Cisco ONS 15454 DWDM Installation and Operations Guide

Product and Software Release 5.0
Last Updated: September 6, 2007

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

Text Part Number: OL-8436-01

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The following information is for FCC compliance of Class A devices: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

The following information is for FCC compliance of Class B devices: The equipment described in this manual generates and may radiate radio-frequency energy. If it is not installed in accordance with Cisco's installation instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in part 15 of the FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

Modifying the equipment without Cisco's written authorization may result in the equipment no longer complying with FCC requirements for Class A or Class B digital devices. In that event, your right to use the equipment may be limited by FCC regulations, and you may be required to correct any interference to radio or television communications at your own expense.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

• Turn the television or radio antenna until the interference stops.

• Move the equipment to one side or the other of the television or radio.

• Move the equipment farther away from the television or radio.

• Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

Modifications to this product not authorized by Cisco Systems, Inc. could void the FCC approval and negate your authority to operate the product.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

CCVP, the Cisco logo, and the Cisco Square Bridge logo are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn is a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networking Academy, Network Registrar, *Packet*, PIX, ProConnect, ScriptShare, SMARTnet, StackWise, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0705R)

Cisco ONS 15454 DWDM Installation and Operations Guide, Release 5.0
Copyright © 2007 Cisco Systems, Inc. All rights reserved.

CONTENTS

About this Guide lxiii

- Revision History lxiii
- Document Objectives lxiv
- Audience lxiv
- Document Organization lxiv
- Related Documentation lxv
- Document Conventions lxv
- Where to Find Safety and Warning Information lxxii
- Obtaining Documentation lxxii
  - Cisco.com lxxii
  - Product Documentation DVD lxxii
  - Cisco Optical Networking Product Documentation CD-ROM lxxiii
  - Ordering Documentation lxxiii
- Documentation Feedback lxxiii
- Cisco Product Security Overview lxxiii
  - Reporting Security Problems in Cisco Products lxxiv
- Obtaining Technical Assistance lxxiv
  - Cisco Technical Support & Documentation Website lxxv
  - Submitting a Service Request lxxv
  - Definitions of Service Request Severity lxxv
- Obtaining Additional Publications and Information lxxvi

CHAPTER 1 **Install the Shelf and Common Control Cards** 1-1

- Before You Begin 1-1
- Required Tools and Equipment (ANSI) 1-3
  - Cisco-Supplied Materials (ANSI) 1-3
  - User-Supplied Materials (ANSI) 1-3
    - Tools Needed (ANSI) 1-4
    - Test Equipment (ANSI) 1-4
- Required Tools and Equipment (ETSI) 1-4
  - Cisco-Supplied Equipment (ETSI) 1-4
  - User-Supplied Equipment (ETSI) 1-5
    - Tools Needed (ETSI) 1-5

Test Equipment (ETSI) 1-6
NTP- G1 Unpack and Inspect the Shelf Assembly 1-6
DLP- G1 Unpack and Verify the Shelf Assembly 1-6
DLP- G2 Inspect the Shelf Assembly 1-7
NTP- G2 Install the Shelf Assembly 1-8
DLP- G3 Reverse the Mounting Bracket to Fit a 19-inch (482.6-mm) Rack (ANSI Only) 1-10
DLP- G4 Install the External Brackets and Air Filter (ANSI Only) 1-11
DLP- G5 Mount the Shelf Assembly in a Rack (One Person) 1-13
DLP- G6 Mount the Shelf Assembly in a Rack (Two People) 1-15
DLP- G7 Mount Multiple Shelf Assemblies in a Rack 1-16
DLP- G8 Install the Air Ramp 1-19
NTP- G3 Open and Remove the Front Door 1-20
DLP- G9 Open the Front Cabinet Compartment (Door) 1-20
DLP- G10 Remove the Front Door 1-21
NTP- G4 Open and Remove the FMEC Cover (ETSI Only) 1-23
DLP- G11 Open the FMEC Cover 1-24
DLP- G12 Remove the FMEC Cover 1-25
NTP- G5 Remove the Backplane Covers (ANSI Only) 1-26
DLP- G13 Remove the Lower Backplane Cover 1-26
DLP- G14 Remove the Backplane Sheet Metal Cover 1-27
NTP- G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only) 1-28
NTP- G7 Install the Power and Ground 1-30
DLP- G15 Connect the Office Ground to the ONS 15454 ETSI 1-32
DLP- G16 Connect the Office Ground to the ONS 15454 ANSI 1-33
DLP- G17 Connect Office Power to the ONS 15454 ETSI 1-35
DLP- G18 Connect Office Power to the ONS 15454 ANSI 1-36
DLP- G19 Turn On and Verify Office Power 1-39
NTP- G8 Install the Fan-Tray Assembly 1-40
NTP- G9 Install the Alarm Expansion Panel (ANSI Only) 1-43
NTP- G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections 1-46
DLP- G20 Install Alarm Wires on the MIC-A/P (ETSI Only) 1-47
DLP- G21 Install Timing Wires on the MIC-C/T/P (ETSI Only) 1-50
DLP- G22 Install LAN Wires on the MIC-C/T/P (ETSI Only) 1-51
DLP- G23 Install Alarm Wires on the Backplane (ANSI Only) 1-52
DLP- G24 Install Timing Wires on the Backplane (ANSI Only) 1-54
DLP- G25 Install LAN Wires on the Backplane (ANSI Only) 1-55
DLP- G26 Install the TL1 Craft Interface (ANSI Only) 1-56
NTP- G11 Install an External Wire-Wrap Panel on the AEP (ANSI Only) 1-57

NTP- G12 Install and Close the FMEC Cover (ETSI Only) 1-61
NTP- G13 Install the Rear Cover (ANSI Only) 1-62
NTP- G14 Install DWDM Equipment 1-64
DLP- G27 Install the DCU Shelf Assembly 1-65
DLP- G28 Install the Fiber Patch-Panel Tray 1-65
DLP- G29 Install the Fiber-Storage Tray 1-66
DLP- G30 Install the FlexLayer Shelf 1-66
DLP- G31 Install the FlexLayer Modules 1-67
DLP- G32 Install the Y-Cable Protection Modules 1-69
NTP- G15 Install the Common Control Cards 1-69
DLP- G33 Install the TCC2 or TCC2P Card 1-70
DLP- G34 Install the AIC-I Card 1-73
NTP- G16 Perform the Shelf Installation Acceptance Test 1-74
DLP- G35 Inspect the Shelf Installation and Connections 1-75
DLP- G36 Measure Voltage 1-76

CHAPTER 2 **Connect the PC and Log into the GUI** 2-1
Before You Begin 2-1
NTP- G17 Set Up Computer for CTC 2-1
DLP- G37 Run the CTC Installation Wizard for Windows 2-3
DLP- G38 Run the CTC Installation Wizard for UNIX 2-6
NTP- G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454 2-9
DLP- G39 Set Up a Windows PC for Craft Connection to an ONS 15454 on the Same Subnet Using Static IP Addresses 2-11
DLP- G40 Set Up a Windows PC for Craft Connection to an ONS 15454 Using Dynamic Host Configuration Protocol 2-13
DLP- G41 Set Up a Windows PC for Craft Connection to an ONS 15454 Using Automatic Host Detection 2-16
DLP- G42 Set Up a Solaris Workstation for a Craft Connection to an ONS 15454 2-19
NTP- G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454 2-21
DLP- G43 Disable Proxy Service Using Internet Explorer (Windows) 2-22
DLP- G44 Disable Proxy Service Using Netscape (Windows and UNIX) 2-22
NTP- G20 Set Up a Remote Access Connection to the ONS 15454 2-23
NTP- G21 Log into the ONS 15454 GUI 2-24
DLP- G46 Log into CTC 2-24
DLP- G47 Install Public-Key Security Certificate 2-27
DLP- G48 Create Login Node Groups 2-28
DLP- G49 Add a Node to the Current Session or Login Group 2-29
DLP- G50 Delete a Node from the Current Session or Login Group 2-30

DLP- G51 Delete a Node from a Specified Login Node Group 2-30
DLP- G52 Change the JRE Version 2-31
DLP- G53 Configure the CTC Alerts Dialog Box for Automatic Popup 2-32

CHAPTER 3 **Turn Up a Node** 3-1

Before You Begin 3-1
NTP- G139 Verify Cisco MetroPlanner Reports and Files 3-2
NTP- G22 Verify Common Card Installation 3-4
NTP- G23 Create Users and Assign Security 3-5
DLP- G54 Create a New User on a Single Node 3-6
DLP- G55 Create a New User on Multiple Nodes 3-6
NTP- G24 Set Up Name, Date, Time, and Contact Information 3-8
NTP- G25 Set Power Monitor Thresholds 3-9
NTP- G26 Set Up CTC Network Access 3-10
DLP- G56 Provision IP Settings 3-11
DLP- G57 Set the IP Address, Default Router, and Network Mask Using the LCD 3-14
DLP- G264 Enable Node Security Mode 3-16
DLP- G58 Create a Static Route 3-17
DLP- G59 Set Up or Change Open Shortest Path First Protocol 3-18
DLP- G60 Set Up or Change Routing Information Protocol 3-20
NTP- G27 Set Up the ONS 15454 for Firewall Access 3-21
DLP- G61 Provision the IIOP Listener Port on the ONS 15454 3-23
DLP- G62 Provision the IIOP Listener Port on the CTC Computer 3-23
NTP- G28 Set Up SNMP 3-24
NTP- G29 Preprovision a Slot 3-26
NTP- G30 Install the DWDM Cards 3-27
NTP- G31 Install the DWDM Dispersion Compensating Units 3-30
NTP- G32 Install the Transponder and Muxponder Cards 3-31
DLP- G273 Preprovision an SFP or XFP Slot 3-33
DLP- G63 Install an SFP or XFP 3-34
DLP- G64 Remove an SFP or XFP 3-34
NTP- G123 Install the Filler Cards 3-35
NTP- G33 Create a Y-Cable Protection Group 3-36
NTP- G34 Install Fiber-Optic Cables on DWDM Cards and DCUs 3-39
DLP- G65 Install Fiber-Optic Cables for OSC Link Terminations Between Two Adjacent Nodes 3-42
DLP- G66 Install Fiber-Optic Cables for a Hub Node 3-45
DLP- G67 Install Fiber-Optic Cables for a Terminal Node 3-47
DLP- G68 Install Fiber-Optic Cables for a Line Amplifier Node 3-49

DLP- G69 Install Fiber-Optic Cables for an OSC Regeneration Node 3-51
DLP- G70 Install Fiber-Optic Cables for an Amplified or Passive OADM Node 3-54
DLP- G71 Install Fiber-Optic Cables for an ROADM Node 3-59
NTP- G140 Install Fiber-Optic Cables Between a Terminal, Hub, or ROADM Node and the Transponder Cards 3-63
DLP- G315 Install Fiber-Optic Cables From the 32WSS/32DMX and 32MUX-O/32DMX-O Cards to the Patch Panel 3-64
DLP- G316 Install Fiber-Optic Cables from a TXP/MXP Node to the Patch Panel 3-68
NTP- G141 Install Fiber-Optic Cables for Y-Cable Protection Modules 3-69
NTP- G36 Calculate Cable Connections 3-70
DLP- G72 Create a DWDM Connection 3-71
DLP- G73 Delete a DWDM Connection 3-72
NTP- G138 Import a Cisco MetroPlanner Configuration File 3-72
NTP- G37 Run Automatic Node Setup 3-73
NTP- G38 Provision OSC Terminations and Ring ID 3-74
NTP- G39 Verify OSCM and OSC-CSM Transmit Power 3-76
DLP- G313 Verify OSC-CSM Transmit Power 3-77
DLP- G314 Verify OSCM Transmit Power 3-78

CHAPTER 4 **Perform Node Acceptance Tests** 4-1

Before You Begin 4-1
NTP- G41 Perform the Terminal and Hub Node with 32MUX-O and 32DMX-O Cards Acceptance Test 4-2
DLP- G268 Provision TXP_MR_2.5G Cards for Acceptance Testing 4-4
NTP- G42 Perform the Terminal Node with 32WSS and 32DMX Cards Acceptance Test 4-5
NTP- G43 Perform the ROADM Node Acceptance Test 4-8
DLP- G310 Verify ROADM Node Pass-Through Channels 4-12
DLP- G311 Verify the East ROADM Add/Drop Channels 4-16
DLP- G312 Verify the West ROADM Add/Drop Channels 4-18
NTP- G44 Perform the Anti-ASE Hub Node Acceptance Test 4-20
NTP- G45 Perform the Line Amplifier Node with OSCM Cards Acceptance Test 4-23
NTP- G46 Perform the Line Amplifier Node with OSC-CSM Cards Acceptance Test 4-26
NTP- G47 Perform the Line Amplifier Node with OSCM and OSC-CSM Cards Acceptance Test 4-30
NTP- G48 Perform the OADM Node Acceptance Test on a Symmetric Node with OSCM Cards 4-33
NTP- G49 Perform the OADM Active Node Acceptance Test on a Symmetric Node with OSC-CSM Cards 4-35
NTP- G50 Perform the OADM Passive Node Acceptance Test on a Symmetric Node with OSC-CSM Cards 4-37
DLP- G78 Verify the 32MUX-O Power 4-39

DLP- G79 Verify the OPT-BST Amplifier Laser and Power 4-39
DLP- G80 Verify the OPT-PRE Amplifier Laser and Power 4-40
DLP- G269 Verify the 32DMX-O Power 4-40
DLP- G270 Verify the 32DMX Power 4-41
DLP- G82 Verify the OSC-CSM Power 4-41
DLP- G83 Verify the OSC-CSM Power on OADM Nodes 4-42
DLP- G84 Verify the OSC-CSM Incoming Power 4-42
DLP- G85 Verify Express Channel Connections on an OADM Node with OSCM Cards 4-43
DLP- G86 Verify Express Channel Connections on an OADM Node with OSC-CSM Cards 4-44
DLP- G87 Verify the AD-xB-xx.x Output Express Power 4-45
DLP- G88 Verify the AD-xC-xx.x Output Express Power 4-46
DLP- G271 Verify the AD-xC-xx.x Output Common Power 4-46
DLP- G272 Verify the AD-xB-xx.x Output Common Power 4-46
DLP- G89 Verify OADM Node Pass-Through Channel Connections 4-47
DLP- G90 Verify an AD-xB-xx.x Pass-Through Connection Power 4-48
DLP- G91 Verify an AD-xC-xx.x Pass-Through Connection 4-49
DLP- G92 Verify 4MD-xx.x Pass-Through Connection Power 4-50
DLP- G93 Verify Add and Drop Connections on an OADM Node with OSCM Cards 4-51
DLP- G94 Verify Add and Drop Connections on OADM Node with OSC-CSM Cards 4-54

CHAPTER 5 **Provision Transponder and Muxponder Cards** 5-1

Before You Begin 5-1

NTP- G128 Manage Pluggable Port Modules 5-2

DLP- G277 Provision a Multirate PPM 5-3
DLP- G278 Provision the Optical Line Rate 5-3
DLP- G274 Verify Topologies for ETR_CLO and ISC Services 5-6
DLP- G280 Delete a PPM 5-7

NTP- G96 Modify Line Settings and PM Parameter Thresholds for TXP_MR_10G and TXP_MR_10E Cards 5-8

DLP- G216 Change Card Settings for TXP_MR_10G and TXP_MR_10E Cards 5-9
DLP- G217 Change Line Settings for TXP_MR_10G and TXP_MR_10E Cards 5-10
DLP- G218 Change Section Trace Settings for the TXP_MR_10G and TXP_MR_10E Cards 5-13
DLP- G219 Change the TXP_MR_10G or TXP_MR_10E Card Line Thresholds for SONET or SDH Payloads 5-15
DLP- G319 Change the TXP_MR_10G or TXP_MR_10E Card Line Thresholds for 10G Ethernet LAN Phy 5-16
DLP- G301 Provision the TXP_MR_10G and TXP_MR_10E Trunk Port Alarm and TCA Thresholds 5-19
DLP- G302 Provision the TXP_MR_10G and TXP_MR_10E Client Port Alarm and TCA Thresholds 5-20

DLP- G221 Change OTN Settings for TXP_MR_10G and TXP_MR_10E Cards 5-22

NTP- G97 Modify Line Settings and PM Parameter Thresholds for MXP_2.5G_10G and MXP_2.5G_10E Cards 5-25

DLP- G222 Change Card Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards 5-26

DLP- G223 Change Line Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards 5-28

DLP- G224 Change Section Trace Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards 5-30

DLP- G225 Change Trunk Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards 5-31

DLP- G226 Change Line Thresholds Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards 5-33

DLP- G303 Provision the MXP_2.5G_10G and MXP_2.5G_10E Trunk Port Alarm and TCA Thresholds 5-34

DLP- G304 Provision the MXP_2.5G_10G and MXP_2.5G_10E Client Port Alarm and TCA Thresholds 5-35

DLP- G228 Change Line OTN Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards 5-36

NTP- G98 Modify Line Settings and PM Parameter Thresholds for TXP_MR_2.5G and TXPP_MR_2.5G Cards 5-39

DLP- G229 Change Card Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards 5-40

DLP- G230 Change Line Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards 5-42

DLP- G231 Change Section Trace Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards 5-43

DLP- G232 Change TXP_MR_2.5G and TXPP_MR_2.5G Cards Line Threshold Settings for SONET or SDH Payloads 5-45

DLP- G320 Change the TXP_MR_2.5G or TXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads 5-46

DLP- G305 Provision the TXP_MR_2.5G and TXPP_MR_2.5G Trunk Port Alarm and TCA Thresholds 5-47

DLP- G306 Provision the TXP_MR_2.5G and TXPP_MR_2.5G Cards Client Port Alarm and TCA Thresholds 5-48

DLP- G234 Change OTN Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards 5-51

NTP- G99 Modify Line Settings and PM Parameter Thresholds for MXP_MR_2.5G and MXPP_MR_2.5G Cards 5-53

DLP- G235 Change Card Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards 5-54

DLP- G236 Change Client Line Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards 5-55

DLP- G237 Change Distance Extension Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards 5-57

DLP- G238 Change OC-48/STM-16 Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards 5-58

DLP- G239 Change Section Trace Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards 5-60

DLP- G240 Change MXP_MR_2.5G and MXPP_MR_2.5G Cards Line Threshold Settings for SONET or SDH Payloads 5-61

DLP- G321 Change the MXP_MR_2.5G or MXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads 5-62

DLP- G307 Provision the MXP_MR_2.5G and MXPP_MR_2.5G Trunk Port Alarm and TCA Thresholds 5-64

DLP- G308 Provision the MXP_MR_2.5G and MXPP_MR_2.5G Client Port Alarm and TCA Thresholds 5-65

CHAPTER 6 **Turn Up Network** 6-1

Before You Begin 6-1

NTP- G51 Verify DWDM Node Turn Up 6-1

NTP- G52 Verify Node-to-Node Connections 6-3

NTP- G53 Set Up Timing 6-3

DLP- G95 Set Up External or Line Timing 6-4

DLP- G96 Set Up Internal Timing 6-6

NTP- G54 Provision and Verify a DWDM Network 6-7

DLP- G99 Create a Provisionable Patchcord 6-10

NTP- G56 Verify the OSNR 6-11

NTP- G142 Perform a Protection Switch Test 6-12

NTP- G57 Create a Logical Network Map 6-14

CHAPTER 7 **Create Channels and Circuits** 7-1

Before You Begin 7-1

NTP- G58 Locate and View Optical Channel Network Connections 7-2

DLP- G100 Search for Optical Channel Network Connections 7-2

DLP- G101 View Optical Channel Network Connection Information 7-3

DLP- G102 Filter the Display of Optical Channel Network Connections 7-6

DLP- G103 View Optical Channel Network Connections on a Span 7-8

NTP- G59 Create and Delete Optical Channel Network Connections 7-9

DLP- G104 Assign a Name to a Port 7-9

DLP- G105 Provision DWDM Optical Channel Network Connections 7-10

DLP- G106 Delete Optical Channel Network Connections 7-12

NTP- G60 Create Overhead Circuits 7-13

DLP- G76 Provision GCC Terminations 7-13

DLP- G97 Provision a Proxy Tunnel 7-14

DLP- G98 Provision a Firewall Tunnel 7-15

DLP- G107 Create an IP-Encapsulated Tunnel 7-16

DLP- G108 Change the Service State for a Port 7-17

DLP- G109 Provision Orderwire 7-18

DLP- G110 Create a User Data Channel Circuit 7-19

NTP- G61 Modify and Delete Overhead Circuits 7-20

DLP- G111 Repair an IP Tunnel 7-21

DLP- G112 Delete Overhead Circuits 7-21

NTP- G62 Create a J0 Section Trace 7-22

CHAPTER 8 **Manage Alarms** 8-1

Before You Begin 8-1

NTP- G63 Document Existing Provisioning 8-2

DLP- G113 Print CTC Data 8-2

DLP- G114 Export CTC Data 8-4

NTP- G64 View Alarms, History, Events, and Conditions 8-5

DLP- G115 View Alarms 8-6

DLP- G116 View Alarm or Event History 8-8

DLP- G117 Change the Maximum Number of Session Entries for Alarm History 8-9

DLP- G118 Display Alarms and Conditions Using Time Zone 8-10

DLP- G119 Synchronize Alarms 8-11

DLP- G120 View Conditions 8-11

NTP- G65 Delete Cleared Alarms from Display 8-13

NTP- G66 View Alarm-Affected Circuits 8-14

NTP- G67 View Alarm Counts on the LCD for a Node, Slot, or Port 8-14

NTP- G68 Create, Download, and Assign Alarm Severity Profiles 8-16

DLP- G121 Create a New or Cloned Alarm Severity Profile 8-16

DLP- G122 Download an Alarm Severity Profile 8-19

DLP- G123 Apply Alarm Profiles to Ports 8-20

DLP- G124 Apply Alarm Profiles to Cards and Nodes 8-22

DLP- G125 Delete Alarm Severity Profiles 8-22

NTP- G69 Enable, Modify, or Disable Alarm Severity Filtering 8-24

DLP- G126 Enable Alarm Filtering 8-25

DLP- G127 Modify Alarm, Condition, and History Filtering Parameters 8-25

DLP- G128 Disable Alarm Filtering 8-27

NTP- G70 Suppress Alarms or Discontinue Alarm Suppression 8-28

DLP- G129 Suppress Alarm Reporting 8-28

DLP- G130 Discontinue Alarm Suppression 8-30

NTP- G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card 8-31

CHAPTER 9 **Monitor Performance** 9-1

Before You Begin 9-1

NTP- G73 Change the PM Display 9-2

DLP- G131 Refresh PM Counts at 15-Minute Intervals 9-2

DLP- G132 Refresh PM Counts at One-Day Intervals 9-3

DLP- G133 View Near-End PM Counts 9-4
DLP- G134 View Far-End PM Counts 9-5
DLP- G135 Reset Current PM Counts 9-5
DLP- G136 Clear Selected PM Counts 9-6
DLP- G137 Set Auto-Refresh Interval for Displayed PM Counts 9-7
DLP- G138 Refresh PM Counts for a Different Port 9-8
NTP- G74 Monitor DWDM Card Performance 9-8
DLP- G139 View Optical Service Channel PM Parameters 9-9
DLP- G140 View Optical Amplifier Power Statistics 9-11
DLP- G141 View Optical Power Statistics for 32MUX-O, 32-WSS, 32-DMX-O, and 32DMX Cards 9-12
DLP- G276 View 4-Channel Multiplexer/Demultiplexer Optical Power Statistics 9-14
DLP- G142 View Channel Optical Add/Drop Multiplexer Power Statistics 9-15
DLP- G143 View Band Optical Add/Drop Multiplexer Power Statistics 9-17
NTP- G75 Monitor Transponder and Muxponder Performance 9-18
DLP- G144 Enable/Disable OTN ITU-T G.709 Performance Monitoring 9-19
DLP- G145 Enable/Disable OTN FEC Performance Monitoring 9-20
DLP- G146 View Optics PM Parameters 9-21
DLP- G147 View Payload PM Parameters 9-22
DLP- G148 View OTN PM Parameters 9-24
DLP- G149 View Payload Statistics PM Parameters 9-26
DLP- G150 View Payload Utilization PM Parameters 9-27
DLP- G151 View Payload History PM Parameters 9-29
DLP- G152 View Payload SONET PM Parameters 9-30
DLP- G153 Create RMON Alarm Thresholds 9-32
DLP- G154 Delete RMON Alarm Thresholds 9-34

CHAPTER 10 **Manage the Node** 10-1
Before You Begin 10-1
NTP- G76 Verify Span Loss 10-2
DLP- G155 Verify Optical Span Loss Using CTC 10-2
NTP- G77 Manage Automatic Power Control 10-3
DLP- G157 Disable Automatic Power Control 10-4
DLP- G158 Enable Automatic Power Control 10-4
DLP- G159 Refresh Automatic Power Control Information 10-5
NTP- G78 View ROADM Node Power Equalization 10-5
NTP- G80 Change Node Management Information 10-6
DLP- G160 Change the Node Name, Date, Time, and Contact Information 10-7
DLP- G161 Change the Login Legal Disclaimer 10-8

NTP- G81 Change CTC Network Access **10-9**
DLP- G162 Change IP Settings **10-10**
DLP- G265 Lock Node Security **10-11**
DLP- G266 Modify Backplane Port IP Settings **10-11**
DLP- G267 Disable Node Security Mode **10-12**
DLP- G163 Modify a Static Route **10-13**
DLP- G164 Delete a Static Route **10-14**
DLP- G165 Disable OSPF **10-14**
DLP- G166 Delete a Proxy Tunnel **10-15**
DLP- G167 Delete a Firewall Tunnel **10-15**
NTP- G82 Customize the CTC Network View **10-16**
DLP- G168 Change the Network View Background Color **10-16**
DLP- G169 Change the Default Network View Background Map **10-17**
DLP- G170 Apply a Custom Network View Background Map **10-18**
DLP- G171 Create Domain Icons **10-18**
DLP- G172 Manage Domain Icons **10-19**
DLP- G173 Enable Dialog Box Do-Not-Display Option **10-20**
DLP- G174 Switch Between TDM and DWDM Network Views **10-21**
NTP- G83 Modify or Delete Card Protection Settings **10-21**
DLP- G175 Modify a Y-Cable Protection Group **10-22**
DLP- G176 Modify a Splitter Protection Group **10-23**
DLP- G177 Delete a Y-Cable Protection Group **10-23**
NTP- G84 Initiate and Clear Y-Cable and Splitter External Switching Commands **10-24**
DLP- G178 Apply a Manual Y-Cable or Splitter Protection Switch **10-25**
DLP- G179 Apply a Force Y-Cable or Splitter Protection Switch **10-25**
DLP- G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch **10-26**
DLP- G181 Apply a Lock-On **10-26**
DLP- G182 Apply a Lockout **10-27**
DLP- G183 Clear a Lock-On or Lockout **10-28**
NTP- G85 Modify or Delete OSC Terminations, GCC Terminations, and Provisionable Patchcords **10-28**
DLP- G184 Change a GCC Termination **10-29**
DLP- G185 Delete a GCC Termination **10-30**
DLP- G186 Delete an OSC Termination **10-30**
DLP- G187 Delete a Provisionable Patchcord **10-31**
NTP- G86 Convert a Pass-Through Connection to an Add/Drop Connection **10-32**
NTP- G87 Change Node Timing Parameters **10-33**
NTP- G88 Modify Users and Change Security **10-35**
DLP- G188 Change Security Policy for a Single Node **10-35**
DLP- G189 Change Security Policy for Multiple Nodes **10-37**

DLP- G190 Change Node Access and PM Clearing Privilege 10-38
DLP- G191 Change User Password and Security Level on a Single Node 10-39
DLP- G192 Change User Password and Security Level for Multiple Nodes 10-40
DLP- G193 Delete a User From a Single Node 10-40
DLP- G194 Delete a User From Multiple Nodes 10-41
DLP- G195 Log Out a User on a Single Node 10-42
DLP- G196 Log Out a User on Multiple Nodes 10-42
NTP- G131 Convert DWDM Nodes to Hybrid Nodes 10-43
NTP- G89 Change SNMP Settings 10-46
DLP- G197 Modify SNMP Trap Destinations 10-46
DLP- G198 Delete SNMP Trap Destinations 10-47

CHAPTER 11 **Change DWDM Card Settings** 11-1
Before You Begin 11-1
NTP- G90 Modify OSCM and OSC-CSM Line Settings and PM Parameters and Thresholds 11-2
DLP- G199 Change the OSCM and OSC-CSM Optical Service Channel Settings 11-2
DLP- G200 Change the OSCM and OSC-CSM Optical Service Channel Thresholds 11-5
DLP- G201 Change Optical Line Parameters for OSCM and OSC-CSM Cards 11-6
DLP- G202 Change the OSCM and OSC-CSM Optical Line Threshold Settings 11-8
DLP- G203 Change the OSCM and OSC-CSM ALS Maintenance Settings 11-10
NTP- G91 Modify OPT-PRE and OPT-BST Line Settings and PM Parameters and Thresholds 11-11
DLP- G204 Change Optical Line Settings for OPT-PRE and OPT-BST Amplifiers 11-12
DLP- G205 Change Optical Line Threshold Settings for OPT-PRE and OPT-BST Amplifiers 11-14
DLP- G206 Change Optical Amplifier Line Settings for OPT-PRE and OPT-BST Amplifiers 11-15
DLP- G207 Change Optical Channel Threshold Settings for OPT-PRE and OPT-BST Amplifiers 11-17
DLP- G322 Change the OPT-BST ALS Maintenance Settings 11-21
NTP- G92 Modify 32MUX-O, 32DMX-O, 32DMX, and 4MD Line Settings and PM Thresholds 11-22
DLP- G208 Change Optical Line Settings for Multiplexer and Demultiplexer Cards 11-23
DLP- G209 Change Optical Line Threshold Settings for Multiplexer and Demultiplexer Cards 11-25
DLP- G210 Change Optical Channel Settings for Multiplexer and Demultiplexer Cards 11-26
DLP- G211 Change Optical Channel Threshold Settings for Multiplexer and Demultiplexer Cards 11-29
NTP- G93 Modify the 32WSS Thresholds and Settings 11-31
DLP- G212 Change Optical Channel Parameters for the 32WSS Card 11-32
DLP- G213 Change the 32WSS Optical Channel Thresholds 11-35
DLP- G214 Change Optical Line Parameters for the 32WSS Card 11-37
DLP- G215 Change the 32WSS Card Optical Line Thresholds 11-39
NTP- G101 Modify Alarm Interface Controller–International Settings 11-41
DLP- G245 Change External Alarms Using the AIC-I Card 11-41

DLP- G246 Change External Controls Using the AIC-I Card 11-42
DLP- G247 Change AIC-I Card Orderwire Settings 11-43
NTP- G102 Change Card Service State 11-44

CHAPTER 12 **Maintain the Node** 12-1
Before You Begin 12-1
NTP- G103 Back Up the Database 12-2
NTP- G104 Restore the Database 12-3
NTP- G105 Restore the Node to Factory Configuration 12-4
DLP- G248 Use the Reinitialization Tool to Clear the Database and Upload Software (Windows) 12-5
DLP- G249 Use the Reinitialization Tool to Clear the Database and Upload Software (UNIX) 12-7
NTP- G106 Reset Cards Using CTC 12-9
DLP- G250 Reset the TCC2/TCC2P Card 12-9
DLP- G251 Reset DWDM Cards Using CTC 12-10
NTP- G108 Viewing the Audit Trail Records 12-11
NTP- G109 Off-Load the Audit Trail Record 12-13
NTP- G110 Off-Load the Diagnostics File 12-13
NTP- G112 Change the Node Timing Reference 12-14
DLP- G259 Manual or Force Switch the Node Timing Reference 12-15
DLP- G260 Clear a Manual or Force Switch on a Node Timing Reference 12-15
NTP- G113 View the ONS 15454 Timing Report 12-16
NTP- G114 Inspect, Clean, and Replace the Air Filter 12-19
NTP- G115 Clean Fiber Connectors 12-22
DLP- G261 Scope and Clean Fiber Connectors and Adapters with Alcohol and Dry Wipes 12-23
DLP- G262 Clean Fiber Connectors with CLETOP 12-23
DLP- G263 Clean the Fiber Adapters 12-24
NTP- G40 Replace the Front Door 12-25
NTP- G116 Replace the Fan-Tray Assembly 12-27
NTP- G117 Replace the ANSI Shelf Alarm Interface Panel 12-32
NTP- G118 Replace the ANSI Shelf Plastic Lower Backplane Cover 12-36
NTP- G135 Edit Network Element Defaults 12-38
NTP- G136 Import Network Element Defaults 12-39
NTP- G137 Export Network Element Defaults 12-40

CHAPTER 13 **Power Down a Node** 13-1
NTP- G119 Power Down the Node 13-1

CHAPTER 14 **Shelf Hardware Reference** 14-1

14.1 Overview 14-2
14.1.1 Cisco ONS 15454 ANSI 14-2
14.1.2 Cisco ONS 15454 ETSI 14-2
14.2 ONS 15454 ANSI Rack Installation 14-3
14.2.1 Reversible Mounting Bracket 14-4
14.2.2 Mounting a Single Node 14-5
14.2.3 Mounting Multiple Nodes 14-5
14.2.4 ONS 15454 ANSI Bay Assembly 14-6
14.3 ONS 15454 ETSI Rack Installation 14-6
14.3.1 Mounting a Single Node 14-7
14.3.2 Mounting Multiple Nodes 14-8
14.4 FlexLayer and Y-Cable Protection 14-9
14.4.1 FlexLayer Modules 14-10
14.4.2 Y-Cable Protection Module 14-13
14.5 Typical DWDM Rack Layouts 14-16
14.6 Front Door 14-19
14.7 ONS 15454 ANSI Backplane Covers 14-26
14.7.1 Lower Backplane Cover 14-27
14.7.2 Rear Cover 14-28
14.7.3 Alarm Interface Panel 14-29
14.7.4 Alarm Interface Panel Replacement 14-29
14.8 ONS 15454 ETSI Front Mount Electrical Connection 14-30
14.9 ONS 15454 ANSI Alarm Expansion Panel 14-30
14.10 Filler Card 14-35
14.11 Cable Routing and Management 14-36
14.11.1 Fiber Management 14-37
14.11.2 Fiber Management Using the Patch-Panel Tray 14-39
14.11.3 Fiber Management Using the Fiber-Storage Tray 14-39
14.11.4 Fiber Management Using the Optional ANSI Tie-Down Bar 14-40
14.12 Fan-Tray Assembly 14-41
14.12.1 Fan Speed and Power Requirements 14-42
14.12.2 Fan Failure 14-43
14.12.3 Air Filter 14-43
14.13 Power and Ground Description 14-43
14.13.1 ONS 15454 ANSI Power and Ground 14-43
14.13.2 ONS 15454 ETSI Power and Ground 14-44
14.14 ONS 15454 ANSI Alarm, Timing, LAN, and Craft Pin Connections 14-44

14.14.1 Alarm Contact Connections 14-45
14.14.2 Timing Connections 14-46
14.14.3 LAN Connections 14-47
14.14.4 TL1 Craft Interface Installation 14-47
14.15 Cards and Slots 14-48
14.15.1 Card Slot Requirements 14-49
14.15.2 Card Replacement 14-50
14.16 Ferrites (ANSI Only) 14-50

CHAPTER 15 **Card Reference** 15-1
15.1 Card Overview 15-2
15.1.1 Common Control Cards 15-2
15.1.2 Front Mount Electrical Connections (ETSI only) 15-2
15.1.3 DWDM Cards 15-2
15.1.4 Transponder and Muxponder Cards 15-3
15.1.5 Card Summary 15-3
15.1.6 Card Compatibility 15-5
15.1.7 Multiplexer, Demultiplexer, and OADM Card Interface Classes 15-6
15.1.8 DWDM Card Channel Allocation Plan 15-8
15.2 Common Control Cards 15-9
15.2.1 TCC2 Card 15-10
15.2.1.1 TCC2 Functionality 15-11
15.2.1.2 Redundant TCC2 Card Installation 15-12
15.2.1.3 TCC2 Card-Level Indicators 15-12
15.2.1.4 Network-Level Indicators 15-12
15.2.2 TCC2P Card 15-13
15.2.3 TCC2P Functionality 15-15
15.2.3.1 Redundant TCC2P Card Installation 15-15
15.2.3.2 TCC2P Card-Level Indicators 15-16
15.2.3.3 Network-Level Indicators 15-16
15.2.4 AIC-I Card 15-16
15.2.4.1 AIC-I Card-Level Indicators 15-17
15.2.4.2 External Alarms and Controls 15-18
15.2.4.3 Orderwire 15-19
15.2.4.4 Power Monitoring 15-20
15.2.4.5 User Data Channel 15-20
15.2.4.6 Data Communications Channel 15-21
15.3 Front Mount Electrical Connections 15-21
15.3.1 MIC-A/P FMEC 15-21

15.3.2 MIC-C/T/P FMEC 15-24
15.4 Optical Service Channel Cards 15-25
15.4.1 OSCM Card 15-26
15.4.1.1 Power Monitoring 15-28
15.4.1.2 OSCM Card-Level Indicators 15-29
15.4.1.3 OSCM Port-Level Indicators 15-29
15.4.2 OSC-CSM Card 15-29
15.4.2.1 Power Monitoring 15-33
15.4.2.2 OSC-CSM Card-Level Indicators 15-34
15.4.2.3 OSC-CSM Port-Level Indicators 15-34
15.5 Optical Amplifier Cards 15-34
15.5.1 OPT-PRE Amplifier 15-35
15.5.1.1 Power Monitoring 15-37
15.5.1.2 OPT-PRE Amplifier Card-Level Indicators 15-38
15.5.1.3 OPT-PRE Port-Level Indicators 15-38
15.5.2 OPT-BST Amplifier Card 15-38
15.5.2.1 Power Monitoring 15-40
15.5.2.2 OPT-BST Amplifier Card-Level Indicators 15-41
15.5.2.3 OPT-BST Port-Level Indicators 15-41
15.5.3 OPT-BST-E Amplifier Card 15-41
15.5.3.1 Power Monitoring 15-44
15.5.3.2 OPT-BST-E Amplifier Card-Level Indicators 15-45
15.5.3.3 OPT-BST-E Port-Level Indicators 15-45
15.6 Multiplexer and Demultiplexer Cards 15-45
15.6.1 32MUX-O Card 15-45
15.6.1.1 Channel Plan 15-47
15.6.1.2 Power Monitoring 15-49
15.6.1.3 32MUX-O Card-Level Indicators 15-49
15.6.1.4 32MUX-O Port-Level Indicators 15-49
15.6.2 32DMX-O Card 15-49
15.6.2.1 Power Monitoring 15-51
15.6.2.2 32DMX-O Card-Level Indicators 15-52
15.6.2.3 32DMX-O Port-Level Indicators 15-52
15.6.3 32DMX Card 15-52
15.6.3.1 ROADM 15-54
15.6.3.2 Power Monitoring 15-55
15.6.3.3 32DMX Card-Level Indicators 15-55
15.6.3.4 32DMX Port-Level Indicators 15-55
15.6.4 4MD-xx.x Card 15-55

15.6.4.1 Wavelength Pairs 15-58
15.6.4.2 Power Monitoring 15-58
15.6.4.3 4MD-xx.x Card-Level Indicators 15-58
15.6.4.4 4MD-xx.x Port-Level Indicators 15-59
15.7 Optical Add/Drop Multiplexer Cards 15-59
15.7.1 AD-1C-xx.x Card 15-59
15.7.1.1 Power Monitoring 15-61
15.7.1.2 AD-1C-xx.x Card-Level Indicators 15-62
15.7.1.3 AD-1C-xx.x Port-Level Indicators 15-62
15.7.2 AD-2C-xx.x Card 15-62
15.7.2.1 Wavelength Pairs 15-64
15.7.2.2 Power Monitoring 15-65
15.7.2.3 AD-2C-xx.x Card-Level Indicators 15-65
15.7.2.4 AD-2C-xx.x Port-Level Indicators 15-66
15.7.3 AD-4C-xx.x Card 15-66
15.7.3.1 Wavelength Pairs 15-68
15.7.3.2 Power Monitoring 15-69
15.7.3.3 AD-4C-xx.x Card-Level Indicators 15-69
15.7.3.4 AD-4C-xx.x Port-Level Indicators 15-70
15.7.4 AD-1B-xx.x Card 15-70
15.7.4.1 Power Monitoring 15-72
15.7.4.2 AD-1B-xx.x Card-Level Indicators 15-73
15.7.4.3 AD-1B-xx.x Port-Level Indicators 15-73
15.7.5 AD-4B-xx.x Card 15-73
15.7.5.1 Power Monitoring 15-75
15.7.5.2 AD-4B-xx.x Card-Level Indicators 15-76
15.7.5.3 AD-4B-xx.x Port-Level Indicators 15-76
15.7.6 32WSS Card 15-76
15.7.6.1 Power Monitoring 15-81
15.7.6.2 32WSS Card-Level Indicators 15-81
15.7.6.3 32WSS Port-Level Indicators 15-81
15.8 Transponder and Muxponder Cards 15-82
15.8.1 TXP_MR_10G Card 15-82
15.8.1.1 Y-Cable Protection 15-83
15.8.1.2 Automatic Laser Shutdown 15-83
15.8.1.3 TXP_MR_10G Card-Level Indicators 15-84
15.8.1.4 TXP_MR_10G Port-Level Indicators 15-84
15.8.2 TXP_MR_10E Card 15-84
15.8.2.1 Key Features 15-85
15.8.2.2 Faceplate and Block Diagram 15-85

15.8.2.3 Client Interface 15-86
15.8.2.4 DWDM Trunk Interface 15-86
15.8.2.5 Y-Cable Protection 15-86
15.8.2.6 Enhanced FEC (E-FEC) Feature 15-87
15.8.2.7 FEC and E-FEC Modes 15-87
15.8.2.8 Client-to-Trunk Mapping 15-87
15.8.2.9 Automatic Laser Shutdown 15-87
15.8.2.10 TXP_MR_10E Card-Level Indicators 15-88
15.8.2.11 TXP_MR_10E Port-Level Indicators 15-88
15.8.3 TXP_MR_2.5G and TXPP_MR_2.5G Cards 15-88
15.8.3.1 Faceplate 15-90
15.8.3.2 Block Diagram 15-91
15.8.3.3 Y-Cable Protection 15-92
15.8.3.4 Splitter Protection 15-93
15.8.3.5 Automatic Laser Shutdown 15-93
15.8.3.6 TXP_MR_2.5G and TXPP_MR_2.5G Safety Labels 15-93
15.8.3.7 TXP_MR_2.5G and TXPP_MR_2.5G Card-Level Indicators 15-94
15.8.3.8 TXP_MR_2.5G and TXPP_MR_2.5G Port-Level Indicators 15-95
15.8.4 MXP_2.5G_10G Card 15-95
15.8.4.1 Y-Cable Protection 15-98
15.8.4.2 Automatic Laser Shutdown 15-98
15.8.4.3 Timing Synchronization 15-98
15.8.4.4 MXP_2.5G_10G Card-Level Indicators 15-99
15.8.4.5 MXP_2.5G_10G Port-Level Indicators 15-99
15.8.5 MXP_2.5G_10E Card 15-99
15.8.5.1 Key Features 15-100
15.8.5.2 Faceplate 15-101
15.8.5.3 Client Interfaces 15-102
15.8.5.4 DWDM Interface 15-102
15.8.5.5 Multiplexing Function 15-102
15.8.5.6 Timing Synchronization 15-103
15.8.5.7 Y-Cable Protection 15-103
15.8.5.8 Enhanced FEC (E-FEC) Capability 15-103
15.8.5.9 FEC and E-FEC Modes 15-104
15.8.5.10 SONET/SDH Overhead Byte Processing 15-104
15.8.5.11 Client Interface Monitoring 15-104
15.8.5.12 Wavelength Identification 15-104
15.8.5.13 Automatic Laser Shutdown 15-105
15.8.5.14 Jitter 15-105
15.8.5.15 Lamp Test 15-106

15.8.5.16 Onboard Traffic Generation 15-106
15.8.5.17 MXP_2.5G_10E Card-Level Indicators 15-106
15.8.5.18 MXP_2.5G_10E Port-Level Indicators 15-106
15.8.6 MXP_MR_2.5G and MXPP_MR_2.5G Cards 15-106
15.8.6.1 Faceplates 15-109
15.8.6.2 Block Diagram 15-110
15.8.6.3 Automatic Laser Shutdown 15-111
15.8.6.4 MXP_MR_2.5G and MXPP_MR_2.5G Safety Labels 15-111
15.8.6.5 MXP_MR_2.5G and MXPP_MR_2.5G Card-Level Indicators 15-113
15.8.6.6 MXP_MR_2.5G and MXPP_MR_2.5G Port-Level Indicators 15-113
15.9 Transponder and Muxponder Protection 15-114
15.9.1 Y-Cable Protection 15-114
15.9.2 Splitter Protection 15-115
15.10 Far-End Laser Control (FELC) 15-116
15.11 Jitter Considerations 15-116
15.12 Termination Modes 15-117
15.13 SFP and XFP Modules 15-118
15.13.1 Compatibility by Card 15-118
15.13.2 SFP and XFP Description 15-119

CHAPTER 16 **Node Reference** 16-1
16.1 DWDM Node Configurations 16-1
16.1.1 Hub Node 16-1
16.1.2 Terminal Node 16-3
16.1.3 OADM Node 16-4
16.1.4 ROADM Node 16-8
16.1.5 Anti-ASE Node 16-10
16.1.6 Line Amplifier Node 16-11
16.1.7 OSC Regeneration Node 16-12
16.2 DWDM and TDM Hybrid Node Types 16-14
16.2.1 1+1 Protected Flexible Terminal Node 16-14
16.2.2 Scalable Terminal Node 16-18
16.2.3 Hybrid Terminal Node 16-21
16.2.4 Hybrid OADM Node 16-23
16.2.5 Hybrid Line Amplifier Node 16-24
16.2.6 Amplified TDM Node 16-26
16.3 Automatic Node Setup 16-29
16.3.1 Automatic Node Setup Parameters 16-31
16.3.2 View and Provision ANS Parameters 16-33

CHAPTER 17 **Network Reference** 17-1

17.1 Network Applications 17-1

17.2 Network Topologies 17-2

17.2.1 Hubbed Rings 17-2

17.2.2 Multihubbed Rings 17-2

17.2.3 Any-to-Any Rings 17-3

17.2.4 Meshed Rings 17-4

17.2.5 Linear Configurations 17-5

17.2.6 Single-Span Link 17-6

17.3 Optical Performance 17-6

17.3.1 Optical Performance for Rings and Linear Networks with OADM Nodes 17-8

17.3.2 Optical Performance for Linear Networks Without OADM Nodes 17-10

17.3.3 Optical Performance for ROADM Rings and Linear Networks 17-12

17.3.4 Optical Performance for Single-Span Networks 17-16

17.4 Automatic Power Control 17-17

17.4.1 APC at the Amplifier Card Level 17-18

17.4.2 APC at the Node and Network Levels 17-19

17.4.3 Managing APC 17-20

17.5 ROADM Power Equalization Monitoring 17-22

17.6 Span Loss Verification 17-23

17.7 Network Optical Safety—Automatic Laser Shutdown 17-24

17.7.1 Scenario 1: Fiber Cut in Nodes Using OPT-BST/OPT-BST-E Cards 17-24

17.7.2 Scenario 2: Fiber Cut in Nodes Using OSC-CSM Cards 17-26

17.8 Network-Level Gain—Tilt Management of Optical Amplifiers 17-28

17.8.1 Gain Tilt Control at the Card Level 17-29

17.8.2 System Level Gain Tilt Control 17-31

17.8.2.1 System Gain Tilt Compensation Without ROADM Nodes 17-31

17.8.2.2 System Gain Tilt Compensation With ROADM Nodes 17-33

CHAPTER 18 **CTC Operation Reference** 18-1

18.1 CTC Software Delivery Methods 18-1

18.1.1 CTC Software Installed on the TCC2/TCC2P Card 18-1

18.1.2 CTC Software Installed on the PC or UNIX Workstation 18-3

18.2 CTC Installation Overview 18-3

18.3 PC and UNIX Workstation Requirements 18-4

18.4 ONS 15454 Connections 18-6

18.5 CTC Window 18-7

18.5.1 Node View 18-7

18.5.1.1 CTC Card Colors 18-7
18.5.1.2 Node View Card Shortcuts 18-10
18.5.1.3 Node View Tabs 18-10
18.5.2 Network View 18-11
18.5.3 Card View 18-12
18.6 TCC2/TCC2P Card Reset 18-14
18.7 TCC2/TCC2P Card Database 18-15
18.8 Software Revert 18-15

CHAPTER 19 **Security and Timing Reference** 19-1
19.1 Users and Security 19-1
19.1.1 Security Requirements 19-1
19.1.2 Security Policies 19-5
19.1.2.1 Idle User Timeout 19-5
19.1.2.2 User Password, Login, and Access Policies 19-6
19.1.2.3 Audit Trail 19-6
19.2 Node Timing 19-6
19.2.1 Network Timing Example 19-7
19.2.2 Synchronization Status Messaging 19-8

CHAPTER 20 **CTC Connectivity Reference** 20-1
20.1 IP Networking Overview 20-1
20.2 IP Addressing Scenarios 20-2
20.2.1 Scenario 1: CTC and ONS 15454s on Same Subnet 20-2
20.2.2 Scenario 2: CTC and ONS 15454s Connected to a Router 20-3
20.2.3 Scenario 3: Using Proxy ARP to Enable an ONS 15454 Gateway 20-4
20.2.4 Scenario 4: Default Gateway on CTC Computer 20-7
20.2.5 Scenario 5: Using Static Routes to Connect to LANs 20-8
20.2.6 Scenario 6: Using OSPF 20-10
20.2.7 Scenario 7: Provisioning the ONS 15454 Proxy Server 20-12
20.2.8 Scenario 8: Dual GNEs on a Subnet 20-18
20.2.9 Scenario 9: IP Addressing with Secure Mode Enabled 20-20
20.3 Provisionable Patchcords 20-22
20.4 Routing Table 20-24
20.5 External Firewalls 20-25
20.6 Open GNE 20-27

CHAPTER 21 **Alarm Management Reference** 20-1

21.1 Overview 20-1

21.2 Alarm Counts on the LCD for a Node, Slot, or Port 20-2

21.3 Alarm Display 20-2

21.3.1 Viewing Alarms by Time Zone 20-2

21.3.2 Controlling Alarm Display 20-3

21.3.3 Filtering Alarms 20-3

21.3.4 Conditions Tab 20-3

21.3.5 Controlling the Conditions Display 20-4

21.3.5.1 Retrieving and Displaying Conditions 20-4

21.3.5.2 Conditions Column Descriptions 20-4

21.3.5.3 Filtering Conditions 20-5

21.3.6 Viewing History 20-5

21.3.6.1 History Column Descriptions 20-6

21.3.6.2 Retrieving and Displaying Alarm and Condition History 20-7

21.4 Alarm Severities 20-7

21.5 Alarm Profiles 20-7

21.5.1 Creating and Modifying Alarm Profiles 20-8

21.5.2 Alarm Profile Buttons 20-9

21.5.3 Alarm Profile Editing 20-10

21.5.4 Alarm Severity Options 20-10

21.5.5 Row Display Options 20-10

21.5.6 Applying Alarm Profiles 20-11

21.6 Alarm Suppression 20-11

21.7 External Alarms and Controls 20-12

21.7.1 External Alarms 20-12

21.7.2 External Controls 20-13

21.7.3 Virtual Wires 20-13

APPENDIX A **CTC Information and Shortcuts** A-1

Display Node, Card, and Network Views A-1

Node Icons on the Network View Map A-2

Manage the CTC Window A-4

CTC Menu and Toolbar Options A-5

CTC Mouse Options A-8

Node View Shortcuts A-10

Network View Tasks A-10

Table Display Options A-11

Equipment Inventory A-12

APPENDIX B **Hardware Specifications** B-1

B.1 Shelf Specifications B-1
B.1.1 Bandwidth B-1
B.1.2 Configurations B-1
B.1.3 Cisco Transport Controller B-2
B.1.4 External LAN Interface B-2
B.1.5 TL1 Craft Interface B-2
B.1.6 Modem Interface B-2
B.1.7 Alarm Interface B-2
B.1.8 EIA Interface (ANSI only) B-3
B.1.9 BITS Interface (ANSI only) B-3
B.1.10 System Timing B-3
B.1.11 System Power B-3
B.1.12 System Environmental Specifications B-4
B.1.13 Dimensions B-4
B.2 General Card Specifications B-4
B.2.1 Power B-5
B.2.2 Temperature B-6
B.3 Common Control Card Specifications B-7
B.3.1 TCC2 Card Specifications B-7
B.3.2 TCC2P Card Specifications B-8
B.3.3 AIC-I Card Specifications B-9
B.3.4 AEP Specifications (ANSI only) B-10
B.3.5 MIC-A/P FMEC Specifications (ETSI only) B-11
B.3.6 MIC-C/T/P FMEC Specifications (ETSI only) B-12
B.4 DWDM Card Specifications B-13
B.4.1 OSCM Card Specifications B-13
B.4.2 OSC-CSM Card Specifications B-14
B.4.3 OPT-PRE Amplifier Card Specifications B-14
B.4.4 OPT-BST Amplifier Card Specifications B-15
B.4.5 OPT-BST-E Amplifier Card Specifications B-16
B.4.6 32MUX-O Card Specifications B-17
B.4.7 32DMX-O Card Specifications B-17
B.4.8 32DMX Card Specifications B-18
B.4.9 4MD-xx.x Card Specifications B-20
B.4.10 AD-1C-xx.x Card Specifications B-21
B.4.11 AD-2C-xx.x Card Specifications B-22

B.4.12 AD-4C-xx.x Card Specifications B-23
B.4.13 AD-1B-xx.x Card Specifications B-25
B.4.14 AD-4B-xx.x Card Specifications B-28
B.4.15 32WSS Card Specifications B-32
B.5 Transponder and Muxponder Card Specifications B-34
B.5.1 TXP_MR_10G Card Specifications B-35
B.5.2 MXP_2.5G_10G Card Specifications B-37
B.5.3 TXP_MR_2.5G and TXPP_MR_2.5G Card Specifications B-39
B.5.4 MXP_MR_2.5G and MXPP_MR_2.5G Card Specifications B-41
B.5.5 MXP_2.5G_10E Card Specifications B-44
B.5.6 TXP_MR_10E Card Specifications B-46
B.6 SFP Specifications B-48
SFP Port Cabling Specifications B-49
B.7 XFP Specifications B-50
B.7.1 XFP Port Cabling Specifications B-50

APPENDIX C **DWDM Administrative and Service States** C-1
C.1 Service States C-1
C.2 Administrative States C-2
C.3 Service State Transitions C-3
C.3.1 DWDM Card Service State Transitions C-3
C.3.2 Optical Payload Port Service State Transitions C-5
C.3.3 OSC Port Service State Transitions C-6
C.3.4 OCHNC Service State Transitions C-6
C.3.5 Transponder/Muxponder Card Service State Transitions C-7
C.3.6 Transponder/Muxponder Port Service State Transitions C-11

APPENDIX D **Network Element Defaults** D-1
D.1 Network Element Defaults Description D-1
D.2 ANSI Platform Defaults D-2
D.2.1 ANSI Card Default Settings D-2
D.2.1.1 MXP-2.5G-10E Card Default Settings D-3
D.2.1.2 MXP-2.5G-10G Card Default Settings D-6
D.2.1.3 MXP-MR-2.5G Card Default Settings D-11
D.2.1.4 MXPP-MR-2.5G Card Default Settings D-13
D.2.1.5 TXP-MR-10E Card Default Settings D-15
D.2.1.6 TXP_MR_10G Card Default Settings D-20
D.2.1.7 TXP-MR-2.5G Card Default Settings D-24
D.2.1.8 TXPP-MR-2.5G Card Default Settings D-30

D.2.1.9 OSCM Card Default Settings **D-36**
D.2.1.10 OSC-CSM Card Default Settings **D-37**
D.2.2 ANSI Node Default Settings **D-38**
D.2.3 ANSI CTC Default Settings **D-42**
D.3 ETSI Platform Defaults **D-43**
D.3.1 ETSI Card Default Settings **D-43**
D.3.1.1 MXP_2.5G_10G Card Default Settings **D-44**
D.3.1.2 MXP_2.5G_10E Card Default Settings **D-48**
D.3.1.3 MXP_MR_2.5G Card Default Settings **D-52**
D.3.1.4 MXPP_MR_2.5G Card Default Settings **D-54**
D.3.1.5 TXP_MR_10E Card Default Settings **D-57**
D.3.1.6 TXP_MR_10G Card Default Settings **D-62**
D.3.1.7 TXP_MR_2.5G Card Default Settings **D-67**
D.3.1.8 TXPP_MR_10G Card Default Settings **D-73**
D.3.1.9 OSCM Card Default Settings **D-79**
D.3.1.10 OSC-CSM Card Default Settings **D-80**
D.3.2 ETSI Node Default Settings **D-81**
D.3.3 ETSI CTC Default Settings **D-85**

GLOSSARY

INDEX

Figure 1-1 Reversing the Mounting Brackets (23-inch [584.2-mm] Position to 19-inch [482.6-mm] Position **1-11**

Figure 1-2 Installing the External Brackets **1-12**

Figure 1-3 Mounting an ONS 15454 ETSI in a Rack **1-14**

Figure 1-4 Three-Shelf ONS 15454 ETSI (15454 SDH) Bay Assembly **1-18**

Figure 1-5 Mounting the Air Ramp in a Rack **1-19**

Figure 1-6 Cisco ONS 15454 ANSI Front Door **1-21**

Figure 1-7 Removing the ONS 15454 ETSI Front Door **1-22**

Figure 1-8 Removing the ONS 15454 ANSI Front Door **1-23**

Figure 1-9 Unscrewing the FMEC Cover **1-24**

Figure 1-10 Removing the ONS 15454 FMEC Cover **1-25**

Figure 1-11 Backplane Covers on the 15454 ANSI Shelf **1-27**

Figure 1-12 Installing FMECs on the ONS 15454 ETSI **1-29**

Figure 1-13 Grounding the ONS 15454 ETSI **1-33**

Figure 1-14 Ground Location on the Backplane **1-34**

Figure 1-15 Cisco ONS 15454 Power Terminals **1-37**

Figure 1-16 Installing the Fan-Tray Assembly on the ONS 15454 ETSI **1-41**

Figure 1-17 Installing the Fan-Tray Assembly on the ONS 15454 ANSI **1-42**

Figure 1-18 Replace Backplane Screws with Standoffs **1-44**

Figure 1-19 Installing Standoffs and the AEP **1-45**

Figure 1-20 AEP Wire-Wrap Connections to Backplane Pins **1-45**

Figure 1-21 Cisco ONS 15454 Backplane Pinouts (Release 3.4 or Later) **1-53**

Figure 1-22 Highlighted Environmental Alarms **1-54**

Figure 1-23 Installing the AEP Cover **1-58**

Figure 1-24 Alarm Input Connector **1-60**

Figure 1-25 Alarm Output Connector **1-61**

Figure 1-26 ONS 15454 ETSI FMEC Cover **1-62**

Figure 1-27 Backplane Attachment for the Rear Cover **1-63**

Figure 1-28 Installing the Rear Cover with Spacers **1-64**

Figure 1-29 ONS 15xxx FlexLayer Shelf Assembly **1-68**

Figure 2-1 Logging into CTC **2-26**

Figure 2-2 Login Node Group **2-29**

Figure 3-1 Cisco MetroPlanner Shelf Layout **3-4**
Figure 3-2 Selecting the IP Address Option **3-14**
Figure 3-3 Changing the IP Address **3-15**
Figure 3-4 Selecting the Save Configuration Option **3-15**
Figure 3-5 Saving and Rebooting the TCC2/TCC2P **3-15**
Figure 3-6 Nodes Behind a Firewall **3-22**
Figure 3-7 CTC Computer and ONS 15454 nodes Residing Behind Firewalls **3-22**
Figure 3-8 Creating an SNMP Trap **3-25**
Figure 3-9 Creating a Y-Cable Protection Group **3-38**
Figure 3-10 Cisco MetroPlanner Internal Connections Table **3-40**
Figure 3-11 Fibering OSC Terminations—Hub Node with OSCM Cards **3-43**
Figure 3-12 Fibering a Hub Node **3-46**
Figure 3-13 Fibering a Line Amplifier Node **3-50**
Figure 3-14 Fibering an OSC Regeneration Node **3-52**
Figure 3-15 Fibering an Amplified OADM Node **3-56**
Figure 3-16 Fibering a Passive OADM Node **3-58**
Figure 3-17 Fibering an ROADM Node **3-61**
Figure 3-18 Using the Patch-Panel Latches to Slide the Patch Panel Away from the Tray **3-65**
Figure 3-19 MPO Cable **3-66**
Figure 3-20 Rear View of the Patch Panel **3-67**
Figure 3-21 Top View of the Patch-Panel Bar **3-67**
Figure 3-22 Front View of the Patch Panel **3-68**
Figure 3-23 OSC Terminations Pane **3-75**
Figure 5-1 Single-Span Topology **5-6**
Figure 5-2 Point-to-Point Topology **5-6**
Figure 5-3 Hubs with No Line Amplifiers **5-7**
Figure 5-4 Hubs with Line Amplifiers **5-7**
Figure 6-1 Maintenance > Protection Tabs **6-13**
Figure 8-1 Selecting CTC Data For Print **8-3**
Figure 8-2 Selecting CTC Data For Export **8-4**
Figure 8-3 CTC Preferences Dialog Box **8-10**
Figure 8-4 Shelf LCD Panel **8-15**
Figure 8-5 Store Profiles Dialog Box **8-18**
Figure 8-6 AD-1C Card Alarm Profile **8-21**
Figure 8-7 Select Node/Profile Combination For Delete Dialog Box **8-23**

Figure 8-8 Alarm Filter Dialog Box General Tab **8-26**
Figure 8-9 Alarm Filter Dialog Box Conditions Tab **8-26**
Figure 8-10 Provisioning External Alarms on the AIC-I Card **8-32**
Figure 9-1 OC3 Line Tab in the Optical Service Channel Card View Performance Window **9-10**
Figure 9-2 Optical Line Tab in the Optical Amplifier Card View Performance Window **9-11**
Figure 9-3 Optical Channel Tab in the Multiplexer/Demultiplexer Card View Performance Window **9-13**
Figure 9-4 Optical Channel Tab in the 4MD Card View Performance Window **9-14**
Figure 9-5 Optical Line Tab in the Channel Filter OADM Card View Performance Window **9-16**
Figure 9-6 Viewing Optics Performance Monitoring Information **9-22**
Figure 9-7 Viewing Payload Performance Monitoring Information **9-23**
Figure 9-8 Viewing OTN ITU-T G.709 Performance Monitoring Information **9-24**
Figure 9-9 Viewing OTN FEC Performance Monitoring Information **9-25**
Figure 9-10 Statistics Tab on the Card View Performance Window **9-26**
Figure 9-11 Utilization Tab on the Card View Performance Window **9-28**
Figure 9-12 History Tab on the Card View Performance Window **9-29**
Figure 9-13 SONET PM Tab on the Card View Performance Window **9-31**
Figure 10-1 Equalized ROADM Power Example **10-6**
Figure 12-1 Restoring the Database—In-Process Notification **12-3**
Figure 12-2 Reinitialization Tool **12-6**
Figure 12-3 Viewing the Audit Trail Records **12-12**
Figure 12-4 ANSI Shelf Fan-Tray Air Filter in an External Filter Bracket (Front Door Removed) **12-20**
Figure 12-5 ETSI Shelf Fan-Tray Air Filter in an External Filter Bracket (Front Door Removed) **12-20**
Figure 12-6 Installing the Door Ground Strap Retrofit Kit **12-25**
Figure 12-7 Shelf Assembly with Door Ground Strap Retrofit Kit Installed **12-26**
Figure 12-8 Removing or Replacing the Fan-Tray Assembly (Front Door Removed) (ANSI) **12-30**
Figure 12-9 Removing or Replacing the Fan-Tray Assembly (Front Door Removed) (ETSI) **12-31**
Figure 12-10 Find the MAC Address **12-33**
Figure 12-11 Lower Backplane Cover **12-33**
Figure 12-12 Repairing Circuits **12-35**
Figure 12-13 Recording the Old MAC Address Before Replacing the AIP **12-35**
Figure 12-14 Circuit Repair Information **12-36**
Figure 12-15 Attaching Plastic Lower Backplane Cover **12-37**
Figure 14-1 Cisco ONS 15454 ANSI Dimensions **14-4**
Figure 14-2 Mounting an ONS 15454 ANSI Shelf in a Rack **14-5**
Figure 14-3 ONS 15454 ETSI Dimensions **14-7**

Figure 14-4 Mounting an ONS 15454 ETSI Shelf in a Rack **14-8**
Figure 14-5 Three-Shelf ONS 15454 ETSI Bay Assembly **14-9**
Figure 14-6 Two-Channel Add/Drop FlexLayer Module Block Diagram **14-11**
Figure 14-7 ONS 15454 Two-Channel Optical Add/Drop FlexLayer Module **14-12**
Figure 14-8 Two-Channel Drop Component Connector Mapping and Labeling **14-12**
Figure 14-9 Two-Channel Add Component Connector Mapping and Labeling **14-13**
Figure 14-10 Typical Y-Cable Protection Module Configuration **14-13**
Figure 14-11 1:2 Splitter and 2:1 Coupler (Y-Cable Protection) Module Block Diagram **14-14**
Figure 14-12 ONS 15454 Y-Cable Protection FlexLayer Module (Single-Mode) **14-14**
Figure 14-13 ONS 15454 Y-Cable Protection FlexLayer Module (Multimode) **14-15**
Figure 14-14 Y-Cable Protection Component Connector Mapping and Labeling **14-15**
Figure 14-15 Typical DWDM Equipment Layout in an ONS 15454 ANSI Rack **14-18**
Figure 14-16 The ONS 15454 Front Door **14-19**
Figure 14-17 Cisco ONS 15454 ANSI Deep Door **14-20**
Figure 14-18 ONS 15454 ANSI Front Door Ground Strap **14-21**
Figure 14-19 Removing the ONS 15454 ANSI Front Door **14-22**
Figure 14-20 Removing the ONS 15454 ETSI Front Door **14-23**
Figure 14-21 ONS 15454 ANSI Front-Door Erasable Label **14-24**
Figure 14-22 ONS 15454 ETSI Front-Door Erasable Label **14-25**
Figure 14-23 Laser Warning on the ONS 15454 ANSI Front-Door Label **14-25**
Figure 14-24 Laser Warning on the ONS 15454 ETSI Front-Door Label **14-26**
Figure 14-25 Backplane Covers **14-27**
Figure 14-26 Removing the Lower Backplane Cover **14-27**
Figure 14-27 Backplane Attachment for Cover **14-28**
Figure 14-28 Installing the Plastic Rear Cover with Spacers **14-29**
Figure 14-29 AEP Printed Circuit Board Assembly **14-31**
Figure 14-30 AEP Block Diagram **14-31**
Figure 14-31 AEP Wire-Wrap Connections to Backplane Pins **14-32**
Figure 14-32 Alarm Input Circuit Diagram **14-33**
Figure 14-33 Alarm Output Circuit Diagram **14-34**
Figure 14-34 Filler Card Faceplate **14-36**
Figure 14-35 Managing Cables on the Front Panel **14-37**
Figure 14-36 Fiber Capacity **14-38**
Figure 14-37 Patch-Panel Tray **14-39**
Figure 14-38 Fiber-Storage Tray **14-40**

Figure 14-39 Tie-Down Bar on the Cisco ONS 15454 ANSI Shelf Assembly **14-41**
Figure 14-40 Position of the ONS 15454 ETSI Fan-Tray Assembly **14-42**
Figure 14-41 Ground Posts on the ONS 15454 ANSI Backplane **14-44**
Figure 14-42 ONS 15454 ANSI Backplane Pinouts **14-45**
Figure 14-43 Installing Cards in the ONS 15454 ANSI **14-48**
Figure 14-44 Installing Cards in the ONS 15454 ETSI Shelf **14-49**
Figure 15-1 TCC2 Faceplate and Block Diagram **15-11**
Figure 15-2 TCC2P Faceplate and Block Diagram **15-14**
Figure 15-3 AIC-I Faceplate and Block Diagram **15-17**
Figure 15-4 RJ-11 Connector **15-20**
Figure 15-5 MIC-A/P Faceplate **15-22**
Figure 15-6 MIC-A/P Block Diagram **15-22**
Figure 15-7 MIC-C/T/P Faceplate **15-25**
Figure 15-8 MIC-C/T/P Block Diagram **15-25**
Figure 15-9 OSCM Card Faceplate **15-27**
Figure 15-10 OSCM Block Diagram **15-28**
Figure 15-11 OSCM VOA Optical Module Functional Block Diagram **15-28**
Figure 15-12 OSC-CSM Faceplate **15-31**
Figure 15-13 OSC-CSM Block Diagram **15-32**
Figure 15-14 OSC-CSM Optical Module Functional Block Diagram **15-33**
Figure 15-15 OPT-PRE Faceplate **15-36**
Figure 15-16 OPT-PRE Block Diagram **15-37**
Figure 15-17 OPT-PRE Optical Module Functional Block Diagram **15-37**
Figure 15-18 OPT-BST Faceplate **15-39**
Figure 15-19 OPT-BST Block Diagram **15-40**
Figure 15-20 OPT-BST Optical Module Functional Block Diagram **15-40**
Figure 15-21 OPT-BST-E Faceplate **15-43**
Figure 15-22 OPT-BST-E Block Diagram **15-44**
Figure 15-23 OPT-BST-E Optical Module Functional Block Diagram **15-44**
Figure 15-24 32MUX-O Faceplate **15-46**
Figure 15-25 32MUX-O Block Diagram **15-47**
Figure 15-26 32MUX-O Optical Module Functional Block Diagram **15-47**
Figure 15-27 32DMX-O Faceplate **15-50**
Figure 15-28 32DMX-O Block Diagram **15-51**
Figure 15-29 32DMX-O Optical Module Functional Block Diagram **15-51**

Figure 15-30 32DMX Faceplate and Ports **15-53**
Figure 15-31 32DMX Block Diagram **15-54**
Figure 15-32 32DMX Optical Module Functional Block Diagram **15-54**
Figure 15-33 4MD-xx.x Faceplate **15-56**
Figure 15-34 4MD-xx.x Block Diagram **15-57**
Figure 15-35 4MD-xx.x Optical Module Functional Block Diagram **15-57**
Figure 15-36 AD-1C-xx.x Faceplate **15-60**
Figure 15-37 AD-1C-xx.x Block Diagram **15-61**
Figure 15-38 AD-1C-xx.x Optical Module Functional Block Diagram **15-61**
Figure 15-39 AD-2C-xx.x Faceplate **15-63**
Figure 15-40 AD-2C-xx.x Block Diagram **15-64**
Figure 15-41 AD-2C-xx.x Optical Module Functional Block Diagram **15-64**
Figure 15-42 AD-4C-xx.x Faceplate **15-67**
Figure 15-43 AD-4C-xx.x Block Diagram **15-68**
Figure 15-44 AD-4C-xx.x Optical Module Functional Block Diagram **15-68**
Figure 15-45 AD-1B-xx.x Faceplate **15-71**
Figure 15-46 AD-1B-xx.x Block Diagram **15-72**
Figure 15-47 AD-1B-xx.x Optical Module Functional Block Diagram **15-72**
Figure 15-48 AD-4B-xx.x Faceplate **15-74**
Figure 15-49 AD-4B-xx.x Block Diagram **15-75**
Figure 15-50 AD-4B-xx.x Optical Module Functional Block Diagram **15-75**
Figure 15-51 32WSS Faceplate and Ports **15-78**
Figure 15-52 32WSS Block Diagram **15-79**
Figure 15-53 32WSS Optical Block Diagram **15-80**
Figure 15-54 TXP_MR_10G Faceplate and Block Diagram **15-83**
Figure 15-55 TXP_MR_10E Faceplate and Block Diagram **15-85**
Figure 15-56 TXP_MR_2.5G and TXPP_MR_2.5G Faceplates **15-91**
Figure 15-57 TXP_MR_2.5G and TXPP_MR_2.5G Block Diagram **15-92**
Figure 15-58 Laser Radiation Warning—Hazard Level Label **15-93**
Figure 15-59 Laser Radiation Warning—Laser Source Connector Label **15-94**
Figure 15-60 FDA Compliance Statement Label **15-94**
Figure 15-61 Electrical Energy Hazard Label **15-94**
Figure 15-62 MXP_2.5G_10G Faceplate **15-97**
Figure 15-63 MXP_2.5G_10G Card Block Diagram **15-98**
Figure 15-64 MXP_2.5G_10E Faceplate **15-101**

Figure 15-65 MXP_2.5G_10E Block Diagram **15-102**
Figure 15-66 MXP_MR_2.5G and MXPP_MR_2.5G Faceplates **15-110**
Figure 15-67 MXP_MR_2.5G and MXPP_MR_2.5G Block Diagram **15-111**
Figure 15-68 Laser Radiation Warning—Hazard Level Label **15-112**
Figure 15-69 Laser Radiation Warning—Laser Source Connector Label **15-112**
Figure 15-70 FDA Compliance Statement Label **15-112**
Figure 15-71 Electrical Energy Hazard Label **15-113**
Figure 15-72 Y-Cable Protection **15-115**
Figure 15-73 Splitter Protection **15-116**
Figure 15-74 Mylar Tab SFP **15-119**
Figure 15-75 Actuator/Button SFP **15-119**
Figure 15-76 Bail Clasp SFP **15-119**
Figure 15-77 Bail Clasp XFP (Unlatched) **15-120**
Figure 15-78 Bail Clasp XFP (Latched) **15-120**
Figure 16-1 Hub Node Configuration Example **16-2**
Figure 16-2 Hub Node Channel Flow Example **16-3**
Figure 16-3 Terminal Node Configuration Example **16-4**
Figure 16-4 Amplified OADM Node Configuration Example **16-5**
Figure 16-5 Amplified OADM Node Channel Flow Example **16-6**
Figure 16-6 Passive OADM Node Configuration Example **16-7**
Figure 16-7 Passive OADM Node Channel Flow Example **16-7**
Figure 16-8 ROADM Node with BST-PRE, OPT-BST, and 32DMX Cards Installed **16-8**
Figure 16-9 ROADM Node with BST-PRE, OPT-BST, and 32DMX-O Cards Installed **16-9**
Figure 16-10 ROADM Optical Signal Flow Example **16-10**
Figure 16-11 Anti-ASE Node Channel Flow Example **16-11**
Figure 16-12 Line Amplifier Node Configuration Example **16-12**
Figure 16-13 OSC Regeneration Line Node Configuration Example **16-13**
Figure 16-14 OSC Regeneration Line Node Flow **16-13**
Figure 16-15 Double Terminal Protection Configuration **16-15**
Figure 16-16 1+1 Protected Single-Span Link with Hub Nodes **16-16**
Figure 16-17 1+1 Protected Single-Span Link with Active OADM Nodes **16-17**
Figure 16-18 1+1 Protected Single-Span Link with Passive OADM Nodes **16-18**
Figure 16-19 Scalable Terminal Channel Flow Example **16-20**
Figure 16-20 Scalable Terminal Example **16-21**
Figure 16-21 Amplified Hybrid Terminal Example **16-22**

Figure 16-22 Passive Hybrid Terminal Example **16-23**
Figure 16-23 Hybrid Amplified OADM Example **16-24**
Figure 16-24 Hybrid Line Amplifier Example **16-25**
Figure 16-25 Hybrid Line Amplifier Channel Flow Example **16-26**
Figure 16-26 Amplified TDM Example with an OPT-BST Amplifier **16-27**
Figure 16-27 Amplified TDM Channel Flow Example With OPT-BST Amplifiers **16-27**
Figure 16-28 Amplified TDM Example with FlexLayer Filters **16-28**
Figure 16-29 Amplified TDM Channel Flow Example With FlexLayer Filters **16-28**
Figure 16-30 Amplified TDM Channel Flow Example With Amplifiers, AD-1C-xx.x Cards, and OSC-CSM Cards **16-29**
Figure 16-31 WDM-ANS Provisioning **16-34**
Figure 17-1 Hubbed Ring **17-2**
Figure 17-2 Multihubbed Ring **17-3**
Figure 17-3 Any-to-Any Ring **17-4**
Figure 17-4 Meshed Ring **17-5**
Figure 17-5 Linear Configuration with an OADM Node **17-5**
Figure 17-6 Linear Configuration without an OADM Node **17-6**
Figure 17-7 Single-Span Link **17-6**
Figure 17-8 Automatic Power Control **17-21**
Figure 17-9 Power Monitoring Subtab **17-22**
Figure 17-10 Span Loss Verification **17-23**
Figure 17-11 Nodes Using OPT-BST/OPT-BST-E Cards **17-25**
Figure 17-12 Nodes Using OSC-CSM Cards **17-27**
Figure 17-13 Effect of Gain Ripple and Gain Tilt on Amplifier Output Power **17-29**
Figure 17-14 Flat Gain (Gain Tilt = 0 dB) **17-30**
Figure 17-15 Effect of VOA Attenuation on Gain Tilt **17-30**
Figure 17-16 System Tilt Compensation Without a ROADM **17-32**
Figure 17-17 MetroPlanner Installation Parameters **17-33**
Figure 17-18 System Tilt Compensation With a ROADM **17-34**
Figure 18-1 CTC Software Versions, Node View **18-2**
Figure 18-2 CTC Software Versions, Network View **18-3**
Figure 18-3 Node View (Default Login View) **18-7**
Figure 18-4 Terminal Loopback Indicator **18-9**
Figure 18-5 Facility Loopback Indicator **18-10**
Figure 18-6 Network in CTC Network View **18-11**
Figure 18-7 CTC Card View Showing a 32DMX-O Card **18-13**

Figure 19-1 ONS 15454 Timing Example **19-8**
Figure 20-1 Scenario 1: CTC and ONS 15454s on Same Subnet (ANSI and ETSI) **20-3**
Figure 20-2 Scenario 2: CTC and ONS 15454s Connected to Router (ANSI and ETSI) **20-4**
Figure 20-3 Scenario 3: Using Proxy ARP (ANSI and ETSI) **20-6**
Figure 20-4 Scenario 3: Using Proxy ARP with Static Routing (ANSI and ETSI) **20-7**
Figure 20-5 Scenario 4: Default Gateway on a CTC Computer (ANSI and ETSI) **20-8**
Figure 20-6 Scenario 5: Static Route With One CTC Computer Used as a Destination (ANSI and ETSI) **20-9**
Figure 20-7 Scenario 5: Static Route With Multiple LAN Destinations (ANSI and ETSI) **20-10**
Figure 20-8 Scenario 6: OSPF Enabled (ANSI and ETSI) **20-11**
Figure 20-9 Scenario 6: OSPF Not Enabled (ANSI and ETSI) **20-12**
Figure 20-10 Proxy Server Gateway Settings (ANSI) **20-14**
Figure 20-11 Proxy Server Gateway Settings (ETSI) **20-14**
Figure 20-12 ONS 15454 Proxy Server with GNE and ENEs on the Same Subnet (ANSI and ETSI) **20-15**
Figure 20-13 Scenario 7: ONS 15454 Proxy Server with GNE and ENEs on Different Subnets (ANSI and ETSI) **20-16**
Figure 20-14 Scenario 7: ONS 15454 Proxy Server With ENEs on Multiple Rings (ANSI and ETSI) **20-17**
Figure 20-15 Scenario 8: Dual GNEs on the Same Subnet (ANSI and ETSI) **20-19**
Figure 20-16 Scenario 8: Dual GNEs on Different Subnets (ANSI and ETSI) **20-20**
Figure 20-17 Scenario 9: ONS 15454 GNE and ENEs on the Same Subnet with Secure Mode Enabled **20-21**
Figure 20-18 Scenario 9: ONS 15454 GNE and ENEs on Different Subnets with Secure Mode Enabled **20-22**
Figure 20-19 Proxy and Firewall Tunnels for Foreign Terminations **20-28**
Figure 20-20 Foreign Node Connection to an ENE Ethernet Port **20-29**
Figure 21-1 Shelf LCD Panel **20-2**
Figure 21-2 Network View Alarm Profiles Window **20-8**
Figure 21-3 OPT-BST Card Alarm Profiles **20-11**
Figure 21-4 External Alarms and Controls Using a Virtual Wire **20-14**

Table 1-1 Pin Connection of the Power FMECs **1-36**

Table 1-2 Pin Assignments for the AEP **1-46**

Table 1-3 Alarm Pin Assignments **1-48**

Table 1-4 MIC-C/T/P Clock Connector Pin Assignment **1-50**

Table 1-5 LAN Pin Assignments **1-51**

Table 1-6 External Timing Pin Assignments for BITS **1-54**

Table 1-7 LAN Pin Assignments for the ONS 15454 ANSI Shelf **1-56**

Table 1-8 Craft Interface Pin Assignments **1-57**

Table 1-9 Alarm Input Pin Assignments **1-58**

Table 1-10 Alarm Output Pin Assignments **1-59**

Table 1-11 ONS 15xxx FlexLayer Hardware Part Numbers **1-67**

Table 1-12 ONS 15454 ETSI Shelf Installation Task Summary **1-74**

Table 1-13 ONS 15454 ANSI Shelf Installation Task Summary **1-75**

Table 2-1 CTC Computer Setup for Local Craft Connections to the ONS 15454 **2-9**

Table 3-1 Cisco MetroPlanner Node Setup Information and Files **3-3**

Table 3-2 LED Behavior During TCC2/TCC2P Reboot **3-13**

Table 3-3 CTC Add Card Menu for DWDM Cards **3-26**

Table 3-4 Protection Types **3-37**

Table 3-5 Cable Connections for Y-Cable Protection of One Client Signal **3-69**

Table 3-6 Cable Connections for Y-Cable Protection of a Second Client Signal **3-70**

Table 4-1 TXP_MR_2.5G Card Wavelengths and Part Numbers **4-4**

Table 4-2 32WSS Ports and Wavelengths Test Checklist **4-9**

Table 5-1 PPM Port Types **5-5**

Table 5-2 TXP_MR-10G and TXP_MR_10E Card Settings **5-10**

Table 5-3 TXP_MR_10G and TXP_MR_10E Transponder Card Line Settings **5-11**

Table 5-4 TXP_MR_10G and TXP_MR_10E Transponder Card Section Trace Settings **5-13**

Table 5-5 TXP_MR_10G and TXP_MR_10E Transponder Card Line Threshold Settings **5-15**

Table 5-6 TXP_MR_10G and TXP_MR 10GE LAN Phy Variables **5-16**

Table 5-7 TXP_MR_10G and TXP_MR_10E Trunk Port Alarm and TCA Thresholds **5-20**

Table 5-8 Client Interfaces Alarm and TCA Thresholds: TXP_MR_10E and TXP_MR_10G Cards **5-21**

Table 5-9 TXP_MR_10G and TXP_MR_10E Transponder Card OTN Settings **5-22**

Table 5-10 TXP_MR_10G and TXP_MR_10E Transponder Card ITU-T G.709 Threshold Settings **5-23**
Table 5-11 TXP_MR_10G and TXP_MR_10E Transponder Card FEC Threshold Settings **5-24**
Table 5-12 TXP_MR_10G and TXP_MR_10E Transponder Card Trail Trace Identifier Settings **5-24**
Table 5-13 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Settings **5-27**
Table 5-14 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line Settings **5-28**
Table 5-15 TXP_MR_10G and MXP_MR_10E Card Section Trace Settings **5-30**
Table 5-16 MXP_2.5G_10G and MXP_2.5G_10E Muxponder Card Trunk Settings **5-32**
Table 5-17 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line Threshold Settings **5-33**
Table 5-18 MXP_2.5G_10G and MXP_2.5G_10E Trunk Port Alarm and TCA Thresholds **5-35**
Table 5-19 Client Interfaces Alarm and TCA Thresholds: MXP_2.5G_10G and MXP_2.5G_10E Cards **5-36**
Table 5-20 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line OTN Settings **5-37**
Table 5-21 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card G.709 Threshold Settings **5-37**
Table 5-22 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card FEC Threshold Settings **5-38**
Table 5-23 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Trail Trace Identifier Settings **5-38**
Table 5-24 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Settings **5-41**
Table 5-25 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Line Settings **5-42**
Table 5-26 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Section Trace Settings **5-44**
Table 5-27 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Line Thresholds Settings for OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16 Payloads **5-45**
Table 5-28 TXP_MR_2.5G and TXPP_MR_2.5G 1G Ethernet, 1G FC/FICON **5-46**
Table 5-29 TXP_MR_2.5G and TXPP_MR_2.5G Trunk Port TCA Thresholds **5-48**
Table 5-30 Client Interfaces Alarm and TCA Thresholds: TXP_MR_2.5G and TXPP_MR_2.5G Cards **5-49**
Table 5-31 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card OTN Line Settings **5-51**
Table 5-32 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card ITU-T G.709 Threshold Settings **5-52**
Table 5-33 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card FEC Threshold Settings **5-52**
Table 5-34 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Trail Trace Identifier Settings **5-52**
Table 5-35 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Settings **5-55**
Table 5-36 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Client Tab Settings **5-56**
Table 5-37 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Distance Extension Settings **5-57**
Table 5-38 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line SONET or SDH Tab Settings **5-59**
Table 5-39 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Section Trace Tab Settings **5-61**
Table 5-40 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Threshold Settings **5-62**
Table 5-41 MXP_MR_2.5G and MXPP_MR 2.5G 1G Ethernet, 1G FC/FICON Variables **5-63**
Table 5-42 Client Interfaces Alarm and TCA Thresholds: MXP_MR_2.5G and MXPP_MR_2.5G Cards **5-66**
Table 7-1 Circuit Protection Types **7-5**
Table 7-2 Cisco ONS 15454 Circuit Status **7-5**

Table 7-3 OCHNC Channels **7-10**
Table 8-1 Alarm Column Descriptions **8-6**
Table 8-2 Color Codes for Alarms and Condition Severities **8-7**
Table 9-1 Channel OADM Optical Line Ports **9-16**
Table 9-2 Channel OADM Optical Line Ports **9-17**
Table 9-3 Band OADM Optical Line Ports **9-17**
Table 9-4 Band OADM Optical Line Ports **9-18**
Table 9-5 MXP_MR_2.5G/MXPP_MR_2.5G Threshold Variables (MIBs) **9-32**
Table 10-1 HTML Commands for the Legal Disclaimer **10-8**
Table 10-2 Managing Domains **10-19**
Table 11-1 OSCM and OSC-CSM Card OC-3 Settings **11-3**
Table 11-2 OSCM and OSC-CSM Cards SONET Threshold Settings **11-5**
Table 11-3 OSCM and OSC-CSM Card Optical Line Parameter Settings **11-7**
Table 11-4 OSCM and OSC-CSM Cards Optical Channel Warning Thresholds Settings **11-9**
Table 11-5 OSCM and OSC-CSM Cards Optical Channel Alarm Thresholds Settings **11-9**
Table 11-6 OSC-CSM or OSCM Maintenance Settings **11-11**
Table 11-7 OPT-PRE and OPT-BST Amplifier Optical Line Settings **11-12**
Table 11-8 OPT-PRE and OPT-BST Cards Optical Channel Warning Thresholds Settings **11-14**
Table 11-9 OPT-PRE and OPT-BST Cards Optical Channel Alarm Thresholds Settings **11-15**
Table 11-10 OPT-PRE and OPT-BST Optical Amplifier Line Settings **11-16**
Table 11-11 OPT-PRE and OPT-BST Cards Amplifier Line Warning Thresholds Settings **11-18**
Table 11-12 OPT-PRE and OPT-BST Cards Amplifier Line Alarm Thresholds Settings **11-18**
Table 11-13 OPT-BST Maintenance Settings **11-21**
Table 11-14 Multiplexer and Demultiplexer Card Optical Line Settings **11-23**
Table 11-15 Multiplexer and Demultiplexer Cards Amplifier Line Warning Thresholds Settings **11-25**
Table 11-16 Multiplexer and Demultiplexer Amplifier Line Alarm Thresholds Settings **11-26**
Table 11-17 Multiplexer and Demultiplexer Card Optical Channel Settings **11-27**
Table 11-18 Multiplexer and Demultiplexer Cards Optical Channel Warning Threshold Settings **11-29**
Table 11-19 Multiplexer and Demultiplexer Cards Optical Channel Alarm Thresholds Settings **11-30**
Table 11-20 32WSS Optical Channel Parameter Settings **11-33**
Table 11-21 32WSS Optical Channel Warning Threshold Settings **11-35**
Table 11-22 32WSS Optical Channel Alarm Thresholds Settings **11-36**
Table 11-23 32WSS Optical Line Parameter Settings **11-38**
Table 11-24 32WSS Optical Channel Warning Threshold Settings **11-39**
Table 11-25 32WSS Optical Channel Alarm Thresholds Settings **11-40**

Table 12-1 Audit Trail Column Definitions **12-12**
Table 12-2 ONS 15454 Timing Report **12-16**
Table 12-3 Incompatibility Alarms for ONS 15454 ANSI **12-27**
Table 12-4 Incompatibility Alarms for ONS 15454 ETSI **12-28**
Table 14-1 ONS 15454 100-GHz Channel Plan **14-10**
Table 14-2 Protection A (TXP 1 and 2) Port Mapping: Combiner from DWDM **14-15**
Table 14-3 Protection A (TXP 1 and 2) Port Mapping: Splitter to DWDM **14-16**
Table 14-4 Protection B (TXP 3 and 4) Port Mapping: Combiner from DWDM **14-16**
Table 14-5 Protection B (TXP 3 and 4) Port Mapping: Splitter to DWDM **14-16**
Table 14-6 Pin Assignments for the AEP **14-32**
Table 14-7 Alarm Input Pin Association **14-33**
Table 14-8 Pin Association for Alarm Output Pins **14-34**
Table 14-9 ANSI Fiber Channel Capacity (One Side of the Shelf) **14-38**
Table 14-10 ETSI Fiber Channel Capacity (One Side of the Shelf) **14-38**
Table 14-11 Fiber-Storage Tray Capacity **14-40**
Table 14-12 Fan Tray Assembly Power Requirements **14-42**
Table 14-13 BITS External Timing Pin Assignments **14-46**
Table 14-14 LAN Pin Assignments **14-47**
Table 14-15 Craft Interface Pin Assignments **14-47**
Table 14-16 Slot and Card Symbols **14-50**
Table 15-1 DWDM and Client Cards for the ONS 15454 **15-3**
Table 15-2 DWDM and Client Card CTC Software Release Compatibility **15-5**
Table 15-3 ONS 15454 Card Interfaces Assigned to Input Power Classes **15-6**
Table 15-4 10-Gbps Interface Optical Performance **15-7**
Table 15-5 2.5-Gbps Interface Optical Performance **15-8**
Table 15-6 DWDM Channel Allocation Plan **15-9**
Table 15-7 TCC2 Card-Level Indicators **15-12**
Table 15-8 TCC2 Network-Level Indicators **15-13**
Table 15-9 TCC2P Card-Level Indicators **15-16**
Table 15-10 TCC2P Network-Level Indicators **15-16**
Table 15-11 AIC-I Card-Level Indicators **15-17**
Table 15-12 Orderwire Pin Assignments **15-20**
Table 15-13 UDC Pin Assignments **15-20**
Table 15-14 DCC Pin Assignments **15-21**
Table 15-15 Alarm Interface Pinouts on the MIC-A/P DB-62 Connector **15-22**

Table 15-16 OSCM VOA Port Calibration **15-28**
Table 15-17 OSCM Card-Level Indicators **15-29**
Table 15-18 OSC-CSM Port Calibration **15-34**
Table 15-19 OSC-CSM Card-Level Indicators **15-34**
Table 15-20 OPT-PRE Port Calibration **15-37**
Table 15-21 OPT-PRE Amplifier Card-Level Indicators **15-38**
Table 15-22 OPT-BST Port Calibration **15-40**
Table 15-23 OPT-BST Card-Level Indicators **15-41**
Table 15-24 OPT-BST-E Port Calibration **15-44**
Table 15-25 OPT-BST-E Card-Level Indicators **15-45**
Table 15-26 32MUX-O Channel Plan **15-48**
Table 15-27 32MUX-O Port Calibration **15-49**
Table 15-28 32MUX-O Card-Level Indicators **15-49**
Table 15-29 32DMX-O Port Calibration **15-51**
Table 15-30 32DMX-O Card-Level Indicators **15-52**
Table 15-31 32DMX Port Calibration **15-55**
Table 15-32 32DMX Card-Level Indicators **15-55**
Table 15-33 4MD-xx.x Channel Sets **15-58**
Table 15-34 4MD-xx.x Port Calibration **15-58**
Table 15-35 4MD-xx.x Card-Level Indicators **15-59**
Table 15-36 AD-1C-xx.x Port Calibration **15-61**
Table 15-37 AD-1C-xx.x Card-Level Indicators **15-62**
Table 15-38 AD-2C-xx.x Channel Pairs **15-65**
Table 15-39 AD-2C-xx.x Port Calibration **15-65**
Table 15-40 AD-2C-xx.x Card-Level Indicators **15-66**
Table 15-41 AD-4C-xx.x Channel Sets **15-69**
Table 15-42 AD-4C-xx.x Port Calibration **15-69**
Table 15-43 AD-4C-xx.x Card-Level Indicators **15-69**
Table 15-44 AD-1B-xx.x Port Calibration **15-72**
Table 15-45 AD-1B-xx.x Card-Level Indicators **15-73**
Table 15-46 AD-4B-xx.x Port Calibration **15-76**
Table 15-47 AD-4B-xx.x Card-Level Indicators **15-76**
Table 15-48 32WSS Port Calibration **15-81**
Table 15-49 32WSS Card-Level Indicators **15-81**
Table 15-50 TXP_MR_10G Card-Level Indicators **15-84**

Table 15-51 TXP_MR_10G Port-Level Indicators **15-84**
Table 15-52 TXP_MR_10E Card-Level Indicators **15-88**
Table 15-53 TXP_MR_10E Port-Level Indicators **15-88**
Table 15-54 2R and 3R Mode and ITU-T G.709 Compliance by Client Interface **15-89**
Table 15-55 Trunk Bit Rates With ITU-T G.709 Enabled **15-90**
Table 15-56 TXP_MR_2.5G and TXPP_MR_2.5G Card-Level Indicators **15-95**
Table 15-57 TXP_MR_2.5G and TXPP_MR_2.5G Port-Level Indicators **15-95**
Table 15-58 MXP_2.5G_10G Card-Level Indicators **15-99**
Table 15-59 MXP_2.5G_10G Port-Level Indicators **15-99**
Table 15-60 MXP_2.5G_10E Trunk Wavelengths **15-104**
Table 15-61 MXP_2.5G_10E Card-Level Indicators **15-106**
Table 15-62 MXP_2.5G_10E Port-Level Indicators **15-106**
Table 15-63 Card Versions **15-107**
Table 15-64 MXP_MR_2.5G and MXPP_MR_2.5G Client Interface Data Rates and Encapsulation **15-108**
Table 15-65 Client Data Rates and Ports **15-108**
Table 15-66 MXP_MR_2.5G and MXPP_MR_2.5G Card-Level Indicators **15-113**
Table 15-67 MXP_MR_2.5G and MXPP_MR_2.5G Port-Level Indicators **15-113**
Table 15-68 Termination Modes **15-117**
Table 15-69 SFP/XFP Card Compatibility **15-118**
Table 16-1 Typical AD Configurations for Scalable Terminal Nodes **16-19**
Table 16-2 ANS Parameters **16-32**
Table 16-3 ANS-WDM > Provisioning Subtab Parameters **16-34**
Table 16-4 ANS Parameters By Node Type **16-36**
Table 16-5 ANS Parameters Summary **16-39**
Table 17-1 Supported Topologies and Node Types **17-7**
Table 17-2 ONS 15454 Client Card Classes **17-7**
Table 17-3 Span Loss for 32-Channel Ring and Linear Networks with OADM Nodes Using SMF Fiber **17-8**
Table 17-4 Span Loss for 16-Channel Ring and Linear Networks with OADM Nodes Using SMF Fiber **17-9**
Table 17-5 Span Loss for 32-Channel Ring and Linear Networks with OADM Nodes Using TW-RS Fiber **17-9**
Table 17-6 Span Loss for 32-Channel Ring and Linear Networks with OADM Nodes Using E-LEAF Fiber **17-10**
Table 17-7 Span Loss for 32-Channel Linear Networks without OADM Nodes Using SMF Fiber **17-10**
Table 17-8 Span Loss for 32-Channel Linear Networks without OADM Nodes Using TW-RS Fiber **17-11**
Table 17-9 Span Loss for 32-Channel Linear Networks without OADM Nodes Using E-LEAF Fiber **17-11**
Table 17-10 Span Loss for 16-Channel Linear Networks without OADM Nodes Using SMF Fiber **17-12**
Table 17-11 Span Loss for Eight-Channel Linear Networks without OADM Nodes Using SMF Fiber **17-12**

Table 17-12 Span Loss for 32-Channel Linear or Ring Networks with all ROADM Nodes Using SMF Fiber **17-13**

Table 17-13 Span Loss for 32-Channel Ring and Linear Networks with ROADM and OADM Nodes Using SMF Fiber **17-13**

Table 17-14 Pass/Fail Criteria for 32-Channel, Eight-Node ROADM Rings Using SMF Fiber **17-14**

Table 17-15 Pass/Fail Criteria for 32-Channel, 16-Node ROADM Rings Using SMF Fiber **17-15**

Table 17-16 Span Loss for Single-Span Link with Eight Channels **17-16**

Table 17-17 Span Loss for Single-Span Link with 16 Channels **17-16**

Table 17-18 Span Loss for Single-Span Link with AD-1C-xx.x Cards, OPT-PRE Amplifiers, and OPT-BST/OPT-BST-E Amplifiers **17-17**

Table 17-19 Span Loss for Single-Span Link with One Channel and OPT-BST Amplifiers **17-17**

Table 17-20 Span Loss for Single-Span Link with One Channel, OPT-BST/OPT-BST-E Amplifiers, OPT-PRE Amplifiers, and ONS 15216 FlexLayer Filters **17-17**

Table 17-21 APC-Managed Parameters **17-21**

Table 17-22 Flat Output Gain Range Limits **17-31**

Table 18-1 JRE Compatibility **18-4**

Table 18-2 Computer Requirements for CTC **18-5**

Table 18-3 ONS 15454 Connection Methods **18-6**

Table 18-4 Node View Card Colors **18-7**

Table 18-5 Node View FMEC Color **18-8**

Table 18-6 Node View Card Statuses **18-8**

Table 18-7 Node View Card Port Colors and Service States **18-9**

Table 18-8 Node View Tabs and Subtabs **18-10**

Table 18-9 DCC Colors Indicating State in Network View **18-11**

Table 18-10 Node Status Shown in Network View **18-12**

Table 18-11 Network View Tabs and Subtabs **18-12**

Table 18-12 Card View Tabs and Subtabs **18-13**

Table 19-1 ONS 15454 Security Levels—Node View **19-2**

Table 19-2 ONS 15454 Security Levels—Network View **19-4**

Table 19-3 ONS 15454 Default User Idle Times **19-5**

Table 19-4 Audit Trail Window Columns **19-6**

Table 19-5 SSM Generation 1 Message Set **19-8**

Table 19-6 SSM Generation 2 Message Set **19-9**

Table 20-1 General ONS 15454 IP Troubleshooting Checklist **20-2**

Table 20-2 ONS 15454 Gateway and End NE Settings **20-15**

Table 20-3 Proxy Server Firewall Filtering Rules **20-17**

Table 20-4 Proxy Server Firewall Filtering Rules When Packet Addressed to ONS 15454 **20-18**

Table 20-5 Cisco ONS 15454 Client/Trunk Card Combinations for Provisionable Patchcords **20-23**

Table 20-6 Cisco ONS 15454 Client/Client Card Combinations for Provisionable Patchcords **20-23**
Table 20-7 Cisco ONS 15454 Trunk/Trunk Card Combinations for Provisionable Patchcords **20-23**
Table 20-8 Sample Routing Table Entries **20-24**
Table 20-9 Ports Used by the TCC2/TCC2P **20-26**
Table 21-1 Alarm Display **20-3**
Table 21-2 Conditions Display **20-4**
Table 21-3 Conditions Column Description **20-4**
Table 21-4 History Column Description **20-6**
Table 21-5 Alarm Profile Buttons **20-9**
Table 21-6 Alarm Profile Editing Options **20-10**
Table A-1 Change CTC Views **A-2**
Table A-2 Description of Node Icons on Network View Map **A-3**
Table A-3 CTC Menu and Toolbar Options **A-5**
Table A-4 CTC Window Mouse Shortcuts **A-9**
Table A-5 Node View Card-Related Shortcuts **A-10**
Table A-6 Network Management Tasks in Network View **A-10**
Table A-7 Table Display Options **A-11**
Table B-1 Individual Card Power Requirements **B-5**
Table B-2 Card Temperature Ranges and Product Names **B-6**
Table B-3 32MUX-O Optical Specifications **B-17**
Table B-4 32DMX-O Optical Specifications **B-18**
Table B-5 32DMX Optical Specifications **B-18**
Table B-6 32DMX Channel Plan **B-19**
Table B-7 4MD-xx.x Optical Specifications **B-21**
Table B-8 AD-1C-xx.x Card Optical Specifications **B-22**
Table B-9 AD-2C-xx.x Card Optical Specifications **B-23**
Table B-10 AD-4C-xx.x Optical Specifications **B-24**
Table B-11 AD-1B-xx.x Channel Allocation Plan by Band **B-25**
Table B-12 AD-1B-xx.x Optical Specifications **B-27**
Table B-13 AD-1B-xx.x Transmit and Receive Dropped Band Wavelength Ranges **B-28**
Table B-14 AD-4B-xx.x Channel Allocation Plan by Band **B-29**
Table B-15 AD-4B-xx.x Optical Specifications **B-31**
Table B-16 AD-4B-xx.x Transmit and Receive Dropped Band Wavelength Ranges **B-31**
Table B-17 32WSS Optical Specifications **B-32**
Table B-18 32WSS Channel Plan **B-33**

Table B-19 TXP_MR_2.5G/TXPP_MR_2.5G Receiver Trunk Side Specifications **B-40**
Table B-20 MXP_MR_2.5G/MXPP_MR_2.5G Receiver Trunk Side Specifications **B-42**
Table B-21 MXP_2.5G_10E Receiver Trunk Side Specifications **B-45**
Table B-22 TXP_MR_10E Receiver Trunk Side Specifications **B-47**
Table B-23 SFP Specifications **B-48**
Table B-24 Single-Mode Fiber SFP Port Cabling Specifications **B-49**
Table B-25 Multimode Fiber SFP Port Cabling Specifications **B-50**
Table B-26 XFP Specifications **B-50**
Table B-27 Single-Mode Fiber XFP Port Cabling Specifications **B-50**
Table C-1 ONS 15454 Service State Primary States and Primary State Qualifiers **C-1**
Table C-2 ONS 15454 Secondary States **C-2**
Table C-3 ONS 15454 Administrative States **C-2**
Table C-4 ONS 15454 Optical Unit Service State Transitions **C-3**
Table C-5 ONS 15454 Optical Payload Port Service State Transitions **C-5**
Table C-6 ONS 15454 OSC Port Service State Transitions **C-6**
Table C-7 ONS 15454 OCHNC Service State Transitions **C-7**
Table C-8 ONS 15454 Transponder/Muxponder Card Service State Transitions **C-7**
Table C-9 ONS 15454 Transponder/Muxponder Port Service State Transitions **C-12**
Table D-1 MXP-2.5G-10E Card Default Settings (ANSI) **D-3**
Table D-2 MXP-2.5G-10G Card Default Settings (ANSI) **D-7**
Table D-3 MXP-MR-2.5G Card Default Settings (ANSI) **D-11**
Table D-4 MXPP-MR-2.5G Card Default Settings (ANSI) **D-13**
Table D-5 TXP-MR-10E Card Default Settings (ANSI) **D-16**
Table D-6 TXP_MR_10G Card Default Settings (ANSI) **D-20**
Table D-7 TXP-MR-2.5G Card Default Settings (ANSI) **D-24**
Table D-8 TXPP-MR-2.5G Card Default Settings (ANSI) **D-30**
Table D-9 OSCM Card Default Settings (ANSI) **D-37**
Table D-10 OSC-CSM Card Default Settings (ANSI) **D-38**
Table D-11 Node Default Settings (ANSI) **D-39**
Table D-12 CTC Default Settings (ANSI) **D-43**
Table D-13 MXP_2.5G_10G Card Default Settings (ETSI) **D-44**
Table D-14 MXP_2.5G_10E Card Default Settings (ETSI) **D-48**
Table D-15 MXP_MR_2.5G Card Default Settings (ETSI) **D-52**
Table D-16 MXPP_MR_2.5G Card Default Settings (ETSI) **D-55**
Table D-17 TXP_MR_10E Card Default Settings (ETSI) **D-57**

Table D-18 TXP_MR_10G Card Default Settings (ETSI) **D-62**
Table D-19 TXP_MR_2.5G Card Default Settings (ETSI) **D-67**
Table D-20 TXPP_MR_10G Card Default Settings (ETSI) **D-73**
Table D-21 OSCM Card Default Settings (ETSI) **D-79**
Table D-22 OSC-CSM Card Default Settings (ETSI) **D-80**
Table D-23 Node Default Settings (ETSI) **D-82**
Table D-24 CTC Default Settings (ETSI) **D-85**

NTP-G1 Unpack and Inspect the Shelf Assembly **1-6**
NTP-G2 Install the Shelf Assembly **1-8**
NTP-G3 Open and Remove the Front Door **1-20**
NTP-G4 Open and Remove the FMEC Cover (ETSI Only) **1-23**
NTP-G5 Remove the Backplane Covers (ANSI Only) **1-26**
NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only) **1-28**
NTP-G7 Install the Power and Ground **1-30**
NTP-G8 Install the Fan-Tray Assembly **1-40**
NTP-G9 Install the Alarm Expansion Panel (ANSI Only) **1-43**
NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections **1-46**
NTP-G11 Install an External Wire-Wrap Panel on the AEP (ANSI Only) **1-57**
NTP-G12 Install and Close the FMEC Cover (ETSI Only) **1-61**
NTP-G13 Install the Rear Cover (ANSI Only) **1-62**
NTP-G14 Install DWDM Equipment **1-64**
NTP-G15 Install the Common Control Cards **1-69**
NTP-G16 Perform the Shelf Installation Acceptance Test **1-74**
NTP-G17 Set Up Computer for CTC **2-1**
NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454 **2-9**
NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454 **2-21**
NTP-G20 Set Up a Remote Access Connection to the ONS 15454 **2-23**
NTP-G21 Log into the ONS 15454 GUI **2-24**
NTP-G139 Verify Cisco MetroPlanner Reports and Files **3-2**
NTP-G22 Verify Common Card Installation **3-4**
NTP-G23 Create Users and Assign Security **3-5**
NTP-G24 Set Up Name, Date, Time, and Contact Information **3-8**
NTP-G25 Set Power Monitor Thresholds **3-9**
NTP-G26 Set Up CTC Network Access **3-10**
NTP-G27 Set Up the ONS 15454 for Firewall Access **3-21**
NTP-G28 Set Up SNMP **3-24**
NTP-G29 Preprovision a Slot **3-26**
NTP-G30 Install the DWDM Cards **3-27**

NTP-G31 Install the DWDM Dispersion Compensating Units **3-30**

NTP-G32 Install the Transponder and Muxponder Cards **3-31**

NTP-G123 Install the Filler Cards **3-35**

NTP-G33 Create a Y-Cable Protection Group **3-36**

NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs **3-39**

NTP-G140 Install Fiber-Optic Cables Between a Terminal, Hub, or ROADM Node and the Transponder Cards **3-63**

NTP-G141 Install Fiber-Optic Cables for Y-Cable Protection Modules **3-69**

NTP-G36 Calculate Cable Connections **3-70**

NTP-G138 Import a Cisco MetroPlanner Configuration File **3-72**

NTP-G37 Run Automatic Node Setup **3-73**

NTP-G38 Provision OSC Terminations and Ring ID **3-74**

NTP-G39 Verify OSCM and OSC-CSM Transmit Power **3-76**

NTP-G41 Perform the Terminal and Hub Node with 32MUX-O and 32DMX-O Cards Acceptance Test **4-2**

NTP-G42 Perform the Terminal Node with 32WSS and 32DMX Cards Acceptance Test **4-5**

NTP-G43 Perform the ROADM Node Acceptance Test **4-8**

NTP-G44 Perform the Anti-ASE Hub Node Acceptance Test **4-20**

NTP-G45 Perform the Line Amplifier Node with OSCM Cards Acceptance Test **4-23**

NTP-G46 Perform the Line Amplifier Node with OSC-CSM Cards Acceptance Test **4-26**

NTP-G47 Perform the Line Amplifier Node with OSCM and OSC-CSM Cards Acceptance Test **4-30**

NTP-G48 Perform the OADM Node Acceptance Test on a Symmetric Node with OSCM Cards **4-33**

NTP-G49 Perform the OADM Active Node Acceptance Test on a Symmetric Node with OSC-CSM Cards **4-35**

NTP-G50 Perform the OADM Passive Node Acceptance Test on a Symmetric Node with OSC-CSM Cards **4-37**

NTP-G128 Manage Pluggable Port Modules **5-2**

NTP-G96 Modify Line Settings and PM Parameter Thresholds for TXP_MR_10G and TXP_MR_10E Cards **5-8**

NTP-G97 Modify Line Settings and PM Parameter Thresholds for MXP_2.5G_10G and MXP_2.5G_10E Cards **5-25**

NTP-G98 Modify Line Settings and PM Parameter Thresholds for TXP_MR_2.5G and TXPP_MR_2.5G Cards **5-39**

NTP-G99 Modify Line Settings and PM Parameter Thresholds for MXP_MR_2.5G and MXPP_MR_2.5G Cards **5-53**

NTP-G51 Verify DWDM Node Turn Up **6-1**

NTP-G52 Verify Node-to-Node Connections **6-3**

NTP-G53 Set Up Timing **6-3**

NTP-G54 Provision and Verify a DWDM Network **6-7**

NTP-G56 Verify the OSNR **6-11**

NTP-G142 Perform a Protection Switch Test **6-12**

NTP-G57 Create a Logical Network Map **6-14**
NTP-G58 Locate and View Optical Channel Network Connections **7-2**
NTP-G59 Create and Delete Optical Channel Network Connections **7-9**
NTP-G60 Create Overhead Circuits **7-13**
NTP-G61 Modify and Delete Overhead Circuits **7-20**
NTP-G62 Create a J0 Section Trace **7-22**
NTP-G63 Document Existing Provisioning **8-2**
NTP-G64 View Alarms, History, Events, and Conditions **8-5**
NTP-G65 Delete Cleared Alarms from Display **8-13**
NTP-G66 View Alarm-Affected Circuits **8-14**
NTP-G67 View Alarm Counts on the LCD for a Node, Slot, or Port **8-14**
NTP-G68 Create, Download, and Assign Alarm Severity Profiles **8-16**
NTP-G69 Enable, Modify, or Disable Alarm Severity Filtering **8-24**
NTP-G70 Suppress Alarms or Discontinue Alarm Suppression **8-28**
NTP-G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card **8-31**
NTP-G73 Change the PM Display **9-2**
NTP-G74 Monitor DWDM Card Performance **9-8**
NTP-G75 Monitor Transponder and Muxponder Performance **9-18**
NTP-G76 Verify Span Loss **10-2**
NTP-G77 Manage Automatic Power Control **10-3**
NTP-G78 View ROADM Node Power Equalization **10-5**
NTP-G80 Change Node Management Information **10-6**
NTP-G81 Change CTC Network Access **10-9**
NTP-G82 Customize the CTC Network View **10-16**
NTP-G83 Modify or Delete Card Protection Settings **10-21**
NTP-G84 Initiate and Clear Y-Cable and Splitter External Switching Commands **10-24**
NTP-G85 Modify or Delete OSC Terminations, GCC Terminations, and Provisionable Patchcords **10-28**
NTP-G86 Convert a Pass-Through Connection to an Add/Drop Connection **10-32**
NTP-G87 Change Node Timing Parameters **10-33**
NTP-G88 Modify Users and Change Security **10-35**
NTP-G131 Convert DWDM Nodes to Hybrid Nodes **10-43**
NTP-G89 Change SNMP Settings **10-46**
NTP-G90 Modify OSCM and OSC-CSM Line Settings and PM Parameters and Thresholds **11-2**
NTP-G91 Modify OPT-PRE and OPT-BST Line Settings and PM Parameters and Thresholds **11-11**
NTP-G92 Modify 32MUX-O, 32DMX-O, 32DMX, and 4MD Line Settings and PM Thresholds **11-22**

NTP-G93 Modify the 32WSS Thresholds and Settings **11-31**
NTP-G101 Modify Alarm Interface Controller–International Settings **11-41**
NTP-G102 Change Card Service State **11-44**
NTP-G103 Back Up the Database **12-2**
NTP-G104 Restore the Database **12-3**
NTP-G105 Restore the Node to Factory Configuration **12-4**
NTP-G106 Reset Cards Using CTC **12-9**
NTP-G108 Viewing the Audit Trail Records **12-11**
NTP-G109 Off-Load the Audit Trail Record **12-13**
NTP-G110 Off-Load the Diagnostics File **12-13**
NTP-G112 Change the Node Timing Reference **12-14**
NTP-G113 View the ONS 15454 Timing Report **12-16**
NTP-G114 Inspect, Clean, and Replace the Air Filter **12-19**
NTP-G115 Clean Fiber Connectors **12-22**
NTP-G40 Replace the Front Door **12-25**
NTP-G116 Replace the Fan-Tray Assembly **12-27**
NTP-G117 Replace the ANSI Shelf Alarm Interface Panel **12-32**
NTP-G118 Replace the ANSI Shelf Plastic Lower Backplane Cover **12-36**
NTP-G135 Edit Network Element Defaults **12-38**
NTP-G136 Import Network Element Defaults **12-39**
NTP-G137 Export Network Element Defaults **12-40**
NTP-G119 Power Down the Node **13-1**

DLP-G1 Unpack and Verify the Shelf Assembly **1-6**
DLP-G2 Inspect the Shelf Assembly **1-7**
DLP-G3 Reverse the Mounting Bracket to Fit a 19-inch (482.6-mm) Rack (ANSI Only) **1-10**
DLP-G4 Install the External Brackets and Air Filter (ANSI Only) **1-11**
DLP-G5 Mount the Shelf Assembly in a Rack (One Person) **1-13**
DLP-G6 Mount the Shelf Assembly in a Rack (Two People) **1-15**
DLP-G7 Mount Multiple Shelf Assemblies in a Rack **1-16**
DLP-G8 Install the Air Ramp **1-19**
DLP-G9 Open the Front Cabinet Compartment (Door) **1-20**
DLP-G10 Remove the Front Door **1-21**
DLP-G11 Open the FMEC Cover **1-24**
DLP-G12 Remove the FMEC Cover **1-25**
DLP-G13 Remove the Lower Backplane Cover **1-26**
DLP-G14 Remove the Backplane Sheet Metal Cover **1-27**
DLP-G15 Connect the Office Ground to the ONS 15454 ETSI **1-32**
DLP-G16 Connect the Office Ground to the ONS 15454 ANSI **1-33**
DLP-G17 Connect Office Power to the ONS 15454 ETSI **1-35**
DLP-G18 Connect Office Power to the ONS 15454 ANSI **1-36**
DLP-G19 Turn On and Verify Office Power **1-39**
DLP-G20 Install Alarm Wires on the MIC-A/P (ETSI Only) **1-47**
DLP-G21 Install Timing Wires on the MIC-C/T/P (ETSI Only) **1-50**
DLP-G22 Install LAN Wires on the MIC-C/T/P (ETSI Only) **1-51**
DLP-G23 Install Alarm Wires on the Backplane (ANSI Only) **1-52**
DLP-G24 Install Timing Wires on the Backplane (ANSI Only) **1-54**
DLP-G25 Install LAN Wires on the Backplane (ANSI Only) **1-55**
DLP-G26 Install the TL1 Craft Interface (ANSI Only) **1-56**
DLP-G27 Install the DCU Shelf Assembly **1-65**
DLP-G28 Install the Fiber Patch-Panel Tray **1-65**
DLP-G29 Install the Fiber-Storage Tray **1-66**
DLP-G30 Install the FlexLayer Shelf **1-66**
DLP-G31 Install the FlexLayer Modules **1-67**

DLP-G32 Install the Y-Cable Protection Modules **1-69**

DLP-G33 Install the TCC2 or TCC2P Card **1-70**

DLP-G34 Install the AIC-I Card **1-73**

DLP-G35 Inspect the Shelf Installation and Connections **1-75**

DLP-G36 Measure Voltage **1-76**

DLP-G37 Run the CTC Installation Wizard for Windows **2-3**

DLP-G38 Run the CTC Installation Wizard for UNIX **2-6**

DLP-G39 Set Up a Windows PC for Craft Connection to an ONS 15454 on the Same Subnet Using Static IP Addresses **2-11**

DLP-G40 Set Up a Windows PC for Craft Connection to an ONS 15454 Using Dynamic Host Configuration Protocol **2-13**

DLP-G41 Set Up a Windows PC for Craft Connection to an ONS 15454 Using Automatic Host Detection **2-16**

DLP-G42 Set Up a Solaris Workstation for a Craft Connection to an ONS 15454 **2-19**

DLP-G43 Disable Proxy Service Using Internet Explorer (Windows) **2-22**

DLP-G44 Disable Proxy Service Using Netscape (Windows and UNIX) **2-22**

DLP-G46 Log into CTC **2-24**

DLP-G47 Install Public-Key Security Certificate **2-27**

DLP-G48 Create Login Node Groups **2-28**

DLP-G49 Add a Node to the Current Session or Login Group **2-29**

DLP-G50 Delete a Node from the Current Session or Login Group **2-30**

DLP-G51 Delete a Node from a Specified Login Node Group **2-30**

DLP-G52 Change the JRE Version **2-31**

DLP-G53 Configure the CTC Alerts Dialog Box for Automatic Popup **2-32**

DLP-G54 Create a New User on a Single Node **3-6**

DLP-G55 Create a New User on Multiple Nodes **3-6**

DLP-G56 Provision IP Settings **3-11**

DLP-G57 Set the IP Address, Default Router, and Network Mask Using the LCD **3-14**

DLP-G264 Enable Node Security Mode **3-16**

DLP-G58 Create a Static Route **3-17**

DLP-G59 Set Up or Change Open Shortest Path First Protocol **3-18**

DLP-G60 Set Up or Change Routing Information Protocol **3-20**

DLP-G61 Provision the IIOP Listener Port on the ONS 15454 **3-23**

DLP-G62 Provision the IIOP Listener Port on the CTC Computer **3-23**

DLP-G273 Preprovision an SFP or XFP Slot **3-33**

DLP-G63 Install an SFP or XFP **3-34**

DLP-G64 Remove an SFP or XFP **3-34**

DLP-G65 Install Fiber-Optic Cables for OSC Link Terminations Between Two Adjacent Nodes **3-42**
DLP-G66 Install Fiber-Optic Cables for a Hub Node **3-45**
DLP-G67 Install Fiber-Optic Cables for a Terminal Node **3-47**
DLP-G68 Install Fiber-Optic Cables for a Line Amplifier Node **3-49**
DLP-G69 Install Fiber-Optic Cables for an OSC Regeneration Node **3-51**
DLP-G70 Install Fiber-Optic Cables for an Amplified or Passive OADM Node **3-54**
DLP-G71 Install Fiber-Optic Cables for an ROADM Node **3-59**
DLP-G315 Install Fiber-Optic Cables From the 32WSS/32DMX and 32MUX-O/32DMX-O Cards to the Patch Panel **3-64**
DLP-G316 Install Fiber-Optic Cables from a TXP/MXP Node to the Patch Panel **3-68**
DLP-G72 Create a DWDM Connection **3-71**
DLP-G73 Delete a DWDM Connection **3-72**
DLP-G313 Verify OSC-CSM Transmit Power **3-77**
DLP-G314 Verify OSCM Transmit Power **3-78**
DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing **4-4**
DLP-G310 Verify ROADM Node Pass-Through Channels **4-12**
DLP-G311 Verify the East ROADM Add/Drop Channels **4-16**
DLP-G312 Verify the West ROADM Add/Drop Channels **4-18**
DLP-G78 Verify the 32MUX-O Power **4-39**
DLP-G79 Verify the OPT-BST Amplifier Laser and Power **4-39**
DLP-G80 Verify the OPT-PRE Amplifier Laser and Power **4-40**
DLP-G269 Verify the 32DMX-O Power **4-40**
DLP-G270 Verify the 32DMX Power **4-41**
DLP-G82 Verify the OSC-CSM Power **4-41**
DLP-G83 Verify the OSC-CSM Power on OADM Nodes **4-42**
DLP-G84 Verify the OSC-CSM Incoming Power **4-42**
DLP-G85 Verify Express Channel Connections on an OADM Node with OSCM Cards **4-43**
DLP-G86 Verify Express Channel Connections on an OADM Node with OSC-CSM Cards **4-44**
DLP-G87 Verify the AD-xB-xx.x Output Express Power **4-45**
DLP-G88 Verify the AD-xC-xx.x Output Express Power **4-46**
DLP-G271 Verify the AD-xC-xx.x Output Common Power **4-46**
DLP-G272 Verify the AD-xB-xx.x Output Common Power **4-46**
DLP-G89 Verify OADM Node Pass-Through Channel Connections **4-47**
DLP-G90 Verify an AD-xB-xx.x Pass-Through Connection Power **4-48**
DLP-G91 Verify an AD-xC-xx.x Pass-Through Connection **4-49**
DLP-G92 Verify 4MD-xx.x Pass-Through Connection Power **4-50**

DLP-G93 Verify Add and Drop Connections on an OADM Node with OSCM Cards **4-51**

DLP-G94 Verify Add and Drop Connections on OADM Node with OSC-CSM Cards **4-54**

DLP-G277 Provision a Multirate PPM **5-3**

DLP-G278 Provision the Optical Line Rate **5-3**

DLP-G274 Verify Topologies for ETR_CLO and ISC Services **5-6**

DLP-G280 Delete a PPM **5-7**

DLP-G216 Change Card Settings for TXP_MR_10G and TXP_MR_10E Cards **5-9**

DLP-G217 Change Line Settings for TXP_MR_10G and TXP_MR_10E Cards **5-10**

DLP-G218 Change Section Trace Settings for the TXP_MR_10G and TXP_MR_10E Cards **5-13**

DLP-G219 Change the TXP_MR_10G or TXP_MR_10E Card Line Thresholds for SONET or SDH Payloads **5-15**

DLP-G319 Change the TXP_MR_10G or TXP_MR_10E Card Line Thresholds for 10G Ethernet LAN Phy **5-16**

DLP-G301 Provision the TXP_MR_10G and TXP_MR_10E Trunk Port Alarm and TCA Thresholds **5-19**

DLP-G302 Provision the TXP_MR_10G and TXP_MR_10E Client Port Alarm and TCA Thresholds **5-20**

DLP-G221 Change OTN Settings for TXP_MR_10G and TXP_MR_10E Cards **5-22**

DLP-G222 Change Card Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards **5-26**

DLP-G223 Change Line Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards **5-28**

DLP-G224 Change Section Trace Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards **5-30**

DLP-G225 Change Trunk Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards **5-31**

DLP-G226 Change Line Thresholds Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards **5-33**

DLP-G303 Provision the MXP_2.5G_10G and MXP_2.5G_10E Trunk Port Alarm and TCA Thresholds **5-34**

DLP-G304 Provision the MXP_2.5G_10G and MXP_2.5G_10E Client Port Alarm and TCA Thresholds **5-35**

DLP-G228 Change Line OTN Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards **5-36**

DLP-G229 Change Card Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards **5-40**

DLP-G230 Change Line Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards **5-42**

DLP-G231 Change Section Trace Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards **5-43**

DLP-G232 Change TXP_MR_2.5G and TXPP_MR_2.5G Cards Line Threshold Settings for SONET or SDH Payloads **5-45**

DLP-G320 Change the TXP_MR_2.5G or TXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads **5-46**

DLP-G305 Provision the TXP_MR_2.5G and TXPP_MR_2.5G Trunk Port Alarm and TCA Thresholds **5-47**

DLP-G306 Provision the TXP_MR_2.5G and TXPP_MR_2.5G Cards Client Port Alarm and TCA Thresholds **5-48**

DLP-G234 Change OTN Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards **5-51**

DLP-G235 Change Card Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards **5-54**

DLP-G236 Change Client Line Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards **5-55**

DLP-G237 Change Distance Extension Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards **5-57**

DLP-G238 Change OC-48/STM-16 Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards **5-58**

DLP-G239 Change Section Trace Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards **5-60**

DLP-G240 Change MXP_MR_2.5G and MXPP_MR_2.5G Cards Line Threshold Settings for SONET or SDH Payloads **5-61**

DLP-G321 Change the MXP_MR_2.5G or MXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads **5-62**

DLP-G307 Provision the MXP_MR_2.5G and MXPP_MR_2.5G Trunk Port Alarm and TCA Thresholds **5-64**

DLP-G308 Provision the MXP_MR_2.5G and MXPP_MR_2.5G Client Port Alarm and TCA Thresholds **5-65**

DLP-G95 Set Up External or Line Timing **6-4**

DLP-G96 Set Up Internal Timing **6-6**

DLP-G99 Create a Provisionable Patchcord **6-10**

DLP-G100 Search for Optical Channel Network Connections **7-2**

DLP-G101 View Optical Channel Network Connection Information **7-3**

DLP-G102 Filter the Display of Optical Channel Network Connections **7-6**

DLP-G103 View Optical Channel Network Connections on a Span **7-8**

DLP-G104 Assign a Name to a Port **7-9**

DLP-G105 Provision DWDM Optical Channel Network Connections **7-10**

DLP-G106 Delete Optical Channel Network Connections **7-12**

DLP-G76 Provision GCC Terminations **7-13**

DLP-G97 Provision a Proxy Tunnel **7-14**

DLP-G98 Provision a Firewall Tunnel **7-15**

DLP-G107 Create an IP-Encapsulated Tunnel **7-16**

DLP-G108 Change the Service State for a Port **7-17**

DLP-G109 Provision Orderwire **7-18**

DLP-G110 Create a User Data Channel Circuit **7-19**

DLP-G111 Repair an IP Tunnel **7-21**

DLP-G112 Delete Overhead Circuits **7-21**

DLP-G113 Print CTC Data **8-2**

DLP-G114 Export CTC Data **8-4**

DLP-G115 View Alarms **8-6**

DLP-G116 View Alarm or Event History **8-8**

DLP-G117 Change the Maximum Number of Session Entries for Alarm History **8-9**

DLP-G118 Display Alarms and Conditions Using Time Zone **8-10**

DLP-G119 Synchronize Alarms **8-11**

DLP-G120 View Conditions **8-11**

DLP-G121 Create a New or Cloned Alarm Severity Profile **8-16**

DLP-G122 Download an Alarm Severity Profile **8-19**
DLP-G123 Apply Alarm Profiles to Ports **8-20**
DLP-G124 Apply Alarm Profiles to Cards and Nodes **8-22**
DLP-G125 Delete Alarm Severity Profiles **8-22**
DLP-G126 Enable Alarm Filtering **8-25**
DLP-G127 Modify Alarm, Condition, and History Filtering Parameters **8-25**
DLP-G128 Disable Alarm Filtering **8-27**
DLP-G129 Suppress Alarm Reporting **8-28**
DLP-G130 Discontinue Alarm Suppression **8-30**
DLP-G131 Refresh PM Counts at 15-Minute Intervals **9-2**
DLP-G132 Refresh PM Counts at One-Day Intervals **9-3**
DLP-G133 View Near-End PM Counts **9-4**
DLP-G134 View Far-End PM Counts **9-5**
DLP-G135 Reset Current PM Counts **9-5**
DLP-G136 Clear Selected PM Counts **9-6**
DLP-G137 Set Auto-Refresh Interval for Displayed PM Counts **9-7**
DLP-G138 Refresh PM Counts for a Different Port **9-8**
DLP-G139 View Optical Service Channel PM Parameters **9-9**
DLP-G140 View Optical Amplifier Power Statistics **9-11**
DLP-G141 View Optical Power Statistics for 32MUX-O, 32-WSS, 32-DMX-O, and 32DMX Cards **9-12**
DLP-G276 View 4-Channel Multiplexer/Demultiplexer Optical Power Statistics **9-14**
DLP-G142 View Channel Optical Add/Drop Multiplexer Power Statistics **9-15**
DLP-G143 View Band Optical Add/Drop Multiplexer Power Statistics **9-17**
DLP-G144 Enable/Disable OTN ITU-T G.709 Performance Monitoring **9-19**
DLP-G145 Enable/Disable OTN FEC Performance Monitoring **9-20**
DLP-G146 View Optics PM Parameters **9-21**
DLP-G147 View Payload PM Parameters **9-22**
DLP-G148 View OTN PM Parameters **9-24**
DLP-G149 View Payload Statistics PM Parameters **9-26**
DLP-G150 View Payload Utilization PM Parameters **9-27**
DLP-G151 View Payload History PM Parameters **9-29**
DLP-G152 View Payload SONET PM Parameters **9-30**
DLP-G153 Create RMON Alarm Thresholds **9-32**
DLP-G154 Delete RMON Alarm Thresholds **9-34**
DLP-G155 Verify Optical Span Loss Using CTC **10-2**

DLP-G157 Disable Automatic Power Control **10-4**
DLP-G158 Enable Automatic Power Control **10-4**
DLP-G159 Refresh Automatic Power Control Information **10-5**
DLP-G160 Change the Node Name, Date, Time, and Contact Information **10-7**
DLP-G161 Change the Login Legal Disclaimer **10-8**
DLP-G162 Change IP Settings **10-10**
DLP-G265 Lock Node Security **10-11**
DLP-G266 Modify Backplane Port IP Settings **10-11**
DLP-G267 Disable Node Security Mode **10-12**
DLP-G163 Modify a Static Route **10-13**
DLP-G164 Delete a Static Route **10-14**
DLP-G165 Disable OSPF **10-14**
DLP-G166 Delete a Proxy Tunnel **10-15**
DLP-G167 Delete a Firewall Tunnel **10-15**
DLP-G168 Change the Network View Background Color **10-16**
DLP-G169 Change the Default Network View Background Map **10-17**
DLP-G170 Apply a Custom Network View Background Map **10-18**
DLP-G171 Create Domain Icons **10-18**
DLP-G172 Manage Domain Icons **10-19**
DLP-G173 Enable Dialog Box Do-Not-Display Option **10-20**
DLP-G174 Switch Between TDM and DWDM Network Views **10-21**
DLP-G175 Modify a Y-Cable Protection Group **10-22**
DLP-G176 Modify a Splitter Protection Group **10-23**
DLP-G177 Delete a Y-Cable Protection Group **10-23**
DLP-G178 Apply a Manual Y-Cable or Splitter Protection Switch **10-25**
DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch **10-25**
DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch **10-26**
DLP-G181 Apply a Lock-On **10-26**
DLP-G182 Apply a Lockout **10-27**
DLP-G183 Clear a Lock-On or Lockout **10-28**
DLP-G184 Change a GCC Termination **10-29**
DLP-G185 Delete a GCC Termination **10-30**
DLP-G186 Delete an OSC Termination **10-30**
DLP-G187 Delete a Provisionable Patchcord **10-31**
DLP-G188 Change Security Policy for a Single Node **10-35**

DLP-G189 Change Security Policy for Multiple Nodes **10-37**
DLP-G190 Change Node Access and PM Clearing Privilege **10-38**
DLP-G191 Change User Password and Security Level on a Single Node **10-39**
DLP-G192 Change User Password and Security Level for Multiple Nodes **10-40**
DLP-G193 Delete a User From a Single Node **10-40**
DLP-G194 Delete a User From Multiple Nodes **10-41**
DLP-G195 Log Out a User on a Single Node **10-42**
DLP-G196 Log Out a User on Multiple Nodes **10-42**
DLP-G197 Modify SNMP Trap Destinations **10-46**
DLP-G198 Delete SNMP Trap Destinations **10-47**
DLP-G199 Change the OSCM and OSC-CSM Optical Service Channel Settings **11-2**
DLP-G200 Change the OSCM and OSC-CSM Optical Service Channel Thresholds **11-5**
DLP-G201 Change Optical Line Parameters for OSCM and OSC-CSM Cards **11-6**
DLP-G202 Change the OSCM and OSC-CSM Optical Line Threshold Settings **11-8**
DLP-G203 Change the OSCM and OSC-CSM ALS Maintenance Settings **11-10**
DLP-G204 Change Optical Line Settings for OPT-PRE and OPT-BST Amplifiers **11-12**
DLP-G205 Change Optical Line Threshold Settings for OPT-PRE and OPT-BST Amplifiers **11-14**
DLP-G206 Change Optical Amplifier Line Settings for OPT-PRE and OPT-BST Amplifiers **11-15**
DLP-G207 Change Optical Channel Threshold Settings for OPT-PRE and OPT-BST Amplifiers **11-17**
DLP-G322 Change the OPT-BST ALS Maintenance Settings **11-21**
DLP-G208 Change Optical Line Settings for Multiplexer and Demultiplexer Cards **11-23**
DLP-G209 Change Optical Line Threshold Settings for Multiplexer and Demultiplexer Cards **11-25**
DLP-G210 Change Optical Channel Settings for Multiplexer and Demultiplexer Cards **11-26**
DLP-G211 Change Optical Channel Threshold Settings for Multiplexer and Demultiplexer Cards **11-29**
DLP-G212 Change Optical Channel Parameters for the 32WSS Card **11-32**
DLP-G213 Change the 32WSS Optical Channel Thresholds **11-35**
DLP-G214 Change Optical Line Parameters for the 32WSS Card **11-37**
DLP-G215 Change the 32WSS Card Optical Line Thresholds **11-39**
DLP-G245 Change External Alarms Using the AIC-I Card **11-41**
DLP-G246 Change External Controls Using the AIC-I Card **11-42**
DLP-G247 Change AIC-I Card Orderwire Settings **11-43**
DLP-G248 Use the Reinitialization Tool to Clear the Database and Upload Software (Windows) **12-5**
DLP-G249 Use the Reinitialization Tool to Clear the Database and Upload Software (UNIX) **12-7**
DLP-G250 Reset the TCC2/TCC2P Card **12-9**
DLP-G251 Reset DWDM Cards Using CTC **12-10**

DLP-G259 Manual or Force Switch the Node Timing Reference **12-15**
DLP-G260 Clear a Manual or Force Switch on a Node Timing Reference **12-15**
DLP-G261 Scope and Clean Fiber Connectors and Adapters with Alcohol and Dry Wipes **12-23**
DLP-G262 Clean Fiber Connectors with CLETOP **12-23**
DLP-G263 Clean the Fiber Adapters **12-24**

About this Guide

Note The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This section explains the objectives, intended audience, and organization of this publication and describes the conventions that convey instructions and other information.

Revision History

Date	Notes
03/28/2007	Revision History Table added for the first time
09/06/2007	Updated the About this Guide chapter

This section provides the following information:

- Document Objectives
- Audience
- Document Organization
- Related Documentation
- Document Conventions
- Where to Find Safety and Warning Information
- Obtaining Documentation
- Documentation Feedback
- Obtaining Technical Assistance
- Obtaining Additional Publications and Information

Document Objectives

This document explains installation, turn up, provisioning, and maintenance for Cisco ONS 15454 dense wavelength division (DWDM) systems. Use this document in conjunction with the appropriate publications listed in the Related Documentation section.

Audience

To use this publication, you should be familiar with Cisco or equivalent optical transmission hardware and cabling, telecommunications hardware and cabling, electronic circuitry and wiring practices, and preferably have experience as a telecommunications technician.

Document Organization

The *Cisco ONS 15454 DWDM Installation and Operations Guide, Release 4.7* is organized into the following chapters:

- Chapter 1, "Install the Shelf and Common Control Cards" provides procedures for installing Cisco ONS 15454 ANSI and ETSI shelves and common control cards including the TCC2 and AIC/AIC-I.
- Chapter 2, "Connect the PC and Log into the GUI" includes procedures to install the Cisco Transport Controller (CTC), set up a computer for different connection types, and log into the Cisco ONS 15454.
- Chapter 3, "Turn Up a Node"provides procedures for node turn up and DWDM card installation.
- Chapter 4, "Perform Node Acceptance Tests" provides acceptance tests for each DWDM node type.
- Chapter 5, "Provision Transponder and Muxponder Cards" provides procedures for provisioning the transponder and muxponder cards.
- Chapter 6, "Turn Up Network" explains how to turn up and test a DWDM network.
- Chapter 7, "Create Channels and Circuits" explains how to create DWDM optical channel network connections (OCHNCs) and overhead circuits.
- Chapter 8, "Manage Alarms"explains how to document existing node data, view and delete alarms, view alarm-affected circuits and LCD alarm counts, manage alarm profiles, filter alarms, suppress alarms, and provision external alarms.
- Chapter 9, "Monitor Performance" provides procedures to change the performance monitoring (PM) display, monitor performance, and manage remote monitoring (RMON) thresholds.
- Chapter 10, "Manage the Node" explains how to modify node provisioning for the Cisco ONS 15454 and perform common management tasks such as monitoring the DWDM automatic power control and span loss values.
- Chapter 11, "Change DWDM Card Settings" explains how to change line, performance monitoring (PM), and threshold settings on Cisco ONS 15454 cards.
- Chapter 12, "Maintain the Node" provides hardware and software maintenance procedures for the Cisco ONS 15454, including procedures for editing, importing, and exporting network element defaults.
- Chapter 13, "Power Down a Node" expains how to shut down an ONS 15454.

- Chapter 14, "Shelf Hardware Reference" includes descriptions of the rack, backplane, FMECs, ferrites, power and ground, fan-tray assembly, air filter, card slots, cables, cable connectors, and cable routing.
- Chapter 15, "Card Reference" provides descriptions of the common control, transponder/muxponder, and DWDM cards as well as small-form factor pluggables (SFPs).
- Chapter 16, "Node Reference" explains the ONS 15454DWDM node types that are available for the ONS 15454. The chapter also explains the DWDM automatic power control, ROADM power equalization, span loss verification, and automatic node setup functions.
- Chapter 17, "Network Reference" explains the ONS 15454 DWDM network applications and topologies.
- Chapter 18, "CTC Operation Reference" includes information about CTC installation, the CTC window, computer requirements, software versions, and database reset and revert.
- Chapter 19, "Security and Timing Reference" describes user security and node/network timing.
- Chapter 20, "CTC Connectivity Reference" includes IP addressing scenarios and information about provisionable patchcords, open GNE, and external firewalls..
- Chapter 21, "Alarm Management Reference" describes Cisco Transport Controller (CTC) alarm management.
- Appendix A, "CTC Information and Shortcuts" describes the CTC views, menus options, tool options, shortcuts, table display options, and shelf inventory data.
- Appendix B, "Hardware Specifications" contains hardware and software specifications for the ONS 15454 ANSI and ETSI shelf assemblies and cards.
- Appendix C, "DWDM Administrative and Service States" describes the state model for Cisco ONS 15454 DWDM cards, optical payload ports, out-of-band optical supervision channel (OSC) ports, optical channel network connections (OCHNC), and transponder/muxponder cards and ports.
- Appendix D, "Network Element Defaults" describes and lists card, node, and CTC level network element (NE) defaults. To edit, import, or export NE defaults, see Chapter 12, "Maintain the Node."

Related Documentation

Use the *Cisco ONS 15454 DWDM Installation and Operations Guide* in conjunction with the following referenced publications:

- *Cisco ONS 15454 Troubleshooting Guide*
- Cisco ONS 15454 SDH Troubleshooting Guide, Release 5.0
- *Cisco ONS SONET TL1 Command Guide, Release 5.0*
- Cisco ONS SDH TL1 Command Guide, Release 5.0
- Release Notes for Cisco ONS 15454 Release 5.0
- Release Notes for Cisco ONS 15454 SDH Release 5.0

Document Conventions

This publication uses the following conventions:

Convention	Application
boldface	Commands and keywords in body text.
italic	Command input that is supplied by the user.
[ ]	Keywords or arguments that appear within square brackets are optional.
{ x | x | x }	A choice of keywords (represented by x) appears in braces separated by vertical bars. The user must select one.
Ctrl	The control key. For example, where Ctrl + D is written, hold down the Control key while pressing the D key.
`screen font`	Examples of information displayed on the screen.
`boldface screen font`	Examples of information that the user must enter.
< >	Command parameters that must be replaced by module-specific codes.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

Caution Means *reader be careful*. In this situation, the user might do something that could result in equipment damage or loss of data.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Waarschuwing **BELANGRIJKE VEILIGHEIDSINSTRUCTIES**

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

Varoitus **TÄRKEITÄ TURVALLISUUSOHJEITA**

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET

Attention **IMPORTANTES INFORMATIONS DE SÉCURITÉ**

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS

Warnung **WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

Avvertenza **IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI

Advarsel **VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

Aviso **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES

¡Advertencia! **INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES

Varning! **VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR

Figyelem

FONTOS BIZTONSÁGI ELOÍRÁSOK

Ez a figyelmezeto jel veszélyre utal. Sérülésveszélyt rejto helyzetben van. Mielott bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplo figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján keresheto meg.

ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!

Предупреждение

ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

警告 重要的安全性说明

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

警告 安全上の重要な注意事項

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

これらの注意事項を保管しておいてください。

주의 중요 안전 지침

이 경고 기호는 위험을 나타냅니다. 작업자가 신체 부상을 일으킬 수 있는 위험한 환경에 있습니다. 장비에 작업을 수행하기 전에 전기 회로와 관련된 위험을 숙지하고 표준 작업 관례를 숙지하여 사고를 방지하십시오. 각 경고의 마지막 부분에 있는 경고문 번호를 참조하여 이 장치와 함께 제공되는 번역된 안전 경고문에서 해당 번역문을 찾으십시오.

이 지시 사항을 보관하십시오.

Aviso **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES

Advarsel **VIGTIGE SIKKERHEDSANVISNINGER**

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemesbeskadigelse. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER

تحذير **إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في أخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز.

قم بحفظ هذه الإرشادات

Upozorenje **VAŽNE SIGURNOSNE NAPOMENE**

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE

Upozornění **DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY**

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKYNY

Προειδοποίηση

ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθεις πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

אזהרה

הוראות בטיחות חשובות

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כד לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה

Opomena

ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА

Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.

ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА

Ostrzeżenie

WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie

DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD

Where to Find Safety and Warning Information

For safety and warning information, refer to the *Cisco Optical Transport Products Safety and Compliance Information* document that accompanied the product. This publication describes the international agency compliance and safety information for the Cisco ONS 15xxx systems. It also includes translations of the safety warnings that appear in the ONS 15xxx system documentation.

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/techsupport

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

Cisco documentation and additional literature are available in the Product Documentation DVD package, which may have shipped with your product. The Product Documentation DVD is updated regularly and may be more current than printed documentation.

The Product Documentation DVD is a comprehensive library of technical product documentation on portable media. The DVD enables you to access multiple versions of hardware and software installation, configuration, and command guides for Cisco products and to view technical documentation in HTML. With the DVD, you have access to the same documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .pdf versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

http://www.cisco.com/en/US/partner/ordering/

Cisco Marketplace:

http://www.cisco.com/go/marketplace/

Cisco Optical Networking Product Documentation CD-ROM

Optical networking-related documentation, including Cisco ONS 15xxx product documentation, is available in a CD-ROM package that ships with your product. The Optical Networking Product Documentation CD-ROM is updated periodically and may be more current than printed documentation.

Ordering Documentation

Beginning June 30, 2005, registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL:

http://www.cisco.com/go/marketplace/

Cisco will continue to support documentation orders using the Ordering tool:

- Registered Cisco.com users (Cisco direct customers) can order documentation from the Ordering tool:

  http://www.cisco.com/en/US/partner/ordering/

- Instructions for ordering documentation using the Ordering tool are at this URL:

  http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

Documentation Feedback

You can rate and provide feedback about Cisco technical documents by completing the online feedback form that appears with the technical documents on Cisco.com.

You can send comments about Cisco documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

http://www.cisco.com/go/psirt

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com

  An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.
- Nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Tip We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.*x* through 8.*x*.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.htm

The link on this page has the current PGP key ID in use.

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is "down," or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

  http://www.cisco.com/packet

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

  or view the digital edition at this URL:

  http://ciscoiq.texterity.com/ciscoiq/sample/

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/ipj

- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:

  http://www.cisco.com/en/US/products/index.html

- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

  http://www.cisco.com/discuss/networking

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

Install the Shelf and Common Control Cards

This chapter explains how to install the Cisco ONS 15454 ETSI and Cisco ONS 15454 ANSI shelf assemblies. Where procedures differ for the two shelf types, the procedure will indicate "ANSI only" or "ETSI only." For a summary of the tools and equipment required for installation, see the "Required Tools and Equipment (ETSI)" section on page 1-4 or the "Required Tools and Equipment (ANSI)" section on page 1-3.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs). Read the installation procedures and precautions before you install the ONS 15454 ANSI or ONS 15454 ETSI and connect the power source.

1. NTP-G1 Unpack and Inspect the Shelf Assembly, page 1-6—Complete this procedure before continuing with the "NTP-G2 Install the Shelf Assembly" procedure on page 1-8.
2. NTP-G2 Install the Shelf Assembly, page 1-8—Complete this procedure to install the shelf assembly in a rack.
3. NTP-G3 Open and Remove the Front Door, page 1-20—Complete this procedure to access the equipment before continuing with other procedures in this chapter.
4. NTP-G4 Open and Remove the FMEC Cover (ETSI Only), page 1-23—Complete this procedure to access the electrical facility connection assembly (EFCA) for the front mount electrical connections (FMECs) before continuing with other procedures in this chapter.
5. NTP-G5 Remove the Backplane Covers (ANSI Only), page 1-26— Complete this procedure to access the backplane before continuing with other procedures.
6. NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only), page 1-28—Complete this procedure to install the MIC-A/P and MIC-T/C/P FMECs, which are required for power supply as well as alarm, timing, and LAN connections.
7. NTP-G7 Install the Power and Ground, page 1-30—Complete this procedure before continuing with the "NTP-G8 Install the Fan-Tray Assembly" procedure on page 1-40.
8. NTP-G8 Install the Fan-Tray Assembly, page 1-40—Complete this procedure to install the fan-tray assembly in the shelf.

9. NTP-G9 Install the Alarm Expansion Panel (ANSI Only), page 1-43—Complete this procedure if you are planning to install the Alarm Interface Controller–International (AIC-I) card and want to increase the number of alarm contacts provided by the AIC-I card.
10. NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections, page 1-46—Complete as needed to set up wire-wrap pin connections.
11. NTP-G11 Install an External Wire-Wrap Panel on the AEP (ANSI Only), page 1-57 —Complete this procedure to connect an external wire-wrap panel to the alarm expansion panel (AEP).
12. NTP-G12 Install and Close the FMEC Cover (ETSI Only), page 1-61—Complete this procedure to install the FMEC cover.
13. NTP-G13 Install the Rear Cover (ANSI Only), page 1-62—Complete this procedure as needed to install the rear cover after you have finished servicing the backplane.
14. NTP-G14 Install DWDM Equipment, page 1-64—Complete this procedure as needed to install equipment needed for DWDM networks.
15. NTP-G15 Install the Common Control Cards, page 1-69—Complete this procedure to install the TCC2/TCC2P card and the AIC-I card.
16. NTP-G16 Perform the Shelf Installation Acceptance Test, page 1-74—Complete this procedure to determine if you have correctly completed all other procedures in the chapter.

Warning **Installation of the equipment must comply with local and national electrical codes.** Statement 1074

Warning **This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open, or both.** Statement 1043

Warning **This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.** Statement 1017

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040

Warning **A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.** Statement 1022

Note The ONS 15454 is suitable for mounting on concrete or other noncombustible surfaces only.

Note In this chapter, “shelf assembly” refers to the steel enclosure that holds cards and connects power, and “node” refers to the entire hardware and software system.

Required Tools and Equipment (ANSI)

You need the following tools and equipment to install and test the ONS 15454 ANSI shelf assembly.

Cisco-Supplied Materials (ANSI)

The following materials are required and are shipped with the ONS 15454 ANSI shelf (wrapped in plastic). The number in parentheses gives the quantity of the item included in the package.

- #12-24 x 3/4 pan-head Phillips mounting screws (48-1004-XX, 48-1007-XX) (8)
- #12 -24 x 3/4 socket set screws (48-1003-XX) (2)
- T-handle #12-24 hex tool for set screws (1)
- ESD wrist strap with 1.8 m (6 ft) coil cable (1)
- Tie wraps (10)
- Pinned hex (Allen) key for front door (1)
- Spacers (50-1193-XX) (4)
- Spacer mounting brackets (2)
- Sheet metal backplane cover (installed) (1)
- External (bottom) brackets for the fan-tray air filter
- Standoff kit (53-0795-XX):
  - Plastic fiber management guides (2)
  - Fan filter bracket screws (53-48-0003) (6)

User-Supplied Materials (ANSI)

The following materials and tools are required but are not supplied with the ONS 15454 ANSI:

- One or more of the following equipment racks:
  - 19-inch ANSI Standard (Telcordia GR-63-CORE) (482.6 mm) rack; total width 22 inches (558.8 mm)
  - 23-inch ANSI Standard (Telcordia GR-63-CORE) (584.2 mm) rack; total width 26 inches (660.4 mm)
- Fuse panel
- Power cable (from fuse and alarm panel to assembly), #10AWG, copper conductors, 194 degrees Fahrenheit (90 degrees Celsius)
- Ground cable #6AWG stranded
- Alarm cable pairs for all alarm connections, #22 or #24 AWG (0.51 mm^2 or 0.64 mm^2), solid tinned
- 100-ohm shielded BITS clock cable pair #22 or #24 AWG (0.51 mm^2 or 0.64 mm^2), twisted-pair T1-type
- Single-mode SC fiber jumpers with UPC polish (55 dB or better) for optical (OC-N) cards
- Shielded coaxial cable terminated with SMB or BNC connectors for DS-3 cards

- Shielded ABAM cable terminated with AMP Champ connectors or unterminated for DS1N-14 cards with #22 or #24 AWG (0.51 mm² or 0.64 mm²) ground wire (typically about two ft [61 cm] in length)
- 6-pair #29 AWG double-shielded cable
- Tie wraps and/or lacing cord
- Labels
- Listed pressure terminal connectors such as ring and fork types; connectors must be suitable for #10 AWG copper conductors

Tools Needed (ANSI)

The following tools are needed to install an ONS 15454 ANSI:

- #2 Phillips screwdriver
- Medium slot-head screwdriver
- Small slot-head screwdriver
- Wire wrapper
- Wire cutters
- Wire strippers
- Crimp tool
- BNC insertion tool

Test Equipment (ANSI)

The following test equipment is needed to install an ONS 15454:

- Voltmeter
- Optical power meter (for use with fiber optics only)
- BER tester, DS-1 and DS-3

Required Tools and Equipment (ETSI)

You need the following tools and equipment to install and test the ONS 15454 ETSI shelf assembly.

Cisco-Supplied Equipment (ETSI)

These materials are required for installation and are supplied with the ONS 15454 ETSI. The shipped quantity of each item is in parentheses.

- Double-hole grounding lug for ground connection with a wire receptacle to accommodate the recommended 13.3 mm² (#6 AWG) multistrand copper wire (1)
- M4 x 8 mm pan-head Phillips screws (2)
- M6 x 20 mm socket set screws (2)
- M6 x 20 mm pan-head Phillips screws (8)
- Tie wraps 0.125-inch (3.2 mm) W x 6.0-inch (152 mm) L (24)

- ESD wrist strap (disposable) (1)
- Pinned Allen key for front door (1)
- Hex key 3-mm long arm (1)
- Bottom brackets for the fan-tray air filter
- Cable assembly, Ethernet, RJ-45 (1)
- Power cable (from fuse and alarm panel to MIC-A/P and MIC-C/T/P) (2)

Caution Only use the power cables that are designed to be used with ONS 15454 ETSI. They are sold separately.

User-Supplied Equipment (ETSI)

The following materials and tools are required for installation but are not supplied with the ONS 15454 ETSI:

- Equipment rack (ETSI rack, 2200 mm [86.6 inch] H x 600 mm [23.6 inch] W x 300 mm [11.8 inch] D)
- Fuse and alarm panel
- Copper ground cable 13.3-mm² (#6 AWG) stranded, specified for up to 90 degrees Celsius (194 degrees Fahrenheit)
- Alarm cable pairs for all alarm connections, 0.51 mm² or 0.64 mm² (#22 or #24 AWG), solid-tinned
- Single-mode SC fiber jumpers with UPC polish (55 dB or better) for optical cards
- Coaxial cable terminated with 1.0/2.3 miniature coax connectors for FMEC cards
- DB-37 cable
- Shielded building integrated timing supply (BITS) clock coaxial cable terminated with 1.0/2.3 miniature coax connectors
- Labels

Note Ring runs are not provided by Cisco and can hinder side-by-side shelf installation where space is limited.

Tools Needed (ETSI)

To install the ONS 15454 ETSI, you need the following tools.

- #2 Phillips screwdriver
- Medium slot-head screwdriver
- Small slot-head screwdriver
- Video fiber connector inspection instrument
- CLETOP cleaning cassette
- Crimping tool—This tool must be large enough to accommodate the girth of the grounding lug when you crimp the grounding cable into the lug.
- Wire stripping tool

Test Equipment (ETSI)

To install the ONS 15454 ETSI, you need the following test equipment.

- Voltmeter
- Power meter (only for use with fiber optics)
- Bit error rate (BER) tester for E1-N-14, E1-42, E3-12, DS3i-N-12, STM1E-12, and FMEC cards

NTP-G1 Unpack and Inspect the Shelf Assembly

Purpose	This procedure explains how to unpack the ONS 15454 shelf assemblies and verify their contents.
Tools/Equipment	Pinned hex (Allen) key for front door
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Complete the "DLP-G1 Unpack and Verify the Shelf Assembly" task on page 1-6.

Step 2 Complete the "DLP-G2 Inspect the Shelf Assembly" task on page 1-7.

Step 3 Continue with the "NTP-G1 Unpack and Inspect the Shelf Assembly" procedure on page 1-6.

Stop. You have completed this procedure.

DLP-G1 Unpack and Verify the Shelf Assembly

Purpose	This task removes the shelf assembly from the package.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 When you receive the ONS 15454 system equipment at the installation site, open the top of the box. The Cisco Systems logo designates the top of the box.

Step 2 Remove the foam inserts from the box. The box contains the ONS 15454 shelf (wrapped in plastic) and a smaller box of items needed for installation.

Step 3 To remove the shelf, grasp both rings of the shelf removal strap and slowly lift the shelf out of the box.

Step 4 Open the smaller box of installation materials, and verify that you have all items listed in the "Required Tools and Equipment (ETSI)" section on page 1-4 or the "Required Tools and Equipment (ANSI)" section on page 1-3.

Note The fan-tray assembly is shipped separately.

Step 5 Return to your originating procedure (NTP).

DLP-G2 Inspect the Shelf Assembly

Purpose	This task verifies that all parts of the shelf assembly are in good condition.
Tools/Equipment	Pinned hex (Allen) key for front door
Prerequisite Procedures	DLP-G1 Unpack and Verify the Shelf Assembly, page 1-6
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Open the shelf using the pinned hex key. For more information, see the "DLP-G9 Open the Front Cabinet Compartment (Door)" task on page 1-20.

Step 2 Verify the following:

- The pins are not bent or broken.
- The frame is not bent.

Step 3 If the pins are bent or broken, or the frame is bent, call your Cisco sales engineer for a replacement.

Step 4 Close the front door before installing.

Step 5 Return to your originating procedure (NTP).

NTP-G2 Install the Shelf Assembly

Purpose	This procedure reverses the mounting bracket and mounts shelf assemblies in a rack.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver Pinned hex tool ETSI only: Two M6 x 20 socket set screws Eight M6 x 20 pan-head Phillips mounting screws ANSI only: Two #12-24 x 3/4 set screws (48-1003-XX) Eight #12-24 x 3/4 pan-head Phillips mounting screws (48-1004-XX, 48-1007-XX)
Prerequisite Procedures	NTP-G1 Unpack and Inspect the Shelf Assembly, page 1-6
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Warning **Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.** Statement 1048

Warning **This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.** Statement 1045

Warning **To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of:**
45°C (113°F). Statement 1047

Warning **Take care when connecting units to the supply circuit so that wiring is not overloaded.** Statement 1018

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

Warning **To prevent airflow restriction, allow at least 1 inch (25.4 mm) of clearance around the ventilation openings.**

Warning **The ONS 15454 must have 1 inch (25.4 mm) of airspace below the installed shelf assembly to allow air flow to the fan intake. The air ramp (the angled piece of sheet metal on top of the shelf assembly) provides this spacing and should not be modified in any way.**

Note The shelf, the air ramp, and the E1-75/120 conversion panel ship with the ETSI mounting brackets installed as needed for installation in an ETSI rack. If you want to install the node in a 19-inch (482.6-mm) rack, the ETSI mounting brackets of the shelf and the air ramp need to be replaced with the 19-inch (482.6-mm) mounting brackets that shipped in the ship kit.

Step 1 (ANSI shelves only.) Complete the "DLP-G3 Reverse the Mounting Bracket to Fit a 19-inch (482.6-mm) Rack (ANSI Only)" task on page 1-10 if you need to convert from a 23-inch (584.2 mm) to a 19-inch (482.6 mm) rack.

Step 2 (ANSI shelves only.) To install the air filter on the bottom of the shelf rather than below the fan-tray assembly, complete the "DLP-G4 Install the External Brackets and Air Filter (ANSI Only)" task on page 1-11.

Step 3 Complete the necessary rack mount task as applicable:

- DLP-G5 Mount the Shelf Assembly in a Rack (One Person), page 1-13
- DLP-G6 Mount the Shelf Assembly in a Rack (Two People), page 1-15
- DLP-G7 Mount Multiple Shelf Assemblies in a Rack, page 1-16
- DLP-G8 Install the Air Ramp, page 1-19

Step 4 Continue with the "NTP-G3 Open and Remove the Front Door" procedure on page 1-20.

Stop. You have completed this procedure.

DLP-G3 Reverse the Mounting Bracket to Fit a 19-inch (482.6-mm) Rack (ANSI Only)

Purpose	This task installs the mounting bracket to convert a 23-inch (584.2 mm) rack to a 19-inch (482.6-mm) rack. This task applies to ONS 15454 ANSI shelves only.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Caution Use only the fastening hardware provided with the ONS 15454 ANSI to prevent loosening, deterioration, and electromechanical corrosion of the hardware and joined material.

Caution When mounting the ONS 15454 in a frame with a nonconductive coating (such as paint, lacquer, or enamel) either use the thread-forming screws provided with the ONS 15454 ANSI ship kit, or remove the coating from the threads to ensure electrical continuity.

Step 1 Remove the screws that attach the mounting bracket to the side of the shelf assembly.

Step 2 Flip the detached mounting bracket upside down.

Text imprinted on the mounting bracket will now also be upside down.

Step 3 Place the widest side of the mounting bracket flush against the shelf assembly (see Figure 1-1).

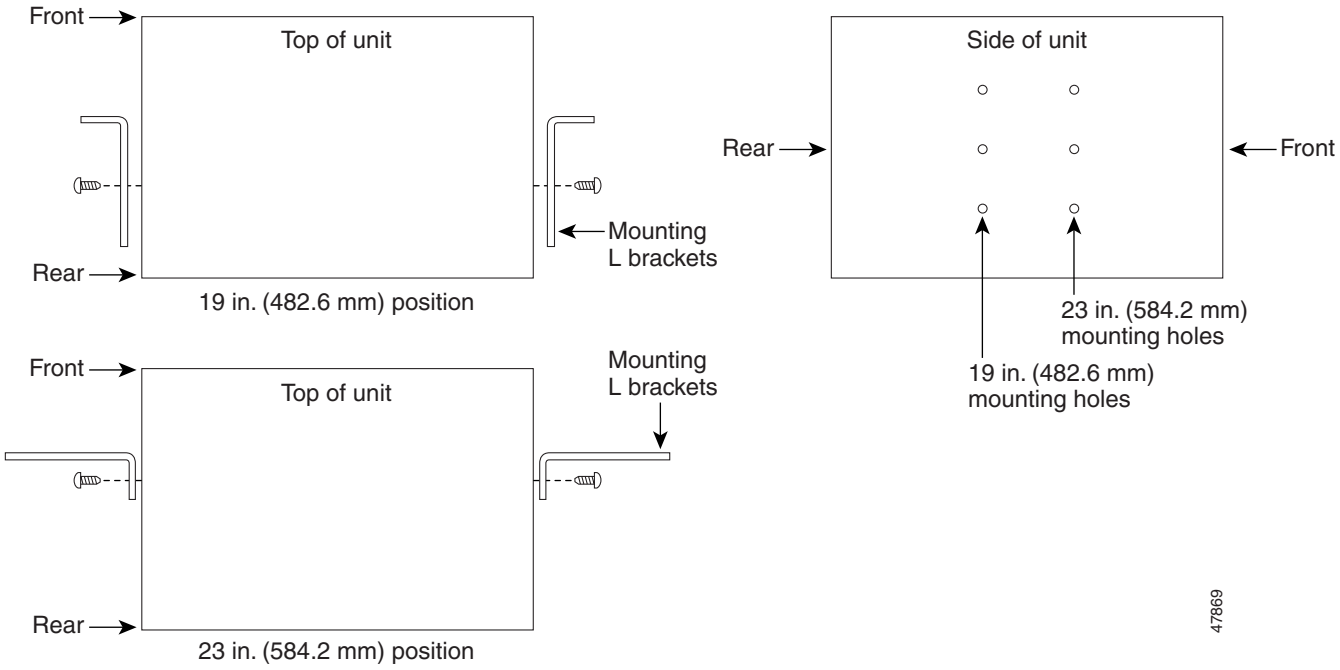
The narrow side of the mounting bracket should be towards the front of the shelf assembly. Text imprinted on the mounting bracket should be visible and upside down.

Step 4 Align the mounting bracket screw holes against the shelf assembly screw holes.

Step 5 Insert the screws that were removed in Step 1 and tighten them.

Step 6 Repeat the task for the mounting bracket on the opposite side.

Figure 1-1 Reversing the Mounting Brackets (23-inch [584.2-mm] Position to 19-inch [482.6-mm] Position



Step 7 Return to your originating procedure (NTP).

DLP-G4 Install the External Brackets and Air Filter (ANSI Only)

Purpose	This task installs the external brackets and air filter on the bottom of the shelf rather than below the fan-tray assembly. Installing the external brackets and air filter on the bottom of the shelf enables access to the air filter without removing the fan-tray assembly. This task applies to the ONS 15454 ANSI shelf only.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver
Prerequisite Procedures	DLP-G3 Reverse the Mounting Bracket to Fit a 19-inch (482.6-mm) Rack (ANSI Only), page 1-10, if applicable
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note If you choose not to install the brackets, install the air filter by sliding it into the compartment at the bottom of the shelf assembly. Each time you remove and reinstall the air filter in the future, you must first remove the fan-tray assembly. Do not install an air filter in both filter locations on any shelf assembly.

Step 1 With the fan-tray assembly removed, place the ONS 15454 facedown on a flat surface.

Note Although the filter will work if it is installed with either side facing up, Cisco recommends that you install it with the metal bracing facing up to preserve the surface of the filter.

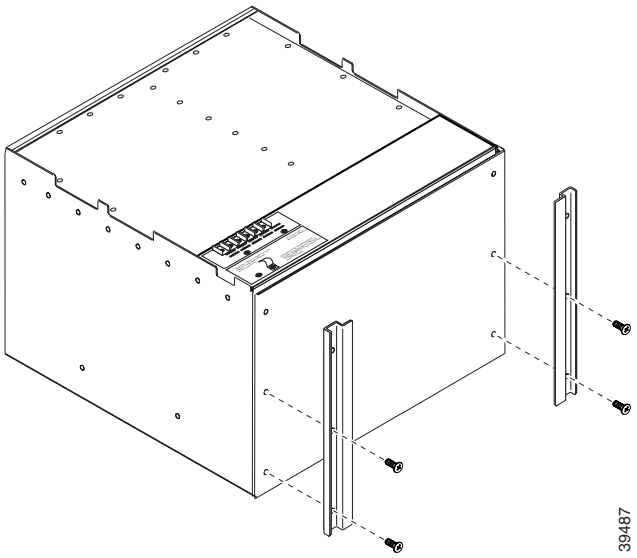
Step 2 Locate the three screw holes that run along the left and right sides of the bottom of the shelf assembly.

Step 3 Secure each bracket to the bottom of the shelf assembly using the screws (48-0003) provided in the backplane standoff kit (53-0795-XX).

Each bracket has a filter stopper and a flange on one end. Make sure to attach the brackets with the stoppers and flanges facing the rear of the shelf assembly (the top, if the ONS 15454 is facedown during installation).

Figure 1-2 illustrates bottom bracket installation. If you do not use the brackets, in the future you must remove the fan-tray assembly before removing the air filter. The brackets enable you to clean and replace the air filter without removing the fan-tray assembly.

Figure 1-2 Installing the External Brackets



Step 4 Slide the air filter into the shelf assembly.

Step 5 Return to your originating procedure (NTP).

DLP-G5 Mount the Shelf Assembly in a Rack (One Person)

Purpose	This task allows one person to mount the shelf assembly in a rack.
Tools/Equipment	Pinned hex tool # 2 Phillips screwdriver ETSI only: Two M6 x 20 socket set screws Eight M6 x 20 pan-head Phillips mounting screws ANSI only: Two #12-24 x 3/4 set screws (48-1003-XX) Eight #12-24 x 3/4 pan-head Phillips mounting screws (48-1004-XX, 48-1007-XX)
Prerequisite Procedures	NTP-G1 Unpack and Inspect the Shelf Assembly, page 1-6
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note The ONS 15454 ETSI requires 616.5 mm (24.24 inch) minimum of vertical rack space and 25 mm (1 inch) below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 ETSI is installed above a shelf assembly, the air ramp between the shelves provides space for air flow. To ensure that the mounting is secure, use two to four M6 mounting screws for each side of the shelf assembly. A shelf assembly should be mounted at the bottom of the rack if it is the only unit in the rack.

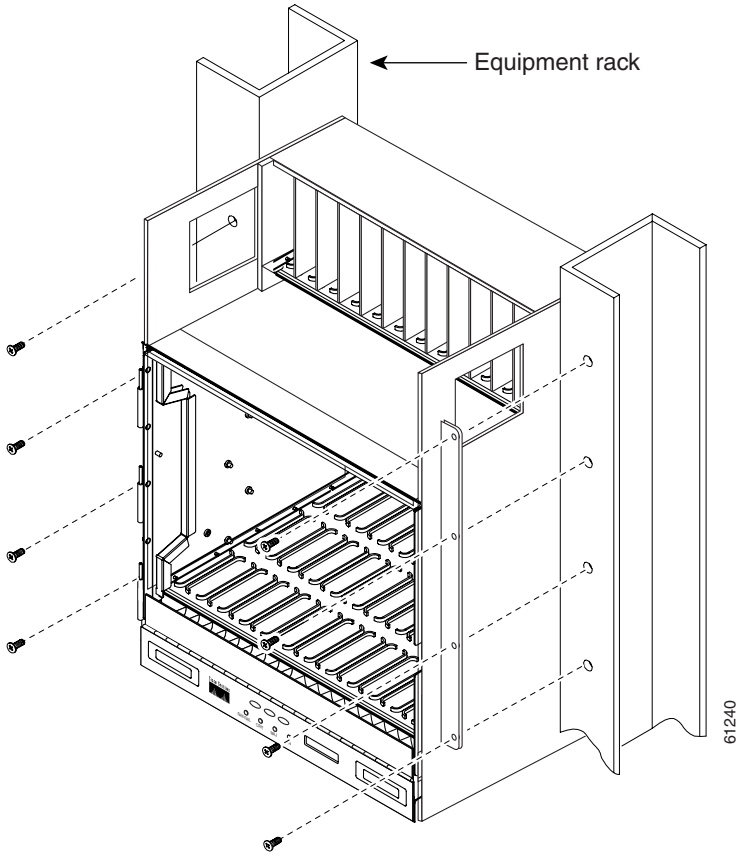
Step 1 Verify that the proper fuse and alarm panel has been installed in the top mounting space. If a fuse and alarm panel is not present, you must install one according to manufacturer instructions:

- (ETSI only) Verify that a 100-A fuse panel (30-A fuse per shelf minimum) is installed.
- (ANSI only) If you are installing the 15454-SA-ANSI or 15454-SA-HD shelf assembly, a 100-A fuse panel (30-A fuse per shelf minimum) is required.
- (ANSI only) If you are installing the 15454-SA-NEBS3 shelf assembly, a standard 80-A fuse panel (20-A fuse per shelf minimum) is required.

Step 2 Ensure that the shelf assembly is set for the desired rack size (either 23 inches [584.2 mm] or 19 inches [482.6 mm]).

Figure 1-3 shows the rack-mounting position for the ONS 15454 ETSI.

Figure 1-3 Mounting an ONS 15454 ETSI in a Rack



Step 3 Using the hex tool that shipped with the assembly, install the two temporary set screws into the holes that will not be used to mount the shelf. Let the set screws protrude sufficiently to hold the mounting brackets.

Step 4 Lift the shelf assembly to the desired position in the rack and set it on the screws.

Step 5 Align the screw holes on the mounting brackets with the mounting holes in the rack.

Step 6 Using the Phillips screwdriver, install one mounting screw in each side of the assembly.

Step 7 When the shelf assembly is secured to the rack, install the remaining mounting screws.

Note Use at least one set of the horizontal screw slots on the shelf assembly to prevent slippage.

Step 8 Using the hex tool, remove the temporary set screws.

Step 9 Return to your originating procedure (NTP).

DLP-G6 Mount the Shelf Assembly in a Rack (Two People)

Purpose	This task allows two people to mount the shelf assembly in a rack.
Tools/Equipment	Pinned hex tool # 2 Phillips screwdriver ETSI only: Two M6 x 20 socket set screws Eight M6 x 20 pan-head Phillips mounting screws ANSI only: Two #12-24 x 3/4 set screws (48-1003-XX) Eight #12-24 x 3/4 pan-head Phillips mounting screws (48-1004-XX, 48-1007-XX)
Prerequisite Procedures	NTP-G1 Unpack and Inspect the Shelf Assembly, page 1-6
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note The ONS 15454 ETSI requires 616.5 mm (24.24 inch) minimum of vertical rack space and 25 mm (1 inch) below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 ETSI is installed above a shelf assembly, the air ramp between the shelves provides space for air flow. To ensure that the mounting is secure, use two to four M6 mounting screws for each side of the shelf assembly. A shelf assembly should be mounted at the bottom of the rack if it is the only unit in the rack.

Note The ONS 15454 ANSI must have one inch (25.4 mm) of airspace below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 is installed underneath a shelf assembly, the air ramp on top of the bottom shelf assembly provides the desired space. However, if the ONS 15454 is installed above third-party equipment, you must provide a minimum spacing of one inch (25.4 mm) between the third-party shelf assembly and the bottom of the ONS 15454. The third-party equipment must not vent heat upward into the ONS 15454.

Step 1 Verify that the proper fuse and alarm panel has been installed in the top mounting space. If a fuse and alarm panel is not present, you must install one according to manufacturer's instructions:

- (ETSI only.) Verify that a 100-A fuse panel (30-A fuse per shelf minimum) is installed.
- (ANSI only.) If you are installing the 15454-SA-ANSI or 15454-SA-HD shelf assembly, a 100-A fuse panel (30-A fuse per shelf minimum) is required.
- (ANSI only.) If you are installing the 15454-SA-NEBS3 shelf assembly, a standard 80-A fuse panel (20-A fuse per shelf minimum) is required.

Step 2 Ensure that the shelf assembly is set for the desired rack size (either 23 inches [584.2 mm] or 19 inches [482.6 mm]).

Step 3 Using the hex tool that shipped with the assembly, install the two set screws into the holes that will not be used to mount the shelf. Let the set screws protrude sufficiently to hold the mounting brackets.

Step 4 Lift the shelf assembly to the desired position in the rack.

Step 5 Align the screw holes on the mounting brackets with the mounting holes in the rack.

Step 6 Have one person hold the shelf assembly in place while the other person uses the Phillips screwdriver to install one mounting screw in each side of the assembly.

Step 7 When the shelf assembly is secured to the rack, install the remaining mounting screws.

Note Use at least one set of the horizontal screw slots on the shelf assembly to prevent slippage.

Step 8 Use the hex tool to remove the temporary set screws.

Step 9 Return to your originating procedure (NTP).

DLP-G7 Mount Multiple Shelf Assemblies in a Rack

Purpose	This task installs multiple shelves in a rack.
Tools/Equipment	Pinned hex tool #2 Phillips screwdriver ETSI only: Two M6 x 20 socket set screws (per shelf) Eight M6 x 20 pan-head Phillips mounting screws (per shelf) ANSI only: Two #12-24 x 3/4 set screws (48-1003-XX) (per shelf) Eight #12-24 x 3/4 pan-head Phillips mounting screws (48-1004-XX, 48-1007-XX) (per shelf)
Prerequisite Procedures	NTP-G1 Unpack and Inspect the Shelf Assembly, page 1-6
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note A standard ETSI rack can hold three ONS 15454 ETSI shelf assemblies and two air ramps. When mounting a shelf assembly in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack. If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Note The ONS 15454 ETSI requires 616.5 mm (24.24 inch) minimum of vertical rack space and 25 mm (1 inch) below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 ETSI is installed above a shelf assembly, the air ramp between the shelves provides space for air flow. When using third-party equipment above the ONS 15454 ETSI, provide a minimum of 25 mm (1 inch) between the third-party unit and the bottom of the ONS 15454 ETSI. The third-party equipment must not vent heat upward into the ONS 15454 ETSI.

Note The ONS 15454 ANSI must have one inch (25.4 mm) of airspace below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 is installed underneath a shelf assembly, the air ramp on top of the bottom shelf assembly provides the desired space. However, if the ONS 15454 is installed above third-party equipment, you must provide a minimum spacing of one inch (25.4 mm) between the third-party shelf assembly and the bottom of the ONS 15454. The third-party equipment must not vent heat upward into the ONS 15454.

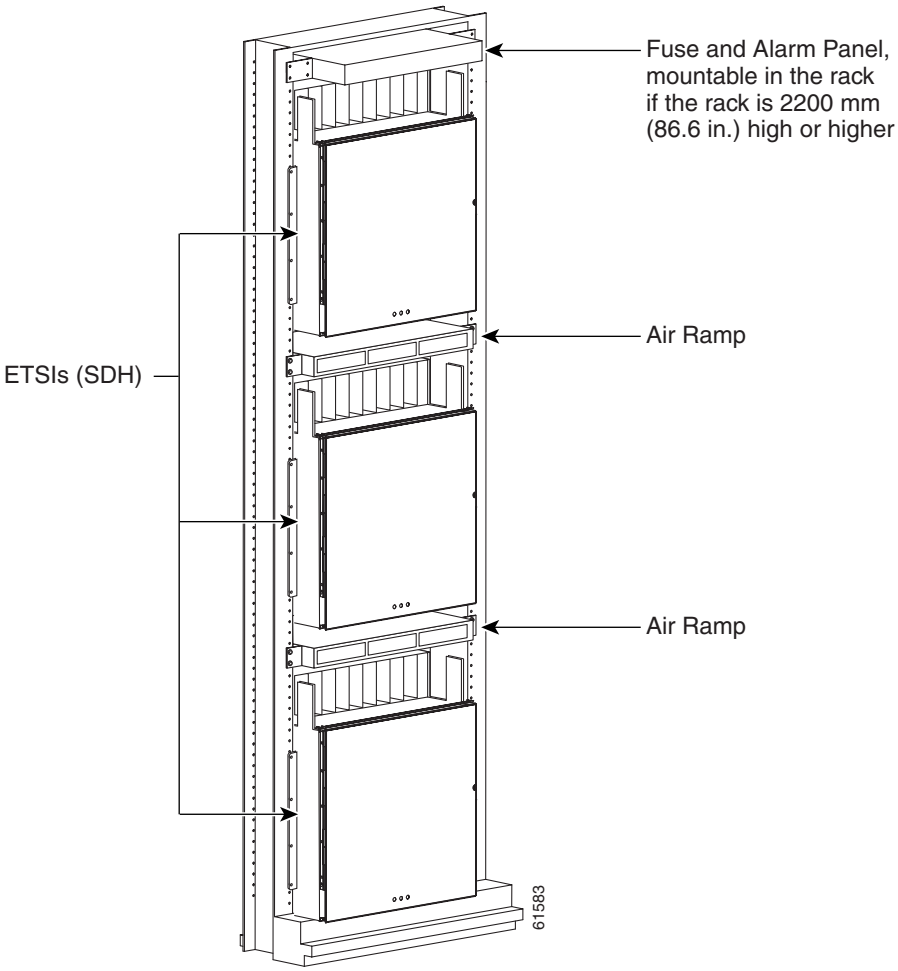
Step 1 Verify that the proper fuse and alarm panel has been installed in the top mounting space. If a fuse and alarm panel is not present, you must install one according to manufacturer's instructions:

- (ETSI only.) Verify that a 100-A fuse panel (30-A fuse per shelf minimum) is installed.
- (ANSI only.) If you are installing the 15454-SA-ANSI or 15454-SA-HD shelf assembly, a 100-A fuse panel (30-A fuse per shelf minimum) is required.
- (ANSI only.) If you are installing the 15454-SA-NEBS3 shelf assembly, a standard 80-A fuse panel (20-A fuse per shelf minimum) is required.

Step 2 Mount the first shelf assembly in the bottom of the rack using the "DLP-G5 Mount the Shelf Assembly in a Rack (One Person)" task on page 1-13 or the "DLP-G6 Mount the Shelf Assembly in a Rack (Two People)" task on page 1-15.

Figure 1-4 shows a three-shelf ONS 15454 ETSI bay assembly.

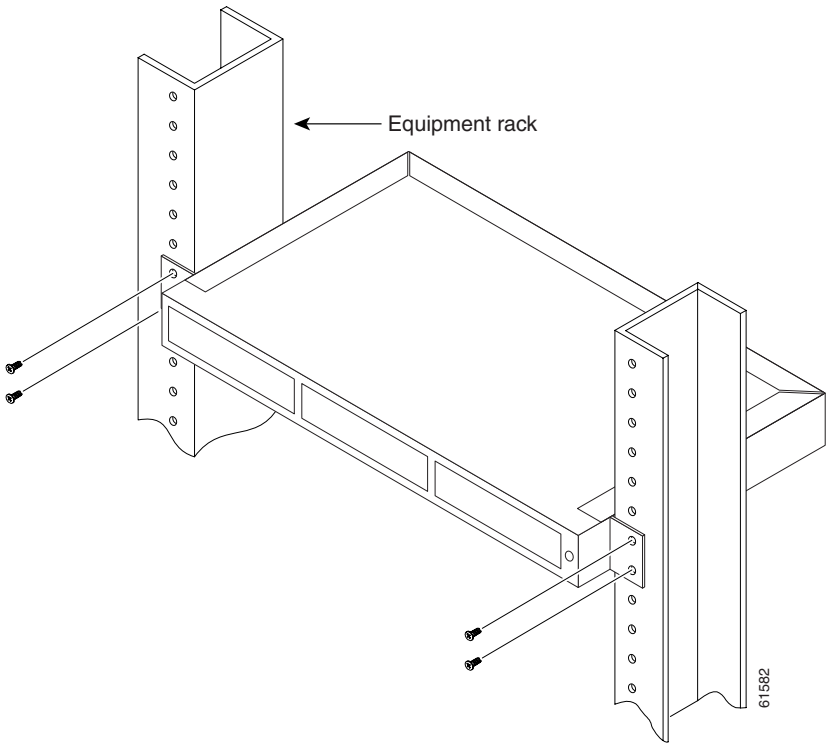
Figure 1-4 Three-Shelf ONS 15454 ETSI (15454 SDH) Bay Assembly



Step 3 (ETSI only.) Mount the air ramp above the ONS 15454 ETSI.

The air ramp is needed if you install more than one ONS 15454 ETSI shelf in a rack. To ensure that the air ramp is secure, use one or two M6 mounting screws for each side of the shelf assembly. Figure 1-5 shows how to mount an air ramp in the rack.

Figure 1-5 Mounting the Air Ramp in a Rack



Step 4 Repeat this task for every shelf assembly you need to install.

Step 5 Return to your originating procedure (NTP).

DLP-G8 Install the Air Ramp

Purpose	Use this task to install the air ramp.
Tools/Equipment	#2 Phillips screwdriver
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 The air ramp requires 1 RU in a standard 19-inch (482.6-mm) or 23-inch (584.2-mm) rack. Locate the RMU space specified in your site plan. See the "14.5 Typical DWDM Rack Layouts" section on page 14-16 for more information about air ramp placement.

Step 2 Verify that the mounting brackets attached to the unit are correct for your rack size. Complete the "DLP-G3 Reverse the Mounting Bracket to Fit a 19-inch (482.6-mm) Rack (ANSI Only)" task on page 1-10 as required.

Step 3 Align the chassis with the rack mounting screw holes; insert and tighten the four screws.

Step 4 Return to your originating procedure (NTP).

NTP-G3 Open and Remove the Front Door

Purpose	This procedure opens and removes the front door to access the equipment.
Tools/Equipment	Open-end wrench Pinned hex (Allen) key
Prerequisite Procedures	NTP-G2 Install the Shelf Assembly, page 1-8
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Complete the "DLP-G9 Open the Front Cabinet Compartment (Door)" task on page 1-20.

Step 2 Complete the "DLP-G10 Remove the Front Door" task on page 1-21.

Step 3 If you are using an ETSI shelf, continue with the "NTP-G4 Open and Remove the FMEC Cover (ETSI Only)" procedure on page 1-23. If you are using an ANSI shelf, continue with the "NTP-G5 Remove the Backplane Covers (ANSI Only)" procedure on page 1-26.

Stop. You have completed this procedure.

DLP-G9 Open the Front Cabinet Compartment (Door)

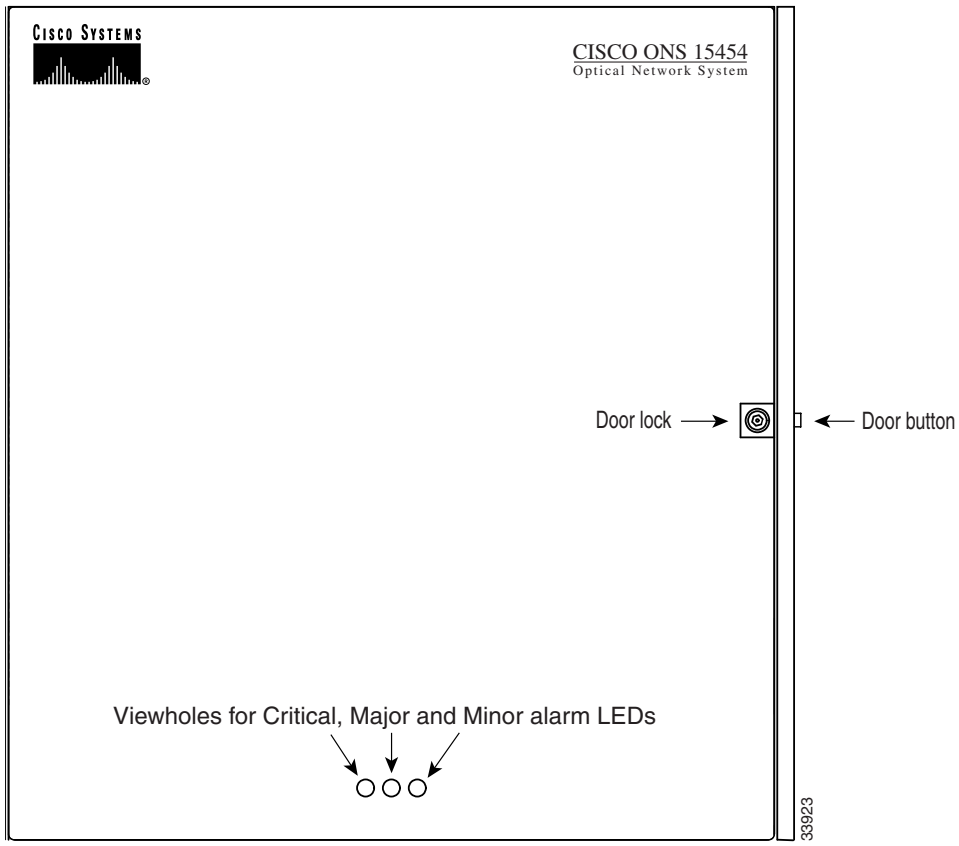
Purpose	This task opens the front door.
Tools/Equipment	Pinned hex (Allen) key
Prerequisite Procedures	NTP-G2 Install the Shelf Assembly, page 1-8
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Note The ONS 15454 shelf assembly has an ESD plug input and is shipped with an ESD wrist strap. The ESD plug input is located on the outside of the shelf assembly on the right side. It is labeled "ESD" on the top and bottom. Always wear an ESD wrist strap and connect the strap to the ESD plug when working on the ONS 15454.

Step 1 Open the front door lock.

The ONS 15454 shelf assembly comes with a pinned hex key for locking and unlocking the front door. Turn the key counterclockwise to unlock the door and clockwise to lock it. Figure 1-6 illustrates the front door of the ANSI shelf.

Figure 1-6 Cisco ONS 15454 ANSI Front Door



Step 2 Press the door button to release the latch. A button on the right side of the shelf assembly releases the door.

Step 3 Swing the door open.

Step 4 Return to your originating procedure (NTP).

DLP-G10 Remove the Front Door

Purpose	This task removes the front cabinet compartment door.
Tools/Equipment	Open-end wrench
Prerequisite Procedures	DLP-G9 Open the Front Cabinet Compartment (Door), page 1-20
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

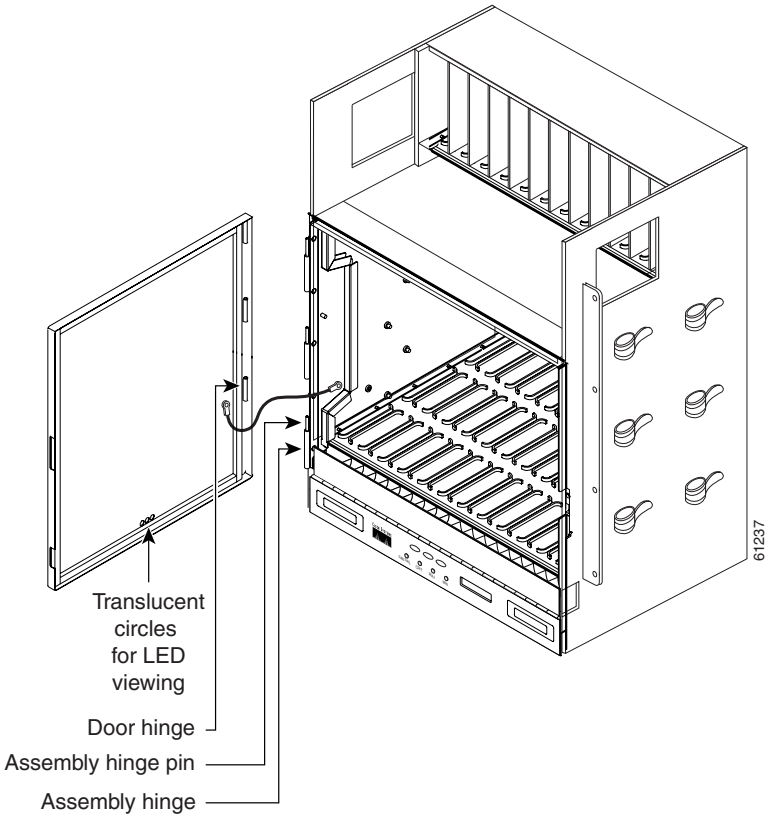
Step 1 For ONS 15454 ETSI shelves:

a. Unscrew the nut holding the ground wire to the shelf. Remove the nut and washer.

b. Remove the ground wire from the shelf.

c. Hold the door at the top left corner and remove the door from its hinges (Figure 1-7).

Figure 1-7 Removing the ONS 15454 ETSI Front Door



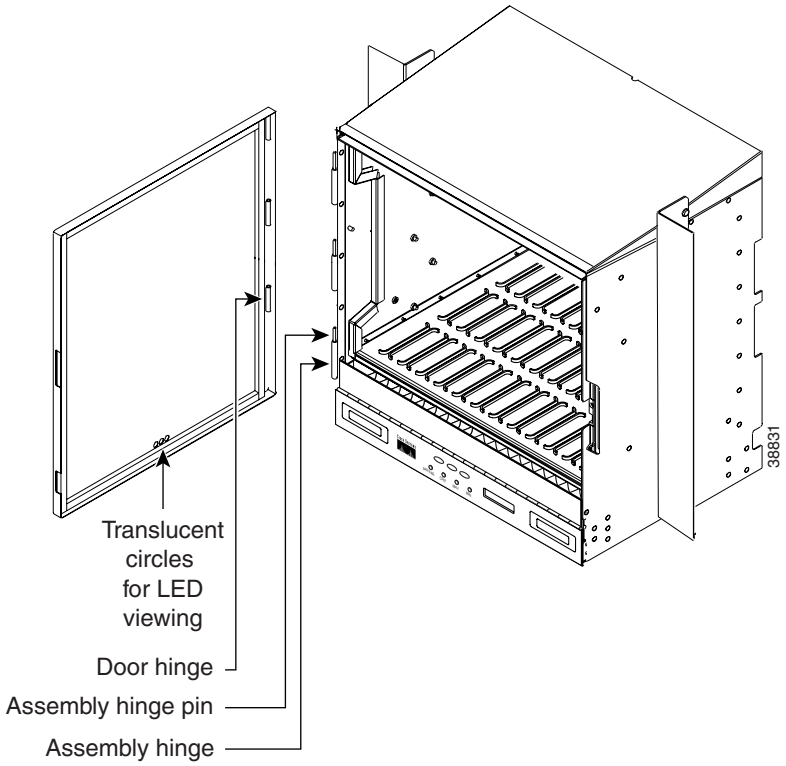
Step 2 For ONS 15454 ANSI shelves:

a. To remove the door ground strap, perform the following:

- To detach the ground strap from the front door, loosen the #6 Kepnut (49-0600-01) using the open-end wrench. Detach the end of the ground strap terminal lug (72-3622-01) from the male stud on the inside of the door.
- To detach the other end of the ground strap from the longer screw on the fiber guide, loosen the #4 Kepnut (49-0337-01) on the terminal lug using the open-end wrench. Remove the terminal lug and lock washer.

b. Lift the door from its hinges at the top left corner of the door (Figure 1-8).

Figure 1-8 Removing the ONS 15454 ANSI Front Door



Step 3 Return to your originating procedure (NTP).

NTP-G4 Open and Remove the FMEC Cover (ETSI Only)

Purpose	This procedure opens and removes the FMEC cover on the ONS 15454 ETSI. The ONS 15454 ETSI has a screw-in panel over the EFCA. The FMEC cover protects the FMEC cards.
Tools/Equipment	Medium slot-head screwdriver
Prerequisite Procedures	NTP-G2 Install the Shelf Assembly, page 1-8
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Complete the "DLP-G11 Open the FMEC Cover" task on page 1-24.

Step 2 Complete the "DLP-G12 Remove the FMEC Cover" task on page 1-25.

Step 3 Continue with the "NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only)" procedure on page 1-28.

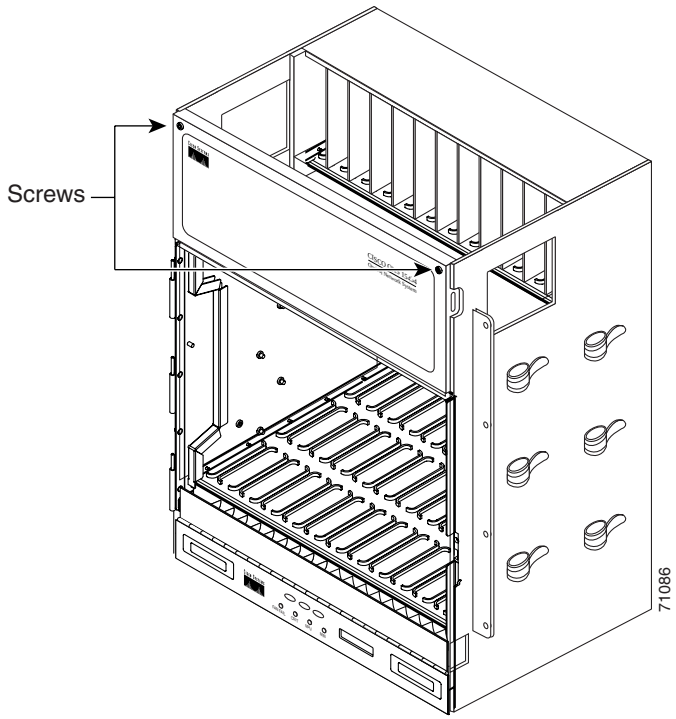
Stop. You have completed this procedure.

DLP-G11 Open the FMEC Cover

Purpose	This task opens the FMEC cover. The FMEC cover must be opened to install the MIC-A/P and the MIC-C/T/P.
Tools/Equipment	Medium slot-head screwdriver
Prerequisite Procedures	DLP-G9 Open the Front Cabinet Compartment (Door), page 1-20
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Unscrew the screws on the FMEC cover (Figure 1-9).

Figure 1-9 Unscrewing the FMEC Cover



Step 2 Use the handles to pull the cover forward.

Step 3 Return to your originating procedure (NTP).

DLP-G12 Remove the FMEC Cover

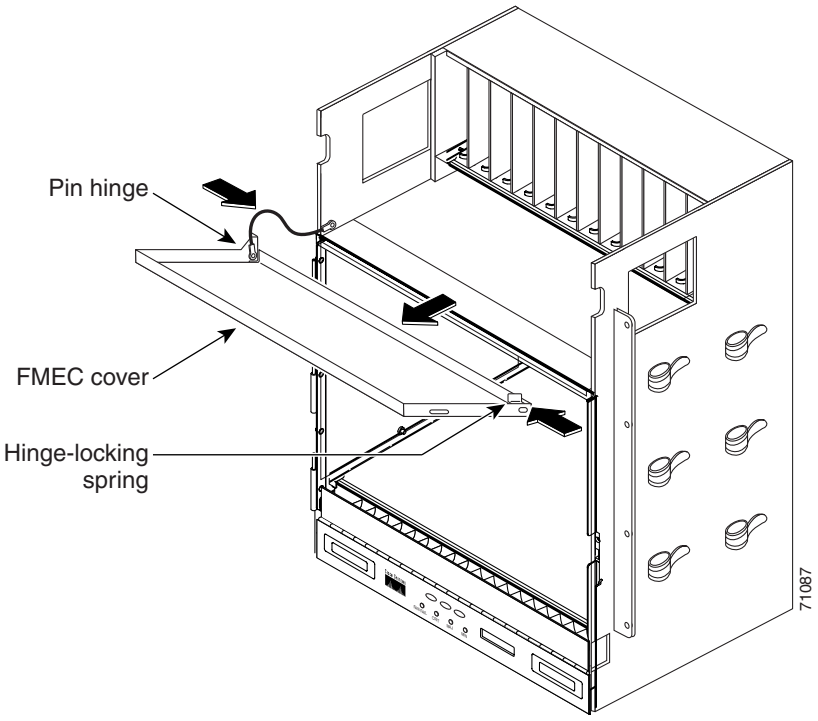
Purpose	This task removes the FMEC cover in order to install the MIC-A/P and the MIC-C/T/P.
Tools/Equipment	Medium slot-head screwdriver
Prerequisite Procedures	DLP-G11 Open the FMEC Cover, page 1-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Unscrew the nut holding the ground wire to the shelf. Remove the nut and washer.

Step 2 Remove the ground wire from the left side of the shelf.

Step 3 Pull the right side of the hinge-locking spring (Figure 1-10).

Figure 1-10 Removing the ONS 15454 FMEC Cover



Step 4 Detach the cover from the pin of the hinge.

Step 5 Remove the cover carefully from the left pin of the hinge.

Step 6 Return to your originating procedure (NTP).

NTP-G5 Remove the Backplane Covers (ANSI Only)

Purpose	This procedure describes how to access the ONS 15454 ANSI backplane by removing the covers. The backplane has two sheet metal covers (one on either side) and a lower backplane cover at the bottom.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver
Prerequisite Procedures	NTP-G2 Install the Shelf Assembly, page 1-8 NTP-G3 Open and Remove the Front Door, page 1-20
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Complete the "DLP-G13 Remove the Lower Backplane Cover" task on page 1-26.

Step 2 Complete the "DLP-G14 Remove the Backplane Sheet Metal Cover" task on page 1-27.

Step 3 Continue with the "NTP-G7 Install the Power and Ground" procedure on page 1-30.

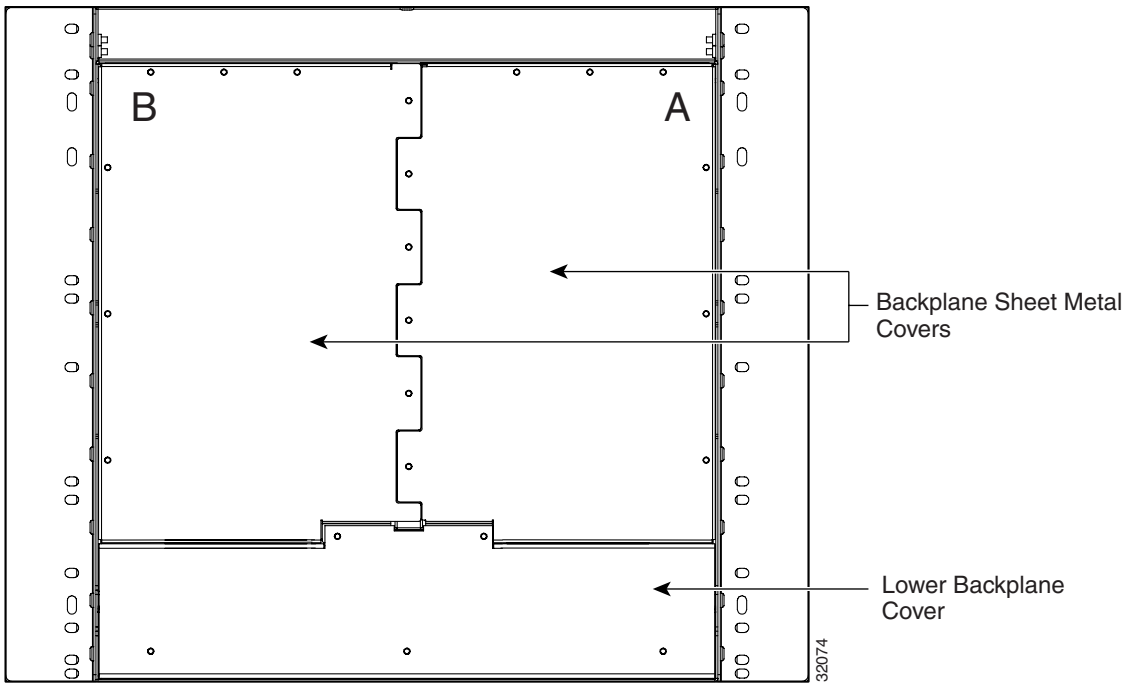
Stop. You have completed this procedure.

DLP-G13 Remove the Lower Backplane Cover

Purpose	This task removes the lower backplane cover of the ONS 15454 ANSI shelf assembly.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Unscrew the five retaining screws that hold the cover in place (Figure 1-11).

Figure 1-11 Backplane Covers on the 15454 ANSI Shelf



Step 2 Grasp the cover on each side.

Step 3 Gently pull the cover away from the backplane.

Step 4 Return to your originating procedure (NTP).

DLP-G14 Remove the Backplane Sheet Metal Cover

Purpose	This task removes the backplane sheet metal cover that is installed on the rear of the 15454 ANSI shelf.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver
Prerequisite Procedures	DLP-G13 Remove the Lower Backplane Cover, page 1-26
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 To remove the backplane sheet metal cover, loosen the five screws that secure it to the ONS 15454 ANSI shelf and pull it away from the shelf assembly (Figure 1-11 on page 1-27).

Step 2 Loosen the nine perimeter screws that hold the backplane sheet metal cover(s) in place.

Step 3 Lift the panel by the bottom to remove it from the shelf assembly.

Step 4 Store the panel for later use. Attach the backplane cover(s) whenever electrical interface assemblies (EIAs) are not installed.

Step 5 Return to your originating procedure (NTP).

NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only)

Purpose	This procedure installs the MIC-A/P and the MIC-T/C/P, which are a type of FMEC installed in the EFCA. The EFCA is located at the top of the ONS 15454 ETSI shelf. It provides connection for installing power, external alarms, timing input and output, and craft interface terminals.This procedure applies to the ETSI shelf only.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver FMEC cards (the MIC-A/P and MIC-T/C/P)
Prerequisite Procedures	NTP-G4 Open and Remove the FMEC Cover (ETSI Only), page 1-23
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Caution Always use the supplied ESD wristband when working with a powered ONS 15454 ETSI. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

Warning **Voltage is present on the backplane when the system is operating. To reduce risk of an electric shock, keep hands and fingers out of the power supply bays and backplane areas.** Statement 166

Note The ONS 15454 ETSI EFCA has 12 FMEC slots numbered sequentially from left to right beginning with Slot 18. Slots 18 to 22 and 25 to 29 provide electrical connections for the corresponding slots, so they are unnecessary in dense wave division multiplexing (DWDM) applications.

Step 1 Ensure you are installing the FMECs in the correct slot:

- FMEC Slot 23 supports the MIC-A/P.

  The MIC-A/P card provides connection for the BATTERY B input, one of the two possible redundant power supply inputs. It also provides connection for eight alarm outputs (coming from the TCC2/TCC2P card), sixteen alarm inputs, and four configurable alarm inputs/outputs.

- FMEC Slot 24 supports the MIC-C/T/P.

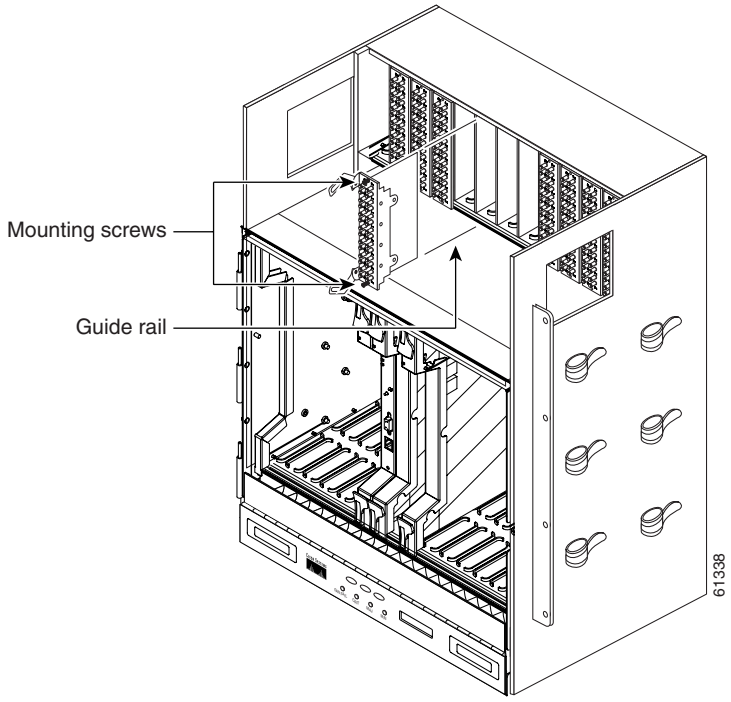
  The MIC-C/T/P card provides connection for the BATTERY A input, one of the two possible redundant power supply inputs. It also provides connection for system management serial port, system management LAN port, and system timing inputs and outputs.

Step 2 Hold the FMEC by the faceplate.

Step 3 Slide the FMEC along the guide rails into the desired FMEC slot or slots.

Step 4 Push the FMEC gently into the connector. The ONS 15454 ETSI FMECs plug into electrical connectors on the back panel of the shelf assembly when the screws are tightened. Figure 1-12 shows FMEC installation.

Figure 1-12 Installing FMECs on the ONS 15454 ETSI



Step 5 Tighten the screws.

Step 6 Continue with the "NTP-G7 Install the Power and Ground" procedure on page 1-30.

Stop. You have completed this procedure.

NTP-G7 Install the Power and Ground

Purpose	This procedure installs power feeds and grounds the ONS 15454.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver Screws (ETSI only.) Power cable (from fuse panel to MIC-A/P and to MIC-C/T/P), shipped with the ONS 15454 ETSI (ANSI only.) Power cable (from fuse and alarm panel to assembly), #10 AWG, copper conductors, 194 degrees F [90 degrees C]) Ground cable 13.3-mm² (#6 AWG) stranded (ETSI only.) Two-hole grounding lug, shipped with the ONS 15454 ETSI Listed pressure terminal connectors such as ring and fork types; connectors must be suitable for 5.26-mm² (#10 AWG) copper conductors (ANSI only.) Wire wrapper Wire cutters Wire strippers Crimp tool Fuse panel
Prerequisite Procedures	(ETSI) NTP-G4 Open and Remove the FMEC Cover (ETSI Only), page 1-23 (ETSI) NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only), page 1-28 (ANSI) NTP-G5 Remove the Backplane Covers (ANSI Only), page 1-26
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Warning **This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.** Statement 39

Warning **Use copper conductors only.** Statement 1025

Warning **Connect the unit only to DC power source that complies with the safety extra-low voltage (SELV) requirements in IEC 60950 based safety standards.** Statement 1033

Warning **This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.** Statement 1045

Warning **A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.** Statement 1022

Warning **This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.** Statement 1028

Caution Always use the supplied ESD wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

Step 1 Verify that the correct fuse and alarm panel is installed in the top mounting space:

- (ETSI only.) Verify that a 100-A fuse panel (30-A fuse per shelf minimum) is installed. If not, install one according to manufacturer's instructions.
- (ANSI only.) If you have the 15454-SA-ANSI or 15454-SA-HD shelf, a 100-A fuse panel (30-A fuse per shelf minimum) should be installed. If not, install one according to manufacturer's instructions.
- (ANSI only.) If you have the 15454-SA-NEBS3 shelf, a standard 80-A fuse panel (20-A fuse per shelf minimum) should be installed. If not, install one according to manufacturer's instructions.

Step 2 Depending on your type of shelf, complete the "DLP-G15 Connect the Office Ground to the ONS 15454 ETSI" task on page 1-32 or the "DLP-G16 Connect the Office Ground to the ONS 15454 ANSI" task on page 1-33.

Step 3 Depending on your shelf, complete the "DLP-G17 Connect Office Power to the ONS 15454 ETSI" task on page 1-35 or the "DLP-G18 Connect Office Power to the ONS 15454 ANSI" task on page 1-36.

Step 4 Complete the "DLP-G19 Turn On and Verify Office Power" task on page 1-39.

Step 5 Continue with the "NTP-G8 Install the Fan-Tray Assembly" procedure on page 1-40.

Stop. You have completed this procedure.

DLP-G15 Connect the Office Ground to the ONS 15454 ETSI

Purpose	This task connects ground to the ONS 15454 ETSI shelf.
Tools/Equipment	2-hole grounding lug, included in the installation kit
	2 Phillips head, M6 (metric) machine screws with locking washers, included in the installation kit
	Grounding wire—Use 13.3-mm² (#6 AWG) copper wire.
	#2 Phillips screwdriver
	Crimping tool—This tool must be large enough to accommodate the girth of the grounding lug when you crimp the grounding cable into the lug.
	Wire stripping tool
Prerequisite Procedures	DLP-G9 Open the Front Cabinet Compartment (Door), page 1-20
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Warning **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire.

Step 2 Insert the stripped end of the grounding wire into the open-end of the grounding lug.

Step 3 Use the crimping tool to secure the grounding wire in two different places in the grounding lug.

Step 4 Locate the grounding receptacle on the side panel of the shelf (Figure 1-13).

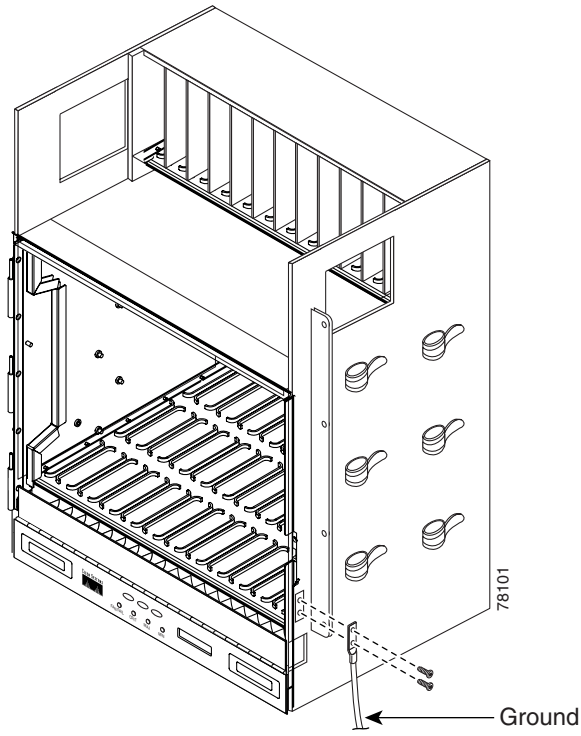
Step 5 Place the grounding lug against the grounding receptacle on the side panel of the shelf.

Step 6 Insert one of the screws through the locking washer and through the hole in the grounding lug. Insert the screw into the threaded holes on the right side of the shelf. Ensure that the grounding lug does not interfere with other system hardware or rack equipment.

Step 7 Repeat Step 6 with the second screw.

Step 8 Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure adequate earth ground for the shelf.

Figure 1-13 Grounding the ONS 15454 ETSI



Step 9 Return to your originating procedure (NTP).

DLP-G16 Connect the Office Ground to the ONS 15454 ANSI

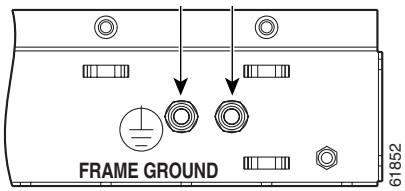
Purpose	This task connects ground to the ONS 15454 ANSI shelf.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver Screws Power cable (from fuse and alarm panel to assembly), #10 AWG, copper conductors, 194 degrees F [90 degrees C]) Ground cable #6 AWG stranded Listed pressure terminal connectors such as ring and fork types; connectors must be suitable for #10 AWG copper conductors
Prerequisite Procedures	DLP-G13 Remove the Lower Backplane Cover, page 1-26
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Verify that the office ground cable (#6 AWG stranded) is connected to the top of the bay according to local site practice.

Step 2 Attach one end of the shelf ground cable (#10 AWG) to the right side of the backplane ground nut. See Figure 1-14 for the location of the ground on the backplane.

Note When terminating a frame ground, use the Kepnut provided with the ONS 15454 and tighten it to a torque specification of 31 in-lb. The Kepnut provides a frame ground connection that minimizes the possibility of loosening caused by rotation during installation and maintenance activity. The type of prevention the kep nut provides for the frame ground connection is inherently provided by the terminal block for battery and battery return connections.

Figure 1-14 Ground Location on the Backplane



Step 3 Attach the other end of the shelf ground cable to the bay.

Step 4 Return to your originating procedure (NTP).

DLP-G17 Connect Office Power to the ONS 15454 ETSI

Purpose	This task connects power to the ONS 15454 ETSI shelf.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver Wire wrapper Wire cutters Wire strippers Crimp tool Fuse panel Power cable (from fuse and alarm panel to assembly), 5.26-mm² (#10 AWG), copper conductors, 194°F [90°C]) Ground cable 13.3-mm² (#6 AWG) stranded Listed pressure terminal connectors such as ring and fork types; connectors must be suitable for 5.26-mm² (#10 AWG) copper conductors
Prerequisite Procedures	DLP-G15 Connect the Office Ground to the ONS 15454 ETSI, page 1-32
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Caution Do not apply power to the ONS 15454 ETSI until you complete all installation steps and check the continuity of the –48 VDC battery and battery return.

Note No more than 2 m (7 ft) of the power supply cable should be exposed between the equipment and the fiber-storage tray.

Note Only use listed compression-type connectors when terminating the battery, battery return, and ground conductors. Connectors must be suitable for copper conductors.

Caution When terminating power, return, and frame ground, do not use soldering lug connectors, screwless (push-in) connectors, quick-connect connectors, or other friction-fit connectors.

Note If the system loses power or if both TCC2/TCC2P cards are reset, you must reset the ONS 15454 ETSI clock. After powering down, the date defaults to January 1, 1970, 00:04:15. To reset the clock, see the "NTP-G24 Set Up Name, Date, Time, and Contact Information" procedure on page 3-8.

Step 1 Verify that the MIC-A/P FMEC is installed in Slot 23 and the MIC-C/T/P FMEC is installed in Slot 24 of the EFCA.

Step 2 Attach the connector on the end of the power cable to the power FMEC.

Step 3 Tighten the screws of the connector on the power cable.

Step 4 Connect the power cable to the fuse panel or power source. Use the pin connections in Table 1-1. The conductor (green with yellow stripes) is used for secondary grounding such as grounding to the rack.

Table 1-1 Pin Connection of the Power FMECs

Pin	Function	Cable Color
A1	Battery return	Black
A2	–48 V battery	Red
A3	Ground	Green with yellow stripes

Step 5 Return to your originating procedure (NTP).

DLP-G18 Connect Office Power to the ONS 15454 ANSI

Purpose	This task connects power to the ONS 15454 ANSI shelf.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver Wire wrapper Wire cutters Wire strippers Crimp tool Fuse panel Power cable (from fuse and alarm panel to assembly), #10 AWG, copper conductors, 194 degrees F [90 degrees C]) Ground cable #6 AWG stranded Listed pressure terminal connectors such as ring and fork types; connectors must be suitable for #10 AWG copper conductors
Prerequisite Procedures	DLP-G16 Connect the Office Ground to the ONS 15454 ANSI, page 1-33
Required/As Needed	Required

Onsite/Remote	Onsite
Security Level	None

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Note The battery return connection is treated as DC-I, as defined in Telcordia GR-1089-CORE Issue 3.

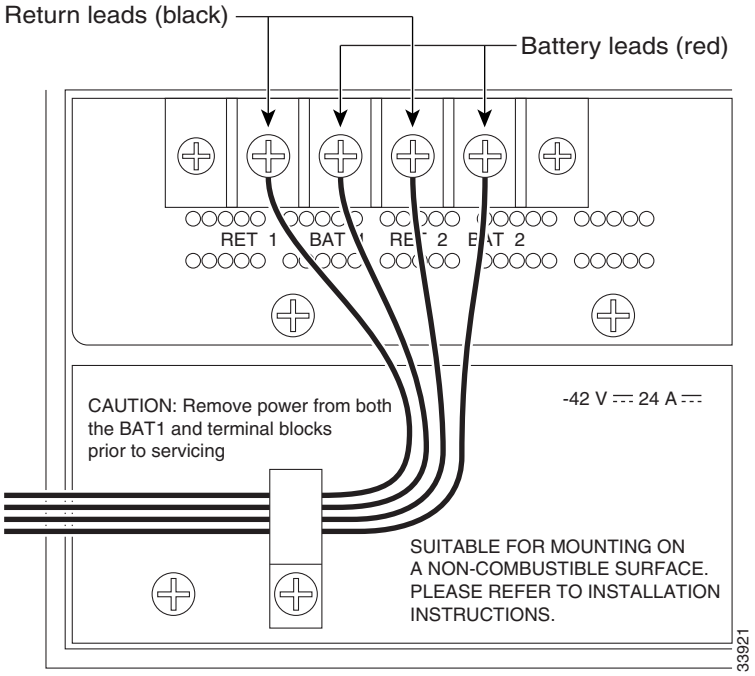
Note If the system loses power or both TCC2/TCC2P cards are reset and the system is not provisioned to get the time from a Network Time Protocol/Simple Network Time Protocol (NTP/SNTP) server, you must reset the ONS 15454 clock. After powering down, the date defaults to January 1, 1970, 00:04:15. To reset the clock, see the "NTP-G24 Set Up Name, Date, Time, and Contact Information" procedure on page 3-8.
If you are using the TCC2/TCC2P cards, the system clock will run for up to three hours. In this case, no action would be required.

Step 1 Connect the office power according to the fuse panel engineering specifications.

Step 2 Measure and cut the cables as needed to reach the ONS 15454 from the fuse panel. Figure 1-15 shows the ONS 15454 power terminals.

Step 3 Dress the power according to local site practice.

Figure 1-15 Cisco ONS 15454 Power Terminals



Step 4 Remove or loosen the #8 power terminal screws on the ONS 15454. To avoid confusion, label the cables connected to the BAT1/RET1 (A) power terminals as 1, and the cables connected to the BAT2/RET2 (B) power terminals as 2.

Note Use only pressure terminal connectors, such as ring and fork types, when terminating the battery, battery return, and frame ground conductors.

Caution Before you make any crimp connections, coat all bare conductors (battery, battery return, and frame ground) with an appropriate antioxidant compound. Bring all unplated connectors, braided strap, and bus bars to a bright finish, then coat with an antioxidant before you connect them. You do not need to prepare tinned, solder-plated, or silver-plated connectors and other plated connection surfaces, but always keep them clean and free of contaminants.

Caution When terminating power, return, and frame ground, do not use soldering lug, screwless (push-in) connectors, quick-connect, or other friction-fit connectors.

Step 5 Strip 1/2 inch (12.7 mm) of insulation from all power cables that you will use.

Step 6 Crimp the lugs onto the ends of all power leads.

Note When terminating battery and battery return connections as shown in Figure 1-15, follow a torque specification of 10 in-lb.

Step 7 Terminate the return 1 lead to the RET1 backplane terminal. Use oxidation-prevention grease to keep the connections noncorrosive.

Step 8 Terminate the negative 1 lead to the negative BAT1 backplane power terminal. Use oxidation prevention grease to keep connections noncorrosive.

Step 9 If you use redundant power leads, terminate the return 2 lead to the positive RET2 terminal on the ONS 15454. Terminate the negative 2 lead to the negative BAT2 terminal on the ONS 15454. Use oxidation-preventative grease to keep connections noncorrosive.

Step 10 Route the cables out below the power terminals using the plastic cable clamp, as shown in Figure 1-15 on page 1-37.

Step 11 Return to your originating procedure (NTP).

DLP-G19 Turn On and Verify Office Power

Purpose	This task measures the power to verify correct power and returns for the ONS 15454 shelf.
Tools/Equipment	Voltmeter
Prerequisite Procedures	DLP-G15 Connect the Office Ground to the ONS 15454 ETSI, page 1-32 DLP-G17 Connect Office Power to the ONS 15454 ETSI, page 1-35 DLP-G16 Connect the Office Ground to the ONS 15454 ANSI, page 1-33 DLP-G18 Connect Office Power to the ONS 15454 ANSI, page 1-36
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Caution Do not apply power to the shelf assembly until you complete all installation steps.

Step 1 Using a voltmeter, verify the office battery and ground at the following points on the fuse and alarm panel:

a. To verify the power, place the black test lead of the voltmeter to the frame ground. Place the red test lead on the A-side connection and verify that it is between –40.5 VDC and –57 VDC. Place the red test lead on the B-side connection and verify that it is between –40.5 VDC and –57 VDC.

Note The voltages –40.5 VDC and –57 VDC are, respectively, the minimum and maximum voltages required to power the chassis.

b. To verify the ground, place the black test lead of the voltmeter to the frame ground. Place the red test lead on the A-side return ground and verify that no voltage is present. Place the red test lead on the B-side return ground and verify that no voltage is present.

Step 2 Complete one of the following to power up the node:

- If you are using a 80-A fuse panel, insert a 20-A fuse into the fuse position according to site practice.
- If you are using a 100-A fuse panel, insert a 30-A fuse into the fuse position according to site practice.

Step 3 Using a voltmeter, verify the ONS 15454 shelf for –48 VDC battery and ground:

a. To verify the A-side of the shelf, place the black lead of the voltmeter to the frame ground. Place the red test lead to the BAT1 (A-side battery connection) red cable. Verify that it reads between –40.5 VDC and –57 VDC. Then place the red test lead of the voltmeter to the RET1 (A-side return ground) black cable and verify that no voltage is present.

Note The voltages –40.5 VDC and –57 VDC are, respectively, the minimum and maximum voltages required to power the chassis.

b. To verify the B-side of the shelf, place the black test lead of the voltmeter to the frame ground. Place the red test lead to the BAT2 (B-side battery connection) red cable. Verify that it reads between –40.5 VDC and –57 VDC. Then place the red test lead of the voltmeter to the RET2 (B-side return ground) black cable and verify that no voltage is present.

Step 4 Return to your originating procedure (NTP).

NTP-G8 Install the Fan-Tray Assembly

Purpose	This procedure installs the fan-tray assembly.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver
Prerequisite Procedures	NTP-G3 Open and Remove the Front Door, page 1-20 NTP-G7 Install the Power and Ground, page 1-30
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Caution Do not operate an ONS 15454 without a fan-tray air filter. A fan-tray air filter is mandatory, except for ONS 15454 ANSI applications in an outside plant cabinet.

Note Error messages appear on the TCC2/TCC2P card, the fan-tray LED, and in Cisco Transport Controller (CTC) when the fan-tray assembly is removed from the shelf or when one fan is not working.

Note If you are installing the ONS 15454 in an outside plant cabinet, remove the air filter to provide maximum cooling capabilities and to comply with Telcordia GR-487-CORE.

Caution You must place the edge of the air filter flush against the front of the fan-tray assembly compartment when installing the fan tray on top of the filter. Failure to do so could result in damage to the filter, the fan tray, or both.

Caution Do not force a fan-tray assembly into place. Doing so can damage the connectors on the fan tray and/or the connectors on the back panel of the shelf assembly.

Note To install the fan-tray assembly, it is not necessary to move any of the fiber-storage facilities.

Step 1 Install the air filter. The air filter can be installed internally between the fan tray and shelf assembly, or externally by mounting the air filter bracket on the bottom of the shelf assembly. Slide the air filter into the bracket.

Step 2 Install the fan-tray assembly. Figure 1-16 shows the fan-tray assembly location on the ONS 15454 ETSI. Figure 1-17 shows the fan-tray assembly location on the ONS 15454 ANSI.

- For the ONS 15454 ETSI shelf, press and hold the locks on the outer edges as you slide the fan-tray assembly into the shelf assembly.
- For the ONS 15454 ANSI shelf, slide the fan-tray assembly into the shelf.

The electrical plug at the rear of the tray should plug into the corresponding receptacle on the assembly.

Caution Do not force a fan-tray assembly into place. This can damage the connectors on the fan-tray assembly and/or the connectors on the back panel of the shelf assembly.

Figure 1-16 Installing the Fan-Tray Assembly on the ONS 15454 ETSI

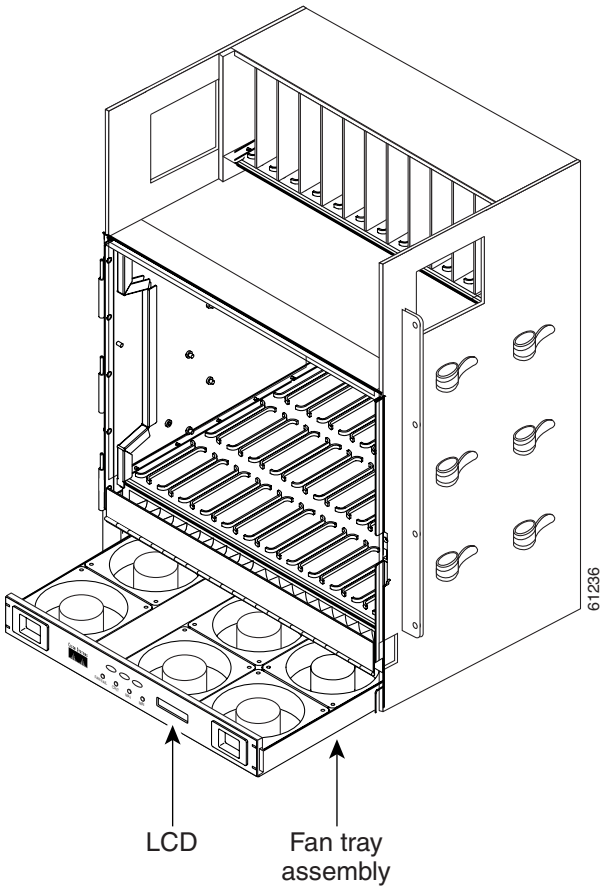
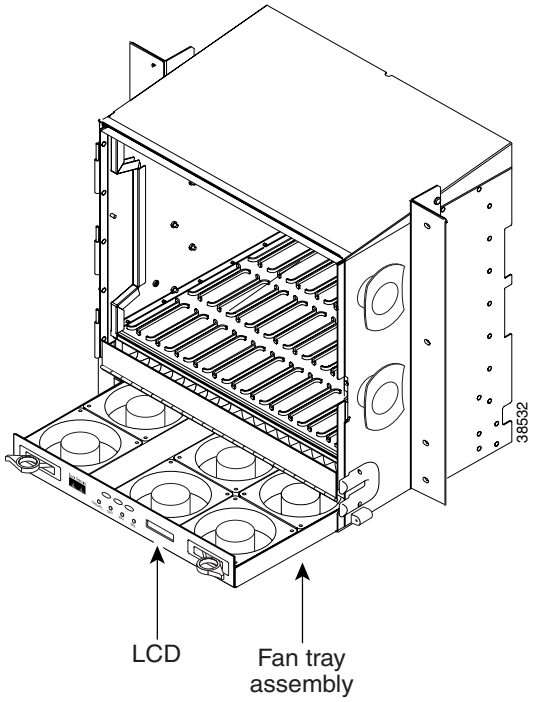


Figure 1-17 Installing the Fan-Tray Assembly on the ONS 15454 ANSI



Step 3 To verify that the tray has plugged into the assembly, look at the fan tray and listen to determine that the fans are running.

Step 4 If you want to install an alarm expansion panel on the ONS 15454 ANSI shelf, continue with the "NTP-G9 Install the Alarm Expansion Panel (ANSI Only)" procedure on page 1-43. Otherwise, continue with the "NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections" procedure on page 1-46.

Stop. You have completed this procedure.

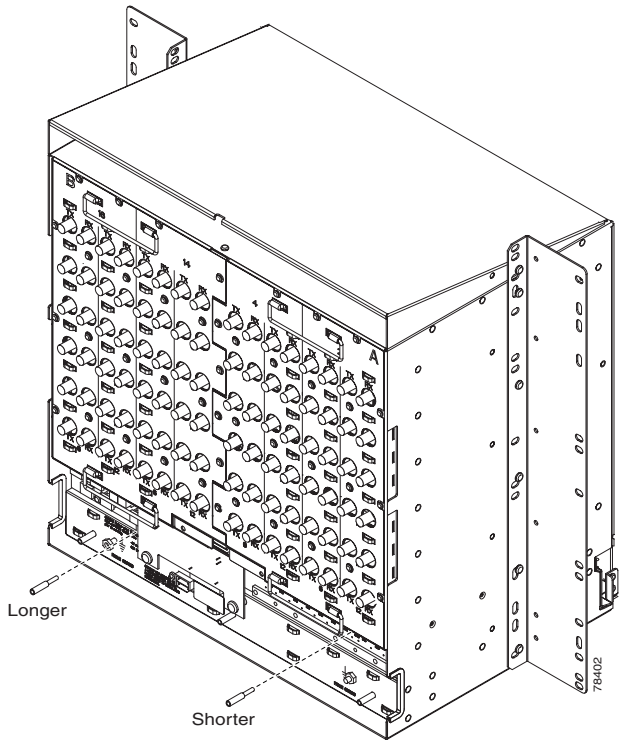
NTP-G9 Install the Alarm Expansion Panel (ANSI Only)

Purpose	This procedure installs an AEP onto the 15454-SA-ANSI or 15454-SA-HD shelf backplane. The AEP provides alarm contacts (32 inputs, 16 outputs) in addition to the 16 provided by the AIC-I card. Typically, the AEP is preinstalled when ordered with the ONS 15454; however, the AEP can be ordered separately. The AIC-I card must be installed before you can provision the alarm contacts enabled by the AEP.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver Wire wrapper 6-pair #29 AWG double-shielded cable Standoffs (4)
Prerequisite Procedures	DLP-G13 Remove the Lower Backplane Cover, page 1-26
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note The AIC-I card provides direct alarm contacts (external alarm inputs and external control outputs). In the ANSI shelf, these AIC-I alarm contacts are routed through the backplane to wire-wrap pins accessible from the back of the shelf. When you install an AEP, the direct AIC-I alarm contacts cannot be used. Only the AEP alarm contacts can be used.

Step 1 Remove the two backplane screws. Replace the two screws with standoffs. Insert the longer standoff on the left, and the shorter standoff on the right (Figure 1-18).

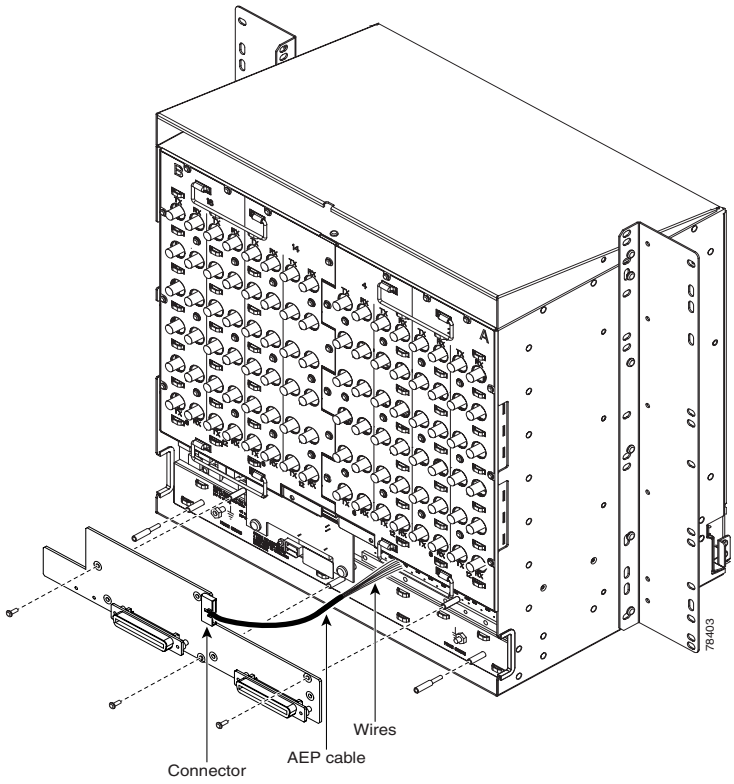
Figure 1-18 Replace Backplane Screws with Standoffs



Step 2 Attach the remaining two standoffs on either side of the backplane (Figure 1-19).

Step 3 Position the AEP board over the standoffs.

Figure 1-19 Installing Standoffs and the AEP



Step 4 Insert and tighten three screws to secure the AEP to the backplane.

Step 5 Connect the AEP cable to the backplane and AEP:

a. Connect the 10 colored wires to the wire-wrap pins on the backplane. Figure 1-20 shows where the cable wires are connected. Table 1-2 shows AEP and AIC-I signals that each wire carries

b. Plug the other end of the AEP cable into AEP connector port. The brown pin is on the top.

Figure 1-20 AEP Wire-Wrap Connections to Backplane Pins

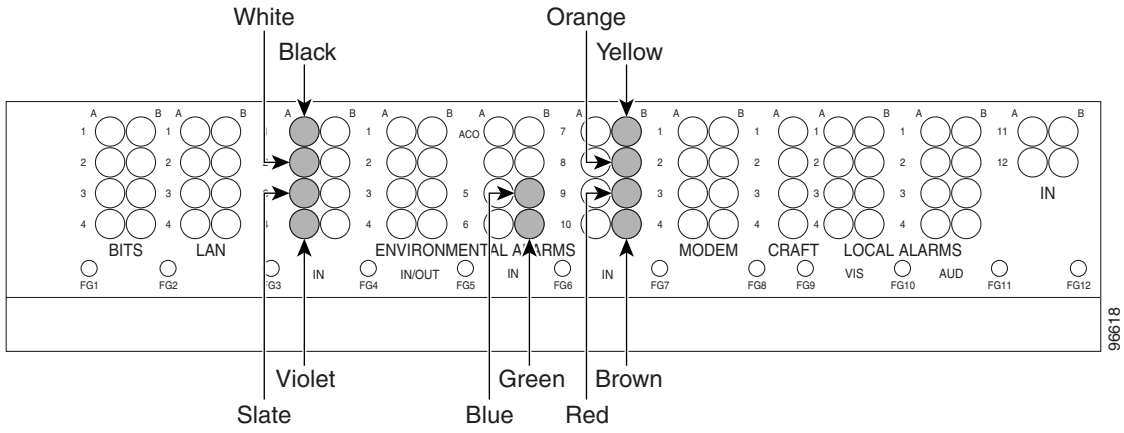


Table 1-2 Pin Assignments for the AEP

AEP Cable Wire	Backplane Pin	AIC-I Signal	AEP Signal
Black	A1	GND	AEP_GND
White	A2	AE_+5	AEP_+5
Slate	A3	VBAT–	VBAT–
Violet	A4	VB+	VB+
Blue	A5	AE_CLK_P	AE_CLK_P
Green	A6	AE_CLK_N	AE_CLK_N
Yellow	A7	AE_DIN_P	AE_DOUT_P
Orange	A8	AE_DIN_N	AE_DOUT_N
Red	A9	AE_DOUT_P	AE_DIN_P
Brown	A10	AE_DOUT_N	AE_DIN_N

Step 6 Continue with the "NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections" procedure on page 1-46.

Stop. You have completed this procedure.

NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections

Purpose This procedure installs alarm, timing, LAN, and craft wires on the ONS 15454 shelf. These wires are attached to the MIC FMECs on the ETSI shelf and attached to the backplane on the ANSI shelf.

Tools/Equipment Connectors according to function

Twisted 0.51 mm² or 0.64 mm² (#22 or #24 AWG) shielded wires for LAN or craft

75-ohm coaxial cable with 1.0/2.3 miniature coax connector

0.51 mm² or 0.64 mm² (#22 or #24 AWG) alarm wires

Prerequisite Procedures (ETSI only.) NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only), page 1-28

(ANSI only.) NTP-G5 Remove the Backplane Covers (ANSI Only), page 1-26

Required/As Needed As needed

Onsite/Remote Onsite

Security Level None

Caution Always use the supplied ESD wristband when working with a powered ONS 15454 ETSI. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

Step 1 For an ONS 15454 ETSI shelf, complete the following tasks as necessary:

- Complete the "DLP-G20 Install Alarm Wires on the MIC-A/P (ETSI Only)" task on page 1-47 if you want to provision external alarms and/or controls with the AIC-I card.
- Complete the "DLP-G21 Install Timing Wires on the MIC-C/T/P (ETSI Only)" task on page 1-50 if you are provisioning external timing.
- Complete the "DLP-G22 Install LAN Wires on the MIC-C/T/P (ETSI Only)" task on page 1-51 to create an external LAN connection. LAN wires or the LAN port on the TCC2/TCC2P card are necessary to create an external LAN connection.

Step 2 For an ONS 15454 ANSI shelf, complete the following tasks as necessary:

- Complete the "DLP-G23 Install Alarm Wires on the Backplane (ANSI Only)" task on page 1-52 if you are using an AIC or AIC-I card and are not using an AEP.
- Complete the "DLP-G24 Install Timing Wires on the Backplane (ANSI Only)" task on page 1-54 if you are provisioning external timing.
- Complete the "DLP-G25 Install LAN Wires on the Backplane (ANSI Only)" task on page 1-55 to create an external LAN connection. LAN wires or the LAN port on the TCC2/TCC2P card are necessary to create an external LAN connection.
- Complete the "DLP-G26 Install the TL1 Craft Interface (ANSI Only)" task on page 1-56 to access TL1 using the craft interface. Craft wires or the EIA/TIA-232 port on the TCC2/TCC2P card are required to access TL1.

Stop. You have completed this procedure.

DLP-G20 Install Alarm Wires on the MIC-A/P (ETSI Only)

Purpose	This task installs alarm cables on the MIC-A/P on the ONS 15454 ETSI so that you can provision external (environmental) alarms and controls with the AIC-I card.
Tools/Equipment	DB-62 connector 0.51 mm² or 0.64 mm² (#22 or #24 AWG) wires
Prerequisite Procedures	NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only), page 1-28
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Using 0.51 mm² or 0.64 mm² (#22 or #24 AWG) wires, connect the alarm and control wires on the appropriate pins of the DB-62 connector. The pin connectors, signal names, and functions are listed in Table 1-3.

Table 1-3 Alarm Pin Assignments

DB-62 Pin Connector	Signal Name	Function
1	ALMCUTOFF–	Alarm cutoff
2	ALMCUTOFF+	Alarm cutoff
3	ALMINP0–	Alarm input pair number 1
4	ALMINP0+	Alarm input pair number 1
5	ALMINP1–	Alarm input pair number 2
6	ALMINP1+	Alarm input pair number 2
7	ALMINP2–	Alarm input pair number 3
8	ALMINP2+	Alarm input pair number 3
9	ALMINP3–	Alarm input pair number 4
10	ALMINP3+	Alarm input pair number 4
11	EXALM0–	Extra alarm 0
12	EXALM0+	Extra alarm 0
13	FGND	Ground
14	EXALM1–	Extra alarm 1
15	EXALM1+	Extra alarm 1
16	EXALM2–	Extra alarm 2
17	EXALM2+	Extra alarm 2
18	EXALM3–	Extra alarm 3
19	EXALM3+	Extra alarm 3
20	EXALM4–	Extra alarm 4
21	EXALM4+	Extra alarm 4
22	EXALM5–	Extra alarm 5
23	EXALM5+	Extra alarm 5
24	EXALM6–	Extra alarm 6
25	EXALM6+	Extra alarm 6
26	FGND	Ground
27	EXALM7–	Extra alarm 7
28	EXALM7+	Extra alarm 7
29	EXALM8–	Extra alarm 8
30	EXALM8+	Extra alarm 8
31	EXALM9–	Extra alarm 9
32	EXALM9+	Extra alarm 9
33	EXALM10–	Extra alarm 10
34	EXALM10+	Extra alarm 10
35	EXALM11–	Extra alarm 11
36	EXALM11+	Extra alarm 11

Table 1-3 Alarm Pin Assignments (continued)

DB-62 Pin Connector	Signal Name	Function
37	ALMOUP0–	Normally open output pair number 1
38	ALMOUP0+	Normally open output pair number 1
39	FGND	Ground
40	ALMOUP1–	Normally open output pair number 2
41	ALMOUP1+	Normally open output pair number 2
42	ALMOUP2–	Normally open output pair number 3
43	ALMOUP2+	Normally open output pair number 3
44	ALMOUP3–	Normally open output pair number 4
45	ALMOUP3+	Normally open output pair number 4
46	AUDALM0–	Normally open minor audible alarm
47	AUDALM0+	Normally open minor audible alarm
48	AUDALM1–	Normally open major audible alarm
49	AUDALM1+	Normally open major audible alarm
50	AUDALM2–	Normally open critical audible alarm
51	AUDALM2+	Normally open critical audible alarm
52	FGND	Ground
53	AUDALM3–	Normally open remote audible alarm
54	AUDALM3+	Normally open remote audible alarm
55	VISALM0–	Normally open minor visible alarm
56	VISALM0+	Normally open minor visible alarm
57	VISALM1–	Normally open major visible alarm
58	VISALM1+	Normally open major visible alarm
59	VISALM2–	Normally open minor visible alarm
50	VISALM2+	Normally open minor visible alarm
61	VISALM3–	Normally open minor visible alarm
62	VISALM3+	Normally open minor visible alarm

Step 2 Connect the other end of the alarm and control wires according to local site practice.

Step 3 Connect the DB-62 connector to the ALARM IN/OUT connector on the MIC-A/P faceplate.

Step 4 Tighten the screws of the connector on the alarm cable.

Step 5 Return to your originating procedure (NTP).

DLP-G21 Install Timing Wires on the MIC-C/T/P (ETSI Only)

Purpose	This task installs the timing cables on the ONS 15454 ETSI MIC-C/T/P.
Tools/Equipment	75-ohm coaxial cable with a 1.0/2.3 miniature coax connector on the MIC-C/T/P side
Prerequisite Procedures	NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only), page 1-28
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Using coaxial cable with 1.0/2.3 miniature coax connectors, connect the clock cable to the appropriate connector on the faceplate of the MIC-C/T/P.

Step 2 Gently push the cable with the 1.0/2.3 miniature coax connector down until the cable connector slides into the 1.0/2.3 miniature coax connector on the faceplate with a click.

The MIC-C/T/P provides 1.0/2.3 miniature coax connectors that are used for timing input and output. The top connectors are for "A" (BITS-1) timing, and the bottom connectors are for "B" (BITS-2) timing. In each case, the left connector is the input and the right connector is the output. The input connectors for timing provide a 75-ohm termination. System cables are available that can convert timing clocks from 75 ohms to 100/120 ohms. Table 1-4 shows MIC-C/T/P pin assignments.

Table 1-4 MIC-C/T/P Clock Connector Pin Assignment

Pin	Function
IN 1	Input from external device
OUT 1	Output to external device
IN 2	Input from external device
OUT 2	Output to external device

A high-impedance option (> 3 kilo-ohms or greater) is possible through a jumper on the MIC-C/T/P FMEC. You can change the top timing input to high impedance by removing the jumper on P3 of the MIC-C/T/P FMEC. You can change the bottom timing input to high impedance by removing the jumper on P2 on the MIC-C/T/P FMEC.

Note Refer to ITU-T G.813 for rules about provisioning timing references.

Step 3 Connect the other end of the cable to the external source of the timing signal according to Table 1-4.

Step 4 Repeat Step 3 for each cable that is required.

Step 5 Return to your originating procedure (NTP).

DLP-G22 Install LAN Wires on the MIC-C/T/P (ETSI Only)

Purpose	This task installs the LAN wires on the ONS 15454 ETSI MIC-C/T/P.
Tools/Equipment	Standard CAT-5 UTP Ethernet cable (straight-through for data terminating equipment [DTE] or cross-over for data circuit-terminating equipment [DCE]) or RJ-45 connector Crimping tool for RJ-45 connector 0.51 mm² or 0.64 mm² (#22 or #24 AWG) wire, preferably CAT-5 UTP
Prerequisite Procedures	NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only), page 1-28
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Rather than using the LAN connection port on the MIC-C/T/P, you can use the LAN connection port on the TCC2/TCC2P card if preferred. Use either the MIC-C/T/P connection or the TCC2/TCC2P card connection. You cannot use the LAN connection port on the MIC-C/T/P and the LAN connection port on the TCC2/TCC2P card simultaneously; however, it is possible for you to make a direct connection from a computer to the LAN connection port on the TCC2/TCC2P card while the LAN connection port on the MIC-C/T/P is in use as long as the computer connected directly to the TCC2/TCC2P card is not connected to a LAN.

Step 1 Using 0.51 mm² or 0.64 mm² (#22 or #24 AWG) wire or CAT-5 UTP Ethernet cable, connect the wires to the RJ-45 connector according to Table 1-5.

Table 1-5 LAN Pin Assignments

LAN	RJ-45 Pin	RJ-45 Pin	Function
LAN 1 Connecting to DCE[1] (a hub or switch) Cross-over Ethernet cable	1	3	PNMSRX+ white/green
	2	6	PNMSRX– green
	3	1	PNMSTX white/orange
	4	4	—
	5	5	—
	6	2	PNMSTX– orange
	7	7	—
	8	8	—

Table 1-5 LAN Pin Assignments (continued)

LAN	RJ-45 Pin	RJ-45 Pin	Function
LAN 1 Connecting to DTE (a PC/workstation or router) Straight-through Ethernet cable	1	1	PNMSRX+ white/green
	2	2	PNMSRX– green
	3	3	PNMSTX+ white/orange
	4	4	—
	5	5	—
	6	6	PNMSTX– orange
	7	7	—
	8	8	—

1. The Cisco ONS 15454 ETSI is DCE.

Step 2 Return to your originating procedure (NTP).

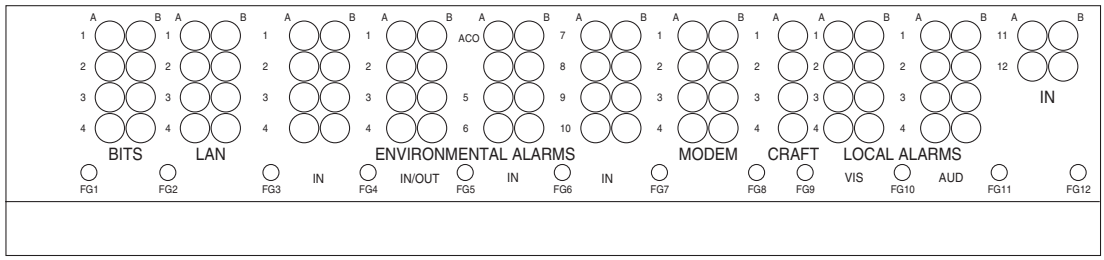
DLP-G23 Install Alarm Wires on the Backplane (ANSI Only)

Purpose	This task installs alarm wires on the backplane so that you can provision external (environmental) alarms and controls with the AIC or AIC-I card. If you are using the AEP, do not perform this task.
Tools/Equipment	Wire wrapper #22 or #24 AWG (0.51 mm² or 0.64 mm²) wires 100-ohm shielded BITS clock cable pair #22 or #24 AWG (0.51 mm² or 0.64 mm²), twisted-pair T1-type
Prerequisite Procedures	NTP-G5 Remove the Backplane Covers (ANSI Only), page 1-26
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Using 100-ohm shielded BITS clock cable pair #22 or #24 AWG (0.51 mm² or 0.64 mm²) twisted-pair T1-type wires, wrap the alarm wires on the appropriate wire-wrap pins according to local site practice. Ground the shield of the BITS Input cable at the BITS end. For BITS Output, wrap the ground shield of the BITS cable to the frame ground pin (FG1) located below the column of BITS pins.

Figure 1-21 shows alarm pin assignments for the AIC-I in the Release 3.4 or higher ONS 15454 backplane, and Figure 1-22 calls out the external alarm pins on that backplane.

Figure 1-21 Cisco ONS 15454 Backplane Pinouts (Release 3.4 or Later)



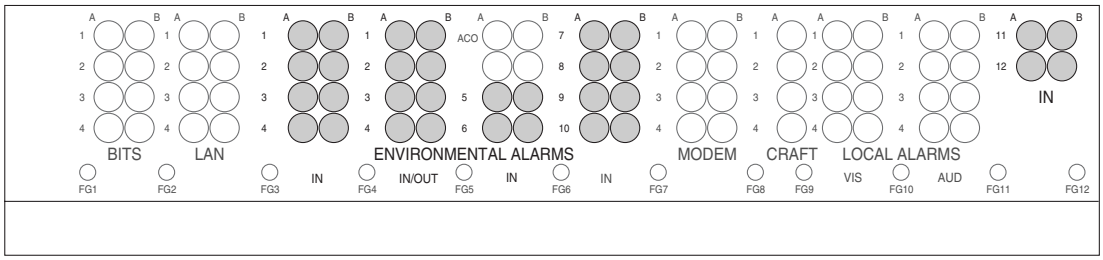
Field	Pin	Function
BITS	A1	BITS Output 2 negative (–)
	B1	BITS Output 2 positive (+)
	A2	BITS Input 2 negative (–)
	B2	BITS Input 2 positive (+)
	A3	BITS Output 1 negative (–)
	B3	BITS Output 1 positive (+)
	A4	BITS Input 1 negative (–)
	B4	BITS Input 1 positive (+)
LAN	Connecting to a hub, or switch	
	A1	RJ-45 pin 6 RX–
	B1	RJ-45 pin 3 RX+
	A2	RJ-45 pin 2 TX–
	B2	RJ-45 pin 1 TX+
	Connecting to a PC/Workstation or router	
	A1	RJ-45 pin 2 RX–
	B1	RJ-45 pin 1 RX+
	A2	RJ-45 pin 6 TX–
	B2	RJ-45 pin 3 TX+
ENVIR ALARMS IN	A1	Alarm input pair number 1: Reports closure on connected wires.
	B1	
	A2	Alarm input pair number 2: Reports closure on connected wires.
	B2	
	A3	Alarm input pair number 3: Reports closure on connected wires.
	B3	
	A4	Alarm input pair number 4: Reports closure on connected wires.
	B4	
	A5	Alarm input pair number 5: Reports closure on connected wires.
	B5	
	A6	Alarm input pair number 6: Reports closure on connected wires.
	B6	
	A7	Alarm input pair number 7: Reports closure on connected wires.
	B7	
	A8	Alarm input pair number 8: Reports closure on connected wires.
	B8	
	A9	Alarm input pair number 9: Reports closure on connected wires.
	B9	
	A10	Alarm input pair number 10: Reports closure on connected wires.
	B10	
	A11	Alarm input pair number 11: Reports closure on connected wires.
	B11	
	A12	Alarm input pair number 12: Reports closure on connected wires.
	B12	

Field	Pin	Function
ENVIR ALARMS IN/OUT N/O	A1/A13	Normally open output pair number 1
	B1/B13	
	A2/A14	Normally open output pair number 2
	B2/B14	
	A3/A15	Normally open output pair number 3
	B3/B15	
	A4/A16	Normally open output pair number 4
	B4/B16	
ACO	A1	Normally open ACO pair
	B1	
CRAFT	A1	Receive (PC pin #2)
	A2	Transmit (PC pin #3)
	A3	Ground (PC pin #5)
	A4	DTR (PC pin #4)
LOCAL ALARMS AUD (Audible) N/O	A1	Alarm output pair number 1: Remote audible alarm.
	B1	
	A2	Alarm output pair number 2: Critical audible alarm.
	B2	
	A3	Alarm output pair number 3: Major audible alarm.
	B3	
	A4	Alarm output pair number 4: Minor audible alarm.
	B4	
LOCAL ALARMS VIS (Visual) N/O	A1	Alarm output pair number 1: Remote visual alarm.
	B1	
	A2	Alarm output pair number 2: Critical visual alarm.
	B2	
	A3	Alarm output pair number 3: Major visual alarm.
	B3	
	A4	Alarm output pair number 4: Minor visual alarm.
	B4	

If you are using an AIC-I card, contacts provisioned as OUT are 1-4. Contacts provisioned as IN are 13-16.

83020

Figure 1-22 Highlighted Environmental Alarms



Note The X.25, Modem, and TBOS pin fields are not active on either pin field.

Step 2 Return to your originating procedure (NTP).

DLP-G24 Install Timing Wires on the Backplane (ANSI Only)

Purpose	This task installs the BITS timing wires on the ONS 15454 ANSI backplane.
Tools/Equipment	Wire wrapper 100-ohm shielded BITS clock cable pair #22 or #24 AWG (0.51 mm² or 0.64 mm²), twisted-pair T1-type
Prerequisite Procedures	NTP-G5 Remove the Backplane Covers (ANSI Only), page 1-26
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Using 100-ohm shielded BITS clock cable #22 or #24 AWG (0.51 mm² or 0.64 mm²), twisted-pair T1-type, wrap the clock wires on the appropriate wire-wrap pins according to local site practice.

Ground the shield of the BITS input cable at the BITS end. For BITS output, wrap the ground shield of the BITS cable to the frame ground pin (FG1) located beneath the column of BITS pins. Table 1-6 lists the pin assignments for the BITS timing pin fields.

Table 1-6 External Timing Pin Assignments for BITS

BITS Pin	Tip/Ring	CTC/TL1 Name	Function
A4	ring	BITS-1	Input from BITS device 1
B4	tip	BITS-1	Input from BITS device 1
A3	ring	BITS-1	Output to external device 1
B3	tip	BITS-1	Output to external device 1
A2	ring	BITS-2	Input from BITS device 2
B2	tip	BITS-2	Input from BITS device 2

Table 1-6 External Timing Pin Assignments for BITS (continued)

BITS Pin	Tip/Ring	CTC/TL1 Name	Function
A1	ring	BITS-2	Output to external device 2
B1	tip	BITS-2	Output to external device 2

Note For more detailed information about timing, see Chapter 19, "Security and Timing Reference." To set up system timing, see the "NTP-G53 Set Up Timing" procedure on page 6-3.

Step 2 Return to your originating procedure (NTP).

DLP-G25 Install LAN Wires on the Backplane (ANSI Only)

Purpose	This task installs the LAN wires on the ONS 15454 ANSI backplane.
Tools/Equipment	Wire wrapper
	#22 or #24 AWG (0.51 mm² or 0.64 mm²) wire, preferably CAT-5 UTP
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Rather than using the LAN wires, you can use the LAN connection port on the TCC2/TCC2P if preferred. Use either the backplane connection or the TCC2/TCC2P front connection. You cannot use the LAN backplane pins and the LAN connection port on the TCC2/TCC2P simultaneously; however, it is possible for you to make a direct connection from a computer to the LAN connection port on the TCC2/TCC2P while the LAN backplane pins are in use as long as the computer that is connected directly to the TCC2/TCC2P is not connected to a LAN.

Step 1 Using #22 or #24 AWG (0.51 mm² or 0.64 mm²) wire or CAT-5 UTP Ethernet cable, wrap the wires on the appropriate wire-wrap pins according to local site practice.

Caution Cross talk might result if both receive (Rx) and transmit (Tx) pins connect on the same twisted pair of wires from the CAT-5 cable. The two Tx pins need to be on one twisted pair, and the two Rx pins need to be on another twisted pair.

A frame ground pin is located beneath each pin field (FG2 for the LAN pin field). Wrap the ground shield of the LAN interface cable to the frame ground pin. Table 1-7 shows the LAN pin assignments.

Table 1-7 LAN Pin Assignments for the ONS 15454 ANSI Shelf

Pin Field	Backplane Pins	RJ-45 Pins	Function/Color
LAN 1 Connecting to data circuit-terminating equipment (DCE) (a hub or switch); the ONS 15454 is a DCE	B2	1	TX+ white/green
	A2	2	TX– green
	B1	3	RX+ white/orange
	A1	6	RX– orange
LAN 1 Connecting to data terminal equipment (DTE) (a PC/workstation or router)	B1	1	RX+ white/green
	A1	2	RX– green
	B2	3	TX+ white/orange
	A2	6	TX– orange

Note The TCC2/TCC2P does not support Ethernet polarity detection. If your Ethernet connection has incorrect polarity (this can only occur with cables that have the receive wire pairs flipped), a "Lan Connection Polarity Reversed" condition is raised. This condition usually occurs during an upgrade or initial node deployment. To correct the situation, ensure that your Ethernet cable has the correct mapping of the wire-wrap pins.

Step 2 Return to your originating procedure (NTP).

DLP-G26 Install the TL1 Craft Interface (ANSI Only)

Purpose	This task installs the TL1 craft interface on the ONS 15454 ANSI shelf using the craft backplane pins. You can also use a LAN cable connected to the TCC2/TCC2P EIA/TIA-232 port to access a TL1 craft interface.
Tools/Equipment	Wire wrapper #22 or #24 AWG (0.51 mm² or 0.64 mm²) alarm wires
Prerequisite Procedures	NTP-G5 Remove the Backplane Covers (ANSI Only), page 1-26
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Rather than using the craft pins, you can use a LAN cable connected to the TCC2/TCC2P EIA/TIA-232 port to access a TL1 craft interface.

Step 1 Using #22 or #24 AWG (0.51 mm² or 0.64 mm²) wire, wrap the craft interface wires on the appropriate wire-wrap pins according to local site practice.

Step 2 Wrap the ground shield of the craft interface cable to the frame-ground pin.

Wrap the ground wire of your computer cable to pin A3 on the craft pin field. Table 1-8 shows the pin assignments for the CRAFT pin field.

Note You cannot use the craft backplane pins and the EIA/TIA-232 port on the TCC2/TCC2P card simultaneously. Using a combination prevents access to the node or causes a loss in connectivity.

Table 1-8 Craft Interface Pin Assignments

Pin Field	Contact	Function
Craft	A1	Receive
	A2	Transmit
	A3	Ground
	A4	DTR

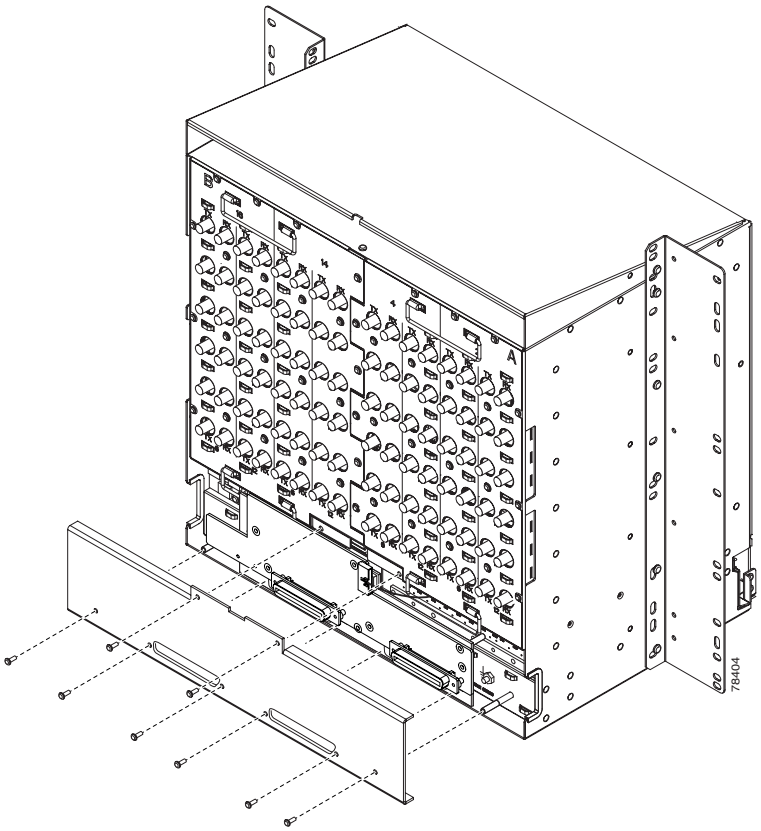
Step 3 Return to your originating procedure (NTP).

NTP-G11 Install an External Wire-Wrap Panel on the AEP (ANSI Only)

Purpose	This procedure connects an external wire-wrap panel to the ONS 15454 ANSI AEP to provide the physical alarm contacts for the AEP.
Tools/Equipment	External wire-wrap panel
Prerequisite Procedures	NTP-G9 Install the Alarm Expansion Panel (ANSI Only), page 1-43
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Position the lower cover over the AEP. Make sure that the AEP AMP Champ connectors protrude through the cutouts in the lower cover (Figure 1-23).

Figure 1-23 Installing the AEP Cover



Step 2 Insert and tighten the eight screws to secure the AEP cover to the AEP.

Step 3 Connect the cables from the external wire-wrap panel to the AMP Champ connectors on the AEP. Table 1-9 lists the alarm input pin assignments.

Table 1-9 Alarm Input Pin Assignments

AMP Champ Pin	Signal Name	AMP Champ Pin	Signal Name
1	ALARM_IN_1–	27	GND
2	GND	28	ALARM_IN_2–
3	ALARM_IN_3–	29	ALARM_IN_4–
4	ALARM_IN_5–	30	GND
5	GND	31	ALARM_IN_6–
6	ALARM_IN_7–	32	ALARM_IN_8–
7	ALARM_IN_9–	33	GND
8	GND	34	ALARM_IN_10–
9	ALARM_IN_11–	35	ALARM_IN_12–
10	ALARM_IN_13–	36	GND
11	GND	37	ALARM_IN_14–
12	ALARM_IN_15–	38	ALARM_IN_16–

Table 1-9 Alarm Input Pin Assignments (continued)

AMP Champ Pin	Signal Name	AMP Champ Pin	Signal Name
13	ALARM_IN_17–	39	GND
14	GND	40	ALARM_IN_18–
15	ALARM_IN_19–	41	ALARM_IN_20–
16	ALARM_IN_21–	42	GND
17	GND	43	ALARM_IN_22–
18	ALARM_IN_23–	44	ALARM_IN_24–
19	ALARM_IN_25–	45	GND
20	GND	46	ALARM_IN_26–
21	ALARM_IN_27–	47	ALARM_IN_28–
22	ALARM_IN_29–	48	GND
23	GND	49	ALARM_IN_30–
24	ALARM_IN_31–	50	—
25	ALARM_IN_+	51	GND1
26	ALARM_IN_0-	52	GND2

Table 1-10 lists the alarm output (external control) pin assignments.

Table 1-10 Alarm Output Pin Assignments

AMP Champ Pin	Signal Name	AMP Champ Pin	Signal Name
1	—	27	COM_0
2	COM_1	28	—
3	NO_1	29	NO_2
4	—	30	COM_2
5	COM_3	31	—
6	NO_3	32	NO_4
7	—	33	COM_4
8	COM_5	34	—
9	NO_5	35	NO_6
10	—	36	COM_6
11	COM_7	37	—
12	NO_7	38	NO_8
13	—	39	COM_8
14	COM_9	40	—
15	NO_9	41	NO_10
16	—	42	COM_10
17	COM_11	43	—

Table 1-10 Alarm Output Pin Assignments (continued)

AMP Champ Pin	Signal Name	AMP Champ Pin	Signal Name
18	NO_11	44	NO_12
19	—	45	COM_12
20	COM_13	46	—
21	NO_13	47	NO_14
22	—	48	COM_14
23	COM_15	49	—
24	NO_15	50	—
25	—	51	GND1
26	NO_0	52	GND2

Figure 1-24 illustrates the alarm input connectors.

Figure 1-24 Alarm Input Connector

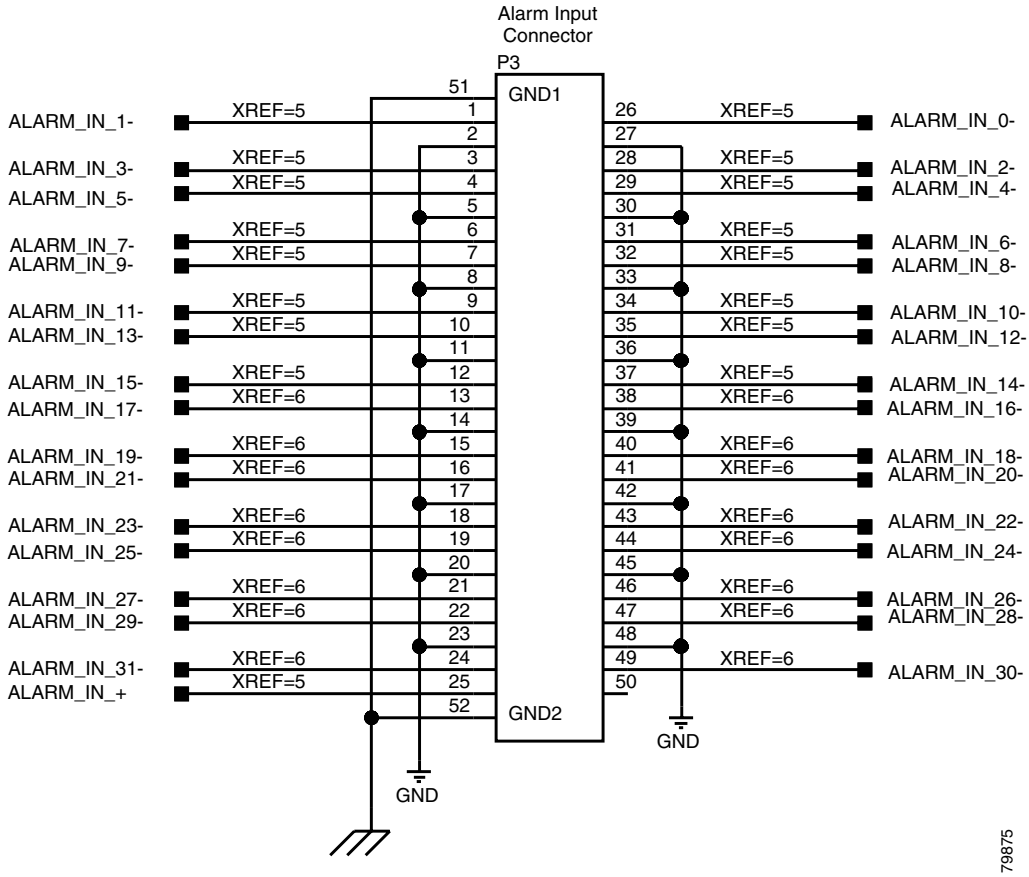
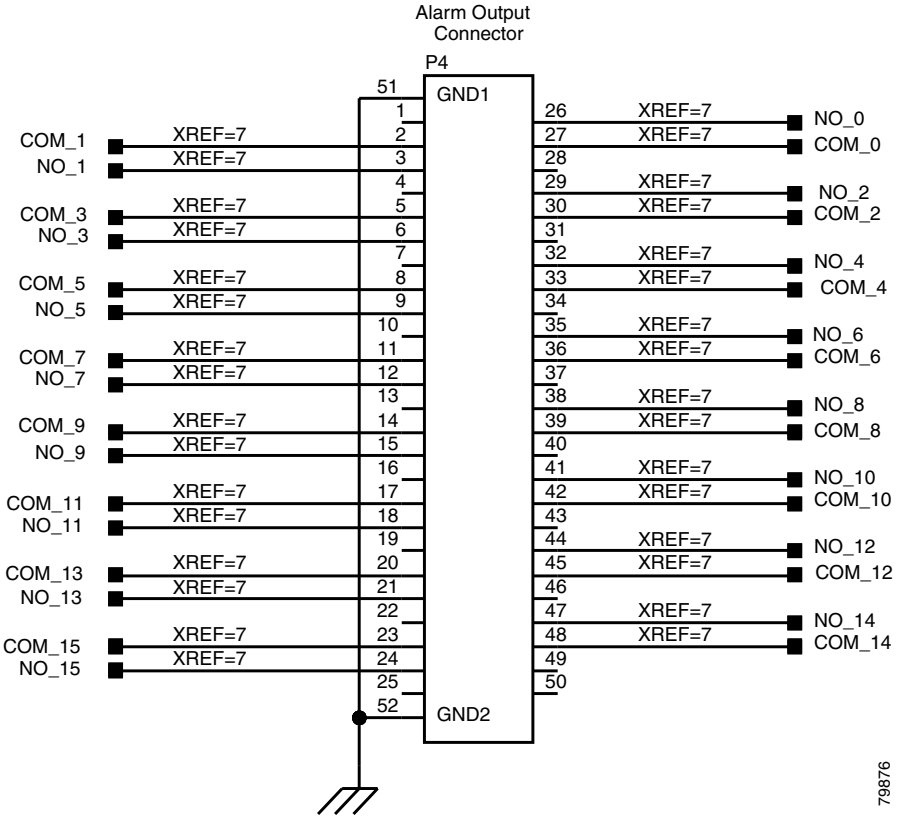


Figure 1-25 illustrates the alarm output connectors.

Figure 1-25 Alarm Output Connector



Step 4 Continue with the "NTP-G12 Install and Close the FMEC Cover (ETSI Only)" procedure on page 1-61 as needed.

Stop. You have completed this procedure.

NTP-G12 Install and Close the FMEC Cover (ETSI Only)

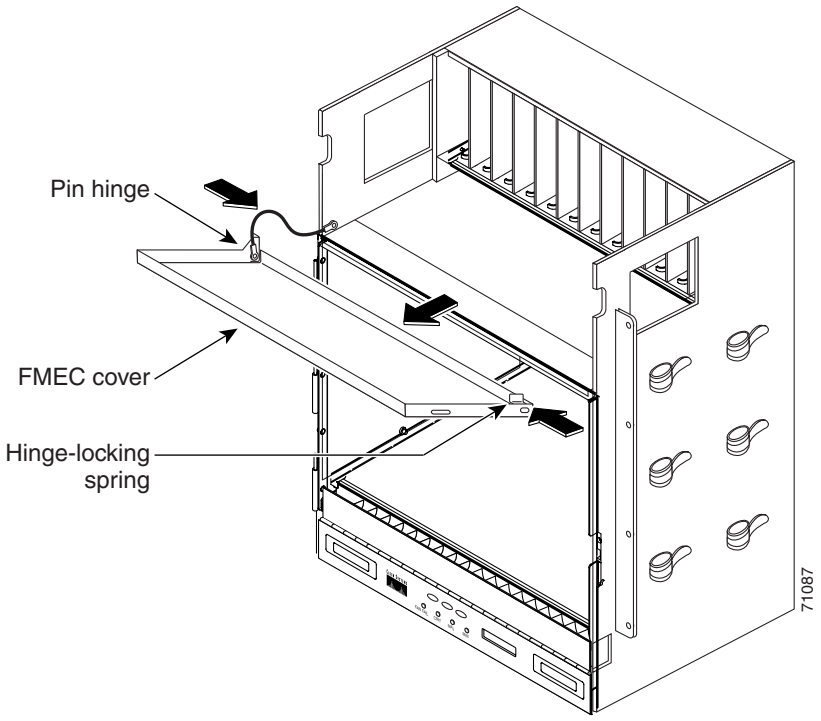
Purpose	This procedure installs and closes the ONS 15454 ETSI FMEC cover.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver
Prerequisite Procedures	NTP-G4 Open and Remove the FMEC Cover (ETSI Only), page 1-23
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Insert the cover carefully onto the left pin of the hinge (Figure 1-26).

Step 2 Move the cover to the right side towards the right pin of the hinge.

Step 3 Pull the right side of the hinge-locking spring (Figure 1-26). Push the cover onto the right pin until the spring snaps into place.

Figure 1-26 ONS 15454 ETSI FMEC Cover



Step 4 Attach the ground wire to the shelf.

Step 5 Attach the washer and nut.

Step 6 Attach the cover to the shelf using the screws on the top of the cover.

Step 7 Continue with the "NTP-G14 Install DWDM Equipment" procedure on page 1-64.

Stop. You have completed this procedure.

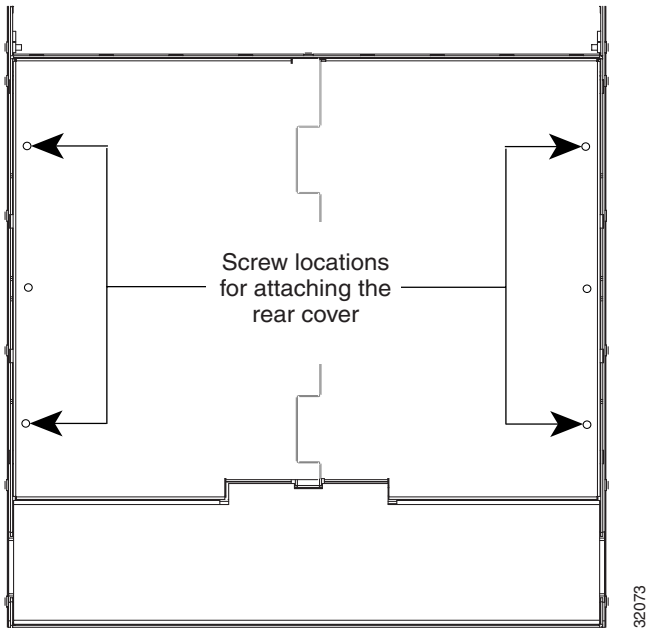
NTP-G13 Install the Rear Cover (ANSI Only)

Purpose	The following procedure explains how to install the rear cover on an ONS 15454 ANSI shelf.
Tools/Equipment	#2 Phillips screwdriver
	Medium slot-head screwdriver
	Small slot-head screwdriver

Prerequisite Procedures	NTP-G5 Remove the Backplane Covers (ANSI Only), page 1-26
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Locate the three screws that run vertically along on each side of the backplane (Figure 1-27).

Figure 1-27 Backplane Attachment for the Rear Cover



Tip Only six screws (three on each side) line up with the screw slots on the mounting brackets, making the screws easy to locate.

Step 2 Loosen the top and bottom screws on one edge of the backplane to provide room to slide the mounting brackets into place using the U-shaped screw slots on each end.

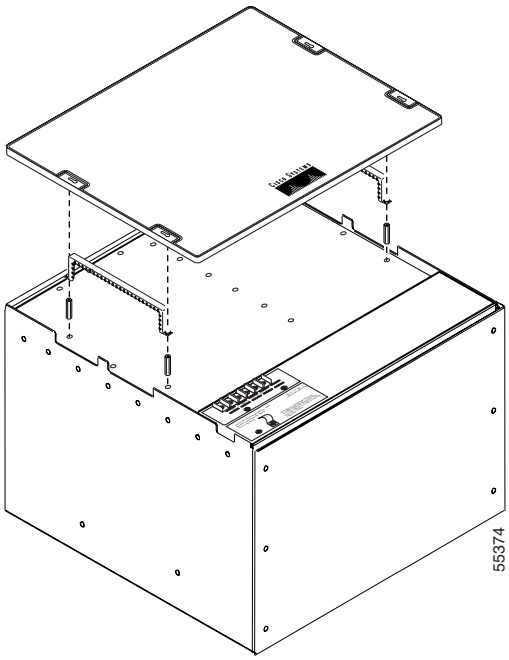
Step 3 Slide one of the mounting brackets into place and tighten the screws.

Step 4 Repeat Steps 2 and 3 for the second mounting bracket.

Step 5 Attach the cover by hanging it from the mounting screws on the back of the mounting brackets and pulling it down until it fits snugly into place.

Figure 1-28 shows rear cover installation using spacers.

Figure 1-28 Installing the Rear Cover with Spacers



Step 6 Continue with the "NTP-G14 Install DWDM Equipment" procedure on page 1-64.

Stop. You have completed this procedure.

NTP-G14 Install DWDM Equipment

Purpose	This procedure installs the optional DWDM assemblies.
Tools/Equipment	#2 Phillips screwdriver Crimping tool (large enough for #10 to #14 AWG) #14 AWG wire
Prerequisite Procedures	NTP-G2 Install the Shelf Assembly, page 1-8
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Complete the "DLP-G27 Install the DCU Shelf Assembly" task on page 1-65 as needed.

Step 2 Complete the "DLP-G28 Install the Fiber Patch-Panel Tray" task on page 1-65 as needed.

Step 3 Complete the "DLP-G29 Install the Fiber-Storage Tray" task on page 1-66 as needed.

Step 4 Complete the "DLP-G8 Install the Air Ramp" task on page 1-19 as needed.

Step 5 Complete the "DLP-G30 Install the FlexLayer Shelf" task on page 1-66 as needed.

Note Procedures for installing FlexLayer hardware in this chapter require that you have a network plan calculated for your DWDM network with Cisco MetroPlanner, Release 2.5. MetroPlanner is a DWDM planning tool that is available your Cisco account representative. MetroPlanner prepares a shelf plan for each network node and calculates the power and attenuation levels for the DWDM cards installed in the node. For information about Cisco MetroPlanner, refer to the *Cisco MetroPlanner DWDM Operations Guide*, Release 2.5.

Step 6 Complete the "DLP-G31 Install the FlexLayer Modules" task on page 1-67 as needed.

Step 7 Complete the "DLP-G32 Install the Y-Cable Protection Modules" task on page 1-69 as needed.

Stop. **You have completed this procedure**.

DLP-G27 Install the DCU Shelf Assembly

Purpose	If you are installing dispersion compensation modules, use this task to install the Dispersion Compensation Unit (DCU) chassis.
Tools/Equipment	#2 Phillips screwdriver Crimping tool #14 AWG wire and lug
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 The DCU chassis requires 1 rack unit (RU) in a standard 19-inch (482.6-mm) or 23-inch (584.2-mm) rack. Locate the RMU space specified in your site plan. See the "14.5 Typical DWDM Rack Layouts" section on page 14-16 for common site layout plans.

Step 2 Two sets of mounting brackets are included with the DCU mounting kit, one set each for 19-inch (482.6-mm) or 23-inch (584.2-mm) racks. Verify that your chassis is equipped with the correct set of brackets for your rack. Change the brackets as required.

Step 3 Align the chassis with the rack mounting screw holes; one at a time, insert and tighten the four screws.

Step 4 Connect a frame ground to the ground terminal provided on either side of the chassis. Use minimum #14 AWG wire.

Step 5 Return to your originating procedure (NTP).

DLP-G28 Install the Fiber Patch-Panel Tray

Purpose	This task installs the fiber patch-panel tray.
Tools/Equipment	#2 Phillips screwdriver

Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 The fiber patch-panel tray requires 1 RU in a standard 19-inch (482.6-mm) or 23-inch (584.2-mm) rack. Locate the RMU space specified in your site plan. See the "14.5 Typical DWDM Rack Layouts" section on page 14-16 for common site configurations.

Step 2 Verify that the mounting brackets attached to the unit are correct for your rack size. Complete "DLP-G3 Reverse the Mounting Bracket to Fit a 19-inch (482.6-mm) Rack (ANSI Only)" task on page 1-10 as required.

Step 3 Align the chassis with the rack mounting screw holes, then insert and tighten the four screws.

Step 4 Return to your originating procedure (NTP).

DLP-G29 Install the Fiber-Storage Tray

Purpose	This task installs the fiber-storage tray. The fiber-storage tray stores slack fiber-optic cable.
Tools/Equipment	#2 Phillips screwdriver
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 The fiber-storage tray requires 1 RU in a standard 19-inch (482.6-mm) or 23-inch (584.2-mm) rack. Locate the RMU space specified in your site plan. See the "14.5 Typical DWDM Rack Layouts" section on page 14-16 for common site configurations.

Step 2 Verify that the mounting brackets attached to the unit are correct for your rack size. Complete "DLP-G3 Reverse the Mounting Bracket to Fit a 19-inch (482.6-mm) Rack (ANSI Only)" task on page 1-10 as required.

Step 3 Align the chassis with the rack mounting screw holes, insert the screws (4), and tighten.

Step 4 Return to your originating procedure (NTP).

DLP-G30 Install the FlexLayer Shelf

Purpose	This task installs the FlexLayer shelf. Perform this task if you are installing any FlexLayer modules.
Tools/Equipment	#2 Phillips screwdriver FlexLayer shelf assembly (15216-FL-SA)

Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 The FlexLayer shelf requires 1 RU in a standard 19-inch (482.6-mm) or 23-inch (584.2-mm) rack. Locate the RMU space specified in your site plan. Refer to Chapter 14, "Shelf Hardware Reference" for typical DWDM site layout plans.

Step 2 A set of mounting brackets are included with the FlexLayer mounting kit, one set each for 19-inch (482.6-mm) or 23-inch (584.2-mm) racks. Verify that your chassis is equipped with the correct set of brackets for your rack. Change the brackets as required.

Step 3 Align the chassis with the rack mounting screw holes; one at a time, insert and tighten the three screws.

Step 4 Repeat this task as necessary for each FlexLayer shelf assembly you want to install.

Step 5 Return to your originating procedure (NTP).

DLP-G31 Install the FlexLayer Modules

Purpose	This task installs the FlexLayer modules in the FlexLayer shelf assembly. You can only install two-channel FlexLayer modules.
Tools/Equipment	#2 Phillips screwdriver FlexLayer modules
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Determine the FlexLayer modules that you want to install in the FlexLayer shelf. The FlexLayer shelf can house up to four Add/Drop FlexLayer modules or four Y-cable splitter modules. Table 1-11 lists the two-channel FlexLayer modules and part numbers. Refer to Chapter 14, "Shelf Hardware Reference" for more information about FlexLayer modules.

Table 1-11 ONS 15xxx FlexLayer Hardware Part Numbers

Part Number	Description
2 Channel Add/Drop FlexLayer Modules	
15216-FLB-2-31.1=	ITU-100 GHz 2 Ch, FlexMod - 1530.33 and 1531.12
15216-FLB-2-32.6=	ITU-100 GHz 2 Ch, FlexMod - 1531.90 and 1532.68
15216-FLB-2-35.0=	ITU-100 GHz 2 Ch, FlexMod - 1534.25 and 1535.04
15216-FLB-2-36.6=	ITU-100 GHz 2 Ch, FlexMod - 1535.82 and 1536.61
15216-FLB-2-38.9=	ITU-100 GHz 2 Ch, FlexMod - 1538.19 and 1538.98
15216-FLB-2-40.5=	ITU-100 GHz 2 Ch, FlexMod - 1539.77 and 1540.56

Table 1-11 ONS 15xxx FlexLayer Hardware Part Numbers (continued)

Part Number	Description
15216-FLB-2-42.9=	ITU-100 GHz 2 Ch, FlexMod - 1542.14 and 1542.94
15216-FLB-2-44.5=	ITU-100 GHz 2 Ch, FlexMod - 1543.73 and 1544.53
15216-FLB-2-46.9=	ITU-100 GHz 2 Ch, FlexMod - 1546.12 and 1546.92
15216-FLB-2-48.5=	ITU-100 GHz 2 Ch, FlexMod - 1547.72 and 1548.51
15216-FLB-2-50.9=	ITU-100 GHz 2 Ch, FlexMod - 1550.12 and 1550.92
15216-FLB-2-52.5=	ITU-100 GHz 2 Ch, FlexMod - 1551.72 and 1552.52
15216-FLB-2-54.9=	ITU-100 GHz 2 Ch, FlexMod - 1554.13 and 1554.94
15216-FLB-2-56.5=	ITU-100 GHz 2 Ch, FlexMod - 1555.75 and 1556.55
15216-FLB-2-58.9=	ITU-100 GHz 2 Ch, FlexMod - 1558.17 and 1558.98
15216-FLB-2-60.6=	ITU-100 GHz 2 Ch, FlexMod - 1559.79 and 1560.61

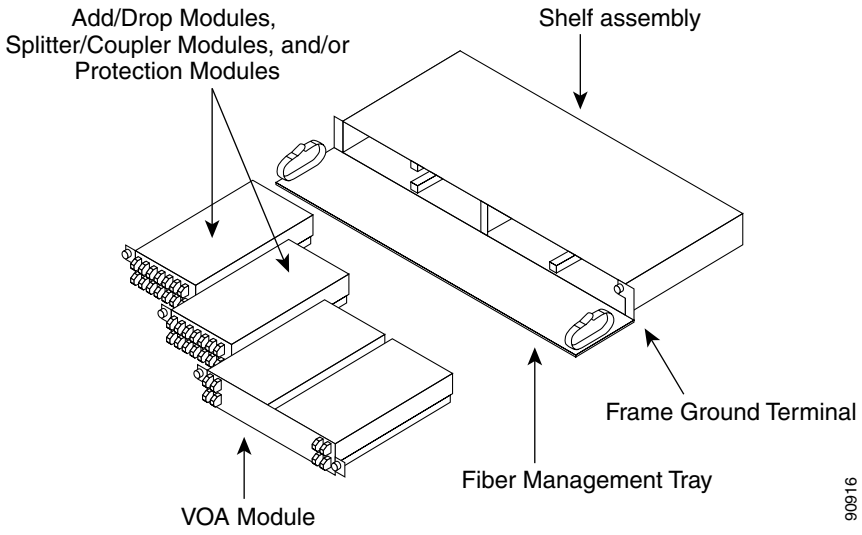
Step 2 Insert the appropriate module into the FlexLayer shelf assembly.

Note FlexLayer modules are not listed in generated Cisco MetroPlanner 2.5 site plans.

Step 3 Use a Phillips screwdriver to install the two accompanying screws.

Figure 1-29 shows the FlexLayer shelf assembly and how the FlexLayer modules can be installed.

Figure 1-29 ONS 15xxx FlexLayer Shelf Assembly



Step 4 Repeat this task as necessary for each FlexLayer module you want to install.

Step 5 Return to your originating procedure (NTP).

DLP-G32 Install the Y-Cable Protection Modules

Purpose	This task installs the Y-cable protection modules in the FlexLayer shelf assembly.
Tools/Equipment	#2 Phillips screwdriver Y-Cable modules: • Multi-Mode Y Cable Protection FlexMod: 15216-CS-MM-Y= • Single-Mode Y Cable Protection FlexMod: 15216-CS-SM-Y=
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Determine the Y-cable modules that you want to install in the FlexLayer shelf.

Step 2 Insert the appropriate Y-cable module into the FlexLayer shelf assembly. Use a Phillips screwdriver to install the two accompanying screws.

Step 3 Repeat this task as necessary for each Y-cable module you want to install (Figure 14-12 on page 14-14).

Step 4 Return to your originating procedure (NTP).

NTP-G15 Install the Common Control Cards

Purpose	This procedure describes how to install the common control cards.
Tools/Equipment	Redundant TCC2/TCC2P cards AIC-I card (optional)
Prerequisite Procedures	NTP-G2 Install the Shelf Assembly, page 1-8 NTP-G14 Install DWDM Equipment, page 1-64
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Warning **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

Caution Always use the supplied ESD wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside to edge of the shelf assembly.

Note If protective clips are installed on the backplane connectors of the cards, remove the clips before installing the cards.

Note If you install a card incorrectly, the FAIL LED flashes continuously.

Step 1 Complete the "DLP-G33 Install the TCC2 or TCC2P Card" task on page 1-70.

Step 2 Complete the "DLP-G34 Install the AIC-I Card" task on page 1-73, if necessary.

Step 3 Continue with the "NTP-G16 Perform the Shelf Installation Acceptance Test" procedure on page 1-74.

DLP-G33 Install the TCC2 or TCC2P Card

Purpose	This task installs redundant TCC2/TCC2P cards. The first card you install in the ONS 15454 must be a TCC2/TCC2P card, and it must initialize before you install any cross-connect or traffic cards.
Tools/Equipment	Two TCC2/TCC2P cards
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Caution Do not remove a TCC2/TCC2P card during the software transfer process, which is indicated by alternate flashing FAIL and ACT/STBY LEDs. Removing a TCC2/TCC2P during the software transfer process will corrupt the system memory.

Note Do not install the second TCC2/TCC2P until the first TCC2/TCC2P is installed and is fully initialized.

Step 1 Open the latches/ejectors of the first TCC2/TCC2P card that you will install.

Step 2 Use the latches/ejectors to firmly slide the card along the guide rails until the card plugs into the receptacle at the back of the slot (Slot 7 or 11).

Note In Step 4 you will be instructed to watch the LED activity (sequence) on the front of the TCC2/TCC2P card. This activity begins immediately after you close the latches in Step 3.

Step 3 Verify that the card is inserted correctly and close the latches/ejectors on the card.

Note It is possible to close the latches/ejectors when the card is not completely plugged into the back panel of the shelf assembly. Ensure that you cannot insert the card any farther.

If you insert a card into a slot provisioned for a different card, all LEDs turn off.

Step 4 As needed, go to Step a to verify the LED activity on the TCC2 card. For the TCC2P card, go to Step b.

a. For the TCC2 card:

- All LEDs turn on for about 5 seconds. The red FAIL LED, the yellow ACT/STBY LED, the red REM LED, the green SYNC LED, and the green ACO LED turn on for about 10 seconds.
- The red FAIL LED and the green ACT/STBY LED turn on for about 40 seconds.
- The red FAIL LED blinks for about 10 seconds. (If both TCC2 cards are installed, this LED blinks on the other TCC2 card, as well.)
- The red FAIL LED turns on for about 5 seconds.
- Both green PWR LEDs turn on for 5 seconds. The PWR LEDs then turn red for 2 to 3 minutes before going to steady green.
- While the PWR LEDs are red, the ACT/STBY, MJ, and MN LEDs turn on, followed by the SNYC LED.
- The boot up process is complete when the PWR LEDs turn green and the ACT/STBY remains on. (The ACT/STBY LED will be green if this is the first TCC2 card installed, and amber if this is the second TCC2 card installed.)

Note It might take up to 4 minutes for the A and B power alarms to clear.

Note Alarm LEDs might be on; disregard alarm LEDs until you are logged into CTC and can view the Alarms tab.

Note If you are logged into CTC, the SFTWDOWN alarm might appear as many as two times while the TCC2 card initializes. The alarm should clear after the card completely boots.

Note If the FAIL LED is on continuously, see the tip below about the TCC2 card automatic upload.

b. For the TCC2P card:

- All LEDs turn on briefly. The red FAIL LED, the yellow ACT/STBY LED, the red REM LED, the green SYNC LED, and the green ACO LED turn on for about 10 seconds.
- The red FAIL LED and the green ACT/STBY LED turn on for about 40 seconds.
- The red FAIL LED blinks for about 10 seconds. (If both TCC2 cards are installed, this LED blinks on the other TCC2 card as well.)
- The red FAIL LED turns on for about 5 seconds.
- The red FAIL LED blinks for about 5 seconds and then becomes solid.
- All LEDs (including the CRIT, MAJ, MIN, REM, SYNC, and ACO LEDs) blink once and turn off for about 10 seconds.
- Both green PWR LEDs turn on for 5 seconds. The PWR LEDs then turn red for 2 to 3 minutes before going to steady green.

- The yellow ACT/STBY turns on and the PWR LEDs turn red for 2 to 3 minutes. (The Sync LED may be green at this time.)
- The yellow ACT/STBY LED turns on. (The ACT/STBY LED might take several minutes to turn on while the DCC processor boots.)

Note It might take up to 3 minutes for the A and B power alarms to clear.

Note Alarm LEDs might be on; disregard alarm LEDs until you are logged into CTC and can view the Alarms tab.

Note If you are logged into CTC, the SFTWDOWN alarm might appear as many as two times while the TCC2P card initializes. The alarm should clear after the card completely boots.

Note If the FAIL LED is on continuously, see the tip in Step 8 about the TCC2P card automatic upload.

Step 5 Verify that the ACT/STBY LED is green if this is the first powered-up TCC2/TCC2P card installed, or yellow for standby if this is the second powered-up TCC2/TCC2P. The IP address, temperature of the node, and time of day appear on the LCD. The default time and date is 12:00 AM, January 1, 1970.

Step 6 The LCD cycles through the IP address, node name, and software version. Verify that the correct software version displays on the LCD.

Step 7 If the LCD shows the correct software version, continue with Step 8. If the LCD does not show the correct software version, refer to your next level of technical support, upgrade the software, or remove the TCC2/TCC2P card and install a replacement card.

Refer to the release-specific software upgrade document to replace the software. To exchange the TCC2/TCC2P card, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide.*

Step 8 Repeat Steps 1 through 7 for the redundant TCC2/TCC2P card If both TCC2/TCC2P cards are already installed, proceed to Step 9.

Tip If you install a standby TCC2/TCC2P card that has a different software version than the active TCC card, the newly installed standby TCC2/TCC2P card automatically copies the software version from the active TCC2/TCC2P card. You do not need to do anything in this situation. However, the loading TCC2/TCC2P card does not boot up in the normal manner. When the standby card is first inserted, the LEDs follow most of then normal bootup sequence. After the red FAIL LED turns on for about 5 seconds, the FAIL LED and the ACT/STBY LED begin to flash alternately for up to 30 minutes while the new software loads onto the active TCC2/TCC2P card. After loading the new software, the upgraded TCC2/TCC2P card's LEDs repeat the appropriate bootup sequence, and the amber ACT/STBY LED turns on.

Note If you insert a card into a slot provisioned for a different card, all LEDs turn off.

Note Alarm LEDs might be on; disregard alarm LEDs until you are logged into CTC and can view the Alarms tab.

Step 9 Return to your originating procedure (NTP).

DLP-G34 Install the AIC-I Card

Purpose	This task installs the AIC-I card. The AIC-I card provides connections for external alarms and controls (environmental alarms).
Tools/Equipment	AIC-I card
Prerequisite Procedures	DLP-G33 Install the TCC2 or TCC2P Card, page 1-70
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note When installing cards, allow each card to boot completely before installing the next card.

Step 1 Open the latches/ejectors on the card.

Step 2 Use the latches/ejectors to firmly slide the card along the guide rails in Slot 9 until the card plugs into the receptacle at the back of the slot.

Step 3 Verify that the card is inserted correctly and close the latches/ejectors on the card.

Note It is possible to close the latches/ejectors when the card is not completely plugged into the backplane. Ensure that you cannot insert the card any further.

Step 4 Verify the following:

- The red FAIL LED turns on for 1 second, then blinks for up to 5 seconds.
- The PWR A and PWR B LEDs become red and the two INPUT/OUTPUT LEDs become green for approximately 3 seconds.
- The PWR A LED turns green, the INPUT/OUTPUT LEDs turn off, and the ACT LED turns on.

Note It might take up to 3 minutes for the PWR A and PWR B LEDs to update.

Note If the red FAIL LED does not turn on, check the power.

Note If you insert a card into a slot provisioned for a different card, no LEDs turn on.

Note If the red FAIL LED is on continuously or the LEDs act erratically, the card is not installed properly. Remove the card and repeat Steps 1 to 4.

Step 5 Return to your originating procedure (NTP).

NTP-G16 Perform the Shelf Installation Acceptance Test

Purpose	Use this procedure to perform a shelf installation acceptance test for the ONS 15454 ETSI and ONS 15454 ANSI.
Tools/Equipment	Voltmeter Oval and/or block ferrites
Prerequisite Procedures	Applicable procedures in Chapter 1, "Install the Shelf and Common Control Cards"
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 If you installed an ONS 15454 ETSI shelf, complete Table 1-12 by verifying that each applicable procedure was completed.

Table 1-12 ONS 15454 ETSI Shelf Installation Task Summary

Description	Completed
NTP-G1 Unpack and Inspect the Shelf Assembly, page 1-6	
NTP-G2 Install the Shelf Assembly, page 1-8	
NTP-G3 Open and Remove the Front Door, page 1-20	
NTP-G4 Open and Remove the FMEC Cover (ETSI Only), page 1-23	
NTP-G6 Install the MIC-A/P and MIC-T/C/P FMECs (ETSI Only), page 1-28	
NTP-G7 Install the Power and Ground, page 1-30	
NTP-G8 Install the Fan-Tray Assembly, page 1-40	
NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections, page 1-46	
NTP-G12 Install and Close the FMEC Cover (ETSI Only), page 1-61	
NTP-G14 Install DWDM Equipment, page 1-64	
NTP-G15 Install the Common Control Cards, page 1-69	

Step 2 If you installed an ONS 15454 ANSI shelf, complete Table 1-13 by verifying that each applicable procedure was completed.

Table 1-13 ONS 15454 ANSI Shelf Installation Task Summary

Description	Completed
NTP-G1 Unpack and Inspect the Shelf Assembly, page 1-6	
NTP-G2 Install the Shelf Assembly, page 1-8	
NTP-G3 Open and Remove the Front Door, page 1-20	
NTP-G5 Remove the Backplane Covers (ANSI Only), page 1-26	
NTP-G7 Install the Power and Ground, page 1-30	
NTP-G8 Install the Fan-Tray Assembly, page 1-40	
NTP-G9 Install the Alarm Expansion Panel (ANSI Only), page 1-43	
NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections, page 1-46	
NTP-G11 Install an External Wire-Wrap Panel on the AEP (ANSI Only), page 1-57	
NTP-G13 Install the Rear Cover (ANSI Only), page 1-62	
NTP-G14 Install DWDM Equipment, page 1-64	
NTP-G15 Install the Common Control Cards, page 1-69	

Step 3 Complete the "DLP-G35 Inspect the Shelf Installation and Connections" task on page 1-75.

Step 4 Complete the "DLP-G36 Measure Voltage" task on page 1-76.

Step 5 Continue with Chapter 2, "Connect the PC and Log into the GUI."

Stop. You have completed this procedure.

DLP-G35 Inspect the Shelf Installation and Connections

Purpose	Use this task to inspect the shelf installation and connections and verify that everything is installed and connected properly.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Make sure all external wiring connections on the backplane (i.e. power, ground, alarms, etc.) are secure. If a wire or cable is loose, return to the appropriate procedure in this chapter to correct it.

Step 2 (ETSI only) To check that the FMEC cover is seated correctly, verify that it can be easily closed without disturbing cables.

Step 3 Return to your originating procedure (NTP).

DLP-G36 Measure Voltage

Purpose	Use this task to measure the power to verify correct power and returns. Perform this task as needed. (You should already have checked the voltage during the "DLP-G19 Turn On and Verify Office Power" task on page 1-39.)
Tools/Equipment	Voltmeter
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Using a voltmeter, verify the office ground and power:

a. Place the black lead (positive) on the frame ground on the bay. Hold it there while completing Step b.

b. Place the red lead (negative) on the fuse power points on the third-party power distribution panel to verify that they read between –40.5 VDC and –57 VDC (power) and 0 (return ground).

Step 2 Using a voltmeter, verify the shelf ground and power wiring:

a. Place the black lead (positive) on the RET1 and the red lead on the BAT1 point. Verify a reading between –40.5 VDC and –57 VDC. If there is no voltage, check the following and correct if necessary:

- Battery and ground are reversed to the shelf.
- Battery is open or missing.
- Return is open or missing.

Step 3 Repeat Step 1 and Step 2 for the RET2 and BAT2 of the redundant power supply input.

Step 4 Return to your originating procedure (NTP).

CHAPTER 2

Connect the PC and Log into the GUI

This chapter explains how to connect PCs and workstations to the Cisco ONS 15454 and how to log into Cisco Transport Controller (CTC) software, which is the ONS 15454 Operation, Administration, Maintenance and Provisioning (OAM&P) user interface. Procedures for connecting to the ONS 15454 ANSI using TL1 are provided in the *Cisco ONS SONET TL1 Command Guide* or for ETSI using the *Cisco ONS 15454 SDH TL1 Command Guide*.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. NTP-G17 Set Up Computer for CTC, page 2-1—Complete this procedure if your PC or workstation has never been connected to an ONS 15454.
2. NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454, page 2-9—Complete this procedure to set up your computer for an onsite craft connection to the ONS 15454.
3. NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454, page 2-21—Complete this procedure to set up your computer to connect to the ONS 15454 using a corporate LAN.
4. NTP-G20 Set Up a Remote Access Connection to the ONS 15454, page 2-23—Complete this procedure to set up your computer for remote modem access to the ONS 15454.
5. NTP-G21 Log into the ONS 15454 GUI, page 2-24—Complete this procedure to log into CTC.

NTP-G17 Set Up Computer for CTC

Purpose	This procedure configures your PC or UNIX workstation to run CTC.
Tools/Equipment	Cisco ONS 15454 Release 5.0 software or documentation CD
Prerequisite Procedures	Chapter 14, "Shelf Hardware Reference"
Required/As Needed	Required

Onsite/Remote	Onsite or remote
Security Level	None

Note If you will log into nodes running CTC software earlier than Software Release 4.6, uninstall JRE 1.4.2 and reinstall JRE 1.3.1_2. To run Software R4.7 or R5.0, uninstall JRE 1.3.1_2 and reinstall JRE 1.4.2.

Step 1 If your computer does not have an appropriate browser installed, complete the following:

- To install Netscape 7.x, download the browser at the following site: http://channels.netscape.com/ns/browsers/default.jsp
- To install Internet Explorer 6.x on a PC, download the browser at the following site: http://www.microsoft.com

Step 2 If your computer is a Windows PC, complete the "DLP-G37 Run the CTC Installation Wizard for Windows" task on page 2-3, then go to Step 4.

Step 3 If your computer is a UNIX workstation, complete the "DLP-G38 Run the CTC Installation Wizard for UNIX" task on page 2-6.

Step 4 When your PC or workstation is set up, continue with the setup procedure appropriate to your network:

- NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454, page 2-9
- NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454, page 2-21
- NTP-G20 Set Up a Remote Access Connection to the ONS 15454, page 2-23

Note Cisco recommends that you configure your browser to disable the caching of user IDs/passwords on computers used to access Cisco optical equipment.

In Internet Explorer, choose **Tools > Internet Options > Content**. Click **Auto Complete** and uncheck the **User names and passwords on forms** option.

In Netscape 7.0, choose **Edit > Preferences > Privacy & Security > Forms** and uncheck the option to save form data. For passwords, choose **Edit > Preferences > Privacy & Security > Passwords** and uncheck the option to remember passwords. Note that passwords can be stored in an encrypted format. Netscape versions earlier than 6.0 do not cache user IDs and passwords.

Stop. You have completed this procedure.

DLP-G37 Run the CTC Installation Wizard for Windows

Purpose	This task installs the CTC online user manuals, Acrobat Reader 6.0.1, JRE 1.4.2, and the CTC JAR files. JRE 1.4.2 is required to run Release 5.0. Pre-installing the CTC JAR files saves time at initial login. If the JAR files are not installed, they are downloaded from the TCC2/TCC2P card the first time you login.
Tools/Equipment	Cisco ONS 15454 Release 5.0 software CD
Prerequisite Procedures	None
Required/As Needed	This task is required if you will use a Windows computer to run CTC and if any one of the following is true: • JRE 1.4.2 is not installed. • CTC online user manuals are not installed and are needed. • CTC JAR files are not installed and needed.
Onsite/Remote	Onsite or remote
Security Level	None

Note If you will log into nodes running CTC software earlier than Software Release 4.6, uninstall JRE 1.4.2 and reinstall JRE 1.3.1_2. To run Software R4.7 or R5.0, uninstall JRE 1.3.1_2 and reinstall JRE 1.4.2.

Note JRE 1.4.2 requires Netscape 7.x or Internet Explorer 6.x

Step 1 Verify that your computer has the following:

- Processor—Pentium III, 700 Mhz or faster
- RAM—384 MB recommended, 512 MB optimum
- Hard drive—20 GB hard drive recommended with at least 50 MB of space available
- Operating system—Windows 98 (1st and 2nd editions), Windows NT 4.0 (with Service Pack 6a), Windows 2000 (with Service Pack 3), or Windows XP Home

  If your operating system is Windows NT 4.0, verify that Service Pack 6a or later is installed. From the Start menu, choose **Programs > Administrative Tools > Windows NT Diagnostics** and check the service pack on the Version tab of the Windows NT Diagnostics dialog box. If Service Pack 6a or later is not installed, do not continue. Install Service Pack 6a following the computer upgrade procedures for your site.

  Note Processor and RAM requirements are guidelines. CTC performance is faster if your computer has a faster processor and more RAM.

Step 2 Insert the Cisco ONS 15454 Release 5.0 software CD into your computer CD drive. The installation program begins running automatically. If it does not start, navigate to the CD directory and double-click **setup.exe**.

The Cisco Transport Controller Installation Wizard displays the components that will be installed on your computer:

- Java Runtime Environment 1.4.2
- Acrobat Reader 6.0.1
- Online User Manuals
- CTC JAR files

Step 3 Click **Next**.

Step 4 Complete one of the following:

- Click **Typical** to install both the Java Runtime Environment and online user manuals. If you already have JRE 1.4.2 installed on your computer, choose **Custom**.
- Click **Custom** if you want to install either the JRE or the online user manuals. By default, Acrobat Reader and the online user manuals are selected.

Step 5 Click **Next**.

Step 6 Complete the following, as applicable:

- If you selected Typical in Step 4, skip this step and continue with Step 7.
- If you selected Custom in Step 4, check the CTC component that you want to install and click **Next**.
  - If you selected Online User Manuals, continue with Step 7.
  - If you did not select Online User Manuals, continue with Step 9.

Step 7 The directory where the installation wizard will install the CTC online user manuals appears. The default is C:\Program Files\Cisco\CTC\Documentation.

- If you want to change the CTC online user manuals directory, type the new directory path in the Directory Name field, or click **Browse** to navigate to the directory.
- If you do not want to change the directory, skip this step.

Step 8 Click **Next**.

Step 9 Review the components that will be installed. If you want to change the components, complete one of the following. If not, proceed to Step 10.

- If you selected Typical in Step 4, click **Back** twice to return to the installation setup type panel. Choose **Custom** and repeat Steps 5 through 8.
- If you selected Custom in Step 4, click **Back** once or twice (depending on the components selected) until the component selection panel appears. Repeat Steps 6 through 8.

Step 10 Click **Next**. It might take a few minutes for the JRE installation wizard to appear. If you selected Custom in Step 4 and did not check Java Runtime Environment 1.4.2, continue with Step 12.

Step 11 To install the JRE, complete the following:

a. In the Java 2 Runtime Environment License Agreement dialog box, view the license agreement and choose one of the following:

- I accept the terms of the license agreement—Accepts the license agreement. Continue with Step b.
- I do not accept the terms of the license agreement—Disables the Next button on the Java 2 Runtime Environment License Agreement dialog box. Click **Cancel** to return to the CTC installation wizard. CTC will not install the JRE. Continue with Step 12.

Note If JRE 1.4.2 is already installed on your computer, the License Agreement panel does not appear. You must click Next and then choose Modify to change the JRE installation or Remove to uninstall the JRE. If you choose Modify and click Next, continue with Step e. If you choose Remove and click Next, continue with Step i.

b. Click **Next**.

c. Choose one of the following:

- Click **Typical** to install all JRE features. If you select Typical, the JRE version installed will automatically become the default JRE version for your browsers.
- Click **Custom** if you want to select the components to install and select the browsers that will use the JRE version.

d. Click **Next**.

e. If you selected Typical, continue with Step h. If you selected Custom, click the drop-down list for each program feature that you want to install and choose the desired setting. The program features include:

- Java 2 Runtime Environment—(Default) Installs JRE 1.4.2 with support for European languages.
- Support for Additional Languages—Adds support for non-European languages.
- Additional Font and Media Support—Adds Lucida fonts, Java Sound, and color management capabilities.

The drop-down list options for each program feature include:

- This feature will be installed on the local hard drive—Installs the selected feature.
- This feature and all subfeatures will be installed on the local hard drive—Installs the selected feature and all subfeatures.
- Don't install this feature now—Does not install the feature (not an option for Java 2 Runtime Environment).

To modify the directory where the JRE version is installed, click **Change**, navigate to the desired directory, and click **OK**..

f. Click **Next**.

g. In the Browser Registration dialog box, check the browsers that you want to register with the Java Plug-In. The JRE version will be the default for the selected browsers. It is acceptable to leave both browser check boxes unchecked.

Note Setting the JRE as the default for these browsers might cause problems with these browsers.

h. Click **Next**.

i. Click **Finish**.

Note If you are uninstalling the JRE, click **Remove**.

Step 12 In the Cisco Transport Controller Installation Wizard, click **Next**. The online user manuals are installed.

Step 13 Click **Finish**.

Step 14 Return to your originating procedure (NTP).

DLP-G38 Run the CTC Installation Wizard for UNIX

Purpose	This task installs the CTC online user manuals, Acrobat 6.0.1, and JRE 1.4.2 on UNIX workstations, as necessary. JRE 1.4.2 is required to run Release 5.0.
Tools/Equipment	Cisco ONS 15454 Release 5.0 software CD
Prerequisite Procedures	None
Required/As Needed	This task is required if you will use a UNIX workstation to run CTC and any of the following are true: • JRE 1.4.2 is not installed. • CTC online user manuals are not installed and are needed.
Onsite/Remote	Onsite or remote
Security Level	None

Note If you will log into nodes running CTC software earlier than Software R4.6, uninstall JRE 1.4.2 and reinstall JRE 1.3.1_2. To run Software R4.7 or R5.0, uninstall JRE 1.3.1_2 and reinstall JRE 1.4.2.

Note JRE 1.4.2 requires Netscape 7.x or Internet Explorer 6.x.

Step 1 Verify that your computer has the following:

- RAM—384 MB recommended, 512 MB optimum
- Hard drive—20 GB hard drive recommended with at least 50 MB of space available
- Operating system—Solaris 8 or 9

Note These requirements are guidelines. CTC performance is faster if your computer has a faster processor and more RAM.

Step 2 Change the directory; type:

cd /cdrom/cdrom0/

Step 3 From the techdoc454 CD directory, type:

./setup.bat

The Cisco Transport Controller Installation Wizard displays the components that will be installed on your computer:

- Java Runtime Environment 1.4.2
- Acrobat Reader 6.0.1
- Online User Manuals

- CTC JAR files

Step 4 Click **Next**.

Step 5 Complete one of the following:

- Click **Typical** to install both the Java Runtime Environment and online user manuals. If you already have JRE 1.4.2 installed on your computer, choose **Custom**.
- Click **Custom** if you want to install either the JRE or the online user manuals.

Step 6 Click **Next**.

Step 7 Complete the following, as applicable:

- If you selected Typical in Step 5, continue with Step 8.
- If you selected Custom in Step 5, check the CTC component that you want to install and click **Next**.
  - If you selected Online User Manuals, continue with Step 8.
  - If you did not select Online User Manuals, continue with Step 10.

Step 8 The directory where the installation wizard will install the CTC online user manuals appears. The default is /usr/doc/ctc.

- If you want to change the CTC online user manuals directory, type the new directory path in the Directory Name field, or click **Browse** to navigate to the directory.
- If you do not want to change the CTC online user manuals directory, skip this step.

Step 9 Click **Next**.

Step 10 Review the components that will be installed.

- If you selected Typical in Step 5, click **Back** twice to return to the installation setup type panel. Choose **Custom** and repeat Steps 6 through 9.
- If you selected Custom in Step 5, click **Back** once or twice (depending on the components selected) you reach the component selection panel and check the desired components. Repeat Steps 7 through 9.

Step 11 Click **Next**. It might take a few minutes for the JRE installation wizard to appear. If you selected Custom in Step 4 and did not check Java Runtime Environment 1.4.2, continue with Step 13.

Step 12 To install the JRE, complete the following:

a. In the Java 2 Runtime Environment License Agreement dialog box, view the license agreement and choose one of the following:

- I accept the terms of the license agreement—Accepts the license agreement. Continue with Step b.
- I do not accept the terms of the license agreement—Disables the Next button on the Java 2 Runtime Environment License Agreement dialog box. Click **Cancel** to return to the CTC installation wizard. CTC will not install the JRE. Continue with Step 13.

Note If JRE 1.4.2 is already installed on your computer, the License Agreement panel does not appear. You must click Next and then choose Modify to change the JRE installation or Remove to uninstall the JRE. If you choose Modify and click Next, continue with Step e. If you choose Remove and click Next, continue with Step i.

b. Click **Next**.

c. Choose one of the following:

- Click **Typical** to install all JRE features. If you select Typical, the JRE version installed will automatically become the default JRE version for your browsers.
- Click **Custom** if you want to select the components to install and select the browsers that will use the JRE version.

d. Click **Next**.

e. If you selected Typical, continue with Step i. If you selected Custom, click the drop-down list for each program feature that you want to install and choose the desired setting. The program features include:

- Java 2 Runtime Environment—(Default) Installs JRE 1.4.2 with support for European languages.
- Support for Additional Languages—Adds support for non-European languages.
- Additional Font and Media Support—Adds Lucida fonts, Java Sound, and color management capabilities.

The drop-down list options for each program feature include:

- This feature will be installed on the local hard drive—Installs the selected feature.
- This feature and all subfeatures will be installed on the local hard drive—Installs the selected feature and all subfeatures.
- Don't install this feature now—Does not install the feature (not an option for Java 2 Runtime Environment).

To modify the directory where the JRE version is installed, click **Change**, navigate to the desired directory, and click **OK**.

f. Click **Next**.

g. In the Browser Registration dialog box, check the browsers that you want to register with the Java Plug-In. The JRE version will be the default for the selected browsers. It is acceptable to leave both browser check boxes unchecked.

Note Setting the JRE version as the default for these browsers might cause problems with these browsers.

h. Click **Next**.

i. Click **Finish**.

Note If you are uninstalling the JRE, click **Remove**.

Step 13 In the Cisco Transport Controller Installation Wizard, click **Next**. The online user manuals are installed.

Step 14 Click **Finish**.

Note Be sure to record the names of the directories you choose for JRE and the online user manuals.

Step 15 Return to your originating procedure (NTP).

NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454

Purpose	This procedure explains how to set up a PC running Windows or a Solaris workstation for an onsite local craft connection to the ONS 15454.
Tools/Equipment	Network interface card (NIC), also referred to as an Ethernet card Straight-through (CAT 5) LAN cable
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	None

Step 1 Complete one of the CTC computer setup tasks shown in Table 2-1 based your CTC connection environment.

Table 2-1 CTC Computer Setup for Local Craft Connections to the ONS 15454

CTC Connection Environment	CTC Computer Setup Task
• You are connecting from a Windows PC. • All nodes that you will access run software earlier than Release 3.3. • You will connect to one ONS 15454. • You need to access non-ONS 15454 applications such as ping and tracert (trace route).	1. Complete the "DLP-G39 Set Up a Windows PC for Craft Connection to an ONS 15454 on the Same Subnet Using Static IP Addresses" task on page 2-11. 2. Continue with Step 2.
• You are connecting from a Windows PC. • The CTC computer is provisioned for Dynamic Host Configuration Protocol (DHCP). • The ONS 15454 has DHCP forwarding enabled. • The ONS 15454 is connected to a DHCP server. **Note** The ONS 15454 does not provide IP addresses. If DHCP is enabled, it passes DCHP requests to an external DHCP server.	1. Complete the "DLP-G40 Set Up a Windows PC for Craft Connection to an ONS 15454 Using Dynamic Host Configuration Protocol" task on page 2-13. 2. Continue with Step 2. **Note** Do not use this task for initial node turn-up. Use the task only if DHCP forwarding is enabled on the ONS 15454. By default, DHCP is not enabled. To enable it, see the "NTP-G26 Set Up CTC Network Access" procedure on page 3-10.

Table 2-1 CTC Computer Setup for Local Craft Connections to the ONS 15454 (continued)

CTC Connection Environment	CTC Computer Setup Task (continued)
• You are connecting from a Windows PC. • All nodes that you will access run software Release 3.3 or later. • You will connect to ONS 15454s at different locations and times and do not wish to reconfigure your PC's IP settings each time. • You will not access or use non-ONS 15454 applications such as ping and tracert (trace route). • If you are using an ANSI shelf, you will connect to the TCC2/TCC2P Ethernet port or backplane LAN pins either directly or through a hub. • If you are using an ETSI shelf, you will connect to the ONS 15454 Ethernet port or the RJ-45 jack on the MIC-C/T/P FMEC either directly or through a hub.	1. Complete the "DLP-G41 Set Up a Windows PC for Craft Connection to an ONS 15454 Using Automatic Host Detection" task on page 2-16. 2. Continue with Step 2.
• You are connecting from a Solaris workstation. • You will connect to one ONS 15454. • You need to access non-ONS 15454 applications such as ping and tracert (trace route).	1. Complete the "DLP-G42 Set Up a Solaris Workstation for a Craft Connection to an ONS 15454" task on page 2-19. 2. Continue with Step 2.

Step 2 Connect a straight-through CAT-5 LAN cable from the PC or Solaris workstation NIC to one of the following:

- RJ-45 (LAN) port on the active or standby TCC2/TCC2P card
- RJ-45 (LAN) port on a hub or switch to which the ONS 15454 is physically connected

Note For instructions on crimping your own straight-through (CAT-5) LAN cables, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note For initial shelf turn-up, you should connect your PC directly to the LAN port on the TCC2/TCC2P card of the ONS 15454.

Step 3 After setting up your CTC computer, continue with the "NTP-G21 Log into the ONS 15454 GUI" procedure on page 2-24 as needed.

Stop. You have completed this procedure.

DLP-G39 Set Up a Windows PC for Craft Connection to an ONS 15454 on the Same Subnet Using Static IP Addresses

Purpose	This task sets up your computer for a local craft connection to the ONS 15454 when: • You will access nodes running software releases earlier than Software Release 3.3. • You will connect to one ONS 15454; if you will connect to multiple ONS 15454s, you might need to reconfigure your computer's IP settings each time you connect to an ONS 15454. • You need to use non-ONS 15454 applications such as ping and tracert (trace route).
Tools/Equipment	None
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Verify the operating system that is installed on your computer:

a. From the Windows Start menu, choose **Settings > Control Panel**.

b. In the Control Panel window, double-click the **System** icon.

c. On the General tab of the System Settings window, verify that the Windows operating system is one of the following: Windows 98, Windows NT 4.0, Windows 2000, or Windows XP.

Step 2 According to the Windows operating system installed on your computer, perform one of the following steps:

- For Windows 98, complete Step 3.
- For Windows NT 4.0, complete Step 4.
- For Windows 2000, complete Step 5.
- For Windows XP, complete Step 6.

Step 3 If you have Windows 98 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Control Panel**.

b. In the Control Panel dialog box, click the **Network** icon.

c. In the Network dialog box, choose **TCP/IP** for your NIC card, then click **Properties**.

d. In the TCP/IP Properties dialog box, click the **DNS Configuration** tab and choose **Disable DNS**.

e. Click the **WINS Configuration** tab and choose **Disable WINS Resolution**.

f. Click the **IP Address** tab.

g. In the IP Address window, click **Specify an IP address**.

h. In the IP Address field, enter an IP address that is identical to the ONS 15454 IP address except for the last octet. The last octet must be 1 or 3 through 254. This IP address appears on the LCD unless its display is suppressed during node provisioning.

i. In the Subnet Mask field, type the same subnet mask as the ONS 15454. The default is **255.255.255.0** (24 bit).

j. Click **OK**.

k. In the TCP/IP dialog box, click the **Gateway** tab.

l. In the New Gateway field, type the ONS 15454 IP address. Click **Add**.

m. Verify that the IP address appears in the Installed Gateways field, then click **OK**.

n. When the prompt to restart your PC appears, click **Yes**.

o. Proceed to Step 7.

Step 4 If you have Windows NT 4.0 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Control Panel**.

b. In the Control Panel dialog box, click the **Network** icon.

c. In the Network dialog box, click the **Protocols** tab, choose **TCP/IP Protocol**, then click **Properties**.

d. Click the **IP Address** tab.

e. In the IP Address window, click **Specify an IP address**.

f. In the IP Address field, enter an IP address that is identical to the ONS 15454 IP address shown on the ONS 15454 LCD except for the last octet. The last octet must be 1 or 3 through 254.

g. In the Subnet Mask field, type **255.255.255.0**.

h. Click **Advanced**.

i. In the Gateways List, click **Add**. The TCP/IP Gateway Address dialog box appears.

j. Type the ONS 15454 IP address in the Gateway Address field.

k. Click **Add**.

l. Click **OK**.

m. Click **Apply**.

n. In some cases, Windows NT 4.0 prompts you to reboot your PC. If you receive this prompt, click **Yes**.

o. Proceed to Step 7.

Step 5 If you have Windows 2000 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Network and Dial-up Connections > Local Area Connection**.

b. In the Local Area Connection Status dialog box, click **Properties**.

c. On the General tab, choose **Internet Protocol (TCP/IP)**, then click **Properties**.

d. Click **Use the following IP address**.

e. In the IP Address field, enter an IP address that is identical to the ONS 15454 IP address shown on the ONS 15454 LCD except for the last octet. The last octet must be 1 or 3 through 254.

f. In the Subnet Mask field, type **255.255.255.0**.

g. In the Default Gateway field, type the ONS 15454 IP address.

h. Click **OK**.

i. In the Local Area Connection Properties dialog box, click **OK**.

j. In the Local Area Connection Status dialog box, click **Close**.

k. Proceed to Step 7.

Step 6 If you have Windows XP installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Control Panel > Network Connections**.

Note If the Network Connections menu is not available, click **Switch to Classic View**.

b. From the Network Connections dialog box, click the **Local Area Connection** icon.

c. From the Local Area Connection Properties dialog box, choose **Internet Protocol (TCP/IP)**, then click **Properties**.

d. In the IP Address field, enter an IP address that is identical to the ONS 15454 IP address shown on the ONS 15454 LCD except for the last octet. The last octet must be 1 or 3 through 254.

e. In the Subnet Mask field, type **255.255.255.0**.

f. In the Default Gateway field, type the ONS 15454 IP address.

g. Click **OK**.

h. In the Local Area Connection Properties dialog box, click **OK**.

i. In the Local Area Connection Status dialog box, click **Close**.

Step 7 Return to your originating procedure (NTP).

DLP-G40 Set Up a Windows PC for Craft Connection to an ONS 15454 Using Dynamic Host Configuration Protocol

Purpose	This task sets up your computer for craft connection to the ONS 15454 using DHCP.
Tools/Equipment	None
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1 NTP-G26 Set Up CTC Network Access, page 3-10
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Do not use this task for initial node turn-up. Use the task only if DHCP forwarding is enabled on the ONS 15454. By default, DHCP is not enabled. To enable it, see the "NTP-G26 Set Up CTC Network Access" procedure on page 3-10.

Note The ONS 15454 does not provide the IP addresses. If DHCP forwarding is enabled, it passes DCHP requests to an external DHCP server.

Step 1 Verify the operating system that is installed on your computer:

a. From the Windows Start menu, choose **Settings > Control Panel**.

b. In the Control Panel window, double-click the **System** icon.

c. On the General tab of the System Settings window, verify that the Windows operating system is one of the following: Windows 98, Windows NT 4.0, Windows 2000, or Windows XP.

Step 2 According to the Windows operating system installed on your computer, perform one of the following steps:

- For Windows 98, complete Step 3.
- For Windows NT 4.0, complete Step 4.
- For Windows 2000, complete Step 5.
- For Windows XP, complete Step 6.

Step 3 If you have Windows 98 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Control Panel**.

b. In the Control Panel dialog box, click the **Network** icon.

c. In the Network dialog box, select **TCP/IP** for your NIC, then click **Properties**.

d. In the TCP/IP Properties dialog box, click the **DNS Configuration** tab and choose **Disable DNS**.

e. Click the **WINS Configuration** tab and choose **Disable WINS Resolution**.

f. Click the **IP Address** tab.

g. In the IP Address window, click **Obtain an IP address automatically**.

h. Click **OK**.

i. When the prompt to restart your PC appears, click **Yes**.

j. Proceed to Step 7.

Step 4 If you have Windows NT 4.0 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Control Panel**.

b. In the Control Panel dialog box, click the **Network** icon.

c. In the Network dialog box, click the **Protocols** tab, choose **TCP/IP Protocol**, then click **Properties**.

d. Click the **IP Address** tab.

e. In the IP Address window, click **Obtain an IP address from a DHCP server**.

f. Click **OK**.

g. Click **Apply**.

h. If Windows prompts you to restart your PC, click **Yes**.

i. Proceed to Step 7.

Step 5 If you have Windows 2000 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Network and Dial-up Connections > Local Area Connection**.

b. In the Local Area Connection Status dialog box, click **Properties**.

c. On the General tab, choose **Internet Protocol (TCP/IP)**, then click **Properties**.

d. Click **Obtain an IP address from a DHCP server**.

e. Click **OK**.

f. In the Local Area Connection Properties dialog box, click **OK**.

g. In the Local Area Connection Status dialog box, click **Close**.

h. Proceed to Step 7.

Step 6 If you have Windows XP installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Control Panel > Network Connections.**

Note If the Network Connections menu is not available, click **Switch to Classic View**.

b. In the Network Connections dialog box, click **Local Area Connection**.

c. In the Local Area Connection Status dialog box, click **Properties**.

d. On the General tab, choose **Internet Protocol (TCP/IP)**, then click **Properties**.

e. Click **Obtain an IP address from a DHCP server**.

f. Click **OK**.

g. In the Local Area Connection Properties dialog box, click **OK**.

h. In the Local Area Connection Status dialog box, click **Close**.

Step 7 Return to your originating procedure (NTP).

DLP-G41 Set Up a Windows PC for Craft Connection to an ONS 15454 Using Automatic Host Detection

Purpose	This task sets up your computer for local craft connection to the ONS 15454 when: • If you are using an ANSI shelf, you will connect to the ONS 15454 Ethernet port or backplane LAN pins either directly or through a hub. • If you are using an ETSI shelf, you will connect to the ONS 15454 Ethernet port or the RJ-45 jack on the MIC-C/T/P FMEC either directly or through a hub. • All nodes that you will access are running Software Release 3.3 or later. • You will connect to multiple ONS 15454s and do not want to reconfigure your IP address each time. • You do not need to access non-ONS 15454 applications such as ping and tracert (trace route).
Tools/Equipment	None
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Verify the operating system that is installed on your computer:

a. From the Windows Start menu, choose **Settings > Control Panel**.

Note In Windows XP, you can select Control Panel directly from the Start menu. Make sure you are in Classic View before continuing with this procedure.

b. In the Control Panel window, double-click the **System** icon.

c. On the General tab of the System Settings window, verify that the Windows operating system is one of the following: Windows 98, Windows NT 4.0, Windows 2000, or Windows XP.

Step 2 According to the Windows operating system installed on your computer, perform one of the following steps:

- For Windows 98, complete Step 3.
- For Windows NT 4.0, complete Step 4.
- For Windows 2000, complete Step 5.
- For Windows XP, complete Step 6.

Step 3 If you have Windows 98 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Control Panel**.

b. In the Control Panel dialog box, click the **Network** icon.

c. In the Network dialog box, select **TCP/IP** for your NIC, then click **Properties**.

d. In the TCP/IP Properties dialog box, click the **DNS Configuration** tab and choose **Disable DNS**.

e. Click the **WINS Configuration** tab and choose **Disable WINS Resolution**.

f. Click the **IP Address** tab.

g. In the IP Address window, click **Specify an IP address**.

h. In the IP Address field, enter any legitimate IP address other than the node IP address as indicated on the LCD of the ONS 15454. The default IP address is 192.1.0.2.

Note You can suppress the LCD IP address display using CTC. For more information, see the "DLP-G162 Change IP Settings" task on page 10-10.

i. In the Subnet Mask field, type the same subnet mask as the ONS 15454. The default is **255.255.255.0** (24 bit).

j. Click **OK**.

k. In the TCP/IP dialog box, click the **Gateway** tab.

l. In the New Gateway field, type the address entered in Step h. Click **Add**.

m. Verify that the IP address appears in the Installed Gateways field, then click **OK**.

n. When the prompt to restart your PC appears, click **Yes**.

o. Proceed to Step 7.

Step 4 If you have Windows NT 4.0 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Control Panel**.

b. In the Control Panel dialog box, click the **Network** icon.

c. In the Network dialog box, click the **Protocols** tab, choose **TCP/IP Protocol**, then click **Properties**.

d. Click the **IP Address** tab.

e. In the IP Address window, click **Specify an IP address**.

f. In the IP Address field, enter any legitimate IP address other than the node IP address as indicated on the LCD of the ONS 15454. The default IP address is 192.1.0.2.

Note You can suppress the LCD IP address display using CTC. For more information, see the "DLP-G162 Change IP Settings" task on page 10-10.

g. In the Subnet Mask field, type the same subnet mask as the ONS 15454. The default is **255.255.255.0** (24 bit).

h. Click **Advanced**.

i. In the Gateways List, click **Add**. The TCP/IP Gateway Address dialog box appears.

j. Type the IP address entered in Step f in the Gateway Address field.

k. Click **Add**.

l. Click **OK**.

m. Click **Apply**.

n. Reboot your PC.

o. Proceed to Step 7.

Step 5 If you have Windows 2000 installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Settings > Network and Dial-up Connections > Local Area Connection**.

b. In the Local Area Connection Status dialog box, click **Properties**.

c. On the General tab, choose **Internet Protocol (TCP/IP)**, then click **Properties**.

d. Click **Use the following IP address**.

e. In the IP Address field, enter any legitimate IP address other than the node IP address as indicated on the LCD of the ONS 15454. The default IP address is 192.1.0.2.

Note You can suppress the LCD IP address display using CTC. For more information, see the "DLP-G162 Change IP Settings" task on page 10-10.

f. In the Subnet Mask field, type the same subnet mask as the ONS 15454. The default is **255.255.255.0** (24 bit).

g. Type the IP address entered in Step e in the Gateway Address field.

h. Click **OK**.

i. In the Local Area Connection Properties dialog box, click **OK**.

j. In the Local Area Connection Status dialog box, click **Close**.

k. Proceed to Step 7.

Step 6 If you have Windows XP installed on your PC, complete the following steps to change its TCP/IP configuration:

a. From the Windows Start menu, choose **Control Panel > Network Connections**.

Note If the Network Connections menu is not available, click **Switch to Classic View**.

b. From the Network Connections dialog box, click the **Local Area Connection** icon to select it. Right-click and select **Properties**.

c. From the Local Area Connection Properties dialog box, click on **Internet Protocol (TCP/IP)** to select it, then click **Properties**.

d. In the IP Address field, enter any legitimate IP address other than the node IP address as indicated on the LCD of the ONS 15454. The default IP address is 192.1.0.2.

e. Select the **Use the Following IP Address:** radio button.

Note You can suppress the LCD IP address display using CTC. For more information, see the "DLP-G162 Change IP Settings" task on page 10-10.

f. In the Subnet Mask field, type the same subnet mask as the ONS 15454. The default is **255.255.255.0** (24 bit).

g. Type the IP address entered in Step d in the Gateway Address field.

h. Click **OK**.

i. In the Local Area Connection Properties dialog box, click **OK**.

j. In the Local Area Connection Status dialog box, click **Close**.

Step 7 Return to your originating procedure (NTP).

DLP-G42 Set Up a Solaris Workstation for a Craft Connection to an ONS 15454

Purpose	This task sets up a Solaris workstation for a craft connection to the ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Log into the workstation as the root user.

Step 2 Check to see if the interface is plumbed by typing:

 # ifconfig *device*

For example:

 # ifconfig hme1

If the interface is plumbed, a message similar to the following appears:

hme1:flags=1000842<BROADCAST,RUNNING,MULTICAST,IPv4>mtu 1500 index 2 inet 0.0.0.0 netmask 0

If a message similar to this one appears, go to Step 4.

If the interface is not plumbed, a message similar to the following appears:

ifconfig: status: SIOCGLIFFLAGS: hme1: no such interface.

If a message similar to this one appears, go to Step 3.

Step 3 Plumb the interface by typing:

 # ifconfig *device* **plumb**

For example:

 # ifconfig hme1 plumb

Step 4 Configure the IP address on the interface by typing:

 # ifconfig *interface ip-address* **netmask** *netmask* **up**

For example:

 # ifconfig hme0 192.1.0.3 netmask 255.255.255.0 up

Note Enter an IP address that is identical to the ONS 15454 IP address except for the last octet. The last octet must be 1 or 3 through 254.

Step 5 In the Subnet Mask field, type **255.255.255.0**. Skip this step if you checked Craft Access Only on the Provisioning > Network > General > Gateway Settings tab.

Step 6 Test the connection:

a. Start Netscape Navigator.

b. Enter the ONS 15454 IP address in the web address (URL) field. If the connection is established, a Java Console window, CTC caching messages, and the Cisco Transport Controller Login dialog box appear. If this occurs, go to Step 2 of the "DLP-G46 Log into CTC" task on page 2-24 to complete the login. If the Login dialog box does not appear, complete Steps c and d.

c. At the prompt, type:

ping *ONS-15454-IP-address*

For example, to connect to an ONS 15454 with a default IP address of 192.1.0.2, type:

ping 192.1.0.2

If your workstation is connected to the ONS 15454, the following message appears:

IP-*address* is alive

Note Skip this step if you checked the Craft Access Only check box at Provisioning > Network > General > Gateway Settings.

d. If CTC is not responding, a "no answer from *x.x.x.x*" message appears. Verify the IP and subnet mask information. Check that the cables connecting the workstation to the ONS 15454 are securely attached. Check the link status by typing:

 # ndd -set /dev/*device* **instance 0**

 # ndd -get /dev/*device* **link_status**

For example:

 # ndd -set /dev/hme instance 0

 # ndd -get /dev/hme link_status

A result of "1" means the link is up. A result of "0" means the link is down.

Note Check the man page for ndd. For example, type: `# man ndd`.

Step 7 Return to your originating procedure (NTP).

NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454

Purpose	This procedure sets up your computer to access the ONS 15454 through a corporate LAN.
Tools/Equipment	Network interface card (NIC), also referred to as an Ethernet card Straight-through (CAT 5) LAN cable
Prerequisite Procedures	• NTP-G17 Set Up Computer for CTC, page 2-1 • The ONS 15454 must be provisioned for LAN connectivity, including IP address, subnet mask, default gateway. • The ONS 15454 must be physically connected to the corporate LAN. • The CTC computer must be connected to the corporate LAN that has connectivity to the ONS 15454.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	None

Step 1 If your computer is already connected to the corporate LAN, go to Step 3. If you changed your computer's network settings for craft access to the ONS 15454, change the settings back to the corporate LAN access settings. This generally means:

- Set the IP Address on the TCP/IP dialog box back to **Obtain an IP address automatically** (Windows 98) or **Obtain an IP address from a DHCP server** (Windows NT 4.0, 2000, or XP).
- If your LAN requires that Domain Name System (DNS) or Windows Internet Naming Service (WINS) be enabled, change the setting on the DNS Configuration or WINS Configuration tab of the TCP/IP dialog box.

Step 2 Connect a straight-through (CAT-5) LAN cable from the PC or Solaris workstation NIC card to a corporate LAN port.

Step 3 If your computer is connected to a proxy server, disable proxy service or add the ONS 15454 nodes as exceptions. To disable proxy service, complete one of the following tasks, depending on the web browser that you use:

- DLP-G43 Disable Proxy Service Using Internet Explorer (Windows), page 2-22
- DLP-G44 Disable Proxy Service Using Netscape (Windows and UNIX), page 2-22

Step 4 Continue with the "NTP-G21 Log into the ONS 15454 GUI" procedure on page 2-24.

Stop. You have completed this procedure.

DLP-G43 Disable Proxy Service Using Internet Explorer (Windows)

Purpose	This task disables proxy service for PCs running Internet Explorer.
Tools/Equipment	None
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1
Required/As Needed	Required if your computer is connected to a network computer proxy server and your browser is Internet Explorer.
Onsite/Remote	Onsite or remote
Security Level	None

Step 1 From the Start menu, select **Settings > Control Panel**.

Note If your computer is running Windows XP, you can select Control Panel directly from the Start menu. Make sure that you are in Classic View before continuing with this procedure.

Step 2 In the Control Panel window, choose **Internet Options**.

Step 3 In the Internet Properties dialog box, click **Connections > LAN Settings**.

Step 4 In the LAN Settings dialog box, complete one of the following tasks:

- Uncheck **Use a proxy server** to disable the service.
- Leave **Use a proxy server** selected and click **Advanced**. In the Proxy Setting dialog box under Exceptions, enter the IP addresses of ONS 15454 nodes that you will access. Separate each address with a semicolon. You can insert an asterisk (*) for the host number to include all the ONS 15454s on your network. Click **OK** to close each open dialog box.

Step 5 Return to your originating procedure (NTP).

DLP-G44 Disable Proxy Service Using Netscape (Windows and UNIX)

Purpose	This task disables proxy service for PCs and UNIX workstations running Netscape.
Tools/Equipment	None
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1
Required/As Needed	Required if your computer is connected to a network computer proxy server and your browser is Netscape.
Onsite/Remote	Onsite or remote
Security Level	None

Step 1 Open Netscape.

Step 2 From the Edit menu, choose **Preferences**.

Step 3 In the Preferences dialog box under Category, choose **Advanced > Proxies**.

Step 4 On the right side of the Preferences dialog box under Proxies, perform one of the following options:

- Choose **Direct connection to the Internet** to bypass the proxy server.
- Choose **Manual proxy configuration** to add exceptions to the proxy server, then click **View**. In the Manual Proxy Configuration dialog box under Exceptions, enter the IP addresses of the ONS 15454 nodes that you will access. Separate each address with a comma. Click **OK** to close each open dialog box.

Step 5 Return to your originating procedure (NTP).

NTP-G20 Set Up a Remote Access Connection to the ONS 15454

Purpose	This procedure connects the CTC computer to an ONS 15454 using a LAN modem. To complete this procedure: • A modem must be connected to the ONS 15454. • The modem must be provisioned for ONS 15454. To run CTC, the modem must be provisioned for Ethernet access.
Tools/Equipment	Modem and modem documentation
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Connect the modem to the RJ-45 (LAN) port on the TCC2/TCC2P card or to the LAN pins on the ONS 15454 backplane (ANSI only) or the RJ-45 jack on the MIC-C/T/P FMEC (ETSI only).

Step 2 While referring to the modem documentation, complete the following tasks to provision the modem for the ONS 15454:

- For CTC access, set the modem for Ethernet access.
- Assign an IP address to the modem that is on the same subnet as the ONS 15454.
- The IP address the modem assigns to the CTC computer must be on the same subnet as the modem and the ONS 15454.

Note For assistance on provisioning specific modems, contact the Cisco Technical Assistance Center (Cisco TAC). See the "Obtaining Technical Assistance" section on page lxxiv as needed.

Step 3 Continue with the "NTP-G21 Log into the ONS 15454 GUI" procedure on page 2-24.

Stop. You have completed this procedure.

NTP-G21 Log into the ONS 15454 GUI

Purpose	This procedure logs into CTC, the graphical user interface software used to manage the ONS 15454. This procedure includes optional node login tasks.
Tools/Equipment	None
Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1 One of the following procedures: • NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454, page 2-9 • NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454, page 2-21 • NTP-G20 Set Up a Remote Access Connection to the ONS 15454, page 2-23
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24.

Note For information about navigating in CTC, see Appendix A, "CTC Information and Shortcuts."

Step 2 As needed, complete the "DLP-G48 Create Login Node Groups" task on page 2-28. Login node groups allow you to manage nodes that are not connected to the login node through a data communications channel (DCC).

Step 3 As needed, complete the "DLP-G49 Add a Node to the Current Session or Login Group" task on page 2-29.

Step 4 As needed, complete the "DLP-G50 Delete a Node from the Current Session or Login Group" task on page 2-30.

Step 5 As needed, complete the "DLP-G51 Delete a Node from a Specified Login Node Group" task on page 2-30.

Step 6 As needed, complete the "DLP-G52 Change the JRE Version" task on page 2-31.

Step 7 As needed, complete the "DLP-G53 Configure the CTC Alerts Dialog Box for Automatic Popup" task on page 2-32.

Stop. You have completed this procedure.

DLP-G46 Log into CTC

Purpose	This task logs into CTC.
Tools/Equipment	None

Prerequisite Procedures	NTP-G17 Set Up Computer for CTC, page 2-1 One of the following procedures: • NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454, page 2-9 • NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454, page 2-21 • NTP-G20 Set Up a Remote Access Connection to the ONS 15454, page 2-23
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Note For information about CTC views and navigation, see Appendix A, "CTC Information and Shortcuts."

Step 1 From the computer connected to the ONS 15454, start Netscape (PC or UNIX) or Internet Explorer (PC only):

- If you are using a PC, launch Netscape or Internet Explorer from the Windows Start menu or a shortcut icon.
- If you are using UNIX, launch Netscape from the command line by typing one of the following:
  - To install Netscape colors for Netscape use, type:

    # netscape -install
  - To limit Netscape to 32 colors so that if the requested color is not available, Netscape chooses the closest color option, type:

    netscape -ncols 32

Note CTC requires a full 24-color palette to run properly. When using color-intensive applications such as Netscape in UNIX, it is possible that UNIX might run out of colors to use for CTC. The **-install** and **-ncols 32** command line options limit the number of colors that Netscape uses.

Step 2 In the Netscape or Internet Explorer web address (URL) field, enter the ONS 15454 IP address. For initial setup, this is the default IP address, 192.1.0.2. (This IP address appears on the LCD. You can suppress the LCD IP address display using CTC after you log in. For more information, see the "DLP-G162 Change IP Settings" task on page 10-10.)

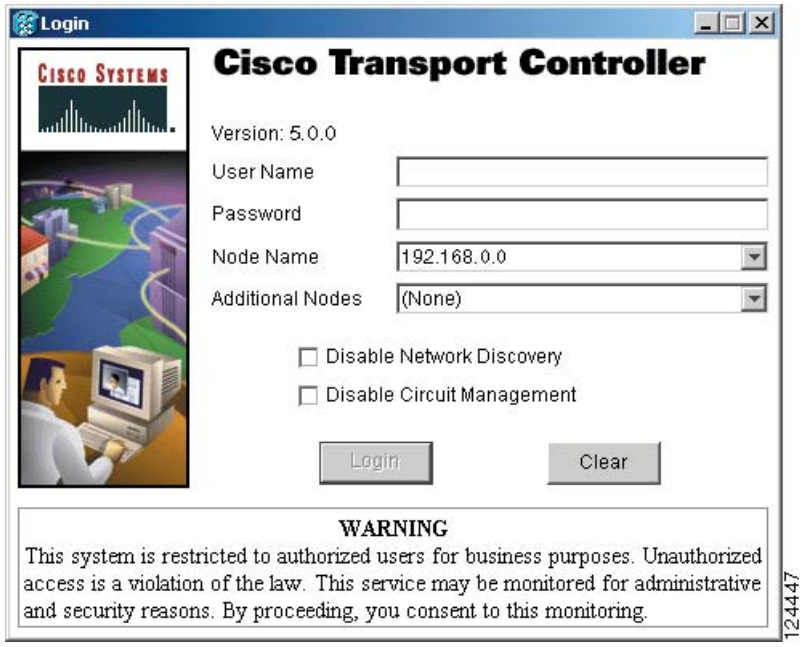
Step 3 Press **Enter**.

Note If you are logging into ONS 15454 nodes in an operation network that are running different releases of CTC software, log into the node running the most recent release. If you log into a node running an older release, you will receive an INCOMPATIBLE-SW alarm for each node in the network running a new release, and CTC will not be able to manage these nodes. To check the software version of a node, select About CTC from the CTC Help menu. This will display the ONS 15454 software version for each node visible on the network view. If the node is not visible, the software version can be read from the LCD display. To resolve an alarm, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 4 If a Java Plug-in Security Warning dialog box appears, complete the "DLP-G47 Install Public-Key Security Certificate" task on page 2-27 to install the public-key security certificate required by Software Release 4.1 and later.

After you complete the security certificate dialog box (or if the certificate is already installed), a Java Console window displays the CTC file download status. The web browser displays information about your Java and system environments. If this is the first login, CTC caching messages appear while CTC files are downloaded to your computer. The first time you connect to an ONS 15454, this process can take several minutes. After the download, the CTC Login dialog box appears (Figure 2-1).

Figure 2-1 Logging into CTC



Note When the CTC Login dialog box appears, it might be minimized.

Step 5 In the Login dialog box, type a user name and password (both are case sensitive). For initial setup, type the user name **CISCO15** and the password **otbu+1**.

Note The CISCO15 user is provided with every ONS 15454. CISCO15 has Superuser privileges, so you can create other users. You must create another Superuser before you can delete the CISCO15 user. CISCO15 is delivered with the otbu+1 password. To change the password for CISCO15, click the Provisioning > Security tabs after you log in and change the password. To set up ONS 15454 users and assign security, go to the "NTP-G23 Create Users and Assign Security" procedure on page 3-5. Additional information about security is provided in the "19.1 Users and Security" section on page 19-1.

Step 6 Each time you log into an ONS 15454, you can make selections on the following login options:

- Node Name—Displays the IP address entered in the web browser and a drop-down list of previously entered ONS 15454 IP addresses. You can select any ONS 15454 on the list for the login, or you can enter the IP address (or node name) of any new node where you want to log in.

- Additional Nodes—Displays a list of current login node groups. To create a login node group or add additional groups, see the "DLP-G48 Create Login Node Groups" task on page 2-28.
- Disable Network Discovery—Check this box to view only the ONS 15454 (and login node group members, if any) entered in the Node Name field. Nodes linked to this node through DCCs are not discovered and will not appear in CTC network view. Using this option can decrease the CTC startup time in networks with many DCC-connected nodes, and can reduce memory consumption.
- Disable Circuit Management—Check this box to disable discovery of existing circuits. Using this option can decrease the CTC initialization time in networks with many existing circuits and reduce memory consumption. This option does not prevent the creation and management of new circuits.

Step 7 Click **Login**.

If the login is successful, the CTC window appears. From here, you can navigate to other CTC views to provision and manage the ONS 15454. If you need to turn up the shelf for the first time, see Chapter 3, "Turn Up a Node." If login problems occur, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 8 Return to your originating procedure (NTP).

DLP-G47 Install Public-Key Security Certificate

Purpose	This task installs the ITU Recommendation X.509 public-key security certificate. The public-key certificate is required to run Software Release 4.1 or later.
Tools/Equipment	None
Prerequisite Procedures	This task is performed during the "DLP-G46 Log into CTC" task on page 2-24. You cannot perform it outside of this task.
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 If the Java Plug-in Security Warning dialog box appears, choose one of the following options:

Note The Java Plug-in Security Warning dialog box options that appear depend on the JRE version you are using. If you installed JRE 1.4.2, you will see the following options: Yes, No, Always, and More Details. If you are using JRE 1.3.1_02, you will see the following options (noted below in parentheses): Grant This Session, Deny, Grant Always, and View Certificate.

- Yes (Grant This Session)—Installs the public-key certificate to your PC only for the current session. After the session is ended, the certificate is deleted. This dialog box will appear the next time you log into the ONS 15454.
- No (Deny)—Denies permission to install the certificate. If you choose this option, you cannot log into the ONS 15454.
- Always (Grant Always)—Installs the public-key certificate and does not delete it after the session is over. Cisco recommends this option.
- More Details (View Certificate)—Allows you to view the public-key security certificate.

Step 2 Return to your originating procedure (NTP).

DLP-G48 Create Login Node Groups

Purpose	This task creates a login node group to display ONS 15454s that have an IP connection but not a DCC connection to the login node.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the Edit menu in node view, choose **Preferences**.

Step 2 Click **Login Node Group** and **Create Group**.

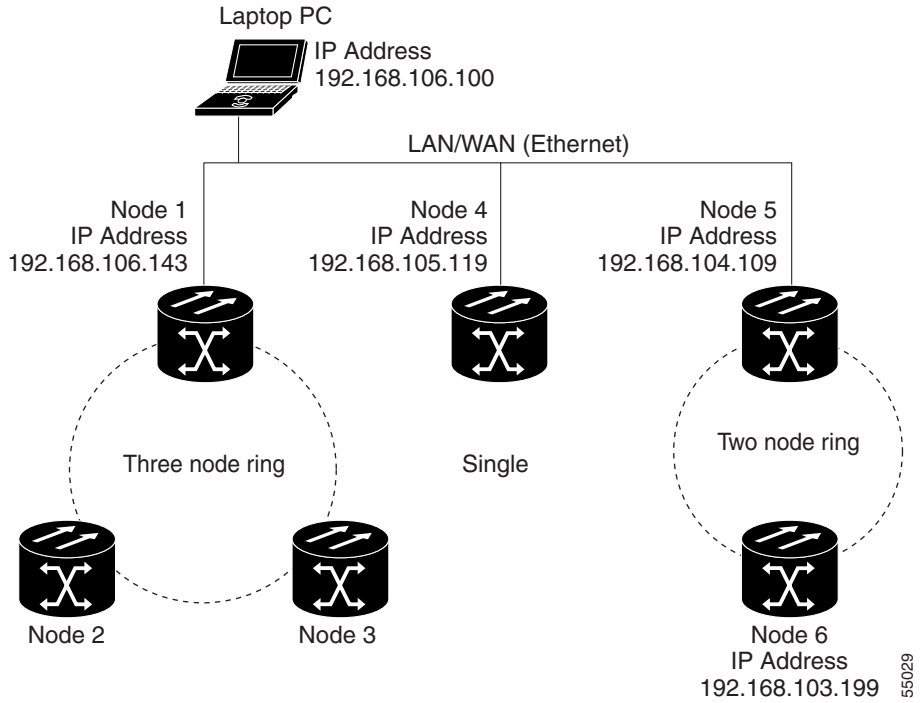
Step 3 Enter a name for the group in the Create Login Group Name dialog box. Click **OK**.

Step 4 In the Members area, type the IP address (or node name) of a node you want to add to the group. Click **Add**. Repeat this step for each node that you want to add to the group.

Step 5 Click **OK**.

The next time you log into an ONS 15454, the login node group will be available in the Additional Nodes list of the Login dialog box. For example, in Figure 2-2, a login node group is created that contains the IP addresses for Nodes 1, 4, and 5. During login, if you choose this group from the Additional Nodes list and Disable Network Discovery is not selected, all nodes in the figure appear. If the login group and Disable Network Discovery are both selected, only Nodes 1, 4, and 5 appear. You can create as many login groups as you need. The groups are stored in the CTC preferences file and are not visible to other users.

Figure 2-2 Login Node Group



Step 6 Return to your originating procedure (NTP).

DLP-G49 Add a Node to the Current Session or Login Group

Purpose	This task adds a node to the current CTC session or login node group.
Tools	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the CTC File menu, click **Add Node**.

Step 2 In the Add Node dialog box, enter the node name (or IP address).

Step 3 If you want to add the node to the current login group, check **Add to current login node group**. Otherwise, leave it unchecked.

Note This check box is active only if you selected a login group when you logged into CTC.

Step 4 Click **OK**.

After a few seconds, the new node appears on the network view map.

Step 5 Return to your originating procedure (NTP).

DLP-G50 Delete a Node from the Current Session or Login Group

Purpose	This task removes a node from the current CTC session or login node group. To remove a node from a login node group that is not the current one, see "DLP-G51 Delete a Node from a Specified Login Node Group" task on page 2-30.
Tools	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the View menu, choose **Go to Network View**.

Step 2 Click the node that you want to delete.

Step 3 From the CTC File menu, click **Delete Selected Node**.

After a few seconds, the node disappears from the network view map.

Step 4 Return to your originating procedure (NTP).

DLP-G51 Delete a Node from a Specified Login Node Group

Purpose	This task removes a node from a specified login node group. To remove a node from the current login node group, see the "DLP-G50 Delete a Node from the Current Session or Login Group" task on page 2-30.
Tools	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the CTC Edit menu, choose **Preferences**.

Step 2 In the Preferences dialog box, click the **Login Node Groups** tab.

Step 3 Click the login node group tab containing the node you want to remove.

Step 4 Click the node you want to remove, then click **Remove**.

Step 5 Click **OK**.

Step 6 Return to your originating procedure (NTP).

DLP-G52 Change the JRE Version

Purpose	This task changes the JRE version, which is useful if you would like to upgrade to a later JRE version from an earlier one without using the software or documentation CD. This does not affect the browser default version. After selecting the desired JRE version, you must exit CTC. The next time you log into a node, the new JRE version will be used.
Tools	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note This task is not used in Release 5.0 because only one JRE version is supported. This task is used in CTC releases that support multiple JRE versions.

Step 1 From the Edit menu, choose **Preferences**.

Step 2 Click the **JRE** tab. The JRE tab shows the current JRE version and the recommended version.

Step 3 Click the **Browse** button and navigate to the JRE directory on your computer.

Step 4 Choose the JRE version.

Step 5 Click **OK**.

Step 6 From the File menu, choose **Exit**.

Step 7 In the confirmation dialog box, click **Yes**.

Step 8 Return to your originating procedure (NTP).

DLP-G53 Configure the CTC Alerts Dialog Box for Automatic Popup

Purpose	This task sets up the CTC Alerts dialog box to open for all alerts, for circuit deletion errors only, or never. The CTC Alerts dialog box displays network disconnection, Send-PDIP inconsistency, circuit deletion status, condition retrieval errors, and software download failure.
Tools	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Click the **CTC Alerts** toolbar icon.

Step 2 In the CTC Alerts dialog box, choose one of the following:

- All alerts—Sets the CTC Alerts dialog box to open automatically for all notifications.
- Error alerts only—Sets the CTC Alerts dialog box to open automatically for circuit deletion errors only.
- Never—Sets the CTC Alerts dialog box to never open automatically.

Step 3 Click **Close**.

Step 4 Return to your originating procedure (NTP).

Turn Up a Node

This chapter explains how to provision a single Cisco ONS 15454 dense wavelength division multiplexing (DWDM) node and turn it up for service, including node name, date and time, timing references, network attributes such as IP address and default router, users and user security, card installation, and DWDM connections.

Note Procedures in this chapter require that you have a network plan calculated for your DWDM network with Cisco MetroPlanner, Release 2.5. Cisco MetroPlanner is a DWDM planning tool that is available from your Cisco account representative. Cisco MetroPlanner prepares a shelf plan for each network node and calculates the power and attenuation levels for the DWDM cards installed in the node. For information about Cisco MetroPlanner, contact your Cisco account representative. For more information about MetroPlanner, refer to the *Cisco MetroPlanner DWDM Installation and Operations Guide, Release 2.5*.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI (ONS 15454) and ETSI (ONS 15454 SDH) shelf assemblies.

Note Procedures in the chapter must be completed at every shelf (node) at your site.

Before You Begin

This section lists the non-trouble procedures (NTPs) that you need to complete to turn up a DWDM node. Turn to a procedure for applicable detailed level procedures (DLPs).

1. NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2—Complete this procedure first.
1. NTP-G22 Verify Common Card Installation, page 3-4—Complete this procedure next.
2. NTP-G23 Create Users and Assign Security, page 3-5—Complete this procedure to create Cisco Transport Controller (CTC) users and assign their security levels.
3. NTP-G24 Set Up Name, Date, Time, and Contact Information, page 3-8—Continue with this procedure to set the node name, date, time, location, and contact information.
4. NTP-G25 Set Power Monitor Thresholds, page 3-9—Continue with this procedure to set the node battery power thresholds.

5. NTP-G26 Set Up CTC Network Access, page 3-10—Continue with this procedure to provision the IP address, default router, subnet mask, and network configuration settings.
6. NTP-G27 Set Up the ONS 15454 for Firewall Access, page 3-21—Continue with this procedure to provision the IP address, default router, subnet mask, and network configuration settings.
7. NTP-G28 Set Up SNMP, page 3-24—Complete this procedure if simple network management protocol (SNMP) will be used for network monitoring.
8. NTP-G29 Preprovision a Slot, page 3-26—Complete this procedure to preprovision the ONS 15454 slots.
9. NTP-G30 Install the DWDM Cards, page 3-27—Complete this procedure to install the DWDM cards, including the OSCM, OSC-CSM, 32WSS, OPT-BST, OPT-PRE, 32-MUX-O, 32-DMX-O, and 32DMX.
10. NTP-G31 Install the DWDM Dispersion Compensating Units, page 3-30—Complete this procedure to install a dispersion compensating unit.
11. NTP-G32 Install the Transponder and Muxponder Cards, page 3-31—Complete this procedure to install TXP and MXP cards.
12. NTP-G123 Install the Filler Cards, page 3-35—Complete this procedure to install ONS 15454 filler cards.
13. NTP-G33 Create a Y-Cable Protection Group, page 3-36—Complete this procedure, as needed, for TXP and MXP cards that will be protected with Y-cable protection.
14. NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs, page 3-39—Complete this procedure, as needed, to install the fiber-optic cables on the DWDM cards.
15. NTP-G140 Install Fiber-Optic Cables Between a Terminal, Hub, or ROADM Node and the Transponder Cards, page 3-63—Complete this procedure, as needed, to connect TXP cards to a terminal, hub, or ROADM node.
16. NTP-G141 Install Fiber-Optic Cables for Y-Cable Protection Modules, page 3-69—Complete this procedure, as needed, to connect fiber-optic cables to Y-Cable modules from TXP cards and the client signal.
17. NTP-G36 Calculate Cable Connections, page 3-70—Complete this procedure to calculate the DWDM cable connections.
18. NTP-G138 Import a Cisco MetroPlanner Configuration File, page 3-72—Complete this procedure next.
19. NTP-G37 Run Automatic Node Setup, page 3-73—Complete this procedure next.
20. NTP-G39 Verify OSCM and OSC-CSM Transmit Power, page 3-76—Complete this procedure next.

NTP-G139 Verify Cisco MetroPlanner Reports and Files

Purpose	This procedure verifies that you have the Cisco MetroPlanner reports and files needed to turn up the node.
Tools/Equipment	None
Prerequisite Procedures	Chapter 1, “Install the Shelf and Common Control Cards”
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Retrieve or higher

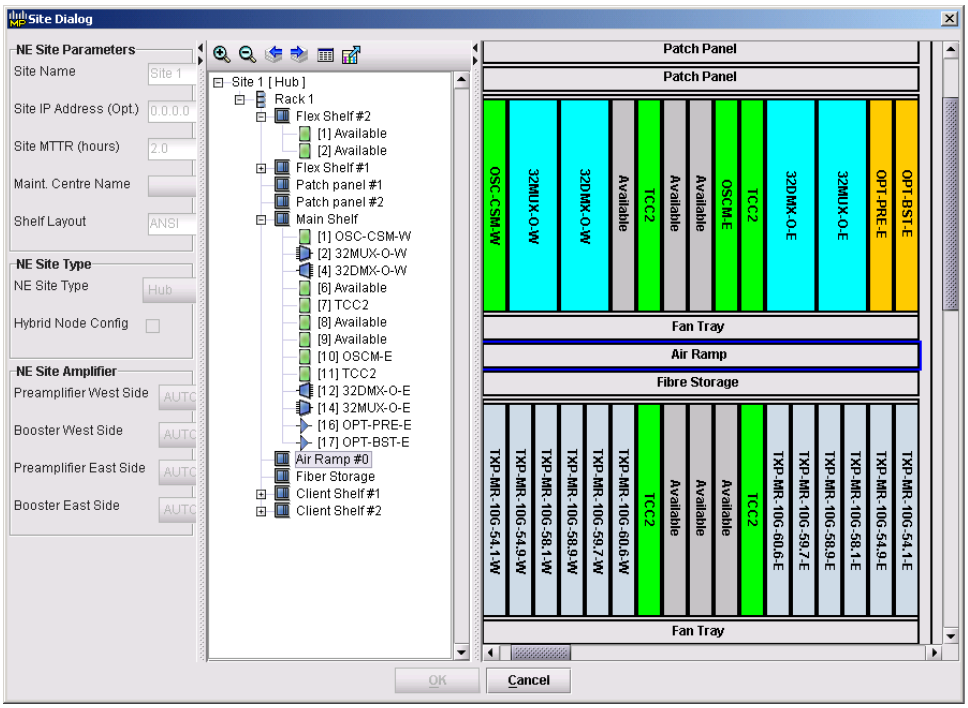
Step 1 Verify that you have the Cisco MetroPlanner reports and files shown in Table 3-1 for the node you will provision. The reports and files can be provided in one of the following options:

- If you have Cisco MetroPlanner, verify that you have the electronic network design plan from which you can generate the reports in MetroPlanner. For information about generating the reports, refer to the *Cisco MetroPlanner DWDM Operations Guide*.
- If you do not have Cisco MetroPlanner, you must have printouts of the reports listed in Table 3-1 except the Assisted Configuration Setup file. Assisted Configuration Setup is an electronic file that will be imported into CTC. You must be able to access it from the CTC computer used to provision the node.

Table 3-1 Cisco MetroPlanner Node Setup Information and Files

Source	Format	Description	Yes	No
Shelf layout	Table or JPG file	Cisco MetroPlanner provides a shelf layout (Figure 3-1) showing the cards that should be installed in each ONS 15454 slot. Cisco MetroPlanner can export this as a table, "Layout Table [site name]," or as a JPG file with a user-defined name.		
Installation Parameters	Table	Provides the target reference values for the variable optical attenuators (VOAs) and output power, optical thresholds and amplifier configuration parameters.		
Internal Connections	Table	Identifies the patch cords that must be installed within the shelf.		
Assisted Configuration Setup	TXT file	This is an electronic file with a TXT extension and a name corresponding to the node you are setting up. The file is imported into CTC where it configures the node parameters based on the network calculated by Cisco MetroPlanner.		
Traffic Matrix	Table	Shows the traffic flow within the node. During node turnup, this report is used to identify the location of Y-cable protection groups		
Cable list	Table or list	A list of cables needed to provision the node. The list can be derived from the Internal Connections table or from the Bill of Materials report prepared by Cisco MetroPlanner.		

Figure 3-1 Cisco MetroPlanner Shelf Layout



If you not do not have all the reports and files listed in Table 3-1, do not continue. See your site or network planner for the required information and files.

Step 2 Print Table 3-1 for reference. You will need information from the reports during node turnup.

Stop. You have completed this procedure.

NTP-G22 Verify Common Card Installation

Purpose	This procedure verifies that the ONS 15454 node has two TCC2/TCC2P cards installed and is ready for turn up.
Tools/Equipment	
Prerequisite Procedures	Chapter 1, "Install the Shelf and Common Control Cards"
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Retrieve or higher

Step 1 Verify that two TCC2/TCC2P cards are installed in Slots 7 and 11.

Step 2 Verify that the green ACT (active) LED is illuminated on one TCC2/TCC2P and the amber STBY (standby) LED is illuminated on the second TCC2/TCC2P.

Note If the TCC2/TCC2P cards are not installed, or if their LEDs are not operating as described, do not continue. Repeat the "DLP-G33 Install the TCC2 or TCC2P Card" task on page 1-70 or refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* to resolve installation problems before proceeding to Step 3.

Step 3 If Alarm Interface Controller-International (AIC-I) card is installed, verify that it is installed in Slot 9 and its ACT (active) LED displays a solid green light.

Step 4 Verify that the software release shown on the LCD matches the software release indicated in your site plan. If the release does not match, perform one of the following procedures:

- Perform a software upgrade using a Cisco ONS 15454 software CD. Refer to the release-specific software upgrade document.
- Replace the TCC2/TCC2P cards with cards containing the correct release.

Stop. **You have completed this procedure**.

NTP-G23 Create Users and Assign Security

Purpose	This procedure creates ONS 15454 users and assigns their security levels.
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you need to create users. If you are already logged in, continue with Step 2.

Note You must log in as a Superuser to create additional users. The CISCO15 user provided with each ONS 15454 can be used to set up other ONS 15454 users. You can add up to 500 users to one ONS 15454.

Step 2 Complete the "DLP-G54 Create a New User on a Single Node" task on page 3-6 or the "DLP-G55 Create a New User on Multiple Nodes" task on page 3-6 as needed.

Note You must add the same user name and password to each node a user will access.

Step 3 If you want to modify the security policy settings, including password aging and idle user timeout policies, complete the "NTP-G88 Modify Users and Change Security" procedure on page 10-35.

Stop. **You have completed this procedure**.

DLP-G54 Create a New User on a Single Node

Purpose	This task creates a new user for one ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > Security > Users** tabs.

Step 2 In the Users window, click **Create**.

Step 3 In the Create User dialog box, enter the following:

- Name—Type the user name. The name must be a minimum of six and a maximum of 20 alphanumeric (a-z, A-Z, 0-9) characters. For TL1 compatibility, the user name must be 6 to 10 characters.
- Password—Type the user password. The password must be a minimum of six and a maximum of 20 alphanumeric (a-z, A-Z, 0-9) and special (+, #,%) characters, where at least two characters are non alphabetic and at least one character is a special character. For TL1 compatibility, the password must be 6 to 10 characters.

Note The password must not contain the user name.

- Confirm Password—Type the password again to confirm it.
- Security Level—Choose a security level for the user: RETRIEVE, MAINTENANCE, PROVISIONING, or SUPERUSER. See the "19.1 Users and Security" section on page 19-1 for information about the capabilities provided with each level.

Note Each security level has a different idle time. The idle time is the length of time that CTC can remain idle before the password must be reentered. The defaults are: Retrieve user = unlimited, Maintenance user = 60 minutes, Provisioning user = 30 minutes, and Superuser = 15 minutes. To change the idle times, see the "NTP-G88 Modify Users and Change Security" procedure on page 10-35.

Step 4 Click **OK**.

Step 5 Return to your originating procedure (NTP).

DLP-G55 Create a New User on Multiple Nodes

Purpose	This task adds a new user to multiple ONS 15454 nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24

Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note All nodes where you want to add users must be accessible in network view.

Step 1 From the View menu, choose **Go to Network View**.

Step 2 Click the **Provisioning > Security > Users** tabs.

Step 3 In the Users window, click **Create**.

Step 4 In the Create User dialog box, enter the following:

- Name—Type the user name. The name must be a minimum of six and a maximum of 20 alphanumeric (a-z, A-Z, 0-9) characters. For TL1 compatibility, the user name must 6 to 10 characters.
- Password—Type the user password. The password must be a minimum of six and a maximum of 20 alphanumeric (a-z, A-Z, 0-9) and special (+, #, %) characters, where at least two characters are non alphabetic and at least one character is a special character. For TL1 compatibility, the password must be 6 to 10 characters. The password must not contain the user name.
- Confirm Password—Type the password again to confirm it.
- Security Level—Choose a security level for the user: RETRIEVE, MAINTENANCE, PROVISIONING, or SUPERUSER. Refer to the "19.1 Users and Security" section on page 19-1 for information about the capabilities provided with each level.

Note Each security level has a different idle time. The idle time is the length of time that CTC can remain idle before it locks up and the password must be reentered. The defaults are: Retrieve user = unlimited, Maintenance user = 60 minutes, Provisioning user = 30 minutes, and Superuser = 15 minutes. To change the idle times, refer to the "NTP-G88 Modify Users and Change Security" procedure on page 10-35.

Step 5 Under "Select applicable nodes," deselect any nodes where you do not want to add the user (all network nodes are selected by default).

Step 6 Click **OK**.

Step 7 In the User Creation Results dialog box, verify that the user was added to all the nodes chosen in Step 5. If not, click **OK** and repeat Steps 2 through 6. If the user was added to all nodes, click **OK** and continue with the next step.

Step 8 Return to your originating procedure (NTP).

NTP-G24 Set Up Name, Date, Time, and Contact Information

Purpose	This procedure provisions identification information for the node, including the node name, a contact name and phone number, the location of the node, and the date, time, and time zone.
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 for the node you will turn up. If you are already logged in, continue with Step 2.

Step 2 In node view, click the **Provisioning > General** tabs.

Step 3 Enter the following information in the fields listed:

- Node Name—Type a name for the node. For TL1 compliance, names must begin with an alpha character and have no more than 20 alphanumeric (a-z, A-Z, 0-9) characters.

  Note To avoid errors when you import the Cisco MetroPlanner configuration file in the "NTP-G138 Import a Cisco MetroPlanner Configuration File" procedure on page 3-72, the CTC node name and the MetroPlanner site name should be the same or at least easy to identify.

- Contact—Type the name of the node contact person and the phone number, up to 255 characters (optional).
- Latitude—Enter the node latitude: N (north) or S (south), degrees, and minutes (optional).
- Longitude—Enter the node longitude: E (east) or W (west), degrees, and minutes (optional).

  CTC uses the latitude and longitude to position ONS 15454 icons on the network view map. To convert a coordinate in degrees to degrees and minutes, multiply the number after the decimal by 60. For example, the latitude 38.250739 converts to 38 degrees, 15 minutes (0.250739 x 60 = 15.0443, rounded to the nearest whole number).
- Description—Type a description of the node. The description can be a maximum of 255 characters.
- Use NTP/SNTP Server—When checked, CTC uses a Network Time Protocol (NTP) or Simple Network Time Protocol (SNTP) server to set the date and time of the node.

  If you do not use an SNTP or NTP server, complete the Date and Time fields. The ONS 15454 will use these fields for alarm dates and times. By default, CTC displays all alarms in the CTC computer time zone for consistency. To change the display to the node time zone, complete the "DLP-G118 Display Alarms and Conditions Using Time Zone" task on page 8-10

  Note Using an NTP or SNTP server ensures that all ONS 15454 network nodes use the same date and time reference. The server synchronizes the node's time after power outages or software upgrades.

  If you check the Use NTP/SNTP Server check box, type the IP address of one of the following:

- An NTP/SNTP server connected to the ONS 15454
- Another ONS 15454 with NTP/SNTP enabled that is connected to the ONS 15454

If you check gateway network element (GNE) for the ONS 15454 SOCKS proxy server (see "DLP-G56 Provision IP Settings" task on page 3-11), external ONS 15454 nodes must reference the gateway ONS 15454 for NTP/SNTP timing. For more information about the ONS 15454 gateway settings, see Chapter 20, "CTC Connectivity Reference."

Caution If you reference another ONS 15454 for the NTP/SNTP server, make sure the second ONS 15454 references an NTP/SNTP server and not the first ONS 15454 (that is, do not create an NTP/SNTP timing loop by having two ONS 15454 nodes reference each other).

- Date—If Use NTP/SNTP Server is not checked, type the current date in the format m/d/yyyy, for example, September 24, 2002 is 9/24/2002.
- Time—If Use NTP/SNTP Server is not checked, type the current time in the format hh:mm:ss, for example, 11:24:58. The ONS 15454 uses a 24-hour clock, so 10:00 PM is entered as 22:00:00.
- Time Zone—Click the field and choose a city within your time zone from the drop-down list. The menu displays the 80 World Time Zones from –11 through 0 (GMT) to +14. Continental United States time zones are GMT-05:00 (Eastern), GMT-06:00 (Central), GMT-07:00 (Mountain), and GMT-08:00 (Pacific).
- Use Daylight Savings Time—Check this check box if the time zone that you chose is using Daylight Savings Time.
- Insert AIS-V on STS-1 SD-P—Not used in DWDM networks.
- SD-P BER—Not used in DWDM networks.

Step 4 Click **Apply**.

Step 5 In the confirmation dialog box, click **Yes**.

Step 6 Review the node information. If you need to make corrections, repeat Steps 3 through 5 to enter the corrections. If the information is correct, continue with the "NTP-G25 Set Power Monitor Thresholds" procedure on page 3-9.

Stop. **You have completed this procedure**.

NTP-G25 Set Power Monitor Thresholds

Purpose	This procedure provisions extreme high, extreme low, and low input battery power thresholds within a –48 volts direct current (VDC) environment. When the thresholds are crossed, the TCC2/TCC2P generates warning alarms in CTC. For ONS 15454 power specifications, see Appendix B, "Hardware Specifications."
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution The default battery power thresholds are normally not changed. Threshold changes should only be performed at the direction of your site administrator.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 for the node you will set up. If you are already logged in, continue with Step 2.

Step 2 In node view, click the **Provisioning > General > Power Monitor** tabs.

Step 3 To change the extreme low battery voltage threshold in 0.5 VDC increments, choose a voltage from the ELWBATVGVdc drop-down list.

Step 4 To change the low battery voltage threshold in 0.5 VDC increments, choose a voltage from the LWBATVGVdc drop-down list.

Step 5 To change the high battery voltage threshold in 0.5 VDC increments, choose a voltage from the HIBATVGVdc drop-down list.

Step 6 To change the extreme high battery voltage threshold in 0.5 VDC increments, choose a voltage from the EHIBATVGVdc drop-down list.

Step 7 Click **Apply**.

Stop. **You have completed this procedure**.

NTP-G26 Set Up CTC Network Access

Purpose	This procedure provisions network access for a node, including its subnet mask, default router, Dynamic Host Configuration Protocol (DHCP) server, IIOP (Internet Inter-Orb Protocol) listener port, gateway settings, static routes, Open Shortest Path First (OSPF) protocol, and Routing Information Protocol (RIP).
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the "DLP-G56 Provision IP Settings" task on page 3-11 to provision the ONS 15454 IP address, subnet mask, default router, DHCP server, IIOP listener port, and SOCKS proxy server settings.

Tip If you cannot log into the node, you can change its IP address, default router, and network mask by using the LCD on the ONS 15454 fan-tray assembly (unless LCD provisioning is suppressed). See the "DLP-G57 Set the IP Address, Default Router, and Network Mask Using the LCD" task on page 3-14 for instructions. However, you cannot use the LCD to provision any other network settings.

Step 3 If TCC2P cards are installed and you want to turn on the ONS 15454 secure mode, which allows two IP addresses to be provisioned for the node, complete the "DLP-G264 Enable Node Security Mode" task on page 3-16.

Note Secure mode is not available if TCC2 cards are installed.

Step 4 If static routes are needed, complete the "DLP-G58 Create a Static Route" task on page 3-17. For more information about static routes, see Chapter 20, "CTC Connectivity Reference."

Step 5 If the ONS 15454 is connected to a LAN or WAN that uses OSPF and you want to share routing information between the LAN/WAN and the ONS network, complete the "DLP-G59 Set Up or Change Open Shortest Path First Protocol" task on page 3-18.

Step 6 If the ONS 15454 is connected to a LAN or WAN that uses RIP, complete the "DLP-G60 Set Up or Change Routing Information Protocol" task on page 3-20.

Stop. **You have completed this procedure**.

DLP-G56 Provision IP Settings

Purpose	This task provisions IP settings, which includes the IP address, default router, DHCP access, firewall access, and SOCKS proxy server settings for an ONS 15454 node.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Caution All network changes should be approved by your network (or LAN) administrator.

Step 1 In node view, click the **Provisioning > Network > General** tabs.

Step 2 Complete the following information in the fields listed:

- IP Address—Type the IP address assigned to the ONS 15454 node.
- Suppress CTC IP Display—Check this check box if you want to prevent the node IP address from being displayed in CTC to users with Provisioning, Maintenance, or Retrieve security levels. (The IP address suppression is not applied to users with Superuser security level.)
- LCD IP Display—Choose one of the following:
  - Allow Configuration—Displays the node IP address on the LCD and allows users to change the IP settings using the LCD. This option enables the "DLP-G57 Set the IP Address, Default Router, and Network Mask Using the LCD" task on page 3-14.
  - Display Only—Displays the node IP address on the LCD but does not allow users to change the IP address using the LCD.
  - Suppress Display—Suppresses the node IP address display on the LCD.

- Default Router—If the ONS 15454 is connected to a LAN, enter the IP address of the default router. The default router forwards packets to network devices that the ONS 15454 cannot directly access. This field is ignored if any of the following are true:
  - The ONS 15454 is not connected to a LAN.
  - SOCKS proxy server is enabled and the ONS 15454 is provisioned as an ENE.
  - OSPF is enabled on both the ONS 15454 and the LAN where the ONS 15454 is connected.
- Forward DHCP Request To—Check this check box to enable DHCP. Also, enter the DHCP server IP address in the Request To field. Unchecked is the default. If you will enable any of the gateway settings to implement the ONS 15454 SOCKS proxy server features, leave this field blank.

Note If you enable DHCP, computers connected to an ONS 15454 node can obtain temporary IP addresses from an external DHCP server. The ONS 15454 only forwards DHCP requests; it does not act as a DHCP server.

- MAC Address—(Display only) Displays the ONS 15454 IEEE 802 MAC address.
- Net/Subnet Mask Length—Type the subnet mask length (decimal number representing the subnet mask length in bits) or click the arrows to adjust the subnet mask length. The subnet mask length is the same for all ONS 15454 nodes in the same subnet.
- TCC CORBA (IIOP) Listener Port—Sets the ONS 15454 IIOP (Internet Inter-Orb Protocol) listener port used for communication between the ONS 15454 and CTC computers. This field is generally not changed unless the ONS 15454 resides behind a firewall that requires a different port. See the "NTP-G27 Set Up the ONS 15454 for Firewall Access" procedure on page 3-21 for more information.
- Gateway Settings—Provisions the ONS 15454 SOCKS proxy server features. (SOCKS is a standard proxy protocol for IP-based applications.) Do not change these options until you review the "20.2.7 Scenario 7: Provisioning the ONS 15454 Proxy Server" section on page 20-12. In SOCKS proxy server networks, the ONS 15454 is either an external network element (ENE), a gateway network element (GNE), or a proxy-only server. Provisioning must be consistent for each NE type.
- Enable SOCKS proxy server on port—If checked, the ONS 15454 serves as a proxy for connections between CTC clients and ONS 15454 nodes that are connected by data communications channels (DCCs) to the proxy ONS 15454. The CTC client establishes connections to DCC-connected nodes through the proxy node. The CTC client does not require IP connectivity to the DCC-connected nodes, only to the proxy ONS 15454. If Enable SOCKS proxy server on port is off, the node does not proxy for any CTC clients. When this box is checked, you can provision one of the following options:
  - External Network Element (ENE)—Choose this option when the ONS 15454 is not connected to a LAN but has DCC connections to other ONS nodes. A CTC computer connected to the ENE through the TCC2/TCC2P TCP/IP (craft) port can manage nodes that have DCC connections to the ENE. However, the CTC computer does not have direct IP connectivity to these nodes or to any LAN/WAN that those nodes might be connected to.
  - Gateway Network Element (GNE)—Choose this option when the ONS 15454 is connected to a LAN and has DCC connections to other nodes. A CTC computer connected to the LAN can manage all nodes that have DCC connections to the GNE, but the CTC computer does not have direct IP connectivity to them. The GNE option isolates the LAN from the DCC network so that IP traffic originating from the DCC-connected nodes and any CTC computers connected to them is prevented from reaching the LAN.

– SOCKS Proxy-Only—Choose this option when the ONS 15454 is connected to a LAN and the LAN is separated from the node by a firewall. The SOCKS Proxy Only is the same as the GNE option, except the SOCKS Proxy Only option does not isolate the DCC network from the LAN.

Step 3 Click **Apply**.

Step 4 Click **Yes** in the confirmation dialog box.

Both TCC2/TCC2P cards reboot, one at a time. During this time (approximately 5 minutes), the active and standby TCC2/TCC2P card LEDs go through the cycle shown in Table 3-2. Eventually, a "Lost node connection, switching to network view" message appears.

Table 3-2 LED Behavior During TCC2/TCC2P Reboot

Reboot Activity	Active TCC2/TCC2P LEDs	Standby TCC2/TCC2P LEDs
Standby TCC2/TCC2P card updated with new network information. Memory test (1 to 2 minutes). If an AIC or AIC-I card is installed, AIC FAIL and alarm LEDs light up briefly when the AIC is updated. The standby TCC2/TCC2P becomes the active TCC2/TCC2P.	ACT/STBY: Flashing green.	1. ACT/STBY: Flashing yellow. 2. FAIL LED: Solid red. 3. All LEDs on except ACT/STBY. 4. CRIT turns off. 5. MAJ and MIN turn off. 6. REM, SYNC, and ACO turn off. 7. All LEDs (except A&B PWR) turn off (1 to 2 minutes). 8. ACT/STBY: Solid yellow. 9. Alarm LEDs: Flash once. 10. ACT/STBY: Solid green.
Memory test (1 to 2 minutes). TCC2/TCC2P updated with new network information. The active TCC2/TCC2P becomes the standby TCC2/TCC2P.	1. All LEDs: Turn off (1 to 2 minutes). CTC displays "Lost node connection, switching to network view" message. 2. FAIL LED: Solid red. 3. FAIL LED: Flashing red. 4. All LEDs on except ACT/STBY. 5. CRIT turns off. 6. MAJ and MIN turn off. 7. REM, SYNC, and ACO turn off; all LEDs are off. 8. ACT/STBY: Solid yellow. 9. ACT/STBY: Flashing yellow. 10. ACT/STBY: Solid yellow.	ACT/STBY: Solid green.

Step 5 Click **OK**. The network view appears. The node icon appears in gray, during which time you cannot access the node.

Step 6 Double-click the node icon when it becomes green.

Step 7 Return to your originating procedure (NTP).

DLP-G57 Set the IP Address, Default Router, and Network Mask Using the LCD

Purpose	This task changes the ONS 15454 IP address, default router, and network mask using the LCD on the fan-tray assembly. Use this task if you cannot log into CTC.
Tools/Equipment	None
Prerequisite Procedures	DLP-G33 Install the TCC2 or TCC2P Card, page 1-70
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note You cannot perform this task if the LCD IP Display on the node view Provisioning > Network tab is set to Display Only or Suppress Display. See the "DLP-G56 Provision IP Settings" task on page 3-11 to view or change the LCD IP Display field.

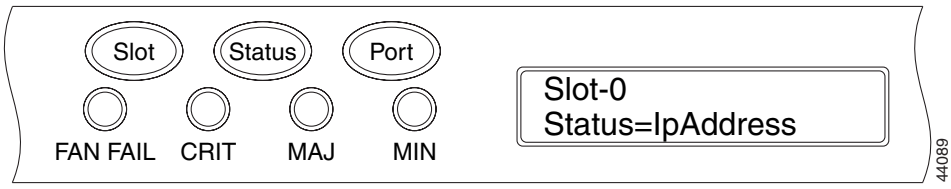
Note The LCD reverts to normal display mode after 5 seconds of button inactivity.

Step 1 On the ONS 15454 front panel, repeatedly press the **Slot** button until Node appears on the LCD.

Step 2 Repeatedly press the **Port** button until the following displays:

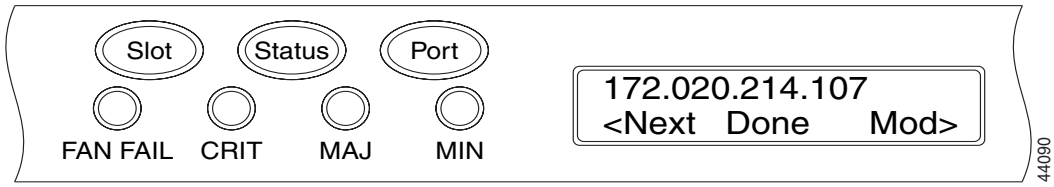
- To change the node IP address, Status=IpAddress (Figure 3-2)
- To change the node network mask, Status=Net Mask
- To change the default router IP address, Status=Default Rtr

Figure 3-2 Selecting the IP Address Option



Step 3 Press the **Status** button to display the node IP address (Figure 3-3), the node subnet mask length, or the default router IP address.

Figure 3-3 Changing the IP Address



Step 4 Push the **Slot** button to move to the IP address or subnet mask digit you need to change. The selected digit flashes.

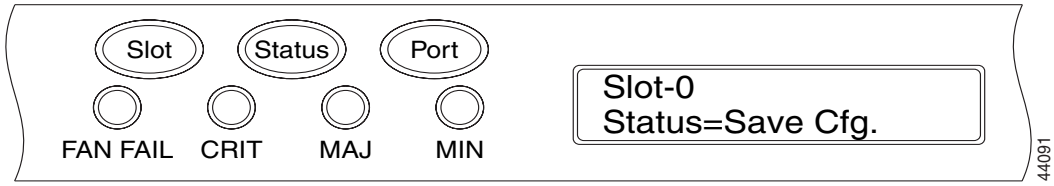
Tip The Slot, Status, and Port button positions correspond to the command position on the LCD. For example, in Figure 3-3, you press the Slot button to invoke the Next command and the Port button to invoke the Done command.

Step 5 Press the **Port** button to cycle the IP address or subnet mask to the correct digit.

Step 6 When the change is complete, press the **Status** button to return to the Node menu.

Step 7 Repeatedly press the **Port** button until the Save Configuration option appears (Figure 3-4).

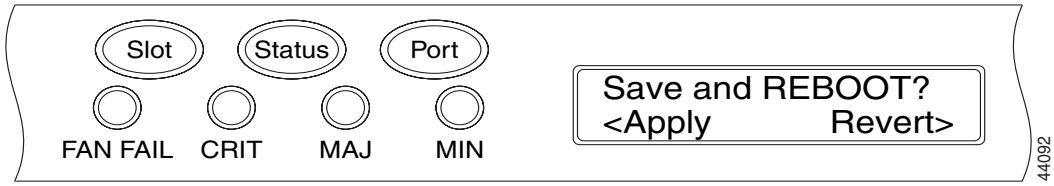
Figure 3-4 Selecting the Save Configuration Option



Step 8 Press the **Status** button to choose the Save Configuration option.

A Save and REBOOT message appears (Figure 3-5).

Figure 3-5 Saving and Rebooting the TCC2/TCC2P



Step 9 Press the **Slot** button to apply the new IP address configuration or press **Port** to cancel the configuration.

Saving the new configuration causes the TCC2/TCC2P cards to reboot. During the reboot, a "Saving Changes - TCC Reset" message displays on the LCD. The LCD returns to the normal alternating display after the TCC2/TCC2P reboot is complete.

Note The IP address and default router must be on the same subnet. If not, you cannot apply the configuration.

Step 10 Return to your originating procedure (NTP).

DLP-G264 Enable Node Security Mode

Purpose	This task enables the ONS 15454 security mode. When security mode is enabled, two IP addresses are assigned to the node. One address is assigned to the backplane LAN port and the other to the TCC2P RJ-45 TCP/IP (LAN) port.
Tools/Equipment	TCC2P cards must be installed.
Prerequisite Procedures	NTP-G103 Back Up the Database, page 12-2 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note This task requires TCC2P cards. The security mode options described in this task will not appear in CTC if TCC2 cards are installed.

Caution The IP address assigned to the TCC2P LAN port must reside on a different subnet from the backplane LAN port and the ONS 15454 default router. Verify that the new TCC2P IP address meets this requirement and is compatible with ONE 15454 network IP addresses.

Note The node will reboot after you complete this task, causing a temporary disconnection between the CTC computer and the node.

Step 1 Click the **Provisioning > Security > Data Comm** tabs.

Step 2 Click **Change Mode**.

Step 3 Review the information on the Change Secure Mode wizard page, then click **Next**.

Step 4 On the TCC Ethernet Port page, enter the IP address and subnet mask for the TCC2P LAN (TCP/IP) port. The IP address cannot reside on the same subnet as the backplane LAN port, nor the ONS 15454 default router.

Step 5 Click **Next**.

Step 6 On the Backplane Ethernet Port page, modify the backplane IP address, subnet mask, and default router, if needed. (You normally do not modify these fields if no ONS 15454 network changes have occurred.)

Step 7 Click **Next**.

Step 8 On the SOCKS Proxy Server Settings page, choose one of the following options:

- External Network Element (ENE)—If selected, the CTC computer is only visible to the ONS 15454 to which the CTC computer is connected. The computer is not visible to the DCC-connected nodes. In addition, firewall is enabled, which means that the node prevents IP traffic from being routed between the DCC and the LAN port.
- Gateway Network Element (GNE)—If selected, the CTC computer is visible to other DCC-connected nodes. The node prevents IP traffic from being routed between the DCC and the LAN port.

Note The SOCKS proxy server is automatically enabled when you enable secure mode.

Step 9 Click **Finish**.

Within the next 30-40 seconds, the TCC2Ps reboot. CTC switches to network view, and the CTC Alerts dialog box appears. In network view, the node changes to grey and a DISCONNECTED condition appears.

Step 10 On the CTC Alerts dialog box, click **Close**. Wait for the reboot to finish. (This may take several minutes.)

Step 11 After the DISCONNECTED condition clears, complete the following steps to suppress the backplane IP address from display in CTC and the LCD. If you do not want to suppress the backplane IP address display, continue with Step 12

a. Display the node in node view.

b. Click the **Provisioning > Security > Data Comm** tabs.

c. On the LCD IP Setting field, choose **Suppress Display**. This removes the IP address from display on the ONS 15454 LCD.

d. Check the **Suppress CTC IP Address** check box. This removes the IP address from display in the CTC information area and from the Provisioning > Security > Data Comm tab.

e. Click **Apply**.

Note After you turn on secure mode, the TCC2P IP address becomes the node IP address.

Step 12 Return to your originating procedure (NTP).

DLP-G58 Create a Static Route

Purpose This task creates a static route to establish CTC connectivity to a computer on another network. This task is performed when:

- CTC computers on one subnet need to connect to ONS 15454 nodes that are connected by a router to ONS 15454 nodes residing on another subnet. OSPF is not enabled and the External Network Element gateway setting is not checked.
- You need to enable multiple CTC sessions among ONS 15454 nodes residing on the same subnet and the External Network Element gateway setting is not enabled.

Tools/Equipment None

Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed.
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Network** tabs.

Step 2 Click the **Static Routing** tab. Click **Create**.

Step 3 In the Create Static Route dialog box, enter the following:

- Destination—Enter the IP address of the computer running CTC. To limit access to one computer, enter the full IP address and a subnet mask of 255.255.255.255. To allow access to all computers on the 192.168.1.0 subnet, enter 192.168.1.0 and a subnet mask of 255.255.255.0. You can enter a destination of 0.0.0.0 to allow access to all CTC computers that connect to the router.
- Mask—Enter a subnet mask. If the destination is a host route (that is, one CTC computer), enter a 32-bit subnet mask (255.255.255.255). If the destination is a subnet, adjust the subnet mask accordingly, for example, 255.255.255.0. If the destination is 0.0.0.0, CTC automatically enters a subnet mask of 0.0.0.0 to provide access to all CTC computers. You cannot change this value.
- Next Hop—Enter the IP address of the router port or the node IP address if the CTC computer is connected to the node directly.
- Cost—Enter the number of hops between the ONS 15454 and the computer.

Step 4 Click **OK**. Verify that the static route appears in the Static Route window.

Note Static route networking examples are provided in Chapter 20, "CTC Connectivity Reference."

Step 5 Return to your originating procedure (NTP).

DLP-G59 Set Up or Change Open Shortest Path First Protocol

Purpose	This task enables the Open Shortest Path First (OSPF) routing protocol on the ONS 15454. Perform this task if you want to include the ONS 15454 in OSPF-enabled networks.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 You will need the OSPF Area ID, Hello and Dead intervals, and authentication key (if OSPF authentication is enabled) provisioned on the router to which the ONS 15454 is connected.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Network > OSPF** tabs.

Step 2 On the top left side of the OSPF pane, complete the following:

- DCC/GCC OSPF Area ID Table—In dotted decimal format, enter the number that identifies the ONS 15454 nodes as a unique OSPF area ID. The Area ID can be any number between 000.000.000.000 and 255.255.255.255, but must be unique to the LAN OSPF area.
- SDCC Metric—This value is normally unchanged. It sets a cost for sending packets across the Section DCC, which is used by OSPF routers to calculate the shortest path. This value should always be higher than the LAN metric. The default SDCC metric is 100.
- LDCC Metric—Sets a cost for sending packets across the Line DCC. This value should always be lower than the SDCC metric. The default LDCC metric is 33. It is usually not changed.

Step 3 In the OSPF on LAN area, complete the following:

- OSPF active on LAN—When checked, enables the ONS 15454 OSPF topology to be advertised to OSPF routers on the LAN. Enable this field on ONS 15454 nodes that directly connect to OSPF routers.
- LAN Port Area ID—Enter the OSPF area ID (dotted decimal format) for the router port where the ONS 15454 is connected. (This number is different from the DCC/GCC OSPF Area ID.)

Step 4 By default, OSPF is set to No Authentication. If the OSPF router requires authentication, complete the following steps. If not, continue with Step 5.

a. Click the **No Authentication** button.

b. In the Edit Authentication Key dialog box, complete the following:

- Type—Choose **Simple Password**.
- Enter Authentication Key—Enter the password.
- Confirm Authentication Key—Enter the same password to confirm it.

c. Click **OK**.

The authentication button label changes to Simple Password.

Step 5 Provision the OSPF priority and interval settings.

The OSPF priority and interval defaults are the defaults most commonly used by OSPF routers. Verify that these defaults match the ones used by the OSPF router where the ONS 15454 is connected.

- Router Priority—Selects the designated router for a subnet.
- Hello Interval (sec)—Sets the number of seconds between OSPF hello packet advertisements sent by OSPF routers. Ten seconds is the default.
- Dead Interval—Sets the number of seconds that will pass while an OSPF router's packets are not visible before its neighbors declare the router down. Forty seconds is the default.
- Transit Delay (sec)—Indicates the service speed. One second is the default.
- Retransmit Interval (sec)—Sets the time that will elapse before a packet is resent. Five seconds is the default.
- LAN Metric—Sets a cost for sending packets across the LAN. This value should always be lower than the SDCC metric. Ten is the default.

Step 6 Under OSPF Area Range Table, create an area range table if one is needed:

Note Area range tables consolidate the information that is outside an OSPF area border. One ONS 15454 in the ONS 15454 OSPF area is connected to the OSPF router. An area range table on this node points the router to the other nodes that reside within the ONS 15454 OSPF area.

a. Under OSPF Area Range Table, click **Create**.

b. In the Create Area Range dialog box, enter the following:

- Range Address—Enter the area IP address for the ONS 15454 nodes that reside within the OSPF area. For example, if the ONS 15454 OSPF area includes nodes with IP addresses 10.10.20.100, 10.10.30.150, 10.10.40.200, and 10.10.50.250, the range address would be 10.10.0.0.
- Range Area ID—Enter the OSPF area ID for the ONS 15454 nodes. This is either the ID in the DCC OSPF Area ID field or the ID in the Area ID for LAN Port field.
- Mask Length—Enter the subnet mask length. In the Range Address example, this is 16.
- Advertise—Check if you want to advertise the OSPF range table.

c. Click **OK**.

Step 7 All OSPF areas must be connected to Area 0. If the ONS 15454 OSPF area is not physically connected to Area 0, use the following steps to create a virtual link table that will provide the disconnected area with a logical path to Area 0:

a. Under OSPF Virtual Link Table, click **Create**.

b. In the Create Virtual Link dialog box, complete the following fields. OSPF settings must match OSPF settings for the ONS 15454 OSPF area:

- Neighbor—The router ID of the Area 0 router.
- Transit Delay (sec)—The service speed. One second is the default.
- Hello Int (sec)—The number of seconds between OSPF hello packet advertisements sent by OSPF routers. Ten seconds is the default.
- Auth Type—If the router where the ONS 15454 is connected uses authentication, choose **Simple Password**. Otherwise, choose **No Authentication**.
- Retransmit Int (sec)—Sets the time that will elapse before a packet is resent. Five seconds is the default.
- Dead Int (sec)—Sets the number of seconds that will pass while an OSPF router's packets are not visible before its neighbors declare the router down. Forty seconds is the default.

c. Click **OK**.

Step 8 After entering ONS 15454 OSPF area data, click **Apply**.

If you changed the Area ID, the TCC2/TCC2P cards reset, one at a time. The reset takes approximately 10 to 15 minutes. Table 3-2 on page 3-13 shows the LED behavior during the TCC2/TCC2P reset.

Step 9 Return to your originating procedure (NTP).

DLP-G60 Set Up or Change Routing Information Protocol

Purpose	This task enables Routing Information Protocol (RIP) on the ONS 15454. Perform this task if you want to include the ONS 15454 in RIP-enabled networks.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 You need to create a static route to the router adjacent to the ONS 15454 for the ONS 15454 to communicate its routing information to non-DCC-connected nodes.

Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Network > RIP** tabs.

Step 2 Check the **RIP Active** check box if you are activating RIP.

Step 3 Choose either RIP Version 1 or RIP Version 2 from the drop-down list, depending on which version is supported in your network.

Step 4 Set the RIP metric. The RIP metric can be set to a number between 1 and 15 and represents the number of hops.

Step 5 By default, RIP is set to No Authentication. If the router that the ONS 15454 is connected to requires authentication, complete the following steps. If not, continue with Step 6.

a. Click the **No Authentication** button.

b. In the Edit Authentication Key dialog box, complete the following:

- Type—Choose **Simple Password**.
- Enter Authentication Key—Enter the password.
- Confirm Authentication Key—Enter the same password to confirm it.

c. Click **OK**.

The authentication button label changes to Simple Password.

Step 6 If you want to complete an address summary, complete the following steps. If not, continue with Step 7. Complete the address summary only if the ONS 15454 is a gateway NE with multiple external ONS 15454 NEs attached with IP addresses in different subnets.

a. In the RIP Address Summary area, click **Create**.

b. In the Create Address Summary dialog box, complete the following:

- Summary Address—Enter the summary IP address.
- Mask Length—Enter the subnet mask length using the up and down arrows.
- Hops—Enter the number of hops. The smaller the number of hops, the higher the priority.

c. Click **OK.**

Step 7 Return to your originating procedure (NTP).

NTP-G27 Set Up the ONS 15454 for Firewall Access

Purpose	This procedure provisions ONS 15454 nodes and CTC computers for access through firewalls.
Tools/Equipment	IIOP listener port number provided by your LAN or firewall administrator
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4
Required/As Needed	As needed

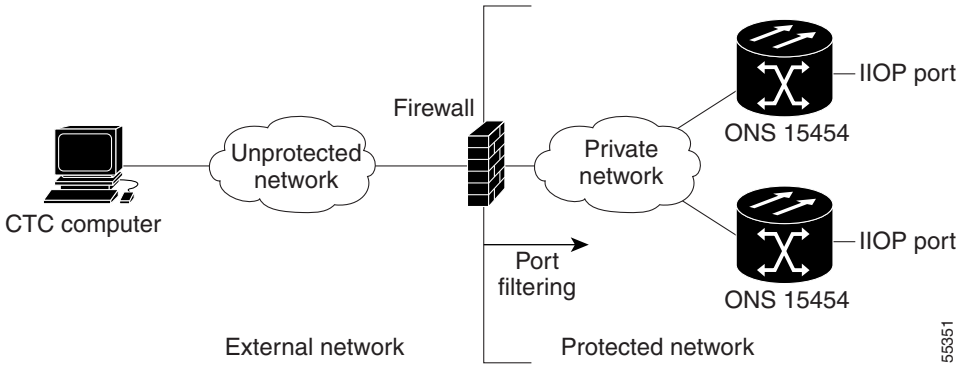
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node that is behind the firewall. See the "DLP-G46 Log into CTC" task on page 2-24 for instructions. If you are already logged in, continue with Step 2.

Step 2 Complete the "DLP-G61 Provision the IIOP Listener Port on the ONS 15454" task on page 3-23.

Figure 3-6 shows ONS 15454 nodes in a protected network and the CTC computer in an external network. For the computer to access the ONS 15454 nodes, you must provision the IIOP listener port specified by your firewall administrator on the ONS 15454.

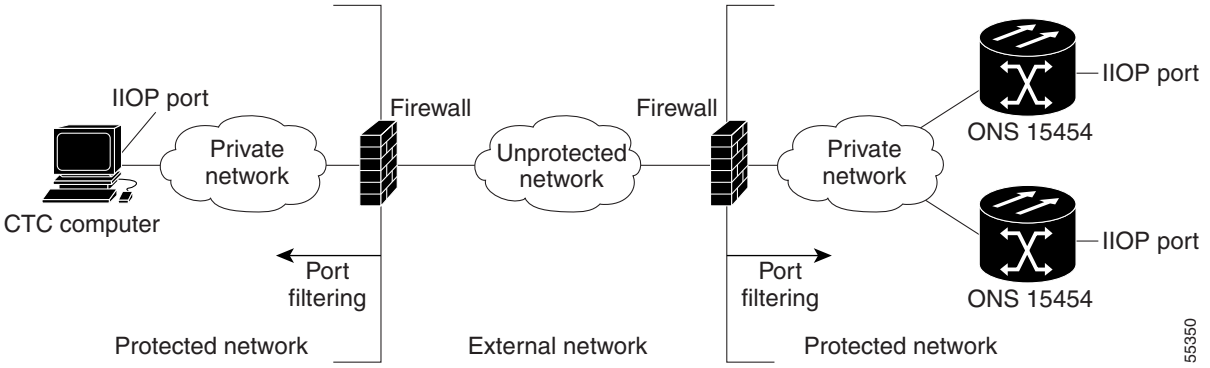
Figure 3-6 Nodes Behind a Firewall



Step 3 If the CTC computer resides behind a firewall, complete the "DLP-G62 Provision the IIOP Listener Port on the CTC Computer" task on page 3-23.

Figure 3-7 shows a CTC computer and ONS 15454 behind firewalls. For the computer to access the ONS 15454, you must provision the IIOP port on the CTC computer and on the ONS 15454.

Figure 3-7 CTC Computer and ONS 15454 nodes Residing Behind Firewalls



Stop. You have completed this procedure.

DLP-G61 Provision the IIOP Listener Port on the ONS 15454

Purpose	This task sets the IIOP listener port on the ONS 15454, which enables you to access ONS 15454 nodes that reside behind a firewall.
Tools/Equipment	IIOP listener port number provided by your LAN or firewall administrator
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note If the Enable SOCKS proxy server on port 1080 check box is checked, CTC will use port 1080 and ignore the configured IIOP port setting. If Enable SOCKS proxy server is subsequently unchecked, the configured IIOP listener port will be used.

Step 1 In node view, click the **Provisioning > Network > General** tabs.

Step 2 In the TCC CORBA (IIOP) Listener Port area, choose a listener port option:

- Default - TCC Fixed—Uses Port 57790 to connect to ONS 15454 nodes on the same side of the firewall or if no firewall is used (default). This option can be used for access through a firewall if Port 57790 is open.
- Standard Constant—Uses Port 683, the CORBA default port number.
- Other Constant—If Port 683 is not used, type the IIOP port specified by your firewall administrator.

Step 3 Click **Apply**.

Step 4 When the Change Network Configuration message appears, click **Yes**.

Both ONS 15454 TCC2/TCC2P cards reboot, one at a time. The reboot takes approximately 15 minutes.

Step 5 Return to your originating procedure (NTP).

DLP-G62 Provision the IIOP Listener Port on the CTC Computer

Purpose	This task selects the IIOP listener port on CTC and must be completed if the computer running CTC resides behind a firewall.
Tools/Equipment	IIOP listener port number from LAN or firewall administrator.
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed.
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the Edit menu, choose **Preferences**.

Step 2 In the Preferences dialog box, click the **Firewall** tab.

Step 3 In the CTC CORBA (IIOP) Listener Port area, choose a listener port option:

- Default - Variable—Use to connect to ONS 15454 nodes from within a firewall or if no firewall is used (default).
- Standard Constant—Use Port 683, the CORBA default port number.
- Other Constant—If Port 683 is not used, enter the IIOP port defined by your administrator.

Step 4 Click **Apply**. A warning appears telling you that the port change will apply during the next CTC login.

Step 5 Click **OK**.

Step 6 In the Preferences dialog box, click **OK**.

Step 7 To access the ONS 15454 using the IIOP port, log out of CTC then log back in. (To log out, choose **Exit from the File menu**).

Step 8 Return to your originating procedure (NTP).

NTP-G28 Set Up SNMP

Purpose	This procedure provisions the SNMP parameters so that you can use SNMP management software with the ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4
Required/As Needed	Required if SNMP is used at your installation.
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to set up SNMP. If you are already logged in, continue with Step 2.

Step 2 In node view, click the **Provisioning > SNMP** tabs.

Step 3 In the Trap Destinations area, click **Create**.

Step 4 Complete the following in the Create SNMP Trap Destination dialog box (Figure 3-8):

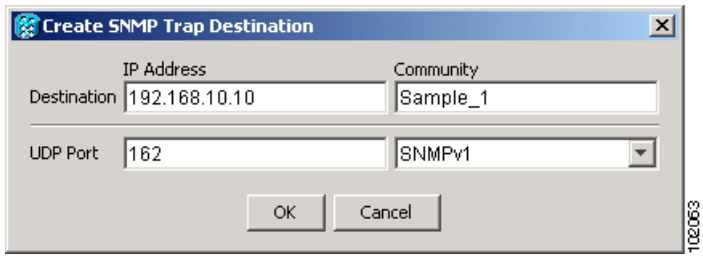
- Destination IP Address—Type the IP address of your network management system. If the node you are logged into is an ENE, set the destination address to the GNE.
- Community—Type the SNMP community name. For a description of SNMP community names, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note The community name is a form of authentication and access control. The community name assigned to the ONS 15454 is case-sensitive and must match the community name of the network management system (NMS).

- UDP Port—The default User Datagram Protocol (UDP) port for SNMP is 162. If the node is an ENE in a SOCKS proxy server network, the UDP port must be set to the GNE's SNMP relay port, which is 391.

- Trap Version—Choose either SNMPv1 or SNMPv2. Refer to your NMS documentation to determine whether to use SNMP v1 or v2.

Figure 3-8 Creating an SNMP Trap



Step 5 Click **OK**. The node IP address of the node where you provisioned the new trap destination appears in the Trap Destinations area.

Step 6 Click the node IP address in the Trap Destinations area. Verify the SNMP information that appears in the Selected Destination list.

Step 7 If you want the SNMP agent to accept SNMP SET requests on certain MIBs, click the **Allow SNMP Sets** check box. If this box is not checked, SET requests are rejected.

Step 8 If you want to set up the SNMP proxy feature to allow network management, message reporting, and performance statistic retrieval across ONS firewalls, click the **Enable SNMP Proxy** check box located on the SNMP tab.

Note The ONS firewall proxy feature only operates on nodes running Software Release 4.6 or later. Using this feature effectively breaches the ONS firewall to exchange management information.

For more information about the SNMP proxy feature, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 9 Click **Apply**.

Step 10 If you are setting up SNMP proxies, for each trap destination address you can set up to three relays that send SNMP trap error counts back to NE:

a. Click the first trap destination IP address. The address and its community name appear in the Destination fields.

b. Enter up to three SNMP Proxy relay addresses and community names in the fields for Relay A, Relay B, and Relay C.

Note The community names specified for each relay node must match one of the provisioned SNMP community names in the NE.

Note The SNMP proxy directs SNMP traps from this node through IpA to IpB to IpC to the trap destination. Ensure that you enter the IP addresses in the correct order so that this sequence runs correctly.

Step 11 Click **Apply**.

Stop. You have completed this procedure.

NTP-G29 Preprovision a Slot

Purpose	This procedure preprovisions the ONS 15454 slots in CTC based upon the Cisco MetroPlanner shelf layout prepared for your site. Preprovisioning the slots ensures that the physical cards are installed in the slots anticipated by the parameters contained in the Cisco MetroPlanner Assisted Configuration Setup that will be imported into CTC.
Tools/Equipment	Cisco MetroPlanner shelf layout or JPG file.
Prerequisite Procedures	Chapter 2, "Connect the PC and Log into the GUI" NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you will preprovision the slots. If you are already logged in, continue with Step 2.

Step 2 In CTC node view, right-click an empty slot where you will install a card.

Step 3 From the Add Card popup menu, choose the card type that will be installed based on the Cisco MetroPlanner shelf layout (see Table 3-1 on page 3-3). Only cards that can be installed in the slot appear in the Add Card popup menu. The 32WSS, 32-MUX-O and 32-DMX-O require two vacant slots, or they will not appear in the menu. Table 3-3 shows the Add Card menu and cards.

Table 3-3 CTC Add Card Menu for DWDM Cards

Category	Option	Card
nXP	MXPP_MR_10E	MXPP_MR_10E
	MXP_MR_10E	MXP_MR_10E
	MXP_MR_10G	MXP_MR_10G
	MXP_MR_2.5G	MXP_MR_2.5G
	TXPP_MR_2.5G	TXPP_MR_2.5G
	TXP_MR_10E	TXP_MR_10E
	TXP_MR_10G	TXP_MR_10G
	TXP_MR_2.5G	TXP_MR_2,5G
MD	32 DMX	32DMX
	32 DMXO	32 DMX-O
	32 MUXO	32 MUX-O
	32 WSS	32WSS
	4MD	4MD-xx.x

Table 3-3 CTC Add Card Menu for DWDM Cards (continued)

Category	Option	Card
OADM	OADM 1 band	AD-1B-xx.x
	OADM 1 Channel	AD-1C-xx.x
	OADM 2 Channels	AD-2C-xx.x
	OADM 4 Bands	AD-4B-xx.x
	OADM 4 Channels	AD-4C-xx.x
Ampli	Optical booster	OPT-BST
	Optical booster ENH	OPT-BST-E
	Optical preamplifier	OPT-PRE
OSC + Combiner/Separator		OSC-CSM

Note When you preprovision a slot, the card appears purple in the CTC shelf graphic, rather than white when a card is installed in the slot. NP (not present) on the card graphic indicates that the card is not physically installed.

Step 4 Repeat Step 3 until all the cards shown in the Cisco MetroPlanner shelf layout are provisioned in CTC.

Stop. **You have completed this procedure**.

NTP-G30 Install the DWDM Cards

Purpose This procedure describes how to install DWDM cards (OPT-PRE, OPT-BST, 32MUX-O, 32DMX-O, 32DMX, 32WSS, 4MD-xx.x, AD-1C-xx.x, AD-2C-xx.x, AD-4C-xx.x, AD-1B-xx.x, AD-4B-xx.x, OSCM, and OSC-CSM).

Tools/Equipment
- Cisco MetroPlanner shelf layout
- The following cards, as required by your site plan: OPT-PRE, OPT-BST, 32MUX-O, 32DMX-O, 32DMX, 32WSS, 4MD-xx.x, AD-1C-xx.x, AD-2C-xx.x, AD-4C-xx.x, AD-1B-xx.x, AD-4B-xx.x, OSCM, or OSC-CSM cards (as applicable)
- The ONS 15454 NE defaults file if the node will use custom NE defaults.

Prerequisite Procedures NTP-G15 Install the Common Control Cards, page 1-69

NTP-G14 Install DWDM Equipment, page 1-64

NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2

Required/As Needed As needed

Onsite/Remote Onsite

Security Level Provisioning or higher

Warning **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

Warning **Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.**

Warning **Class I (CDRH) and Class 1M (IEC) laser products.** Statement 1055

Warning **Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.** Statement 1056

Caution Always use the supplied ESD wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

Note If protective clips are installed on the backplane connectors of the cards, remove the clips before installing the cards.

Note If you install a card incorrectly, the FAIL LED flashes continuously.

Step 1 If the node requires a custom network element (NE) defaults settings to be installed on the node, complete the "NTP-G136 Import Network Element Defaults" procedure on page 12-39. If not, continue with Step 2.

Caution Custom NE defaults, if required, must be installed before you install the DWDM cards.

Step 2 Display the Cisco MetroPlanner shelf layout (see Table 3-1 on page 3-3).

Step 3 Remove the DWDM card from its packaging, then remove the protective caps from the backplane connectors.

Step 4 Open the card latches/ejectors.

Step 5 Use the latches/ejectors to firmly slide the card along the slot guide rails until the card plugs into the receptacle at the back of the slot.

Step 6 Verify that the card is inserted correctly and close the latches/ejectors on the card.

Note It is possible to close the latches/ejectors when the card is not completely plugged into the backplane. Ensure that you cannot insert the card any further.

The following LED activity will occur:

- The FAIL LED turns on for approximately 35 seconds. During this time, the ACT LED will cycle through various states, and then extinguish.
- The FAIL LED blinks for approximately 40 seconds.
- All LEDs turn on and then turn off within 5 seconds.
- If new software is being downloaded to the card, the ACT and SF LEDs blink for 20 seconds to 3 to 5 minutes, depending on the card type.
- The ACT LED turns on.
- The signal fail (SF) LED might persist until all card ports connect to their far-end counterparts and a signal is present.

Step 7 If the card does not boot up properly, or the LED activity does not mirror the activity in Step 6, check the following:

- When a physical card type does not match the type of card provisioned for that slot in CTC, the card might not boot. If a DWDM card does not boot, open CTC and ensure that the slot is not provisioned for a different card type before assuming that the card is faulty.
- If the red FAIL LED does not turn on, check the power.
- If you insert a card into a slot provisioned for a different card, all LEDs turn off.
- If the red FAIL LED is on continuously or the LEDs behave erratically, the card is not installed. Remove the card and repeat Steps 3 to 6. If the card does not boot up properly the second time, it may be defective. Contact your next level of support.

Note The DWDM node type is determined by the cards that are installed. For example, if two 32DMX-O and two 32MUX-O cards are installed but no AD-xC or AD-xB cards are installed, CTC considers the node a hub node. However, if one 32DMX-O and one 32MUX-O card are installed with no AD-xC or AD-xB cards, CTC considers the node a terminal node. For more information, refer to Chapter 15, "Card Reference."

Step 8 Repeat Steps 3 through 7 until all the DWDM cards are installed in the node.

Step 9 If OPT-PRE cards are installed, complete one of the following steps for each OPT-PRE card based upon the Cisco MetroPlanner shelf layout. If OPT-PRE cards are not installed, you have completed this procedure.

- If the Cisco MetroPlanner shelf layout does not include DCUs, install a 4-dB attenuator with a tolerance of +/– 1 dB between the OPT-PRE DC TX and RX ports for each OPT-PRE installed in the shelf.
- If the shelf layout includes DCUs, complete the "NTP-G31 Install the DWDM Dispersion Compensating Units" procedure on page 3-30 for each side of the shelf that requires a DCU.

Stop. You have completed this procedure.

NTP-G31 Install the DWDM Dispersion Compensating Units

Purpose	This procedure describes how to install the dispersion compensating units (DCU-xx.x) for DWDM shelves.
Tools/Equipment	DCU-xx.x cards
Prerequisite Procedures	NTP-G15 Install the Common Control Cards, page 1-69 NTP-G14 Install DWDM Equipment, page 1-64 NTP-G30 Install the DWDM Cards, page 3-27 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Warning **Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.**

Warning **Class I (CDRH) and Class 1M (IEC) laser products.** Statement 1055

Warning **Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.** Statement 1056

Caution Always use the supplied ESD wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

Note If protective clips are installed on the backplane connectors of the DCUs, remove the clips before installing the units.

Step 1 Pull the DCU latch inward with your finger.

Step 2 Firmly slide the DCU along the guide rails until the card plugs into the receptacle at the back of the horizontal dispersion compensating card slot at the top of the shelf.

Note The west DCU is commonly installed on the left side and the east DCU is commonly installed on the right side.

Note Double check the placement of the DCU(s) with your Cisco MetroPlanner shelf layout. If you install the wrong DCU in a slot, remove the DCU and install the correct one.

Step 3 Release the finger latch.

Note It is possible to close the latch when the DCU is not completely plugged into the backplane. Ensure that you cannot insert the DCU any further.

Step 4 Verify that the DCU is engaged with the backplane by grasping and gently pulling the card handle. If the card does not move, it is fully installed. If it moves, repeat Steps 2 and 3.

Stop. You have completed this procedure.

NTP-G32 Install the Transponder and Muxponder Cards

Purpose	This procedure describes how to install the ONS 15454 transponder (TXP) and muxponder (MXP) cards.
Tools/Equipment	TXP_MR_10G, TXP_MR_10E, TXP_MR_2.5G, TXPP_MR_2.5G, MXP_2.5G_10G, MXP_2.5G_10E, MXP_MR_2.5G, and MXPP_MR_2.5G cards (as applicable)
Prerequisite Procedures	NTP-G15 Install the Common Control Cards, page 1-69 NTP-G14 Install DWDM Equipment, page 1-64 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Warning **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

Warning **Class 1 laser product.** Statement 1008

Warning **Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.**

Warning **Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.** Statement 1056

Caution Always use the supplied ESD wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

Note If protective clips are installed on the backplane connectors of the cards, remove the clips before installing the cards.

Note If you install a card incorrectly, the FAIL LED flashes continuously.

Step 1 Display Cisco MetroPlanner shelf layout (see Table 3-1 on page 3-3) for the node where you will install the TXP and MXP cards.

Step 2 Remove the TXP or MXP card from its packaging, then remove the protective clips from the backplane connectors.

Step 3 Open the card latches/ejectors.

Step 4 Use the latches/ejectors to firmly slide the TXP or MXP card along the guide rails until the card plugs into the receptacle at the back of the slot designated by the Cisco MetroPlanner shelf layout.

Step 5 Verify that the card is inserted correctly and close the latches/ejectors on the card.

Note It is possible to close the latches and ejectors when the card is not completely plugged into the backplane. Ensure that you cannot insert the card any further.

The following LED activity will occur:

- The red FAIL LED turns on for approximately 30 seconds. During this time, the ACT LED will cycle through various states, and then extinguish.
- The red FAIL LED blinks for approximately 45 seconds.
- All LEDs blink once and turn off for approximately 10 seconds while the ACT and SF LEDs cycle through various stages.
- The ACT or ACT/STBY LED turns on. The SF LED might persist until all card ports connect to their far-end counterparts and a signal is present.

Step 6 If the card does not boot up properly, or the LED activity does not mirror Step 5, check the following:

- When a physical card type does not match the type of card provisioned for that slot in CTC, the card might not boot. If a TXP or MXP card does not boot, open CTC and ensure that the slot is not provisioned for a different card type before assuming that the card is faulty.
- If the red FAIL LED does not turn on, check the power.
- If you insert a card into a slot provisioned for a different card, all LEDs turn off.
- If the red FAIL LED is on continuously or the LEDs behave erratically, the card is not installed properly. Remove the card and repeat Steps 3 to 5.

Step 7 If the TXP or MXP requires a small-form pluggable (SFP or XFP) connector, complete one of the following tasks:

- DLP-G63 Install an SFP or XFP, page 3-34—complete this task to install the physical SFP or XFP into the TXP or MXP.

- DLP-G273 Preprovision an SFP or XFP Slot, page 3-33—(optional) complete this task if you do not have the physical SFP or XFP and wish to preprovision the SFP or XFP slot. If you preprovision a multirate SFP or XFP, complete the "DLP-G278 Provision the Optical Line Rate" task on page 5-3.

Note Provisionable port modules (PPMs) determine how the SFPs and XFPs are used in CTC. PPM provisioning procedures are provided in Chapter 5, "Provision Transponder and Muxponder Cards."

Step 8 If you need to remove an SFP or XFP, complete the "DLP-G64 Remove an SFP or XFP" task on page 3-34.

Note You will provision the TXP and MXP cards after you complete all node turnup procedures. TXP and MXP provisioning procedures are provided in Chapter 5, "Provision Transponder and Muxponder Cards."

Stop. You have completed this procedure.

DLP-G273 Preprovision an SFP or XFP Slot

Purpose	This procedure provisions small form-factor pluggables (SFP/XFPs), which connect fiber to TXP and MXP cards. SFP/XFPs are referred to as pluggable port modules (PPMs) in CTC.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP or MXP card where you want to provision PPM settings.

Step 2 Click the **Provisioning > Pluggable Port Modules** tabs.

Step 3 In the Pluggable Port Modules pane, click **Create**. The Create PPM dialog box appears.

Step 4 In the Create PPM dialog box, complete the following:

- PPM—Choose the slot number where the SFP/XFP is installed from the drop-down list.
- PPM Type—Choose the number of ports supported by your SFP/XFP from the drop-down list. The drop-down list displays the number of PPMs that are available for provisioning. If only one port is supported, **PPM (1 port)** is the only menu option.

Step 5 Click **OK**. The newly created port appears on the Pluggable Port Modules pane. The row on the Pluggable Port Modules pane turns light blue. The Actual Equipment Type column remains blank until the actual SFP/XFP is installed. After the SFP/XFP is installed, the row on the pane turns white and the Actual Equipment Type column shows the equipment name.

Step 6 Verify that the PPM appears in the list on the Pluggable Port Modules pane. If it does not, repeat Steps 3 through 5.

Step 7 Repeat the task to provision a second PPM, if needed. If not, continue with Step 8.

Step 8 Return to your originating procedure (NTP).

DLP-G63 Install an SFP or XFP

Purpose	This task installs SFPs or XFPs into TXP and MXP cards. SFP/XFPs provide a fiber interface to the card.
Tools/Equipment	None
Prerequisite Procedures	NTP-G32 Install the Transponder and Muxponder Cards, page 3-31 DLP-G273 Preprovision an SFP or XFP Slot, page 3-33
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Note SFPs and XFPs are generically called PPMs (Pluggable-Port Modules) in CTC. After installing the SFP or XFP, multirate PPMs (PPMs that provide OC-3 or OC-12 line rates) must be provisioned in CTC. See the "DLP-G277 Provision a Multirate PPM" task on page 5-3.

Step 1 Verify that the SFP is correct for your network and TXP or MXP card (see Table 15-69 on page 15-118). Check that you are installing compatible SFPs, for example, SX to SX or LX/LH to LX/LH.

Step 2 Install the SFP:

- For a mylar tab SFP/XFP: slide the SFP/XFP into the slot.
- For an actuator/button SFP/XFP: slide the SFP/XFP all the way into the slot until you hear a click.
- For a bail clasp SFP/XFP: latch (flip upwards) the bail clasp before inserting into the slot then slide into the slot.

Note SFP/XFPs are keyed to prevent incorrect installation.

Step 3 Do not remove the protective caps from the SFP/XFP until you are ready to attach the network fiber-optic cable.

Step 4 Return to your originating procedure (NTP).

DLP-G64 Remove an SFP or XFP

Purpose	This task removes SFP/XFPs from TXP and MXP cards.
Tools/Equipment	None
Prerequisite Procedures	NTP-G32 Install the Transponder and Muxponder Cards, page 3-31
Required/As Needed	As needed

Onsite/Remote	Onsite
Security Level	Provisioning or higher

Note This task removes the SFP/XFP hardware. To delete the provisioning for an SFP/XFP, see the "DLP-G280 Delete a PPM" procedure on page 5-7.

Step 1 If a fiber is connected, disconnect the network fiber cable from the GBIC SC-type connector or SFP/XFP LC-type connector.

Step 2 Release the SFP/XFP from the slot by performing one of the following actions (depending which latch is on the SFP/XFP):

- For a mylar tab SFP/XFP: pull out the mylar tab.
- For an actuator/button SFP/XFP: press the actuator/button.
- For a bail clasp SFP/XFP: unlatch the bail clasp and swing it downward.

Step 3 Slide the SFP/XFP out of the slot.

Step 4 Return to your originating procedure (NTP).

NTP-G123 Install the Filler Cards

Purpose	This procedure explains how to install the filler cards (blank faceplates) in any unused traffic or AIC-I card slots (Slots 1 through 6, 9, and 11 through 17). The filler card aids in maintaining proper air flow and EMI requirements and is detected by CTC in Software Release 6.0 and higher.
Tools/Equipment	Filler cards (Cisco P/N 15454-FILLER)
Prerequisite Procedures	NTP-G30 Install the DWDM Cards, page 3-27 NTP-G31 Install the DWDM Dispersion Compensating Units, page 3-30 NTP-G32 Install the Transponder and Muxponder Cards, page 3-31
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Warning **Blank faceplates (filler panels) serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards and faceplates are in place.** Statement 156

Caution Always use the supplied electrostatic discharge (ESD) wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower right outside edge of the shelf assembly and ensure the shelf assembly is properly grounded.

Step 1 Open the card ejectors.

Step 2 Slide the card along the guide rails into the correct slot.

Step 3 Close the ejectors.

Step 4 Repeat for any remaining unused card slots.

Stop. You have completed this procedure.

NTP-G33 Create a Y-Cable Protection Group

Purpose	This procedure creates a Y-cable protection group between the client ports of two transponder (TXP_MR_10G, TXP_MR_10E, or TXP_MR_2.5G) or two muxponder (MXP_2.5G_10G, MXP_2.5G_10E, MXP_MR_2.5G, MXPP_MR_2.5G) cards. For additional information about Y-cable protection, see the "15.9.1 Y-Cable Protection" section on page 15-114.
Tools/Equipment	Installed TXP or MXP cards. Cisco MetroPlanner Traffic Matrix
Prerequisite Procedures	NTP-G15 Install the Common Control Cards, page 1-69 NTP-G14 Install DWDM Equipment, page 1-64 DLP-G46 Log into CTC, page 2-24 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Loss of Pointer Path (LOP-P) alarms can occur on a split signal if the ports are not in a Y-cable protection group.

Step 1 View the Cisco MetroPlanner Traffic Matrix (see Table 3-1 on page 3-3) for your site. Verify the TXP or MXP cards that need Y-cable protection groups. (Cards requiring Y-cable protection are indicated with "Y-Cable" in the Traffic Matrix table Protection Type column. Refer to the *Cisco MetroPlanner DWDM Operations Guide* for more information.)

Step 2 Verify that the TXP or MXP cards are installed according to the requirements specified in Table 3-4. This table describes the protection types available in the ONS 15454 for DWDM client cards.

Table 3-4 Protection Types

Type	Cards	Description and Installation Requirements
Y Cable	MXP_2.5_10G MXP_2.5_10E TXP_MR_10G TXP_MR_10E TXP_MR_2.5G MXP_MR_2.5G	Pairs a working transponder or muxponder card/port with a protect transponder or muxponder card/port. The protect port must be on a different card than the working port and it must be the same card type as the working port. The working and protect port numbers must be the same, that is, Port 1 can only protect Port 1, Port 2 can only protect Port 2, etc.
Splitter	TXPP_MR_2.5G MXPP_MR_2.5G	A splitter protection group is automatically created when a TXPP_MR_2.5G or MXPP_MR_2.5G card is installed. You can edit the splitter protection group name.

Step 3 Verify that pluggable port modules (PPM) are provisioned for the same payload and payload rate on the TXP and MXP cards where you will create the Y-cable protection group. You can use either of the following methods:

- In node view, move your mouse over the TXP or MXP client port. If a PPM is provisioned, two dots appear in the port graphic, and the port and PPM payload and rate appear when you move the mouse over the port.
- Display the TXP or MXP card in card view. Click the **Provisioning > Pluggable Port Module** tabs. Verify that a PPM is provisioned in the Pluggable Port Module area, and the payload type and rate is provisioned for it in the Selected PPM area.

The PPM payload and payload rate must be the same for both TXP or MXP cards. If they are not the same, for example, if the PPM payload and payload rate are not the same, you must either change the provisioned payload rate to match, or replace the PPM (SFP or XFP).

Step 4 In node view, click the **Provisioning > Protection** tabs.

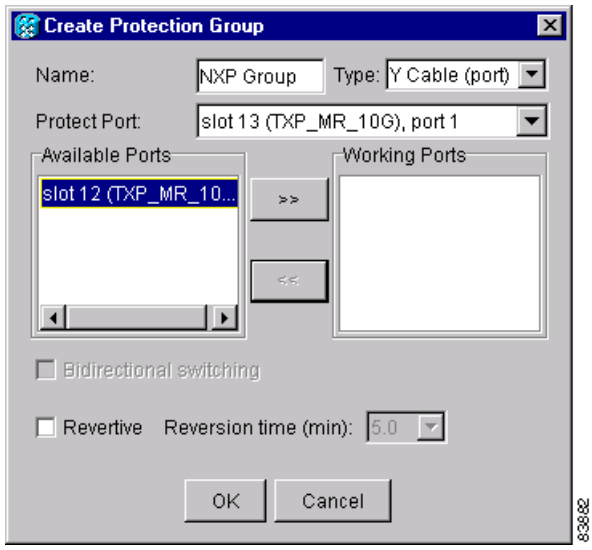
Step 5 In the Protection Groups area, click **Create**.

Step 6 In the Create Protection Group dialog box, enter the following:

- Name—Type a name for the protection group. The name can have up to 32 alphanumeric (a-z, A-Z, 0-9) characters. Special characters are permitted. For TL1 compatibility, do not use question mark (?), backslash (\), or double quote (“) characters.
- Type—Choose **Y Cable** from the drop-down list.
- Protect Port—From the drop-down list, choose the port that will be the standby or protection port to the active port. The menu displays the available transponder or muxponder ports. If transponder or muxponder cards are not installed, no ports appear in the drop-down list.

After you choose the protect port, a list of available working ports appear in the Available Ports list, as shown in Figure 3-9. If no cards are available, no ports appear. If this occurs, you can not complete this task until you install the physical cards or preprovision the ONS 15454 slots using the “NTP-G29 Preprovision a Slot” procedure on page 3-26.

Figure 3-9 Creating a Y-Cable Protection Group



Step 7 From the Available Ports list, choose the port that will be protected by the port you selected in Protect Ports. Click the top arrow button to move the port to the Working Ports list.

Step 8 Complete the remaining fields:

- Revertive—Check this check box if you want traffic to revert to the working port after failure conditions remain corrected for the amount of time entered in the Reversion Time field.
- Reversion time—If Revertive is checked, select a reversion time from the drop-down list. The range is 0.5 to 12.0 minutes. The default is 5.0 minutes. Reversion time is the amount of time that will elapse before the traffic reverts to the working card. The reversion timer starts after conditions causing the switch are cleared.

Step 9 Click **OK**.

Step 10 Repeat this procedure for every protection indicated in the Cisco MetroPlanner Traffic Matrix.

Stop. You have completed this procedure.

NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs

Purpose	This procedure installs the fiber-optic cables to DWDM cards and dispersion compensating units.
Tools/Equipment	Fiber-optic cables Cisco MetroPlanner Internal Connections table
Prerequisite Procedures	NTP-G30 Install the DWDM Cards, page 3-27 NTP-G31 Install the DWDM Dispersion Compensating Units, page 3-30 (as applicable) NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

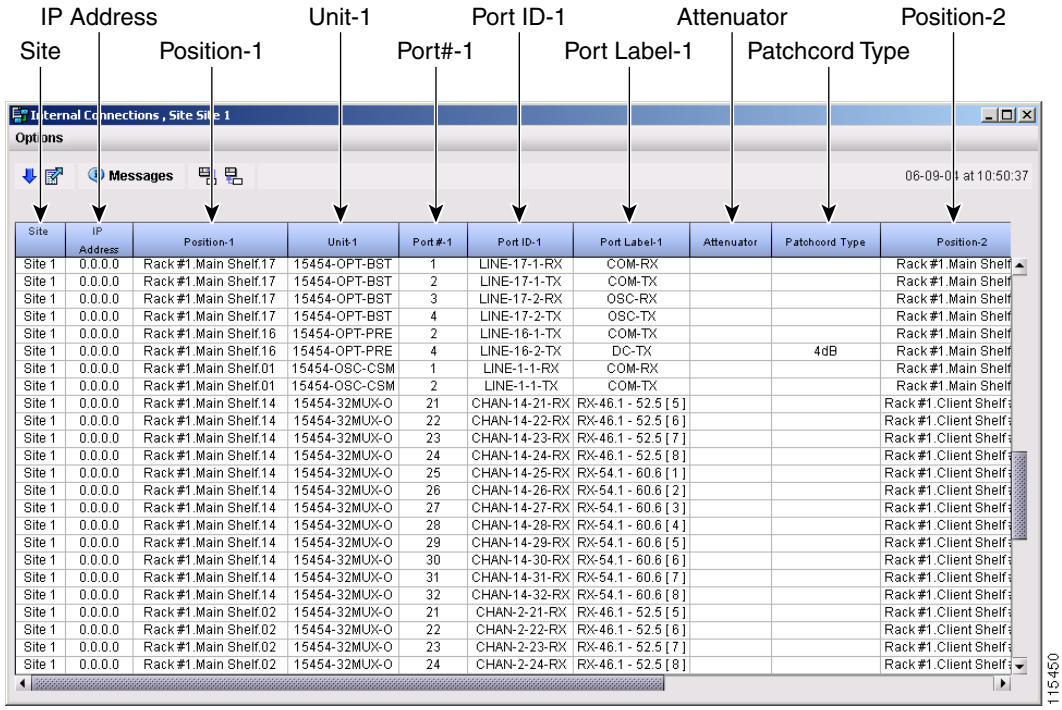
Warning **Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.**

Warning **Class I (CDRH) and Class 1M (IEC) laser products.** Statement 1055

Note In this procedure, you will generally connect fibers in an east-to-west or west-to-east pattern. “West” refers to cards and ports in Slots 1 through 8. “East” refers to cards and ports installed in Slots 10 through 17.

Step 1 View the Cisco MetroPlanner Internal Connections table. Figure 3-10 shows an example.

Figure 3-10 Cisco MetroPlanner Internal Connections Table



Site	IP Address	Position-1	Unit-1	Port#-1	Port ID-1	Port Label-1	Attenuator	Patchcord Type	Position-2
Site 1	0.0.0.0	Rack#1.Main Shelf.17	15454-OPT-BST	1	LINE-17-1-RX	COM-RX			Rack#1.Main Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.17	15454-OPT-BST	2	LINE-17-1-TX	COM-TX			Rack#1.Main Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.17	15454-OPT-BST	3	LINE-17-2-RX	OSC-RX			Rack#1.Main Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.17	15454-OPT-BST	4	LINE-17-2-TX	OSC-TX			Rack#1.Main Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.16	15454-OPT-PRE	2	LINE-16-1-TX	COM-TX			Rack#1.Main Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.16	15454-OPT-PRE	4	LINE-16-2-TX	DC-TX		4dB	Rack#1.Main Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.01	15454-OSC-CSM	1	LINE-1-1-RX	COM-RX			Rack#1.Main Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.01	15454-OSC-CSM	2	LINE-1-1-TX	COM-TX			Rack#1.Main Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	21	CHAN-14-21-RX	RX-46.1 - 52.5 [5]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	22	CHAN-14-22-RX	RX-46.1 - 52.5 [6]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	23	CHAN-14-23-RX	RX-46.1 - 52.5 [7]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	24	CHAN-14-24-RX	RX-46.1 - 52.5 [8]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	25	CHAN-14-25-RX	RX-54.1 - 60.6 [1]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	26	CHAN-14-26-RX	RX-54.1 - 60.6 [2]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	27	CHAN-14-27-RX	RX-54.1 - 60.6 [3]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	28	CHAN-14-28-RX	RX-54.1 - 60.6 [4]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	29	CHAN-14-29-RX	RX-54.1 - 60.6 [5]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	30	CHAN-14-30-RX	RX-54.1 - 60.6 [6]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	31	CHAN-14-31-RX	RX-54.1 - 60.6 [7]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.14	15454-32MUX-O	32	CHAN-14-32-RX	RX-54.1 - 60.6 [8]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.02	15454-32MUX-O	21	CHAN-2-21-RX	RX-46.1 - 52.5 [5]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.02	15454-32MUX-O	22	CHAN-2-22-RX	RX-46.1 - 52.5 [6]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.02	15454-32MUX-O	23	CHAN-2-23-RX	RX-46.1 - 52.5 [7]			Rack#1.Client Shelf
Site 1	0.0.0.0	Rack#1.Main Shelf.02	15454-32MUX-O	24	CHAN-2-24-RX	RX-46.1 - 52.5 [8]			Rack#1.Client Shelf

Step 2 Review the Cisco MetroPlanner Internal Connections table for the node you are provisioning. The table identifies the patch cord that you must cable by their end points. Position 1 identifies the fiber start point; Position 2 indicates the fiber end point. The patch cord end points are identified by site, slot, and port. Information provided by the Internal Connections table includes:

- Site—The DWDM network site number for the node where you are provisioning the internal connections.
- IP Address—The node IP address.
- Position-1—The first position rack, shelf, and slot. For example, Rack#1.Main Shelf.02 refers to Slot 2 in the Main Shelf of Rack #1. Refer to the Cisco MetroPlanner Site Dialog window for rack and shelf names and locations.
- Unit-1—The ONS 15454 DWDM card (unit) that is installed in the first position slot.
- Port#-1—The port identifier shown in the CTC for the first Position-1 connection.
- Port ID-1—The port identifier shown in TL1 for the Position-1 connection.
- Port Label-1—The name of the physical port printed on the card's front plate and shown in CTC card view for the Position-1 connection.
- Attenuator—Indicates whether attenuation is required.
- Patchcord Type—Indicates the level of attenuation that is required, if needed.
- Position-2—The second position rack, shelf, and slot. For example, Rack#1.Main Shelf.02 refers to Slot 2 in the Main Shelf of Rack #1. Refer to the Cisco MetroPlanner Site Dialog window for rack and shelf names and locations.
- Unit-2—The ONS 15454 DWDM card (unit) that is installed in the Position-2 slot.
- Port #2—The port identifier shown in CTC for the first Position-2 connection.
- Port ID-2—The port identifier shown in TL1 for the Position-2 connection.

- Port Label-2—The name of the physical port printed on the card's front plate and shown in CTC card view for the Position-2 connection.
- Manually Set—Indicates whether you must create the connection manually in CTC. A Yes appearing in this column means you must create the connection manually.

Caution Failure to create the required manual connections will prevent the node from turning up properly.

Step 3 Verify that fibers are available to complete the connections shown in the Internal Connections table.

Step 4 Complete the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 for all fiber connections, even new fiber. Dust particles can degrade performance. Put caps on any fiber connectors that are not used.

Step 5 If you will not perform node acceptance tests for this site, complete the "DLP-G65 Install Fiber-Optic Cables for OSC Link Terminations Between Two Adjacent Nodes" task on page 3-42. Otherwise, continue with Step 6.

Step 6 On the front of the fiber-storage tray (usually installed below the node you are fibering), push the tabs on the left and right sides inward to release the lock on the tray.

Step 7 Pull the fiber-storage tray away from the shelf until it is fully opened.

Step 8 Open the fold-down door that at the bottom of the shelf assembly to expose the cable-routing channel (Figure 14-35 on page 14-37).

Step 9 Using the Cisco MetroPlanner Internal Connection table, install the fiber-optic cables. Steps provided in the following tasks can be used as general guidelines; however, the fiber-optic cabling at your site will probably differ from the examples shown in the tasks.

- DLP-G66 Install Fiber-Optic Cables for a Hub Node, page 3-45
- DLP-G67 Install Fiber-Optic Cables for a Terminal Node, page 3-47
- DLP-G68 Install Fiber-Optic Cables for a Line Amplifier Node, page 3-49
- DLP-G69 Install Fiber-Optic Cables for an OSC Regeneration Node, page 3-51
- DLP-G70 Install Fiber-Optic Cables for an Amplified or Passive OADM Node, page 3-54
- DLP-G71 Install Fiber-Optic Cables for an ROADM Node, page 3-59

Step 10 To close the fiber-storage tray, push the tray back toward the rack until it locks into place.

Stop. You have completed this procedure.

DLP-G65 Install Fiber-Optic Cables for OSC Link Terminations Between Two Adjacent Nodes

Purpose	This task explains how to install fiber-optic cables for optical to enable the Optical Service Channel (OSC) link termination between two adjacent DWDM Nodes.
Tools	Fiber-optic cables Cisco MetroPlanner Internal Connections table
Prerequisite Procedures	NTP-G115 Clean Fiber Connectors, page 12-22 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note If you are performing the node acceptance tests in Chapter 4, "Perform Node Acceptance Tests," you can perform this task after node acceptance testing is complete.

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

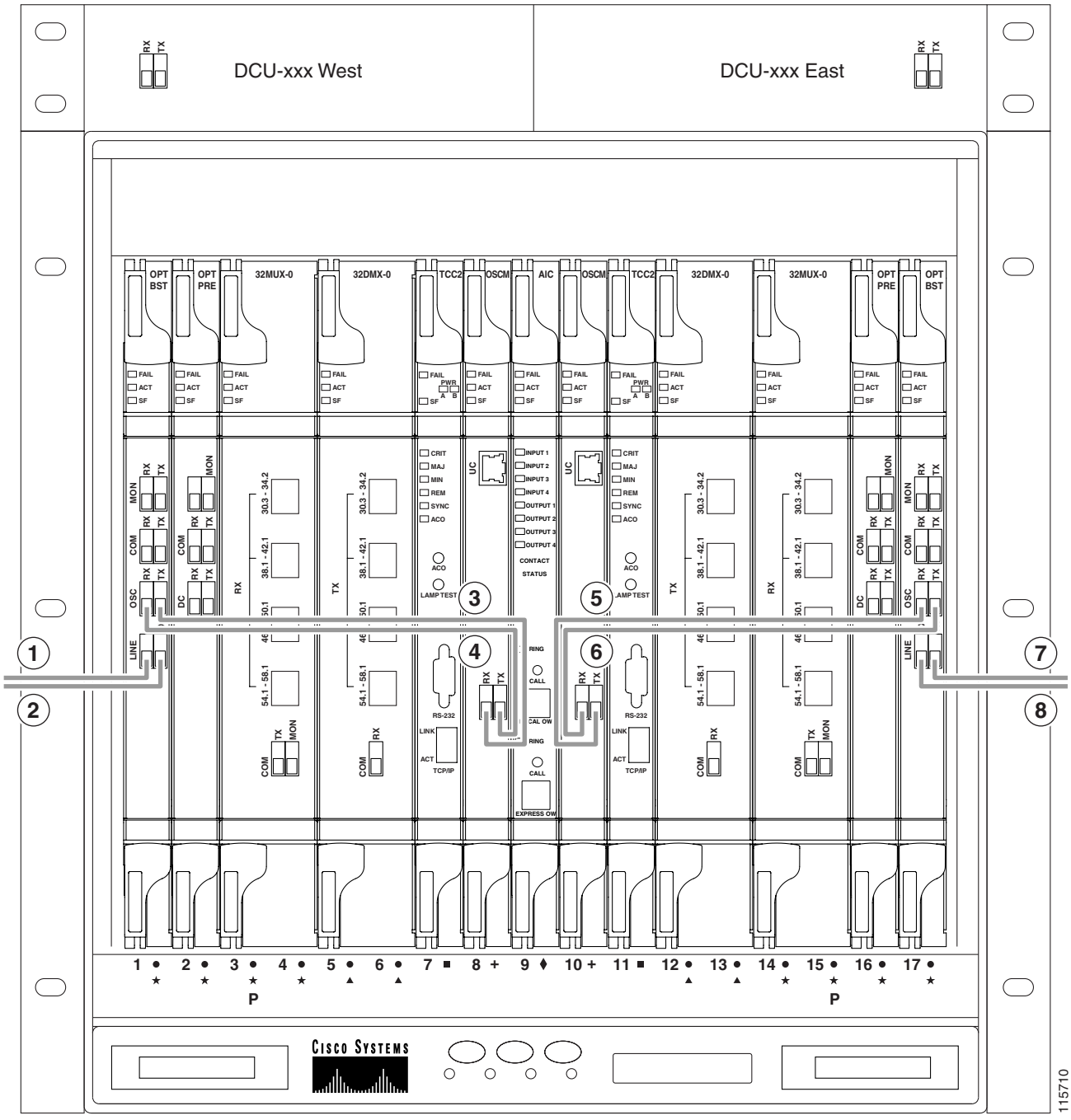
Step 1 Refer to the Cisco MetroPlanner Internal Connections table (see Table 3-1 on page 3-3) for your site when completing OSC connections. Before you begin the OSC connections, read the following rules:

- The OPT-BST and the OSC-CSM are the only cards that directly interface with the line (span) fiber.
- The OSCM only carries optical service channels, not DWDM channels.
- The OSCM and the OSC-CSM cannot both be installed on the same side of the shelf (east or west). You can have different cards on each side, for example an OSCM on the west side and an OSC-CSM on the east side.
- When an OPT-BST and an OSC-CSM are both used on the same side of the node, the OPT-BST combines the supervision channel with the DWDM channels and the OSC-CSM acts as an OSCM; it does not carry DWDM traffic.
- If an OPT-BST and OSCM card are installed on the east side, the east OPT-BST OSC RX port is connected to the east OSCM TX port, and the east OPT-BST OSC TX port is connected to the east OSCM RX port.
- If you have an OPT-BST and OSC-CSM card are installed on the east side, the east OPT-BST OSC RX port is connected to the east OSC-CSM LINE TX port, and the east OPT-BST OSC TX port is connected to the east OSC-CSM LINE RX port.
- If an OPT-BST and OSCM card are installed on the west side, The west OPT-BST OSC TX port is connected to the west OSCM RX port, and the west OPT-BST OSC RX port is connected to the west OSCM TX port.
- If you have an OPT-BST and OSC-CSM card are installed on the west side, the west OPT-BST OSC TX port is connected to the west OSC-CSM LINE RX port, and the west OPT-BST OSC RX port is connected to the west OSC-CSM LINE TX port.

Figure 3-11 shows an example of OSC fibering for a hub node with OSCM cards installed.

Note Install fiber-optic cables based on the Cisco MetroPlanner Internal Connections table for your site.

Figure 3-11 Fibering OSC Terminations—Hub Node with OSCM Cards



1	West OPT-BST LINE RX to east OPT-BST or OSC-CSM LINE TX on adjacent node	**5**	East OSCM TX to east OPT-BST OSC RX
2	West OPT-BST LINE TX to east OPT-BST or OSC-CSM LINE RX on adjacent node	**6**	East OSCM RX to east OPT-BST OSC TX
3	West OPT-BST OSC TX to west OSCM RX	**7**	East OPT-BST LINE TX to west OPT-BST or OSC-CSM LINE RX on adjacent node
4	West OPT-BST OSC RX to west OSCM TX	**8**	East OPT-BST LINE RX to west OPT-BST or OSC-CSM LINE TX on adjacent node

Step 2 Plug one end of a fiber into the west OPT-BST or OSC-CSM LINE TX connector.

Step 3 Route the fiber cable on the card faceplate through the fiber clip on the faceplate, if provided. (Fiber clips are factory-attached to the faceplates of 32MUX-O, 32DMX-O, OSCM, OPT-PRE, and OPT-BST cards.)

Step 4 Route the fiber cable through the cable-routing channel and cutout on the appropriate side of the shelf assembly, as necessary (Figure 14-35 on page 14-37).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

Step 5 Plug the other end of the fiber cable into the adjacent node east OPT-BST or OSC-CSM LINE RX connector. Repeat in the other direction (east to west, TX to RX). Always connect the west line ports to the adjacent node east line ports.

Note Cards display an SF LED after the OSC terminations are created (see the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74) and transmit and receive fibers are not connected correctly. For example, an RX port is connected to another RX port or a TX port is connected to another TX port.

Step 6 If OSCM cards are not installed, continue with Step 7. If OSCM cards are installed on both sides of the shelf, complete Steps a through d. If an OSCM is installed on the west side of the shelf, but not the east side, complete Steps a and b only. If the OSCM is installed on the east side of the shelf but not the west, complete Steps c and d only.

- **a.** Plug one end of a fiber into the west OPT-BST OSC RX connector and the other end into west OSCM OSC TX connector.
- **b.** Plug another fiber into the west OSCM OSC RX connector and the other end to the west OPT-BST OSC TX connector.
- **c.** plug one end of a fiber into the east OPT-BST OSC RX connector and the other end into the east OSCM TX connector.
- **d.** Plug another fiber into the east OSCM OSC RX connector and the other end to the east OPT-BST OSC TX connector.

Step 7 Repeat Steps 2 and 6 at each node in the network. If this is the final node, continue with Step 8.

Step 8 Return to your originating procedure (NTP).

DLP-G66 Install Fiber-Optic Cables for a Hub Node

Purpose	This task installs fiber-optic cables on a hub node DWDM shelf.
Tools	Fiber-optic cables
Prerequisite Procedures	NTP-G115 Clean Fiber Connectors, page 12-22 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

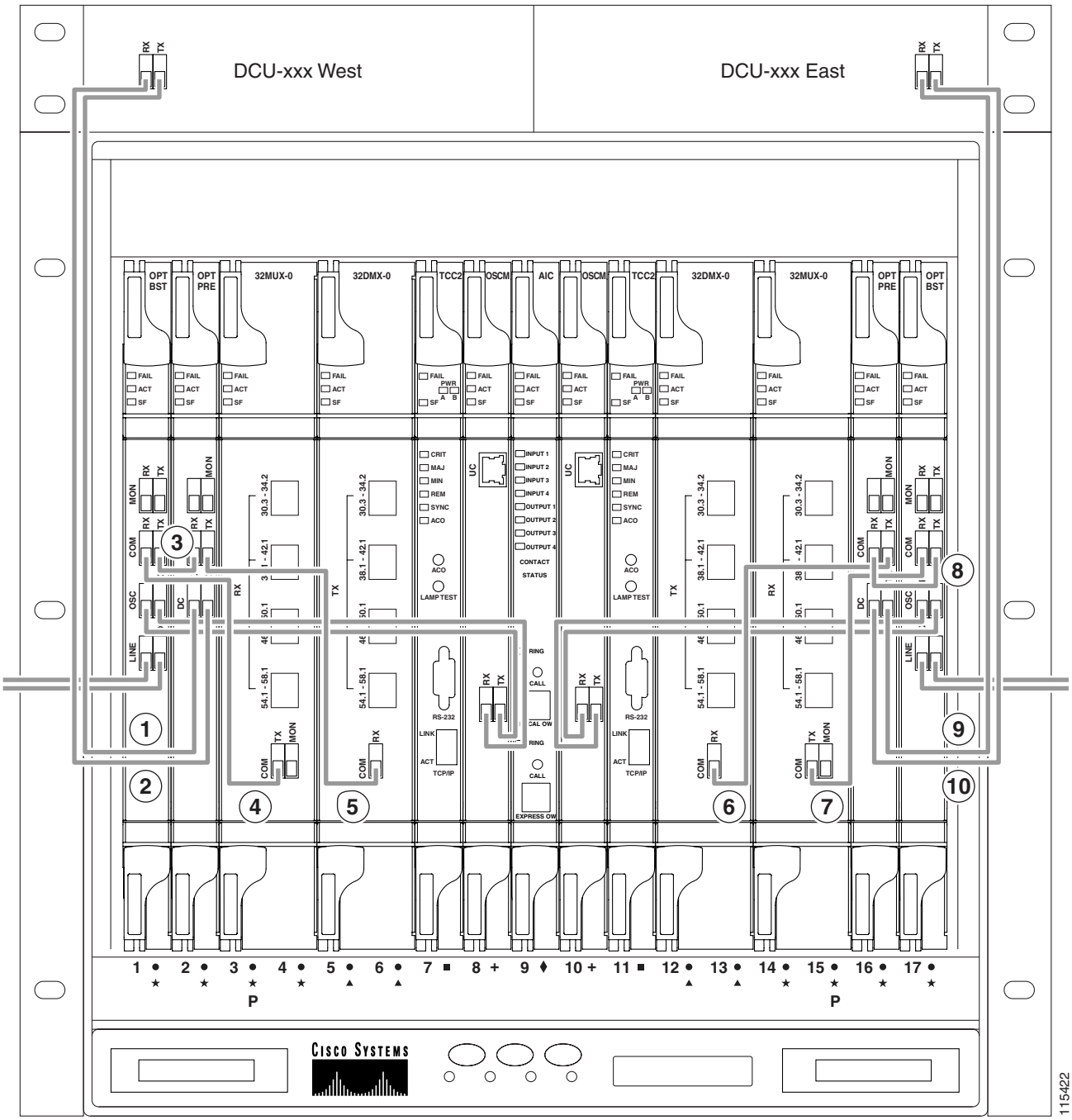
Step 1 Refer to the Cisco MetroPlanner Internal Connections table (see Table 3-1 on page 3-3) for your site when completing connections. Before you begin hub node connections, read the following rules:

- The west OPT-BST or OSC-CSM card common (COM) TX port is connected to the west OPT-PRE COM RX port or the west 32DMX-O COM RX port.
- The west OPT-PRE COM TX port is connected to the west 32DMX-O COM RX port.
- The west 32MUX-O COM TX port is connected to the west OPT-BST or west OSC-CSM COM RX port.
- The east 32MUX-O COM TX port is connected to the east OPT-BST or east OSC-CSM COM RX port.
- The east OPT-BST or east OSC-CSM COM TX port is connected to the east OPT-PRE COM RX port or the east 32DMX-O COM RX port.
- The east OPT-PRE COM TX port is connected to the east 32DMX-O COM RX port.

Figure 3-12 shows an example of a hub node with cabling. In the example, OSCM cards are installed. If OSC-CSM are installed, they are usually installed in Slots 1 and 17.

Note Figure 3-12 is an example. Always install fiber-optic cables based on the Cisco MetroPlanner Internal Connections table for your site.

Figure 3-12 Fibering a Hub Node



1	West DCU TX to west OPT-PRE DC RX[1]	**6**	East 32DMX-O COM RX to east OPT-PRE COM TX
2	West DCU RX to west OPT-PRE DC TX[1]	**7**	East 32MUX-O COM TX to east OPT-BST COM RX
3	West OPT-BST COM TX to west OPT-PRE COM RX	**8**	East OPT-PRE COM RX to east OPT-BST COM TX
4	West OPT-BST COM RX to west 32MUX-O COM TX	**9**	East DCU TX to east OPT-PRE DC RX[1]
5	West OPT-PRE COM TX to west 32DMX-O COM RX	**10**	East DCU RX to east OPT-PRE DC TX[1]

1. If a DCU is not installed, a 4-dB attenuator loop, +/– 1 dB must be installed between the OPT-PRE DC ports.

Step 2 Plug one end of the fiber cable into the desired RX port.

Step 3 Route the fiber cable on the card faceplate through the fiber clip on the faceplate, if provided. (Fiber clips are factory-attached to the faceplates of 32MUX-O, 32DMX-O, OSCM, OPT-PRE, and OPT-BST cards.)

Step 4 Route the fiber cable through the cable-routing channel and cutout on the appropriate side of the shelf assembly, as necessary (Figure 14-35 on page 14-37).

Step 5 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 14-38 on page 14-40).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

Step 6 Route the fiber cable out either side of the fiber-storage tray as necessary.

Step 7 Plug the other end of the cable into the desired TX port.

Note Cards display an SF LED after the OSC terminations are created (see the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74) and transmit and receive fibers are not connected correctly. For example, an RX port is connected to another RX port or a TX port is connected to another TX port.

Step 8 Repeat Step 2 until you have connected the nodes according to the site plan.

Step 9 Return to your originating procedure (NTP).

DLP-G67 Install Fiber-Optic Cables for a Terminal Node

Purpose	This task installs fiber-optic cables on a terminal node DWDM shelf.
Tools	Fiber-optic cables
Prerequisite Procedures	NTP-G115 Clean Fiber Connectors, page 12-22 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Step 1 Refer to the Cisco MetroPlanner Internal Connections table (see Table 3-1 on page 3-3) for your site when completing connections. Before you begin terminal node connections, read the following rules:

- A terminal site has only one side (as compared to a hub node, which has two sides). The terminal side can be either east or west.
- The terminal side OPT-BST or OSC-CSM card common (COM) TX port is connected to the terminal side OPT-PRE COM RX port or the 32DMX-O COM RX port.
- The terminal side OPT-PRE COM TX port is connected to the terminal side 32DMX-O COM RX port.
- The terminal side 32MUX-O COM TX port is connected to the terminal side OPT-BST or OSC-CSM COM RX port.

Step 2 Plug one fiber cable end into the desired RX port.

Step 3 Route the fiber cable on the card faceplate through the fiber clip on the faceplate, if provided. (Fiber clips are factory-attached to the faceplates of 32MUX-O, 32DMX-O, OSCM, OPT-PRE, and OPT-BST cards.)

Step 4 Route the fiber cable through the cable-routing channel and cutout on the appropriate side of the shelf assembly, as necessary (Figure 14-35 on page 14-37).

Step 5 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 14-38 on page 14-40).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

Step 6 Route the fiber cable out either side of the fiber-storage tray as necessary.

Step 7 Plug the other end of the cable into the desired TX port.

Note Cards display an SF LED after the OSC terminations are created (see the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74) and transmit and receive fibers are not connected correctly. For example, an RX port is connected to another RX port or a TX port is connected to another TX port.

Step 8 Repeat Step 2 until you have connected the nodes according to the site plan.

Step 9 Return to your originating procedure (NTP).

DLP-G68 Install Fiber-Optic Cables for a Line Amplifier Node

Purpose	This task installs fiber-optic cables on a line amplifier node in a DWDM shelf.
Tools	Fiber-optic cables
Prerequisite Procedures	NTP-G115 Clean Fiber Connectors, page 12-22 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

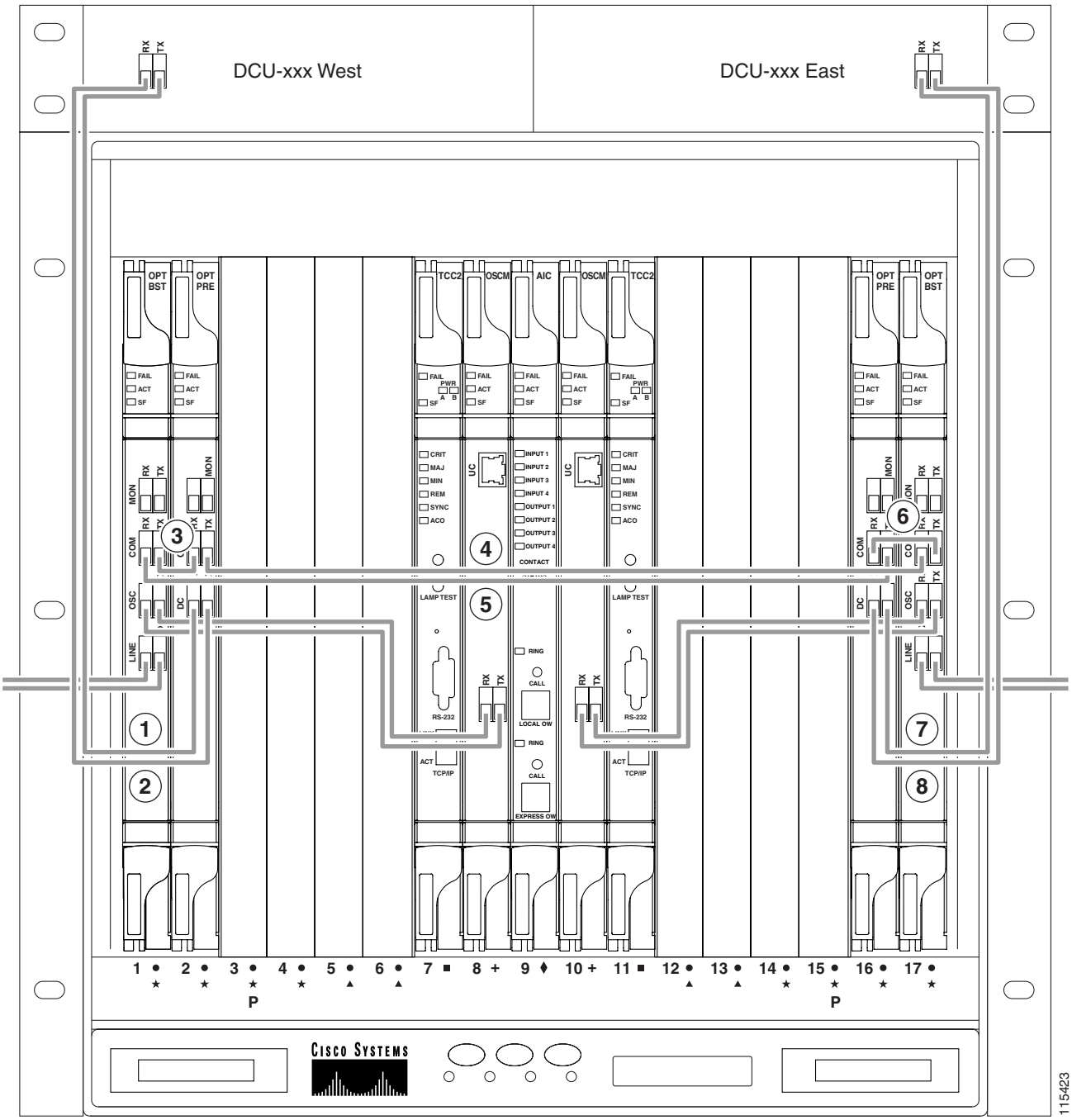
Step 1 Refer to the Cisco MetroPlanner Internal Connections table (see Table 3-1 on page 3-3) for your site when completing connections. Before you begin the line amplifier node connections, read the following rules:

- Line amplifier node layout allows all combinations of OPT-PRE and OPT-BST and allows you to use asymmetrical card choices in west-to-east and east-to-west configurations. For a given line direction, you can configure the four following possibilities:
  - Only preamplification (OPT-PRE)
  - Only booster amplification (OPT-BST)
  - Both preamplification and booster amplification (where a line amplifier node has amplification in at least one direction)
  - Neither preamplification nor booster amplification
- If a west OPT-PRE card is installed:
  - The west OSC-CSM or OPT-BST COM TX is connected to the west OPT-PRE COM RX port.
  - The west OPT-PRE COM TX port is connected to the east OSC-CSM or OPT-BST COM RX port.
- If a west OPT-PRE card is not installed, the west OSC-CSM or the OPT-BST COM TX port is connected to the east OSC-CSM or OPT-BST COM RX port.
- If an east OPT-PRE card is installed:
  - The east OSC-CSM or OPT-BST COM TX port is connected to the east OPT-PRE COM RX port.
  - The east OPT-PRE COM TX port is connected to the west OSC-CSM or OPT-BST COM RX port.
- If an east OPT-PRE card is not installed, the east OSC-CSM or OPT-BST COM TX port is connected to the west OSC-CSM or OPT-BST COM RX port.

Figure 3-13 shows an example of a line amplifier node with cabling.

Note Figure 3-13 is an example. Always install fiber-optic cables based on the Cisco MetroPlanner Internal Connections table for your site.

Figure 3-13 Fibering a Line Amplifier Node



1	West DCU TX to west OPT-PRE DC RX[1]	**5**	West OPT-BST COM RX to east OPT-PRE COM TX
2	West DCU RX to west OPT-PRE DC TX[1]	**6**	West OPT-BST COM RX to east OPT-PRE COM TX
3	West OPT-BST COM TX to west OPT-PRE COM RX	**7**	East DCU TX to east OPT-PRE DC RX[1]
4	West OPT-PRE COM TX to east OPT-BST COM RX	**8**	East DCU RX to east OPT-PRE DC TX[1]

1. If a DCU is not installed, a 4-dB attenuator loop, +/– 1 dB must be installed between the OPT-PRE DC ports.

Step 2 Plug one end of the fiber cable into the desired RX port.

Step 3 Route the fiber cable on the card faceplate through the fiber clip on the faceplate, if provided. (Fiber clips are factory-attached to the faceplates of OSCM, OPT-PRE, and OPT-BST cards.)

Step 4 Route the fiber cable through the cable-routing channel and cutout on the appropriate side of the shelf assembly, as necessary (Figure 14-35 on page 14-37).

Step 5 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 14-38 on page 14-40).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

Step 6 Route the fiber cable out either side of the fiber-storage tray as necessary.

Step 7 Plug the other end of the cable into the desired TX port.

Note Cards display an SF LED after the OSC terminations are created (see the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74) and transmit and receive fibers are not connected correctly. For example, an RX port is connected to another RX port or a TX port is connected to another TX port.

Step 8 Repeat Step 2 until you have connected the nodes according to the site plan.

Step 9 Return to your originating procedure (NTP).

DLP-G69 Install Fiber-Optic Cables for an OSC Regeneration Node

Purpose	This task installs fiber-optic cables on an OSC regeneration node in a DWDM shelf.
Tools	Fiber-optic cables
Prerequisite Procedures	NTP-G115 Clean Fiber Connectors, page 12-22 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Step 1 Refer to the Cisco MetroPlanner Internal Connections table (see Table 3-1 on page 3-3) for your site when completing connections. Before you begin OSC regeneration node connections, read the following rules:

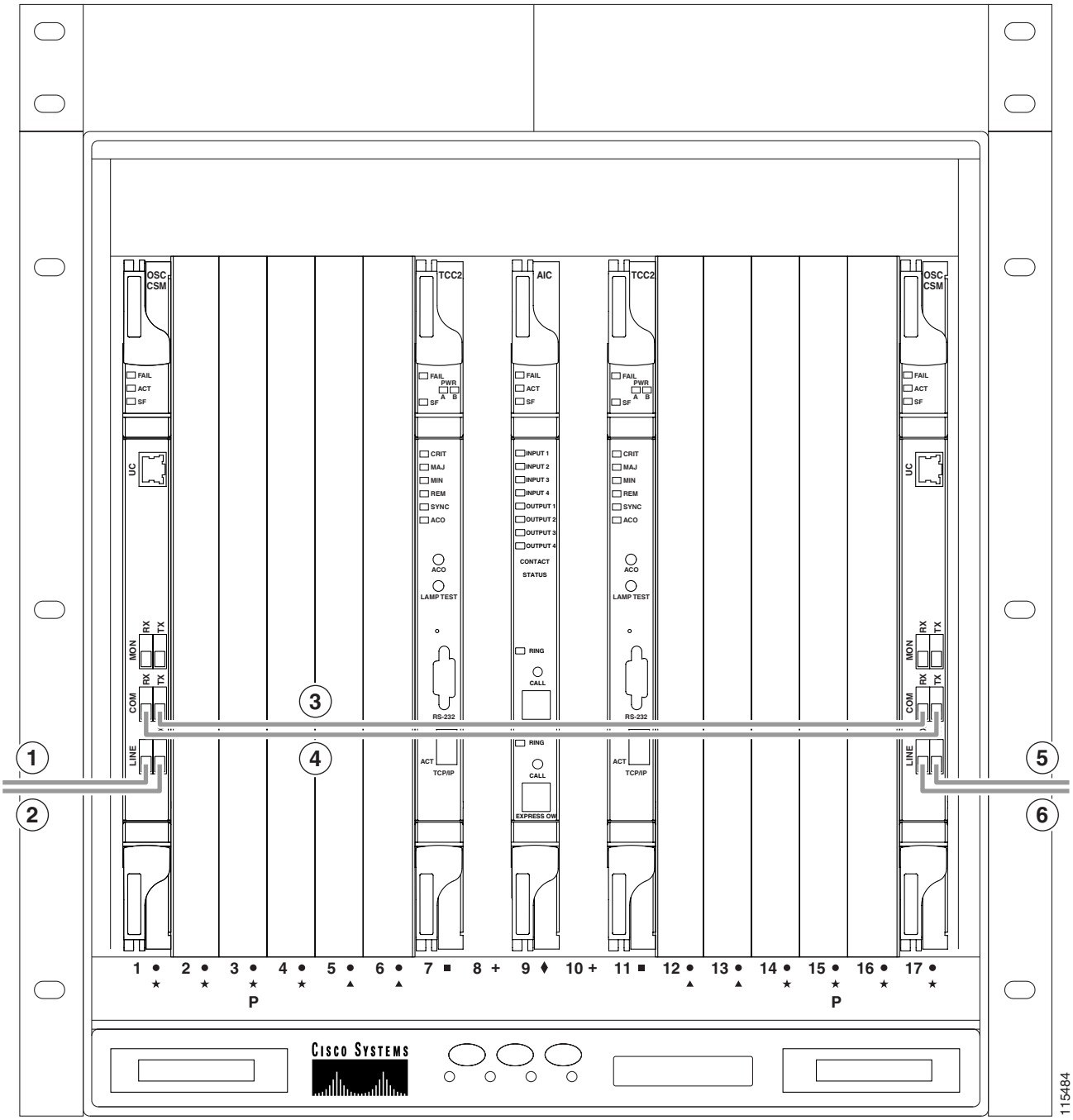
- The west OSC-CSM COM TX port connects to the east OSC-CSM COM RX port.
- The west OSC-CSM COM RX port connects to the east OSC-CSM COM TX port.

- Slots 2 through 5 and 12 through 16 can be used for TXP/MXP cards.

Figure 3-14 shows an example of an OSC regeneration node with cabling.

Note Figure 3-14 is an example. Always install fiber-optic cables based on the Cisco MetroPlanner Internal Connections table for your site.

Figure 3-14 Fibering an OSC Regeneration Node



1	West OSC-CSM LINE RX to east OSC-CSM or OPT-BST LINE TX on adjacent node	**4**	West OSC-CSM COM RX to east OSC-CSM COM TX
2	West OSC-CSM LINE TX to east OSC-CSM or OPT-BST LINE RX on adjacent node	**5**	East OSC-CSM LINE RX to west OSC-CSM or OPT-BST LINE TX on adjacent node
3	West OSC-CSM COM TX to east OSC-CSM COM RX	**6**	East OSC-CSM LINE TX to west OSC-CSM or OPT-BST LINE RX on adjacent node

Step 2 Plug one end of the fiber cable into the desired RX port.

Step 3 Route the fiber cable on the card faceplate through the fiber clip on the faceplate, if provided. (Fiber clips are factory-attached to the faceplates of OSCM, OPT-PRE, and OPT-BST cards.)

Step 4 Route the fiber cable through the cable-routing channel and cutout on the appropriate side of the shelf assembly, as necessary (Figure 14-35 on page 14-37).

Step 5 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 14-38 on page 14-40).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

Step 6 Route the fiber cable out either side of the fiber-storage tray as necessary.

Step 7 Plug the other end of the cable into the desired TX port.

Note Cards display an SF LED after the OSC terminations are created (see the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74) and transmit and receive fibers are not connected correctly. For example, an RX port is connected to another RX port or a TX port is connected to another TX port.

Step 8 Repeat Step 2 until you have connected the nodes according to the site plan.

Step 9 Return to your originating procedure (NTP).

DLP-G70 Install Fiber-Optic Cables for an Amplified or Passive OADM Node

Purpose	This task gives instructions, rules, and examples to install fiber-optic cables on an amplified or passive optical add/drop multiplexing (OADM) node in a DWDM shelf.
Tools	Fiber-optic cables
Prerequisite Procedures	NTP-G115 Clean Fiber Connectors, page 12-22 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Note Amplified OADM nodes contain OPT-PRE cards and/or OPT-BST cards. Passive OADM nodes do not. Both contain add/drop channel or band cards.

Step 1 Refer to the Cisco MetroPlanner Internal Connections table (see Table 3-1 on page 3-3) for your site when completing connections. Before you begin connecting fiber-optic cabling for amplified or passive OADM nodes, read the following rules for all OADM connections:

- The two sides of the OADM node do not need to be symmetrical. On each side, Cisco MetroPlanner can create one of the following four configurations:
  - OPT-BST and OPT-PRE
  - OSC-CSM and OPT-PRE
  - Only OSC-CSM
  - Only OPT-BST

Step 2 Consult the following rules for OADM node express path cabled connections:

- TX ports should only be connected to RX ports.
- EXP ports are connected only to COM ports in between AD-xC or AD-xB cards that all belong to the east side (that is, they are daisy-chained).
- EXP ports are connected only to COM ports in between AD-xC or AD-xB cards that all belong to the west side (that is, they are daisy-chained).
- The EXP port of the last AD-xC or AD-xB card on the west side is connected to the EXP port of the first AD-xC or AD-xB card on the east side.
- The OPT-BST COM RX port is connected to the nearest (in slot position) AD-xC or AD-xB COM TX port.
- The OPT-PRE COM TX port is connected to the nearest (in slot position) AD-xC or AD-xB COM RX port.
- If OADM cards are located in adjacent slots, the TCC2/TCC2P card assumes they are connected in a daisy-chain between the EXP ports and COM ports as noted previously.

- The first west AD-xC or AD-xB card COM RX port is connected to the west OPT-PRE or OSC-CSM COM TX port.
- The first west AD-xC or AD-xB card COM TX port is connected to the west OPT-BST or OSC-CSM COM RX port.
- The first east AD-xC or AD-xB card COM RX port is connected to the east OPT-PRE or OSC-CSM COM TX port.
- The first east AD-xC or AD-xB card COM TX port is connected to the east OPT-BST or OSC-CSM RX port.
- If a west OPT-PRE is present, the west OPT-BST or OSC-CSM COM TX port is connected to the west OPT-PRE COM RX port.
- If an east OPT-PRE is present, the east OPT-BST or OSC-CSM COM TX port is connected to the east OPT-PRE COM RX port.

Step 3 Consult the following rules for OADM node add/drop path cabled connections:

- AD-xB add/drop (RX or TX) ports are only connected to the following ports:
  - 4MD COM TX or 4MD COM RX ports
  - Another AD-xB add/drop port (a pass-through configuration)
- An AD-xB add/drop band port is only connected to a 4MD card belonging to the same band.
- For each specific AD-xB, the add and drop ports for that band card are connected to the COM TX and COM RX ports of the same 4MD card.
- The AD-xB and 4MD cards are located in the same side (the connected ports will all have the same line direction).

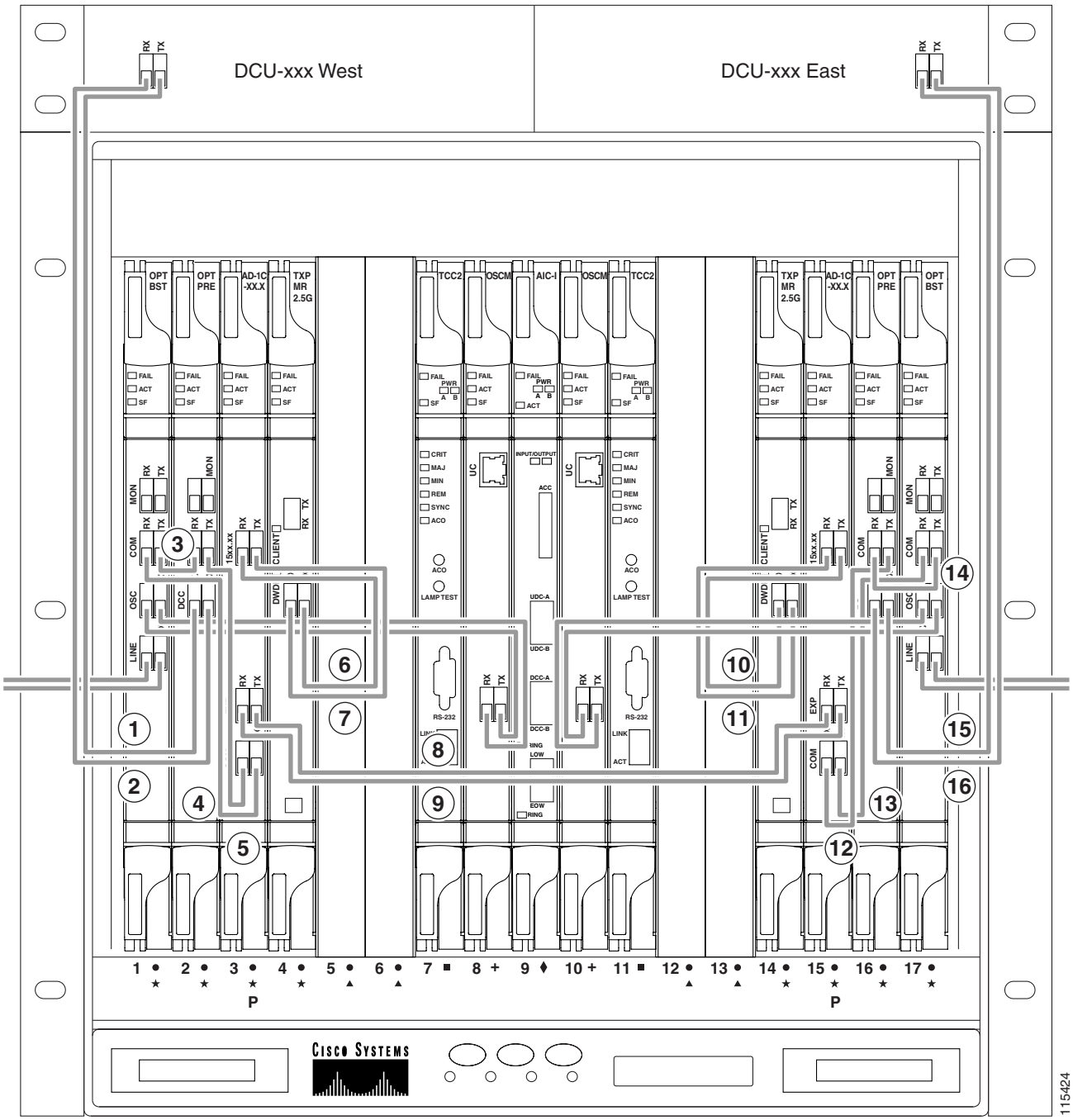
Step 4 Consult the following rules for OADM node pass-through path cabled connections:

- Pass-through connections are only established between add and drop ports on the same band or channel and same line direction.
- Only connect AD-xC or AD-xB add/drop ports to other AD-xC or AD-xB add/drop ports (as pass-through configurations).
- An add (RX) port is only connected to a drop (TX) port.
- Only connect 4MD client input/output ports to other 4MD client input/output ports.
- A west AD-xB drop (TX) port is connected to the corresponding west 4MD COM RX port.
- A west AD-xB add (RX) port is connected to the corresponding west 4MD COM TX port.
- An east AD-xB drop (TX) port is connected to the corresponding east 4MD COM RX port.
- An east AD-xB add (RX) port is connected to the corresponding east 4MD COM TX port.

Figure 3-15 shows an example of an amplified OADM node with AD-1C-xx.x cards installed.

Note Figure 3-15 is an example. Always install fiber-optic cables based on the Cisco MetroPlanner Internal Connections table for your site.

Figure 3-15 Fibering an Amplified OADM Node



1	West DCU TX to west OPT-PRE DC RX[1]	**9**	West AD-1C-xx.x EXP RX to east AD-1C-xx.x EXP TX
2	West DCU RX to west OPT-PRE DC TX[1]	**10**	East TXP_MR_2.5G DWDM RX to east AD-1C-xx.x(15xx.xx) TX
3	West OPT-BST COM TX to west OPT-PRE COM RX	**11**	East TXP_MR_2.5G DWDM TX to east AD-1C-xx.x (15xx.xx) RX

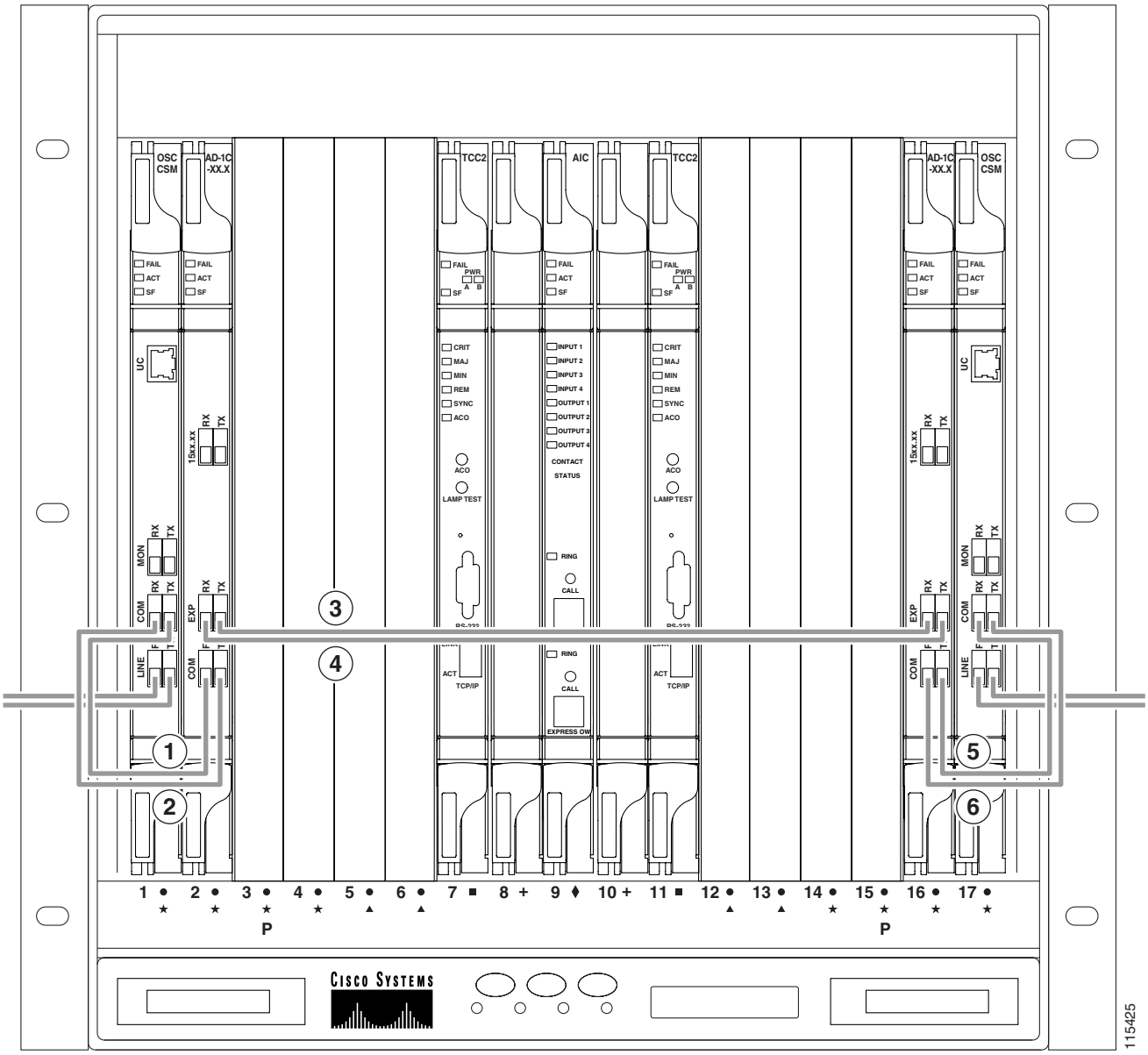
4	West OPT-BST COM RX to west AD-1C-xx.x COM TX	**12**	East AD-1C-xx.x COM RX to OPT-PRE COM TX
5	West OPT-PRE COM TX to west AD-1C-xx.x COM RX	**13**	East AD-1C-xx.x COM TX to OPT-BST COM RX
6	West AD-1C-xx.x (15xx.xx) RX to west TXP_MR_2.5G DWDM TX	**14**	East OPT-PRE COM RX to east OPT-BST COM TX
7	West AD-1C-xx.x (15xx.xx) TX to west TXP_MR_2.5G DWDM RX	**15**	East DCU TX to east OPT-PRE DC RX[1]
8	West AD-1C-xx.x EXP TX to east AD-1C-xx.x EXP RX	**16**	East DCU RX to east OPT-PRE DC TX[1]

1. If a DCU is not installed, a 4-dB attenuator loop, +/– 1 dB must be installed between the OPT-PRE DC ports.

Figure 3-16 shows an example of a passive OADM node with two AD-1C-xx.x cards installed.

Note Figure 3-16 is an example. Always install fiber-optic cables based on the Cisco MetroPlanner Internal Connections table for your site.

Figure 3-16 Fibering a Passive OADM Node



1	West OSC-CSM COM TX to west AD-1C-xx.x COM RX	**4**	West OSC-CSM EXP RX to east AD-1C-xx.x EXP TX
2	West OSC-CSM COM RX to west AD-1C-xx.x COM TX	**5**	East AD-1C-xx.x COM TX to east OSC-CSM COM RX
3	West OSC-CSM EXP TX to east AD-1C-xx.x EXP RX	**6**	East AD-1C-xx.x COM RX to east OSC-CSM COM TX

Step 5 Plug one end of the fiber cable into the RX port.

Step 6 Route the fiber cable on the card faceplate through the fiber clip on the faceplate, if provided. (Fiber clips are factory-attached to the faceplates of 32MUX-O, 32DMX-O, OSCM, OPT-PRE, and OPT-BST cards.)

Step 7 Route the fiber cable through the cable-routing channel and cutout on the appropriate side of the shelf assembly, as necessary (Figure 14-35 on page 14-37).

Step 8 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 14-38 on page 14-40).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

Step 9 Route the fiber cable out either side of the fiber-storage tray as necessary.

Step 10 Plug the other end of the cable into the TX port.

Note Cards display an SF LED after the OSC terminations are created (see the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74) and transmit and receive fibers are not connected correctly. For example, an RX port is connected to another RX port or a TX port is connected to another TX port.

Step 11 Repeat Step 5 until you have connected the nodes according to the site plan.

Step 12 Return to your originating procedure (NTP).

DLP-G71 Install Fiber-Optic Cables for an ROADM Node

Purpose	This task gives instructions, rules, and examples to install fiber-optic cables on an reconfigurable optical add/drop multiplexing (ROADM) node in a DWDM shelf.
Tools	Fiber-optic cables
Prerequisite Procedures	NTP-G115 Clean Fiber Connectors, page 12-22 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Note To avoid errors, connect fiber-optic cable in fiber connections so that the farthest slot to the right represents the east port, and the farthest slot to the left represents the west port. Inter-shelf, line side connections (connections that span between adjacent sites), should be made such that fiber connected to an east port on one node connects into the west port on an adjacent node.

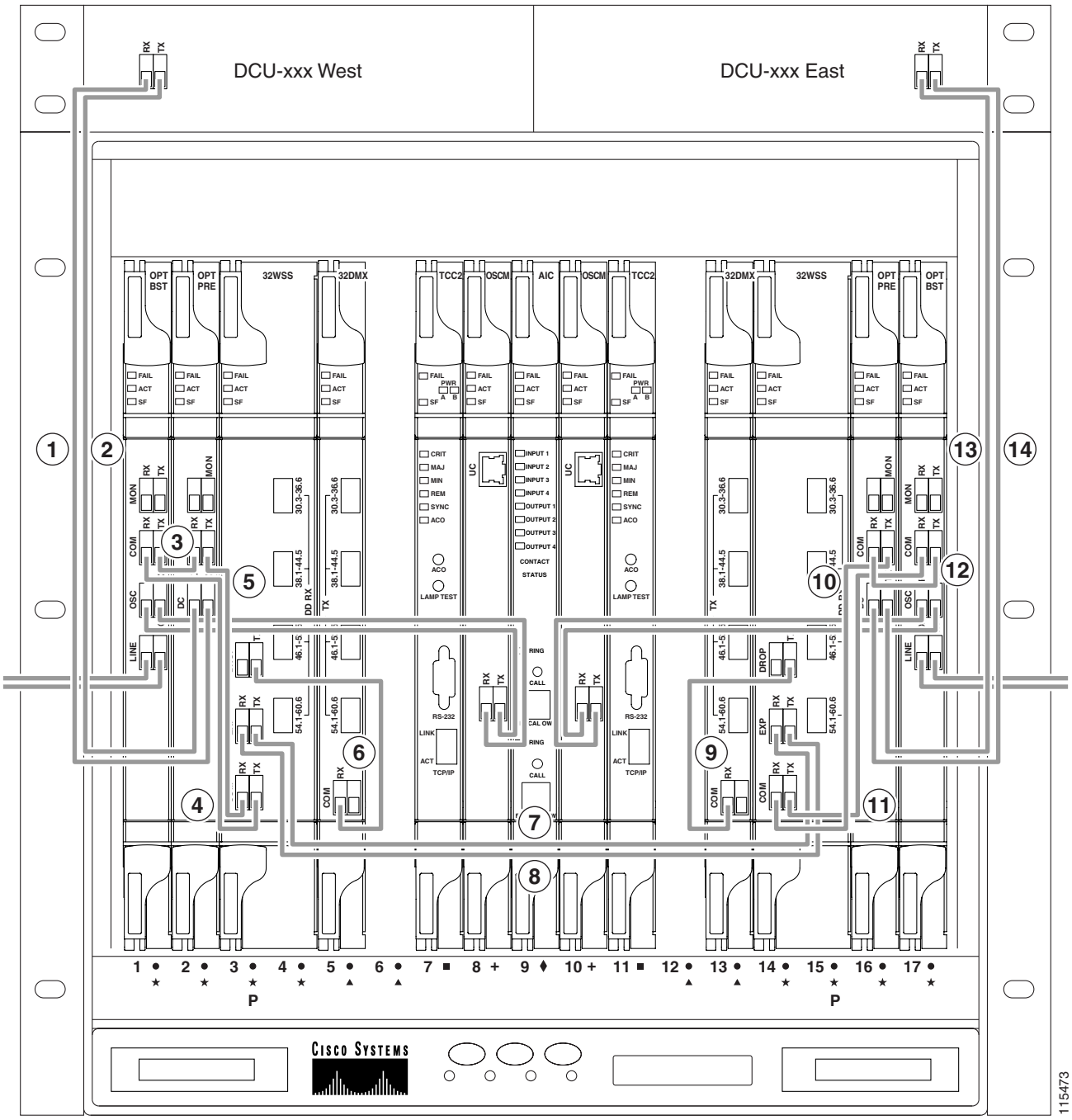
Step 1 Refer to the Cisco MetroPlanner Internal Connections table (see Table 3-1 on page 3-3) for your site when completing connections. Before you begin connecting fiber-optic cabling for ROADM nodes, read and understand the following rules:

- The west OPT-BST or OSC-CSM COM TX port is connected to the west OPT-PRE COM RX port.
- The west OPT-PRE COM TX port is connected to the west 32WSS COM RX port.
- The west OPT-BST or OSC-CSM COM RX port is connected to the west 32WSS COM TX port.
- The west OPT-BST (if installed) OSC TX port is connected to the west OSCM RX port.
- The west OPT-BST (if installed) OSC RX port is connected to the west OSCM TX port.
- The west 32WSS EXP TX port is connected to the east 32WSS EXP RX port.
- The west 32WSS EXP RX port is connected to the east 32WSS EXP TX port.
- The west 32WSS DROP TX port is connected to the west 32DMX COM RX port.
- The east OPT-BST or OSC-CSM COM TX port is connected to the east OPT-PRE COM RX port.
- The east OPT-PRE COM TX port is connected to the east 32WSS COM RX port.
- The east OPT-BST or OSC-CSM COM RX port is connected to the east 32WSS COM TX port.
- The east OPT-BST (if installed) OSC TX port is connected to the east OSCM RX port.
- The east OPT-BST (if installed) OSC RX port is connected to the east OSCM TX port.
- The east 32WSS DROP TX port is connected to the east 32DMX COM RX port.

Figure 3-17 shows an example of an amplified ROADM node with cabling.

Note Figure 3-17 is an example. Always install fiber-optic cables based on the Cisco MetroPlanner Internal Connections table for your site.

Figure 3-17 Fibering an ROADM Node



1	West DCU TX to west OPT-PRE DC RX[1]	**8**	West 32WSS EXP RX to east 32WSS EXP TX
2	West DCU RX to west OPT-PRE DC TX[1]	**9**	East 32DMX COM RX to east 32WSS DROP TX
3	West OPT-BST COM TX to west OPT-PRE COM RX	**10**	East 32WSS COM RX to east OPT-PRE COM TX
4	West 32WSS COM TX to west OPT-BST COM RX	**11**	East 32WSS COM TX to east OPT-BST COM RX

5	West 32WSS COM RX to west OPT-PRE COM TX	**12**	East OPT-BST COM TX to east OPT-PRE COM RX
6	West 32DMX COM RX to west 32WSS DROP TX	**13**	East DCU RX to east OPT-PRE DC TX[1]
7	West 32WSS EXP TX to east 32WSS EXP RX	**14**	East DCU TX to east OPT-PRE DC RX[1]

1. If a DCU is not installed, a 4-dB attenuator loop, +/– 1 dB must be installed between the OPT-PRE DC ports.

Note Cards display an SF LED after the OSC terminations are created (see the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74) and transmit and receive fibers are not connected correctly. For example, an RX port is connected to another RX port or a TX port is connected to another TX port.

Step 2 Plug one end of the fiber into the desired RX port.

Step 3 Route the fiber cable on the card faceplate through the fiber clip on the faceplate, if provided. (Fiber clips are factory-attached to the faceplates of 32WSS, 32DMX-O, OSCM, OPT-PRE, and OPT-BST cards.)

Step 4 Route the fiber cable through the cable-routing channel and cutout on the appropriate side of the shelf assembly, as necessary (Figure 14-35 on page 14-37).

Step 5 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 14-38 on page 14-40).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

Step 6 Route the fiber cable out either side of the fiber-storage tray as necessary.

Step 7 Plug the other end of the cable into the correct TX port.

Step 8 Repeat Step 2 until you have connected the node(s) according to the site plan.

Step 9 Return to your originating procedure (NTP).

NTP-G140 Install Fiber-Optic Cables Between a Terminal, Hub, or ROADM Node and the Transponder Cards

Purpose	This procedure routes fiber-optic cables to the patch panel from 32MUX-O, 32WSS, 32DMX-O, and 32DMX cards in a terminal, hub, or ROADM node; and from the patch panel to TXP/MXP cards.
Tools/Equipment	The following node types require the following equipment. The cards and patch panels should already be installed before you begin this procedure. Terminal node: • 32DMX-O card (1) • 32MUX-O card (1) • Patch panel (1) • Fiber-optic cables, terminated on one end with one multifiber push-on (MPO) connector and 8 LC-type connectors on the other end (8) Hub node: • 32DMX-O card (2) • 32MUX-O card (2) • Patch panel (2) • Fiber-optic cables, terminated on one end with one (MPO) connector and 8 LC-type connectors on the other end (16) ROADM node: • 32WSS card (2) • 32DMX card (2) • Patch panel (2) • Fiber-optic cables, terminated on one end with one (MPO) connector and 8 LC-type connectors on the other end (16) Fiber-optic cables
Prerequisite Procedures	DLP-G28 Install the Fiber Patch-Panel Tray, page 1-65 DLP-G29 Install the Fiber-Storage Tray, page 1-66 NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs, page 3-39
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 On the front of the patch-panel tray, push the tabs on the left and right sides inward to release the lock on the tray.

Step 2 Pull the patch-panel tray away from the shelf until it is fully opened.To install fiber-optic cables between a hub, terminal, or ROADM node and the transponder (TXP) cards, perform the following tasks:

- DLP-G315 Install Fiber-Optic Cables From the 32WSS/32DMX and 32MUX-O/32DMX-O Cards to the Patch Panel, page 3-64
- DLP-G316 Install Fiber-Optic Cables from a TXP/MXP Node to the Patch Panel, page 3-68

Step 3 To close the fiber-storage tray, push the tray back toward the rack until it locks into place.

Stop. **You have completed this procedure**.

DLP-G315 Install Fiber-Optic Cables From the 32WSS/32DMX and 32MUX-O/32DMX-O Cards to the Patch Panel

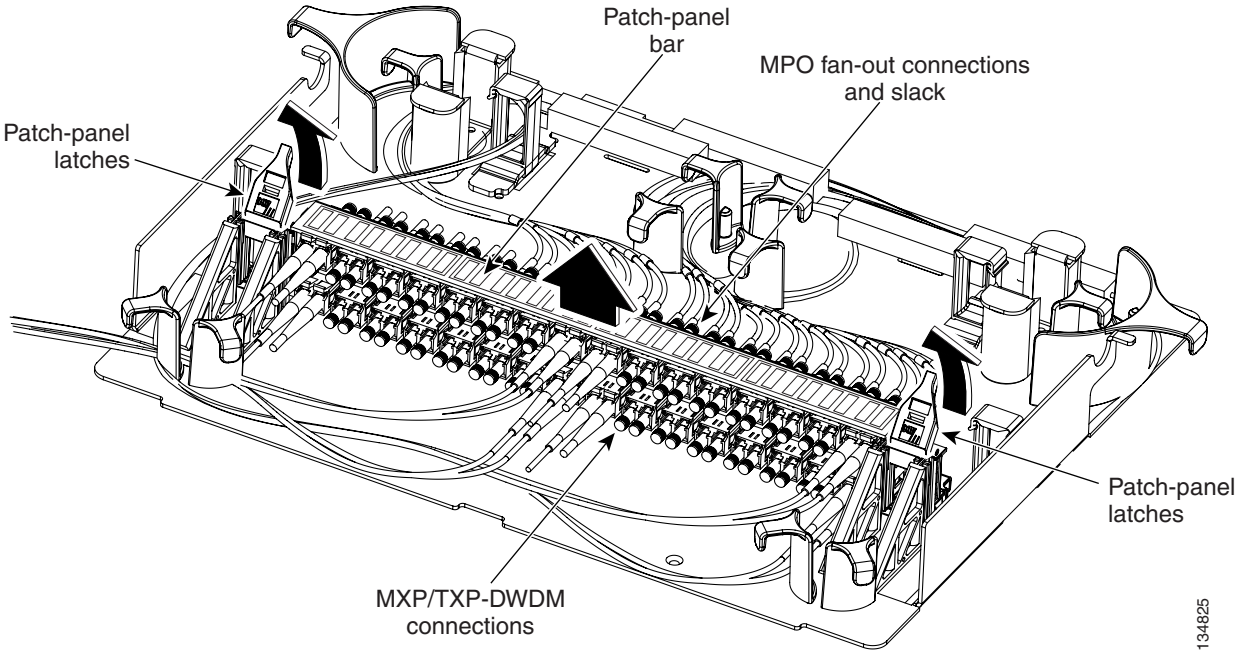
Purpose	This task describes how to route fiber-optic cables to the patch panel from 32MUX-O, 32WSS, 32DMX-O, and 32DMX cards in a terminal, hub, or ROADM node.
Tools/Equipment	The following node types require the following equipment. The cards and patch panels should already be installed before you begin this procedure. Terminal node: • 32DMX-O card (1) • 32MUX-O card (1) • Patch panel (1) • Multifiber push-on (MPO) cables (8) Hub node: • 32DMX-O card (2) • 32MUX-O card (2) • Patch panel (2) • MPO cables (16) ROADM node: • 32WSS card (2) • 32DMX card (2) • Patch panel (2) • MPO cables (16)
Prerequisite Procedures	NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs, page 3-39
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note For a ROADM or hub node, two patch panels will be used, one for the east side and one for the west. The east side 32WSS/32DMX card will connect to the east patch panel. The west side 32WSS/32DMX card will connect to the west patch panel.

Step 4 Choose either the east or west-side of the shelf to cable the 32WSS and 32DMX cards, or 32MUX-O and 32DMX-O cards.

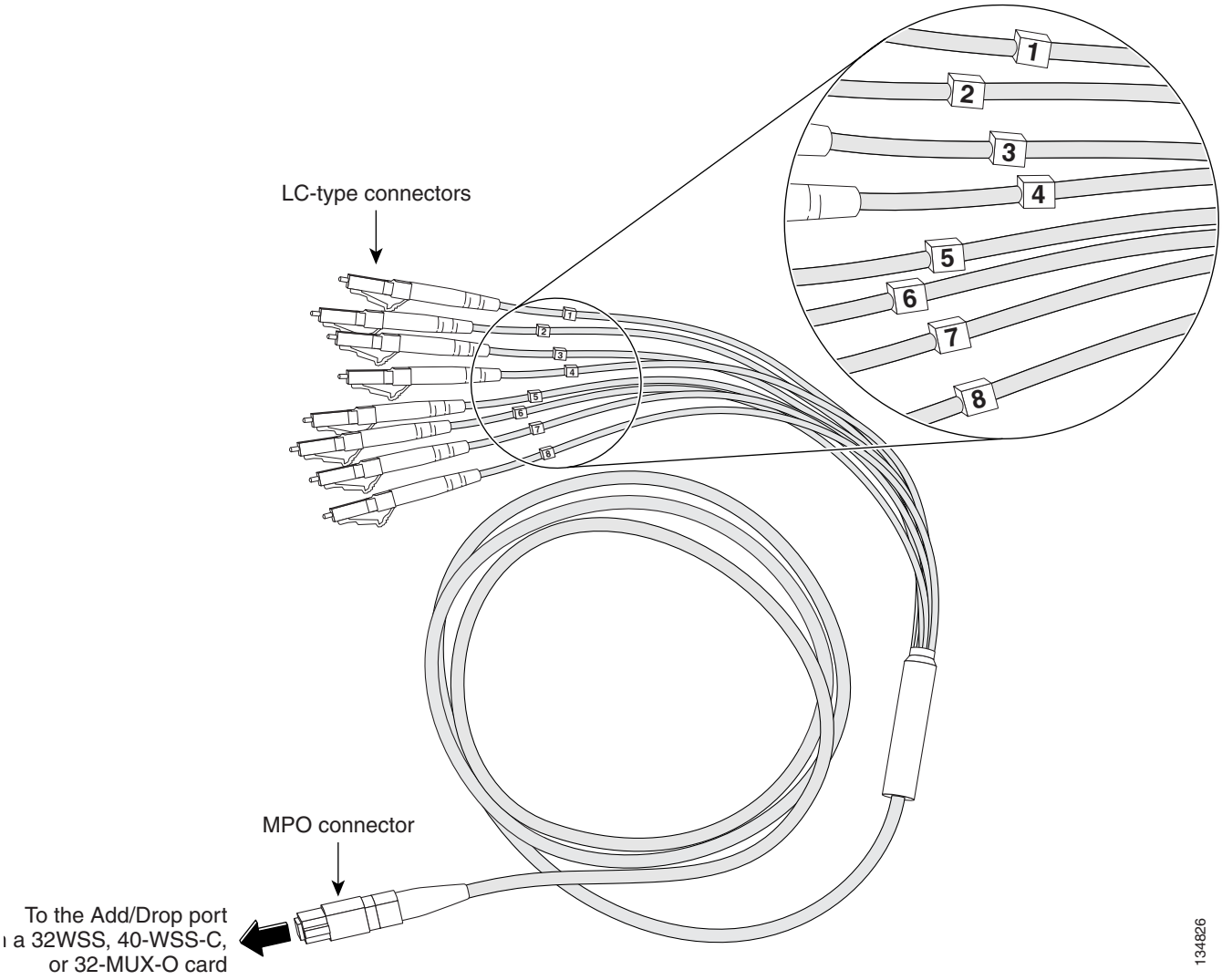
Step 5 On the patch panel, pull up firmly on the two latches and use them to slide the patch panel up until it snaps in place above the tray (Figure 3-18).

Figure 3-18 Using the Patch-Panel Latches to Slide the Patch Panel Away from the Tray



Step 6 At the 32WSS or 32MUX-O card in the node, plug the MPO connector of an MPO cable (Figure 3-19) into the top Add RX port (30.3 -36.6) of the card. If you are connecting to the next MPO cable, plug it into the MPO connector below the previous MPO cable.

Figure 3-19 MPO Cable



Step 7 Route the MPO cable slack through the patch-panel tray as necessary.

Caution When you close the patch-panel tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the patch-panel tray, make sure adequate cable slack remains.

Step 8 While facing the front of the patch panel, at the rear of the patch panel plug the eight LC-connector fan-out cables on the MPO cable into their corresponding connectors on the bottom row of the patch panel. You should plug the fan-out cables from left to right (as you face the patch panel), following the numbers tagged (1 through 8) on the cables.

Figure 3-20 shows the patch-panel connectors from the rear of the patch-panel tray. Figure 3-21 shows the assigned wavelengths for each port on the patch panel, as indicated at the top of the patch-panel bar. The numbers on the patch-panel bar correspond to a 15xx.xx wavelength on the ITU grid.

Figure 3-20 Rear View of the Patch Panel

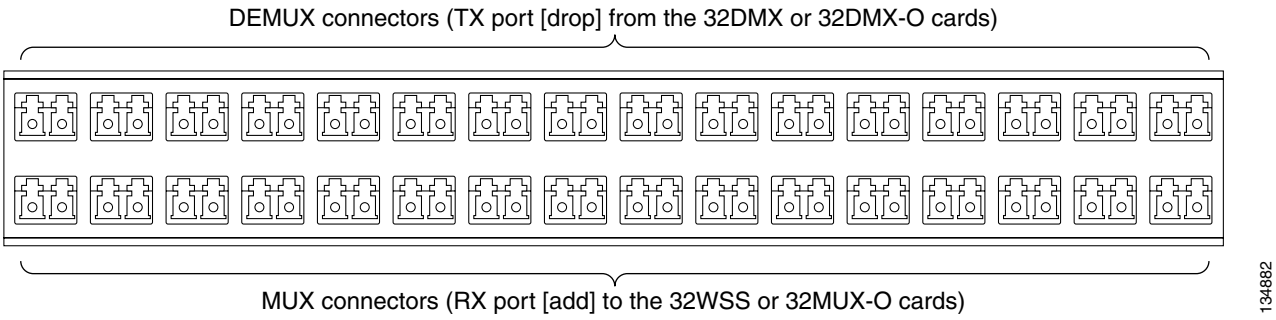
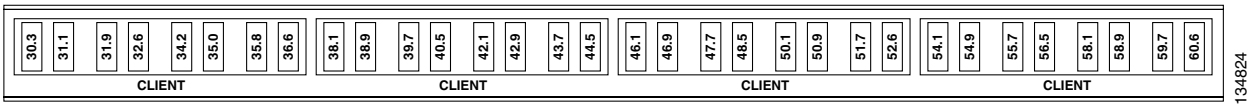


Figure 3-21 Top View of the Patch-Panel Bar



Step 9 As necessary, repeat Steps 6 through 8 for the remaining three Add Rx ports on the 32WSS or MUX-O card, until all 32 connectors on the bottom row of the rear of the patch panel are connected.

Step 10 At the adjacent 32DMX or DMX-O card in that side of the shelf, plug the MPO connector of an MPO cable into the top ADD RX port (30.3 -36.6) of the 32DMX or DMX-O card. If you are connecting to the next MPO cable, plug it into the MPO connector below the previous MPO cable.

Step 11 Route the MPO cable slack through the patch-panel tray as necessary.

Caution When you close the patch-panel tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the patch-panel tray, make sure adequate cable slack remains.

Step 12 While facing the front of the patch panel, at the rear of the patch panel plug the eight LC-connector fan-out cables on the MPO cable into their corresponding connectors on the top row of the patch panel. You should plug the fan-out cables from left to right (as you face the patch panel), following the numbers tagged (1 through 8) on the cables.

Step 13 As necessary, repeat Steps 10 through 12 for the remaining three Add Rx ports on the 32DMX card, until all 24 connectors on the top row of the rear of the patch panel are connected.

Step 14 For a hub or ROADM node, repeat Steps 6 through 13 to cable the other side of the shelf to the second patch panel. For a terminal node, go to Step 15.

Step 15 Return to your originating procedure (NTP).

DLP-G316 Install Fiber-Optic Cables from a TXP/MXP Node to the Patch Panel

Purpose	This task describes how to route fiber-optic cables from the patch panel to TXP/MXP cards in a transponder/muxponder shelf.
Tools/Equipment	TXP/MXP card(s) Fiber-optic cable(s)
Prerequisite Procedures	NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs, page 3-39
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 At the appropriate TXP/MXP card, plug a fiber-optic cable into the TX port of the DWDM connector.

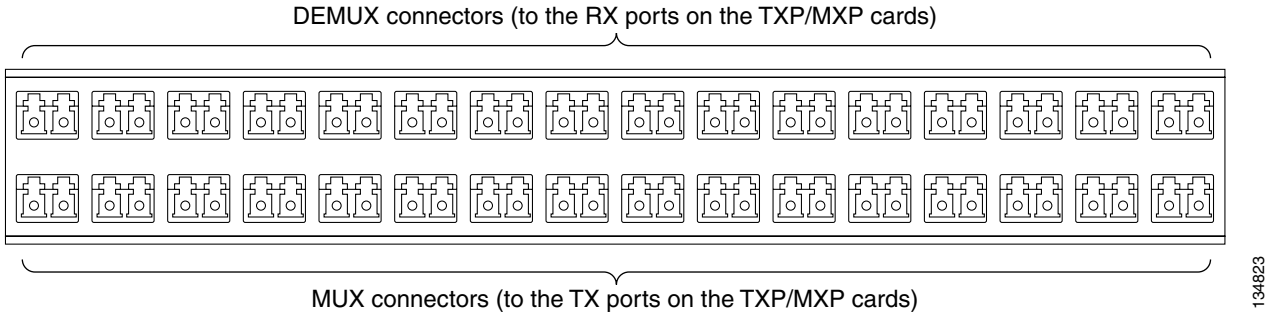
Step 2 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 14-38 on page 14-40).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

Step 3 On the DWDM (front) side of the patch panel, plug the other end of the cable into the connector on the bottom row that corresponds to the wavelength to which the TXP/MXP port is tuned. (See Figure 3-21 on page 3-67 for a view of the wavelengths assigned to the patch-panel connectors).

Figure 3-22 shows the patch-panel connectors from the front of the patch-panel tray.

Figure 3-22 Front View of the Patch Panel



Step 4 Plug a fiber-optic cable into the RX port of the DWDM connector on that TXP/MXP card.

Step 5 On the DWDM (front) side of the patch panel, plug the other end of the cable into the connector on the top row that corresponds to the wavelength to which the TXP/MXP port is tuned.

Step 6 Repeat Steps 1 through 5 for all of the TXP/MXP cards you want to connect to this patch panel.

Step 7 Return to your originating procedure (NTP).

NTP-G141 Install Fiber-Optic Cables for Y-Cable Protection Modules

Purpose	This procedure installs and routes fiber-optic cables from the client signal to the Y-cable protection module (single mode or multimode), and from the Y-cable module to the transponder node. Using one Y-cable protection module, you can protect one client signal with two TXP/MXP cards, and two client signals with four TXP/MXP cards.
Tools/Equipment	Fiber-optic cables
Prerequisite Procedures	DLP-G32 Install the Y-Cable Protection Modules, page 1-69 NTP-G32 Install the Transponder and Muxponder Cards, page 3-31
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note See the "14.4 FlexLayer and Y-Cable Protection" section on page 14-9 for more information about Y-cable protection.

Step 1 Install fiber-optic cables between the TXP/MXP cards and Y-cable module, and between the client device(s) and Y-cable module. As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray as you install cables between the Y-cable module and TXP/MXP cards (Figure 14-38 on page 14-40).

Caution When you close the fiber-storage tray, the cables must not be pinched, and the cable bend radius must be equal to or greater than the minimum radius that is recommended in your site specifications. As you route each cable through the fiber-storage tray, make sure adequate cable slack remains.

To protect one client signal, connect the fiber-optic cables according to either Table 3-5 or Table 3-6. To protect two client signals using a single Y-cable module, connect the cables according to both Table 3-5 and Table 3-6.

Table 3-5 Cable Connections for Y-Cable Protection of One Client Signal

From	To (Y-Cable Port Number)
Client 1 TX port	10
Client 1 RX port	5
TXP/MXP 1 TX port	1
TXP/MXP 1 RX port	2

Table 3-5 Cable Connections for Y-Cable Protection of One Client Signal (continued)

From	To (Y-Cable Port Number)
TXP/MXP 2TX port	6
TXP/MXP 2RX port	7

Table 3-6 Cable Connections for Y-Cable Protection of a Second Client Signal

From	To (Y-Cable Port Number)
Client 2 TX port	12
Client 2 RX port	11
TXP/MXP 3 TX port	3
TXP/MXP 3 RX port	4
TXP/MXP 4 TX port	8
TXP/MXP 4 RX port	9

Stop. You have completed this procedure.

NTP-G36 Calculate Cable Connections

Purpose	This procedure verifies the cards that are installed in the shelf and calculates the connections that should be provisioned for them.
Tools/Equipment	Cisco MetroPlanner shelf layout Cisco MetroPlanner Internal Connections table
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to provision the DWDM cable connections. If you are already logged in, continue with Step 2.

Step 2 Click the **Provisioning > WDM-ANS > Connections** tabs.

Step 3 Click **Calculate Connections**.

CTC verifies that the cards installed in the ONS 15454 shelf are compatible and will operate together as a valid DWDM node configuration. Furthermore, based on the cards installed or pre-provisioned, CTC calculates the intra-shelf patch cords that are expected to be installed. If the cards are not compatible or missing, for example, if an OPT-BST is installed but an OSCM card is not installed, the calculate connections function generates an error.

Note The connections calculation is not based on the Cisco MetroPlanner shelf layout. Calculations are based on the cards that are physically installed. If the Cisco MetroPlanner shelf layout calls for a hub node but OADM cards are installed, CTC calculates connections based on the cards expected for an OADM node.

Step 4 If no errors were generated, continue with Step 5. If errors appear, verify that the cards installed in the shelf match the Cisco MetroPlanner shelf layout. If the wrong cards are installed or are missing, install the correct cards following the "NTP-G30 Install the DWDM Cards" procedure on page 3-27.

Step 5 Verify that the connections in the CTC Connections tab match the connections in the Cisco MetroPlanner Internal Connections table. The CTC Connections tab will not show OPT-PRE dispersion compensation units (DCUs), connections, span connections, or connections between TXP and MXP cards and the DWDM cards.

Step 6 Complete the "DLP-G72 Create a DWDM Connection" task on page 3-71 for any connections that require manual provisioning. (Connections that require manual creation are indicated by a "Yes" in the Cisco MetroPlanner Internal Connections table Manually Set column.) If you need to delete a connection, complete the "DLP-G73 Delete a DWDM Connection" task on page 3-72.

Note Although CTC calculates most DWDM connections automatically, some connections cannot be calculated because of the DWDM card type and position. You must create these connections manually. For example, connections related to optical bypass circuits must be manually provisioned.

Stop. You have completed this procedure.

DLP-G72 Create a DWDM Connection

Purpose	This task creates a DWDM connection manually when CTC is unable to calculate the connections automatically.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > WDM-ANS > Connections** tabs.

Step 2 Click **Create**.

Step 3 In the Create Optical Link dialog box, choose the From and To slots and ports from the drop-down lists.

Step 4 If the connection is unidirectional, uncheck the **bidirectional** check box.

Step 5 Click **OK**. The new connection appears in the Connections table, but its State is "Uncommitted."

Step 6 Click the new connection in the table. Click **Commit**. The connection state changes to "Connected."

Step 7 If you need to create additional connections, repeat Steps 2 through 6 for each new connection. If not, continue with Step 8.

Step 8 Return to your originating procedure (NTP).

DLP-G73 Delete a DWDM Connection

Purpose	This task deletes a DWDM connection.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > WDM-ANS > Connection** tabs.

Step 2 Click the connection you want to delete.

Step 3 Click **Delete**, then click **Yes**.

Step 4 Return to your originating procedure (NTP).

NTP-G138 Import a Cisco MetroPlanner Configuration File

Purpose	This task imports the Cisco MetroPlanner Assisted Configuration Setup file into a node to configure the node automatically.
Tools/Equipment	A Cisco MetroPlanner Assisted Configuration Setup file prepared for the node must be available on a local or network drive Cisco MetroPlanner Installation Parameters
Prerequisite Procedures	NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Caution Importing the correct Cisco MetroPlanner configuration file is very important. Verify that have the correct MetroPlanner configuration file for your node before you begin this task. The file will have the same name as the node name in Cisco MetroPlanner.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to run automatic node setup. If you are already logged in, continue with Step 3.

Step 2 In CTC node view, click the **Provisioning > WDM-ANS > Provisioning** tabs.

Step 3 Click **Import**. The Import NE Update From File dialog box opens.

Step 4 Enter the path to the Assisted Configuration Setup file (see Table 3-1 on page 3-3), or click **Browse** and navigate to the configuration file using the Open dialog box. Click **Open**.

Step 5 Click **OK**.

Step 6 Click **OK** on the import confirmation.

The Import NE Update From File dialog box closes, and the MetroPlanner configuration settings are imported.

Step 7 Verify that the imported parameters are correct according to the printout of the MetroPlanner parameters file.

Stop. **You have completed this procedure**.

NTP-G37 Run Automatic Node Setup

Purpose	This procedure runs the CTC DWDM automatic node setup (ANS) function. ANS adjusts the values of the variable optical attenuators to equalize the per-channel power at the amplifier level.
Tools/Equipment	The Cisco MetroPlanner Installation Parameters file
Prerequisite Procedures	NTP-G36 Calculate Cable Connections, page 3-70 NTP-G138 Import a Cisco MetroPlanner Configuration File, page 3-72 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-2
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to run automatic node setup. If you are already logged in, continue with Step 2.

Step 2 Referring to the Cisco MetroPlanner Installation Parameters (see Table 3-1 on page 3-3), identify the parameters that have a Yes in the Manually Set column. If there are no parameters that have a Yes in the Manually Set column, continue with Step 6.

Step 3 In CTC, display the card where the parameter is to be provisioned in card view.

Step 4 Enter the specified Calibration parameter from the Cisco MetroPlanner Installation Parameters table. Click **Apply**.

Step 5 Repeat Steps 2 through 4 for all parameters in the Cisco MetroPlanner Installation Parameters table that display Yes in the Manually Set field.

Step 6 Change to node view.

Step 7 Click the **Provisioning > WDM-ANS > Port Status** tab.

Step 8 Click **Launch ANS**.

Step 9 In the Apply Launch ANS dialog box, click **Yes**.

Step 10 In the Launch ANS confirmation dialog box, click **OK**.

Step 11 Verify that one of the following statuses appears in the Link Status column for all ports.

- Success - Changed—The parameter setpoint was recalculated successfully.
- Success - Unchanged—The parameter setpoint did not need recalculation.
- Not Applicable—The parameter setpoint does not apply to this node type.

If one of the following statuses is shown, complete the provided instructions:

- Fail - Out of Range—The calculated setpoint is outside the expected range. Repeat the "NTP-G36 Calculate Cable Connections" procedure on page 3-70 to verify that all connections were provisioned correctly, paying attention to connections that require manual provisioning.

Note The Fail - Out of Range condition must be cleared before proceeding. Contact your next level of support if you are unable to clear this status.

- Fail - Port in IS State—The parameter could not be calculated because the port is in-service. This status should normally not appear at this point in node turnup. If it does, display the card in card view, change the port admin state to OOS,DSLB (ANSI) or Locked,disabled (ETSI) and repeat Steps 6 through 11.

Stop. **You have completed this procedure**.

NTP-G38 Provision OSC Terminations and Ring ID

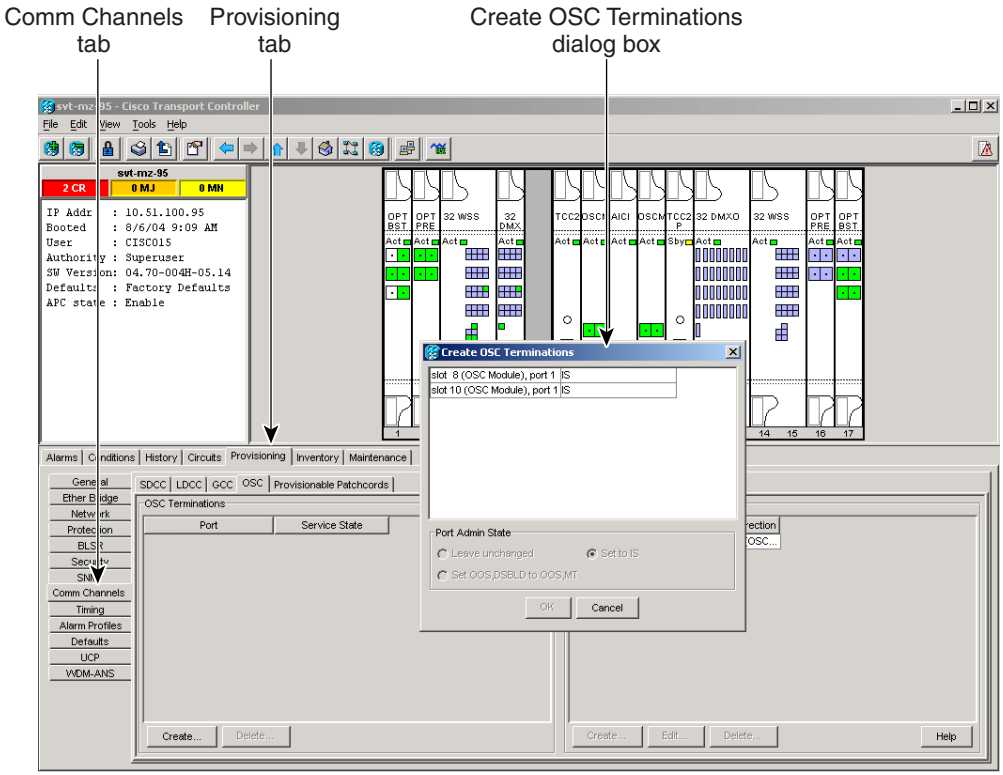
Purpose	This procedure provisions the OSC terminations and Ring ID.
Tools/Equipment	None
Prerequisite Procedures	NTP-G138 Import a Cisco MetroPlanner Configuration File, page 3-72
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to provision the OSC Terminations. If you are already logged in, continue with Step 2.

Step 2 In node view, click the **Provisioning > Comm Channels > OSC** tabs.

Step 3 In the OSC Terminations pane, click **Create** (Figure 3-23).

Figure 3-23 OSC Terminations Pane



Step 4 In the Create OSC Terminations dialog box, choose the ports where you want to create the OSC termination. To select more than one port, press the **Shift** key (to select a range of ports) or the **Ctrl** key (to select multiple individual ports), and click **OK**.

Note OSC on the DWDM node uses a separate OC3/STM1 channel to transport the section data communications channel (SDCC), which is used for ONS 15454 DCC terminations.

Ports are automatically placed in service. Until network OSC connections between adjacent nodes are created. The following alarms might appear:

- SDCC Termination Failure alarm on the OSCM or OSC-CSM card
- LOS-P alarm on the OC-3 port (port #1) on the OSCM or OSC-CSM card
- OPWR-LFAIL alarm on the OPT-BST or OSC-CSM card

Note After the OSC termination is created, the line ports are placed in service and span power levels are checked.

Step 5 In node view, click the **Provisioning > Comm Channels > OSC** tabs.

Step 6 Click the **OSC** tab.

Step 7 In the DWDM Ring ID area, click **Create.**

Step 8 In the DWDM Ring ID dialog box, enter the following information:

- Ring ID—Enter the same ID for all nodes on the ring. Choose a number from 1 to 255. The default value to be applied is 1. This applies to all nodes in the network.
- West Line—Select a card from the drop-down list. Selectable cards are OSCM or OSC-CSM. Slots 1 through 8 represent the west side of the node.
- East Line—Select a card from the drop-down list. Selectable cards are OSCM or OSC-CSM. Slots 10 through 17 represent the east side of the node.

Step 9 Click **OK**.

Stop. **You have completed this procedure**.

NTP-G39 Verify OSCM and OSC-CSM Transmit Power

Purpose	This procedure verifies the transmit power of the ONS 15454 Optical Service Channel Module (OSCM) and the Optical Service Channel + Combiner Separator Module (OSC-CSM).
Tools/Equipment	None
Prerequisite Procedures	NTP-G37 Run Automatic Node Setup, page 3-73
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to verify the OSCM or OSC-CSM transmit power. If you are already logged in, continue with Step 2.

Step 2 In the node view shelf graphic, double-click the west OSCM or OSC-CSM card.

Step 3 Click the **Maintenance > ALS** tabs.

Step 4 Click the table cell under ALS Mode and choose **Disable** from the drop-down list. Click **Apply**.

Step 5 If a second OSC-CSM or OSCM card is installed, repeat Steps 2 through 4 on the second card. If not, or if you have completed the steps, continue with Step 6.

Step 6 Complete one of the following tasks, depending on whether you are checking an OSC-CSM or OSCM card:

- DLP-G313 Verify OSC-CSM Transmit Power, page 3-77
- DLP-G314 Verify OSCM Transmit Power, page 3-78

Step 7 Display the OSC-CSM or OSCM in card view.

Step 8 Click the **Maintenance > ALS** tabs.

Step 9 From the ALS Mode drop-down list, choose **AutoRestart**. Click **Apply**.

Step 10 If a second OSC-CSM or OSCM card is installed, repeat Steps 7 through 9 on the second card.

Stop. **You have completed this procedure**.

DLP-G313 Verify OSC-CSM Transmit Power

Purpose	This procedure verifies the transmit power of the OSC_CSM card.
Tools/Equipment	None
Prerequisite Procedures	"DLP-G46 Log into CTC" task on page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Step 1 Display the OSC-CSM card in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Locate the Power parameter for Port 7, then record the value_____. If an OPT-PRE card is installed in the same side of the shelf as the OSC-CSM, continue with Step 4. If not, continue with Step 7.

Step 4 Change to node view, then click the **Provisioning > WDM-ANS** tabs.

Step 5 Record the amplifier working mode value from one of the following:

For OSC-CSM cards installed on the east side:

a. In the Selector window on the left, expand the East Side parameters tree view.

b. Expand the RX category.

c. Expand the Amplifier category, then highlight Working Mode.

d. Record the EastSide.Rx.Amplifier.Working Mode parameter displayed on the right side of the pane.

For OSC-CSM cards installed on the west side:

a. In the Selector window on the left, expand the West Side parameters tree view.

b. Expand the RX category.

c. Expand the Amplifier category, then highlight Working Mode.

d. Record the WestSide.Rx.Amplifier.Working Mode parameter displayed on the right side of the pane.

Step 6 If the value recorded in Step 5 is Control Gain, continue with Step 7. If the value recorded in Step 5 is Control Power, verify that the value recorded in Step 3 is equal to –1.5 dBm, +/- .5 dBm. If so, continue with Step 9. If not, complete the following steps:

a. Click the **Maintenance > ALS** tabs. Verify that the ALS Command is set to OSRI off. If so, continue with Step b. If not, click the cell and choose **Off** from the drop-down list. Click **Apply**, then click **Yes**.

b. Delete the two OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

c. Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

d. Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

e. Repeat Steps 3 through 8. If the power level is still not within the specified range, contact your next level of support.

Step 7 In node view, click the **Provisioning > WDM-ANS** tabs. Record the Add&Drop - Output Power value for the following:

a. If an OSC-CSM is not installed on the east side, continue with Step e. If an OSC-CSM card is installed on the east side, in the Selector window on the left, expand the East Side parameters tree view.

b. Expand the TX category.

c. Expand the Power category, then highlight Add&Drop - Output Power.

d. Record the EastSide.Tx.Power.Add&Drop - Output Power parameter displayed on the right side of the pane.

e. An OSC-CSM is not installed on the west side, continue with Step 8. OSC-CSM is installed on the west side, in the Selector window on the left, expand the West Side parameters tree view.

f. Expand the TX category.

g. Expand the Power category, then highlight Add&Drop - Output Power

h. View the WestSide.Tx.Power.Add&Drop - Output Power parameter displayed on the right side of the pane.

Step 8 Verify that the power value recorded in Step 3 is equal to the value recorded in Step 7 or –6.5 dBm, whichever is less, +/– .5 dBm. If the power level is not within this range, complete the following steps. Otherwise, continue with Step 9.

a. Click the **Maintenance > ALS** tabs. Verify that the ALS Command is set to OSRI off. If not, click the cell and choose **Off** from the drop-down list. Click **Apply**, then click **Yes**.

b. Clean the optical connections. See the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22.

c. Delete the two OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

d. Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

e. Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

f. Repeat Steps 3 through 8. If the power level is still not within the specified range, contact your next level of support.

Step 9 Return to your originating procedure.

DLP-G314 Verify OSCM Transmit Power

Purpose	This procedure verifies the transmit power of the OSCM card.
Tools/Equipment	None
Prerequisite Procedures	"DLP-G46 Log into CTC" task on page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Step 1 Display the OSCM card in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Record the Port 3 Power value _____. If an OPT-PRE card is installed in the same side of the shelf as the OSCM, continue with Step 4. If not, verify that the value is equal to –5 dBm +/– .5 dBm. If so, continue with Step 7. If not, continue with Step 6, Substep a.

Step 4 Change to node view, then click the **Provisioning > WDM-ANS** tabs.

Step 5 Record the amplifier working mode value from one of the following:

For OSCM cards installed on the east side:

a. In the Selector window on the left, expand the East Side parameters tree view.

b. Expand the RX category.

c. Expand the Amplifier category, then highlight Working Mode.

d. Record the EastSide.Rx.Amplifier.Working Mode parameter displayed on the right side of the pane.

For OCSM cards installed on the west side:

a. In the Selector window on the left, expand the West Side parameters tree view.

b. Expand the RX category.

c. Expand the Amplifier category, then highlight Working Mode.

d. Record the WestSide.Rx.Amplifier.Working Mode parameter displayed on the right side of the pane.

Step 6 If the working mode recorded in Step 5 is Control Gain, verify that the value recorded in Step 3 is equal to –5 dBm +/– .5 dBm. If the value recorded in Step 5 is Control Power, verify that the value recorded in Step 3 is equal to 0.5 dBm, +/– .5 dBm. If the power level is not within this range, complete the following steps. Otherwise, continue with Step 7.

a. Click the **Maintenance > ALS** tabs. Verify that the ALS Command is set to OSRI off. If not, click the cell and choose **Off** from the drop-down list. Click **Apply**, then click **Yes**.

b. Clean the optical connections. See the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22.

c. Complete the following procedures:

- Delete the two OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.
- Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.
- Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

d. Repeat Steps 3 through 8. If the power level is still not within the specified range, contact your next level of support.

Step 7 Return to your originating procedure.

Perform Node Acceptance Tests

This chapter provides test procedures to verify the cards installed in the ONS 15454 are performing correctly. The procedures are optional.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI (SONET) and ETSI (SDH) shelf assemblies.

Before You Begin

This section lists the non-trouble procedures (NTPs) that you need to complete to validate a DWDM node. Turn to a procedure for applicable detailed level procedures (DLPs).

1. NTP-G41 Perform the Terminal and Hub Node with 32MUX-O and 32DMX-O Cards Acceptance Test, page 4-2—Complete this procedure to test terminal and hub nodes with 32MUX-O and 32DMX-O cards installed.
2. NTP-G42 Perform the Terminal Node with 32WSS and 32DMX Cards Acceptance Test, page 4-5—Complete this procedure to test terminal nodes with 32WSS and 32DMX cards installed.
3. NTP-G43 Perform the ROADM Node Acceptance Test, page 4-8—Complete this procedure to test ROADM nodes.
4. NTP-G44 Perform the Anti-ASE Hub Node Acceptance Test, page 4-20—Complete this procedure to test anti-ASE hub nodes.
5. NTP-G45 Perform the Line Amplifier Node with OSCM Cards Acceptance Test, page 4-23—Complete this procedure to test line amplifier nodes with OSCM cards installed on both the east and west sides of the shelf.
6. NTP-G46 Perform the Line Amplifier Node with OSC-CSM Cards Acceptance Test, page 4-26—Complete this procedure to test line amplifier nodes with OSC-CSM cards installed on both the east and west sides of the shelf.
7. NTP-G47 Perform the Line Amplifier Node with OSCM and OSC-CSM Cards Acceptance Test, page 4-30—Complete this procedure to test line amplifier nodes with OSCM and OSC-CSM cards installed.
8. NTP-G48 Perform the OADM Node Acceptance Test on a Symmetric Node with OSCM Cards, page 4-33—Complete this procedure to test OADM nodes with OSCM cards installed on both the east and west sides of the shelf.

9. NTP-G49 Perform the OADM Active Node Acceptance Test on a Symmetric Node with OSC-CSM Cards, page 4-35—Complete this procedure to test OADM nodes with OSC-CSM and OPT-BST cards installed on both the east and west sides of the shelf.
10. NTP-G50 Perform the OADM Passive Node Acceptance Test on a Symmetric Node with OSC-CSM Cards, page 4-37—Complete this procedure to test OADM nodes with OSC-CSM cards installed on both the east and west sides of the shelf and no OPT-BST cards.

NTP-G41 Perform the Terminal and Hub Node with 32MUX-O and 32DMX-O Cards Acceptance Test

Purpose	This procedure tests a DWDM terminal or hub node with 32MUX-O and 32DMX-O cards.
Tools/Equipment	A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1) An optical power meter or optical spectrum analyzer 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node"
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Note This procedure tests the west side of hub nodes first, then the east side. If you are testing a terminal node, apply instructions for the west side of the hub node to the terminal side (east or west) of the terminal node.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the hub or terminal node that you want to test. If you are already logged in, continue with Step 2.

Step 2 From the View menu, choose **Go to Network View**.

Step 3 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Note If OSC terminations are created, there will be two alarms, one for low power on the Optical Booster (OPT-BST) card, and the other an OSC channel alarm.

Step 4 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are listed as Success - Changed, Success - Unchanged, or Not Applicable. If any are not, complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

Step 5 Create a physical loopback on the west or terminal OPT-BST amplifier by using a patch cord with 10-dB bulk attenuators to connect the LINE TX port to the LINE RX port.

Note An "SDCC Termination Failure" alarm will appear due to the OSC signal loopback.

Step 6 Verify that the OSC link becomes active on the west Optical Service Channel Module (OSCM) or Optical Service Channel and Combiner/Separator Module (OSC-CSM). (The OSC termination must already be provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.)

Step 7 Set the tunable laser or the TXP_MR_2.5G card to the first wavelength (1530.33 nm) of the 100-GHz ITU-T grid. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

Step 8 Connect the tunable laser transmitter or TXP_MR_2.5G card DWDM TX port to the CHAN RX 01 port on the west (or terminal) 32-Channel Multiplexer (32MUX-O) card using the available patch panel.

Step 9 Display the west (or terminal) 32MUX-O card in card view.

Step 10 Click the **Provisioning > Optical Chn > Parameters** tabs.

Step 11 Change the Port 1 Admin State to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI).

Step 12 Verify that the Port 1 power level reaches the provisioned VOA (variable optical attenuator) Power Ref setpoint.

Note The tunable laser minimum output optical power (Pout) must be 6 dBm. If the output power is lower than the specified value, the 32MUX-O card might not reach the provisioned setpoint.

Step 13 If an OPT-BST card is installed, complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 on the west (or terminal side) OPT-BST to ensure that the amplifier is working properly.

Step 14 Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 on the west (or terminal) OPT-PRE to ensure that the amplifier is working properly.

Step 15 Restore the default IS,AINS (ANSI) or Unlocked,automaticInService (ETSI) admin state to the 32MUX-O port that was changed to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) in Step 11.

Step 16 Repeat Steps 7 through 15 for the remaining 32 wavelengths of the 100-Ghz grid to verify the correct behavior of all VOAs inside the 32MUX-O card.

Step 17 Remove the loopback created in Step 5.

Step 18 If the node is a hub node, repeat Steps 5 through 17 for the east side cards.

Step 19 Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73 to restore the original configuration.

Step 20 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Stop. You have completed this procedure.

DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing

Purpose	This procedure provisions a TXP_MR_2.5G card for acceptance testing when a tunable laser is not available.
Tools/Equipment	Eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1)
Prerequisite Procedures	NTP-G32 Install the Transponder and Muxponder Cards, page 3-31 NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs, page 3-39
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 If you have installed and verified the TXP_MR-2.5G cards, continue with Step 3. If you have not installed the TXP cards, verify that you have TXP_MR_2.5G cards for every wavelength that you will test. Table 4-1 lists the TXP_MR_2.5G part numbers and wavelengths.

Table 4-1 TXP_MR_2.5G Card Wavelengths and Part Numbers

Part Number	Wavelengths
15454-MR-L1-30.3	1530.33 – 1532.68
15454-MR-L1-34.2	1534.25 –1536.61
15454-MR-L1-38.1	1538.19 – 1540.56
15454-MR-L1-42.1	1542.14 – 1544.53
15454-MR-L1-46.1	1546.12 – 1548.51
15454-MR-L1-50.1	1550.12 – 1552.52
15454-MR-L1-54.1	1554.13 – 1556.55
15454-MR-L1-58.1	1558.17 – 1560.61

Step 2 Install each TXP card using the "NTP-G32 Install the Transponder and Muxponder Cards" procedure on page 3-31. If there are not enough open slots to install all the cards at one time, you can perform the acceptance tests one TXP at a time. However, you will need to uninstall and install the TXP cards for the wavelengths being tested.

Step 3 Display the TXP_MR_2.5G for the first wavelength you are testing (see Table 4-1) in card view.

Step 4 Click the **Provisioning > Line > [*Service Type*]** subtabs where [*Service Type*] is either SONET (ANSI) or SDH (ETSI).

Step 5 Click the Admin State column for the trunk port and choose **OOS,Disable** (ANSI) or **Unlocked,disable** (ETSI) from the drop-down list.

Step 6 Click **Apply**, then click **Yes**.

Step 7 Click the **Provisioning > Card** subtabs.

Step 8 In the Wavelength field, choose the first wavelength required by the acceptance test.

Step 9 Click **Apply**.

Step 10 Click the **Provisioning > Line > [*Service Type*]** subtabs.

Step 11 Click the Admin State column for the trunk port and choose **OOS,Maintenance** (ANSI) or **Unlocked,Maintenance** (ETSI) from the drop-down list.

Step 12 Click **Apply**, then click **Yes**.

Step 13 Connect a power meter to the DWDM TX port. Verify that the output power falls within –4.5 dBm and 1 dBm. If it does not fall within this range, replace the card or contact your next level of support.

Step 14 Repeat Steps 3 through 13 for all the installed TXP cards.

Step 15 Return to the originating procedure (NTP).

NTP-G42 Perform the Terminal Node with 32WSS and 32DMX Cards Acceptance Test

Purpose	This procedure tests a DWDM terminal node with 32WSS and 32DMX cards installed.
Tools/Equipment	• A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1) • An optical power meter or optical spectrum analyzer • 1 bulk attenuator (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node"
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Note This procedure creates an optical loopback on the OPT-BST line. An optical signal is sent from the 32WSS input (add) to the OPT-BST common RX and back out the OPT-BST TX line. The OPT-BST line receives the looped signal from the OPT-BST TX. It then passes the signal to the OPT-BST common TX and into the OPT-PRE common RX. The OPT-PRE sends the signal to the 32DMX. The optical signal from the tunable laser or TXP_MR_2.5G must pass successfully through the 32WSS and out the 32DMX.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the hub or terminal node that you want to test. If you are already logged in, continue with Step 2.

Step 2 Display the terminal node in node view.

Step 3 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Note If OSC terminations are created, an OSC channel alarm will appear.

Step 4 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are listed as Success - Changed, Success - Unchanged, or Not Applicable. If any are not, or if errors (indicated in red) appear, delete the OSC channels and complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73. Provision the OSC channels when complete.

Step 5 Create a physical loopback on the OPT-BST or OCSM or OSC-CSM amplifier by using a patch cord with 10-dB bulk attenuators to connect the LINE TX port to the LINE RX port.

Note An "SDCC Termination Failure" alarm will appear due to the OSC signal loopback. This is observed as an alarm on Port 1 of the OSCM or OSC-CSM card.

Step 6 Wait 90 seconds, then verify that the OSC link is active on the west Optical Service Channel Module (OSCM) or Optical Service Channel and Combiner/Separator Module (OSC-CSM) by observing whether or not the LOS alarm on the OSCM or OSC-CSM and the OPT-BST card (if present) clears. (The OSC Termination must already be provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.)

Step 7 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 8.

a. Set the output power to a nominal value, such as –3 dBm.

b. Set the tuner to the wavelength you will test, then continue with Step 9.

Step 8 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1, if needed.

Step 9 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the CHAN RX 01 port on the 32-Channel Wavelength Selective Switch (32WSS) card using the available patch panel.

Note The tunable laser minimum output optical power (Pout) must be –6 dBm. If the output power is lower than –6 dBm, the 32WSS card might not reach the provisioned set point.

Step 10 Display the 32WSS card in card view.

Step 11 Click the **Provisioning > Optical Chn Optical Connector [n] > Parameters** tabs, where n = the optical connector number that carries the wavelengths you will test. Refer to Table 4-2 on page 4-9, if needed.

Step 12 Click the **Admin State** table cell for the Add port carrying the tested wavelength, then choose **OOS,MT** (for ANSI) or **Locked,maintenance** (ETSI) from the drop-down list. For example, if the tested wavelength is 1530.33 (shown as 1530.3), you would click the Port 1 Admin State field and choose OOS,MT or Locked,maintenance from the drop-down list.

Step 13 Change the Admin State of the pass-through (PT) port corresponding to the port in Step 8 to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). For example, if the tested wavelength is 1530.33 (shown as 1530.3), you would click the Port 33 Admin State field and choose OOS,MT or Locked,maintenance

from the drop-down list. Refer to Table 4-2 on page 4-9, if needed.Click the **Provisioning > Optical Chn Optical Connector [n] > Parameters** tabs, where n = the optical connector number that carries the wavelength under test.

Step 14 Click **Apply**, then click **Yes**.

Step 15 Click the **Maintenance** tab.

Step 16 For Channel #1, change Operating Mode to **Add Drop**.

Step 17 Click **Apply**, then click **Yes**.

Step 18 Click the **Provisioning > Optical Chn > Parameters** tabs.

Step 19 Verify that the actual power coming from the tunable laser or TXP-MR-2.5G card shown under the Power column is equal to the specified VOA Power Ref power shown in the same row.

Step 20 Click the **Optical Line** tab.

Step 21 Verify that the TX COM port (#67) has the same power as the VOA Power Ref set point in Step19. This verifies that the optical signal is traveling correctly through the WSS card.

Step 22 Verify that the Port 1 power level reaches the provisioned VOA Power Ref setpoint.

Step 23 If an OPT-BST card is installed, complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 on the OPT-BST to ensure that the amplifier is working properly.

Step 24 Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 on the OPT-PRE to ensure that the amplifier is working properly.

Step 25 Complete the "DLP-G269 Verify the 32DMX-O Power" task on page 4-40 or "DLP-G270 Verify the 32DMX Power" task on page 4-41 to verify the 32DMX-O or 32DMX card is powered correctly.

Step 26 Display the 32WSS in card view.

Step 27 Click the **Maintenance** tab.

Step 28 For the circuit (channel) under test, click the **Operating Mode** table cell and choose **Not Assigned** from the drop-down list.

Step 29 Click **Apply**, then **Yes**.

Step 30 Click the **Provisioning > Optical Chn: Optical Connector** tabs.

Step 31 Click the **Admin State** table cell then choose **IS,AINS** (for ANSI) or **Unlocked,AutomaticInService** (ETSI) from the drop-down list for all ports that were changed to OOS,MT or Locked,Maintenance.

Step 32 Repeat Steps 7 through 31 for the remaining 31 wavelengths of the 100-Ghz grid to verify the correct behavior of all variable optical attenuators (VOAs) inside the 32WSS card.

Step 33 Restore the default admin states to the OPT-BST, OPT-PRE, and 32DMX ports that were changed to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) in Steps 12. Remove the loopback created in Step 5.

Step 34 Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73 to restore the original configuration.

Step 35 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Stop. You have completed this procedure.

NTP-G43 Perform the ROADM Node Acceptance Test

Purpose	The ROADM node acceptance test verifies that the node is operating properly before you connect it to the network. The test verifies that each add/drop and pass-through port on the 32WSS and 32DMX card operates properly and verifies the operation of the amplifiers. The test also checks the power levels at each transmit and receive port to ensure that power loss in the cabling is within tolerance.
Tools/Equipment	• A tunable laser or eight TXP cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4) • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node"
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Note Because the node is isolated and no line-side fibers are connected during the test, the power levels going into the line-side components will not be the same as a real network setup. Therefore, if the ROADM shelf does not contain OPT-BST and OPT-PRE amplifiers on both the east and west sides, you must lower the OPT-PRE power thresholds so it turns on properly. At the end of the test, you will run automatic node setup to configure the node with the correct parameters for the network acceptance test.

Step 1 Make a copy of Table 4-2 and place it in a convenient location for reference throughout this procedure. The table shows the 32WSS ports and wavelengths assigned to them. The 32 wavelengths are divided among four physical MPO connectors on the 32WSS card. Each MPO connector is assigned eight wavelengths. In CTC, the MPO connector appears in the card view Provisioning > Optical Connector subtab. Each Optical Connector subtab represents an MPO connector. Ports 1 through 32 are the receive (RX) ports; Ports 33 through 64 are the pass-through (PT) ports.

Table 4-2 32WSS Ports and Wavelengths Test Checklist

32WSS Provisioning Subtab	Port #	Wavelength	Tested PT	Tested Add/Drop West	Tested Add/Drop East
Optical Chn:	RX 1, PT 33	1530.33			
Optical Connector 1	RX 2, PT 34	1531.12			
	RX 3, PT 35	1531.90			
	RX 4, PT 36	1532.68			
	RX 5, PT 37	1534.25			
	RX 6, PT 38	1535.04			
	RX 7, PT 39	1535.82			
	RX 8, PT 40	1536.61			
Optical Chn:	RX 9, PT 41	1538.19			
Optical Connector 2	RX 10, PT 42	1538.98			
	RX 11, PT 43	1539.77			
	RX 12, PT 44	1540.56			
	RX 13, PT 45	1542.14			
	RX 14, PT 46	1542.94			
	RX 15, PT 47	1543.73			
	RX 16, PT 48	1544.53			
Optical Chn:	RX 17, PT 49	1546.12			
Optical Connector 3	RX 18, PT 50	1546.92			
	RX 19, PT 51	1547.72			
	RX 20, PT 52	1548.51			
	RX 21, PT 53	1550.12			
	RX 22, PT 54	1550.92			
	RX 23, PT 55	1551.72			
	RX 24, PT 56	1552.52			
Optical Chn:	RX 25, PT 57	1554.13			
Optical Connector 4	RX 26, PT 58	1554.94			
	RX 27, PT 59	1555.75			
	RX 28, PT 60	1556.55			
	RX 29, PT 61	1558.17			
	RX 30, PT 62	1558.98			
	RX 31, PT 63	1559.79			
	RX 32, PT 64	1560.61			

Step 2 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the ROADM node that you want to test. If you are already logged in, continue with Step 3.

Step 3 Display the ROADM node in node view.

Step 4 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Note The OSC terminations created during node turnup will generate two alarms for each side of the shelf, one for loss of signal on the Optical Booster (OPT-BST) card, and the other an LOS alarm on the OSC_CSM or OSCM card.

Step 5 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are listed as Success - Changed, Success - Unchanged, or Not Applicable. If any are not, complete the following steps:

a. Delete the two OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

b. Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

c. Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Step 6 Display the east 32WSS in card view.

Step 7 Click the **Provisioning > Optical Chn Optical Connector [n] > Parameters** tabs, where n = the optical connector number that carries the wavelengths you will test. Refer to Table 4-2 on page 4-9, if needed.

Step 8 Click the **Admin State** table cell for the Add port carrying the tested wavelength, then choose **OOS,MT** (for ANSI) or **Locked,maintenance** (ETSI) from the drop-down list. For example, if the tested wavelength is 1530.33 (shown as 1530.3), you would click the Port 1 Admin State field and choose OOS,MT or Locked,maintenance from the drop-down list.

Step 9 Change the Admin State of the pass-through (PT) port corresponding to the port in Step 8 to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). For example, if the tested wavelength is 1530.33 (shown as 1530.3), you would click the Port 33 Admin State field and choose OOS,MT or Locked,maintenance from the drop-down list. Refer to Table 4-2 on page 4-9, if needed.

Step 10 Click **Apply**, then click **Yes** to confirm.

Step 11 Repeat Steps 7 through 10 for all wavelengths that you will test.

Step 12 Display the west 32WSS in card view.

Step 13 Repeat Steps 7 through 10 for the west 32WSS card.

Step 14 Display the east 32DMX or 32-DMX-O in card view and complete the steps below:

For a 32-DMX:

a. Choose the **Provisioning > Optical Line > Parameters** tabs.

b. For Port 33, click the **Admin State** table cell and choose **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) from the drop-down list.

c. Click **Apply**, then click **Yes** to confirm.

For a 32DMX-O:

a. Choose **Provisioning > Optical Chn > Parameters** tabs.

b. For each wavelength being tested, click the **Admin State** table cell and choose **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) from the drop-down list.

c. Click **Apply**, then click **Yes** to confirm.

Step 15 Repeat Step 14 for the west 32DMX or 32DMX-O card.

Step 16 Complete the "DLP-G310 Verify ROADM Node Pass-Through Channels" task on page 4-12.

Step 17 Complete the following tasks for channels that will be added or dropped on the node.

- DLP-G311 Verify the East ROADM Add/Drop Channels, page 4-16.
- DLP-G312 Verify the West ROADM Add/Drop Channels, page 4-18

Step 18 Display the east 32WSS in card view.

Step 19 Click the **Provisioning > Optical Chn Optical Connector [n] > Parameters** tabs, where n = the optical connector number that carries the wavelengths you tested.

Step 20 Click the **Admin State** table cell then choose **IS,AINS** (for ANSI) or **Unlocked,AutomaticInService** (ETSI) from the drop-down list for all ports that were changed to OOS,MT or Locked,Maintenance.

Step 21 Click **Apply**.

Step 22 Repeat Steps 19 and 21 for all the ports that are **OOS,MT** or **Locked,maintenance on the east 32WSS card.**

Step 23 Display the west 32WSS in card view.

Step 24 Repeat Steps 19 through 21 for all ports on the west 32WSS card.

Step 25 Display the east 32DMX in card view.

Step 26 Choose the **Provisioning > Optical Line > Parameters** tabs.

Step 27 For Port 33, click the **Admin State** table cell and choose **IS,AINS** (ANSI) or **Unlocked,AutomaticInService** (ETSI) from the drop-down list.

Step 28 Click **Apply**.

Step 29 Display the west 32DMX card in card view.

Step 30 Repeat Steps 26 through 28 for the west 32DMX card.

Step 31 Delete both OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

Step 32 Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

Step 33 Create the two OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Step 34 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment failure alarms appear on the node. If alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Stop. **You have completed this procedure**.

DLP-G310 Verify ROADM Node Pass-Through Channels

Purpose	This procedure verifies the signal flow through a ROADM node for pass-through channels. Configuring a channel pass-through mode means the channel passes through both 32WSS cards. The channel passes through the first 32WSS from the COM RX port to the EXP TX port. In the second 32WSS, the channel goes from the EXP RX port to the COM TX port. The channel is not terminated inside the node.
Tools/Equipment	• A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4) • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	"DLP-G46 Log into CTC" task on page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Step 1 Create a physical loopback on the west OPT-BST or OSC-CSM by connecting the LINE TX port to its LINE RX port. For OPT-BST cards, connect a 10-dB bulk attenuator to the fiber. (OSC-CSM cards do not require attenuation.)

Caution Failure to use proper attenuation may damage equipment.

Step 2 If an OPT-PRE amplifier is installed on the west side (where the physical loopback was created), perform the following steps. If not, continue with Step 3.

a. Display the OPT-PRE card in card view, then click the **Provisioning > Optical Line > Optics Thresholds** tabs.

b. Under Types, click **Alarm**, then click **Refresh**. The alarm thresholds for the OPT-PRE will appear.

c. Double click the Power Failure Low table cell for Port 1 (1-Line-2-1 RX) and delete current value.

d. Type a new value of **–30**, then press **Enter** on your computer, then click **Apply** in the CTC window.

e. If an OPT-PRE is installed on the east side, complete Steps a through d for the east OPT-PRE. If an OPT-PRE is not installed on the east side, continue with Step 3.

Step 3 Wait 2-3 minutes, then in node view click the **Alarms** tab. Verify that the LOS alarm on the west OSCM or OSC-CSM, and the OPT-BST cards have cleared. The clearing of the LOS alarms indicates the OSC link is active on the west side.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback.

Step 4 Display the west 32WSS card in card view.

Step 5 Click the **Maintenance** tab.

Step 6 For each wavelength that you will test, click the table cell under Operating Mode and choose **Pass Through from the drop-down list**.

Step 7 Click **Apply**, then click **Yes** to confirm.

Step 8 Display the east 32WSS card in card view.

Step 9 Repeat Steps 5 through 7 for the east 32WSS card.

Step 10 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 11.

- **a.** Set the output power to a nominal value, such as –3 dBm.
- **b.** Set the tuner to the wavelength you will test, then continue with Step 12.

Step 11 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1, if needed.

Step 12 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the east OPT-BST or OSC-CSM LINE RX port. If an east OPT-PRE is installed, insert a 10 dB attenuator on the fiber coming from the TXP_MR_2.5G card.

Caution Failure to use proper attenuation may damage equipment.

Step 13 If an east OPT-PRE card is installed, complete the following steps. If not, continue with Step 14.

- **a.** Display the east OPT-PRE in card view.
- **b.** Click the **Provisioning > Optical Line > Parameters** tabs.
- **c.** Locate the Power parameter for Port 1. Record the value.
- **d.** Display the east OPT-BST or OSC-CSM in card view.
- **e.** Click the **Provisioning > Optical Line > Parameters** tabs.
- **f.** Locate the Power value for Port 2 (if an OPT-BST) or Port 3 (if an OSC-CSM). Verify that the value matches the power recorded in Step c, +/– 1.5 dB. If not, use the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 to clean the fiber connection between the OPT-PRE and OPT-BST or OSC-CSM.
- **g.** Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40.

Step 14 Verify the east 32WSS to OPT-BST, OPT-PRE or OSC-CSM cable connection:

- **a.** Display the east 32WSS in card view.
- **b.** Click the **Provisioning > Optical Line > Parameters tabs.**
- **c.** Locate the Port 68 Power parameter. Record the value.
- **d.** If an east OPT-PRE is installed, display it in card view, and complete the step below. If not, continue with Step e.
  - Click the **Provisioning > Opt.Ampli.Line > Parameters** tabs and read the Total Output Power value for Port 2, then continue with Step g.
- **e.** **If an east OPT-BST is installed,** display it in card view, and complete the step below. If not, continue with Step f.
  - Click the **Provisioning > Opt.Ampli.Line > Parameters** tabs and read the Power value for Port 3, then continue with Step g.

f. **D**isplay the east OSC-CSM in card view, click the **Provisioning > Optical Line > Parameters** tabs and read the Power value for Port 2, then continue with Step g.

g. Verify that the value in Step d, e, or f matches the power recorded in Step c, +/– 1.5 dB. If not, use the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 to clean the fiber connection between the 32WSS and the OPT-PRE, OPT-BST or OSC-CSM cards.

Step 15 Verify the EXPRESS cable connection between the two 32WSS cards:

a. Display the east 32WSS in card view.

b. Click the **Provisioning > Optical Line > Parameters** tabs.

c. Locate the Port 65 Power parameter. Record the value.

a. Display the west 32WSS in card view.

b. Click the **Provisioning > Optical Line > Parameters** tabs.

c. Locate the Power value for Port 66. Verify that the value matches the power recorded in Step c., +/– 1 dB. If not, use the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 to clean the fiber connection between the 32WSS cards

Step 16 Display the west 32WSS card in card view.

Step 17 Click the **Provisioning** > **Optical Chn Optical Connector [n]** > **Parameters** tabs, where n = the connector number containing the wavelength you are testing. Refer to Table 4-2 on page 4-9, if needed.

Step 18 Wait approximately 60 seconds, then locate the Power and VOA Power Ref parameters for the tested pass-through port. Verify that the Power value is equal to the VOA Power Ref value, +/– 1.5 dBm.

Step 19 If an OPT-BST is installed on the east side, complete the following steps. If not, continue with Step 20.

a. Display the east OPT-BST in card view.

b. Click the **Provisioning > Optical Line > Parameters** tabs.

c. Locate the Port 1 Power parameter. Record the value.

d. Display the east 32WSS in card view.

e. Click the **Provisioning > Optical Line > Parameters** tabs.

f. Locate the Power value for Port 67. Verify that the value matches the power recorded in Step c., +/– 1 dB. If not, use the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 to clean the fiber connection between the OPT-BST and 32WSS cards.

g. Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39.

Step 20 If an west OPT-PRE card is installed, complete the following steps. If not, continue with Step 14.

a. Display the west OPT-PRE in card view.

b. Click the **Provisioning > Optical Line > Parameters** tabs.

c. Locate the Power parameter for Port 1. Record the value.

d. Display the west OPT-BST or OSC-CSM in card view.

e. Click the **Provisioning > Optical Line > Parameters** tabs.

f. Locate the Power value for Port 2 (if an OPT-BST) or Port 3 (if an OSC-CSM). Verify that the value matches the power recorded in Step c, +/– 1.5 dB. If not, use the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 to clean the fiber connection between the OPT-PRE and OPT-BST or OSC-CSM.

g. Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40.

Step 21 Verify the west 32WSS to OPT-BST, OPT-PRE or OSC-CSM cable connection:

a. Display the west 32WSS in card view.

b. Click the **Provisioning > Optical Line > Parameters tabs.**

c. Locate the Port 68 Power parameter. Record the value.

d. If an west OPT-PRE is installed, display it in card view, and complete the step below. If not, continue with Step e.

- Click the **Provisioning > Opt.Ampli.Line > Parameters** tabs and read the Total Output Power value for Port 2, then continue with Step g.

e. **If an west OPT-BST is installed,** display it in card view, and complete the step below. If not, continue with Step f.

- Click the **Provisioning > Opt.Ampli.Line > Parameters** tabs and read the Power value for Port 3, then continue with Step g.

f. **D**isplay the west OSC-CSM in card view, click the **Provisioning > Opt.Ampli.Line > Parameters** tabs and read the Power value for Port 2, then continue with Step g.

g. Verify that the value in Step d, e, or f matches the power recorded in Step c, +/– 1.5 dB. If not, use the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 to clean the fiber connection between the 32WSS and the OPT-PRE, OPT-BST or OSC-CSM cards.

Step 22 Verify the EXPRESS cable connection between the two 32WSS cards:

a. Display the west 32WSS in card view.

b. Click the **Provisioning > Optical Line > Parameters** tabs.

c. Locate the Port 65 Power parameter. Record the value.

a. Display the east 32WSS in card view.

b. Click the **Provisioning > Optical Line > Parameters** tabs.

c. Locate the Power value for Port 66. Verify that the value matches the power recorded in Step c., +/– 1 dB. If not, use the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 to clean the fiber connection between the 32WSS cards

Step 23 Display the east 32WSS card in card view.

Step 24 Click the **Provisioning** > **Optical Chn Optical Connector [n]** > **Parameters** tabs, where n = the connector number containing the wavelength you are testing. Refer to Table 4-2 on page 4-9, if needed.

Step 25 Wait approximately 60 seconds, then locate the Power and VOA Power Ref parameters for the tested pass-through port. Verify that the Power value is equal to the VOA Power Ref value, +/– 1.5 dBm. If the power value is not equal to the VOA Power Ref value, +/– 1.5 dBm, check your connections and clean the fibers from the 32WSS to the patch panel and from the patch panel to the TXP card using the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22, then repeat Step 24. If this does not change the power value, consult your next level of support.

Step 26 If an OPT-BST is installed on the east side, complete the following steps. If not, continue with Step 27.

a. Display the east OPT-BST in card view.

b. Click the **Provisioning > Optical Line > Parameters** tabs.

c. Locate the Port 1 Power parameter. Record the value.

d. Display the east 32WSS in card view.

e. Click the **Provisioning > Optical Line > Parameters** tabs.

f. Locate the Power value for Port 67. Verify that the value matches the power recorded in Step c., +/– 1 dB. If not, use the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 to clean the fiber connection between the OPT-BST and 32WSS cards.

g. Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39.

Step 27 Repeat Steps 10 through 26 for the remaining wavelengths to be tested. If you have tested all the wavelengths, continue with Step 28.

Step 28 Display the east 32WSS card in card view.

Step 29 Click the **Maintenance** tab.

Step 30 Under Operating Mode, click the table cell and choose **Not Assigned from the drop-down list** for all wavelengths.

Step 31 Click **Apply**, then click **Yes** to confirm.

Step 32 Display the west 32WSS in card view.

Step 33 Repeat Steps 29 through 31 for the west 32WSS card.

Step 34 Remove the TXP or tunable laser from the east OPT-BST or OSC-CSM line side TX and RX ports.

Step 35 Remove the loopback fiber from the line RX and TX in the west OPT-BST or OSC-CSM card.

Step 36 Return to your originating procedure.

DLP-G311 Verify the East ROADM Add/Drop Channels

Purpose	This procedure verifies the signal flow through the east side of a ROADM node for add/drop channels.
Tools/Equipment	• A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4) • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	"DLP-G46 Log into CTC" task on page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Step 1 In node view, display the Alarms tab.

Step 2 Create a physical loopback on the east OPT-BST or OSC-CSM by connecting the LINE TX port to its LINE RX port. For OPT-BST cards, connect a 10-dB bulk attenuator to the fiber. (OSC-CSM cards do not require attenuation.)

Caution Failure to use proper attenuation may damage equipment.

Step 3 Wait 2-3 minutes, then click the **Alarms** tab. Verify that the LOS alarm on the east OSCM or OSC-CSM, and the OPT-BST cards have cleared. The clearing of the LOS alarm indicates the OSC link is active on the east side.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback.

Step 4 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 5.

a. Set the output power to a nominal values, such as –3 dBm.

b. Set the tuner to the wavelength you are testing, then continue with Step 7.

Step 5 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1 on page 4-4, if needed.

Step 6 If you are using a TXP_MR_2.5G, connect the TX port to a power meter and record the output power.

Step 7 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the east side fiber patch panel MUX port that corresponds to the east 32WSS card port carrying the tested wavelength.

Step 8 Connect the TXP_MR_2.5G DWDM RX port or the power meter RX port to the east side fiber patch panel DMX port that corresponds to the east 32DMX card port carrying the tested wavelength.

Step 9 Display the east 32WSS in card view.

Step 10 Click the **Maintenance** tab.

Step 11 For each wavelength that you will test, click the table cell under Operating Mode and choose **Add Drop from the drop-down list**.

Step 12 Click **Apply**, then click **Yes** to confirm.

Step 13 Click the **Provisioning > Optical Chn Optical Connector [n] > Parameters** tabs, where n = the connector number containing the wavelength you are testing. Refer to Table 4-2 on page 4-9, if needed.

Step 14 Scroll to the right until you see the Power Add parameter. Verify that the Power Add value for the tested port is equal to the output power level of the tunable laser or TXP_MR_2.5G card (measured in Step 6). +/– 1 dBm**.**

Step 15 Display the east 32DMX card in card view.

Step 16 Click the **Provisioning > Optical Chn > Parameters** tab. Record the value under the Power parameter for the wavelength under test.

Step 17 Verify that the power value from Step 16 reaches the EastSide.Rx.Power.Add&Drop - Drop Power setpoint +/– 1 dBm. To view this setpoint:

a. Go to node view and click the **Provisioning > WDM-ANS > Provisioning** tabs.

b. In the Selector window on the left, expand the East Side parameters tree view.

c. Expand the RX category.

d. Expand the Power category, then highlight Add&Drop - Drop Power

e. View the EastSide.Rx.Power.Add&Drop - Drop Power parameter on the right side of the pane.

If the power values do not match, +/– 2 dBm, remove, clean and replace each cable on the east side of the shelf. See the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22**.**

Step 18 Display the TXP_MR_2.5G in card view.

Step 19 Click the **Performance > Optics PM > Current Values** tabs.

Step 20 Under the Port 2 (Trunk) column, locate the RX Optical Power value. Verify that the value matches the power in Step 16 +/– 2 dBm. If the power values do not match, +/– 2 dBm, remove, clean and replace the cable connecting the TXP_MR_2.5G RX port to the east fiber patch panel DMX port for the tested wavelength. See the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22. Repeat this step. If the power values still do not match, +/– 2 dBm, contact your next level of support.

Step 21 Repeat Steps 4 through 20 for the remaining wavelengths.

Step 22 Display the east 32WSS in card view.

Step 23 Click the **Maintenance** tab.

Step 24 Click the table cell under Operating Mode and choose **Not Assigned from the drop-down list for all wavelengths**.

Step 25 Click **Apply**, then click **Yes** to confirm.

Step 26 Disconnect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port from the east side fiber patch panel MUX port that corresponds to the east 32WSS card port carrying the tested wavelength.

Step 27 Disconnect the TXP_MR_2.5G DWDM RX port or the power meter RX port from the east side fiber patch panel DMX port that corresponds to the east 32DMX card port carrying the tested wavelength.

Step 28 Unplug the physical loopback fiber from the line TX and RX in the OPT-BST or OSC-CSM card.

Step 29 Return to your originating procedure.

DLP-G312 Verify the West ROADM Add/Drop Channels

Purpose	This procedure verifies the signal flow through the west side of a ROADM node for add/drop channels.
Tools/Equipment	• A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4) • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	"DLP-G46 Log into CTC" task on page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Note Throughout this task, west refers to Slots 1 through 8, and east refers to Slots 10 through 17.

Step 1 In node view, display the Alarms tab.

Step 2 Create a physical loopback on the west OPT-BST or OSC-CSM by connecting a fiber with 10-dB bulk attenuator from the OPT-BST LINE TX port to its LINE RX port. For OPT-BST cards, connect a 10-dB bulk attenuator to the fiber. (OSC-CSM cards do not require attenuation.)

Caution Failure to use proper attenuation may damage equipment.

Step 3 Wait 90 seconds, then click the **Alarms** tab. Verify that the LOS alarms on the west OSCM or OSC-CSM, and the OPT-BST cards have cleared. The clearing of the LOS alarms indicates the OSC link is active on the west side.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback.

Step 4 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 5.

a. Set the output power to a nominal values, such as –3 dBm.

b. Set the tuner to the wavelength you are testing, then continue with Step 7.

Step 5 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1, if needed.

Step 6 If you are using a TXP_MR_2.5G, connect the TX port to a power meter and record the output power.

Step 7 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the west side fiber patch panel MUX port that corresponds to the west 32WSS card port carrying the tested wavelength.

Step 8 Connect the TXP_MR_2.5G DWDM RX port to the west side fiber patch panel DMX port that corresponds to the west 32DMX card port carrying the tested wavelength.

Step 9 Display the west 32WSS in card view.

Step 10 Click the **Maintenance** tab.

Step 11 For each wavelength that you will test, click the table cell under Operating Mode and choose **Add Drop from the drop-down list**.

Step 12 Click **Apply**, then click **Yes** to confirm.

Step 13 Click the **Provisioning > Optical Chn Optical Connector [n] > Parameters** tabs, where n = the connector number containing the wavelength you are testing. Refer to Table 4-2 on page 4-9, if needed.

Step 14 Scroll to the right until you see the Power Add parameter. Verify that the Power Add value for the tested port is equal to the output power level of the tunable laser or TXP_MR_2.5G card (measured in Step 6). +/– 1 dBm**.**

Step 15 Display the west 32DMX card in card view.

Step 16 Click the **Provisioning > Optical Chn > Parameters** tab. Record the value under the Power parameter for the wavelength under test.

Step 17 Verify that the power value from Step 16 reaches the WestSide.Rx.Power.Add&Drop - Drop Power setpoint +/– 2 dBm. To view this setpoint:

a. Go to node view and click the **Provisioning > WDM-ANS > Provisioning** tabs.

b. In the Selector window on the left, expand the West Side parameters tree view.

c. Expand the RX category.

d. Expand the Power category, then highlight Add&Drop - Drop Power

e. View the WestSide.Rx.Power.Add&Drop parameter on the right side of the pane.

If the power values do not match, +/– 2 dBm, remove, clean and replace each cable on the west side of the shelf. See the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22.

Step 18 Display the TXP_MR_2.5G in card view.

Step 19 Click the **Performance > Optics PM > Current Values** tabs

Step 20 Under the Port 2 (Trunk) column, locate the RX Optical Power value. Verify that the value matches the power in Step 16 +/– 2 dBm. If the power values do not match, +/– 2 dBm, remove, clean and replace the cable connecting the TXP_MR_2.5G RX port to the west fiber patch panel DMX port for the tested wavelength. See the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22. Repeat this step. If the power values still do not match, +/– 2 dBm, contact your next level of support.

Step 21 Repeat Steps 4 through 20 for the remaining wavelengths.

Step 22 Display the west 32WSS in card view.

Step 23 Click the **Maintenance** tab.

Step 24 Click the table cell under Operating Mode and choose **Not Assigned from the drop-down list for all wavelengths**.

Step 25 Click **Apply**, then click **Yes** to confirm.

Step 26 Remove the TXP or tunable laser from the west side patch panel.

Step 27 Unplug the physical loopback fiber from the line TX and RX in the OPT-BST or OSC-CSM card.

Step 28 Return to your originating procedure.

NTP-G44 Perform the Anti-ASE Hub Node Acceptance Test

Purpose	This procedure tests an anti-ASE hub node.
Tools/Equipment	• A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1) • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node."
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to perform the acceptance test. If you are already logged in, continue with Step 2.

Step 2 From the View menu, choose **Go to Network View**.

Step 3 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Note The OSC terminations created during node turnup will generate two alarms for each side of the shelf, one for loss of signal on the Optical Booster (OPT-BST) card, and the other an LOS alarm on the OSC_CSM or OSCM card.

Step 4 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are Success - Changed, Success - Unchanged, or Not Applicable. If any are not, complete the following steps:

a. Delete the two OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

b. Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

c. Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Step 5 From your Cisco MetroPlanner site configuration file, identify the dropped and added channels that are configured in pass-through mode in both directions.

Note Configuring a channel pass-through mode means that the channel is dropped along one direction by a 32DMX-O (15xx.xx TX port) located on one side (west or east) of the shelf, and then added by another 32MUX-O (1522.22 RX port) on the opposite side of the shelf but in the same direction. The channel is not terminated inside the site.

Step 6 Create a loopback on the west OPT-BST amplifier by connecting a patch cord from the LINE TX port to the LINE RX port with a 10-dB bulk attenuator.

Step 7 Verify that the OSC link becomes active on the west OSCM or OSC-CSM card. (The OSC Termination must already be provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.)

Step 8 For pass-through channels, continue with Step 9. For add and drop channels, continue with Step 18.

Step 9 Verify the first channel connection configured in pass-through mode in both directions:

a. If you are using a tunable laser, set the output power to a nominal value, such as –3 dBm. If you are using a TXP_MR_2.5G card, continue with Step b.

b. Set the tunable laser or TXP_MR_2.5G card to a corresponding wavelength on the 100-GHz ITU-T grid. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

c. Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the LINE RX port of the east OPT-BST using a 10-dB bulk attenuator.

Step 10 Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for the east OPT-PRE amplifier.

Step 11 Complete the "DLP-G269 Verify the 32DMX-O Power" task on page 4-40 for the west 32MUX-O and 32DMX-O cards.

Step 12 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the west OPT-BST amplifier.

Step 13 Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for the west OPT-PRE amplifier.

Step 14 Complete the "DLP-G269 Verify the 32DMX-O Power" task on page 4-40 for the west 32MUX-O and 32DMX-O cards.

Step 15 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the east OPT-BST amplifier.

Step 16 Repeat Steps 9 through 15 for the remaining wavelengths on the 100-GHz grid that are pass-through wavelengths.

Step 17 If you have add and drop channels, continue with Step 18 to verify the channels. If not, continue with Step 29.

Step 18 Set the tunable laser or TXP_MR_1.5G card to the first wavelength of the 100-GHz ITU-T grid that is not a pass-through wavelength. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

Step 19 Connect the tunable laser or TXP_MR_1.5G card to the CHAN RX *nn* port on the west 32MUX-O, where *nn* is the first add or drop channel.

Step 20 Display the west 32MUX-O in card view.

Step 21 Click the **Provisioning > Optical Chn > Parameter**s tabs.

Step 22 Change the Admin State of Port *nn* to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI).

Step 23 Check that the power value on Port *nn* reaches the provisioned setpoint (VOA Power Ref).

Step 24 Display the west 32DMX-O in card view.

Step 25 Click the **Provisioning > Optical Chn > Parameter**s tabs.

Step 26 Change the Admin State of Port *nn* to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI).

Step 27 Check that the power value on Port *nn* reaches the provisioned setpoint (VOA Power Ref).

Step 28 (Optional) Connect a power meter to the CHAN TX *nn* port through the patch panel and verify that the physical optical power coming out of drop Port *nn* on the west 32DMX-O is consistent with the value read on the meter within 0.5 dB.

Step 29 Repeat Steps 18 through 28 for the remaining wavelengths on the 100-GHz grid that are not pass-through wavelengths.

Step 30 Remove the loopback connection on the west OPT-BST.

Step 31 Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73 to restore the original configuration.

Step 32 Create a loopback on the east OPT-BST amplifier by connecting a patch cord from the LINE TX port to the LINE RX port with 10-dB bulk attenuator.

Step 33 Verify that the OSC link becomes active on the east OSCM card. (The OSC termination must be already provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.)

Step 34 Repeat 18 through 33 for the east side cards.

Step 35 Remove the loopback on the east OPT-BST.

Step 36 Restore the default admin state (IS,AINS/Unlocked,automaticInService) on all the ports previously set to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI).

Stop. You have completed this procedure.

NTP-G45 Perform the Line Amplifier Node with OSCM Cards Acceptance Test

Purpose	This procedure tests a line amplifier node with OSCM cards installed on both the east and west sides of the shelf by looping a single wavelength through the shelf.
Tools/Equipment	• A tunable laser or one TXP_MR_2.5G card • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node."
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to perform the acceptance test. If you are already logged in, continue with Step 3.

Step 2 If you are using TXP_MR_2.5G cards, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Node View**.

Step 4 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Note The OSC terminations created during node turnup will generate two alarms for each side of the shelf, one for loss of signal on the Optical Booster (OPT-BST) card, and the other an LOS alarm on the OSC_CSM or OSCM card.

Step 5 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are listed as Success - Changed, Success - Unchanged, or Not Applicable. If any are not, complete the following steps:

a. Delete the two OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

b. Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

c. Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Step 6 Create a loopback on the west OPT-BST by using a fiber with a 10-dB bulk attenuator to connect the LINE TX port to the LINE RX port.

Step 7 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 8.

a. Set the output power to a nominal values, such as –3 dBm.

b. Set the tuner to the wavelength under test, then continue with Step 9.

Step 8 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1 on page 4-4, if needed.

Step 9 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the LINE RX port of the east OPT-BST using a 10-dB bulk attenuator.

Caution Failure to use proper attenuation may damage equipment.

Step 10 Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on the west OPT-BST and OSCM cards have cleared. The clearing of the LOS alarms indicates the OSC link is active on the west side.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback, an LOS-O alarm appears on the east OPT-BST card, and an LOS on the east OCSM.

If the alarms clear, continue with Step 11. If not, perform the following steps:

a. Display the west OPT-BST card in card view.

b. Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

c. Under Types, click **Alarms**, then click **Refresh**.

d. Locate the Port 2 Power Failure Low parameter. Double-click the table cell and change the value to –30 dBm.

e. Locate the Port 4 Power Failure Low parameter. Double-click the table cell and change the value to –40 dBm.

f. Click **Apply**, and then **Yes**.

g. Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on the west OPT-BST card has cleared. If so, continue with Step 11. If not, disconnect the OSCM card from the OPT-BST.

h. Create a loopback on the OSCM card by connecting a patch cable from the OSC TX port to the OSC RX port using a 10-dB bulk attenuator.

i. Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on the west OSCM card has cleared. If so, replace the OPT-BST card. If not, replace the OSCM card. See the"NTP-G30 Install the DWDM Cards" procedure on page 3-27.

Step 11 If an OPT-PRE card is installed on the east side, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for it. If not, continue with Step 12.

Step 12 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the west OPT-BST amplifier.

Step 13 If an OPT-PRE amplifier is installed on the west side, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40. It not, continue with continue with Step 14.

Step 14 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the east OPT-BST amplifier.

Step 15 Disconnect the TXP or tunable laser from the east OPT-BST card.

Step 16 Remove the loopback on the west OPT-BST created in Step 6.

Step 17 Create a loopback on the east OPT-BST by connecting a patch cord from the LINE TX port to the LINE RX port with a 10-dB bulk attenuator.

Step 18 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 19.

a. Set the output power to a nominal values, such as –3 dBm.

b. Set the tuner to the wavelength under test, then continue with Step 20.

Step 19 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1 on page 4-4, if needed.

Step 20 Connect tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the LINE RX port of the west OPT-BST using a 10-dB bulk attenuator.

Caution Failure to use proper attenuation may damage equipment.

Step 21 Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on the east OPT-BST and OSCM cards have cleared. The clearing of the LOS alarms indicates the OSC link is active on the east side.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback, an LOS-O alarm appears on the west OPT-BST card, and an LOS on the west OCSM.

If the alarms clear, continue with Step 22. If not, perform the following steps:

a. Display the east OPT-BST card in card view.

b. Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

c. Under Types, click **Alarms**, then click **Refresh**.

d. Locate the Port 2 Power Failure Low parameter. Double-click the table cell and change the value to –30 dBm.

e. Locate the Port 4 Power Failure Low parameter. Double-click the table cell and change the value to –40 dBm.

f. Click **Apply**, and then **Yes**.

g. Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on the east OPT-BST card has cleared. If so, continue with Step 22. If not, disconnect the OSCM card from the OPT-BST.

h. Create a loopback on the OSCM card by connecting a patch cable from the OSC TX port to the OSC RX port using a 10-dB bulk attenuator.

i. Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on the east OSCM card has cleared. If so, replace the OPT-BST card. If not, replace the OSCM card. See the"NTP-G30 Install the DWDM Cards" procedure on page 3-27.

Step 22 If an OPT-PRE card is installed on the west side, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for it. If not, continue with Step 23.

Step 23 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the east OPT-BST amplifier.

Step 24 If an OPT-PRE amplifier is installed on the east side, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40. It not, continue with continue with Step 25.

Step 25 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the west OPT-BST amplifier.

Step 26 Disconnect the TXP or tunable laser from the west OPT-BST card.

Step 27 Remove the loopback on the west OPT-BST amplifier created in Step 6.

Step 28 Delete both OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

Step 29 Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73 to restore the original configuration.

Step 30 Create the two OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Stop. **You have completed this procedure**.

NTP-G46 Perform the Line Amplifier Node with OSC-CSM Cards Acceptance Test

Purpose	This procedure tests a line amplifier node with OSC-CSM cards installed on both the east and west sides of the shelf by looping a single wavelength through the shelf.
Tools/Equipment	• A tunable laser or TXP_MR_2.5G card • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node."
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to perform the acceptance test. If you are already logged in, continue with Step 3.

Step 2 If you are using TXP_MR_2.5G cards, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Node View**.

Step 4 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Note The OSC terminations created during node turnup will generate LOS alarm on the OSC-CSM card.

Step 5 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are listed as Success - Changed, Success - Unchanged, or Not Applicable. If any are not, complete the following:

a. Delete the two OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

b. Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

c. Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Step 6 Create a physical loopback on the west OSC-CSM by connecting the LINE TX port to the LINE RX port with a fiber and 10-dB bulk attenuator.

Caution Failure to use proper attenuation may damage equipment.

Step 7 Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarm on the west OSC-CSM card has cleared. The clearing of the LOS alarm indicates the OSC link is active on the west side.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback, and an LOS alarm will appear for the east OSC-CSM, Port 1 (OSC).

If the alarm clears, continue with Step 8. If not, perform the following steps:

a. Remove the 10-dB bulk attenuator on the OSC-CSM LINE TX and LINE RX ports and reconnect using only the patch cord.

b. In node view, click the **Alarms** tab. If the LOS alarm on the west OSC-CSM card clears, continue with Step 8. If not, continue with Step c.

c. Display the OSC-CSM in card view.

d. Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

e. Under Types, click **Alarm**, then click **Refresh.**

f. Locate the Port 3 Power Failure Low parameter. Double-click the table cell and change the value to –30 dBm.

g. Locate the Port 6 Power Failure Low parameter. Double-click the table cell and change the value to –40 dBm.

h. Click **Apply**, and then **Yes**.

i. In node view, Click the **Alarms** tab. If the LOS alarm on the west OSC-CSM card clears, continue with Step 8. If not, replace the OSC-CSM card.

Step 8 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 9.

a. Set the output power to a nominal values, such as –3 dBm.

b. Set the tuner to the wavelength under test, then continue with Step 10.

Step 9 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1 on page 4-4, if needed.

Step 10 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the east OSC-CSM LINE RX port using a 10-dB bulk attenuator.

Caution Failure to use proper attenuation may damage equipment.

Step 11 If an OPT-PRE card is installed on the east side, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for it. If not, continue with Step 12.

Step 12 Display the west OSC-CSM card in card view.

Step 13 Click the **Provisioning > Optical Line > Parameters** tabs. Locate the Port 3 Power value. Verify that the value is higher than –30 dBm. If the power value is not higher than –30dBm, check your connections and clean the fibers using the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22. If this does not change the power value, consult your next level of support.

Step 14 If an OPT-PRE is installed on the west side of the shelf, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40. If not, continue with Step 15.

Step 15 Display the east OSC-CSM card in card view.

Step 16 Click the **Provisioning > Optical Line > Parameters** tabs. Locate the Port 2 Power value. Verify that the value is higher than –30 dBm. If the power value is not higher than –30dBm, check your connections and clean the fibers using the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22. If this does not change the power value, consult your next level of support.

Step 17 Disconnect the TXP or tunable laser from the east OSC-CSM card.

Step 18 Remove the physical loopback created on the west OSC-CSM in Step 6.

Step 19 Create a loopback on the east OSC-CSM by connecting the LINE TX port with LINE RX port using a patch cord and 10-dB bulk attenuator.

Caution Failure to use proper attenuation may damage equipment.

Step 20 Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarm on the east OSC-CSM card has cleared. The clearing of the LOS alarm indicates the OSC link is active on the east side.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback, and an LOS alarm will appear for the west OSC-CSM, Port 1 (OSC).

If the alarm clears, continue with Step 21. If not, perform the following steps:

a. Remove the 10-dB bulk attenuator on the OSC-CSM LINE TX and LINE RX ports and reconnect using only the patch cord.

b. Wait 90 seconds then, in node view, click the **Alarms** tab. If the LOS alarm on the east OSC-CSM card clears, continue with Step 21. If not, continue with Step c.

c. Display the OSC-CSM in card view.

d. Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

e. Under Types, click **Alarm**, then click **Refresh.**

f. Locate the Port 3 Power Failure Low parameter. Double-click the table cell and change the value to –30 dBm.

g. Locate the Port 6 Power Failure Low parameter. Double-click the table cell and change the value to –40 dBm.

h. Click **Apply**, and then **Yes**.

i. In node view, Click the **Alarms** tab. If the LOS alarm on the east OSC-CSM card clears, continue with Step 21. If not, replace the OSC-CSM card.

Step 21 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 22.

a. Set the output power to a nominal values, such as –3 dBm.

b. Set the tuner to the wavelength under test, then continue with Step 23.

Step 22 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1 on page 4-4, if needed.

Step 23 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the west OSC-CSM LINE RX port using a 10-dB bulk attenuator.

Caution Failure to use proper attenuation may damage equipment.

Step 24 If an OPT-PRE card is installed on the west side, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for it. If not, continue with Step 25.

Step 25 Display the east OSC-CSM card in card view.

Step 26 Click the **Provisioning > Optical Line > Parameters** tabs. Locate the Port 3 Power value. Verify that the value is higher than –30 dBm. If the power value is not higher than –30dBm, check your connections and clean the fibers using the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22. If this does not change the power value, consult your next level of support.

Step 27 If an OPT-PRE is installed on the east side of the shelf, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for the east OPT-PRE amplifier. If not, continue with Step 28.

Step 28 Display the west OSC-CSM card in card view.

Step 29 Click the **Provisioning > Optical Line > Parameters** tabs and locate the Power value for Port 2. Verify that the value is higher than –30 dBm. If the power value is not higher than –30dBm, check your connections and clean the fibers using the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22. If this does not change the power value, consult your next level of support.

Step 30 Disconnect the TXP or tunable laser from the west OSC-CSM card.

Step 31 Remove the loopback created on the east OSC-CSM in Step 6.

Step 32 Delete both OSC channels. See the "DLP-G186 Delete an OSC Termination" task on page 10-30.

Step 33 Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73 to restore the original configuration.

Step 34 Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Stop. You have completed this procedure.

NTP-G47 Perform the Line Amplifier Node with OSCM and OSC-CSM Cards Acceptance Test

Purpose	This procedure tests a line amplifier node with an OSC-CSM card installed on one side of the shelf and an OSCM card installed on the other.
Tools/Equipment	• A tunable laser or TXP_MR_2.5G card • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node."
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to perform the acceptance test. If you are already logged in, continue with Step 2.

Step 2 If you are using TXP_MR_2.5G cards, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Node View**.

Step 4 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Note The OSC terminations created during node turnup will generate two alarms for each side of the shelf, one for loss of signal on the Optical Booster (OPT-BST) card, and the other an LOS alarm on the OSC_CSM or OSCM card.

Step 5 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are listed as Success - Changed, Success - Unchanged, or Not Applicable. If any are not, complete the following:

a. Delete the two OSC channels using the "DLP-G186 Delete an OSC Termination" task on page 10-30.

b. Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

c. Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Step 6 Create a loopback on the OSC-CSM card by connecting the LINE TX port to the LINE RX port using a patch cord and 10-dB bulk attenuator.

Caution Failure to use proper attenuation may damage equipment.

Step 7 Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarm on the OSC-CSM card has cleared. The clearing of the LOS alarm indicates the OSC link is active for this side of the shelf.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback.

If the alarm clears, continue with Step 8. If not, perform the following steps:

a. Remove the 10-dB bulk attenuator on the OSC-CSM LINE TX and LINE RX ports and reconnect using only the patch cord.

b. In node view, click the **Alarms** tab. If the LOS alarm on the OSC-CSM card clears, continue with Step 8. If not, continue with Step c.

c. Display the OSC-CSM in card view.

d. Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

e. Under Types, click **Alarm**, then click **Refresh.**

f. Locate the Port 3 Power Failure Low parameter. Double-click the table cell and change the value to –30 dBm.

g. Locate the Port 6 Power Failure Low parameter. Double-click the table cell and change the value to –40 dBm.

h. Click **Apply**, and then **Yes**.

i. In node view, Click the **Alarms** tab. If the LOS alarm on the OSC-CSM card clears, continue with Step 21. If not, replace the OSC-CSM card.

Step 8 If you are using a tunable laser, follow the manufacturer's instructions to complete the following steps. If you are using a TXP_MR_2.5G card, continue with Step 9.

a. Set the output power to a nominal values, such as –3 dBm.

b. Set the tuner to the wavelength under test, then continue with Step 11.

Step 9 If you are using a TXP_MR_2.5G card, complete the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4 for the TXP containing the wavelength you will test. Refer to Table 4-1 on page 4-4, if needed.

Step 10 Measure the TXP output power by connecting the TXP DWDM TX port to a test meter. Record the results for future reference.

Step 11 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the OPT-BST LINE RX port using a 10-dB bulk attenuator.

Caution Failure to use proper attenuation may damage equipment.

Step 12 Display the OPT-BST in card view.

Step 13 Click the **Provisioning > Optical Line > Parameters** tabs. Verify that the power value on Port 2 (Out Com) is equal to the optical power from the tunable laser or TXP_MR_2.5G card (measured in Step 10) +/– 1 dBm.

Step 14 If an OPT-PRE card is installed on the side opposite the OSC-CSM, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for it. If not, continue with Step 15.

Step 15 Display the OSC-CSM card in card view.

Step 16 Click the **Provisioning > Optical Line > Parameters** tabs and locate the Port 3 Power value. Verify that the value is higher than –30 dBm. If the power value is not higher than –30dBm, check your connections and clean the fibers using the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22. If this does not change the power value, consult your next level of support.

Step 17 If an OPT-PRE card is installed on the same side as the OSC-CSM, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for it. If not, continue with Step 18.

Step 18 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the OPT-BST card.

Step 19 Disconnect the TXP or tunable laser from the OPT-BST card.

Step 20 Remove the loopback fiber on the OSC-CSM card.

Step 21 Delete both OSC channels. See the "DLP-G186 Delete an OSC Termination" task on page 10-30.

Step 22 Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73 to restore the original configuration.

Step 23 Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Step 24 Create a loopback on the OPT-BST card by connecting the LINE TX port with LINE RX port using a patch cord and 10-dB bulk attenuator.

Step 25 Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on the OPT-BST and OSCM cards have cleared. The clearing of the LOS alarms indicates the OSC link is active for this side of the shelf.

Note An SDCC Termination Failure alarm will continue to appear due to the OSC signal loopback.

If the alarms clear, continue with Step 26. If not, perform the following steps:

a. Display the OPT-BST card in card view.

b. Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

c. Under Types, click **Alarms**, then click **Refresh**.

d. Locate the Port 2 Power Failure Low parameter. Double-click the table cell and change the value to –30 dBm.

e. Locate the Port 4 Power Failure Low parameter. Double-click the table cell and change the value to –40 dBm.

f. Click **Apply**, and then **Yes**.

g. Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on the OPT-BST card has cleared. If so, continue with Step 25. If not, disconnect the OSCM card from the OPT-BST.

h. Create a loopback on the OSCM card by connecting a patch cable from the OSC TX port to the OSC RX port using a 10-dB bulk attenuator.

i. Wait 90 seconds, then in node view click the **Alarms** tab. Verify that the LOS alarms on OSCM card has cleared. If so, replace the OPT-BST card. If not, replace the OSCM card. See the"NTP-G30 Install the DWDM Cards" procedure on page 3-27.

Step 26 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the OSC-CSM LINE RX port using a 10-dB bulk attenuator.

Step 27 If an OPT-PRE is installed on the same side of the shelf as the OSC-CSM, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40. If not, continue with Step 27.

Step 28 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the OPT-BST card.

Step 29 Display the OSC-CSM card in card view.

Step 30 Click the **Provisioning > Optical Line > Parameters** tabs. Verify that the power value on Port 3 (Out Com) is equal to the optical power from the tunable laser or TXP_MR_2.5G card (measured in Step 10 +/– 1 dBm.

Step 31 If an OPT-PRE card is installed on the side opposite the OSC-CSM, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for it. If not, continue with Step 32.

Step 32 Disconnect the TXP or tunable laser from the OSC-CSM card.

Step 33 Remove the loopback fiber on the OPT-BST amplifier card.

Step 34 Delete both OSC channels. See the "DLP-G186 Delete an OSC Termination" task on page 10-30.

Step 35 Complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73 to restore the original configuration.

Step 36 Create the OSC channels using the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Stop. **You have completed this procedure**.

NTP-G48 Perform the OADM Node Acceptance Test on a Symmetric Node with OSCM Cards

Purpose	This procedure checks the integrity of all the optical connections inside an OADM node with OSCM cards installed on both the east and west sides of the shelf. Three connection types are tested: • Express • Pass-through • Add/Drop
Tools/Equipment	A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1) An optical power meter or optical spectrum analyzer Two bulk attenuators (10 dB) with LC connectors
Prerequisite Procedures	Chapter 3, "Turn Up a Node."
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the OADM node where you want to perform the acceptance test. If you are already logged in, continue with Step 2.

Step 2 From the View menu, choose **Go to Network View**.

Step 3 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Step 4 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are Success - Changed, Success - Unchanged, or Not Applicable. If not, complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

Step 5 Check your Cisco MetroPlanner site configuration file to verify the presence of added and dropped bands (including four channels at 100 GHz) configured in pass-through mode in either direction.

Note Configuring a band in pass-through mode means the band is dropped in one direction by an AD-xB-xx.x card on one side (east or west) of the node, then added by another AD-xB-x.xx card on the opposite side in the same direction. The band is not terminated inside the node.

Step 6 If no bands are configured in pass-through mode, continue with Step 7. If a band is configured in pass-through mode, mark it and skip the related optical test for the express, add, and drop sections. Band pass-through connections are verified separately.

Step 7 Check the site configuration file from Cisco MetroPlanner to verify the presence of dropped or added channels configured in pass-through mode in either direction.

Note Configuring a channel in pass-through mode means the channel is dropped in one direction by an AD-xC-xx.x card on one side (east or west) of the node, then added by another AD-xC x.xx card on the opposite side in the same direction. The channel is not terminated inside the node.

Step 8 If no channels are configured in pass-through mode, continue with Step 9. If a channel is configured in pass-through mode, mark it and skip the related optical test for the express, add, and drop sections. Channel pass-through connections are verified separately.

Step 9 Create a loopback on the west OPT-BST by connecting the LINE TX port to the LINE RX port using a patch cord and 10-dB bulk attenuator.

Step 10 Verify that the OSC link becomes active on the west OSCM card. (The OSC termination must be already provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.) If the OSC link becomes active, continue with Step 11. If the OSC link does not turn up, complete the following steps:

a. Modify the OSC Fail Low thresholds. Click the **Provisioning > Optical Line > Optics Thresholds** tabs and change the Port 4 opwrMin (minimum power) to –40 dBm.

b. Modify the COM TX Fail Low Threshold. Change the Port 2 opwrMin (minimum power) to –30 dBm.

c. If the OSC link turns up, continue with Step 11. If the OSC link is still down, disconnect the OSCM card from the OPT-BST.

d. Create a loopback on the OSCM card by connecting patch cable from the OSC TX port to the OSC RX port using a 10-dB bulk attenuator.

e. If the OSC link turns up, replace the OPT-BST card. If the OSC link does not turn up, replace the OSCM card.

Note Due to the OSC signal loopback, an SDCC Termination Failure alarm might be raised.

Step 11 If the node has express bands or channels, complete the "DLP-G85 Verify Express Channel Connections on an OADM Node with OSCM Cards" task on page 4-43. If the node does not have express bands or channels, continue with Step 12.

Step 12 If connections configured in pass-through mode are present (noted inSteps 5 and 7), complete the "DLP-G89 Verify OADM Node Pass-Through Channel Connections" task on page 4-47. If not, continue with Step 13.

Step 13 If connections have add/drop connections, complete the "DLP-G93 Verify Add and Drop Connections on an OADM Node with OSCM Cards" task on page 4-51.

Stop. **You have completed this procedure**.

NTP-G49 Perform the OADM Active Node Acceptance Test on a Symmetric Node with OSC-CSM Cards

Purpose	This procedure checks the integrity of all the optical connections inside an OADM node with OSC-CSM and OPT-BST cards installed on both the east and west sides of the shelf. Three connection types are tested: • Express • Pass-through • Add/Drop
Tools/Equipment	• A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1) • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node."
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the OADM node where you want to perform the acceptance test. If you are already logged in, continue with Step 2.

Step 2 From the View menu, choose **Go to Network View**.

Step 3 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Step 4 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are Success - Changed, Success - Unchanged, or Not Applicable. If not, complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

Step 5 Check the Cisco MetroPlanner site configuration file to verify the presence of added and dropped bands (including 4 channels at 100 GHz) configured in pass-through mode in either direction.

Note Configuring a band in pass-through mode means the band is dropped in one direction by an AD-xB-xx.x card on one side (east or west) of the node, then added by another AD-xB-x.xx card on the opposite side in the same direction. The band is not terminated inside the node.

Step 6 If no bands are configured in pass-through mode, continue with Step 7. If a band is configured in pass-through mode, mark it and skip the related optical test for the express, add, and drop sections. Band pass-through connections are verified separately.

Step 7 Check the site configuration file from Cisco MetroPlanner to verify the presence of dropped or added channels configured in pass-through mode in either direction.

Note Configuring a channel in pass-through mode means the channel is dropped in one direction by an AD-xC-xx.x card on one side (east or west) of the node, then added by another AD-xC x.xx card on the opposite side in the same direction. The channel is not terminated inside the node.

Step 8 If no channels are configured in pass-through mode, continue with Step 9. If a channel is configured in pass-through mode, mark it and skip the related optical test for the express, add, and drop sections. Channel pass-through connections are verified separately.

Step 9 Create a loopback on the west OSC-CSM card by connecting the LINE TX port to the LINE RX port using a patch cord and a 10-dB bulk attenuator.

Step 10 Verify that the OSC link becomes active on the west OSC-CSM card. (The OSC termination must be already provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.)

Note Due to the OSC signal loopback, an SDCC Termination Failure alarm might be raised.

Step 11 If the OSC link becomes active, continue with Step 12. If the OSC link does not turn up, perform the following troubleshooting steps:

a. Remove the 10-dB bulk attenuator between the LINE TX and LINE RX connection. If the OSC link becomes active, continue with Step 11. If not, continue with Step b.

b. Modify the OSC Fail Low thresholds. Click the **Provisioning > Optical Line > Optics Thresholds** tabs and change the Port 6 opwrMin (minimum power) to –40 dBm.

c. Modify the COM TX Fail Low Threshold. Change the Port 3 opwrMin (minimum power) to –30 dBm.

d. If the OSC link turns up, continue with Step 12. If it does not turn up, replace the OSC-CSM card.

Step 12 If the node has express bands or channels, complete the "DLP-G86 Verify Express Channel Connections on an OADM Node with OSC-CSM Cards" task on page 4-44. If the node does not have express bands or channels, continue with Step 13.

Step 13 If connections configured in pass-through mode are present (noted in Steps 5 and 7), complete the "DLP-G89 Verify OADM Node Pass-Through Channel Connections" task on page 4-47. If not, continue with Step 14.

Step 14 If connections have add/drop connections, complete the "DLP-G94 Verify Add and Drop Connections on OADM Node with OSC-CSM Cards" task on page 4-54.

Stop. **You have completed this procedure**.

NTP-G50 Perform the OADM Passive Node Acceptance Test on a Symmetric Node with OSC-CSM Cards

Purpose	This procedure checks the integrity of all the optical connections inside an OADM node with OSC-CSM and no OPT-BST cards installed on the east and west sides of the shelf.Three connection types are tested: • Express • Pass-through • Add/Drop
Tools/Equipment	• A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1) • An optical power meter or optical spectrum analyzer • 2 bulk attenuators (10 dB) LC
Prerequisite Procedures	Chapter 3, "Turn Up a Node."
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the OADM node where you want to perform the acceptance test. If you are already logged in, continue with Step 2.

Step 2 From the View menu, choose **Go to Network View**.

Step 3 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear indicating equipment failure or other hardware problems. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Step 4 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs. Verify that all statuses under Link Status are Success - Changed, Success - Unchanged, or Not Applicable. If not, complete the "NTP-G37 Run Automatic Node Setup" procedure on page 3-73.

Step 5 Check the Cisco MetroPlanner site configuration file to verify the presence of a dropped/added bands (including 4 channels at 100 GHz) configured in pass-through mode in either direction.

Note Configuring a band in pass-through mode means the band is dropped in one direction by an AD-xB-xx.x card on one side (east or west) of the node, then added by another AD-xB x.xx card on the opposite side in the same direction. The band is not terminated inside the node.

Step 6 If no bands are configured in pass-through mode, continue with Step 7. If a band is configured in pass-through mode, mark it and skip the related optical test for the express, add, and drop sections. Band pass-through connections are verified separately.

Step 7 Check the site configuration file from Cisco MetroPlanner to verify the presence of dropped or added channels configured in pass-through mode in either direction.

Note Configuring a channel in pass-through mode means the channel is dropped in one direction by an AD-xC-xx.x card on one side (east or west) of the node, then added by another AD-xC x.xx card on the opposite side in the same direction. The channel is not terminated inside the node.

Step 8 If no channels are configured in pass-through mode, continue with Step 9. If a channel is configured in pass-through mode, mark it and skip the related optical test for the express, add, and drop sections. Channel pass-through connections are verified separately.

Step 9 Create a loopback on the west OSC-CSM card by connecting the LINE TX port to the LINE RX port using a patch cord and 10-dB bulk attenuator.

Step 10 Verify that the OSC link becomes active on the west OSC-CSM card. (The OSC termination must be already provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.)

Note Due to the OSC signal loopback, an SDCC Termination Failure alarm might be raised.

Step 11 If the OSC link becomes active, continue with Step 12. If the OSC link does not turn up, perform the following troubleshooting steps:

- **a.** Remove the 10-dB bulk attenuator between the LINE TX and LINE RX connection. If the OSC link becomes active, continue with Step 12. If not, continue with Step b.
- **b.** Modify the OSC Fail Low thresholds. Click the **Provisioning > Optical Line > Optics Thresholds** tabs and change the Port 6 opwrMin (minimum power) to –40 dBm.
- **c.** Modify the COM TX Fail Low Threshold. Change the Port 3 opwrMin (minimum power) to –30 dBm.
- **d.** If the OSC link turns up, continue with Step 13. If it does not turn up, replace the OSC-CSM card.

Step 12 If the node has express bands or channels, complete the "DLP-G86 Verify Express Channel Connections on an OADM Node with OSC-CSM Cards" task on page 4-44. If the node does not have express bands or channels, continue with Step 12.

Step 13 If connections configured in pass-through mode are present (noted in Steps 5 and 7), complete the "DLP-G89 Verify OADM Node Pass-Through Channel Connections" task on page 4-47. If not, continue with Step 14.

Step 14 If connections have add/drop connections, complete the "DLP-G94 Verify Add and Drop Connections on OADM Node with OSC-CSM Cards" task on page 4-54.

Stop. You have completed this procedure.

DLP-G78 Verify the 32MUX-O Power

Purpose	This task verifies 32MUX-O power.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the 32MUX-O in card view.

Step 2 Click the **Provisioning > Optical Chn > Parameters** tabs.

Step 3 Change the Admin State of the correspondent port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI).

Step 4 Check that the power value on the port reaches the provisioned setpoint (VOA Power Ref).

Step 5 Return to your originating procedure (NTP).

DLP-G79 Verify the OPT-BST Amplifier Laser and Power

Purpose	This task verifies that the OPT-BST amplifier laser is on and provisioned to the correct power.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, double-click the OPT-BST amplifier to display the card view.

Step 2 Click the **Maintenance > ALS** tabs. If the value in the Currently Shutdown field is NO, continue with Step 3. If not, complete the following steps:

- **a.** Check the OSRI setting. If it is set to On, change it to Off and click **Apply**.
- **b.** Check the Currently Shutdown field. If it changes to NO, continue with Step 3. If not, contact your next level of support. The amplifier might need to be replaced.

Step 3 Click the **Provisioning > Opt Ampli Line > Parameters** tabs.

Step 4 Click **Reset**.

Step 5 Scroll to the right and locate the Signal Output Power parameter for Port 6. Verify that the Signal Output Power value is greater than or equal to 1.5 dBm.

If the Signal Output Power is not greater than or equal to 1.5 dBm, do not continue. Begin troubleshooting or contact your next level of support.

Step 6 Return to your originating procedure (NTP).

DLP-G80 Verify the OPT-PRE Amplifier Laser and Power

Purpose	This task verifies that the OPT-PRE amplifier laser is on and provisioned to the correct power.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, double-click the OPT-PRE amplifier to display the card view.

Step 2 Click the **Maintenance > ALS** tabs.

Step 3 If the value shown in the Currently Shutdown field is NO, continue with Step 4. If not, complete the following steps:

a. If the OSRI setting is set to ON, click the table cell and choose OFF from the drop-down list.

b. Click **Apply**.

Step 4 Click the **Provisioning > Opt Ampli Line > Parameters** tabs.

Step 5 Locate the Signal Output Power parameter for Port 2. Verify that the Signal Output Power value is greater than or equal to 1.5 dBm. If the optical power is greater than or equal to 1.5 dBm, continue with Step 6. If the the optical power is less than 1.5 dBm, check your connections and clean the fibers using the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22. If this does not change the power value, consult your next level of support.

Step 6 Scroll to the right to locate the DCU Insertion Loss parameter. Verify that the DCU Insertion Loss value is less than or equal to 10 dB.

If the optical power is not greater than or equal to 10 dB, do not continue. Begin troubleshooting or contact your next level of support.

Step 7 Return to your originating procedure (NTP) or task (DLP).

DLP-G269 Verify the 32DMX-O Power

Purpose	This task verifies that the 32DMX-O card is provisioned to the correct power.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24

Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the 32DMX-O card in card view.

Step 2 Click the **Provisioning > Optical Chn > Parameters** tabs.

Step 3 Change the Admin State for the appropriate port to **OOS,DSLB** (ANSI) or **Locked,disabled** (ETSI).

Step 4 Verify that the VOA Power Ref reaches the provisioned set point.

Step 5 (Optional.) Connect a power meter to the CHAN TX 01 port through the patch panel. Verify that the physical optical power value coming from drop Port 1 on the west 32DMX-O card is consistent with the value read (the maximum allowed error is +/– 0.5 dBm).

Step 6 Return to your originating procedure (NTP).

DLP-G270 Verify the 32DMX Power

Purpose	This task verifies that the 32DMX card is provisioned to the correct power.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the 32DMX card in card view.

Step 2 Click the **Provisioning > Optical Chn > Parameters** tabs.

Step 3 Change the Admin State for Port 33 to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI)

Step 4 Verify that the VOA Power Ref reaches the provisioned set point.

Step 5 (Optional.) Connect a power meter to the CHAN TX 01 port through the patch panel. Verify that the physical optical power value coming from drop Port 1 on the west 32DMX card is consistent with the value read (the maximum allowed error is +/– 1 dBm).

Step 6 Change the Admin State for Port 1 to **OOS,DSLB** (ANSI) or **Locked,disabled** (ETSI).

Step 7 Return to your originating procedure (NTP).

DLP-G82 Verify the OSC-CSM Power

Purpose	This task verifies OSC-CSM card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24

Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the OSC-CSM card in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 If an OPT-PRE is not installed on the same side of the shelf as the OSC-CSM, verify the Port 3 Power value is higher than the default no-power value of –30 dBm. If the power is not higher than –30dBm, contact your next level of support.

Step 4 Return to your originating procedure (NTP).

DLP-G83 Verify the OSC-CSM Power on OADM Nodes

Purpose	This task verifies OSC-CSM card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the OSC-CSM card in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Verify that the Power value for Port 3 is higher than the default no-power value of –30 dBm. The calculated expected power value for Port 3 is:

Pout COM TX of last AD-xy-xx.x – IL02 OSC-CSM (COM RX > LINE TX) – 10 dB (bulk attenuator)

Step 4 Double-check the value.

Note Actual output power is affected by many factors. Always consider the calculated expected power to be a general guideline and not a precise value.

Step 5 Return to your originating procedure (NTP).

DLP-G84 Verify the OSC-CSM Incoming Power

Purpose	This task verifies OSC-CSM card incoming power.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24

Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the OSC-CSM card in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Verify that the Power value for Port 2 is higher than the default no-power value of –30 dBm. The calculated expected power value for Port 2 is:

Pout COM TX of OPT-PRE (this normally is + 2 dBm)

Note Actual output power is affected by many factors. Always consider the calculated expected power to be a general guideline and not a precise value.

Step 4 Return to your originating procedure (NTP).

DLP-G85 Verify Express Channel Connections on an OADM Node with OSCM Cards

Purpose	This task verifies the express channel connections during an OADM node acceptance.
Tools/Equipment	A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4)
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 If you are using a tunable laser, set the output power to a nominal value, such as –3 dBm. If not, continue with Step 2.

Step 2 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the east OPT-BST LINE RX port.

Step 3 Based on the Cisco MetroPlanner site configuration file, tune the tunable laser of TXP_MR_2.5G card to a wavelength (on the 100-GHz ITU-T grid) that runs on the express path of all AD-xB-xx.x and AD-xC-xx.x cards on the east-to-west and west-to-east directions. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

Step 4 If an OPT-PRE card is installed on the east side, insert a 10-dB bulk attenuator on the COM RX port and complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40. If an OPT-PRE card is not installed on the east side, continue with Step 5.

Step 5 If AD-xB-xx.x cards are installed on the east side, complete the "DLP-G87 Verify the AD-xB-xx.x Output Express Power" task on page 4-45 for each east side card. If not, continue with Step 6.

Note If AD-xB-xx.x and AD-xC-xx.x cards are both installed in one direction, the received express channels will run into the AD-xB-xx.x cards first, then into the AD-xC-xx.x cards.

Step 6 If AD-xC-xx.x cards are installed on the east side, complete the "DLP-G88 Verify the AD-xC-xx.x Output Express Power" task on page 4-46 for each east side card. If not, continue with Step 7.

Step 7 If AD-xC-xx.x cards are installed on the west side, complete the "DLP-G271 Verify the AD-xC-xx.x Output Common Power" task on page 4-46 for each west side card. If not, continue with Step 8.

Step 8 If AD-xB-xx.x cards are installed on the west side, complete the "DLP-G272 Verify the AD-xB-xx.x Output Common Power" task on page 4-46 for each west side card. If not, continue with Step 9.

Step 9 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the OPT-BST installed on the east side.

Step 10 If an OPT-PRE card is installed on the west side, complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40. If an OPT-PRE card is not installed, continue with Step 11.

Step 11 Repeat Steps 5 through 8 to the AD-xB-xx.x and AD-xC-xx.x cards along the west-to-east direction.

Step 12 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 for the OPT-BST installed on the east side.

Step 13 Return to the originating procedure (NTP).

DLP-G86 Verify Express Channel Connections on an OADM Node with OSC-CSM Cards

Purpose	This task verifies the express channel connections during an OADM node acceptance.
Tools/Equipment	A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4)
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 If you are using a tunable laser, set the output power to a nominal value, such as –3 dBm. If not, continue with Step 2.

Step 2 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the LINE RX port of the east OSC-CSM card.

Step 3 If an OPT-PRE amplifier card is installed on the east side, install a 10-dB bulk attenuator on the COM RX port.

Step 4 Based on the Cisco MetroPlanner site configuration file, tune the tunable laser or TXP_MR_2.5G card to a wavelength (on the 100-GHz ITU-T grid) that runs on the express path of all AD-xB-xx.x and AD-xC-xx.x cards on the east-to-west and west-to-east directions. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

Step 5 Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for the OPT-PRE amplifier card installed on the west side.

Step 6 If AD-xB-xx.x cards are installed on the east side, complete the "DLP-G87 Verify the AD-xB-xx.x Output Express Power" task on page 4-45 for each east side card. If not, continue with Step 7.

Note If Ad-xB-xx.xand AD-xC cards are both installed in one direction, the received express channels will run into the AD-xB-xx.x cards first, then into the AD-xC-xx.x cards.

Step 7 If AD-xC-xx.x cards are installed on the east side, complete the "DLP-G88 Verify the AD-xC-xx.x Output Express Power" task on page 4-46 for each east side card. If not, continue with Step 8.

Step 8 If AD-xC-xx.x cards are installed on the west side, complete the "DLP-G271 Verify the AD-xC-xx.x Output Common Power" task on page 4-46 for each west side card. If not, continue with Step 9.

Step 9 If AD-xB-xx.x cards are installed on the west side, complete the "DLP-G272 Verify the AD-xB-xx.x Output Common Power" task on page 4-46 for each west side card. If not, continue with Step 10.

Step 10 Complete the "DLP-G83 Verify the OSC-CSM Power on OADM Nodes" task on page 4-42 for the OSC-CSM installed on the west side.

Step 11 Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 for the OPT-PRE card installed on the east side.

Step 12 Repeat Steps 6 through 9 for the AD-xB-xx.x and AD-xC-xx.x cards along the west-to-east direction.

Step 13 Complete the "DLP-G83 Verify the OSC-CSM Power on OADM Nodes" task on page 4-42 for the OSC-CSM installed on the west side.

Step 14 Return to the originating procedures (NTPs).

DLP-G87 Verify the AD-xB-xx.x Output Express Power

Purpose	This task verifies the output express power of Band OADM (AD-xB-xx.x) cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the AD-xB-xx.x in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Change the Output Express port Admin State to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

Step 4 Verify that the Output Express port Power value is greater than the default no-power value of –28 dBm.

Step 5 Return to your originating procedure (NTP).

DLP-G88 Verify the AD-xC-xx.x Output Express Power

Purpose	This task verifies the output express power of the Channel OADM (AD-xC-xx.x) cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the AD-xC-xx.x in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Change the Output Express port Admin State to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

Step 4 Verify that the Output Express port Power value is greater than the default no-power value of –30 dBm.

Step 5 Return to your originating procedure (NTP).

DLP-G271 Verify the AD-xC-xx.x Output Common Power

Purpose	This task verifies the common power of the Channel OADM (AD-xC-xx.x) cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the AD-xC-xx.x in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Verify that the Output Com port Power value is greater than the default no-power value of –30 dBm.

Step 4 Return to your originating procedure (NTP).

DLP-G272 Verify the AD-xB-xx.x Output Common Power

Purpose	This task verifies the output common power of the Channel OADM (AD-xB-xx.x) cards.
Tools/Equipment	None

Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Display the AD-xB-xx.x in card view.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Verify that the Output Com port Power value is greater than the default no-power value of –28 dBm.

Step 4 Return to your originating procedure (NTP).

DLP-G89 Verify OADM Node Pass-Through Channel Connections

Purpose	This task verifies the pass-through channel connections during an OADM node acceptance test.
Tools/Equipment	A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4)
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Superuser

Step 1 Identify the first band connection configured in pass-through mode in both directions.

Step 2 Set the tunable laser or TXP_MR_2.5G card to the wavelength of the band to be tested. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

Step 3 Complete the "DLP-G90 Verify an AD-xB-xx.x Pass-Through Connection Power" task on page 4-48 for the first pass-through connection.

Step 4 (Optional.) Complete one of the following:

- If OSCM cards are installed, connect a power meter to the east OPT-BST LINE TX port and verify that the east amplifier is turned on by the pass-through wavelength.
- If OSC-CSM cards are installed, complete the "DLP-G84 Verify the OSC-CSM Incoming Power" task on page 4-42 for the east OSC-CSM card.

Step 5 Complete Steps 2 through 4 for all band connections configured in pass-through mode in both directions.

Step 6 If channel pass-through connections are not present, continue with Step 15. If channel pass-through connections are present, continue with one of the following steps:

- If the pass-through channel connections use an AD-xC-xx.x card, continue with Step 7.
- If the pass-through channel connections use a 4MD-xx.x card, continue with Step 11.

Step 7 Tune the tunable laser on a wavelength (1 of 4) belonging to the channel to be tested.

Step 8 Complete the "DLP-G91 Verify an AD-xC-xx.x Pass-Through Connection" task on page 4-49 for the first pass-through connection.

Step 9 (Optional.) Complete one of the following:

- If an OSCM card is installed, connect a power meter to LINE TX port on the front-pane and verify that the east OPT-BST amplifier is turned on by the pass-through wavelength.
- If an OSC-CSM card is installed, complete the "DLP-G84 Verify the OSC-CSM Incoming Power" task on page 4-42 for the east OSC-CSM card.

Step 10 If the pass-through connections use a 4-channel multiplexer/demultiplexer (4MD-xx.x), continue with Step 11. If not, continue with Step 15.

Step 11 Identify the first channel connection that is configured in pass-through mode using the 4MD-xx.x cards in both directions.

Step 12 Tune the tunable laser on the corresponding wavelength.

Step 13 Complete the "DLP-G92 Verify 4MD-xx.x Pass-Through Connection Power" task on page 4-50.

Step 14 (Optional.) Perform one of the following:

- If an OSCM card is installed, connect a power meter to LINE TX port on the card front panel and verify that the east OPT-BST amplifier is turned on by the pass-through wavelength.
- If an OSC-CSM card is installed, complete the "DLP-G84 Verify the OSC-CSM Incoming Power" task on page 4-42 for the east OSC-CSM card.

Step 15 Return to your originating procedure (NTP).

DLP-G90 Verify an AD-xB-xx.x Pass-Through Connection Power

Purpose	This task verifies an AD-xB-xx.x pass-through connection.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Verify the east AD-xB-xx.x band TX power:

a. Display the east AD-xB-xx.x in card view.

b. Click the **Provisioning > Optical Band > Parameters** tabs.

c. Change the Admin State of the BAND TX (east-to-west) port related to the wavelength selected on the tunable laser to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

d. Verify that the BAND TX port Power value is higher than the default no-power value of –30 dBm.

Step 2 Verify the west AD-xB-xx.x card RX and TX power:

a. Display the west AD-xB-xx.x card in card view.

b. Click the **Provisioning > Optical Band > Parameters** tabs.

c. Verify that the Power value of the BAND RX (east-to-west) port is higher than the default no-power value of –30 dBm.

d. Change the Admin State of the BAND TX (west-to-east) port related to the wavelength selected on the tunable laser to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

e. Verify that the BAND TX port Power value is higher than the default no-power value of –30 dBm.

Step 3 Verify the band RX port on the east AD-xB-xx.x card:

a. Display the east AD-xB-xx.x in card view.

b. Click the **Provisioning > Optical Band > Parameters** tabs.

c. Verify that the Power value of the BAND RX (West to East) port is higher than the default no-power value of –30 dBm.

Step 4 Return to your originating procedure (NTP).

DLP-G91 Verify an AD-xC-xx.x Pass-Through Connection

Purpose	This task verifies an AD-xC-xx.x pass-through connection.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Verify the east AD-xC-xx.x channel TX power:

a. Display the east AD-xC-xx.x in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Verify that the power value for the CHAN TX port is higher than the default no-power value of –35 dBm.

d. If the AD-xC-xx.x card is an AD-4C-xx.x card, a VOA (applied to all four channels) is installed along the drop path and needs to be activated in Step e.

e. Change the Admin State of the CHAN TX port related to the wavelength selected on the tunable laser to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

f. Verify that the power value of the CHAN TX port is higher than the default no-power value of –35 dBm.

Step 2 Verify the channel power for the corresponding west AD-xC-xx.x card:

a. Display the west AD-xC-xx.x card in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Verify that the power value of the CHAN TX port is higher than the default no-power value of –35 dBm.

d. Verify that the Power value of the CHAN RX port reaches the provisioned setpoint (VOA Power Ref).

e. Change the Admin State of the CHAN TX port related to the wavelength selected on the tunable laser to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

f. If the AD-xC-xx.x is an AD-4C-W card, a VOA (applying to all four channels) is installed along the drop path and needs to be activated in Step g.

g. Change the Admin State of the CHAN TX port related to the wavelength selected on the tunable laser to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

h. Verify that the power value of the CHAN TX port is higher than the default no-power value of –35 dBm.

Step 3 Verify the east AD-xC-xx.x channel RX power:

a. Display the east AD-xC-xx.x in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Change the Admin State of the CHAN RX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength selected on the tunable laser.

d. Verify that the Power value of the CHAN RX port reaches the provisioned setpoint (VOA Power Ref).

Step 4 Return to your originating procedure (NTP).

DLP-G92 Verify 4MD-xx.x Pass-Through Connection Power

Purpose	This task verifies 4MD-xx.x pass-through connection.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Verify the TX band power on the related east AD-xB-xx.x card:

a. Display the east AD-xB-xx.x card in card view.

b. Click the **Provisioning > Optical Band > Parameters** tabs.

c. Change the Admin State of the BAND TX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength selected on the tunable laser.

d. Verify that the BAND TX Power value is higher than the default no-power value of –30 dBm.

Step 2 Verify the TX power on the related east 4MD-xx.x (east-to-west) card:

a. Display the east 4MD-xx.x card in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Verify that the Power value on the CHAN TX port is higher than the default no-power value of –35 dBm.

Step 3 Verify the RX band power on the west AD-xB-xx.x card (east-to-west):

a. Display the west Ad-xB-xx.x card in card view

b. Click the Provisioning > Optical Band > Parameters tabs.

c. Verify that the BAND RX Power value is higher than the default no-power values of –30 dBm.

Step 4 Verify the west 4MD-xx.x (east-to-west):

a. Display the west 4MD-xx.x card in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Change the Admin State of the CHAN RX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength selected on the tunable laser.

d. Verify that the Power value of the CHAN RX port reaches the provisioned setpoint (VOA Power Ref).

Step 5 Verify the TX band power on the west AD-xB-xx.x (west-to-east):

a. Display the west AD-xB-xx.x card in card view.

b. Click the **Provisioning > Optical Band > Parameters** tabs.

c. Change the Admin State of the BAND TX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength selected on the tunable laser.

d. Verify that the BAND TX Power value is higher than the default no-power value of –30 dBm.

Step 6 Verify the west 4MD-xx.x (west-to-east):

a. Display the west 4MD-xx.x card in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Verify that the Power value on the CHAN TX port is higher than the default no-power value of –35 dBm.

Step 7 Verify the east 4MD-xx.x (west-to-east):

a. Display the east 4MD-xx.x card in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Change the Admin State of the CHAN RX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength selected on the tunable laser.

d. Verify that the Power value of the CHAN RX port reaches the provisioned setpoint (VOA Power Ref).

Step 8 Return to your originating procedure (NTP).

DLP-G93 Verify Add and Drop Connections on an OADM Node with OSCM Cards

Purpose	This task verifies the add and drop channel connections for an OADM node with OSCM cards installed.
Tools/Equipment	A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4)
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Superuser

Note In this task, you will verify add and drop connections in the following order: east-to-west add and west-to-east drop, Steps 1 through 15; west-to-east add and east-to-west drop, Steps 16 through 17.

Step 1 Based on the Cisco MetroPlanner site configuration file, tune the tunable laser or TXP_MR_2.5G card to a wavelength (belonging to the 100-GHz ITU-T grid) of the channel running on the first add path of the first west AD-xC-xx.x or west 4MD-xx.x card on the east-to-west direction. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

Step 2 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the corresponding 15xx.x RX port (on the card front panel) of the west AD-xC-xx.x or 4MD-xx.x card.

Step 3 Verify the west AD-xC-xx.x or 4MD-xx.x (east-to-west):

- **a.** Display the west AD-xC-xx.x or 4MD-xx.x card in card view.
- **b.** Click the **Provisioning > Optical Chn > Parameters** tabs.
- **c.** Change the Admin State of the CHAN RX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength chosen on the tunable laser.
- **d.** Verify that the Power value of the CHAN RX port reaches the provisioned setpoint (VOA Power Ref).

Step 4 Complete the "DLP-G79 Verify the OPT-BST Amplifier Laser and Power" task on page 4-39 on the west OPT-BST amplifier to verify that the added wavelength turns on the laser.

Step 5 If the add connection uses a 4MD-xx.x card, continue with Step 6. If the add connection uses an AD-xC-xx.x card, move to Step 10.

Step 6 Verify the RX band port on the west AD-xB-xx.x card:

- **a.** Display the west Ad-xB-xx.x card in card view
- **b.** Click the **Provisioning > Optical Band > Parameters** tabs.

Step 7 Verify that the BAND RX Power value is higher than the default no-power values of –30 dBm

Step 8 Verify band TX port on the west AD-xB-xx.x (west to east):

- **a.** Display the west AD-xB-xx.x card in card view.
- **b.** Click the **Provisioning > Optical Band > Parameters** tabs.
- **c.** Change the Admin State of the BAND TX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength selected on the tunable laser.
- **d.** Verify that the Power value of the BAND TX port is higher than the default no-power value of –30 dBm.

Step 9 Verify the west 4MD-xx.x card (west to east):

- **a.** Display the west 4MD-xx.x card in card view.
- **b.** Click the **Provisioning > Optical Chn > Parameters** tabs.
- **c.** Verify that the Power value of the CHAN TX port is higher than the default no-power value of –30 dBm.

Step 10 Verify the west AD-xC-xx.x (west-to-east) card:

- **a.** Display the west AD-xC-xx.x card in card view.
- **b.** If the AD-xC-xx.x card is an AD-4C-xx.x card, a VOA (applied to all four channels) is installed along the drop path and needs to be activated according to Step g.

c. Click the **Provisioning > Optical Chn > Parameters** tabs.

d. Verify that the Power value of the CHAN TX port is higher than the default no-power value of –35 dBm.

e. Display the east AD-xC-xx.x in card view.

f. Click the **Provisioning > Optical Chn > Parameters** tabs.

g. Change the Admin State of the CHAN TX port related to the wavelength selected on the tunable laser or TXP_MR_2.5G card to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

h. Verify that the power value for the CHAN TX port is higher than the default no-power value of –35 dBm.

i. Perform the output power check.

Step 11 (Optional.) Connect a power meter to the proper 15xx.x TX port on the front panel (the dual port compared with the port where the tunable laser or TXP_MR_2.5G card is connected). Verify that the physical optical power value from that port is consistent with the value displayed on the Provisioning > Optical Chn > Parameters tab for the proper CHAN TX power value +/– 0.5 dB.

Step 12 Repeat Steps 8 through 11 for all add paths of any west AD-xC-xx.x or 4MD-xx.x cards along the east-to-west direction.

Step 13 Remove the loopback on the west OPT-BST amplifier and create a loopback on the east OPT-BST amplifier.

Step 14 Verify that the OSC link becomes active on the east OSCM card. (The OSC termination must be already provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.) If the OSC link becomes active, continue with Step 15. If the OSC link does not become active, perform the following steps:

a. Modify the OSC Fail Low thresholds by clicking the **Provisioning > Optical Line > Optics Thresholds** tabs and changing the Port 2 opwrMin (minimum power) to –40 dBm.

b. If the OSC link turns up, continue with Step 15. If the OSC link remains down, disconnect the OSCM card from the OPT-BST.

c. Create a loopback on the OSCM card by connecting patch cable from the OSC TX port to the OSC RX port using a 10-dB bulk attenuator.

d. If the OSC link turns up, replace the OPT-BST card. If the OSC link does not turn up, replace the OSCM card. See the"NTP-G30 Install the DWDM Cards" procedure on page 3-27.

Note Due to the OSC signal loopback, an SDCC Termination Failure alarm might be raised.

Step 15 Based on the Cisco MetroPlanner site configuration file, tune the tunable laser or TXP_MR_2.5G card to a wavelength (belonging to the 100-GHz ITU-T grid) of the channel running on the first add path of the first add path of the first AD-xC-xx.x-E or 4MD-xx.x-E card on the west-to-east direction. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

Step 16 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the correspondent 15xx.x RX port (on the card front panel) of the east AD-xC-xx.x-E or east 4MD-xx.x-E card.

Step 17 Repeat Steps 3 through 15, applying the steps to the west-to-east direction.

Step 18 Remove the loopback connection and Restore the default admin state (IS,AINS or Unlocked,automaticInService) on all the ports previously set to OOS,MT (ANSI) or Locked,maintenance (ETSI).

Step 19 Launch ANS to recover the correct Node Configuration.

Step 20 Return to your originating procedure (NTP).

DLP-G94 Verify Add and Drop Connections on OADM Node with OSC-CSM Cards

Purpose	This task verifies the add and drop channel connections for an OADM node with OSC-CSM cards installed.
Tools/Equipment	A tunable laser or eight TXP_MR_2.5G cards covering the 32 C-band wavelengths (see Table 4-1 on page 4-4)
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Superuser

Note In this task, you will verify add and drop connections in the following order: east-to-west and west-to-east drop: Steps 1 through 15; west-to-east add and east-to-west drop: Steps 16 through 17.

Step 1 Based on the Cisco MetroPlanner site configuration file, tune the tunable laser or TXP_MR_2.5G card to a wavelength (belonging to the 100-GHz ITU-T grid) of the channel running on the first add path of the first west AD-xC-xx.x or west 4MD-xx.x card on the east-to-west direction. Refer to the tunable laser manufacturer's documentation or the "DLP-G268 Provision TXP_MR_2.5G Cards for Acceptance Testing" task on page 4-4.

Step 2 Connect the tunable laser transmitter or the TXP_MR_2.5G card DWDM TX port to the corresponding 15xx.x RX port (on the card front panel) of the west AD-xC-xx.x or 4MD-xx.x card.

Step 3 Verify the west AD-xC-xx.x or 4MD-xx.x (east-to-west):

a. Display the west AD-xC-xx.x or 4MD-xx.x card in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Change the Admin State of the CHAN RX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength selected on the tunable laser.

d. Verify that the Power value of the CHAN RX port reaches the provisioned setpoint (VOA Power Ref).

Step 4 Complete the "DLP-G80 Verify the OPT-PRE Amplifier Laser and Power" task on page 4-40 on the west OPT-PRE amplifier to verify that the added wavelength turns on the laser.

Step 5 If the add connection uses a 4MD-xx.x card, continue with Step 6. If the add connection uses an AD-xC-xx.x card, move to Step 10.

Step 6 Verify the west AD-xB-xx.x:

a. Display the west AD-xB-xx.x card in card view.

b. Click the **Provisioning > Optical Band > Parameters** tabs.

c. Change the Admin State of the BAND TX port to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI) for the channel related to the wavelength selected on the tunable laser.

d. Verify that the Power value of the BAND TX port is higher than the default no-power value of –30 dBm.

Step 7 Display the related AD-xB-xx.x card (west-to-east direction) in card view.

Step 8 Change the admin state of the drop BAND TX port related to the wavelength selected on the tunable laser to OOS,MT.

Step 9 (Optional.) Connect a power meter to the proper 15xx.xs TX port on the front panel (the dual port compared with the port where the tunable laser is connected). Verify that the physical optical power value from that port is consistent with the value displayed on the Provisioning > Optical Chn > Parameters tab for the proper CHAN TX power value +/– 0.5 dB.

Step 10 Verify the west AD-xC-xx.x (west-to-east) card:

a. Display the west AD-xC-xx.x card in card view.

b. Click the **Provisioning > Optical Chn > Parameters** tabs.

c. Verify that the Power value of the CHAN TX port is higher than the default no-power value of –35 dBm.

d. Display the east AD-xC-xx.x in card view.

e. Click the **Provisioning > Optical Chn > Parameters** tabs.

f. Verify that the power value for the CHAN TX port is higher than the default no-power value of –35 dBm.

g. If the AD-xC-xx.x card is an AD-4C-xx.x card, a VOA (applied to all four channels) is installed along the drop path and needs to be activated in Step h.

h. Change the Admin State of the CHAN TX port related to the wavelength selected on the tunable laser to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI). Click **Apply**.

i. Perform the output power check.

Step 11 (Optional.) Connect a power meter to the proper 15xx.xx TX port on the front panel (the dual port compared with the port where the tunable laser is connected). Verify that the physical optical power value from that port is consistent with the value on Provisioning > Optical Chn > Parameters tab for the proper CHAN TX power value +/– 0.5 dB.

Step 12 Repeat Steps 8 through 11 for all add paths of any west AD-xC-xx.x or 4MD-xx.x cards along the east-to-west direction.

Step 13 Remove the loopback on the west OSC-CSM.

Step 14 In node view, click the **Provisioning > WDM-ANS > Port Status** tabs.

Step 15 Click **Launch ANS**.

Step 16 Create a loopback on the east OSC-CSM card by connecting the OSC-CSM LINE RX and LINE TX ports using a patch cord and 10-dB bulk attenuator.

Step 17 Verify that the OSC link becomes active on the west OSC-CSM card. (The OSC termination must be already provisioned. If not, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.)

Note Due to the OSC signal loopback, an SDCC Termination Failure alarm might be raised.

Step 18 If the OSC link becomes active, continue with Step 19. If the OSC link does not turn up, perform the following troubleshooting steps:

- **a.** Remove the 10-dB bulk attenuator between the LINE TX and LINE RX connection. If the OSC link becomes active, continue with Step 19. If not, continue with Step b.
- **b.** Modify the OSC Fail Low thresholds. Click the **Provisioning > Optical Line > Optics Thresholds** tabs and change the Port 6 opwrMin (minimum power) to –40 dBm.
- **c.** Modify the COM TX Fail Low Threshold. Change the Port 3 opwrMin (minimum power) to –30 dBm.
- **d.** If the OSC link turns up, continue with Step 19. If it does not turn up, replace the OSC-CSM card.

Step 19 Check the site configuration file from Cisco MetroPlanner and identify the wavelength (belonging to the 100 Ghz ITU-T grid) of the channel running on the first add path of the first AD-xC-xx.x-E or 4MD-xx.x-E card on the west-to-east direction.

Step 20 Connect the tunable laser to the correspondent 15xx.x RX port (on the card front panel) of the east AD-xC-xx.x-E or east 4MD-xx.x-E card.

Step 21 Repeat Steps 3 through 20, applying the steps to the west-to-east direction.

Step 22 Restore the default admin state (IS,AINS/Unlocked,automaticInService) on all the ports previously set to **OOS,MT** (ANSI) or **Locked,maintenance** (ETSI).

Step 23 Launch ANS to recover the correct node configuration.

Step 24 Return to your originating procedure (NTP).

CHAPTER 5

Provision Transponder and Muxponder Cards

This chapter explains how to provision transponder (TXP) and muxponder (MXP) cards. The provisioning must be performed before you provision the DWDM network and create circuits.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

Before performing any of the following procedures, investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* as necessary.

Caution Provisioning TXPs and MXPs can be service affecting. You should make all changes during a scheduled maintenance window.

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. NTP-G128 Manage Pluggable Port Modules, page 5-2—Complete this procedure to provision a multirate pluggable port module (PPM), provision or change the optical line rate of a PPM, or delete a PPM. PPMs provide the fiber interface to the TXP and MXP cards. Only the TXP_MR_10G does not accept PPMs.
2. NTP-G96 Modify Line Settings and PM Parameter Thresholds for TXP_MR_10G and TXP_MR_10E Cards, page 5-8—As needed, complete this procedure to change the transmission settings for TXP_MR_10G and TXP_MR_10E cards.
3. NTP-G97 Modify Line Settings and PM Parameter Thresholds for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-25—As needed, complete this procedure to change the transmission settings for MXP_2.5G_10G and MXP_2.5G_10E cards.
4. NTP-G98 Modify Line Settings and PM Parameter Thresholds for TXP_MR_2.5G and TXPP_MR_2.5G Cards, page 5-39—As needed, complete this procedure to change the transmission settings for TXP_MR_2.5G and TXPP_MR_2.5G cards.
5. NTP-G99 Modify Line Settings and PM Parameter Thresholds for MXP_MR_2.5G and MXPP_MR_2.5G Cards, page 5-53—As needed, complete this procedure to change the transmission settings for MXP_MR_2.5G and MXPP_MR_2.5G cards.

NTP-G128 Manage Pluggable Port Modules

Purpose	Complete this procedure to provision a multirate PPM, provision or change the optical line rate of a multirate PPM, or delete a PPM. If a single-rate PPM is installed, the PPM screen will autoprovision and no further steps are necessary.
Tools/Equipment	None
Prerequisite Procedures	DLP-G63 Install an SFP or XFP, page 3-34
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note A small-form factor pluggable (SFP) is the hardware device that plugs into a TXP or MXP card faceplate to provide a fiber interface to the card. In CTC, SFPs are called pluggable port modules (PPMs).

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 to log into an ONS 15454 on the network. If you are already logged in, continue with Step 2.

Step 2 Click the **Alarms** tab:

a. Verify that the alarm filter is not turned on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

c. Complete the "DLP-G114 Export CTC Data" task on page 8-4 to export alarm and condition information.

Step 3 Complete the "DLP-G277 Provision a Multirate PPM" task on page 5-3. If you preprovisioned a multirate PPM (DLP-G273 Preprovision an SFP or XFP Slot, page 3-33), skip this step and continue with Step 5. Single-rate PPMs do not require provisioning.

Step 4 If you are provisioning an IBM ETR_CLO (External Time Reference – Control Link Oscillator) or InterSystem Coupling link (ISC) service on the PPM, complete "DLP-G274 Verify Topologies for ETR_CLO and ISC Services" task on page 5-6. Otherwise, continue with Step 5.

Step 5 Complete the "DLP-G278 Provision the Optical Line Rate" task on page 5-3 to assign a line rate to a TXP or MXP port.

Step 6 Complete the "DLP-G280 Delete a PPM" task on page 5-7 as needed.

Stop. You have completed this procedure.

DLP-G277 Provision a Multirate PPM

Purpose	This task provisions a multirate PPM in CTC. If the PPM was preprovisioned using the "DLP-G273 Preprovision an SFP or XFP Slot" task on page 3-33, or the SFP or XFP is physically installed, this task is unnecessary unless the PPM has an OOS-AUMA,UAS service state.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP or MXP card where you want to provision PPM settings.

Step 2 Click the **Provisioning > Pluggable Port Modules** tabs.

Step 3 In the Pluggable Port Modules pane, click **Create**. The Create PPM dialog box appears.

Step 4 In the Create PPM dialog box, complete the following:

- PPM—Click the slot number where the SFP is installed from the drop-down list.
- PPM Type—Click the number of ports supported by your SFP from the drop-down list. If only one port is supported, **PPM (1 port)** is the only menu option.

Note The first port can be created only if the trunk is in the OOS-MA,DSBLD (ANSI)/Locked-enabled,disabled (ETSI) service state.

Step 5 Click **OK**. The newly created port appears on the Pluggable Port Modules pane. The row on the Pluggable Port Modules pane turns white and the Actual Equipment Type column lists the equipment name.

Step 6 Verify that the PPM appears in the list on the Pluggable Port Modules pane. If it does not, repeat Steps 3 through 5.

Step 7 Repeat the task to provision a second PPM.

Step 8 Return to your originating procedure (NTP).

DLP-G278 Provision the Optical Line Rate

Purpose	This task provisions the line rate on a multirate pluggable port module (PPM). Single-rate PPMs do not need to be provisioned.
Tools/Equipment	None
Prerequisite Procedures	DLP-G277 Provision a Multirate PPM, page 5-3 DLP-G274 Verify Topologies for ETR_CLO and ISC Services, page 5-6, if you are provisioning an ETR_CLO service. DLP-G46 Log into CTC, page 2-24

Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP or MXP card where you want to provision PPM ports. If the data rate you are provisioning is DV-6000, HDTV, ESCON, SDI/D1 Video, ISC-3, or ETR_CLO, complete the following steps. Otherwise, continue with Step 2.

a. Click the **Provisioning > OTN > OTN Lines** tabs.

b. In the G.709 OTN field, choose **Disable**.

c. In the FEC field, choose **Disable**.

d. Click **Apply**.

Step 2 Click the **Provisioning > Pluggable Port Modules** tabs.

Step 3 In the Pluggable Ports pane, click **Create**. The Create Port dialog box appears.

Step 4 In the Create Port dialog box, complete the following:

- Port—Click the PPM number and port number from the drop-down list. The first number indicates the PPM and the second number indicates the port number on the PPM. For example, the first PPM with one port displays as 1-1 and the second PPM with one port displays as 2-1. The PPM number can be 1 to 4, but the port number is always 1.
- Port Type—Click the type of port from the drop-down list. The port type menu displays the supported port rates on your PPM. See Table 5-1 for definitions of the supported rates on the TXP or MXP card.

Step 5 Click **OK**. The row on the Pluggable Ports pane turns light blue until the actual SFP is installed, and then the row turns white.

Step 6 Repeat Steps 3 through 5 to configure the port rates as needed.

Table 5-1 PPM Port Types

Card	Port Type
TXP_MR_2.5G and TXPP_MR_2.5G	• OC-3/STM1—155 Mbps • OC-12/STM4—622 Mbps • OC-48/STM16—2.48 Gbps • ONE_GE—One Gigabit Ethernet 1.125 Gbps • ESCON—Enterprise System Connection (IBM signal) • DV6000—Proprietary signal from video vendor • SDI_D1_VIDEO—Serial Digital Interface and Digital Video signal type 1 • HDTV—High Definition Television • PASS-THRU—Not specified • FC1G—Fiber Channel 1.06 Gbps • FC2G—Fiber Channel 2.125 Gbps • FICON1G—Fiber CON 1.06 Gbps (IBM signal) • FICON2G—Fiber CON 2.125 Gbps (IBM signal) • ETR_CLO—External Time Reference – Control Link Oscillator • ISC compat—InterSystem Coupling Link 1 (ISC1) • ISC peer—InterSystem Coupling Link 3 (ISC3)
MXP_2.5G_10G and MXP_2.5G_10E	• OC-48/STM16—2.48 Gbps
TXP_MR_10E	• OC-192/STM-64—10 Gbps • 10G Ethernet LAN Phy—10 Gbps Ethernet • 10G Fiber Channel—10 Gbps Fiber Channel
MXP_MR_2.5G and MXPP_MR_2.5G	• FC1G—Fiber Channel 1.06 Gbps • FC2G—Fiber Channel 2.125 Gbps • FICON1G—Fiber CON 1.06 Gbps (IBM signal) • FICON2G—Fiber CON 2.125 Gbps (IBM signal) • ONE_GE—One Gigabit Ethernet 1.125 Gbps

Note The TXP_MR_10G is the only TXP or MXP card that does not accept PPMs.

Step 7 Return to your originating procedure (NTP).

DLP-G274 Verify Topologies for ETR_CLO and ISC Services

Purpose	This task verifies that the DWDM network topology can support the IBM ETR_CLO and ISC services. These services cannot be provisioned on all DWDM topologies.
Tools/Equipment	Cisco MetroPlanner site plan.
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Display your site plan in Cisco MetroPlanner.

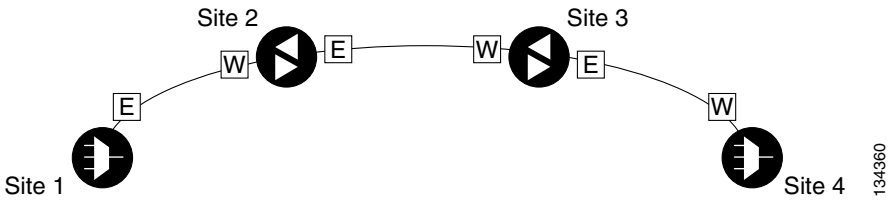
Step 2 Verify that the topology where you plan to run the ETR_CLO or ISC service is one of the topologies that supports these services:

- Single span—Two terminal sites with 32MUX-O and 32DMX-O, or 32WSS and32DMX or 32-DMX-O cards installed and no intermediate sites in between. Figure 5-1 shows a single-span topology as displayed in Cisco MetroPlanner.

Figure 5-1 Single-Span Topology

- Point-to-Point—Two terminal sites with 32MUX-O and 32DMX-O or 32WSS and32DMX or 32-DMX-O cards installed. Line amplifiers can be installed between the terminal sites, but intermediate (traffic terminating) sites cannot be installed. Figure 5-2 shows a point-to-point topology as shown in Cisco MetroPlanner.

Figure 5-2 Point-to-Point Topology



- Two hubs—Two hub nodes in a ring with 32MUX-O and 32DMX-O 32WSS and32DMX or 32-DMX-O cards installed. Line amplifiers can be installed between the hubs.

Figure 5-3 shows two hub nodes with no line amplifier nodes installed. Figure 5-4 shows two hub nodes line amplifier nodes installed.

Figure 5-3 Hubs with No Line Amplifiers

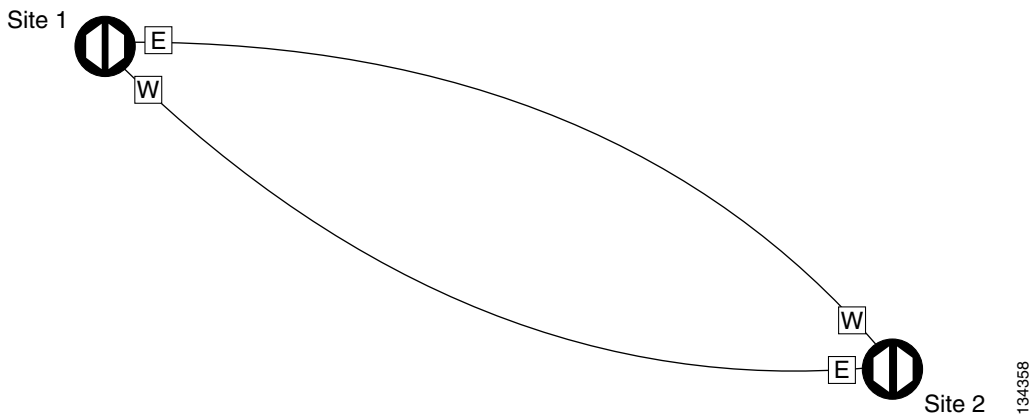
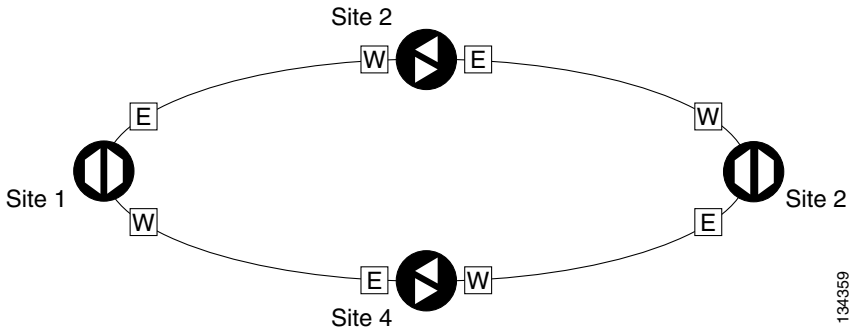


Figure 5-4 Hubs with Line Amplifiers



Step 3 Return to your originating procedure.

DLP-G280 Delete a PPM

Purpose	This task deletes PPM provisioning for SFPs or XFPs installed on TXP or MXP cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G63 Install an SFP or XFP, page 3-34 or DLP-G273 Preprovision an SFP or XFP Slot, page 3-33
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note This task does not apply to the TXP_MR_10G card.

Step 1 In node view, double-click the TXP or MXP card where you want to delete PPM settings.

Step 2 Click the **Provisioning > Pluggable Port Modules** tabs.

Step 3 To delete a PPM and the associated ports:

Note You cannot delete a port if the client is in the IS-NR (ANSI)/Unlocked-enabled (ETSI) service state, is part of a protection group, has a GCC or DCC in use, is used as a timing source, has circuits, or has overhead circuits. You can delete a port if the trunk is in service and the client is in the OOS-MA,DSBLD (ANSI)/Locked-enabled,disabled (ETSI) service state, with the exception of the last port. You can delete the last port only if the trunk is in a OOS-MA,DSBLD (ANSI)/Locked-enabled,disabled (ETSI) service state.

a. Click the PPM line that you want to delete that appears in the Pluggable Port Modules pane. The highlight changes to dark blue.

b. Click **Delete**. The Delete PPM dialog box appears.

c. Click **Yes**. The PPM provisioning is removed from the Pluggable Port Modules pane and the Pluggable Ports pane.

Step 4 Verify that the PPM provisioning is deleted. CTC shows an empty slot after the PPM is deleted.

Step 5 If you need to remove the PPM hardware (the SFP or XFP), complete the "DLP-G64 Remove an SFP or XFP" task on page 3-34.

Step 6 Return to your originating procedure (NTP).

NTP-G96 Modify Line Settings and PM Parameter Thresholds for TXP_MR_10G and TXP_MR_10E Cards

Purpose	This procedure changes the line and threshold settings for TXP_MR_10G and TXP_MR_10E cards.
Tools/Equipment	None
Prerequisite Procedures	NTP-G32 Install the Transponder and Muxponder Cards, page 3-31 DLP-G63 Install an SFP or XFP, page 3-34 DLP-G277 Provision a Multirate PPM, page 5-3 (if necessary) DLP-G278 Provision the Optical Line Rate, page 5-3 (if necessary)
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note The TXP_MR_10G card does not support PPMs.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the transponder card settings. If you are already logged in, continue with Step 2.

Step 2 As needed, complete the "NTP-G103 Back Up the Database" procedure on page 12-2 to preserve the existing transmission settings.

Step 3 Perform any of the following tasks as needed:

- DLP-G216 Change Card Settings for TXP_MR_10G and TXP_MR_10E Cards, page 5-9
- DLP-G217 Change Line Settings for TXP_MR_10G and TXP_MR_10E Cards, page 5-10
- DLP-G219 Change the TXP_MR_10G or TXP_MR_10E Card Line Thresholds for SONET or SDH Payloads, page 5-15
- DLP-G319 Change the TXP_MR_10G or TXP_MR_10E Card Line Thresholds for 10G Ethernet LAN Phy, page 5-16
- DLP-G301 Provision the TXP_MR_10G and TXP_MR_10E Trunk Port Alarm and TCA Thresholds, page 5-19
- DLP-G302 Provision the TXP_MR_10G and TXP_MR_10E Client Port Alarm and TCA Thresholds, page 5-20
- DLP-G218 Change Section Trace Settings for the TXP_MR_10G and TXP_MR_10E Cards, page 5-13
- DLP-G221 Change OTN Settings for TXP_MR_10G and TXP_MR_10E Cards, page 5-22

Stop. You have completed this procedure.

DLP-G216 Change Card Settings for TXP_MR_10G and TXP_MR_10E Cards

Purpose	This task changes the card settings for TXP_MR_10G and TXP_MR_10E multirate (10 Gbps) transponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_10G or TXP_MR_10E card where you want to change the card settings.

Step 2 Click the **Provisioning > Card** tabs.

Step 3 Modify any of the settings described in Table 5-2.

Table 5-2 TXP_MR-10G and TXP_MR_10E Card Settings

Parameter	Description	Options – ONS 15454	Options – ONS 15454 SDH
Termination Mode	Sets the mode of operation. See the "15.12 Termination Modes" section on page 15-117 for more details.	• Transparent • Section (TXP_MR_10E only) • Line	• Transparent • Regeneration Section (TXP_MR_10E only) • Multiplex Section
AIS/Squelch Configuration	(TXP_MR_10E only) Sets the transparent termination mode configuration.	• Squelch • AIS	• Squelch • AIS
Wavelength	Sets the wavelength of the DWDM side optical transmitter.	• First Tunable Wavelength • Further wavelengths in 100-GHz ITU spacing • Supported wavelengths are in white and marked by asterisks (**); unsupported wavelengths are gray. **Note** The four available wavelengths are listed in the Card Parameters section of the window and also in the Maintenance > Info subtab.	• First Tunable Wavelength • Further wavelengths in 100-GHz ITU spacing • Supported wavelengths are in white and marked by asterisks (**); unsupported wavelengths are gray. **Note** The four available wavelengths are listed in the Card Parameters section of the window and also in the Maintenance > Info subtab.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G217 Change Line Settings for TXP_MR_10G and TXP_MR_10E Cards

Purpose	This task changes the line settings for TXP_MR_10G and TXP_MR_10E transponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_10G or TXP_MR_10E card where you want to change the line settings.

Step 2 Click the **Provisioning > Line > SONET (including 10G Ethernet WAN phy)** tabs.

Step 3 Modify any of the settings described in Table 5-3.

Note In Table 5-3, some parameter tabs do not always apply to both the TXP_MR_10G and TXP_MR_10E cards. If a tab does not apply, it will not appear in CTC.

Table 5-3 TXP_MR_10G and TXP_MR_10E Transponder Card Line Settings

Parameter	Description	Options – ONS 15454	Options – ONS 15454 SDH
Port	(Display only) Displays the port number.	• 1-1 (OC192) • 2 (Trunk)	• 1-1 (STM64) • 2 (Trunk)
Port Name	Provides the ability to assign the specified port a name.	User-defined. Name can be up to 32 alphanumeric/special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.	User-defined. Name can be up to 32 alphanumeric/special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	• IS • IS,AINS • OOS,DSBLD • OOS,MT	• Unlocked • Unlocked,automaticInService • Locked,disabled • Locked,maintenance
Service State	(Display only) Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	• IS-NR • OOS-AU,AINS • OOS-MA,DSBLD • OOS-MA,MT	• Unlocked-enabled • Unlocked-disabled, automaticInService • Locked-enabled,disabled • Locked-enabled,maintenance
SF BER	(SONET [ANSI] or SDH [ETSI] including 10G Ethernet WAN Phy only) Sets the signal fail bit error rate.	• 1E-3 • 1E-4 • 1E-5	• 1E-3 • 1E-4 • 1E-5
SD BER	(SONET [ANSI] or SDH [ETSI] including 10G Ethernet WAN Phy only) Sets the signal degrade bit error rate.	• 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9	• 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9
AINS Soak	(SONET [ANSI] or SDH [ETSI] including 10G Ethernet WAN Phy only) Sets the automatic in-service soak period. Double click the time and use the up and down arrows to change settings.	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments

Table 5-3 TXP_MR_10G and TXP_MR_10E Transponder Card Line Settings (continued)

Parameter	Description	Options – ONS 15454	Options – ONS 15454 SDH
Type	(SONET [ANSI] or SDH [ETSI] including 10G Ethernet WAN Phy only) The optical transport type.	• SONET • SDH	• SONET • SDH
ALS Mode	Sets the automatic laser shutdown function mode. The DWDM transmitter supports ALS according to ITU-T G.644 (06/99). ALS can be disabled or be set for three mode options.	• Disable (default): ALS is off; the laser is not automatically shut down when traffic outages (LOS) occur. • Auto Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. It automatically restarts when the conditions that caused the outage are resolved. • Manual Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. However, the laser must be manually restarted when conditions that caused the outage are resolved. • Manual Restart for Test: Manually restarts the laser for testing.	• Disable (default): ALS is off; the laser is not automatically shut down when traffic outages (LOS) occur. • Auto Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. It automatically restarts when the conditions that caused the outage are resolved. • Manual Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. However, the laser must be manually restarted when conditions that caused the outage are resolved. • Manual Restart for Test: Manually restarts the laser for testing.
ProvidesSync	(TXP_MR_10E, OC192 only) Sets the ProvidesSync card parameter. If checked, the card is provisioned as a network element timing reference.	Checked or unchecked	Checked or unchecked
SyncMsgIn	(TXP_MR_10E, OC192 only) Sets the EnableSync card parameter. Enables synchronization status messages (S1 byte), which allow the node to choose the best timing source.	Checked or unchecked	Checked or unchecked
Send DoNotUse	(TXP_MR_10E, OC192 only) Sets the Send DoNotUse card state. When checked, sends a DUS (do not use) message on the S1 byte.	Checked or unchecked	Checked or unchecked
Max Size	(TXP_MR_10E, 10_GE LAN Phy only) Sets the maximum Ethernet packet size.	• 1548 bytes • Jumbo (64 to 9,216 bytes)	• 1548 bytes • Jumbo (64 to 9,216 bytes)
Incoming MAC Address	(TXP_MR_10E, 10_GE LAN Phy only) Sets the incoming MAC address.	Value of MAC address. 6 bytes in hexadecimal format.	Value of MAC address. 6 bytes in hexadecimal format.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G218 Change Section Trace Settings for the TXP_MR_10G and TXP_MR_10E Cards

Purpose	This task changes the section trace settings for the TXP_MR_10G and TXP_MR_10E transponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note The Section Trace tab is available for the TXP_MR_10G and TXP_MR_10E cards only if no PPM or an OC192 PPM has been provisioned. The tab is not available if a TEN_GE LAN Phy or FC10G PPM has been provisioned.

Step 1 In node view, double-click the TXP_MR_10G or TXP_MR_10E card where you want to change the section trace settings.

Step 2 Click the **Provisioning > Line > Section Trace** tabs.

Step 3 Modify any of the settings described in Table 5-4.

Table 5-4 TXP_MR_10G and TXP_MR_10E Transponder Card Section Trace Settings

Parameter	Description	Options – ONS 15454	Options — ONS 15454 SDH
Port	Sets the port number.	• 1-1 (OC192) • 2—Trunk	• 1-1 (STM64) • 2—Trunk
Trace Mode	Sets the trace mode.	• Off/None • Manual	• Off/None • Manual
Section Trace String Size	Sets the trace string size.	• 1 byte • 16 byte	• 1 byte • 16 byte

Table 5-4 TXP_MR_10G and TXP_MR_10E Transponder Card Section Trace Settings (continued)

Parameter	Description	Options – ONS 15454	Options — ONS 15454 SDH
Transmit	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size	String of trace string size
Expected	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size	String of trace string size
Received	(Display only) Displays the current received string. You can click Refresh to manually refresh this display, or select the Auto-refresh every 5 sec check box to keep this panel updated.	String of trace string size	String of trace string size

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G219 Change the TXP_MR_10G or TXP_MR_10E Card Line Thresholds for SONET or SDH Payloads

Purpose	This task changes the line threshold settings for TXP_MR_10G and TXP_MR_10E transponder cards carrying SONET or SDH payloads, including the physical 10G Ethernet WAN payload.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_10G or TXP_MR_10E card where you want to change the line threshold settings.

Step 2 Click the **Provisioning > Line Thresholds > SONET Thresholds** tabs.

Step 3 Modify any of the settings described in Table 5-5.

Note You must modify Near End, and Far End independently; 15 Min and 1 Day independently; Line and Section independently. To do so choose the appropriate radio button and click **Refresh**.

Table 5-5 TXP_MR_10G and TXP_MR_10E Transponder Card Line Threshold Settings

Parameter	Description	Options – ONS 15454	Options – ONS 15454 SDH
Port	(Display only) Port number	• 1-1 (OC192) • 2 (Trunk)	• 1-1 (STM64) • 2 (Trunk)
CV	Coding violations	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Line, or Section. Select a bullet and click **Refresh**.	Numeric. Can be set for Near End for 15-minute or one-day intervals multiplex section (Far End only), Section, or Regeneration Section. bullet and click **Refresh**.
ES	Errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Line, or Section. Select a bullet and click **Refresh**.	Numeric. Can be set for Near End for 15-minute or one-day intervals multiplex section (Far End only), Section, or Regeneration Section. bullet and click **Refresh**.
SES	Severely errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Line, or Section. Select a bullet and click **Refresh**.	Numeric. Can be set for Near End for 15-minute or one-day intervals multiplex section (Far End only), Section, or Regeneration Section. bullet and click **Refresh**.

Table 5-5 TXP_MR_10G and TXP_MR_10E Transponder Card Line Threshold Settings (continued)

Parameter	Description	Options – ONS 15454	Options – ONS 15454 SDH
FC	Failure count	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Line, or Section. Select a bullet and click **Refresh**.	Numeric. Can be set for Near End or for 15-minute or one-day intervals, or Regeneration Section Select a bullet a **Refresh**.
UAS	Unavailable seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Line, or Section. Select a bullet and click **Refresh**.	Numeric. Can be set for Near End or for 15-minute or one-day intervals, or Regeneration Section. Select a bullet a **Refresh**.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G319 Change the TXP_MR_10G or TXP_MR_10E Card Line Thresholds for 10G Ethernet LAN Phy

Purpose	This task changes the line threshold settings for TXP_MR_10G and TXP_MR_10E transponder cards carrying the physical 10G Ethernet LAN payload.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Display the TXP_MR_10G or TXP_MR_10E card where you want to change the line threshold settings in card view.

Step 2 Click the **Provisioning > Line Thresholds > RMON Thresholds** tabs.

Step 3 Click **Create**. The Create Threshold dialog box appears.

Step 4 From the Port drop-down list, choose the applicable port.

Step 5 From the Variable drop-down list, choose an Ethernet variable. See Table 5-6 for a list of available Ethernet thresholds.

Table 5-6 TXP_MR_10G and TXP_MR 10GE LAN Phy Variables

Variable	Description
ifInOctets	Total number of octets received on the interface, including framing characters.
rxTotalPkts	Total number of received packets.
ifInMulticastPkts	Number of multicast frames received error free.

Table 5-6 TXP_MR_10G and TXP_MR 10GE LAN Phy Variables (continued)

ifInBroadcastPkts	Number of packets, delivered by a sub-layer to an higher sub-layer, which were addressed to a broadcast address at this sub-layer.
ifInErrors	Number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol.
ifInErrorBytePkts	Number of receive error bytes.
ifInFramingErrorPkts	Number of receive framing error counters.
ifInJunkInterPkts	Number of receive interpacket junk counters.
ifOutOctets	Total number of octets transmitted out of the interface, including framing characters.
txTotalPkts	Total number of transmit packets.
ifOutMulticastPkts	Number of multicast frames transmitted error free.
ifOutBroadcastPkts	Total number of packets that higher-level protocols requested be transmitted, and which were addressed to a broadcast address at this sub-layer, including those that were discarded or not sent.
dot3StatsFCSErrors	Number of frames with frame check errors, that is, there is an integral number of octets, but an incorrect Frame Check Sequence (FCS).
dot3StatsFrameTooLong	Number of received frames that were larger than the maximum size permitted.
etherStatsUndersizePkts	Total number of packets received that were less than 64 octets long (excluding framing bits, but including FCS octets) and were otherwise well formed.
etherStatsFragments	Total number of packets received that were less than 64 octets in length (excluding framing bits but including FCS octets) and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). Note that it is entirely normal for etherStatsFragments to increment. This is because it counts both runts (which are normal occurrences due to collisions) and noise hits.
etherStatsPkts64Octets	Total number of packets (including bad packets) received that were 64 octets in length (excluding framing bits but including FCS octets).
etherStatsPkts65to127Octets	Total number of packets (including bad packets) received that were between 65 and 127 octets in length inclusive (excluding framing bits but including FCS octets).
etherStatsPkts128to255Octets	The total number of packets (including bad packets) received that were between 128 and 255 octets in length inclusive (excluding framing bits but including FCS octets).

Table 5-6 TXP_MR_10G and TXP_MR 10GE LAN Phy Variables (continued)

etherStatsPkts256to511Octets	Total number of packets (including bad packets) received that were between 256 and 511 octets in length inclusive (excluding framing bits but including FCS octets).
etherStatsPkts512to1023Octets	Total number of packets (including bad packets) received that were between 512 and 1023 octets in length inclusive (excluding framing bits but including FCS octets).
etherStatsPkts1024to1518Octets	Total number of packets (including bad packets) received that were between 1024 and 1518 octets in length inclusive (excluding framing bits but including FCS octets).
etherStatsBroadcastPkts	Total number of good packets received that were directed to the broadcast address. Note that this does not include multicast packets.
etherStatsMulticastPkts	Total number of good packets received that were directed to a multicast address. Note that this number does not include packets directed to the broadcast address.
etherStatsOversizePkts	Total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed.
etherStatsJabbers	Total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).
etherStatsOctets	Total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets).
etherStatsCRCAlignErrors	Total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).
rxPauseFrames	Number of received 802.x pause frames
rxControlFrames	Number of MAC control frames passed by the MAC sub-layer to the MAC control sub-layer.
rxUnknownOpcodeFrames	Number of MAC control frames received that contain an opcode that is not supported by the device.

Step 6 From the Alarm Type drop-down list, indicate whether the event will be triggered by the rising threshold, falling threshold, or both the rising and falling thresholds.

Step 7 From the Sample Type drop-down list, choose either **Relative** or **Absolute**. Relative restricts the threshold to use the number of occurrences in the user-set sample period. Absolute sets the threshold to use the total number of occurrences, regardless of time period.

Step 8 Type in an appropriate number of seconds for the Sample Period.

Step 9 Type in the appropriate number of occurrences for the Rising Threshold.

For a rising type of alarm, the measured value must move from below the falling threshold to above the rising threshold. For example, if a network is running below a rising threshold of 1000 collisions every 15 seconds and a problem causes 1001 collisions in 15 seconds, the excess occurrences trigger an alarm.

Step 10 Enter the appropriate number of occurrences in the Falling Threshold field. In most cases a falling threshold is set lower than the rising threshold.

A falling threshold is the counterpart to a rising threshold. When the number of occurrences is above the rising threshold and then drops below a falling threshold, it resets the rising threshold. For example, when the network problem that caused 1001 collisions in 15 minutes subsides and creates only 799 collisions in 15 minutes, occurrences fall below a falling threshold of 800 collisions. This resets the rising threshold so that if network collisions again spike over a 1000 per 15-minute period, an event again triggers when the rising threshold is crossed. An event is triggered only the first time a rising threshold is exceeded (otherwise, a single network problem might cause a rising threshold to be exceeded multiple times and cause a flood of events).

Step 11 Click **OK** to complete the procedure.

Step 12 Return to your originating procedure (NTP).

DLP-G301 Provision the TXP_MR_10G and TXP_MR_10E Trunk Port Alarm and TCA Thresholds

Purpose	This task provisions the TXP_MR_10G and TXP_MR_10E trunk port alarm and TCA thresholds.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_10G or TXP_MR_10E card where you want to change the trunk port alarm and TCA settings.

Step 2 Click the **Provisioning > Optics Thresholds** tabs.

Step 3 Referring to Table 5-7, provision the trunk port (Port 2) TCA thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Note Do not modify the Laser Bias parameters.

Step 4 Click **Apply**.

Table 5-7 TXP_MR_10G and TXP_MR_10E Trunk Port Alarm and TCA Thresholds

Card	Alarm RX Power Low	Alarm RX Power High	TCA RX Power Low	TCA RX Power High	Alarm TX Power Low	Alarm TX Power High	TCA TX Power Low	TCA TX Power High
TXP_MR_10G	–24 dBm	–8 dBm	–22 dBm	–8 dBm	2 dBm	4 dBm	–1 dBm	7 dBm
TXP_MR_10E	–20 dBm	–8 dBm	–18 dBm	–9 dBm	3 dBm	7 dBm	0 dBm	9 dBm

Step 5 Under Types, click the **Alarm** radio button and click **Refresh**.

Step 6 Referring to Table 5-7, provision the trunk port (Port 2) Alarm thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 7 Click **Apply**.

Step 8 Return to your originating procedure (NTP).

DLP-G302 Provision the TXP_MR_10G and TXP_MR_10E Client Port Alarm and TCA Thresholds

Purpose	This task provisions the client port alarm and threshold cross alert (TCA) thresholds for the TXP_MR_10G and TXP_MR_10E Cards
Tools/Equipment	None
Prerequisite Procedures	DLP-G278 Provision the Optical Line Rate, page 5-3 DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_10G or TXP_MR_10E card where you want to change the client port alarm and TCA settings.

Step 2 Click the **Provisioning > Optics Thresholds** tabs. The TCA thresholds are shown by default.

Step 3 Referring to Table 5-8, provision the Port 1 (Client) TCA thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low based on the client interface at the other end. For additional information about client SFP and XFP interfaces, also known as Pluggable Port Modules (PPMs), refer to the Hardware Specifications chapter in the *Cisco ONS 15454 Reference Manual*.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Note Do not modify the Laser Bias parameters.

Step 4 Click **Apply**.

Table 5-8 Client Interfaces Alarm and TCA Thresholds: TXP_MR_10E and TXP_MR_10G Cards

Port Type (by CTC)	Pluggable Port Module (XFP)	Alarm RX Power Low	Alarm RX Power High	Alarm TX Power Low	Alarm TX Power High	TCA RX Power Low	TCA RX Power High	TCA TX Power Low	TCA TX Power High
SONET (or SDH)	TXP_MR_10E uses ONS-XC-10G-S1	–14	2	–9	2	–11	–1	–12	5
	TXP_MR_10G (XFP not present)	–14	2	–9	2	–11	–1	–12	5
10G Ethernet LAN Phy	TXP_MR_10E uses ONS-XC-10G-S1	–17	4	–9	2	–14	1	–12	5
	TXP_MR_10G (XFP not present)	–17	4	–9	2	–14	1	–12	5
10G Ethernet WAN PHY	TXP_MR_10E uses ONS-XC-10G-S1	–17	4	–9	2	–14	1	–12	5
	TXP_MR_10G (XFP not present)	–17	4	–9	2	–14	1	–12	5

Step 5 Under Types, click the **Alarm** radio button and click **Refresh**.

Step 6 Referring to Table 5-8, provision the Port 1 (Client) Alarm thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low based on the client interface that is provisioned.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 7 Click **Apply**.

Step 8 Return to your originating procedure.

DLP-G221 Change OTN Settings for TXP_MR_10G and TXP_MR_10E Cards

Purpose	This task changes the line optical transport network (OTN) settings for TXP_MR_10G and TXP_MR_10E transponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_10G or TXP_MR_10E card where you want to change the OTN settings.

Step 2 Click one of the **Provisioning > OTN** tabs: OTN Lines, G.709 Thresholds, FEC Thresholds, or Trail Trace Identifier.

Step 3 Modify any of the settings described in Tables 5-9 through 5-12.

Note You must modify Near End, and Far End independently; 15 Min and 1 Day independently; SM and PM independently. To do so choose the appropriate radio button and click **Refresh**.

Table 5-9 describes the values on the Provisioning > OTN > OTN Lines tab.

Table 5-9 TXP_MR_10G and TXP_MR_10E Transponder Card OTN Settings

Parameter	Description	Options
Port #	(Display only) Port number.	2
G.709 OTN	Sets the OTN lines according to ITU-T G.709. Check box to enable.	• Enabled • Disabled
FEC	Sets the OTN lines FEC mode. FEC mode can be Disabled, Enabled or Enhanced FEC mode can be enabled (to provide greater range and lower bit error rate).	• Enabled—(TXP_MR_10G only) FEC is on • Disabled—FEC is off • Standard—(TXP_MR_10E only) Standard FEC is on. • Enhanced—(TXP_MR_10E only) Enhanced FEC is on

Table 5-9 TXP_MR_10G and TXP_MR_10E Transponder Card OTN Settings (continued)

Parameter	Description	Options
SD BER	Sets the signal degrade bit error rate.	• 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9
Asynch/Synch Mapping	(TXP_MR_10E only) The card can perform multiplexing per ITU-T G.709. The ODUk (client SONET/SDH payload) can be mapped to the Optical Channel (OTUk) either asynchronously or synchronously with this setting.	• Asynch mapping • Synch mapping

Table 5-10 describes the values on the Provisioning > OTN > G.709 Thresholds tab.

Table 5-10 TXP_MR_10G and TXP_MR_10E Transponder Card ITU-T G.709 Threshold Settings

Parameter	Description	Options
Port	(Display only) Port number.	2
ES	Severely errored seconds. Two types of thresholds can be asserted. Selecting the SM (OTUk) radio button selects FEC and overhead management and performance monitoring using OTUk. Selecting the PM radio button selects path performance monitoring using ODUk.	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.
SES	Severely errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select the bullet and click **Refresh**.
UAS	Unavailable seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select the bullet and click **Refresh**.
BBE	Background block errors	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select the bullet and click **Refresh**.
FC	Failure counter	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select the bullet and click **Refresh**.

Table 5-11 describes the values on the Provisioning > OTN > FEC Thresholds tab.

Table 5-11 TXP_MR_10G and TXP_MR_10E Transponder Card FEC Threshold Settings

Parameter	Description	Options
Port	(Display only) Displays the port number and optional name.	2
Bit Errors Corrected	Displays the number of bit errors corrected during the selected time period.	Numeric display. Can be set for 15-minute or one-day intervals.
Uncorrectable Words	Displays the number of uncorrectable words in the selected time period.	Numeric display. Can be set for 15-minute or one-day intervals.

Table 5-12 describes the values on the Provisioning > OTN > Trail Trace Identifier tab.

Table 5-12 TXP_MR_10G and TXP_MR_10E Transponder Card Trail Trace Identifier Settings

Parameter	Description	Options
Port	Sets the port number.	• 1 • 2
Level	Sets the level.	• Section • Path
Trace Mode	Sets the trace mode.	• Off/None • Auto • Manual
Transmit	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size; trail trace identifier is 64 bytes in length.
Expected	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Received	(Display only) Displays the current received string. You can click Refresh to manually refresh this display, or select the Auto-refresh every 5 sec check box to keep this panel updated.	String of trace string size

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

NTP-G97 Modify Line Settings and PM Parameter Thresholds for MXP_2.5G_10G and MXP_2.5G_10E Cards

Purpose	This procedure changes the line and threshold settings for MXP_2.5G_10G and MXP_2.5G_10E muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	NTP-G32 Install the Transponder and Muxponder Cards, page 3-31. DLP-G63 Install an SFP or XFP, page 3-34 DLP-G277 Provision a Multirate PPM, page 5-3 (if necessary) DLP-G278 Provision the Optical Line Rate, page 5-3 (if necessary)
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the muxponder card settings. If you are already logged in, continue with Step 2.

Step 2 As needed, complete the "NTP-G103 Back Up the Database" procedure on page 12-2 to preserve the existing transmission settings.

Step 3 Perform any of the following tasks as needed:

- DLP-G222 Change Card Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-26
- DLP-G223 Change Line Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-28
- DLP-G224 Change Section Trace Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-30
- DLP-G225 Change Trunk Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-31
- DLP-G226 Change Line Thresholds Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-33
- DLP-G303 Provision the MXP_2.5G_10G and MXP_2.5G_10E Trunk Port Alarm and TCA Thresholds, page 5-34
- DLP-G304 Provision the MXP_2.5G_10G and MXP_2.5G_10E Client Port Alarm and TCA Thresholds, page 5-35
- DLP-G228 Change Line OTN Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-36

Step 4 As needed, complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G222 Change Card Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards

Purpose	This task changes the card settings for MXP_2.5G_10G or MXP_2.5G_10E muxponder cards, including payload type, termination mode, and wavelength.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_2.5G_10G or and MXP_2.5G_10E card where you want to change the card settings.

Step 2 Click the **Provisioning > Card** tabs.

Step 3 Modify any of the settings described in Table 5-13.

Table 5-13 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Settings

Parameter	Description	Options
Termination Mode	Sets the mode of operation. Options that do not apply to a card do not display. The MXP_2.5G_10G card is based on SONET/SDH multiplexing. The transparent mode terminates and rebuilds the B1 byte (as well as other bytes) of the incoming OC-48/STM-16 signal. The B2 byte is not touched. The MXP_2.5G_10E card is fully transparent in transparent mode based on the OTN/G.709 multiplexing scheme. It does not terminate the B1 byte or other bytes. It encapsulates OC-48/STM-16 bytes into ODU1 first, then multiplexes them into an OTU2. See the "15.12 Termination Modes" section on page 15-117 for more information.	For ANSI platforms: • Transparent • Section (MXP_2.5G_10E only) • Line (MXP_2.5g_10E only) For ETSI platforms: • Transparent • Multiplex Section (MXP_2.5G_10E only) • Regeneration Section (MXP_2.5g_10E only)
Wavelength	Set the wavelength of the DWDM side optical transmitter. You can set the wavelength to the First Tunable Wavelength or to further wavelengths in 100 GHz ITU spacing.	• First Tunable Wavelength • Further wavelengths in 100-GHz ITU grid specification • Supported wavelengths are in white and marked by asterisks (**); unsupported wavelengths are gray **Note** The four available wavelengths are listed in the Card Parameters section of the window and also in the Maintenance > Info subtab.
AIS/Squelch	(MXP_2.5G_10E only) Sets the transparent termination mode configuration.	• Ais • Squelch
Card Parameters	Displays the settings for the card.	Information only

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G223 Change Line Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards

Purpose	This task changes the line settings for MXP_2.5G_10G or MXP_2.5G_10E muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Double-click the MXP_2.5G_10G or MXP_2.5G_10E card where you want to change the line settings.

Step 2 Click the **Provisioning > Line > SONET** [ANSI] or **SDH** [ETSI] tabs.

Note The SONET tab appears only if you have created a PPM for a given port.

Step 3 Modify any of the settings described in Table 5-14.

Note You must modify Near End, and Far End independently; 15 Min and 1 Day independently; Line and Section independently. To do so choose the appropriate radio button and click **Refresh**.

Table 5-14 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line Settings

Parameter	Description	Options
Port #	(Display only) Port number. Ports 1 to 4 are client ports (OC-48/STM-16). Port 5 (TXP_2.5G_10G) is the DWDM trunk (OC-192/STM-64) that provides wavelength services.	• 1 • 2 • 3 • 4 • 5 (MXP_2.5G_10G only)
Port Name	Provides the ability to assign the specified port a logical name.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	• IS (ANSI) or Unlocked (ETSI) • IS,AINS(ANSI) or Unlocked,automaticInService (ETSI) • OOS,DSBLD(ANSI) or Locked,disabled (ETSI) • OOS,MT(ANSI) or Locked,maintenance (ETSI)

Table 5-14 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line Settings (continued)

Parameter	Description	Options
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	• IS-NR (ANSI) or Unlocked-enabled (ETSI) • OOS-AU,AINS (ANSI) or Unlocked-disabled, automaticInService (ETSI) • OOS-MA,DSBLD (ANSI) or Locked-enabled,disabled (ETSI) • OOS-MA,MT (ANSI) or Locked-enabled,maintenance (ETSI)
ALS Mode	Sets the automatic laser shutdown function mode. The DWDM transmitter supports ALS according to ITU-T G.644 (06/99). ALS can be disabled or be set for three mode options.	• Disable (default): ALS is off; the laser is not automatically shut down when traffic outages (LOS) occur. • Auto Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. It automatically restarts when the conditions that caused the outage are resolved. • Manual Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. However, the laser must be manually restarted when conditions that caused the outage are resolved. • Manual Restart for Test: Manually restarts the laser for testing.
SF BER	Sets the signal fail bit error rate.	• 1E-3 • 1E-4 • 1E-5
SD BER	Sets the signal degrade bit error rate.	• 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9
AINS Soak	Sets the automatic in-service soak period. Double click the time and use the up and down arrows to change settings.	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments
Type	The optical transport type	• SONET • SDH
ProvidesSync	Sets the ProvidesSync card parameter. If checked, the card is provisioned as a network element timing reference. (This parameter does not appear for the MXP_2.5G_10E trunk port.)	Checked or unchecked

Table 5-14 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line Settings (continued)

Parameter	Description	Options
SyncMsgIn	Enables synchronization status messages (S1 byte), which allow the node to choose the best timing source. (This parameter does not appear for the MXP_2.5G_10E trunk port.)	Checked or unchecked
Send DoNotUse	When checked, sends a DUS (do not use) message on the S1 byte. (This parameter does not appear for the MXP_2.5G_10E trunk port.)	Checked or unchecked

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G224 Change Section Trace Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards

Purpose	This task changes the section trace settings for MXP_2.5G_10G and MXP_2.5G_10E muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note The Section Trace tab appears only if you have created a PPM for the card.

Step 6 In node view, double-click the MXP_2.5G_10G or MXP_2.5G_10E card where you want to change the section trace settings.

Step 7 Click the **Provisioning > Line > Section Trace** tabs.

Step 8 Modify any of the settings described in Table 5-15.

Table 5-15 TXP_MR_10G and MXP_MR_10E Card Section Trace Settings

Parameter	Description	Options
Port	Sets the port number.	• 1 • 2 • 3 • 4
Trace Mode	Sets the trace mode.	• Off/None • Manual

Table 5-15 TXP_MR_10G and MXP_MR_10E Card Section Trace Settings (continued)

Parameter	Description	Options
Section Trace String Size	Sets the trace string size. Select either radio button.	• 1 byte • 16 byte
Transmit	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Expected	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Received	(Display only) Displays the current received string. You can click Refresh to manually refresh this display, or select the Auto-refresh every 5 sec check box to keep this panel updated.	String of trace string size

Step 9 Click **Apply**.

Step 10 Return to your originating procedure (NTP).

DLP-G225 Change Trunk Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards

Purpose	This task provisions the trunk settings for MXP_2.5G_10G and MXP_2.5G_10E muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_2.5G_10G or MXP_2.5G_10E card where you want to change the section trace settings.

Step 2 Click the **Provisioning > Line > Trunk** tab.

Step 3 Modify any of the settings described in Table 5-16.

Table 5-16 MXP_2.5G_10G and MXP_2.5G_10E Muxponder Card Trunk Settings

Parameter	Description	Options
Port #	(Display only) Displays the port number. Port 5 is the DWDM trunk (OC-192/STM-64) that provides wavelength services.	5
Port Name	Provides the ability to assign the specified port a logical name.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	• IS (ANSI) or Unlocked (ETSI) • IS,AINS(ANSI) or Unlocked,automaticInService (ETSI) • OOS,DSBLD(ANSI) or Locked,disabled (ETSI) • OOS,MT(ANSI) or Locked,maintenance (ETSI)
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	• IS-NR (ANSI) or Unlocked-enabled (ETSI) • OOS-AU,AINS (ANSI) or Unlocked-disabled, automaticInService (ETSI) • OOS-MA,DSBLD (ANSI) or Locked-enabled,disabled (ETSI) • OOS-MA,MT (ANSI) or Locked-enabled,maintenance (ETSI)
ALS Mode	Sets the automatic laser shutdown function mode. The DWDM transmitter supports ALS according to ITU-T G.644 (06/99). ALS can be disabled or be set for three mode options.	• Disable (default): ALS is off; the laser is not automatically shut down when traffic outages (LOS) occur. • Auto Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. It automatically restarts when the conditions that caused the outage are resolved. • Manual Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. However, the laser must be manually restarted when conditions that caused the outage are resolved. • Manual Restart for Test: Manually restarts the laser for testing.
AINS Soak	(OC-N and STM-N payloads only) Sets the automatic in-service soak period.	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G226 Change Line Thresholds Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards

Purpose	This task changes the line threshold settings for MXP_2.5G_10G or MXP_2.5G_10E muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_2.5G_10G or MXP_2.5G_10E card where you want to change the line threshold settings.

Step 2 Click the **Provisioning > Line Thresholds** tabs.

Step 3 Modify any of the settings described in Table 5-17.

Note You must modify Near End, and Far End independently; 15 Min and 1 Day independently; Line and Section independently. To do so choose the appropriate radio button and click **Refresh**.

Note In Table 5-17, some parameter tabs or selections do not always apply to both the MXP_2.5G_10G and MXP_2.5G_10E cards. If the tabs or selections do not apply, they do not appear in CTC.

Table 5-17 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line Threshold Settings

Parameter	Description	Options
Port	(Display only) Port number	• 1 • 2 • 3 • 4 • 5 (MXP_2.5G_10G only)
CV	Coding violations	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Section, or Path. Select a bullet and click **Refresh**.
ES	Errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Section, or Path. Select the bullet and click **Refresh**.

Table 5-17 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line Threshold Settings

Parameter	Description	Options
SES	Severely errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Section, or Path. Select the bullet and click **Refresh**.
FC	(Line only) Failure count	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, for Line only. Select the bullet and click **Refresh**.
UAS	(Line only) Unavailable seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, for Line only. Select the bullet and click **Refresh**.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G303 Provision the MXP_2.5G_10G and MXP_2.5G_10E Trunk Port Alarm and TCA Thresholds

Purpose	This task changes the MXP_2.5G_10G and MXP_2.5G_10E trunk port alarm and TCA thresholds.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_2.5G_10G or MXP_2.5G_10E card where you want to change the trunk port alarm and TCA settings.

Step 2 Click the **Provisioning > Optics Thresholds** tabs.

Step 3 Select a **15 Min** or **1 Day** performance monitoring interval radio button and then click **Refresh**.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 4 Referring to Table 5-18, provision the trunk port (Port 5) TCA thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low.

Note Do not modify the Laser Bias parameters.

Step 5 Click **Apply**.

Table 5-18 MXP_2.5G_10G and MXP_2.5G_10E Trunk Port Alarm and TCA Thresholds

Card	Alarm RX Power Low	Alarm RX Power High	TCA RX Power Low	TCA RX Power High	Alarm TX Power Low	Alarm TX Power High	TCA TX Power Low	TCA TX Power High
MXP_2.5G_10G	–24 dBm	–8 dBm	–22 dBm	–8 dBm	2 dBm	4 dBm	–1 dBm	7 dBm
MXP_2.5G_10E	–20 dBm	–8 dBm	–18 dBm	–9 dBm	3 dBm	7 dBm	0 dBm	9 dBm

Step 6 Under Types, click the **Alarm** radio button and click **Refresh**.

Step 7 Referring to Table 5-18, provision the trunk port (Port 5) Alarm thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 8 Click **Apply**.

Step 9 Return to your originating procedure (NTP).

DLP-G304 Provision the MXP_2.5G_10G and MXP_2.5G_10E Client Port Alarm and TCA Thresholds

Purpose	This task provisions the client port alarm and threshold cross alert (TCA) thresholds for the MXP_2.5G_10G and MXP_2.5G_10E Cards
Tools/Equipment	None
Prerequisite Procedures	DLP-G278 Provision the Optical Line Rate, page 5-3 DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_2.5G_10G and MXP_2.5G_10E card where you want to change the client port alarm and TCA settings.

Step 2 Click the **Provisioning > Optics Thresholds** tabs. The TCA thresholds are shown by default.

Step 3 Referring to Table 5-19, provision the Port N (where N = 1 through 4) TCA thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low based on the client interface at the other end. For additional information about client SFP and XFP interfaces, also known as Pluggable Port Modules (PPMs), refer to the Hardware Specifications chapter in the *Cisco ONS 15454 Reference Manual*.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 4 Click **Apply**.

Table 5-19 Client Interfaces Alarm and TCA Thresholds: MXP_2.5G_10G and MXP_2.5G_10E Cards

Port Type (by CTC)	Pluggable Port Module (SFP)	Alarm RX Power Low	Alarm RX Power High	Alarm TX Power Low	Alarm TX Power High	TCA RX Power Low	TCA RX Power High	TCA TX Power Low	TCA TX Power High
OC-48	ONS-SE-2G-S1	-21	0	-13	0	-18	-3	-16	3
	15454-SFP-OC48-IR	-21	3	-8	3	-18	0	-11	6
STM-16	ONS-SE-2G-S1	-21	0	-13	0	-18	-3	-16	3
	15454E-SFP-L.16.1	-21	3	-8	3	-18	0	-11	6

Step 5 Repeat Steps 3 and 4 to provision each additional client port.

Step 6 Under Types, click the **Alarm** radio button and click **Refresh**.

Step 7 Referring to Table 5-19, provision the Port N (where N = 1 through 4) Alarm thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low based on the client interface that is provisioned.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 8 Click **Apply**.

Step 9 Repeat Steps 7 and 8 to provision each additional client port. Otherwise, continue with Step 10.

Step 10 Return to your originating procedure.

DLP-G228 Change Line OTN Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards

Purpose	This task changes the line OTN settings for MXP_2.5G_10G or MXP_2.5G_10E muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_2.5G_10G or MXP_2.5G_10E card where you want to change the line OTN settings.

Step 2 Click one of the **Provisioning > OTN** tabs: OTN Lines, OTN G.709 Thresholds, FEC Thresholds, or Trail Trace Identifier.

Step 3 Modify any of the settings described in Tables 5-20 through 5-23.

Note You must modify Near End, and Far End independently; 15 Min and 1 Day independently; SM and PM independently. To do so choose the appropriate radio button and click **Refresh**.

Table 5-20 describes the values on the Provisioning > OTN > OTN Lines tab.

Note In Table 5-20, some parameter tabs or values do not always apply to both the MXP_2.5G_10G and MXP_2.5G_10E cards. When the tabs or values do not apply, they do not appear to the user.

Table 5-20 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Line OTN Settings

Parameter	Description	Options
Port #	(Display only) Displays the port number.	5
G.709 OTN	Sets the OTN lines according to ITU-T G.709.	• Enabled • Disabled
FEC	Sets the OTN line FEC mode. FEC mode can be Disabled or Enabled. Enhanced FEC mode can be enabled (to provide greater range and lower bit error rate). E-FEC applies only to the MXP_2.5G_10E card.	• Enabled—(MXP_2.5G_10G only) FEC is on • Disabled—FEC is off • Standard—(MXP_2.5G_10E only) FEC is on • Enhanced—(MXP_2.5G_10E only) Enhanced FEC is on
SF BER	Sets the signal fail bit error rate.	• 1E-5
SD BER	Sets the signal degrade bit error rate.	• 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9
Asynch/Synch Mapping	The MXP_2.5G_10E can perform standard ODU multiplexing according to ITU-T G.709. The card uses this to aggregate the four OC-48 client signals.	• ODU Multiplex

Table 5-21 describes the values on the Provisioning > OTN > OTN G.709 Thresholds tab.

Table 5-21 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card G.709 Threshold Settings

Parameter	Description	Options
Port	(Display only) Port number	5
ES	Errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.

Table 5-21 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card G.709 Threshold Settings

Parameter	Description	Options
SES	Severely errored seconds. Two types of thresholds can be asserted. Selecting the SM (OTUk) radio button selects FEC and overhead management and performance monitoring using OTUk. Selecting the PM radio button selects path performance monitoring using ODUk.	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.
UAS	Unavailable seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.
BBE	Background block errors	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.
FC	Failure counter	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.

Table 5-22 describes the values on the Provisioning > OTN > FEC Thresholds tab.

Table 5-22 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card FEC Threshold Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	5
Bit Errors Corrected	Displays the number of bit errors corrected during the interval selected. The interval can be set for 15 minutes or one day.	Numeric
Uncorrectable Words	Displays the number of uncorrectable words during the interval selected. The interval can be set for 15 minutes or one day.	Numeric

Table 5-23 describes the values on the Provisioning > OTN > Trail Trace Identifier tab.

Table 5-23 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Trail Trace Identifier Settings

Parameter	Description	Options
Port	Sets the port number. The trail trace identifier is applicable only to the trunk interface, which handles G.709 frames.	• 5
Level	Sets the level.	• Section • Path

Table 5-23 MXP_2.5G_10G or MXP_2.5G_10E Muxponder Card Trail Trace Identifier Settings

Parameter	Description	Options
Trace Mode	Sets the trace mode.	• Off/None • Manual
Transmit	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size; trail trace identifier is 64 bytes in length.
Expected	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Received	(Display only) Displays the current received string. You can click Refresh to manually refresh this display, or select the Auto-refresh every 5 sec box to keep this panel updated.	String of trace string size

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

NTP-G98 Modify Line Settings and PM Parameter Thresholds for TXP_MR_2.5G and TXPP_MR_2.5G Cards

Purpose This procedure changes the line and threshold settings for TXP_MR_2.5G and TXPP_MR_2.5G transponder cards.

Tools/Equipment None

Prerequisite Procedures NTP-G32 Install the Transponder and Muxponder Cards, page 3-31

DLP-G63 Install an SFP or XFP, page 3-34

DLP-G277 Provision a Multirate PPM, page 5-3 (if necessary)

DLP-G278 Provision the Optical Line Rate, page 5-3 (if necessary)

Required/As Needed As needed

Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the transponder card settings. If you are already logged in, continue with Step 2.

Step 2 As needed, complete the "NTP-G103 Back Up the Database" procedure on page 12-2 to preserve the existing transmission settings.

Step 3 Perform any of the following tasks as needed:

- DLP-G229 Change Card Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards, page 5-40
- DLP-G230 Change Line Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards, page 5-42
- DLP-G231 Change Section Trace Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards, page 5-43
- DLP-G232 Change TXP_MR_2.5G and TXPP_MR_2.5G Cards Line Threshold Settings for SONET or SDH Payloads, page 5-45
- DLP-G320 Change the TXP_MR_2.5G or TXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads, page 5-46
- DLP-G305 Provision the TXP_MR_2.5G and TXPP_MR_2.5G Trunk Port Alarm and TCA Thresholds, page 5-47
- DLP-G306 Provision the TXP_MR_2.5G and TXPP_MR_2.5G Cards Client Port Alarm and TCA Thresholds, page 5-48
- DLP-G234 Change OTN Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards, page 5-51

Stop. You have completed this procedure.

DLP-G229 Change Card Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards

Purpose	This task changes the card settings for TXP_MR_2.5G and TXPP_MR_2.5G transponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_2.5G or TXPP_MR_2.5G card where you want to change the card settings.

Step 2 Click the **Provisioning > Card** tabs.

Step 3 Modify any of the settings described in Table 5-24.

Table 5-24 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Settings

Parameter	Description	Options
Termination Mode	Sets the mode of operation (option only supported for SONET/SDH payloads). See the "15.12 Termination Modes" section on page 15-117 for more information.	• Transparent • Section • Line
Wavelength	Sets the wavelength of the DWDM side optical transmitter.	• First Tunable Wavelength • Further wavelengths in 100-GHz ITU spacing • Supported wavelengths are in white and marked by asterisks (**); unsupported wavelengths are gray. **Note** The four available wavelengths are listed in the Card Parameters section of the window and also in the Maintenance > Info subtab.
Regeneration Peer Slot	Sets the slot containing another TXP_MR_2.5G or TXPP_MR_2.5G card to create a regeneration peer group. A regeneration peer group facilitates management of two TXP_MR_2.5G or TXPP_MR_2.5G cards that are needed to perform a complete signal regeneration. The regeneration peer group synchronizes provisioning of the two cards. Payload type and G.709 OTN changes made on one TXP_MR_2.5G or TXPP_MR_2.5G card are reflected on the peer TXP_MR_2.5G or TXPP_MR_2.5G card. **Note**: Y-cable protection groups cannot be created on TXP_MR_2.5G or TXPP_MR_2.5G cards that are in a regeneration peer group.	• None • 1 • 2 • 3 • 4 • 5 • 6 • 12 • 13 • 14 • 15 • 16 • 17
Regeneration Group Name	Sets the regeneration peer group name.	User defined.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G230 Change Line Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards

Purpose	This task changes the line settings for TXP_MR_2.5G and TXPP_MR_2.5G transponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_2.5G or TXPP_MR_2.5G card where you want to change the line settings.

Step 2 Click the **Provisioning > Line** tabs and any additional PPM tabs depending on the client interface. Tabs and parameter selections vary according to PPM provisioning.

Step 3 Modify any of the settings described in Table 5-25.

Table 5-25 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Line Settings

Parameter	Description	Options
Port #	(Display only) Displays the port number.	• 1 • 2 • 3 (TXPP_MR_2.5G card only)
Port Name	The user can assign a logical name for each of the ports shown by filling in this field.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	• IS (ANSI) or Unlocked (ETSI) • IS,AINS(ANSI) or Unlocked,automaticInService (ETSI) • OOS,DSBLD(ANSI) or Locked,disabled (ETSI) • OOS,MT(ANSI) or Locked,maintenance (ETSI)
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	• IS-NR (ANSI) or Unlocked-enabled (ETSI) • OOS-AU,AINS (ANSI) or Unlocked-disabled, automaticInService (ETSI) • OOS-MA,DSBLD (ANSI) or Locked-enabled,disabled (ETSI) • OOS-MA,MT (ANSI) or Locked-enabled,maintenance (ETSI)

Table 5-25 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Line Settings (continued)

Parameter	Description	Options
ALS Mode	Sets the automatic laser shutdown function.	• Disabled (default) • Auto Restart • Manual Restart • Manual Restart for Test
SF BER	(OC-N and STM-N payloads only) Sets the signal fail bit error rate.	• 1E-3 • 1E-4 • 1E-5
SD BER	(OC-N and STM-N payloads only) Sets the signal degrade bit error rat.	• 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9
AINS Soak	(OC-N and STM-N payloads only) Sets the automatic in-service soak period.	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments
Type	The optical transport type. (OC-N and STM-N payloads only)	• SONET • SDH

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G231 Change Section Trace Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards

Purpose	This task changes the section trace settings for TXP_MR_2.5G and TXPP_MR_2.5G transponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note This task only applies to SONET services.

Step 1 In node view, double-click the TXP_MR_2.5G or TXPP_MR_2.5G card where you want to change the section trace settings.

Step 2 Click the **Provisioning > Line > Section Trace** tabs.

Step 3 Modify any of the settings described in Table 5-26.

Table 5-26 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Section Trace Settings

Parameter	Description	Options
Port	(Display only) Port number.	• 1 • 2 • 3 (TXPP_MR_2.5G only)
Trace Mode	Sets the trace mode.	• Off/None • Manual
Section Trace String Size	Sets the trace string size.	• 1 byte • 16 byte
Transmit	Displays the current transmit string; sets a new transmit string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Expected	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Received	(Display only) Displays the current received string. You can click Refresh to manually refresh this display, or choose Auto-refresh every 5 sec box to keep this display updated automatically.	String of trace string size

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G232 Change TXP_MR_2.5G and TXPP_MR_2.5G Cards Line Threshold Settings for SONET or SDH Payloads

Purpose	This task changes the line threshold settings for TXP_MR_2.5G and TXPP_MR_2.5G transponder cards carrying OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16 payloads.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_2.5G or TXPP_MR_2.5G card where you want to change the line threshold settings.

Step 2 Click the **Provisioning > Line Thresholds** tabs,

Note You must modify Near End, and Far End independently; 15 Min and 1 Day independently; Line and Section independently. To do so choose the appropriate radio button and click **Refresh**.

Step 3 Modify any of the settings in Table 5-27.

Table 5-27 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Line Thresholds Settings for OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16 Payloads

Parameter	Description	Options
Port	(Display only) Port number	• 1 • 2 • 3 (TXPP_MR_2.5G card only)
CV	Coding violations	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Section, or Path. Select the bullet and click **Refresh**.
ES	Errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Section, or Path. Select the bullet and click **Refresh**.
SES	Severely errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for Line (Far End only), Section, or Path. Select the bullet and click **Refresh**.
SEFS	(Section only) Severely errored framing seconds	Numeric. Can be set for Far End, for 15-minute or one-day intervals for Section only. Select the bullet and click **Refresh**.

Table 5-27 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Line Thresholds Settings for OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16 Payloads (continued)

Parameter	Description	Options
FC	(Line only) Failure count	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals for Line only. Select the bullet and click **Refresh**.
UAS	(Line only) Unavailable seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, for Line only. Select the bullet and click **Refresh**.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G320 Change the TXP_MR_2.5G or TXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads

Purpose	This task changes the line threshold settings for TXP_MR_2.5G and TXPP_MR_2.5G transponder cards carrying the 1G Ethernet, 1G FC/FICON payloads.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Display the TXP_MR_2.5G or TXPP_MR_2.5G card where you want to change the line threshold settings in card view.

Step 2 Click the **Provisioning > Line Thresholds > RMON Thresholds** tabs.

Step 3 Click **Create**. The Create Threshold dialog box appears.

Step 4 From the Port drop-down list, choose the applicable port.

Step 5 From the Variable drop-down list, choose an Ethernet variable. See Table 5-28 for a list of available Ethernet thresholds.

Table 5-28 TXP_MR_2.5G and TXPP_MR_2.5G 1G Ethernet, 1G FC/FICON

Variable	Description
ifInErrors	Number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
rxTotalPkts	Total number of received packets.

Table 5-28 TXP_MR_2.5G and TXPP_MR_2.5G 1G Ethernet, 1G FC/FICON

8b10bStatsEncodingDispErrors	Number of 8b10b disparity violations on the Fiber Channel line side.
8b10bIdleOrderedSets	Number of received packets containing idle ordered sets.
8b10bNonIdleOrderedSets	Number of received packets containing non-idle ordered sets.
8b10bDataOrderedSets	Number of received packets containing data ordered sets.

Step 6 From the Alarm Type drop-down list, indicate whether the event will be triggered by the rising threshold, falling threshold, or both the rising and falling thresholds.

Step 7 From the Sample Type drop-down list, choose either **Relative** or **Absolute**. Relative restricts the threshold to use the number of occurrences in the user-set sample period. Absolute sets the threshold to use the total number of occurrences, regardless of time period.

Step 8 Type in an appropriate number of seconds for the Sample Period.

Step 9 Type in the appropriate number of occurrences for the Rising Threshold.

For a rising type of alarm, the measured value must move from below the falling threshold to above the rising threshold. For example, if a network is running below a rising threshold of 1000 collisions every 15 seconds and a problem causes 1001 collisions in 15 seconds, the excess occurrences trigger an alarm.

Step 10 Enter the appropriate number of occurrences in the Falling Threshold field. In most cases a falling threshold is set lower than the rising threshold.

A falling threshold is the counterpart to a rising threshold. When the number of occurrences is above the rising threshold and then drops below a falling threshold, it resets the rising threshold. For example, when the network problem that caused 1001 collisions in 15 minutes subsides and creates only 799 collisions in 15 minutes, occurrences fall below a falling threshold of 800 collisions. This resets the rising threshold so that if network collisions again spike over a 1000 per 15-minute period, an event again triggers when the rising threshold is crossed. An event is triggered only the first time a rising threshold is exceeded (otherwise, a single network problem might cause a rising threshold to be exceeded multiple times and cause a flood of events).

Step 11 Click **OK** to complete the procedure.

Step 12 Return to your originating procedure (NTP).

DLP-G305 Provision the TXP_MR_2.5G and TXPP_MR_2.5G Trunk Port Alarm and TCA Thresholds

Purpose	This task changes the TXP_MR_2.5G and TXPP_MR_2.5G trunk port alarm and TCA thresholds.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_2.5G or TXPP_MR_2.5G card where you want to change the trunk port alarm and TCA settings.

Step 2 Click the **Pluggable Port Modules** tab. Under Pluggable Ports, record the Rate that is provisioned.

Step 3 Look up the rate in Table 15-54 on page 15-89 and determine whether it is 2R or 3R.

Step 4 Click the **Provisioning > Optics Thresholds** tabs.

Step 5 Click the **15 Min** performance monitoring interval radio button and click **Refresh**.

Step 6 Referring to Table 5-29, provision the trunk port (Port 2) TCA thresholds for RX Power High and RX Power Low depending on whether the rate is 2R or 3R.

Note Do not modify the Laser Bias parameters.

Step 7 Click **Apply**.

Table 5-29 TXP_MR_2.5G and TXPP_MR_2.5G Trunk Port TCA Thresholds

Signal	TCA RX Power Low	TCA RX Power High
3R	–23 dBm	–9 dBm
2R	–24 dBm	–9 dBm

Step 8 Under Types, click the **Alarm** radio button and click **Refresh**.

Step 9 Provision the trunk port (Port 2) Alarm thresholds for RX Power High to –7 dBm and the RX Power Low to –26 dBm.

Step 10 Click **Apply**.

Step 11 Click the **1 Day** performance monitoring interval radio button, click **Refresh**, then repeat Steps 6 through 10. If you have completed both intervals, continue with Step 12.

Step 12 Return to your originating procedure (NTP).

DLP-G306 Provision the TXP_MR_2.5G and TXPP_MR_2.5G Cards Client Port Alarm and TCA Thresholds

Purpose	This task provisions the client port alarm and threshold cross alert (TCA) thresholds for the TXP_MR_2.5G and TXPP_MR_2.5G cards
Tools/Equipment	None
Prerequisite Procedures	DLP-G278 Provision the Optical Line Rate, page 5-3 DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_2.5G and TXPP_MR_2.5G card where you want to change the client port alarm and TCA settings.

Step 2 Click the **Provisioning > Optics Thresholds** tabs. The TCA thresholds are shown by default.

Step 3 Referring to Table 5-30, provision the Port 1 (client) TCA thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low based on the client interface at the other end. For additional information about client SFP and XFP interfaces, also known as Pluggable Port Modules (PPMs), refer to the Hardware Specifications chapter in the *Cisco ONS 15454 Reference Manual*.

Note Do not modify the Laser Bias parameters.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 4 Click **Apply**.

Table 5-30 Client Interfaces Alarm and TCA Thresholds: TXP_MR_2.5G and TXPP_MR_2.5G Cards

Port Type (by CTC)	Pluggable Port Module (SFP)	Alarm RX Power Low	Alarm RX Power High	Alarm TX Power Low	Alarm TX Power High	TCA RX Power Low	TCA RX Power High	TCA TX Power Low	TCA TX Power High
OC-3	15454-SFP3-1-IR	–26	–5	–18	–5	–23	–8	–21	–2
STM-1	15454E-SFP-L.1.1	–27	–7	–18	–5	–24	–10	–21	–2
OC-12	15454-SFP12-4-IR	–31	–4	–18	–5	–28	–7	–21	–2
STM-4	15454E-SFP-L.4.1	–31	–5	–18	–5	–28	–8	–21	–2
OC-48	ONS-SE-2G-S1	–21	0	–13	0	–18	–3	–16	3
	15454-SFP-OC48-IR	–21	3	–8	3	–18	0	–11	6
STM-16	ONS-SE-2G-S1	–21	0	–13	0	–18	–3	–16	3
	15454E-SFP-L.16.1	–21	3	–8	3	–18	0	–11	6
ONE_GE	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–20	3	–13	–1	–17	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
ESCON	15454-SFP-200 15454E-SFP-200	–24	–11	–32	–11	–21	–14	–35	–8
DV6000	15454-SFP-OC48-IR	–31	–4	–18	–5	–28	–7	–21	–2
	15454E-SFP-L.16.1	–21	3	–8	3	–18	0	–11	6
SDI_D1_VIDEO	15454-SFP12-4-IR	–31	–4	–18	–5	–28	–7	–21	–2
	15454E-SFP-L.4.1	–31	–5	–18	–5	–28	–8	–21	–2
HDTV	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
PASS-THRU	2R MODE (not specified)	Service Dependent							

Table 5-30 Client Interfaces Alarm and TCA Thresholds: TXP_MR_2.5G and TXPP_MR_2.5G Cards (continued)

Port Type (by CTC)	Pluggable Port Module (SFP)	Alarm RX Power Low	Alarm RX Power High	Alarm TX Power Low	Alarm TX Power High	TCA RX Power Low	TCA RX Power High	TCA TX Power Low	TCA TX Power High
FC1G	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–20	3	–13	–1	–17	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
FC2G	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–18	3	–13	–1	–15	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
FICON1G	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–20	3	–13	–1	–17	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
FICON2G	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–20	3	–13	–1	–17	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
ETR_CLO	15454-SFP-200 15454E-SFP-200	–20	3	–13	–1	–17	0	–16	3
ISC compat	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
ISC peer	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3

Step 5 Under Types, click the **Alarm** radio button and click **Refresh**.

Step 6 Referring to Table 5-30, provision the Alarm thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low based on the client interface that is provisioned.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 7 Click **Apply**.

Step 8 Return to your originating procedure.

DLP-G234 Change OTN Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards

Purpose	This task changes the OTN settings for TXP_MR_2.5G and TXPP_MR_2.5G transponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the TXP_MR_2.5G or TXPP_MR_2.5G card where you want to change the OTN settings.

Step 2 Click one of the **Provisioning > OTN** subtabs: OTN Lines, G.709 Thresholds, FEC Thresholds, or Trail Trace Identifier.

Step 3 Modify any of the settings described in Tables 5-31 through 5-34.

Note You must modify Near End and Far End; 15 Min and 1 Day; and SM and PM independently. To do so choose the appropriate radio button and click **Refresh**.

Table 5-31 describes the values on the Provisioning > OTN > OTN Lines tab.

Table 5-31 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card OTN Line Settings

Parameter	Description	Options
Port #	(Display only) Displays the port number.	2
G.709 OTN	Sets the OTN lines according to ITU-T G.709.	• Enabled • Disabled
FEC	Sets the OTN lines to FEC.	• Enabled • Disabled
SF BER	Sets the signal fail bit error rate.	• 1E-5
SD BER	Sets the signal degrade bit error rate.	• 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9

Table 5-32 describes the values on the Provisioning > OTN > G.709 Thresholds tab.

Table 5-32 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card ITU-T G.709 Threshold Settings

Parameter	Description	Options
Port[1]	(Display only) Port number.	2
ES	Errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.
SES	Severely errored seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.
UAS	Unavailable seconds	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.
BBE	Background block errors	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.
FC	Failure counter	Numeric. Can be set for Near End or Far End, for 15-minute or one-day intervals, or for SM (OTUk) or PM (ODUk). Select a bullet and click **Refresh**.

1. Latency for 1G-FC payload without ITU-T G.709 is 4 microseconds, with ITU-T G.709 is 40 microseconds. Latency for 2G-FC payload without ITU-T G.709 is 2 microseconds, with ITU-T G.709 is 20 microseconds. Consider these values when planning a FC network that is sensitive to latency.

Table 5-33 describes the values on the Provisioning > OTN > FEC Threshold tab.

Table 5-33 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card FEC Threshold Settings

Parameter	Description	Options
Port	(Display only) Port number.	2
Bit Errors Corrected	Sets the value for bit errors corrected.	Numeric. Can be set for 15-minute or one-day intervals.
Uncorrectable Words	Sets the value for uncorrectable words.	Numeric. Can be set for 15-minute or one-day intervals.

Table 5-34 describes the values on the Provisioning > OTN > Trail Trace Identifier tab.

Table 5-34 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Trail Trace Identifier Settings

Parameter	Description	Options
Port	(Display only) Port number.	2
Level	Sets the level.	• Section • Path
Trace Mode	Sets the trace mode.	• Off/None • Manual

Table 5-34 TXP_MR_2.5G and TXPP_MR_2.5G Transponder Card Trail Trace Identifier Settings

Parameter	Description	Options
Transmit	Displays the current transmit string; sets a new transmit string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Expected	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Received	(Display only) Displays the current received string. You can click Refresh to manually refresh this display, or select the Auto-refresh every 5 sec check box to keep this panel updated.	String of trace string size

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

NTP-G99 Modify Line Settings and PM Parameter Thresholds for MXP_MR_2.5G and MXPP_MR_2.5G Cards

Purpose	This procedure changes the line and threshold settings for MXP_MR_2.5G and MXPP_MR_2.5G muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	NTP-G32 Install the Transponder and Muxponder Cards, page 3-31 DLP-G63 Install an SFP or XFP, page 3-34 DLP-G277 Provision a Multirate PPM, page 5-3 (if necessary) DLP-G278 Provision the Optical Line Rate, page 5-3 (if necessary)
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the muxponder card settings. If you are already logged in, proceed to Step 2.

Step 2 As needed, complete the "NTP-G103 Back Up the Database" procedure on page 12-2 to preserve the existing transmission settings.

Step 3 Perform any of the following tasks as needed:

- DLP-G235 Change Card Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards, page 5-54
- DLP-G236 Change Client Line Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards, page 5-55
- DLP-G237 Change Distance Extension Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards, page 5-57
- DLP-G238 Change OC-48/STM-16 Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards, page 5-58
- DLP-G239 Change Section Trace Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards, page 5-60
- DLP-G321 Change the MXP_MR_2.5G or MXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads, page 5-62
- DLP-G320 Change the TXP_MR_2.5G or TXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads, page 5-46
- DLP-G307 Provision the MXP_MR_2.5G and MXPP_MR_2.5G Trunk Port Alarm and TCA Thresholds, page 5-64
- DLP-G308 Provision the MXP_MR_2.5G and MXPP_MR_2.5G Client Port Alarm and TCA Thresholds, page 5-65

Note To use the Alarm Profiles tab, including creating alarm profiles and suppressing alarms, see Chapter 8, "Manage Alarms."

Stop. You have completed this procedure.

DLP-G235 Change Card Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards

Purpose	This task changes the card settings for MXP_MR_2.5G and MXPP_MR_2.5G muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Card settings can be changed only if the facilities are out-of-service (OOS).

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to change the card settings.

Step 2 Click the **Provisioning > Card** tabs.

Step 3 Modify any of the settings described in Table 5-35.

Table 5-35 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Settings

Parameter	Description	Options
Card Mode	Sets the mode of operation (option only supported for SONET/SDH payloads). Note: this setting is not currently supported. The only option available currently is FC-GE.	• FC-GE
Wavelength	Sets the wavelength of the DWDM side optical transmitter.	• First Tunable Wavelength • Further wavelengths in 100-GHz ITU spacing • Supported wavelengths are in white and marked by asterisks (**); unsupported wavelengths are gray. **Note** The four available wavelengths are listed in the Card Parameters section of the window and also in the Maintenance > Info subtab.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G236 Change Client Line Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards

Purpose	This task changes the line settings for MXP_MR_2.5G and MXPP_MR_2.5G muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to change the line settings.

Step 2 Click the **Provisioning > Line > [client service]** tabs. Tabs and parameter selections vary according to PPM provisioning.

Step 3 Modify any of the settings for the Client tab as described in Table 5-36.

Table 5-36 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Client Tab Settings

Parameter	Description	Options
Port #	(Display only) Port number.	• 1 • 2
Port Name	The user can assign a logical name for each of the ports shown by filling in this field.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	• IS (ANSI) or Unlocked (ETSI) • IS,AINS(ANSI) or Unlocked,automaticInService (ETSI) • OOS,DSBLD(ANSI) or Locked,disabled (ETSI) • OOS,MT(ANSI) or Locked,maintenance (ETSI)
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	• IS-NR (ANSI) or Unlocked-enabled (ETSI) • OOS-AU,AINS (ANSI) or Unlocked-disabled, automaticInService (ETSI) • OOS-MA,DSBLD (ANSI) or Locked-enabled,disabled (ETSI) • OOS-MA,MT (ANSI) or Locked-enabled,maintenance (ETSI)
ALS Mode	Sets the automatic laser shutdown function.	• Disabled (default) • Auto Restart • Manual Restart • Manual Restart for Test

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G237 Change Distance Extension Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards

Purpose	This task changes the distance extension settings for MXP_MR_2.5G and MXPP_MR_2.5G muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Distance extension settings can be changed only if the facilities are out-of-service (OOS).

Note The distance extension parameters only apply to client ports (1 to 8) and not to the trunk ports (Port 9 for MXP_MR_2.5G card or Ports 9 and 10 for the MXPP_MR_2.5G card).

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to change the distance extension settings.

Step 2 Click the **Provisioning > Line > Distance Extension** tabs. Tabs and parameter selections vary according to PPM provisioning.

Step 3 Modify any of the settings for the Distance Extension tab as described in Table 5-37.

Table 5-37 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Distance Extension Settings

Parameter	Description	Options
Port #	(Display only) Port number.	• 1 • 2
Enable Distance Extension	Allows end-to-end distances of up to 1600 km for FC1G and up to 800 km for FC2G. If Distance Extension is enabled, set the connected Fibre Channel switches to Interop or Open Fabric mode, depending on the Fibre Channel switch. By default, the MXP_MR_2.5G and MXPP_MR_2.5G card will interoperate with the Cisco MDS storage products.	Checked or unchecked
Auto Detect Credits	Allows automatic detection of buffer credits for FC flow control.	Checked or unchecked
Credits Available	(Display only) Displays the number of buffer credits available.	Numeric (range depends on the client equipment attached to the card)

Table 5-37 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Distance Extension Settings (continued) (continued)

Parameter	Description	Options
Autoadjust GFP Buffer Threshold	This parameter allows the threshold of the GFP buffer between two MXP_MR_2.5G or two MXPP_MR_2.5G cards to be automatically adjust ed.	Checked or unchecked
GFP Buffers Available	Displays the number of GFP buffers available between two MXP_MR_2.5G or two MXPP_MR_2.5G cards.	Numeric

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G238 Change OC-48/STM-16 Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards

Purpose	This task changes the OC-48/STM-16 settings for MXP_MR_2.5G and MXPP_MR_2.5G muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note OC-48/STM-16 settings apply only to the trunk ports (Port 9 for the MXP_MR_2.5G card and Ports 9 and 10 for the MXPP_MR_2.5G card.)

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to change the OC-48/STM-64 settings.

Step 2 Click the **Provisioning > Line > SONET** (ANSI) or **SDH** (ETSI). Tabs and parameter selections vary according to PPM provisioning.

Step 3 Modify any of the settings for the SONET or SDH tab as described in Table 5-38.

Table 5-38 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line SONET or SDH Tab Settings

Parameter	Description	Options
Port #	(Display only) Port number.	9 (trunk for MXP_MR_2.5G) or 9-10 (trunk for MXPP_MR_2.5G)
Port Name	Provides the ability to assign the specified port a name.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	• IS (ANSI) or Unlocked (ETSI) • IS,AINS(ANSI) or Unlocked,automaticInService (ETSI) • OOS,DSBLD(ANSI) or Locked,disabled (ETSI) • OOS,MT(ANSI) or Locked,maintenance (ETSI)
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	• IS-NR (ANSI) or Unlocked-enabled (ETSI) • OOS-AU,AINS (ANSI) or Unlocked-disabled, automaticInService (ETSI) • OOS-MA,DSBLD (ANSI) or Locked-enabled,disabled (ETSI) • OOS-MA,MT (ANSI) or Locked-enabled,maintenance (ETSI)
SF BER[1]	Sets the signal fail bit error rate.	• 1E-3 • 1E-4 • 1E-5
SD BER[1]	Sets the signal degrade bit error rate.	• 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9
AINS Soak	Sets the automatic in-service soak period. Double click the time and use the up and down arrows to change settings.	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments
Type	The optical transport type.	• SONET (ANSI) • SDH (ETSI)

Table 5-38 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line SONET or SDH Tab Settings (continued)

Parameter	Description	Options
ALS Mode	Sets the automatic laser shutdown function mode. The DWDM transmitter supports ALS according to ITU-T G.644 (06/99). ALS can be disabled or be set for three mode options.	• Disable (default): ALS is off; the laser is not automatically shut down when traffic outages (LOS) occur. • Auto Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. It automatically restarts when the conditions that caused the outage are resolved. • Manual Restart: ALS is on; the laser automatically shuts down when traffic outages (LOS) occur. However, the laser must be manually restarted when conditions that caused the outage are resolved. • Manual Restart for Test: Manually restarts the laser for testing.
ProvidesSync	Sets the ProvidesSync card parameter. If checked, the card is provisioned as a network element timing reference.	Checked or unchecked
SyncMsgIn	Sets the EnableSync card parameter. Enables synchronization status messages (S1 byte), which allow the node to choose the best timing source.	Checked or unchecked
Send DoNotUse	Sets the Send DoNotUse card state. When checked, sends a DUS (do not use) message on the S1 byte.	Checked or unchecked

1. BER and SD thresholds apply only to trunk ports (Port 9 for MXP_MR_2.5G and Ports 9 and 10 for MXPP_MR_2.5G).

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G239 Change Section Trace Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards

Purpose	This task changes the section trace settings for MXP_MR_2.5G and MXPP_MR_2.5G muxponder cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to change the section trace settings.

Step 2 Click the **Provisioning > Line > Section Trace** tabs. Tabs and parameter selections vary according to PPM provisioning.

Step 3 Modify any of the settings in the Section Trace tab as described in Table 5-39.

Table 5-39 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Section Trace Tab Settings

Parameter	Description	Options
Port	(Display only) Port number.	• 9 (trunk for MXP_MR_2 and 10 (trunk for MXPP_
Trace Mode	Sets the trace mode.	• Off/None • Manual
Section Trace String Size	Sets the trace string size.	• 1 byte • 16 byte
Transmit	Displays the current transmit string; sets a new transmit string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Expected	Displays the current expected string; sets a new expected string. You can click the button on the right to change the display. Its title changes, based on the current display mode. Click Hex to change the display to hexadecimal (button changes to ASCII); click ASCII to change the display to ASCII (button changes to Hex).	String of trace string size
Received	(Display only) Displays the current received string. You can click Refresh to manually refresh this display, or select the Auto-refresh every 5 sec check box to keep this panel updated.	String of trace string size

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G240 Change MXP_MR_2.5G and MXPP_MR_2.5G Cards Line Threshold Settings for SONET or SDH Payloads

Purpose	This task changes the line threshold settings for MXP_MR_2.5G and MXPP_MR_2.5G muxponder cards for SONET or SDH payloads.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to change the line threshold settings.

Step 2 Click the **Provisioning > Line Thresholds > SONET (or SDH) Thresholds** tabs.

Step 3 Modify any of the settings as shown in Table 5-40.

Note You must modify Near End, and Far End independently; 15 Min and 1 Day independently; Line and Section independently. To do so choose the appropriate radio button and click **Refresh**.

Table 5-40 MXP_MR_2.5G and MXPP_MR_2.5G Muxponder Card Line Threshold Settings

Field	Description	Options
Port	(Display only) Port number.	• 9 (trunk for MXP_MR_2.5G) • 9-10 (trunk for MXPP_MR_2.5G)
CV	Coding violations.	Numeric. Can be set for Near End or Far End, for 15-mi one-day intervals, or for Line (Far End only), Section, o Select the bullet and click **Refresh**.
ES	Errored seconds.	Numeric. Can be set for Near End or Far End, for 15-mi one-day intervals, or for Line (Far End only), Section, o Select the bullet and click **Refresh**.
SES	Severely errored seconds.	Numeric. Can be set for Near End or Far End, for 15-mi one-day intervals, or for Line (Far End only), Section, o Select the bullet and click **Refresh**.
FC	(Line only) Failure count.	Numeric. Can be set for Near End or Far End, for 15-mi one-day intervals for Line only. Select the bullet and cli **Refresh**.
UAS	(Line only) Unavailable seconds.	Numeric. Can be set for Near End or Far End, for 15-mi one-day intervals, for Line only. Select the bullet and cl **Refresh**.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G321 Change the MXP_MR_2.5G or MXPP_MR_2.5G Card Line Thresholds for 1G Ethernet or 1G FC/FICON Payloads

Purpose	This task changes the line threshold settings for MXP_MR_10G and MXPP_MR_10E transponder cards carrying the 1G Ethernet, 1G FC/FICON payloads.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed

Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Display the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to change the line threshold settings in card view.

Step 2 Click the **Provisioning > Line Thresholds > RMON Thresholds** tabs.

Step 3 Click **Create**. The Create Threshold dialog box appears.

Step 4 From the Port drop-down list, choose the applicable port.

Step 5 From the Variable drop-down list, choose an Ethernet variable. See Table 5-41 for a list of available Ethernet thresholds.

Table 5-41 MXP_MR_2.5G and MXPP_MR 2.5G 1G Ethernet, 1G FC/FICON Variables

Variable	Description
ifInOctets	Number of bytes received since the last counter reset.
rxTotalPkts	Total number of Receive packets.
ifInDiscards	Number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol.
ifInErrors	Total number of receive errors.
ifOutOctets	The total number of octets transmitted out of the interface, including framing characters.
txTotalPkts	Total number of Transmitted packets.
ifOutDiscards	Number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted.
mediaIndStatsRxFramesTruncated	Total number of frames received that are less than 5 bytes. This value is a part of HDLC and GFP port statistics.
mediaIndStatsRxFramesTooLong	Number of received frames that exceed the MTU. This value is part of HDLC and GFP port statistics.
mediaIndStatsRxFramesBadCRC	Number of receive data frames with payload CRC errors when HDLC framing is used.
mediaIndStatsTxFramesBadCRC	Number of transmitted data frames with payload CRC errors when HDLC framing is used.
fcStatsLinkRecoveries	Number of link recoveries.
fcStatsZeroTxCredits	Number of transmit attempts that failed because of unavailable credits.
8b10bInvalidOrderedSets	Number of 8b10b disparity violations on the Fibre Channel line side.
8b10bStatsEncodingDispErrors	Number of 8b10b disparity violations on the Fibre Channel line side.

Step 6 From the Alarm Type drop-down list, indicate whether the event will be triggered by the rising threshold, falling threshold, or both the rising and falling thresholds.

Step 7 From the Sample Type drop-down list, choose either **Relative** or **Absolute**. Relative restricts the threshold to use the number of occurrences in the user-set sample period. Absolute sets the threshold to use the total number of occurrences, regardless of time period.

Step 8 Type in an appropriate number of seconds for the Sample Period.

Step 9 Type in the appropriate number of occurrences for the Rising Threshold.

For a rising type of alarm, the measured value must move from below the falling threshold to above the rising threshold. For example, if a network is running below a rising threshold of 1000 collisions every 15 seconds and a problem causes 1001 collisions in 15 seconds, the excess occurrences trigger an alarm.

Step 10 Enter the appropriate number of occurrences in the Falling Threshold field. In most cases a falling threshold is set lower than the rising threshold.

A falling threshold is the counterpart to a rising threshold. When the number of occurrences is above the rising threshold and then drops below a falling threshold, it resets the rising threshold. For example, when the network problem that caused 1001 collisions in 15 minutes subsides and creates only 799 collisions in 15 minutes, occurrences fall below a falling threshold of 800 collisions. This resets the rising threshold so that if network collisions again spike over a 1000 per 15-minute period, an event again triggers when the rising threshold is crossed. An event is triggered only the first time a rising threshold is exceeded (otherwise, a single network problem might cause a rising threshold to be exceeded multiple times and cause a flood of events).

Step 11 Click **OK** to complete the procedure.

Step 12 Return to your originating procedure (NTP).

DLP-G307 Provision the MXP_MR_2.5G and MXPP_MR_2.5G Trunk Port Alarm and TCA Thresholds

Purpose	This task changes the MXP_MR_2.5G and MXPP_MR_2.5G trunk port alarm and TCA thresholds.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to change the trunk port alarm and TCA settings.

Step 2 Click the **Provisioning > Optics Thresholds** tabs.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 3 Provision the trunk port (Port 9) TCA thresholds for RX Power High to –9 dBm and the RX Power Low to –23 dBm.

Step 4 Under Types, click the **Alarm** radio button and click **Refresh**.

Note Do not modify the Laser Bias parameters.

Step 5 Provision the trunk port (Port 9) Alarm thresholds for RX Power High to –7 dBm and the RX Power Low to –26 dBm.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 6 Click **Apply**.

Step 7 Return to your originating procedure (NTP).

DLP-G308 Provision the MXP_MR_2.5G and MXPP_MR_2.5G Client Port Alarm and TCA Thresholds

Purpose	This task provisions the client port alarm and threshold cross alert (TCA) thresholds for the MXP_MR_2.5G and MXPP_MR_2.5G Cards
Tools/Equipment	None
Prerequisite Procedures	DLP-G278 Provision the Optical Line Rate, page 5-3 DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the MXP_MR_2.5G and MXPP_MR_2.5G card where you want to change the client port alarm and TCA settings.

Step 2 Click the **Provisioning > Optics Thresholds** tabs. The TCA thresholds are shown by default.

Step 3 Referring to Table 5-19, provision the client ports (Ports 1 through 8) TCA thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low based on the client interface at the other end. For additional information about client SFP and XFP interfaces, also known as Pluggable Port Modules (PPMs), refer to the Hardware Specifications chapter in the *Cisco ONS 15454 Reference Manual*.

Note Do not modify the Laser Bias parameters.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 4 Click **Apply**.

Table 5-42 Client Interfaces Alarm and TCA Thresholds: MXP_MR_2.5G and MXPP_MR_2.5G Cards

Port Type (by CTC)	Pluggable Port Module (XFP)	Alarm RX Power Low	Alarm RX Power High	Alarm TX Power Low	Alarm TX Power High	TCA RX Power Low	TCA RX Power High	TCA TX Power Low	TCA TX Power High
FC1G	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–20	3	–13	–1	–17	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
FC2G	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–18	3	–13	–1	–15	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
FICON1G	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–20	3	–13	–1	–17	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
FICON2G	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–20	3	–13	–1	–17	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3
ONE_GE	15454-SFP-GEFC-SX 15454E-SFP-GEFC-S	–20	3	–13	–1	–17	0	–16	3
	15454-SFP-GE+-LX 15454E-SFP-GE+-LX	–23	0	–13	0	–20	–3	–16	3

Step 5 Repeat Steps 3 and 4 to provision each additional client port.

Step 6 Under Types, click the **Alarm** radio button and click **Refresh**.

Step 7 Referring to Table 5-19, provision the client ports (Ports 1 through 8) Alarm thresholds for RX Power High, RX Power Low, TX Power High, and TX Power Low based on the client interface that is provisioned.

Note You must modify 15 Min and 1 Day independently. To do so choose the appropriate radio button and click **Refresh**.

Step 8 Click **Apply**.

Step 9 Repeat Steps 7 and 8 to provision each additional client port. Otherwise, continue with Step 10.

Step 10 Return to your originating procedure.

Turn Up Network

This chapter explains how to turn up and test a Cisco ONS 15454 dense wavelength division multiplexing (DWDM) network. For DWDM topology reference information and span loss tables, see Chapter 17, "Network Reference."

There are two main DWDM network types, metro core, where the channel power is equalized and dispersion compensation is applied, and metro access, where the channels are not equalized and dispersion compensation is not applied. The DWDM network topologies supported are hubbed rings, multihubbed rings, meshed rings, linear configurations, and single-span links. The DWDM node types supported are hub, terminal, optical add/drop multiplexing (OADM), reconfigurable optical add/drop multiplexing (ROADM) anti-amplified spontaneous emissions (ASE), and line amplifier. For DWDM and hybrid node turn up procedures, see Chapter 3, "Turn Up a Node."

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. NTP-G51 Verify DWDM Node Turn Up, page 6-1—Complete this procedure before beginning network turn up.
2. NTP-G52 Verify Node-to-Node Connections, page 6-3—Complete this procedure next.
3. NTP-G53 Set Up Timing, page 6-3—Complete this procedure next.
4. NTP-G54 Provision and Verify a DWDM Network, page 6-7—Complete this procedure next.
5. NTP-G56 Verify the OSNR, page 6-11—Complete as needed.
6. NTP-G57 Create a Logical Network Map, page 6-14—Complete as needed.

NTP-G51 Verify DWDM Node Turn Up

Purpose	This procedure verifies that each ONS 15454 is ready for DWDM network turn up before adding nodes to a network. This procedure applies to all ROADM, OADM, or line amplifier locations.
Tools/Equipment	None

Prerequisite Procedures	Chapter 3, "Turn Up a Node"
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into an ONS 15454 on the network that you will test. See the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, proceed to Step 2.

Step 2 Click the **Alarms** tab.

a. Verify that the alarm filter is not turned on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Step 3 Verify that the software version shown in the node view status area matches your site plan. (The status area is located to the left of the shelf graphic.) If the software is not the correct version, install the correct version from the ONS 15454 software CD. Upgrade procedures are located in the release-specific software upgrade document. Follow the upgrade procedures appropriate to the software currently installed on the node. TCC2/TCC2P cards can also be ordered with the latest software release.

Step 4 Click the **Provisioning > General** tabs. Verify that all general node information settings are correct according to documentation provided by the network administrator. If not, see the "NTP-G80 Change Node Management Information" procedure on page 10-6.

Step 5 Click the **Provisioning > Network** tabs. Ensure that the IP settings and other Cisco Transport Controller (CTC) network access information is correct according to documentation provided by the network administrator. If not, see the "NTP-G81 Change CTC Network Access" procedure on page 10-9.

Step 6 Click the **Provisioning > Protection** tabs. Verify that all required protection groups have been created according to documentation provided by the network administrator. If not, see the"NTP-G33 Create a Y-Cable Protection Group" procedure on page 3-36 or the "NTP-G83 Modify or Delete Card Protection Settings" procedure on page 10-21.

Step 7 Click the **Provisioning > Security** tabs. Verify that all users have been created and that their security levels are correct according to documentation provided by the network administrator. If not, see the "NTP-G88 Modify Users and Change Security" procedure on page 10-35.

Step 8 If Simple Network Management Protocol (SNMP) is provisioned on the node, click the **Provisioning > SNMP** tabs. Verify that all SNMP settings are correct according to documentation provided by the network administrator. If not, see the "NTP-G89 Change SNMP Settings" procedure on page 10-46.

Step 9 Repeat this procedure at each node in the network.

Stop. You have completed this procedure.

NTP-G52 Verify Node-to-Node Connections

Purpose	This procedure verifies OSC terminations between nodes and checks span attenuation. This procedure applies to all ROADM, OADM, or line amplifier locations.
Tools/Equipment	None
Prerequisite Procedures	NTP-G51 Verify DWDM Node Turn Up, page 6-1
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Check to see if fiber is connected to the OPT-BST or OSC-CSM LINE RX and TX ports. If yes, continue with Step 2. If not, complete the following tasks:

a. Clean the fiber using the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22.

b. Install the fiber using the "DLP-G65 Install Fiber-Optic Cables for OSC Link Terminations Between Two Adjacent Nodes" task on page 3-42.

Step 2 Verify the network fiber connections:

- The east Line TX and Line RX ports connect to the west Line RX and TX ports of the adjacent node.
- The west Line TX and Line RX ports connect to the east Line RX and TX ports of the adjacent node.

Step 3 Complete the "DLP-G46 Log into CTC" task on page 2-24 at a network node.

Step 4 Click the **Provisioning > Comm Channels > OSC** tab. Verify that OSC terminations were created for the east and west OSC-CSM or OSCM cards and the port state is In-Service and Normal (IS-NR [ANSI])/Unlocked-enabled (ETSI). If so, continue with Step 5. If OSC terminations are not created, complete the "NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74.

Step 5 Complete the "DLP-G155 Verify Optical Span Loss Using CTC" task on page 10-2. If the measured span loss is within the minimum and maximum expected span loss values, continue with Step 6. If not, clean the fiber connected to the OPT-BST or OSC-CSM on both ends of the span, then repeat the "DLP-G155 Verify Optical Span Loss Using CTC" task on page 10-2. If the span loss is within the minimum and maximum expected span loss values, continue with Step 6. If not, contact your next level of support.

Step 6 Repeat Steps 2 through 5 at each network node.

Stop. You have completed this procedure.

NTP-G53 Set Up Timing

Purpose	This procedure provisions the ONS 15454 timing.
Tools/Equipment	None
Prerequisite Procedures	NTP-G51 Verify DWDM Node Turn Up, page 6-1
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you will set up timing. If you are already logged in, continue with Step 2.

Step 2 Complete the "DLP-G95 Set Up External or Line Timing" task on page 6-4 if an external building integrated timing supply (BITS) source is available. This is the common ONS 15454 timing setup procedure.

Step 3 If an external BITS source is not available, complete the "DLP-G96 Set Up Internal Timing" task on page 6-6. This task can only provide Stratum 3 timing.

Step 4 Repeat this procedure at each node in the network.

Stop. **You have completed this procedure**.

DLP-G95 Set Up External or Line Timing

Purpose	This task defines the ONS 15454 timing source (external or line).
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Timing > General** tabs.

Step 2 In the General Timing area, complete the following information:

- Timing Mode—Choose **External** if the ONS 15454 derives its timing from a BITS source wired to the backplane pins (ANSI) or a MIC-C/T/P FMEC (ETSI); choose **Line** if timing is derived from an OSC-CSM or OSCM card that is optically connected to the timing node. A third option, Mixed, allows you to set external and line timing references.

Note Because Mixed timing might cause timing loops, Cisco does not recommend its use. Use this mode with care.

- SSM Message Set—For DWDM nodes, choose the Generation 2 synchronization status messaging (SSM) option. Generation 1 is used only by SONET or SDH ONS 15454s that are connected to equipment that does not support Generation 2.
- Quality of RES—If your timing source supports the reserved S1 byte, set the timing quality here. (Most timing sources do not use RES.) Qualities are displayed in descending quality order as ranges. For example, ST3<RES<ST2 means the timing reference is higher than a Stratum 3 and lower than a Stratum 2. See *Chapter 19, "Security and Timing Reference"* for more information about SSM, including definitions of the SONET timing levels.
- Revertive—Select this check box if you want the ONS 15454 to revert to a primary reference source after the conditions that caused it to switch to a secondary timing reference are corrected.
- Revertive Time—If Revertive is checked, choose the amount of time the ONS 15454 will wait before reverting to its primary timing source. Five minutes is the default.

Step 3 In the Reference Lists area, complete the following information:

Note Reference Lists defines up to three timing references for the node and up to six BITS Out references. BITS Out references define the timing references used by equipment that can be attached to the node's BITS Out pins on the backplane (ANSI) or FMEC (ETSI). If you attach equipment to BITS Out pins, you normally attach it to a node with Line mode because equipment near the external timing reference can be directly wired to the reference.

- NE Reference—Allows you to define three timing references (Ref 1, Ref 2, Ref 3). The node uses Reference 1 unless a failure occurs to that reference, in which case the node uses Reference 2. If Reference 2 fails, the node uses Reference 3, which is typically set to Internal Clock. Reference 3 is the Stratum 3 clock provided on the TCC2/TCC2P card. The options displayed depend on the Timing Mode setting.
  - If the Timing Mode is set to External, your options are BITS-1, BITS-2, and Internal Clock.
  - If the Timing Mode is set to Line, your options are the node's working OSCM, OSC-CSM, or MXP cards and Internal Clock. Choose the cards/ports that are directly or indirectly connected to the node wired to the BITS source. Set Reference 1 to the card that is closest to the BITS source. For example, if Slot 5 is connected to the node wired to the BITS source, choose Slot 5 as Reference 1.
  - If the Timing Mode is set to Mixed, both BITS and OSC or MXP cards are available, allowing you to set a mixture of external BITS and OSC or MXP cards as timing references.
- BITS-1 Out/BITS-2 Out—Sets the timing references for equipment wired to the BITS Out backplane (ANSI) or FMEC (ETSI) pins. BITS-1 Out and BITS-2 Out are enabled when BITS-1 Out and BITS-2 Out facilities are put in service. If Timing Mode is set to external, choose the OSC or MXP card used to set the timing. If Timing Mode is set to Line, you can choose an OSC or MXP card or choose NE Reference to have the BITS-1 Out and/or BITS-2 Out follow the same timing references as the NE.

Note All MXP card client ports are available for timing regardless of the card's termination mode. MXP trunk ports can be a timing reference when G.709 is set to OFF and the Termination Mode is set to LINE.

Step 4 Click **Apply**.

Step 5 Click the **BITS Facilities** tab.

Step 6 In the BITS Facilities area, complete the following information:

Note The BITS Facilities section sets the parameters for your BITS-1 and BITS-2 timing references. Many of these settings are determined by the timing source manufacturer. If equipment is timed through BITS Out, you can set timing parameters to meet the requirements of the equipment.

- BITS In State—If Timing Mode is set to External or Mixed, set the BITS In State for BITS-1 and/or BITS-2 to **IS** (in service) depending whether one or both BITS input pin pairs on the backplane (ANSI) or FMEC (ETSI) are connected to the external timing source. If Timing Mode is set to Line, set the BITS In State to **OOS** (out of service).

- BITS Out State—If equipment is connected to the node's BITS output pins on the backplane (ANSI) or FMEC (ETSI) and you want to time the equipment from a node reference, set the BITS Out State for BITS-1 and/or BITS-2 to **IS**, depending on which BITS Out pins are used for the external equipment. If equipment is not attached to the BITS output pins, set the BITS Out State to **OOS**.

Step 7 If the BITS In State for BITS-1 and BITS-2 is set to OOS, continue with Step 3. If the BITS In State is set to IS for either BITS-1 or BITS-2, complete the following information:

- Coding—Set to the coding used by your BITS reference, either B8ZS (binary 8-zero substitution) or AMI (alternate mark inversion).
- Framing—Set to the framing used by your BITS reference, either ESF (Extended Super Frame) or SF (D4) (Super Frame).
- Sync Messaging—Check to enable SSM. SSM is not available if Framing is set to SF (D4).
- AIS Threshold—If SSM is disabled or SF (D4) is used, set the quality level where a node sends an alarm indication signal (AIS) from the BITS-1 Out and BITS-2 Out backplane (ANSI) or FMEC (ETSI) pins. An AIS is raised when the optical source for the BITS reference falls to or below the SSM quality level defined in this field.
- LBO—If you are timing an external device connected to the BITS Out pins, set the distance between the device and the ONS 15454. Options are: 0-134 ft. (default), 124-266 ft., 267-399 ft., 400-533 ft., and 534-655 ft. Line build out (LBO) relates to the BITS cable length.

Step 8 Click **Apply**.

Note Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for timing-related alarms.

Step 9 Return to your originating procedure (NTP).

DLP-G96 Set Up Internal Timing

Purpose	This task sets up internal timing (Stratum 3) for an ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed (use only if a BITS source is not available)
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Internal timing is Stratum 3 and not intended for permanent use. All ONS 15454 SONET or SDH nodes should be timed to a Stratum 2 or better primary reference source. Internal timing is appropriate for DWDM nodes.

Step 1 In node view, click the **Provisioning > Timing > General** tabs.

Step 2 In the General Timing area, enter the following:

- Timing Mode—Set to **External**.

- SSM Message Set—Set to **Generation 1**.
- Quality of RES—Does not apply to internal timing.
- Revertive—Does not apply to internal timing.
- Revertive Time—Does not apply to internal timing.

Step 3 In the Reference Lists area, enter the following information:

- NE Reference
  - Ref 1—Set to **Internal Clock**.
  - Ref 2—Set to **Internal Clock**.
  - Ref 3—Set to **Internal Clock**.
- BITS-1 Out/BITS-2 Out—Set to **None**.

Step 4 Click **Apply**.

Step 5 Click the **BITS Facilities** tab.

Step 6 In the BITS Facilities area, change the BITS In State and BITS Out State to **OOS** for BITS 1 and BITS 2 Disregard the other BITS Facilities settings; they are not relevant to internal timing.

Step 7 Click **Apply**.

Step 8 Return to your originating procedure (NTP).

NTP-G54 Provision and Verify a DWDM Network

Purpose	This procedure verifies the performance of all cable connections and cards in a network topology. You can also use this procedure to troubleshoot any problems with DWDM network setup.
Tools/Equipment	Test set or protocol analyzer Cisco MetroPlanner Traffic Matrix
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G277 Provision a Multirate PPM, page 5-3 DLP-G278 Provision the Optical Line Rate, page 5-3 NTP-G96 Modify Line Settings and PM Parameter Thresholds for TXP_MR_10G and TXP_MR_10E Cards, page 5-8 NTP-G97 Modify Line Settings and PM Parameter Thresholds for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-25 NTP-G98 Modify Line Settings and PM Parameter Thresholds for TXP_MR_2.5G and TXPP_MR_2.5G Cards, page 5-39 NTP-G99 Modify Line Settings and PM Parameter Thresholds for MXP_MR_2.5G and MXPP_MR_2.5G Cards, page 5-53
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 to log into an ONS 15454 on the network.

Step 2 Click the **Alarms** tab:

a. Verify that the alarm filter is not turned on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no equipment (EQPT) alarms appear. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Step 3 Using the Cisco MetroPlanner Traffic Matrix (see Table 3-1 on page 3-3) for your site, identify the first channel (ITU wavelength) to be provisioned. Use the transponder, muxponder, or line card that corresponds to the selected wavelength.

Step 4 As needed, complete the "DLP-G99 Create a Provisionable Patchcord" task on page 6-10. This is an optional step requiring DCC connectivity between the node and subtended client shelf or GCC connectivity between the transponders.

Step 5 Create the optical channels at all sites according to the Cisco MetroPlanner Traffic Matrix. Complete the "DLP-G105 Provision DWDM Optical Channel Network Connections" task on page 7-10.

Note The amplifiers automatically calculate the optical output power to maintain a constant power level on each channel every time a channel is created on the DWDM network. Automatic power control (APC) also starts every 60 minutes. If the span length changes, APC modifies amplifier gains and express variable optical attenuation (VOA). For more information about APC, see the "17.4 Automatic Power Control" section on page 17-17.

Step 6 Select one of the nodes and go to node view.

Step 7 If an OPT-PRE is installed, complete the following steps. If not, continue with Step 8.

a. Display the OPT-PRE card in card view.

b. Click the **Provisioning > Opt.Ampli.Line > Parameters** tabs.

c. Locate the Port 2 Signal Output Power. Verify that this value is equal to or higher than the Channel Power Ref value, which you can view by scrolling to the right. If so, continue with Step d. If the value is lower, contact your next level of support.

Note If the OPT-PRE is not carrying traffic, the values will not match.

d. Repeat Steps a through c for the second OPT-PRE, if one is installed. If not, continue with Step 8.

Step 8 If an OPT-BST is installed, complete the following steps. If not, continue with Step 9.

a. Display the OPT-BST card in card view.

b. Click the **Provisioning > Opt.Ampli.Line > Parameters** tabs.

c. Locate the Port 6 Signal Output Power. Verify that this value is equal to or higher than the Channel Power Ref value, which you can view by scrolling to the right. If so, continue with Step d. If the value is lower, contact your next level of support.

Note If the OPT-BST is not carrying traffic, the values will not match.

d. Repeat Steps a through c for the second OPT-BST, if one is installed. If not, continue with Step 9.

Step 9 If the node is a fixed OADM with AD-xC-xx.x or AD-xB-xx.x cards installed with a new circuit carrying traffic for the first time, complete one of the procedures. If not, continue with Step 10.

- If the circuit is terminated inside the node, change to node view and click the **Provisioning > WDM-ANS > Provisioning** tabs. In the Selector area, click **West Pin** field and then **Pin AD Stage**. Verify that the value matches the value for the first OADM card in your circuit heading west to east shown in the COM RX port, ±2 dB. If the values are outside of the error margins, contact your next level of support.
- If the circuit passes through the node, change to node view and click the **Provisioning > WDM-ANS > Provisioning** tabs. Click **West Pin** field and then **Pin AD Stage**. Verify that the value matches the value for the first OADM card in your circuit heading west to east shown in the COM RX port, ±2 dB. Click **East Pin** and **Pout AD Stage**. Verify the value matches the value for the first OADM card in your circuit heading west to east shown in the COM TX port, ±1 dB. If the values are outside of the error margins, contact your next level of support.
- If the circuit starts from the node, change to node view and click the **Provisioning > WDM-ANS > Provisioning** tabs. Click **East Pin** field and then **Pin AD Stage**. Verify the value matches the value for the first OADM card in your circuit heading west to east shown in the COM TX port, ±1 dB. If the values are outside of the error margins, contact your next level of support.

Step 10 Check the received power range:

a. Navigate to the node where the first TXP, MXP, or line card is installed

b. Display the TXP, MXP, or line card in card view.

c. Complete the "DLP-G136 Clear Selected PM Counts" task on page 9-6.

d. Click the **Performance > Optics PM** tab.

e. Record the values shown in the RX Optical Pwr field.

f. Click the **Provisioning > Optics Thresholds** tabs.

g. Verify that the value in Step e falls between the values shown for the RX Power High and RX Power Low. If so, continue with Step 11. If not, complete one of the following.

- Power lower than range—clean the trunk fiber at the patch panel and on the TXP or MXP and repeat Steps e through g. If the power is still too low, contact your next level of support.
- Power higher than range—add attenuation to the fiber and repeat Steps e through g.

Step 11 Perform a short-term bit error rate (BER) test:

a. Complete the "DLP-G136 Clear Selected PM Counts" task on page 9-6 for the transponder, muxponder, or line card.

b. Display the TXP, MXP, or line card in card view.

c. Click the **Performance > Payload PM** tabs, or, if OTN is provisioned, the **Performance > OTN PM** tabs.

d. Perform a short-term BER test using a test signal from a test set or protocol analyzer.

e. Monitor the payload PM for at least 10 minutes for errors.

Note To see an accurate performance monitoring count, the BER test results must be consistent with the transmitted bit rate for at least 10 minutes.

Note For information about using a test set or protocol analyzer, refer to the test set or protocol analyzer user guide.

Step 12 Repeat Steps 7 through 11 for all sites that have add/drop traffic.

Step 13 If a node fails any test, repeat the test after verifying correct setup and configuration. If the test fails again, refer to the next level of support.

After all tests are successfully completed and no alarms exist in the network, the network is ready for service.

Stop. You have completed this procedure.

DLP-G99 Create a Provisionable Patchcord

Purpose	This task creates a provisionable patchcord, also called a virtual link. They appear as dashed lines in CTC network view. For the specific situations in which a patchcord is necessary, see the "20.3 Provisionable Patchcords" section on page 20-22.
Tools/Equipment	OC-N, transponder/muxponder, optical add/drop multiplexer, and multiplexer/demultiplexer cards
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note This task requires DCC connectivity between the node and subtended client shelves or GCC connectivity between the transponders. To provision DCC/GCC, perform the "DLP-G76 Provision GCC Terminations" task on page 7-13.

Note An optical port requires two patchcords when the remote end is Y-cable protected or is an add/drop multiplexer or multiplexer/demultiplexer port.

Step 1 In node view, click the **Provisioning > Comm Channels > PPC** tabs. If you are in network view, click the **Provisioning > Provisionable Patchcords** tabs.

Step 2 Click **Create**. The Provisionable Patchcord dialog box appears.

Step 3 In the Origination Node area, complete the following:

a. If you are in node view, the Origination Node defaults to the current node. If you are in network view, click the desired origination node from the drop-down list.

b. Type a patchcord identifier (0 through 32767) in the TX and RX ID fields.

c. Click the desired origination slot/port from the list of available slots/ports.

Step 4 In the Termination Node area, complete the following:

a. Click the desired termination node from the drop-down list. If the remote node has not previously been discovered by CTC but is accessible by CTC, type the name of the remote node.

b. Type a patchcord identifier (0 through 32767) in the TX and RX ID fields. The origination and termination IDs must be different if the patchcord is set up between two cards on the same node.

c. Click the desired termination slot/port from the list of available slots/ports. The origination port and the termination port must be different.

Step 5 If you need to provision transmit and receive separately for multiplexer/demultiplexer cards, check the **Separate Tx/Rx** check box. If not, continue with Step 6. The origination and termination TX ports are already provisioned. Complete the following to provision the RX ports:

a. In the Origination Node area, type a patchcord identifier (0 through 32767) in the RX ID field. The origination Tx and Rx and termination Tx and Rx IDs must be different.

b. Click the desired origination slot/port from the list of available slots/ports.

c. In the Termination Node area, type a patchcord identifier (0 through 32767) in the RX ID field. The origination Tx and Rx and termination Tx and Rx IDs must be different.

d. Click the desired termination slot/port from the list of available slots/ports.

Step 6 Click **OK**.

Step 7 If you provisioned a patchcord on a port in a 1+1 protection group, a dialog box appears to ask if you would like to provision the peer patchcord. Click **Yes**. Repeat Steps 3 through 6.

Step 8 Return to your originating procedure (NTP).

NTP-G56 Verify the OSNR

Purpose	This procedure verifies the OSNR. The OSNR is the ratio between the signal power level and the noise power level.
Tools/Equipment	Optical spectrum analyzer
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at an ONS 15454 on the network.

Step 2 Using an optical spectrum analyzer, check the received OSNR for each transmitted channel on both ends of the span. Identify the last OSC-CSM, OPT-PRE, or OPT-BST MON port before the channel is dropped. If OPT-PRE cards are installed with an OPT-BST or OSC-CSM card, use the OPT-PRE MON port.

Note For OSNR values for each card class, refer to Chapter 15, "Card Reference."

Step 3 If the OSNR is too low, check the following, depending on your node configuration:

Note The purpose of this step is not to improve the signal-to-noise ratio (SNR), but to match the per-channel power level within the receive (RX) port power range.

- Check the fiber connections between the OPT-BST amplifier or the OSC-CSM and the OPT-PRE amplifier and if needed, clean the connectors. See the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22.
- On the near-end OPT-BST amplifier, check the equalization of the added channels at the monitor output.
- On the OPT-PRE amplifier, check the output power on both COM TX and DC TX ports.
- On the far-end OPT-PRE amplifier, check the amplifier gain tilt at the monitor output.

If the OSNR is still too low, contact your next level of support.

Step 4 Repeat Steps 2 and 3 for all traffic in the network.

Stop. You have completed this procedure.

NTP-G142 Perform a Protection Switch Test

Purpose	This procedure tests the optical path, client transponders, and Y-cable protection groups in your system for proper operation. The test signals might be generated by either the actual client device or a test set, whichever is available. Cisco recommends that you repeat this test at each node in the network where protection group traffic is dropped.
Tools/Equipment	A list of protection groups. This information is provided in the Cisco MetroPlanner Traffic Matrix A test set or actual client device that provides the required payload for the circuits that are provisioned.
Prerequisite Procedures	
Required/As Needed	As needed
Onsite/Remote	Onsite; personnel are required onsite at each end of the circuit under test.
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at an ONS 15454 on the network.

Step 2 Identify the Y-cable circuit to be tested by viewing the Traffic Matrix for your site. Locate the transponders in the ONS 15454 node that will be used for the protection group.

Step 3 Verify that the Y-cable protection group is provisioned:

a. In node view, click the **Provisioning > Protection** tabs.

b. In the Protect and Working column headings area, confirm the correct transponders are in the Y-cable protection group by viewing the slot number and card type.

c. If the required protection group is not provisioned, stop and perform "NTP-G33 Create a Y-Cable Protection Group" procedure on page 3-36. Otherwise continue with Step 4.

Step 4 Repeat Step 3 for each Y-cable protection group at this node. When all protection groups are verified, proceed to Step 5.

Step 5 Physically connect the transmitter of the client or test set to either Port 10 or Port 12 of the Y-cable module protecting the circuit under test. (See **Table 3-5 on page 3-69** and **Table 3-6 on page 3-70.**)

Step 6 If you connected the transmitter to Port 10, connect the client or test set receiver to Port 5 on the Y-cable module. If not, connect the client or test set receiver to Port 11 of the Y-cable module.

Step 7 At the far-end site for the circuit under test, physically loop the Y-cable module as follows:

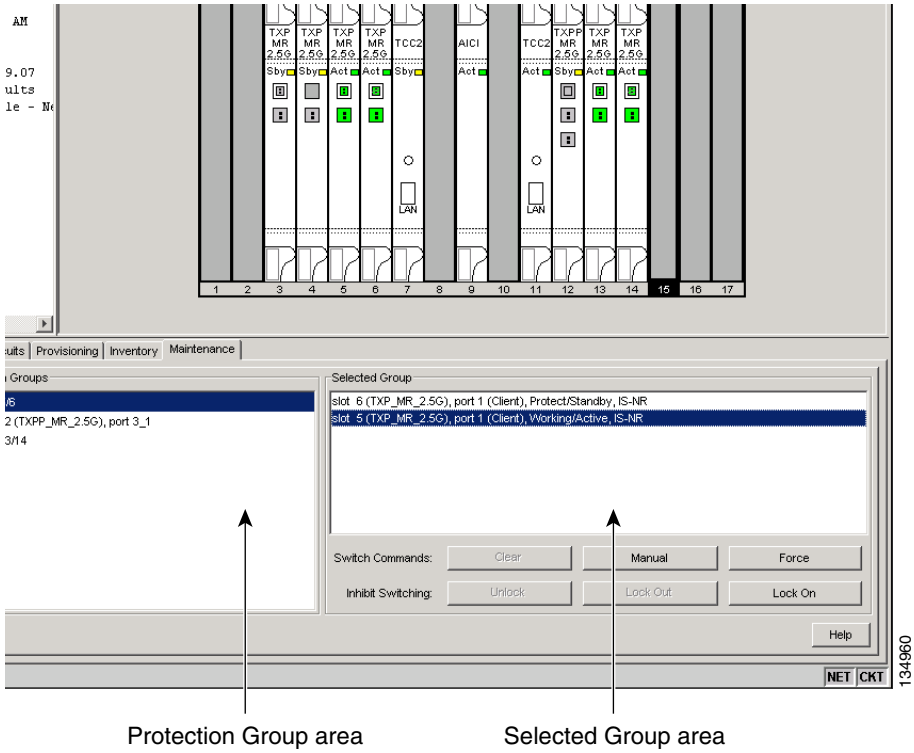
- **a.** If this is the first client on the Y-cable module, loop Port 10 to Port 5 on the far end Y-cable module.
- **b.** If this is the second client on the Y-cable module, loop Ports 11 and 12 on the far end Y-cable module.

Step 8 At the near-end site for the circuit under test, place the client device or test set into service and begin transmitting the required payload.

Step 9 In CTC, display the near-end site in node view.

Step 10 Click the **Maintenance > Protection** tabs (Figure 6-1).

Figure 6-1 Maintenance > Protection Tabs



Step 11 In the Protection Groups area, highlight the protection group to be tested.

Step 12 In the Selected Group area, identify the slot that is Active and the slot that is Standby.

Step 13 Verify the LED display on the physical cards in the shelf match the following:

- **a.** For the Active TXP card, record the slot number_____. Verify the port LEDs below:
  - DWDM port is green.
  - Client port is green.

b. For the Standby TXP card, record the slot number_____. Verify port LEDs below:
   - DWDM Port is green.
   - Client Port is not illuminated.

Step 14 In the Selected Group area highlight the Active transponder slot.

Step 15 From the Switch Commands area below the selected group area, click **Manual**, then click **YES**.

Step 16 From the Selected Group area, record the following information and verify the active and standby transponder slots are the opposite of Step 13.
- Active TXP card slot number_____
- Standby TXP card slot number_____

Step 17 Verify the LED display on the physical cards in the shelf match the following:

a. Active transponder slot LEDs:
   - DWDM port is green.
   - Client port is green.

b. For the Standby transponder slot LEDs:
   - DWDM Port is green.
   - Client Port is not illuminated.

Step 18 Confirm the client or test set at the local site is operating normally with no alarms. If the test set is reporting active alarms, contact your next level of support. (Note: It is normal to see a traffic hit on the test set during a protection switch)

Step 19 From the Switch Commands area below the selected group area, click **Clear**, then click **YES** to return the protection group to the original state.

Step 20 Repeat Steps 5 through 19, for each protection group at your site.

Stop. **You have completed this procedure**.

NTP-G57 Create a Logical Network Map

Purpose	This procedure allows a Superuser to create a consistent network view for all nodes on the network.
Tools	None
Prerequisite Procedures	This procedure assumes that network turn up is complete.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at a node on the network where you want to create the network map. If you are already logged in, continue with Step 2.

Step 2 From the View menu, choose **Go to Network View**.

Step 3 Change the position of the nodes in the network view according to your site plan.

a. Click a node to select it, then press the **Ctrl** key while you drag and drop a node icon to a new location.

b. Repeat Step a for each node you need to position.

Step 4 On the network view map, right-click and choose **Save Node Position**.

Step 5 Click **Yes** in the Save Node Position dialog box.

CTC opens a progress bar and saves the new node positions.

Note Retrieve, Provisioning, and Maintenance users can move nodes on the network map, but only Superusers can save new network map configurations. To restore the view to a previously saved version of the network map, right-click on the network view map and choose Reset Node Position.

Stop. You have completed this procedure.

Create Channels and Circuits

This chapter explains how to create Cisco ONS 15454 dense wavelength division multiplexing (DWDM) optical channel network connections (OCHNCs) and overhead circuits.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

Before performing any of the following procedures, investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 Troubleshooting Guide* and the *Cisco ONS 15454 SDH Troubleshooting Guide* as necessary.

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. NTP-G58 Locate and View Optical Channel Network Connections, page 7-2—Complete as needed to find, view, and filter OCHNCs.
2. NTP-G59 Create and Delete Optical Channel Network Connections, page 7-9—Complete as needed.
3. NTP-G60 Create Overhead Circuits, page 7-13—Complete as needed to create IP-encapsulated tunnels, provision orderwire, or user data channel (UDC) circuits.
4. NTP-G61 Modify and Delete Overhead Circuits, page 7-20—Complete as needed to repair IP circuits and delete overhead circuits.
5. NTP-G62 Create a J0 Section Trace, page 7-22—Complete as needed to monitor interruptions or changes to traffic between two nodes.

NTP-G58 Locate and View Optical Channel Network Connections

Purpose	This procedure allows you to locate and view DWDM OCHNCs.
Tools/Equipment	None
Prerequisite Procedures	DLP-G105 Provision DWDM Optical Channel Network Connections, page 7-10
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at a node on the network where you want to view the circuits. If you are already logged in, continue with Step 2.

Note Do not check Disable Circuit Management in the Login dialog box. No circuits appear if this option is checked.

Step 2 As needed, complete the "DLP-G100 Search for Optical Channel Network Connections" task on page 7-2.

Step 3 As needed, complete the "DLP-G101 View Optical Channel Network Connection Information" task on page 7-3.

Step 4 As needed, complete the "DLP-G102 Filter the Display of Optical Channel Network Connections" task on page 7-6.

Step 5 As needed, complete the "DLP-G103 View Optical Channel Network Connections on a Span" task on page 7-8.

Stop. You have completed this procedure.

DLP-G100 Search for Optical Channel Network Connections

Purpose	This task searches for DWDM OCHNCs and ONS 15454 circuits at the network, node, or card level.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Navigate to the appropriate Cisco Transport Controller (CTC) view:

- To search the entire network, choose **View > Go to Network View**.

- To search for circuits that originate, terminate, or pass through a specific node, choose **View > Go to Other Node**, then choose the node you want to search and click **OK**.
- To search for circuits that originate, terminate, or pass through a specific card, double-click the card on the shelf graphic in node view to open the card in card view.

Step 2 Click the **Circuits** tab.

Step 3 If you are in node or card view, choose the scope for the search, **Node or Network (All)**, in the Scope drop-down list located at the bottom right side of the screen. Choose **Node to see all of the circuits on that node, or Network (All) to see all circuits in the network.**

Step 4 Click **Search** if you need to search through the list of circuits.

Step 5 In the Circuit Name Search dialog box, complete the following:

- Find What—Enter the text of the circuit name you want to find.
- Match whole word only—Check this check box to instruct CTC to select circuits only if the entire word matches the text in the Find What field.
- Match case—Check this check box to instruct CTC to select circuits only when the capitalization matches the capitalization entered in the Find What field.
- Direction—Choose the direction for the search. Searches are conducted up or down from the currently selected circuit.

Step 6 Click **Find Next**. If a match is found the circuit will be highlighted. To contine the search, click **Find Next** again to find the next circuit.

Step 7 Repeat Steps 5 and 6 until you are finished, then click **Cancel**.

Step 8 Return to your originating procedure (NTP).

DLP-G101 View Optical Channel Network Connection Information

Purpose	This task provides information about DWDM OCHNCs and ONS 15454 circuits.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Navigate to the appropriate CTC view:

Note The following order is the default column sequence, the order may be different on your screen, depending on your individual CTC setup.

- To view circuits for an entire network, choose **View > Go to Network View**.
- To view circuits that originate, terminate, or pass through a specific node, choose **View > Go to Other Node**, then choose the node you want to search and click **OK**.

- To view circuits that originate, terminate, or pass through a specific card, in node view, double-click the card containing the circuits you want to view.

Note In node or card view, you can change the scope of the circuits that appear by choosing Card (in card view), Node, or Network from the Scope drop-down list in the bottom right corner of the Circuits window.

Step 2 Click the **Circuits** tab. The Circuits tab shows the following information:

- Circuit Name—Name of the circuit. The circuit name can be manually assigned or automatically generated.
- Type—Circuit types are OCHNC.

Note The following circuit types are not applicable to DWDM nodes: STS, VT, VTT (VT tunnel), VAP (VT aggregation point), STS-v (STS VCAT circuit), VT-v (VT VCAT circuit), HOP (high-order circuit), LOP (low-order circuit), VCT (VC low-order tunnel), VCA (VC LOP_v (low-order VCAT circuit)>

- Size—Circuit size. OCHNC sizes are Equipped not specific, Multi-rate, 2.5 Gbps No FEC (forward error correction), 2.5 Gbps FEC, 10 Gbps No FEC, and 10 Gbps FEC.

Note The following circuit types under the circuit size column are not applicable to DWDM nodes: STS, VT, VCAT, VC12, VC11, VC3, VC4.

- OCHNC Wlen—For OCHNCs, the wavelength provisioned for the optical channel network connection. See Table 7-3 on page 7-10 for a list of channels and wavelengths.
- Direction—The circuit direction, either two-way or one-way.
- OCHNC Dir—The line direction of the OCHNC, either East to West or West to East. If the direction is West to East, the channel exits from the node through the LINE-TX port of the OSC-CSM-E or OPT-BST-E named the East Side Card by MetroPlanner (typically these cards are hosted by Slot 17). If the direction is East to West, the channel exits from the node through the LINE-TX port of OSC-CSM-W or OPT-BST-W named as West Side Card by MetroPlanner (typically these cards are hosted by Slot 1).
- Protection—The type of circuit protection. See Table 7-1 for a list of protection types.
- Status—The circuit status. Table 7-2 lists the circuit statuses that can appear.
- Source—The circuit source in the format: *node/slot/port "port name"* (if a port name has been assigned by the user, the name will appear in quotes).

Note The user can assign a specific "port name" to every port of any DWDM card after completing the "DLP-G104 Assign a Name to a Port" task on page 7-9.

- Destination—The circuit destination in same format as the circuit source. STSs, VTs, VCs, and tributary units are not applicable to DWDM nodes.
- # of VLANS—The number of VLANs used by an Ethernet circuit. VLANs are not applicable to DWDM nodes.
- # of Spans—The number of internode links that constitute the circuit.

- State—The circuit service state, which is an aggregate of its cross-connects. For ANSI, the service states are IS, OOS, or OOS-PARTIAL. For ETSI, the service states are Unlocked, Locked, or Locked-partial. For more information about ANSI and ETSI service states, see the Appendix C, "DWDM Administrative and Service States."
  - IS/Unlocked—All cross-connects are in service and operational.
  - OOS/Locked—All cross-connects are Out-of-Service and Management, Maintenance (OOS-MA,MT) and/or Out-of-Service and Management, Disabled (OOS-MA,DSBLD) for ANSI or Locked-enabled,maintenance and/or Locked-enabled,disabled for ETSI.
  - OOS-PARTIAL/Locked-partial—At least one cross-connect is In-Service and Normal (IS-NR [ANSI]) or Unlocked-enabled (ETSI) and others are out-of-service.

Note Right-clicking a column title (Circuit name, Type, etc.) opens a menu that allows you to show or hide the desired circuit details.

Table 7-1 Circuit Protection Types

Protection Type	Description
Y-Cable	The circuit is protected by a transponder or muxponder card Y-cable protection group.
Splitter	The circuit is protected by the protect transponder splitter protection.
Unprot	A circuit with a source and destination on different nodes is not protected.
N/A	A circuit with connections on the same node is not protected.
Unknown	A circuit has a source and destination on different nodes and communication is down between the nodes. This protection type appears if not all circuit components are known.

Table 7-2 Cisco ONS 15454 Circuit Status

Status	Definition/Activity
CREATING	CTC is creating a circuit.
DISCOVERED	CTC created a circuit. All components are in place and a complete path exists from the circuit source to the circuit destination.
DELETING	CTC is deleting a circuit.

Table 7-2 Cisco ONS 15454 Circuit Status (continued)

Status	Definition/Activity
PARTIAL	A CTC-created circuit is missing a cross-connect or network span, a complete path from source to destination(s) does not exist, or an alarm interface panel (AIP) change occurred on one of the circuit nodes and the circuit is in need of repair. (AIPs store the node MAC address.) In CTC, circuits are represented using cross-connects and network spans. If a network span is missing from a circuit, the circuit status is PARTIAL. However, a PARTIAL status does not necessarily mean a circuit traffic failure has occurred, because traffic might flow on a protect path. Network spans are in one of two states: up or down. On CTC circuit and network maps, up spans are shown as green lines, and down spans are shown as gray lines. If a failure occurs on a network span during a CTC session, the span remains on the network map but its color changes to gray to indicate the span is down. If you restart your CTC session while the failure is active, the new CTC session cannot discover the span and its span line will not appear on the network map. Subsequently, circuits routed on a network span that goes down will appear as DISCOVERED during the current CTC session, but they will appear as PARTIAL to users who log in after the span failure. The PARTIAL status does not appear for OCHNC circuit types.
DISCOVERED_TL1	A TL1-created circuit or a TL1-like CTC-created circuit is complete. A complete path from source to destination(s) exists. This status does not appear for OCHNC circuit types.
PARTIAL_TL1	A TL1-created circuit or a TL1-like CTC-created circuit is missing a cross-connect, and a complete path from source to destination(s) does not exist. This status does not appear for OCHNC circuit types.

Step 3 Return to your originating procedure (NTP).

DLP-G102 Filter the Display of Optical Channel Network Connections

Purpose	This task filters the display of OCHNCs and circuits in the Circuits window. You can filter the circuits in network, node, or card view based on circuit or OCHNC name, size, type, direction, and other attributes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Navigate to the appropriate CTC view:

- To filter network circuits, choose **View > Go to Network View**.
- To filter circuits that originate, terminate, or pass through a specific node, choose **View > Go to Other Node**, then choose the node you want to search and click **OK**.
- To filter circuits that originate, terminate, or pass through a specific card, double-click the card on the shelf graphic in node view to open the card in card view.

Step 2 Click the **Circuits** tab.

Step 3 Set the attributes for filtering the circuit display:

a. Click the **Filter** button.

b. In the Circuit Filter dialog box, set the filter attributes by choosing one or more of the following:

- Name—Enter a complete or partial circuit name to filter circuits based on the circuit name; otherwise leave the field blank.
- Direction—Choose one: **Any** (direction not used to filter circuits), **1-way** (display only one-way circuits), or **2-way** (display only two-way circuits).
- OCHNC Dir—(DWDM optical channel network connections only.) Choose one: **East to West** (displays only east-to-west circuits); **West to East** (displays only west-to-east circuits).
- OCHNC Wlen—(DWDM optical channel network connections only.) Choose an OCHNC wavelength to filter the circuits. For example, choosing 1530.33 will display channels provisioned on the 1530.33-nm wavelength.
- Status—Choose one: **Any** (status not used to filter circuits) or **Discovered** (display only discovered circuits). Other statuses do not apply to OCHNCs.
- State—Choose one: **OOS (ANSI)** or **Locked (ETSI)** to display only out-of-service circuits; **IS (ANSI)** or **Unlocked (ETSI)** to display only in-service circuits (optical channel network connections have IS/Unlocked states only); or **OOS-PARTIAL (ANSI)** or **Locked-partial (ETSI)** to display only circuits with cross-connects in mixed service states.
- Slot—Enter a slot number to filter circuits based on the source or destination slot; otherwise leave the field blank.
- Port—Enter a port number to filter circuits based on the source or destination port; otherwise leave the field blank.
- Type—Choose one: **Any** (type not used to filter circuits) or **OCHNC** (displays only optical channel network connections).

Note The following circuit types are not applicable to DWDM nodes: STS (displays only STS circuits), VT (displays only VT circuits), VT Tunnel (displays only VT tunnels), STS-V (displays STS VCAT circuits), VT-V (displays VT VCAT circuits), and VT Aggregation Point (displays only VT aggregation points), VC_HO_PATH_CIRCUIT (displays VC4 and VC4-Nc circuits), VC_LO_PATH_CIRCUIT (displays only VC3 and VC12 circuits), VC_LO_PATH_TUNNEL (displays only low-order tunnels), VC_LO_PATH_AGGREGATION (displays only log-order aggregation points), VC_HO_PATH_VCAT_CIRCUIT (displays high-order VCAT circuits), VC_LO_PATH_VCAT_CIRCUIT (displays low-order VCAT circuits).

- Size—Click the appropriate check boxes to filter circuits based on size: Multi-rate, Equipment non specific, 2.5 Gbps FEC, 2.5 Gbps No FEC, 10 Gbps FEC, or 10 Gbps No FEC.

VT1.5, STS-1, STS3c, STS-6c, STS-9c, STS-12c, STS-24c, STS-48c, and STS-192c are not applicable to ANSI DWDM nodes. VC12, VC3, VC4, VC4-2c, VC4-3c, VC4-4c, VC4-6c, VC4-8c, VC4-9c, VC4-16c, and VC4-64 are not applicable to ETSI DWDM nodes.

The check boxes shown depend on the Type field selection. If you chose Any, all sizes are available. If you chose OCHNC as the circuit type, Multi-rate, Equipment non specific, 2.5 Gbps FEC, 2.5 Gbps No FEC, 10 Gbps FEC, and 10 Gbps No FEC appear.

Step 4 Click **OK**. Circuits matching the attributes in the Filter Circuits dialog box appear in the Circuits window.

Step 5 To turn filtering off, click the Filter icon in the lower right corner of the Circuits window. Click the icon again to turn filtering on, and click the **Filter** button to change the filter attributes.

Step 6 Return to your originating procedure (NTP).

DLP-G103 View Optical Channel Network Connections on a Span

Purpose	This task allows you to view OCHNCs and circuits on an ONS 15454 span.
Tools/Equipment	None
Prerequisite Procedures	DLP-G105 Provision DWDM Optical Channel Network Connections, page 7-10 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, choose **View > Go to Network View**. If you are already in network view, continue with Step 2.

Step 2 Right-click the green line containing the circuits you want to view and choose **Circuits** to view DWDM OCHNCs or unprotected circuits on the span.

In the Circuits on Span dialog box, you can view information about the circuits that traverse the span. The information that appears depends on the circuit type. For DWDM OCHNCs, the following information appears:

- OCHNC Wavelength—The wavelength provisioned for the OCHNC.
- DIR—2-way, or 1-way
- OCHNC Dir—The direction provisioned for the OCHNC, either east-to-west or west-to-east.
- Circuit—The OCHNC circuit name.

Step 3 Return to your originating procedure (NTP).

NTP-G59 Create and Delete Optical Channel Network Connections

Purpose	This procedure creates and deletes DWDM OCHNCs.
Tools/Equipment	None
Prerequisite Procedures	Chapter 3, "Turn Up a Node"
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at a node on the network where you want to create and delete OCHNCs. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the OCHNC source and destination ports before you create the circuit, complete the "DLP-G104 Assign a Name to a Port" task on page 7-9. If not, continue with the next step.

Step 3 Complete the "DLP-G105 Provision DWDM Optical Channel Network Connections" task on page 7-10 as needed.

Step 4 Complete the "DLP-G106 Delete Optical Channel Network Connections" task on page 7-12 as needed.

Stop. You have completed this procedure.

DLP-G104 Assign a Name to a Port

Purpose	This task assigns a name to a port on any ONS 15454 card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Double-click the card that has the port you want to provision. This can be any port on a traffic carring card.

Step 2 Click the **Provisioning** tab.

Step 3 Click the **Port Name** column for the port number to which you are assigning a name.

Step 4 Type the port name.

The port name can be up to 32 alphanumeric/special characters. The field is blank by default.

Step 5 Click **Apply**.

Step 6 Return to your originating procedure (NTP).

DLP-G105 Provision DWDM Optical Channel Network Connections

Purpose	This task creates an OCHNC between ONS 15454s that are provisioned for DWDM.
Tools/Equipment	An OCHNC add port on the source node and an OCHNC drop port on destination node of the same wavelength are required.
	DLP-G46 Log into CTC, page 2-24
Prerequisite Procedures	All procedures in Chapter 3, "Turn Up a Node" and Chapter 5, "Provision Transponder and Muxponder Cards" must be completed at all nodes within the OCHNC route.
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Choose **View > Go to Network View**.

Step 2 Click the **Circuits** tab, then click **Create**.

Step 3 In the Circuit Creation dialog box, choose **OCHNC** from the Circuit Type list.

Step 4 Click **Next**.

Step 5 Define the circuit attributes:

- Name—Assign a name to the OCHNC. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—Equipped non specific is the default. You cannot change it.
- OCHNC Channel—Choose the wavelength you want to provision. Table 7-3 lists the thirty-two available wavelengths.

Table 7-3 OCHNC Channels

Channel No.	Channel ID	Frequency (GHz)	Wavelength (nm)
1	30.3	195.9	1530.33
2	31.2	195.8	1531.12
3	31.9	195.7	1531.90
4	32.6	195.6	1532.68
5	34.2	195.4	1534.25
6	35.0	195.3	1535.04
7	35.8	195.2	1535.82
8	36.6	195.1	1536.61
9	38.1	194.9	1538.19
10	38.9	194.8	1538.98
11	39.7	194.7	1539.77
12	40.5	194.6	1540.56

Table 7-3 OCHNC Channels (continued)

Channel No.	Channel ID	Frequency (GHz)	Wavelength (nm)
13	42.1	194.4	1542.14
14	42.9	194.3	1542.94
15	43.7	194.2	1543.73
16	44.5	194.1	1544.53
17	46.1	193.9	1546.12
18	46.9	193.8	1546.92
19	47.7	193.7	1547.72
20	48.5	193.6	1548.51
21	50.1	193.4	1550.12
22	50.9	193.3	1550.92
23	51.7	193.2	1551.72
24	52.5	193.1	1552.52
25	54.1	192.9	1554.13
26	54.9	192.8	1544.94
27	55.7	192.7	1555.75
28	56.5	192.6	1556.55
29	58.1	192.4	1558.17
30	58.9	192.3	1558.98
31	59.7	192.2	1559.79
32	60.6	192.1	1560.61

- OCHNC Direction—Choose the OCHNC direction, either East to West or West to East. If you choose West to East, the channel will exit the node through the LINE-TX port of the OSC-CSM-E or OPT-BST-E named as East Side Card by MetroPlanner (typically these cards are hosted by Slot 17). If you choose East to West, the channel will exit the node through the LINE-TX port of the OSC-CSM-W or OPT-BST-W named as West Side Card by MetroPlanner (typically these cards are hosted by Slot 1).
- Bidirectional—Check this check box to create a bidirectional OCHNC; uncheck it to create a unidirectional OCHNC.

Step 6 Click **Next**.

Step 7 In the Circuit Source area, choose the source node from the Node drop-down list.

Step 8 Click **Next**.

Step 9 In the Circuit Destination area, choose the destination node from the Node drop-down list.

Step 10 Click **Finish**. The circuit may take a few minutes to come up, depending on the size of the network. If problems persist, refer to the *Cisco ONS 15454 DWDM Troubleshooting Guide*as necessary.

Step 11 Return to your originating procedure (NTP).

DLP-G106 Delete Optical Channel Network Connections

Purpose	This task deletes circuits and DWDM OCHNCs.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2, or record the circuit information if it will be recreated.

Step 2 Consult your network operations center, or other appropriate personel, to verify that the OCHNC can be safely deleted.

Step 3 Investigate all network alarms and resolve any problems that might be affected by the OCHNC deletion.

Step 4 Choose **View > Go to Network View**.

Step 5 Click the **Circuits** tab.

Step 6 Choose the OCHNCs you want to delete, then click **Delete**.

Step 7 In the Delete Circuits confirmation dialog box, check **Notify when completed**, as needed.

If checked, the CTC Alerts confirmation dialog box indicates when the OCHNC is deleted. During this time, you cannot perform other CTC functions. If you are deleting many OCHNCs, waiting for confirmation might take a few minutes. Circuits are deleted whether or not this check box is checked.

Note The CTC Alerts dialog box will not automatically open to show a deletion error unless you checked All alerts or Error alerts only in the CTC Alerts dialog box. For more information, see the "DLP-G53 Configure the CTC Alerts Dialog Box for Automatic Popup" task on page 2-32. If the CTC Alerts dialog box is not set to open automatically with a notification, the red triangle inside the CTC Alerts toolbar icon indicates that a notification exists.

Step 8 Complete one of the following:

- If you checked "Notify when completed," the CTC Alerts dialog box appears. If you want to save the information, continue with Step 9. If you do not want to save the information, continue with Step 10.
- If you did not check "Notify when completed," the Circuits window appears. Continue with Step 11.

Step 9 If you want to save the information in the CTC Alerts dialog box, complete the following steps. If you do not want to save it, continue with Step 10.

a. Click **Save**.

b. Click **Browse** and navigate to the directory where you want to save the file.

c. Type the file name using a .txt file extension, and click **OK**.

Step 10 Click **Close** to close the CTC Alerts dialog box.

Step 11 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2 if you require a backup of your changes.

Step 12 Return to your originating procedure (NTP).

NTP-G60 Create Overhead Circuits

Purpose	This procedure creates overhead circuits on an ONS 15454 network. Overhead circuits include GCC, IP-encapsulated tunnels, the Alarm Interface Controller (AIC) and Alarm Interface Controller–International (AIC-I) card orderwire, and the AIC-I card user data channel (UDC).
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you will create the overhead circuit. If you are already logged in, continue with Step 2.

Step 2 Choose **View > Go to Network View**.

Step 3 Complete the "DLP-G76 Provision GCC Terminations" task on page 7-13.

Step 4 Complete the "DLP-G97 Provision a Proxy Tunnel" task on page 7-14.

Step 5 Complete the "DLP-G98 Provision a Firewall Tunnel" task on page 7-15.

Step 6 As needed, complete the "DLP-G107 Create an IP-Encapsulated Tunnel" task on page 7-16, then continue with the next step.

Step 7 After creating an IP-encapsulated tunnel, put the ports that are hosting the IP-encapsulated tunnel in service. See the "DLP-G108 Change the Service State for a Port" task on page 7-17.

Step 8 As needed, complete the "DLP-G109 Provision Orderwire" task on page 7-18.

Step 9 As needed, complete the "DLP-G110 Create a User Data Channel Circuit" task on page 7-19.

Stop. You have completed this procedure.

DLP-G76 Provision GCC Terminations

Purpose	This task creates the DWDM GCC terminations required for network setup when using the TXP_MR_10G, TXP_MR_2.5G, TXPP_MR_2.5G, and MXP_2.5G_10G cards. Perform this task before you create circuits for these cards. In this task, you can also set up the node so that it has direct IP access to a far-end non-ONS node over the GCC network.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed

Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view click the **Provisioning > Comm Channels > GCC** tabs.

Step 2 In the GCC Terminations pane, click **Create**.

Step 3 In the Create optical transport network (OTN) GCC Terminations dialog box, click the ports where you want to create the GCC termination. To select more than one port, press the **Shift** key or the **Ctrl** key.

Note GCC refers to the general communications channel, which is used for ONS 15454 transponders and muxponders in DWDM applications.

Step 4 (Optional) From the GCC Rate drop-down list, choose from two options:

- 192k is the line rate of Section DCC (SDCC)—This is the default option.
- 576k is the line rate of Line DCC (LDCC)—This option will be supported in a future software release.

Step 5 Click **Set to IS** if you want to put ports in service.

Step 6 If the SDCC termination is to include a non-ONS node, check the **Far End is Foreign** check box. This automatically sets the far-end node IP address to 0.0.0.0, which means that any address can be specified by the far end. To change the default to a specific the IP address, see the "DLP-G184 Change a GCC Termination" task on page 10-29.

Step 7 Select **Disable OSPF on link** to turn off OSPF.

Step 8 Click **OK**. Until the Far End GCC terminations are created and the ports are in service, GCC-EOC alarms appear.

Step 9 Return to your originating procedure (NTP).

DLP-G97 Provision a Proxy Tunnel

Purpose	This task sets up a proxy tunnel to communicate with a non-ONS far-end node. Proxy tunnels are only necessary when the proxy server is enabled and a foreign GCC termination exists, or if static routes exist so that the GCC network is used to access remote networks or devices. You can provision a maximum of 12 proxy server tunnels.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G76 Provision GCC Terminations, page 7-13
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note If the proxy server is disabled, you cannot set up a proxy tunnel.

Note This task does not apply if secure mode is enabled.

Step 1 In Node view, click the **Provisioning > Network > Proxy** subtabs.

Step 2 Click **Create**.

Step 3 In the Create Tunnel dialog box, complete the following:

- Source Address—Type the IP address of the source node (32 bit length) or source subnet (any other length).
- Length—Choose the length of the source subnet mask.
- Destination Address—Type the IP address of the destination node (32 bit length) or destination subnet (any other length).
- Length—Choose the length of the destination subnet mask.

Step 4 Click **OK**.

Step 5 Continue with your originating procedure (NTP).

DLP-G98 Provision a Firewall Tunnel

Purpose	This task provisions destinations that will not be blocked by the firewall. Firewall tunnels are only necessary when the proxy server is enabled and a foreign GCC termination exists, or if static routes exist so that the GCC network is used to access remote networks or devices. You can provision a maximum of 12 firewall tunnels.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G76 Provision GCC Terminations, page 7-13
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note If the proxy server is configured as proxy-only or is disabled, you cannot set up a firewall tunnel.

Note This task does not apply if secure mode is enabled.

Step 1 In Node view, click the **Provisioning > Network > Firewall** subtabs.

Step 2 Click **Create**.

Step 3 In the Create Tunnel dialog box, complete the following:

- Source Address—Type the IP address of the source node (32 bit length) or source subnet (any other length).

- Length—Choose the length of the source subnet mask.
- Destination Address—Type the IP address of the destination node (32 bit length) or destination subnet (any other length).
- Length—Choose the length of the destination subnet mask.

Step 4 Click **OK**.

Step 5 Continue with your originating procedure (NTP).

DLP-G107 Create an IP-Encapsulated Tunnel

Purpose	This task creates an IP-encapsulated tunnel to transport traffic from third-party SONET/SDH equipment across ONS 15454 networks. IP-encapsulated tunnels are created on the Section DCC channel (D1-D3) (if not used by the ONS 15454 as a terminated data communications channel [DCC]).
Tools/Equipment	An OSCM, OSC-CSM, MXP_2.5_10E, MXP_2.5_10G, MXPP_MR_2.5G, or MXP_MR_2.5G card must be installed.
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Each ONS 15454 can have up to ten IP-encapsulated tunnel connections. Terminated Section DCCs (SDCCs) used by the ONS 15454 cannot be used as a tunnel endpoint, and an SDCC that is used as a tunnel endpoint cannot be terminated. All tunnel connections are bidirectional.

Step 1 Verify that IP addresses are provisioned at both the source and destination nodes of the planned tunnel. For more information, see the "DLP-G56 Provision IP Settings" task on page 3-11.

Step 2 In network view, click the **Provisioning > Overhead Circuits** tabs.

Step 3 Click **Create**.

Step 4 In the Overhead Circuit Creation dialog box, complete the following in the Circuit Attributes area:

- Name—Type the tunnel name.
- Type—Choose **IP Tunnel-D1-D3**.
- Maximum Bandwidth—Type the percentage of total SDCC bandwidth used in the IP tunnel (the minimum percentage is 10 percent).

Step 5 Click **Next**.

Step 6 In the Circuit Source area, complete the following:

- Node—Choose the source node.
- Slot—Choose the source slot.
- Port—If applicable, choose the source port.
- Channel—Displays IPT (D1-D3).

Step 7 Click **Next**.

Step 8 In the Circuit Destination area, complete the following:

- Node—Choose the destination node.
- Slot—Choose the destination slot.
- Port—If applicable, choose the destination port.
- Channel—Displays IPT (D1-D3).

Step 9 Click **Finish**.

Step 10 Return to your originating procedure (NTP).

DLP-G108 Change the Service State for a Port

Purpose	This task puts a port in service or removes a port from service. After creating an IP-encapsulated tunnel, put the ports that are hosting the IP-encapsulated tunnel in service.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view on the shelf graphic, double-click the card with the port(s) you want to put in or out of service. The card view appears.

Step 2 Click the **Provisioning > Line** tabs.

Step 3 In the Admin State column for the desired port, choose one of the following from the drop-down list:

- **IS (ANSI)** or **Unlocked (ETSI)**—Puts the port in the IS-NR (ANSI) or Unlocked-enabled (ETSI) service state.
- **OOS,DSBLD (ANSI)** or **Locked,disabled (ETSI)**—Puts the port in the OOS-MA,DSBLD (ANSI) or Locked-enabled,disabled (ETSI) service state.

  For ANSI nodes, traffic is not passed on the port until the service state is changed to IS-NR; OOS-MA,MT; or Out-of-Service and Autonomous, Automatic In-Service (OOS-AU,AINS). For ETSI nodes, traffic is not passed on the port until the service state is changed to Unlocked-enabled; Locked-enabled,maintenance; or Unlocked-disabled,automaticInService.
- **OOS,MT (ANSI)** or **Locked,maintenance (ETSI)**—Puts the port in the OOS-MA,MT/Locked-enabled,maintenance service state. This service state does not interrupt traffic flow, but alarm reporting is suppressed and loopbacks are allowed. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command. Use the OOS-MA,MT/Locked-enabled,maintenance service state for testing or to suppress alarms temporarily. Change to the IS-NR/Unlocked-enabled or OOS-AU,AINS/Unlocked-disabled,automaticInService service states when testing is complete.

- **IS,AINS (ANSI)** or **Unlocked,automaticInService (ETSI)**—Puts the port in the OOS-AU,AINS/Unlocked-enabled,automaticInService service state. In this service state, alarm reporting is suppressed, but traffic is carried and loopbacks are allowed. After the soak period passes, the port changes to IS-NR/Unlocked-enabled. Raised fault conditions, whether their alarms are reported or not, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command.

For more information about service states, see Appendix C, "DWDM Administrative and Service States."

Step 4 If you set the Admin State to IS-AINS/Unlocked, automaticInService, set the soak period time in the AINS Soak field. This is the amount of time that the port will stay in the OOS-AU,AINS/Unlocked-enabled,automaticInService service state after a signal is continuously received. When the soak period elapses, the port changes to the IS-NR/Unlocked-enabled service state.

Step 5 Click **Apply**. The new port service state appears in the Service State column.

Step 6 As needed, repeat this task for each port.

Step 7 Return to your originating procedure (NTP).

DLP-G109 Provision Orderwire

Purpose	This task provisions orderwire on the AIC or the AIC-I card.
Tools/Equipment	An AIC or AIC-I card must be installed in Slot 9. An OSCM, OSC-CSM, MXP_2.5_10E, MXP_2.5_10G, MXPP_MR_2.5G, or MXP_MR_2.5G card must be installed.
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In the network view, click the **Provisioning > Overhead Circuits** tabs.

Step 2 Click **Create**.

Step 3 In the Overhead Circuit Creation dialog box, complete the following fields in the Circuit Attributes area:

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces).
- Circuit Type—Choose either **Local Orderwire** or **Express Orderwire** depending on the orderwire path that you want to create. If regenerators are not used between ONS 15454 nodes, you can use either local or express orderwire channels. If regenerators exist, use the express orderwire channel. You can provision up to four ONS 15454 OC-N ports for each orderwire path.
- PCM—Choose the Pulse Code Modulation voice coding and companding standard, either **Mu_Law** (North America, Japan) or **A_Law** (Europe). The provisioning procedures are the same for both types of orderwire.

Caution When provisioning orderwire for ONS 15454s residing in a ring, do not provision a complete orderwire loop. For example, a four-node ring typically has east and west ports provisioned at all four nodes. However, to prevent orderwire loops, provision two orderwire ports (east and west) at all but one of the ring nodes.

Step 4 Click **Next**.

Step 5 In the Circuit Source area, complete the following:

- Node—Choose the source node.
- Slot—Choose the source slot.
- Port—If applicable, choose the source port.

Step 6 Click **Next**.

Step 7 In the Circuit Destination area, complete the following:

- Node—Choose the destination node.
- Slot—Choose the destination slot.
- Port—If applicable, choose the destination port.

Step 8 Click **Finish**.

Step 9 Return to your originating procedure (NTP).

DLP-G110 Create a User Data Channel Circuit

Purpose	This task creates a user data channel (UDC) circuit on the ONS 15454. A UDC circuit allows you to create a dedicated data channel between nodes.
Tools/Equipment	OSCM, OSC-CSM, MXPP_MR_2.5G, or MXP_MR_2.5G must be installed.
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In network view, click the **Provisioning > Overhead Circuits** tabs.

Step 2 Click **Create**.

Step 3 In the Overhead Circuit Creation dialog box, complete the following fields in the Circuit Attributes area:

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces).
- Type—Choose either **User Data-F1** or **User Data D-4-D-12** from the drop-down list. (User Data D-4-D-12 is not available if the ONS 15454 is provisioned for DWDM.)

Step 4 Click **Next**.

Step 5 In the Circuit Source area, complete the following:

- Node—Choose the source node.
- Slot—Choose the source slot.
- Port—If applicable, choose the source port.

Step 6 Click **Next**.

Step 7 In the Circuit Destination area, complete the following:

- Node—Choose the destination node.
- Slot—Choose the destination slot.
- Port—If applicable, choose the destination port.

Step 8 Click **Finish**.

Step 9 Return to your originating procedure (NTP).

NTP-G61 Modify and Delete Overhead Circuits

Purpose	This procedure repairs IP circuits and deletes overhead circuits.
Tools/Equipment	None
Prerequisite Procedures	NTP-G60 Create Overhead Circuits, page 7-13
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Deleting circuits can be service affecting and should be performed during a maintenance window.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 for a node on the network where you want to repair or delete a circuit. If you are already logged in, continue with Step 2.

Step 2 As needed, complete the "DLP-G111 Repair an IP Tunnel" task on page 7-21.

Step 3 As needed, complete the "DLP-G112 Delete Overhead Circuits" task on page 7-21.

Stop. You have completed this procedure.

DLP-G111 Repair an IP Tunnel

Purpose	This task repairs circuits that have a PARTIAL status as a result of node IP address changes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G107 Create an IP-Encapsulated Tunnel, page 7-16
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Obtain the original IP address of the node in question.

Step 2 From the View menu, choose **Go to Network View**.

Step 3 From the Tools menu, choose **Overhead Circuits > Repair IP Circuits**.

Step 4 Review the text in the IP Repair wizard and click **Next**.

Step 5 In the Node IP address area, complete the following:

- Node—Choose the node that has a PARTIAL circuit.
- Old IP Address—Type the node's original IP address.

Step 6 Click **Next**.

Step 7 Click **Finish**.

Step 8 Return to your originating procedure (NTP).

DLP-G112 Delete Overhead Circuits

Purpose	This task deletes overhead circuits. Overhead circuits include IP-encapsulated tunnels, AIC and AIC-I card orderwire, and user data channels.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Deleting overhead circuits is service affecting if the circuits are in service (IS). To put circuits out of service (OOS), see the "DLP-G108 Change the Service State for a Port" task on page 7-17.

Step 1 From the View menu, choose **Go to Network View**.

Step 2 Click the **Provisioning > Overhead Circuits** tabs.

Step 3 Click the overhead circuit that you want to delete: local or express orderwire, user data, IP-encapsulated tunnel, or DCC tunnel.

Step 4 Click **Delete**.

Step 5 In the confirmation dialog box, click **Yes** to continue.

Step 6 Return to your originating procedure (NTP).

NTP-G62 Create a J0 Section Trace

Purpose	This procedure creates a repeated, fixed-length string of characters used to monitor interruptions or changes to traffic between nodes.
Tools/Equipment	At least one of the following cards must be installed: MXP_MR_2.5G, MXPP_MR_2.5G, TXP_MR_2.5G, TXPP_MR_2.5G, MXP_2.5G_10E, TXP_MR_10E, MXP_2.5G_10G, or TXP_MR_10G.
Prerequisite Procedures	None
Required/As Needed	As needed (optional if path trace is set)
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at a node on the network where you will create the section trace. If you are already logged in, continue with Step 2.

Step 2 In node view, double-click the MXP_MR_2.5G, MXPP_MR_2.5G, TXP_MR_2.5G, TXPP_MR_2.5G, MXP_2.5G_10E, TXP_MR_10E, MXP_2.5G_10G, or TXP_MR_10G card.

Step 3 Click the **Provisioning > Line > Section Trace** tabs.

Step 4 From the Port drop-down list, choose the port for the section trace.

Step 5 From the Trace Mode drop-down list, enable the section trace expected string by choosing **Manual**:

- Off/None
- Manual—The string entered in the Current Expected String field is the baseline. An alarm is raised when a string that differs from the Current Expected String is received.

Step 6 In the Section Trace String Size area, click **1 byte**, or **16 byte** . The 1 byte option allows you to enter one character; the 16 byte option allows a 15 character string.

Step 7 In the New Transmit String field, enter the string that you want to transmit. Enter a string that makes the destination port easy to identify, such as the node IP address, node name, or another string. If the New Transmit String field is left blank, the J0 transmits a string of null characters.

Step 8 If you set the Section Trace Mode field to Manual, enter the string that the destination port should receive from the source port in the New Expected String field. If you set Section Trace Mode to Auto, skip this step.

Step 9 Click the **Disable AIS/RDI on TIM-S is detected** check box if you want to suppress the alarm indication signal (AIS) and remote defect indication (RDI) when the STS Section Trace Identifier Mismatch Path (TIM-S) alarm appears. Refer to the *Cisco ONS 15454 Troubleshooting Guide* and the *Cisco ONS 15454 SDH Troubleshooting Guide* for descriptions of alarms and conditions.

Step 10 Click **Apply**.

Step 11 After you set up the section trace, the received string appears in the Received field. The following options are available:

- Click **Hex Mode** to display section trace in hexadecimal format. The button name changes to ASCII Mode. Click it to return the section trace to ASCII format.
- Click the **Reset** button to reread values from the port.
- Click **Default** to return to the section trace default settings (Section Trace Mode is set to Off and the New Transmit and New Expected Strings are null).

Caution Clicking Default will generate alarms if the port on the other end is provisioned with a different string.

The expect and receive strings are updated every few seconds if the Section Trace Mode field is set to Auto or Manual.

Stop. You have completed this procedure.

Manage Alarms

This chapter contains the procedures for viewing and managing the alarms and conditions on a Cisco ONS 15454.

Cisco Transport Controller (CTC) detects and reports alarms generated by the Cisco ONS 15454 and the Optical Networking System (ONS) network. You can use CTC to monitor and manage alarms at a card, node, or network level. You can also view alarm counts on the LCD front panel.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. NTP-G63 Document Existing Provisioning, page 8-2—Complete this procedure as needed to print or export node data.
2. NTP-G64 View Alarms, History, Events, and Conditions, page 8-5—Complete this procedure as needed to see alarms and conditions occurring on the node and a complete history of alarm and condition messages.
3. NTP-G65 Delete Cleared Alarms from Display, page 8-13—Complete this procedure as needed to delete cleared alarm information.
4. NTP-G66 View Alarm-Affected Circuits, page 8-14—Complete this procedure as needed to find circuits that are affected by a particular alarm or condition.
5. NTP-G67 View Alarm Counts on the LCD for a Node, Slot, or Port, page 8-14—Complete this procedure as needed to see a statistical count of alarms that have occurred for a slot or port.
6. NTP-G68 Create, Download, and Assign Alarm Severity Profiles, page 8-16—Complete this procedure as needed to change the default severity for certain alarms, to assign the new severities to a port, card, or node, and to delete alarm profiles.
7. NTP-G69 Enable, Modify, or Disable Alarm Severity Filtering, page 8-24—Complete this procedure as needed to enable, disable, or modify alarm severity filtering in the Conditions, Alarms, or History screens at the node or network level.
8. NTP-G70 Suppress Alarms or Discontinue Alarm Suppression, page 8-28—Complete this procedure as needed to suppress reported alarms at the port, card, or node level and to disable the suppress command to resume normal alarm reporting.

9. NTP-G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card, page 8-31—Complete this procedure as needed to provision external alarms and controls on the Alarm Interface Controller-International (AIC-I) card.

NTP-G63 Document Existing Provisioning

Purpose	Use this procedure to document existing provisioning by printing card, node, or network CTC information or exporting card, node, or network information as delineated text files to other applications. This procedure is useful for network record keeping and troubleshooting.
Tools/Equipment	A printer connected to the CTC computer by a direct or network connection
Prerequisite Procedures	Chapter 3, "Turn Up a Node"
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to print or export data. If you are already logged in, continue with Step 2.

Step 2 As needed, complete the "DLP-G113 Print CTC Data" task on page 8-2.

Step 3 As needed, complete the "DLP-G114 Export CTC Data" task on page 8-4.

Stop. You have completed this procedure.

DLP-G113 Print CTC Data

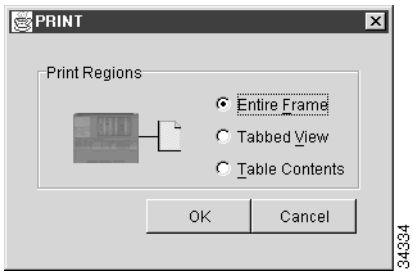
Purpose	This task prints CTC card, node, or network data in graphical or tabular format on a Windows-provisioned printer.
Tools/Equipment	Printer connected to the CTC computer by a direct or network connection
Prerequisite procedures	DLP-G46 Log into CTC, page 2-24
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Click the tab (and subtab, if present) containing the information you want to print. For example, click the **Alarms** tab to print Alarms window data.

The print operation is available for all network, node, and card view windows.

Step 2 From the File menu choose **Print**. The Print dialog box opens (Figure 8-1).

Figure 8-1 Selecting CTC Data For Print



Step 3 In the Print dialog box, click a printing option:

- Entire Frame—Prints the entire CTC window including the graphical view of the card, node, or network. This option is available for all windows.
- Tabbed View—Prints the lower half of the CTC window containing tabs and data. The printout includes the selected tab (on top) and the data shown in the tab window. For example, if you print the History window Tabbed View, you print only history items appearing in the window. This option is available for all windows.
- Table Contents—Prints CTC data in table format without graphical representations of shelves, cards, or tabs. This option applies to all windows except:
  - Provisioning > General > General and Power Monitor windows
  - Provisioning > Network > General windows
  - Provisioning > Security > Policy, Access, and Legal Disclaimer windows
  - Provisioning > SNMP window
  - Provisioning > Timing window > General and BITS Facilities windows
  - Maintenance > Cross-Connect > Cards window
  - Maintenance > Database window
  - Maintenance > Diagnostic window
  - Maintenance > Protection window
  - Maintenance > Timing > Source window

  The Table Contents option prints all the data contained in a table and the table column headings. For example, if you print the History window Table Contents view, you print all data included in the table whether or not items appear in the window.

Tip When you print using the Tabbed View option, it can be difficult to distinguish whether the printout applies to the network, node, or card view. To determine the view, compare the tabs on the printout. The network, node, and card views are identical except that network view does not contain an Inventory tab or Performance tab.

Step 4 Click **OK**.

Step 5 In the Windows Print dialog box, click a printer and click **OK**.

Step 6 Repeat this task for each window that you want to print.

Step 7 Return to your originating procedure (NTP).

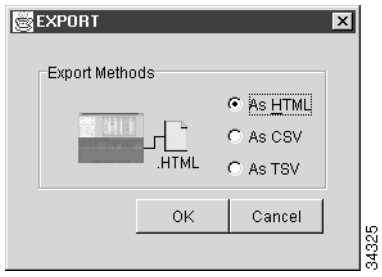
DLP-G114 Export CTC Data

Purpose	This task exports CTC table data as delineated text to view or edit the data in text editor, word processing, spreadsheet, database management, or web browser applications. The export operation applies to all tabular data except: • Provisioning > General > General and Power Monitor windows • Provisioning > Network > General windows • Provisioning > Security > Policy, Access, and Legal Disclaimer windows • Provisioning > SNMP window • Provisioning > Timing window • Maintenance > Cross-Connect > Cards windows • Maintenance > Database window • Maintenance > Diagnostic window • Maintenance > Protection window • Maintenance > Timing > Source windows • Maintenance > DWDM > ROADM Power Monitoring window [ETSI only]
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-24
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Click the tab containing the information you want to export (for example, the Alarms tab or the Circuits tab).

Step 2 Choose **Export** from the File menu. The Export dialog box appears (Figure 8-2).

Figure 8-2 Selecting CTC Data For Export



Step 3 In the Export dialog box, click a data format:

- As HTML—Saves data as a simple HTML table file without graphics. The file must be viewed or edited with applications such as Netscape Navigator, Microsoft Internet Explorer, or other applications capable of opening HTML files.

- As CSV—Saves the CTC table as comma-separated values (CSV). This option does not apply to the Maintenance > Timing > Report window.
- As TSV—Saves the CTC table as tab-separated values (TSV).

Step 4 Click **OK**.

Step 5 In the Save dialog box, enter a name in the File name field.

Step 6 Navigate to a directory where you want to store the file.

Step 7 Click **Save**.

Step 8 Repeat the task for each window that you want to export.

Note If you want to open a file in a text editor or word processor application, procedures will vary. Typically you can use the File > Open command to view the CTC data, or you can double-click the file name and choose an application such as Notepad. Text editor and word processor applications format the data exactly as it is exported, including comma or tab separators. All applications that open the data files allow you to format the data.

If you want to open the file in spreadsheet and database management applications, procedures will vary. Typically you need to open the application and choose File > Import, then choose a delimited file to format the data in cells.

Spreadsheet and database management programs also allow you to manage the exported data. An exported file cannot be opened in CTC.

Step 9 Return to your originating procedure (NTP).

NTP-G64 View Alarms, History, Events, and Conditions

Purpose	Use this procedure to view current or historical alarms and conditions for a card, node, or network. This information is useful for monitoring and troubleshooting hardware and software events.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24.

Step 2 Complete the "DLP-G115 View Alarms" task on page 8-6 as needed.

Step 3 Complete the "DLP-G116 View Alarm or Event History" task on page 8-8 as needed.

Step 4 Complete the "DLP-G117 Change the Maximum Number of Session Entries for Alarm History" task on page 8-9 as needed.

Step 5 Complete the "DLP-G118 Display Alarms and Conditions Using Time Zone" task on page 8-10 as needed.

Step 6 Complete the "DLP-G119 Synchronize Alarms" task on page 8-11 as needed.

Step 7 Complete the "DLP-G120 View Conditions" task on page 8-11 as needed.

Stop. You have completed this procedure.

DLP-G115 View Alarms

Purpose	Use this task to view current alarms on a card, node, or network.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In the card, node, or network view, click the **Alarms** tab to view the alarms for that card, node, or network.

Table 8-1 describes the columns in the Alarms window.

Note Unless otherwise indicated, each column appears in card, node, and network view.

Table 8-1 Alarm Column Descriptions

Column	Information Recorded
Num	Sequence number of the original alarm. (This tab displays in node and card views only.)
Ref	Reference number of the original alarm. (This tab displays in node and card views only.)
New	Indicates a new alarm; to change this status, click either the Synchronize button or the Delete Cleared Alarms button.
Date	Date and time of the alarm.
Node	The name of the node where the alarm occurred. (This tab display only in network view.)
Object	TL1 access identifier (AID) for the alarmed object; for an STSmon or VTmon, this is the monitored STS or VT.
Eqpt Type	If an alarm is raised on a card, the card type in this slot.
Slot	If an alarm is raised on a card, the slot where the alarm occurred (appears only in network and node view).
Port	If an alarm is raised on a card, the port where the alarm is raised; for STSTerm and VTTerm, the port refers to the upstream card it is partnered with.

Table 8-1 Alarm Column Descriptions (continued)

Column	Information Recorded
Path Width	Indicates how many STSs are contained in the alarmed path. This information complements the alarm object notation, which is explained in the *Cisco ONS 15454 Troubleshooting Guide* and the *Cisco ONS 15454 SDH Troubleshooting Guide*.
Sev	Severity level: CR (Critical), MJ (Major), MN (minor), NA (Not Alarmed), NR (Not Reported).
ST	Status: R (raised), C (clear), T (transient).
SA	When checked, indicates a service-affecting alarm.
Cond	The error message/alarm name; these names are alphabetically defined in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide.*
Description	Description of the alarm.
Shelf	When checked, indicates a multi-shelf alarm.

Table 8-2 lists the color codes for alarm and condition severities.

Table 8-2 Color Codes for Alarms and Condition Severities

Color	Description
Red	Raised Critical (CR) alarm
Orange	Raised Major (MJ) alarm
Yellow	Raised Minor (MN) alarm
Magenta (pink)	Raised Not Alarmed (NA) condition
Blue	Raised Not Reported (NR) condition
White	Cleared (C) alarm or condition

Step 2 If alarms are present, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for information and troubleshooting procedures.

Step 3 Return to your originating procedure (NTP).

DLP-G116 View Alarm or Event History

Purpose	This task is used to view past cleared and uncleared ONS 15454 alarm messages at the card, node, or network level. This task is useful for troubleshooting configuration, traffic, or connectivity issues that are indicated by alarms.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Decide whether you want to view the alarm message history at the node, network, or card level.

Step 2 To view node alarm history:

a. In node view, click the **History > Session** tabs to view the alarms and conditions (events) raised during the current session.

b. Click the **History > Node** tabs.

If you check the **Alarms** check box, the node's alarm history appears. If you check the **Events** check box, the node's Not Alarmed and transient event history appears. If you check both check boxes, you will retrieve node history for alarms and events.

c. Click **Retrieve** to view all available messages for the History > Node tabs.

Note Alarms can be unreported when they are filtered out of the display using the Filter button in either tab. See the "DLP-G126 Enable Alarm Filtering" task on page 8-25 for information.

Tip Double-click an alarm in the alarm table or an event (condition) message in the history table to display the view that corresponds to the alarm message. For example, double-clicking a card alarm takes you to card view. In network view, double-clicking a node alarm takes you to node view.

Step 3 To view network alarm history:

a. From the View menu choose **Go to Network View**.

b. Click the **History** tab.

Alarms and conditions (events) raised during the current session appear.

Step 4 To view card alarm history:

a. From the View menu choose **Go to Previous View**.

b. Double-click a card on the shelf graphic to open the card-level view. TCC2/TCC2P cards do not have a card view.

c. Click the **History > Session** tab to view the alarm messages raised during the current session.

d. Click the **History > Card** tab to retrieve all available alarm messages for the card and click **Retrieve**.

If you check the **Alarms** check box, the node's alarm history appears. If you check the **Events** check box, the Not Alarmed and transient event history appears. If you check both boxes, node history for both alarms and events appears.

Note The ONS 15454 can store up to 640 critical alarm messages, 640 major alarm messages, 640 minor alarm messages, and 640 condition messages. When any of these limits is reached, the ONS 15454 discards the oldest events in that category.

Raised and cleared alarm messages (and events, if selected) appear.

Step 5 Return to your originating procedure (NTP).

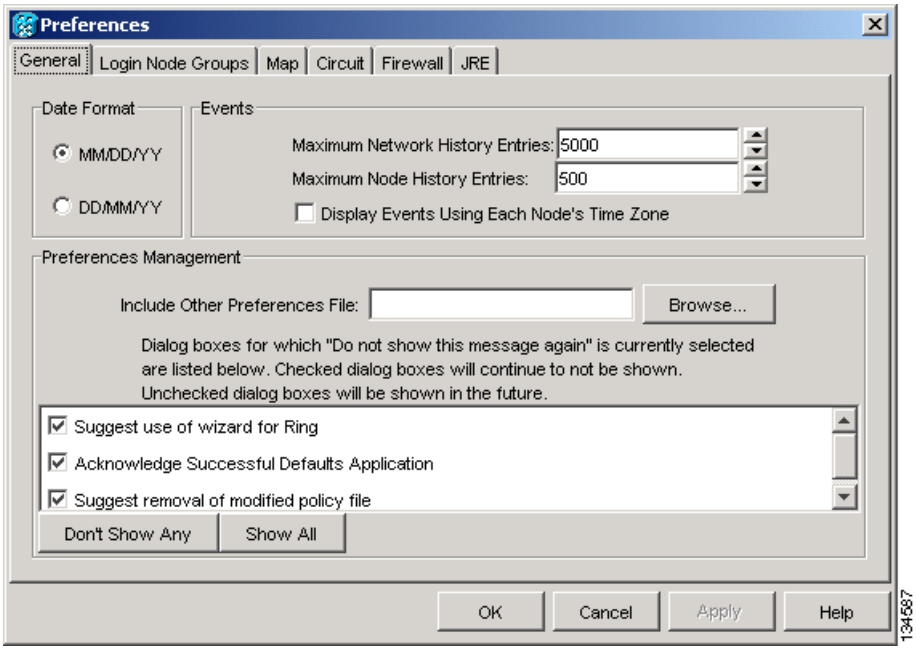
DLP-G117 Change the Maximum Number of Session Entries for Alarm History

Purpose	This task changes the maximum number of session entries included in the alarm history. Use this task to expand the history list to save information for future reference or troubleshooting.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the Edit menu, choose **Preferences**.

The CTC Preferences dialog box appears (Figure 8-3).

Figure 8-3 CTC Preferences Dialog Box



Step 2 Click the up or down arrow buttons next to the Maximum History Entries field to change the entry.

Step 3 Click **Apply** and **OK**.

Note Setting the Maximum History Entries value to the high end of the range uses more CTC memory and could impair CTC performance.

Note This task changes the maximum history entries recorded for CTC sessions. It does not affect the maximum number of history entries viewable for a network, node, or card.

Step 4 Return to your originating procedure (NTP).

DLP-G118 Display Alarms and Conditions Using Time Zone

Purpose	This task changes the timestamp for events to the timezone of the ONS node reporting the alarm. By default, the events timestamp is set to the timezone for the CTC workstation.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the Edit menu, choose **Preferences**.

The CTC Preferences dialog box appears (Figure 8-3 on page 8-10).

Step 2 Check the **Display Events Using Each Node's Timezone** check box. The Apply button is enabled.

Step 3 Click **Apply** and **OK**.

Step 4 Return to your originating procedure (NTP).

DLP-G119 Synchronize Alarms

Purpose	This task is used to view ONS 15454 events at the card, node, or network level and to refresh the alarm listing so that you can check for new and cleared alarms and conditions.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 At the card, node, or network view, click the **Alarms** tab.

Step 2 Click **Synchronize**.

This button causes CTC to retrieve a current alarm summary for the card, node, or network. This step is optional because CTC updates the Alarms window automatically as raise/clear messages arrive from the node.

Note Alarms that have been raised during the session will have a check mark in the Alarms window New column. When you click Synchronize, the check mark disappears.

Step 3 Return to your originating procedure (NTP).

DLP-G120 View Conditions

Purpose	This task is used to view conditions (events with a Not Reported [NR] severity) at the card, node, or network level. Conditions give you a clear record of changes or events that do not result in alarms.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 From the card, node, or network view, click the **Conditions** tab.

Step 2 Click **Retrieve**.

The Retrieve button requests the current set of fault conditions from the node, card, or network. The window is not updated when events change on the node. You must click Retrieve to see any changes.

Conditions include all fault conditions raised on the node, whether or not they are reported.

Note Alarms can be unreported if they are filtered out of the display. See the "DLP-G126 Enable Alarm Filtering" task on page 8-25 for information.

Events that are reported as Major (MJ), Minor (MN), or Critical (CR) severities are alarms. Events that are reported as Not-Alarmed (NA) are conditions. Conditions that are not reported at all are marked Not-Reported (NR) in the Conditions window severity column.

Conditions that have a default severity of Critical (CR), Major (MJ), Minor (MN), or Not-Alarmed (NA) but are not reported due to exclusion or suppression are shown as NR in the Conditions window.

Note For more information about alarm suppression, see the "DLP-G129 Suppress Alarm Reporting" task on page 8-28.

Current conditions are shown with the severity chosen in the alarm profile, if used. For more information about alarm profiles, see the "NTP-G68 Create, Download, and Assign Alarm Severity Profiles" procedure on page 8-16.

Note When a port is placed in the Out-of-Service and Management, Maintenance (OOS-MA,MT) (ANSI) or Locked-enabled, maintenance (ETSI) service state, it raises an Alarms Suppressed for Maintenance (AS-MT) condition. For information about alarm and condition troubleshooting, refer to the *Cisco ONS 15454 Troubleshooting Guide* and the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 3 If you want to apply exclusion rules, check the **Exclude Same Root Cause** check box at the node or network view, but do not check the Exclude Same Root Cause check box in card view.

An exclusion rule eliminates all lower-level alarms or conditions that originate from the same cause. For example, a fiber break may cause an LOS alarm, an AIS condition, and an SF condition. If you check the Exclude Same Root Cause check box, only the LOS alarm will appear. According to Telcordia, exclusion rules apply to a query of "all conditions from a node."

Step 4 Return to your originating procedure (NTP).

NTP-G65 Delete Cleared Alarms from Display

Purpose	Use this procedure to delete Cleared (C) status alarms from the Alarms window or transient messages from the CTC History window.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 To delete cleared node-level alarms:

a. In the node view, click the **Alarms** tab.

b. Click **Delete Cleared Alarms**.

- If the Autodelete Cleared Alarms check box is checked, an alarm disappears from the window when it is cleared.
- If the Autodelete Cleared Alarms check box is not checked, an alarm remains in the window when it is cleared. The alarm appears white in the window and has a Clear (CL) severity. The alarm can be removed by clicking the **Delete Cleared Alarms** button.

This action removes any cleared ONS 15454 alarms from the Alarms tab. The rows of cleared alarms turn white and have a C in their status (ST) column.

Step 3 To delete cleared card-level alarms:

a. In node view, double-click the card graphic for the card you want to open.

b. Click the **Alarms** tab and then click **Delete Cleared Alarms**, referring to the note in Step 2.

Step 4 To delete cleared network-level alarms:

a. In node view, click **View > Go to Network View**.

b. Click the **Alarms** tab and then click **Delete Cleared Alarms**, referring to the note in Step 2.

Step 5 To remove the transient messages from the History window, click **Delete Cleared Alarms**. Transient messages are single messages, not raise-and-clear pairs (that is, they do not have companion messages stating they are cleared).

Stop. You have completed this procedure.

NTP-G66 View Alarm-Affected Circuits

Purpose	Use this procedure to view all Optical Channel Network Connections (OCHNCs) and ONS 15454 circuits, if any, that are affected by an alarm or condition.
Tools/Equipment	None
Prerequisite Procedures	NTP-G64 View Alarms, History, Events, and Conditions, page 8-5
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 In the network, node, or card view, click the **Alarms** tab or **Conditions** tab and then right-click anywhere in the row of an active alarm or condition.

Note The node view is the default, but you can also navigate to the Alarms tab in the network view or card view to perform Step 2.

The Select Affected Circuit option appears on the shortcut menu.

Step 3 Left-click or right-click **Select Affected Circuits**.

The **Circuits** window appears with the affected Optical Channel Network Connection (OCHNC) highlighted.

Stop. You have completed this procedure.

NTP-G67 View Alarm Counts on the LCD for a Node, Slot, or Port

Purpose	Use this procedure to view an alarm summary for a node, slot, or port without using CTC.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 If you want to view the entire alarm summary for the node, press either the **Slot** button or **Port** button on the LCD panel until "Node" appears on the LCD. You will also see the direction, "Status=Alm Ct." This means that if you press the Status button at this time, as directed in Step 2, you will see an alarm count for the node.

Step 2 Press the **Status** button to see a summary of alarms and severities for the node. You will see a message similar to "Alm Ct: 2: MJ:2 MN:2," meaning that there are two critical alarms, two major alarms, and two minor alarms.

Step 3 If you want to see alarm counts for a particular slot, such as the alarms for an OC-3 card in Slot 3, press the **Slot** button until you see "Slot-3" on the LCD. You will see the direction, "Status=Alm Ct Sum."

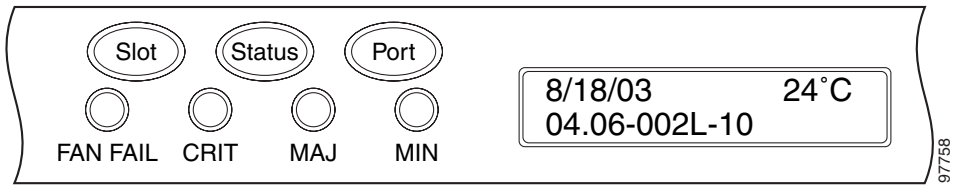
Step 4 Press the **Status** button to see a summary of alarms and severities against the slot. For example, you might see "Slot-3 Alm Sum:0 MJ:1 MN:2." This means that there are no critical alarms, one major alarm, and two minor alarms against the slot.

Step 5 If you want to view the alarms against a port on the card, such as Port 3 of the OC-3 card you viewed previously, press the **Port** button until you see "Port-3 Status=Alm Ct."

Step 6 Press **Status** to view alarm count against the port. You will see a message similar to "Slot-3 Port-0 Ct:0 MJ:1 MN:0." This means that there is one major alarm against this port.

Figure 8-4 shows the shelf LCD panel.

Figure 8-4 Shelf LCD Panel



To return to the previous view from the Port screen, continue to press **Port** until the display cycles through all the ports on the slot.

To return to the node menu from the Slot screen, press **Slot** until you cycle through all the slots and see "Node."

If you do not press any buttons, the LCD will return to its default display with the node name. However, if you did not cycle through the options to return to the node status, you will see the slot or port where you last checked status.

Note A blank LCD results when the fuse on the alarm interface panel (AIP) board has blown. If this occurs, contact the Cisco Technical Assistance Center (TAC). See the "Obtaining Technical Assistance" section on page lxxiv.

Stop. You have completed this procedure.

NTP-G68 Create, Download, and Assign Alarm Severity Profiles

Purpose	Use this procedure to create a customized alarm profile at the network, node, or card level. This procedure also provides links to tasks that describe how to assign custom severities individually to each port, card, or node, and to delete alarm profiles.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to create an alarm profile. If you are already logged in, continue with Step 2 to create, clone or modify an alarm profile, or go to Step 3 to download an alarm profile.

Step 2 Complete the "DLP-G121 Create a New or Cloned Alarm Severity Profile" task on page 8-16. This task clones a current alarm profile, renames the profile, and customizes the new profile.

Step 3 Complete the "DLP-G122 Download an Alarm Severity Profile" task on page 8-19. This task downloads an alarm severity profile from a CD or a node.

Note After storing a created or downloaded alarm profile, you must go to the node (either by logging into it or clicking on it from the network view) and activate the profile by applying it to the shelf, one or more cards, or one or more ports.

Step 4 As necessary, complete the "DLP-G123 Apply Alarm Profiles to Ports" task on page 8-20 or the "DLP-G124 Apply Alarm Profiles to Cards and Nodes" task on page 8-22.

Step 5 As necessary, complete the "DLP-G125 Delete Alarm Severity Profiles" task on page 8-22.

Stop. You have completed this procedure.

DLP-G121 Create a New or Cloned Alarm Severity Profile

Purpose	This task creates a custom severity profile or clones and modifies the default severity profile.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the CTC window, View Menu, select Go To Network View.

Step 2 To access the alarm profile editor from network view, click the **Provisioning > Alarm Profiles** tabs.

Note To access the profile editor from node or card view, click the **Provisioning > Alarm Profiles > Alarm Profile Editor** tabs.

Step 3 If you want to create a new profile based on the default profile in use, click **New**. Continue with Step 9.

Step 4 If you want to create a profile using an existing profile located on the node, click **Load** and **From Node** in the Load Profiles dialog box.

a. Click the node name you are logged into in the Node Names list.

b. Click the name of an existing profile in the Profile Names list, such as **Default**. Continue with Step 6.

Step 5 If you want to create a profile using an existing profile located in a file that is stored locally or on a network drive, click **From File** in the Load Profiles dialog box.

a. Click **Browse**.

b. Navigate to the file location in the **Open** dialog box.

c. Click **Open**.

Note All default or user-defined severity settings that are Critical (CR) or Major (MJ) are demoted to Minor (MN) in Non-Service-Affecting (NSA) situations as defined in Telcordia GR-474-CORE.

Step 6 Click **OK**.

The alarm severity profile appears in the Alarm Profiles window.The alarm profile list contains a master list of alarms that is used for a mixed node network. Some of these alarms might not be used in all ONS nodes.

Step 7 Right-click anywhere in the profile column to view the profile editing shortcut menu. (Refer to Step 10 for further information about the Default profile.)

Step 8 Click **Clone** in the shortcut menu.

Tip To see the full list of profiles, including those available for loading or cloning, click Available. You must load a profile before you can clone it.

Step 9 In the New Profile dialog box, enter a name in the New Profile Name field.

Profile names must be unique. If you try to import or name a profile that has the same name as another profile, CTC adds a suffix to create a new name. Long file names are supported.

Step 10 Click **OK**.

A new alarm profile (named in Step 9) is created. (If this is the first alarm profile created during installation, the default alarm profile settings are displayed in the AlarmType::Condition column on the left.) This profile duplicates the default profile severities and appears at the right of the previous profile column in the Alarm Profiles window. You can select it and drag it to a different position.

Note Up to 10 profiles, including the two reserved profiles, Inherited and Default, can be stored in CTC.

The Default profile sets severities to standard Telcordia GR-253-CORE settings. If an alarm has an Inherited profile, it inherits (copies) its severity from the same alarm's severity at the higher level. For example, if you choose the Inherited profile from the network view, the severities at the lower levels (node, card, and port) will be copied from this selection. A card with an Inherited alarm profile copies the severities used by the node that contains the card. (If you are creating profiles, you can apply these separately at any level. To do this, refer to the "DLP-G124 Apply Alarm Profiles to Cards and Nodes" task on page 8-22.)

Step 11 Modify (customize) the new alarm profile:

a. In the new alarm profile column, click the alarm severity you want to change in the custom profile.

b. Choose a severity from the drop-down list.

c. Repeat Steps a and b for each severity you want to customize. Refer to the following guidelines when you view the alarms or conditions after making modifications:

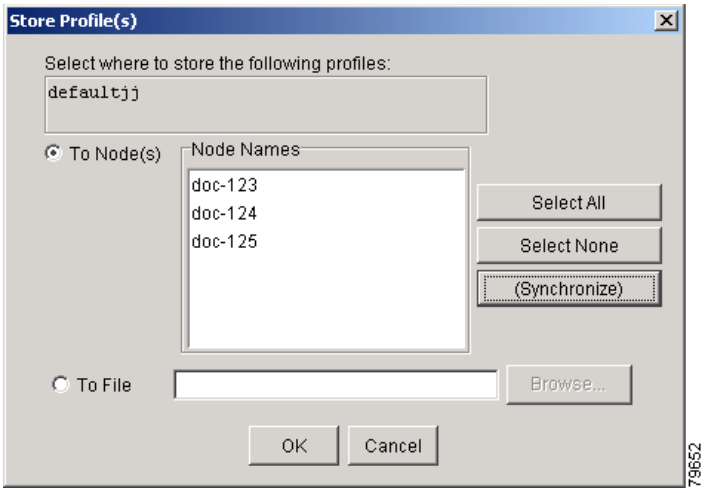
- All Critical (CR) or Major (MJ) default or user-defined severity settings are demoted to Minor (MN) in Non-Service-Affecting (NSA) situations as defined in Telcordia GR-474-CORE.
- Default severities are used for all alarms and conditions until you create and apply a new profile.
- Changing a severity to inherited (I) or unset (U) does not change the severity of the alarm.

Step 12 After you have customized the new alarm profile, right-click the profile column to highlight it.

Step 13 Click **Store**.

Step 14 In the Store Profiles dialog box, click **To Node(s)** and go to Step a below, or click **To File** and go to Step b (Figure 8-5).

Figure 8-5 Store Profiles Dialog Box



a. Choose the node where you want to save the profile:

- If you want to save the profile to only one node, click the node in the Node Names list.
- If you want to save the profile to all nodes, click **Select All**.
- Press the Ctrl key, and simultaneously left-click the node where the profile is to be saved.
- If you do not want to save the profile to any nodes, click **Select None**.
- If you want to update alarm profile information, click **(Synchronize)**.

- Click **OK** to save the profile.

b. Save the profile:

- Click **Browse** and navigate to the profile save location.
- Enter a name in the File name field.
- Click **Select** to choose this name and location. Long file names are supported. CTC supplies a suffix of *.pfl to stored files.
- Click **OK** to store the profile.

Step 15 As needed, perform any of the following actions. The following options are located at the bottom of the **Provision>Alarm Profile** window.

- Click the **Hide Identical Rows** check box to configure the Alarm Profiles window to view rows with dissimilar severities.
- Click the **Hide Reference Values** check box to configure the Alarm Profiles window to view severities that do not match the Default profile.
- Click the **Only show service-affecting severities** check box to configure the Alarm Profiles window not to display Minor and some Major alarms that will not affect service.

Step 16 Return to your originating procedure (NTP).

DLP-G122 Download an Alarm Severity Profile

Purpose	This task downloads a custom alarm severity profile from a network-drive accessible CD-ROM, floppy disk, or hard disk location.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note You must always store the alarm profile after editing it. If you edit an alarm profie without saving it, changes to the profile will be lost if you change views in CTC.

Step 1 To access the alarm profile editor from network view, click the **Provisioning > Alarm Profiles** tabs.

Note To access the profile editor from node or card view, click the **Provisioning > Alarm Profiles > Alarm Profile Editor** tabs.

Step 2 Click **Load**.

Step 3 If you want to download a profile that exists on the node, click **From Node** in the Load Profiles dialog box.

a. Click the node name you are logged into in the Node Names list.

b. Click the name of the profile in the Profile Names list, such as **Default**.

c. Click **OK.**

Step 4 If you want to download a profile that is stored locally or on a network drive, click **From File** in the Load Profile dialog box.

a. Click **Browse**.

b. Navigate to the file location in the **Open** dialog box.

c. Click **Open**.

Note All default or user-defined severity settings that are Critical (CR) or Major (MJ) are demoted to Minor (MN) in Non-Service-Affecting (NSA) situations as defined in Telcordia GR-474.

Step 5 Click **OK**.

The downloaded profile appears at the right side of the Alarm Profiles window.

Step 6 Right-click anywhere in the downloaded profile column to view the profile editing shortcut menu.

Step 7 Click **Store**.

Step 8 In the Store Profiles dialog box, click **To Node(s)**.

a. Choose the nodes where you want to save the profile:

- If you want to save the profile to only one node, click the node in the Node Names list.
- If you want to save the profile to all nodes, click **Select All**.
- Press the Ctrl key, and simultaneously left-click the node where the profile is to be saved.
- If you do not want to save the profile to any nodes, click **Select None**.
- If you want to update alarm profile information, click **Synchronize**.

b. **Click OK**.

Step 9 Return to your originating procedure (NTP).

DLP-G123 Apply Alarm Profiles to Ports

Purpose	This task applies a custom or default alarm severity profile to a port or ports.
Tools/Equipment	None
Prerequisite Procedures	DLP-G121 Create a New or Cloned Alarm Severity Profile, page 8-16 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note You can also apply alarm profiles to cards using the "DLP-G124 Apply Alarm Profiles to Cards and Nodes" task on page 8-22.

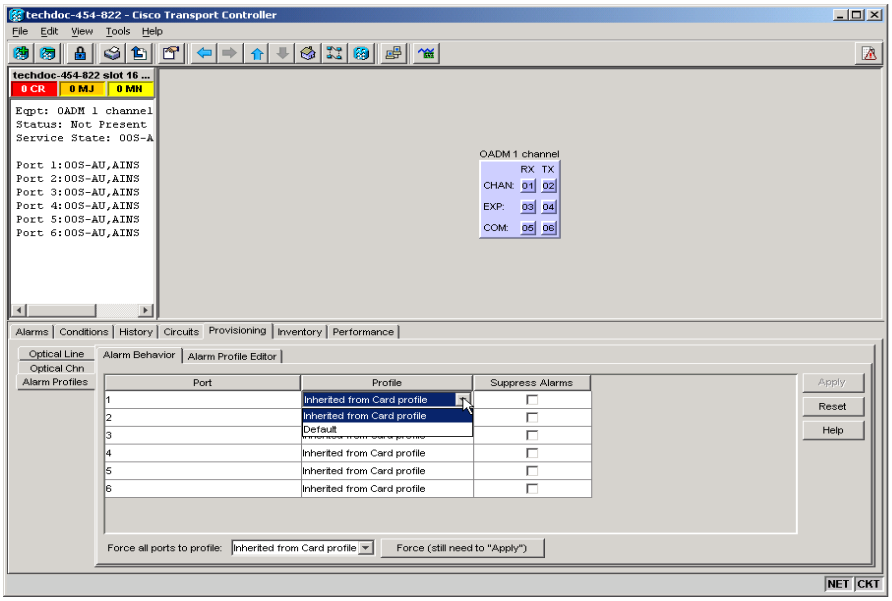
Step 1 In the node view, double-click the card you want to change to open the card view.

Note The card view is not available for the TCC2/TCC2P card.

Click the **Provisioning > Alarm Profiles > Alarm Behavior** tabs.

Figure 8-6 shows alarm profiles for the AD-1C card, for example. CTC shows Parent Card Profile: Inherited.

Figure 8-6 AD-1C Card Alarm Profile



Go to Step 2 to apply profiles to a port. Go to Step 3 to apply profiles to all ports on a card.

Step 2 To apply profiles on a port basis:

a. In card view, click the port row in the Profile column.

b. Choose the new profile from the drop-down list.

c. Click **Apply**.Confirm the profile updated to the port correctly.

Step 3 To apply profiles to all ports on a card:

a. In card view, click the **Force all ports to profile** drop-down arrow at the bottom of the window.

b. Choose the new profile from the drop-down list.

c. Click **Force (still need to "Apply")**.

d. Click **Apply**. Confirm the profile updated to all ports correctly.

In node view the Port Level Profiles column indicates port-level profiles with a notation such as "exist (1)".

Step 4 To reapply a previous alarm profile after you have applied a new one, select the previous profile and click **Apply** again.

Step 5 Return to your originating procedure (NTP).

DLP-G124 Apply Alarm Profiles to Cards and Nodes

Purpose	This task applies a custom or default alarm profile to cards or nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G121 Create a New or Cloned Alarm Severity Profile, page 8-16 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Alarm Profiles > Alarm Behavior** tab.

Step 2 To apply profiles to a card:

- **a.** Click a selection from the Profile column for the card.
- **b.** Choose the new profile from the drop-down list.
- **c.** Click **Apply**.

Step 3 To apply the profile to an entire node:

- **a.** Click the **Force All Ports to Profile** drop-down arrow at the bottom of the window.
- **b.** Choose the new alarm profile from the drop-down list.
- **c.** Click **Force (still need to apply).**

Step 4 Click **Apply** again.

Step 5 Return to your originating procedure (NTP).

DLP-G125 Delete Alarm Severity Profiles

Purpose	This task deletes a custom or default alarm severity profile.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 To access the alarm profile editor from network view, click the **Provisioning > Alarm Profiles** tabs.

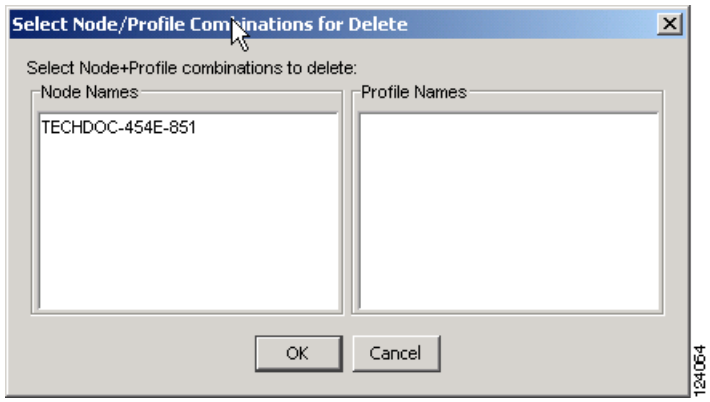
Note To access the profile editor from node or card view, click the **Provisioning > Alarm Profiles > Alarm Profile Editor** tabs.

Step 2 Click the profile that you want to delete. (Click in the column that displays the profile name and this selects it.)

Step 3 Click **Delete**.

The Select Node/Profile Combination for Delete dialog box appears (Figure 8-7).

Figure 8-7 Select Node/Profile Combination For Delete Dialog Box



Note You cannot delete the Inherited or Default alarm profiles.

Note A previously created alarm profile cannot be deleted unless it has been stored on the node. If the profile is visible on the Alarm Profiles tab but is not listed in the Select Node/Profile Combinations to Delete dialog box, continue with Step 8.

Step 4 Click the node names in the Node Names list to highlight the profile location.

Tip If you hold the Shift key down, you can select consecutive node names. If you hold the Ctrl key down, you can select any combination of nodes.

Step 5 Click the profile names you want to delete in the Profile Names list.

Step 6 Click **OK**.

Step 7 Click **Yes** in the Delete Alarm Profile dialog box.

If you delete a profile from a node, it still appears in the network view Provisioning > Alarm Profile Editor window unless you remove it using the following step.

Step 8 To remove the alarm profile from the window, right-click the column of the profile you deleted and choose **Remove** from the shortcut menu.

If a node and profile combination is selected but does not exist, a warning appears: "One or more of the profiles selected do not exist on one or more of the node(s) selected." For example, if node A has only profile 1 stored and the user tries to delete both profile 1 and profile 2 from node A, this warning appears. However, the operation still removes profile 1 from node A.

The Default and Inherited special profiles cannot be deleted and do not appear in the Select Node/Profile Combination for Delete Window.

Step 9 Return to your originating procedure (NTP).

NTP-G69 Enable, Modify, or Disable Alarm Severity Filtering

Purpose	Use this procedure to start, change, or stop alarm filtering for one or more severities in the Alarms, Conditions, and History windows in all network nodes.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to enable alarm severity filtering. If you are already logged in, continue with Step 2.

Step 2 As needed, complete the "DLP-G126 Enable Alarm Filtering" task on page 8-25. This task enables alarm filtering at the card, node, and network views for all nodes in the network. Alarm filtering can be enabled for alarms, conditions, or events.

Step 3 As needed, complete the "DLP-G127 Modify Alarm, Condition, and History Filtering Parameters" task on page 8-25 to modify the alarm filtering for network nodes to show or hide particular alarms or conditions.

Step 4 As needed, complete the "DLP-G128 Disable Alarm Filtering" task on page 8-27 to disable alarm profile filtering for all network nodes.

Stop. You have completed this procedure.

DLP-G126 Enable Alarm Filtering

Purpose	This task enables alarm filtering for alarms, conditions, or event history in all network nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 At the node, network, or card view, click the **Alarms** tab.

Step 2 Click the **Filter** tool icon on the right side of the bottom toolbar.

Note The Filter tool icon differs from the Filter button at the bottom left of the screen.

Alarm filtering is enabled if the tool is selected and disabled if the tool is raised (not selected).

Alarm filtering is enabled in the card, node, and network views of the same window for all nodes in the network. For example, if the Filter tool is enabled in the node view Alarms window, the network view Alarms window and card view Alarms window also show the tool enabled.

Step 3 If you want alarm filtering enabled when you view conditions, repeat Steps 1 and 2 using the Conditions window.

Step 4 If you want alarm filtering enabled when you view alarm history, repeat Steps 1 and 2 using the History window.

Step 5 Return to your originating procedure (NTP).

DLP-G127 Modify Alarm, Condition, and History Filtering Parameters

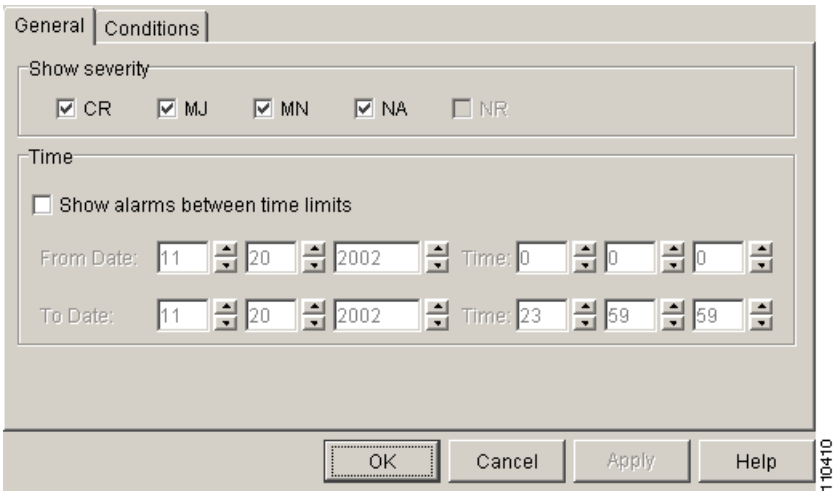
Purpose	This task changes alarm and condition reporting in all network nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G126 Enable Alarm Filtering, page 8-25 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 At the node, network, or card view, click the **Alarms** tab, **Conditions** tab, or **History** tab.

Step 2 Click the **Filter** button on the left side of the bottom toolbar.

The filter dialog box appears, displaying the General tab. Figure 8-8 shows the Alarm Filter dialog box; the Conditions and History tabs have similar dialog boxes.

Figure 8-8 Alarm Filter Dialog Box General Tab



In the General tab Show Severity box, you can choose which alarm severities will show through the alarm filter and provision a time period during which filtered alarms show through the filter. To change the alarm severities shown in the filter, go to Step 3. To change the time period filter for the alarms, go to Step 4.

Step 3 In the Show Severity area, click the check boxes for the severities [Critical (CR), Major (MJ), Minor (MN), or Not-Alarmed (NA)] you want to be reported at the network level. Leave severity check boxes deselected (unchecked) to prevent those severities from appearing.

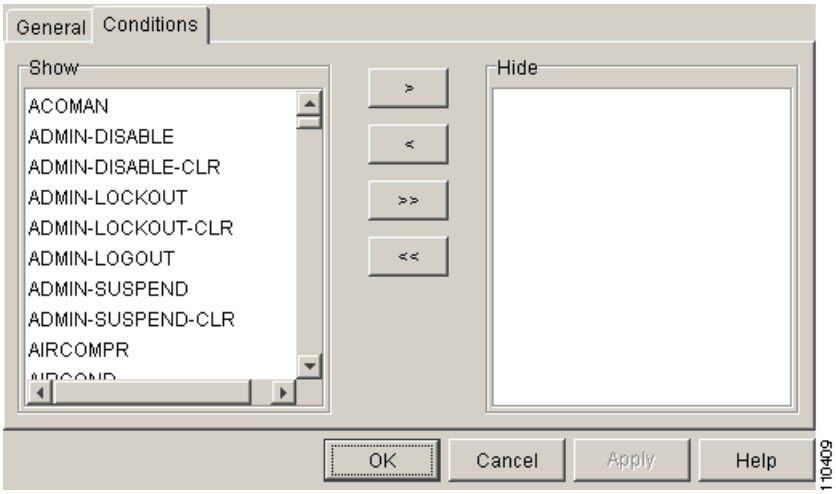
When alarm filtering is disabled, all alarms show.

Step 4 In the Time area, click the **Show alarms between time limits** check box to enable it. Click the up and down arrows in the From Date, To Date, and Time fields to modify what period of alarms are shown.

To modify filter parameters for conditions, continue with Step 5. If you do not need to modify them, continue with Step 6.

Step 5 Click the filter dialog box **Conditions** tab (Figure 8-9).

Figure 8-9 Alarm Filter Dialog Box Conditions Tab



When filtering is enabled, conditions in the Show list are visible and conditions in the Hide list are invisible.

- To move conditions individually from the Show list to the Hide list, click the > button.
- To move conditions individually from the Hide list to the Show list, click the < button.
- To move conditions collectively from the Show list to the Hide list, click the >> button.
- To move conditions collectively from the Hide list to the Show list, click the << button.

Note Conditions include alarms.

Step 6 Click **Apply** and **OK**.

Alarm and condition filtering parameters are enforced when alarm filtering is enabled (see the "DLP-G126 Enable Alarm Filtering" task on page 8-25), and the parameters are not enforced when alarm filtering is disabled (see the "DLP-G128 Disable Alarm Filtering" task on page 8-27).

Step 7 Return to your originating procedure (NTP).

DLP-G128 Disable Alarm Filtering

Purpose	This task turns off specialized alarm filtering in all network nodes so that all severities are reported in CTC.
Tools/Equipment	None
Prerequisite Procedures	DLP-G126 Enable Alarm Filtering, page 8-25 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 At the node, network, or card view, click the **Alarms** tab.

Step 2 Click the **Filter** tool icon on the right side of the bottom toolbar.

Note The Filter tool icon differs from the Filter button at the bottom left of the screen.

Alarm filtering is enabled if the tool is indented and disabled if the tool is raised (not selected).

Step 3 If you want alarm filtering disabled when you view conditions, click the **Conditions** tab and click the Filter tool.

Step 4 If you want alarm filtering disabled when you view alarm history, click the **History** tab and click the Filter tool.

Step 5 Return to your originating procedure (NTP).

NTP-G70 Suppress Alarms or Discontinue Alarm Suppression

Purpose	Use this procedure to prevent alarms from being reported for a port, card, or node in circumstances when an alarm or condition is known to exist but you do not want to include it in the display. This procedure also provides a link to a task that explains how to resume normal alarm reporting by discontinuing the suppression.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the "DLP-G129 Suppress Alarm Reporting" task on page 8-28 to enable the node to send autonomous messages that clear specific raised alarms and cause suppressed alarms to appear in the Conditions window.

Suppressing one or more alarms prevents them from appearing in Alarm or History windows or in any other clients. The suppress command causes CTC to display them in the Conditions window with their severity, their severity color code, and service-affecting status.

Step 3 Complete the "DLP-G130 Discontinue Alarm Suppression" task on page 8-30 to discontinue alarm suppression and resume normal alarm reporting.

Stop. You have completed this procedure.

DLP-G129 Suppress Alarm Reporting

Purpose	This task suppresses the reporting of ONS 15454 alarms at the node, card, or port level.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution If multiple CTC/TL1 sessions are open, suppressing alarms in one session suppresses the alarms in all other open sessions.

Note Alarm suppression at the node level does not supersede alarm suppression at the card or port level. Suppression can exist independently for all three entities, and each entity will raise separate alarms suppressed by the user command (AS-CMD) alarm.

Step 1 If you are in node view, click the **Provisioning > Alarm Profiles > Alarm Behavior** tabs.

Step 2 To suppress alarms for the entire node:

a. Check the **Suppress Alarms** check box.

b. Click **Apply**.

All raised alarms for the node will change color to white in the Alarms window and their status will change to cleared. After suppressing alarms, clicking **Synchronize** in the Alarms window will remove cleared alarms from the window. However, an AS-CMD alarm will show in node or card view to indicate that node-level alarms were suppressed, and the word System will appear in the Object column.

Note The only way to suppress BITS, power source, or system alarms is to suppress alarms for the entire node. These cannot be suppressed separately.

Step 3 To suppress alarms for individual cards:

a. In the alarm behavior window, locate the card row (using the Location column for the slot number or the Eqpt Type column for the equipment name).

b. Check the **Suppress Alarms column** check box on that row.

Alarms that directly apply to this card will change appearance as described in Step 2. For example, if you suppressed raised alarms for an OC-48 card in Slot 16, raised alarms for this card will change in node or card view. The AS-CMD alarm will show the slot number in the Object number. For example, if you suppressed alarms for a Slot 16 OC-48 card, the AS-CMD object will be “SLOT-16.”

Click **Apply**.

Step 4 To suppress alarms for individual card ports, double-click the card in node view.

Step 5 Click the **Provisioning > Alarm Profiles > Alarm Behavior** tabs.

Step 6 Check the **Suppress Alarms** column check box for the port row where you want to suppress alarms (Figure 8-6 on page 8-21).

Step 7 Click **Apply**.

Alarms that apply directly to this port will change appearance as described in Step 2. (However, alarms raised on the entire card will remain raised.) A raised AS-CMD alarm that shows the port as its object will appear in either alarm window. For example, if you suppressed alarms for Port 1 on the Slot 16 OC-48 card, the alarm object will show “FAC-16-1.”

Step 8 Return to your originating procedure (NTP).

DLP-G130 Discontinue Alarm Suppression

Purpose	This task discontinues alarm suppression and reenables alarm reporting on a port, card, or node.
Tools/Equipment	None
Prerequisite Procedures	DLP-G129 Suppress Alarm Reporting, page 8-28 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution If multiple CTC sessions are open, discontinuing suppression in one session will discontinue suppression in all other open sessions.

Step 1 To discontinue alarm suppression for the entire node:

a. In node view, click the **Provisioning > Alarm Profiles > Alarm Behavior** tab.

b. Uncheck the **Suppress Alarms** check box.

Suppressed alarms will reappear in the Alarms window. (They might have previously been cleared from the window using the Synchronize button.) The AS-CMD alarm with the System object will be cleared in all views.

Step 2 To discontinue alarm suppression for individual cards:

a. In the node view, click the **Provisioning > Alarm Profiles > Alarm Behavior** tabs.

b. Locate the card that was suppressed in the slot list.

c. Uncheck the Suppress Alarms column check box for that slot.

d. Click **Apply**.

Suppressed alarms will reappear in the Alarms window. (They might have previously been cleared from the window using the Synchronize button.) The AS-CMD alarm with the slot object (for example, SLOT-16) will be cleared in all views.

Step 3 To discontinue alarm suppression for ports, click the the **Provisioning > Alarm Profiles > Alarm Behavior** tabs.

Step 4 Uncheck the **Suppress Alarms** check box for the port(s) you no longer want to suppress.

Step 5 Click **Apply**.

Suppressed alarms will reappear in the Alarms window. (They might have previously been cleared from the window using the Synchronize button.) The AS-CMD alarm with the port object (for example, FAC-16-1) will be cleared in all views.

Step 6 Return to your originating procedure (NTP).

NTP-G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card

Purpose	Use this procedure to create external (environmental) alarms and external controls for the AIC-I card.
Tools/Equipment	An AIC-I card must be installed in Slot 9.
Prerequisite Procedures	DLP-G34 Install the AIC-I Card, page 1-73
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note On the ONS 15454 ANSI shelf, the AIC-I card alarm provides direct alarm contacts (external alarm inputs and external control outputs) routed through the backplane to wire-wrap pins accessible from the back of the shelf. If you install an Alarm Expansion Panel (AEP), the AIC-I alarm contacts cannot be used. Only the AEP alarm contacts can be used. For further information about the AEP, see "NTP-G9 Install the Alarm Expansion Panel (ANSI Only)" procedure on page 1-43 and the "NTP-G11 Install an External Wire-Wrap Panel on the AEP (ANSI Only)" procedure on page 1-57. The ONS 15454 ETSI shelf is not compatible with the AEP.

Note For information about the AIC-I alarms, controls, and virtual wire, refer to the "21.7.3 Virtual Wires" section on page 21-13.

Step 1 If you are using an ONS 15454 ANSI shelf, verify the backplane wiring. If you are using the AEP, see the "NTP-G9 Install the Alarm Expansion Panel (ANSI Only)" procedure on page 1-43. Otherwise, see the "NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections" procedure on page 1-46 for information about the ONS 15454 backplane pins.

- **a.** For external alarms, verify that the external device relays are wired to the ENVIR ALARMS IN backplane pins.
- **b.** For external controls, verify that the external device relays are wired to the ENVIR ALARMS OUT backplane pins.

Step 2 If you are using an ONS 15454 ETSI shelf, verify the alarm contact wiring. See the "NTP-G10 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections" procedure on page 1-46 for information about the ONS 15454 SDH contacts.

- **a.** For external alarms, verify that the external device relays are wired to the ENVIR ALARMS IN connector pins.
- **b.** For external controls, verify the external device relays are wired to the ENVIR ALARMS OUT connector pins.

Step 3 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 4 In the node view, double-click the AIC-I card on the shelf graphic. The card view appears.

Step 5 Click the **Provisioning > Card** tabs.

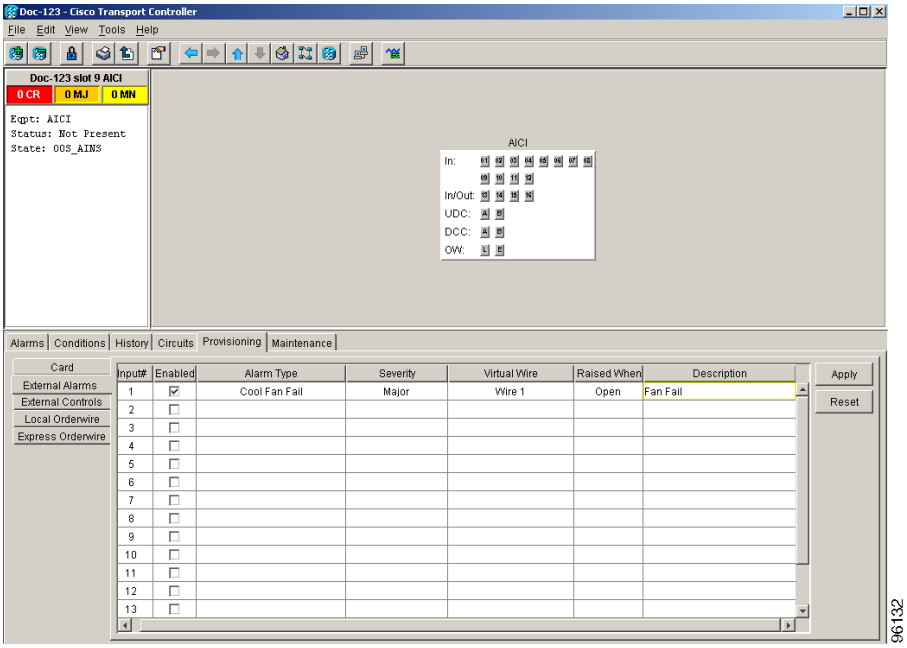
Step 6 In the Alarm Contacts area, click the Add Extension radio button if you are using the AEP. Clicking this option will choose the External Alarm input/output type and the AEP extension type; it will give you access to 16 external alarm contacts.

Step 7 If you did not click Add Extension, in the Input/Output area, choose either External Alarm or External Control. (External Alarm will limit your input/output options as explained in Step 6.) Choosing External Control will enable both external alarms and external controls. This will convert four of the external alarm contacts to external controls, leaving 12 available external control contacts. The extension type for both options is AEP.

Step 8 Click **Apply**.

Step 9 If you are provisioning external alarms, click the **External Alarms** tab (Figure 8-10). If you are not provisioning external alarms, skip Steps 10 through 12 and go to Step 13.

Figure 8-10 Provisioning External Alarms on the AIC-I Card



Step 10 For external alarms, complete the following fields:

- Enabled—Check the check box to activate the fields for the alarm input number.
- Alarm Type—Choose an alarm type from the drop-down list.
- Severity—Choose a severity from the drop-down list.

  The severity determines the alarm's severity in the Alarms and History tabs and determines whether the LEDs are activated. Critical (CR), Major (MJ), and Minor (MN) alarms activate the LEDs. Not Alarmed (NA) and Not Reported (NR) do not activate LEDs, but do report the information in CTC.
- Virtual Wire—Choose the virtual wire number from the drop-down list to assign the external device to a virtual wire. Otherwise, do not change the None default.
- Raised When—From the drop-down list, choose the contact condition (open or closed) that triggers the alarm.
- Description—A default description is provided; enter a different description if needed. (Double-click on the cell and highlight the text to change it.)

Step 11 To provision additional devices, complete Step 10 for each additional device.

Step 12 Click **Apply**.

When you provision an external alarm, the alarm object is ENV-IN-*nn*. The variable *nn* refers to the external alarm's number, regardless of the name you assign.

Step 13 For external controls, click the **External Controls** tab and complete the following fields for each control wired to the ONS 15454 backplane (ANSI) or FMEC connector pins (ETSI):

- Enabled—Check this check box to activate the fields for the alarm input number.
- Control Type—Choose the control type from the drop-down list: air conditioner, engine, fan, generator, heat, light, sprinkler, or miscellaneous.
- Trigger Type—Choose a trigger type: a local minor, major, or critical alarm; a remote minor, major, or critical alarm; or a virtual wire activation.
- Description—Enter a description. (Double-click on the cell and highlight the text to change it.)

Step 14 To provision additional external controls, complete Step 13 for each device.

Step 15 Click **Apply**.

Note External alarms and controls should be recorded locally for the NE. Both the Alarm name and resolution are node-specific.

Stop. You have completed this procedure.

Monitor Performance

This chapter explains how to enable and view performance monitoring statistics for the Cisco ONS 15454. Performance monitoring (PM) parameters are used by service providers to gather, store, and set thresholds and report performance data for early detection of problems. For more PM information, details, and definitions, refer to the *Cisco ONS 15454 Troubleshooting Guide* (for ANSI shelves) or *the Cisco ONS 15454 SDH Troubleshooting Guide* (for ETSI shelves).

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

Before performing any of the following procedures, investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 Troubleshooting Guide or Cisco ONS 15454 SDH Troubleshooting Guide* as necessary.

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. NTP-G73 Change the PM Display, page 9-2—Complete as needed to change the displayed PM counts.
2. NTP-G74 Monitor DWDM Card Performance, page 9-8—Complete as needed to monitor dense wavelength division multiplexing (DWDM) performance.
3. NTP-G75 Monitor Transponder and Muxponder Performance, page 9-18—Complete as needed to monitor transponder (TXP) and muxponder (MXP) card performance.

Note For additional information regarding PM parameters, refer to Telcordia's GR-1230-CORE, GR-499-CORE, and GR-253-CORE documents and GR-820-CORE document titled Generic Digital Transmission Surveillance, and in the ANSI T1.231 document entitled *Digital Hierarchy - Layer 1 In-Service Digital Transmission Performance Monitoring*.

NTP-G73 Change the PM Display

Purpose	This procedure enables you to change the display of PM counts by selecting drop-down list or radio button options in the Performance window.
Tools/Equipment	None
Prerequisite Procedures	Before you monitor performance, be sure you have created the appropriate circuits and provisioned the card according to your specifications. For more information, see Chapter 7, "Create Channels and Circuits," Chapter 5, "Provision Transponder and Muxponder Cards," and Chapter 11, "Change DWDM Card Settings."
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node that you want to monitor. If you are already logged in, continue with Step 2.

Step 2 In node view, double-click the DWDM, TXP, or MXP card where you want to view PM counts. The card view appears.

Step 3 As needed, use the following tasks to change the display of PM counts:

- DLP-G131 Refresh PM Counts at 15-Minute Intervals, page 9-2
- DLP-G132 Refresh PM Counts at One-Day Intervals, page 9-3
- DLP-G133 View Near-End PM Counts, page 9-4
- DLP-G134 View Far-End PM Counts, page 9-5
- DLP-G135 Reset Current PM Counts, page 9-5
- DLP-G136 Clear Selected PM Counts, page 9-6
- DLP-G137 Set Auto-Refresh Interval for Displayed PM Counts, page 9-7
- DLP-G138 Refresh PM Counts for a Different Port, page 9-8

Stop. You have completed this procedure.

DLP-G131 Refresh PM Counts at 15-Minute Intervals

Purpose	This task changes the window view to display PM counts in 15-minute intervals.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** tab.

Step 3 Click to any of the tabs, subtabs, and ports (found in the Ports: drop-down list where available) for that card where you want to change the PM count interval.

Note You cannot change the PM count interval on the TXP or MXP cards' Current Values tab.

Step 4 Click the **15 min** radio button.

Step 5 Click **Refresh**. Performance monitoring parameters appear in 15-minute intervals synchronized with the time of day.

Step 6 View the Curr column to find PM counts for the current 15-minute interval.

Each monitored performance parameter has corresponding threshold values for the current time period. If the value of the counter exceeds the threshold value for a particular 15-minute interval, a threshold crossing alert (TCA) is raised. The number represents the counter value for each specific performance monitoring parameter.

Step 7 View the Prev-*n* columns to find PM counts for the previous 15-minute intervals.

Note If a complete 15-minute interval count is not possible, the value appears with a yellow background. An incomplete or incorrect count can be caused by monitoring for less than 15 minutes after the counter started, changing the node timing settings, changing the time zone settings, replacing a card, resetting a card, or changing port service states. When the problem is corrected, the subsequent 15-minute interval appears with a white background.

Step 8 Return to your originating procedure (NTP).

DLP-G132 Refresh PM Counts at One-Day Intervals

Purpose	This task changes the window view to display PM parameters in 1-day intervals.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** tab.

Step 3 Click the **1 day** radio button.

Step 4 Click to any of the tabs, subtabs, and ports (found in the Ports: drop-down list where available) for that card where you want to change the PM count interval.

Note You cannot change the PM count interval on the TXP or MXP cards' Optics PM > Current Values tab.

Step 5 Click **Refresh**. Performance monitoring appears in 1-day intervals synchronized with the time of day.

Step 6 View the Curr column to find PM counts for the current 1-day interval.

Each monitored performance parameter has corresponding threshold values for the current time period. If the value of the counter exceeds the threshold value for a particular 1-day interval, a TCA is raised. The number represents the counter value for each specific performance monitoring parameter.

Step 7 View the Prev-*n* columns to find PM counts for the previous 1-day intervals.

Note If a complete count over a 1-day interval is not possible, the value appears with a yellow background. An incomplete or incorrect count can be caused by monitoring for less than 24 hours after the counter started, changing node timing settings, changing the time zone settings, replacing a card, resetting a card, or changing port service states. When the problem is corrected, the subsequent 1-day interval appears with a white background.

Step 8 Return to your originating procedure (NTP).

DLP-G133 View Near-End PM Counts

Purpose	This task enables you to view near-end PM counts for the selected card and port.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** tab.

Step 3 Click to any of the tabs, subtabs, and ports (found in the Ports: drop-down list where available) for that card where you want to view near-end PM counts.

Step 4 Click the **Near End** radio button, where available. (Viewing near-end PM counts is not available for some tabs.)

Step 5 Click **Refresh**. All PM parameters occurring for the selected card on the incoming signal appear. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 6 View the Curr column to find PM counts for the current time interval.

Step 7 View the Prev-*n* columns to find PM counts for the previous time intervals.

Step 8 Return to your originating procedure (NTP).

DLP-G134 View Far-End PM Counts

Purpose	This task enables you to view far-end PM parameters for the selected card and port.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** tab.

Step 3 Click to any of the tabs, subtabs, and ports (found in the Ports: drop-down list where available) for that card where you want to view far-end PM counts.

Step 4 Click the **Far End** radio button, where available. (Viewing far-end PM counts is not available for some tabs.)

Step 5 Click **Refresh**. All PM parameters recorded by the far-end node for the selected card on the outgoing signal appear. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 6 View the Curr column to find PM counts for the current time interval.

Step 7 View the Prev-*n* columns to find PM counts for the previous time intervals.

Step 8 Return to your originating procedure (NTP).

DLP-G135 Reset Current PM Counts

Purpose	This task clears the current PM count, but it does not clear the cumulative PM count. This task allows you to see how quickly PM counts rise.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** tab.

Step 3 Click to any of the tabs, subtabs, and ports (found in the Ports: drop-down list where available) for that card where you want to reset the current PM counts.

Note You cannot change the PM count interval on the TXP or MXP cards' Optics PM > Current Values tab.

Step 4 Click **Baseline**.

Note The Baseline button clears the PM counts displayed in the current time interval but does not clear the PM counts on the card. When the current time interval expires or the window view changes, the total number of PM counts on the card and on the window appears in the appropriate column. The baseline values are discarded if you change views to a different window and then return to the Performance window.

Step 5 View the current statistics columns to observe changes to PM counts for the current time interval.

Step 6 Return to your originating procedure (NTP).

DLP-G136 Clear Selected PM Counts

Purpose	This task uses the Clear button to clear specified PM counts depending on the option selected.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Caution Pressing the Clear button can mask problems if used incorrectly. This button is commonly used for testing purposes. After pressing this button, the current bin is marked invalid. Also note that the unavailable seconds (UAS) count is not cleared if you were counting UAS; therefore, this count could be unreliable when you press Clear.

Step 1 In node view, double-click the card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** tab.

Step 3 Click to any of the tabs, subtabs, and ports (found in the Ports: drop-down list where available) for that card where you want to reset the current PM counts.

Note You cannot clear the PM count interval on the TXP or MXP cards' Optics PM > Current Values tab.

Step 4 Click **Clear**.

Step 5 From the Clear Statistics dialog box, click one of the following radio buttons:

- **Displayed statistics**: Clearing displayed statistics erases all PM counts associated with the current combination of statistics on the selected port from the card and the window. This means that the selected time interval, direction, and signal type counts are erased from the card and the window.
- **All statistics for port** *x*: Clearing all statistics for port *x* erases all PM counts associated with all combinations of the statistics on the selected port from the card and the window. This means that all time intervals, directions, and signal type counts are erased from the card and the window.
- **All statistics for card**: Clearing all statistics for card erases all PM counts for all ports from the card and the window.

Step 6 From the Clear Statistics dialog box, click **OK** to clear the selected statistics. Click **Yes** to confirm the change.

Step 7 Verify that the selected PM counts have been cleared.

Step 8 Return to your originating procedure (NTP).

DLP-G137 Set Auto-Refresh Interval for Displayed PM Counts

Purpose	This task changes the window auto-refresh intervals for updating the displayed PM counts.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** tab.

Step 3 Click to any of the tabs, subtabs, and ports (found in the Ports: drop-down list where available) for that card where you want to set the auto-refresh interval for displayed PM counts.

Step 4 From the Auto-refresh drop-down list, choose one of the following options:

- **None**: This option disables the auto-refresh feature.
- **15 Seconds**: This option sets the window auto-refresh to 15-second time intervals.
- **30 Seconds**: This option sets the window auto-refresh to 30-second time intervals.
- **1 Minute**: This option sets the window auto-refresh to 1-minute time intervals.
- **3 Minutes**: This option sets the window auto-refresh to 3-minute time intervals.
- **5 Minutes**: This option sets the window auto-refresh to 5-minute time intervals.

Step 5 Click **Refresh**. The PM counts for the newly selected auto-refresh time interval appear.

Depending on the selected auto-refresh interval, the displayed PM counts automatically update when each refresh interval completes. If the auto-refresh interval is set to None, the PM counts that appear are not updated unless you click Refresh.

Step 6 Return to your originating procedure (NTP).

DLP-G138 Refresh PM Counts for a Different Port

Purpose	This task changes the window view to display PM counts for another port on a multiport card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** tab.

Step 3 Click to any of the tabs or subtabs for that card where you want refresh PM counts.

Step 4 In the Port drop-down list, choose a port.

Step 5 Click **Refresh**. The PM counts for the newly selected port appear.

Step 6 Return to your originating procedure (NTP).

NTP-G74 Monitor DWDM Card Performance

Purpose	This procedure enables you to view, transmit, and receive performance information for OSCM, OSC-CSM, 32MUX-O, 32DMX-O, 4MD, AD-xC-xx.x, AD-xB-xx.x, 32WSS, OPT-BST, and OPT-PRE cards and ports during selected time intervals to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	Before you monitor performance, be sure you have created the appropriate circuits and provisioned the card according to your specifications. For more information, see Chapter 7, "Create Channels and Circuits" and Chapter 11, "Change DWDM Card Settings."
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" procedure on page 2-24 at the node that you want to monitor. If you are already logged in, continue with Step 2.

Step 2 Complete the following tasks as needed:

- DLP-G139 View Optical Service Channel PM Parameters, page 9-9.
- DLP-G140 View Optical Amplifier Power Statistics, page 9-11.
- DLP-G141 View Optical Power Statistics for 32MUX-O, 32-WSS, 32-DMX-O, and 32DMX Cards, page 9-12.
- DLP-G276 View 4-Channel Multiplexer/Demultiplexer Optical Power Statistics, page 9-14
- DLP-G142 View Channel Optical Add/Drop Multiplexer Power Statistics, page 9-15.
- DLP-G143 View Band Optical Add/Drop Multiplexer Power Statistics, page 9-17.

Note To refresh, reset, or clear PM counts, see the "NTP-G73 Change the PM Display" procedure on page 9-2.

Stop. You have completed this procedure.

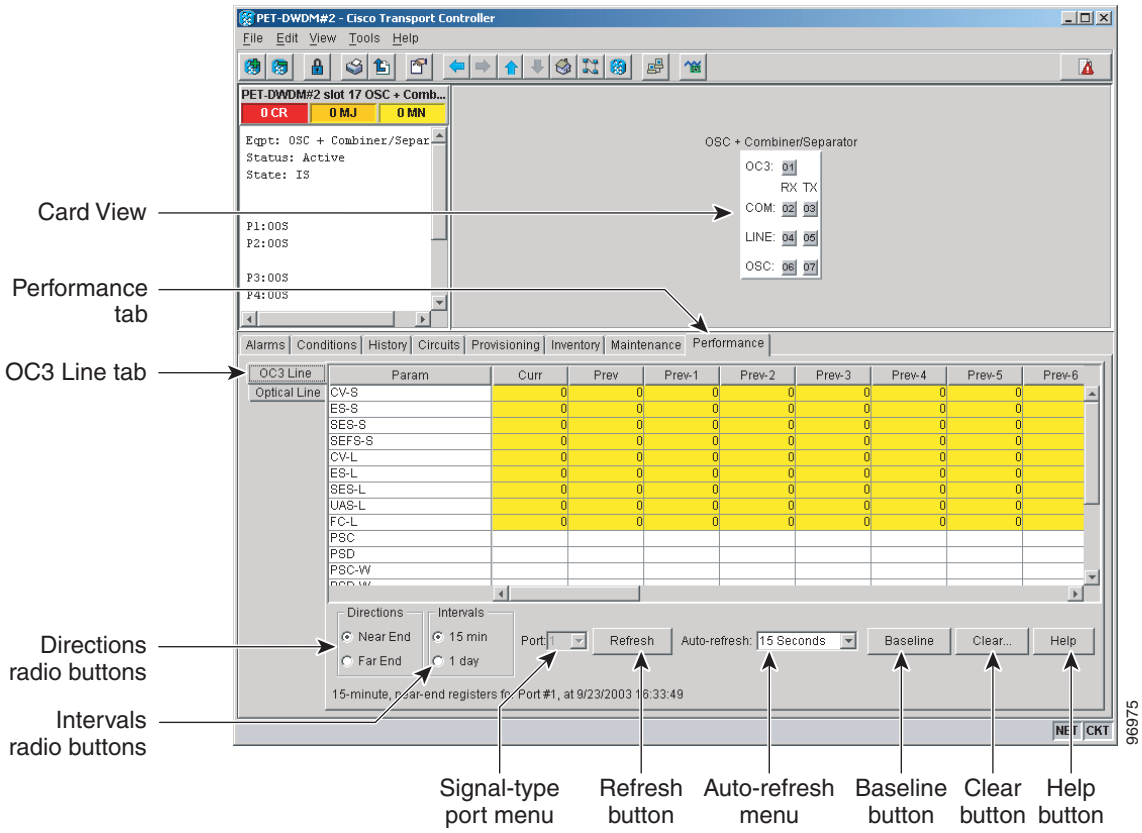
DLP-G139 View Optical Service Channel PM Parameters

Purpose	This task enables you to view optical service channel (OSC) PM counts at selected time intervals on an Optical Service Channel Module (OSCM) or Optical Service Channel and Combiner/Separator Module (OSC-CSM) card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the OSCM or OSC-CSM card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance > OC3 Line** tabs (Figure 9-1).

Figure 9-1 OC3 Line Tab in the Optical Service Channel Card View Performance Window



Step 3 Click **Refresh**. PMs appear for the OC3 (Port 1).

Step 4 Click the **Optical Line** tab.

Step 5 On the port menu, choose the optical line port whose power statistics you want to view:

- 2—COM RX
- 3—COM TX
- 4—LINE RX (available only on the OSC-CSM card)
- 5—LINE TX (available only on the OSC-CSM card)
- 6—OSC RX (available only on the OSC-CSM card)
- 7—OSC TX (available only on the OSC-CSM card)

Step 6 Click **Refresh**. The minimum, maximum, and average optical power statistics for the selected line port appear.

Step 7 Return to your originating procedure (NTP).

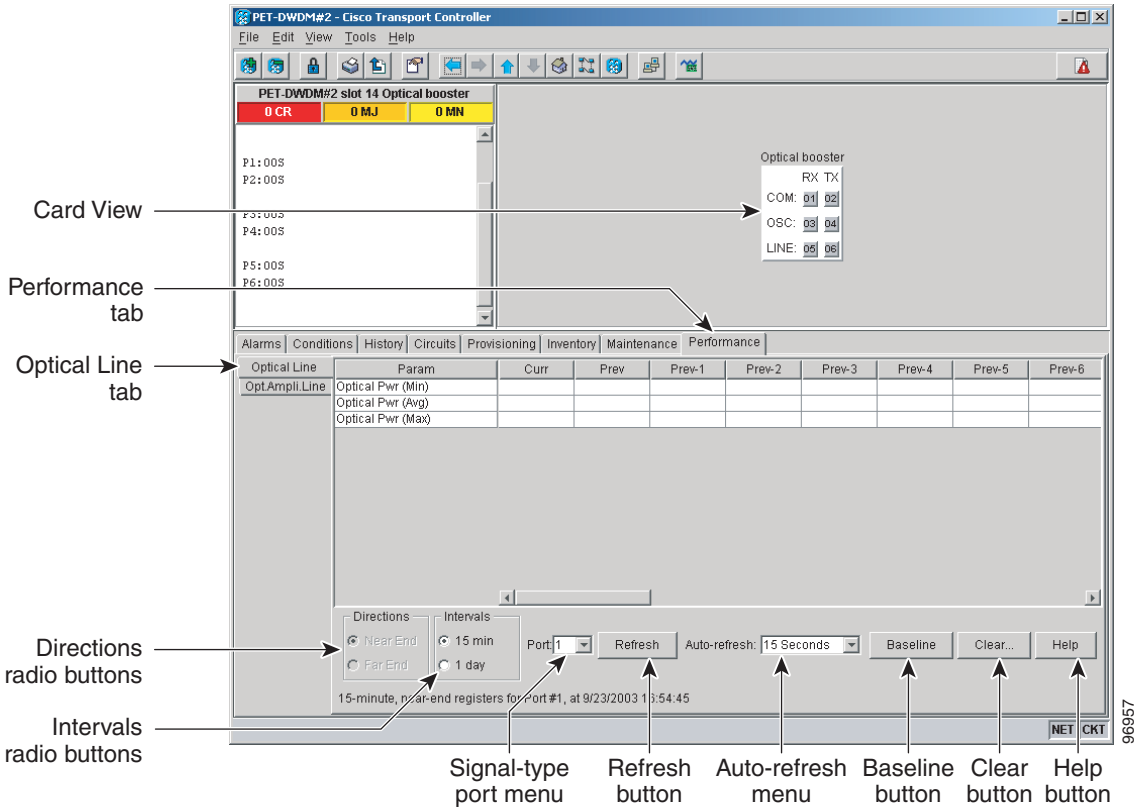
DLP-G140 View Optical Amplifier Power Statistics

Purpose	This task enables you to view the power statistics on an Optical Preamplifier (OPT-PRE) or Optical Booster (OPT-BST) amplifier card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the optical amplifier card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** > **Optical Line** tabs (Figure 9-2).

Figure 9-2 Optical Line Tab in the Optical Amplifier Card View Performance Window



Step 3 In the Port field, choose an optical line port whose optical power statistics you want to view:

- For the OPT-PRE card, the following ports are available to view:
  - 1—COM RX
  - 3—DC RX
  - 4—DC TX

- For the OPT-BST card, the following ports are available to view:
  - 1—COM RX
  - 2—COM TX
  - 3—OSC RX
  - 4—OSC TX
  - 5—Line RX

Step 4 Click **Refresh**. Optical power statistics for the selected port appear.

Step 5 Click the **Opt. Ampli. Line** tab.

Step 6 Click **Refresh**. Optical power statistics for the optical amplifier output port (COM TX, Port 02 for the OPT-PRE card, and Line TX, Port 06 for the OPT-BST card) appear.

Step 7 Return to your originating procedure (NTP).

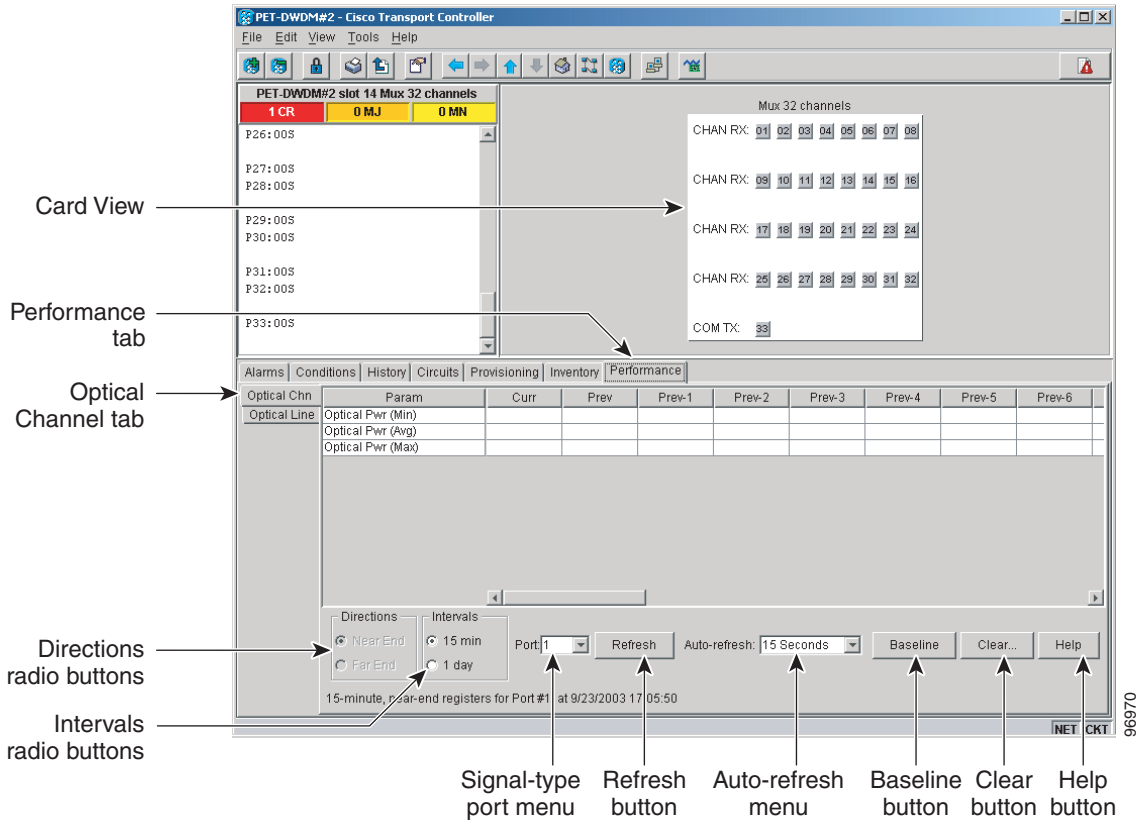
DLP-G141 View Optical Power Statistics for 32MUX-O, 32-WSS, 32-DMX-O, and 32DMX Cards

Purpose	This task enables you to view optical power statistics for a 32MUX-O (32-Channel Multiplexer), 32-WSS (32-Channel Wavelength Selective Switch), 32-DMX-O, and 32DMX (32-Channel Demultiplexer) card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the 32MUX-O, 32-WSS, 32-DMX-O, or 32DMX card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance** > **Optical Chn** tabs (Figure 9-3 on page 9-13).

Figure 9-3 Optical Channel Tab in the Multiplexer/Demultiplexer Card View Performance Window



Step 3 In the Port field, choose an optical channel to view by selecting the port whose optical power statistics you want to view. There are 32 available ports for 32MUX-O, 32DMX-O, and 32DMX cards. The 32WSS has 64 available ports.

Step 4 Click **Refresh**. Optical channel power statistics (minimum, maximum, average) for the selected port appear.

Step 5 Click the **Optical Line** tab.

Step 6 For a 32WSS card, select the port for which you wish to monitor power statistics (65, 66, 67, 68, or 69). For a 32DMX or 32DMX-O card, accept the default port (33).

Step 7 Click **Refresh**. Optical channel power statistics (minimum, maximum, average) for the selected port appear.

Step 8 Return to your originating procedure (NTP).

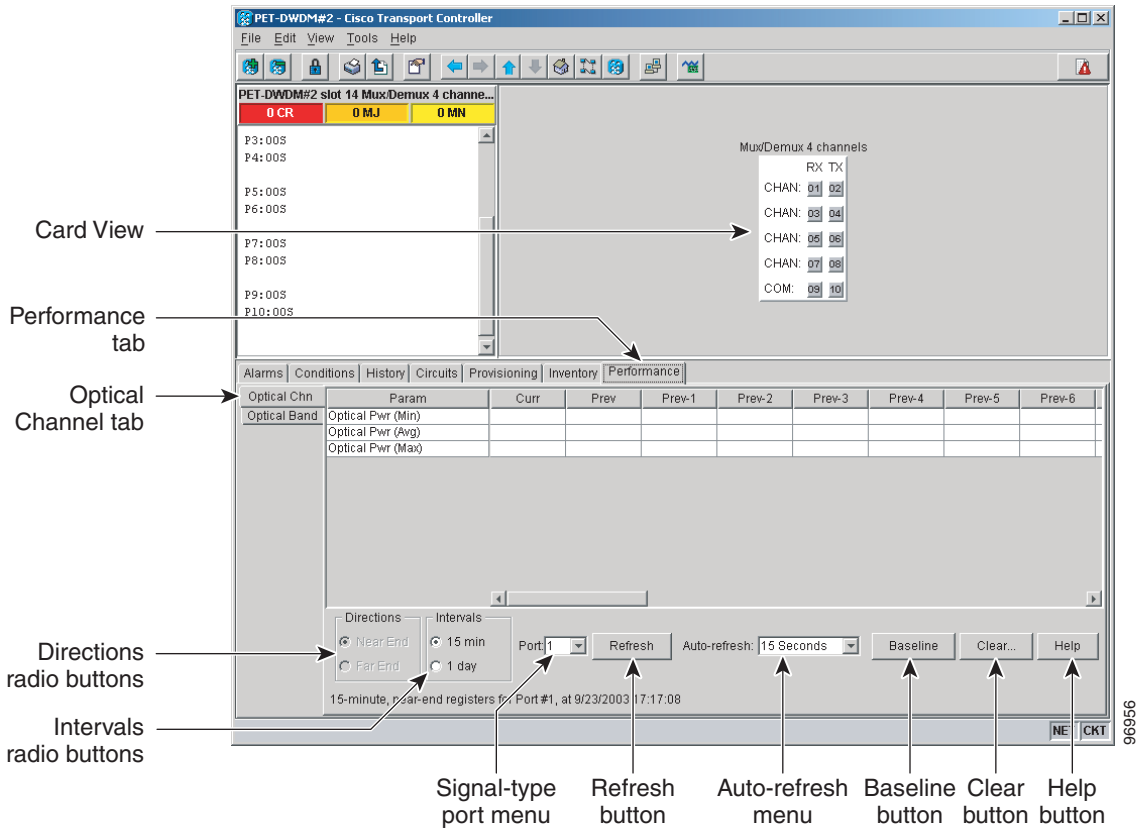
DLP-G276 View 4-Channel Multiplexer/Demultiplexer Optical Power Statistics

Purpose	This task enables you to view the minimum, maximum, and average optical power statistics for a 4-Channel Multiplexer/Demultiplexer (4MD-xx.x) card channel and band ports.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the 4MD-xxx card where you want to the optical power statistics. The card view appears.

Step 2 Click the **Performance** > **Optical Chn** tabs (Figure 9-4).

Figure 9-4 Optical Channel Tab in the 4MD Card View Performance Window



Step 3 On the port menu, choose the channel port (1 through 8 for CHAN ports 01 through 08) whose power statistics you want to view.

Step 4 Click **Refresh**. The minimum, maximum, and average optical power for the selected channel port appear.

Step 5 To change the auto-refresh interval, click **Auto Refresh** and choose one of the automatic refresh intervals: None, 15 seconds, 30 seconds, 1 minute, 3 minutes, 5 minutes.

Step 6 Click the **Optical Band** tab.

Step 7 On the port menu, choose the band port (9 or 10 for COM ports 09 and 10) whose power statistics you want to view.

Step 8 Click **Refresh**. The minimum, maximum, and average optical power for the selected band port appear.

Step 9 To change the auto-refresh interval, click **Auto Refresh** and choose one of the automatic refresh intervals: None, 15 seconds, 30 seconds, 1 minute, 3 minutes, 5 minutes.

Step 10 Return to your originating procedure (NTP).

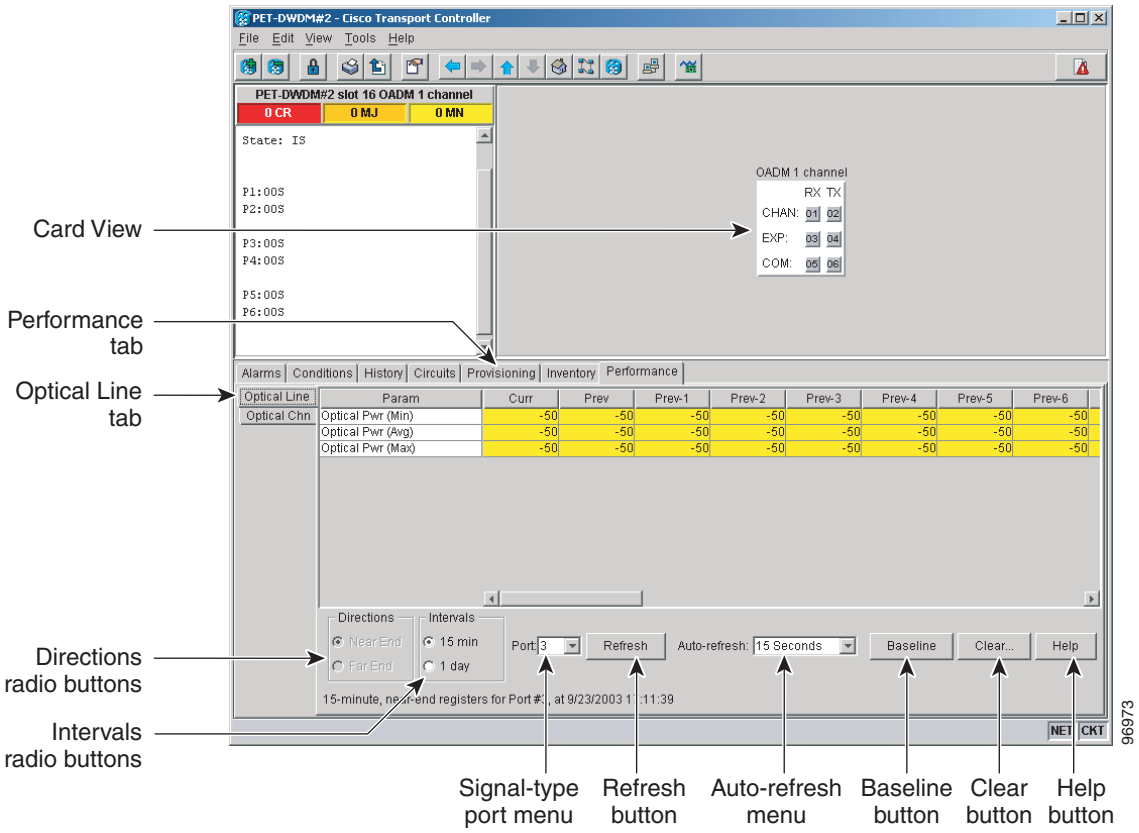
DLP-G142 View Channel Optical Add/Drop Multiplexer Power Statistics

Purpose	This task enables you to view channel optical add/drop channel multiplexer (OADM) minimum, maximum, and average power statistics on an 1-Channel OADM (AD-1C-xx.x), 2-Channel OADM (AD-2C-xx.x), or 4-Channel OADM (AD-4C-xx.x) card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the optical AD-xC-xx.x card where you want to view the optical power statistics. The card view appears.

Step 2 Click the **Performance > Optical Line** tabs (Figure 9-5).

Figure 9-5 Optical Line Tab in the Channel Filter OADM Card View Performance Window



Step 3 In the Port field, choose an optical line port (Table 9-1) whose optical power statistics you want to view.

Table 9-1 Channel OADM Optical Line Ports

	Port Number		
Port Name	AD-1C-xx.x	AD-2C-xx.x	AD-4C-xx.x
EXP RX	3	5	9
EXP TX	4	6	10
COM RX	5	7	11
COM TX	6	8	12

Step 4 Click **Refresh**. Optical line power statistics for the selected port appear.

Step 5 Click the **Optical Chn** tab.

Step 6 In the Port field, choose an optical channel port (Table 9-1) whose optical power statistics you want to view.

Table 9-2 Channel OADM Optical Line Ports

Port Name	Port Number		
	AD-1C-xx.x	AD-2C-xx.x	AD-4C-xx.x
CHAN RX	1	1	1
CHAN TX	2	2	2
CHAN RX	—	3	3
CHAN TX	—	4	4
CHAN RX	—	—	5
CHAN TX	—	—	6
CHAN RX	—	—	7
CHAN TX	—	—	8

Step 7 Click **Refresh**. Optical channel performance monitoring statistics for the selected port appear.

Step 8 Return to your originating procedure (NTP).

DLP-G143 View Band Optical Add/Drop Multiplexer Power Statistics

Purpose	This task enables you to view band optical add/drop channel multiplexer minimum, maximum, and average power statistics on an 1-Band OADM (AD-1B-xx.x) or the 4-Band OADM (AD-4B-xx.x) card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the optical AD-xB-xx.x card where you want to view the optical power statistics. The card view appears.

Step 2 Click the **Performance > Optical Line** tabs.

Step 3 In the Port field, choose an optical line port (Table 9-3) whose optical power statistics you want to view.

Table 9-3 Band OADM Optical Line Ports

Port Name	Port Number	
	AD-1B-xx.x	AD-4B-xx.x
EXP RX	3	9
EXP TX	4	10
COM RX	5	11
COM TX	6	12

Step 4 Click **Refresh**. Optical line power statistics for the selected port appear.

Step 5 Click the **Optical Band** tab.

Step 6 In the Port field, choose an optical band port (Table 9-4) whose optical power statistics you want to view.

Table 9-4 Band OADM Optical Line Ports

	Port Number	
Port Name	AD-1B-xx.x	AD-4B-xx.x
BAND RX	1	1
BAND TX	2	2
BAND RX	—	3
BAND TX	—	4
BAND RX	—	5
BAND TX	—	6
BAND RX	—	7
BAND TX	—	8

Step 7 Click **Refresh**. Optical channel performance monitoring statistics for the selected port appear.

Step 8 Return to your originating procedure (NTP).

NTP-G75 Monitor Transponder and Muxponder Performance

Purpose	This procedure enables you to view node near-end or far-end performance during selected time intervals on a transponder (TXP_MR_10G, TXP_MR_2.5G, TXPP_MR_2.5G, TXP_MR_10E), or a muxponder (MXP_2.5G_10E, MXP_MR_2.5G, MXPP_MR_2.5G, MXP_2.5G_10G) card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	Before you monitor performance, be sure you have created the appropriate circuits and provisioned the card according to your specifications. For more information, see Chapter 7, "Create Channels and Circuits" and Chapter 11, "Change DWDM Card Settings."
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node that you want to monitor. If you are already logged in, continue with Step 2.

Step 2 Complete the "DLP-G144 Enable/Disable OTN ITU-T G.709 Performance Monitoring" task on page 9-19 as needed for any TXP or MXP card, except the TXP_MR_10E and MXP_2.5G_10E cards, to enable or disable optical transport network (OTN) ITU-T G.709 monitoring.

Step 3 Complete the "DLP-G145 Enable/Disable OTN FEC Performance Monitoring" task on page 9-20 as needed for TXP_MR_10E and MXP_2.5G_10E cards to enable or disable OTN forward error correction (FEC) monitoring.

Step 4 Complete the following tasks as needed to view PM parameters:

- DLP-G146 View Optics PM Parameters, page 9-21.
- DLP-G147 View Payload PM Parameters, page 9-22.
- DLP-G148 View OTN PM Parameters, page 9-24.
- DLP-G149 View Payload Statistics PM Parameters, page 9-26.
- DLP-G150 View Payload Utilization PM Parameters, page 9-27.
- DLP-G151 View Payload History PM Parameters, page 9-29.
- DLP-G152 View Payload SONET PM Parameters, page 9-30.
- DLP-G153 Create RMON Alarm Thresholds, page 9-32.
- DLP-G154 Delete RMON Alarm Thresholds, page 9-34.

Note To refresh, reset, or clear PM counts, see the "NTP-G73 Change the PM Display" procedure on page 9-2.

Stop. You have completed this procedure.

DLP-G144 Enable/Disable OTN ITU-T G.709 Performance Monitoring

Purpose	This task enables or disables OTN ITU-T G.709 monitoring of near-end or far-end performance on a card and port during selected time intervals to detect possible problems. This task can be performed for any TXP or MXP card except the TXP_MR_10E and MXP_2.5G_10E cards. See the "DLP-G145 Enable/Disable OTN FEC Performance Monitoring" task on page 9-20 for TXP_MR_10E or MXP_2.5G_10E cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the card you want to monitor. The card view appears.

Step 2 Determine if the port where you want to enable or disable OTN ITU-T G.709 is in-service (IS). (Click the **Provisioning > Line** tabs, and observe the Service State column for that port.) If it is IS, perform the following tasks for that port. If not, go to Step 3.

a. DLP-G108 Change the Service State for a Port, page 7-17 to set the port to OOS,DSBLD.

b. DLP-G185 Delete a GCC Termination, page 10-30, if GCC is provisioned on that port.

Step 3 Click the **Provisioning > OTN > OTN Lines** tabs.

Step 4 From the G.709 OTN drop-down menu select Enable or Disable to enable or disable ITU-T G.709 for that port. (Disable is the default).

Step 5 Click **Apply**.

Step 6 Click the **Performance** tab to view PM parameters. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note If you set the port's service state to OOS,DSBLD in Step 2, set the port's service state back to IS, and provision GCC for that port according to the "DLP-G76 Provision GCC Terminations" procedure on page 7-13.

Step 7 Return to your originating procedure (NTP).

DLP-G145 Enable/Disable OTN FEC Performance Monitoring

Purpose	This task enables or disables OTN FEC monitoring of node near-end or far-end performance on a selected TXP_MR_10E or MXP_2.5G_10E card and port during selected time intervals.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the card you want to monitor. The card view appears.

Step 2 Determine if the port where you want to enable or disable FEC is in-service (IS). (Click the **Provisioning > Line** tabs, and observe the Service State column for that port.) If it is IS, perform the following tasks for that port. If not, go to Step 3.

a. DLP-G108 Change the Service State for a Port, page 7-17 to set the port to OOS,DSBLD.

b. DLP-G185 Delete a GCC Termination, page 10-30, if GCC is provisioned on that port.

Step 3 Click the **Provisioning > OTN > OTN Lines** tabs.

Step 4 Make an FEC selection based on the following rules:

- Choose **Disable** to disable the OTN FEC monitoring.
- Choose **Enable** to enable standard FEC monitoring for that port (default).

Step 5 Click **Apply**.

Step 6 Click the **Performance** tab to view PM parameters. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note If you set the port's service state to OOS,DSBLD in Step 2, set the port's service state back to IS, and provision GCC for that port according to the "DLP-G76 Provision GCC Terminations" procedure on page 7-13.

Step 7 Return to your originating procedure (NTP).

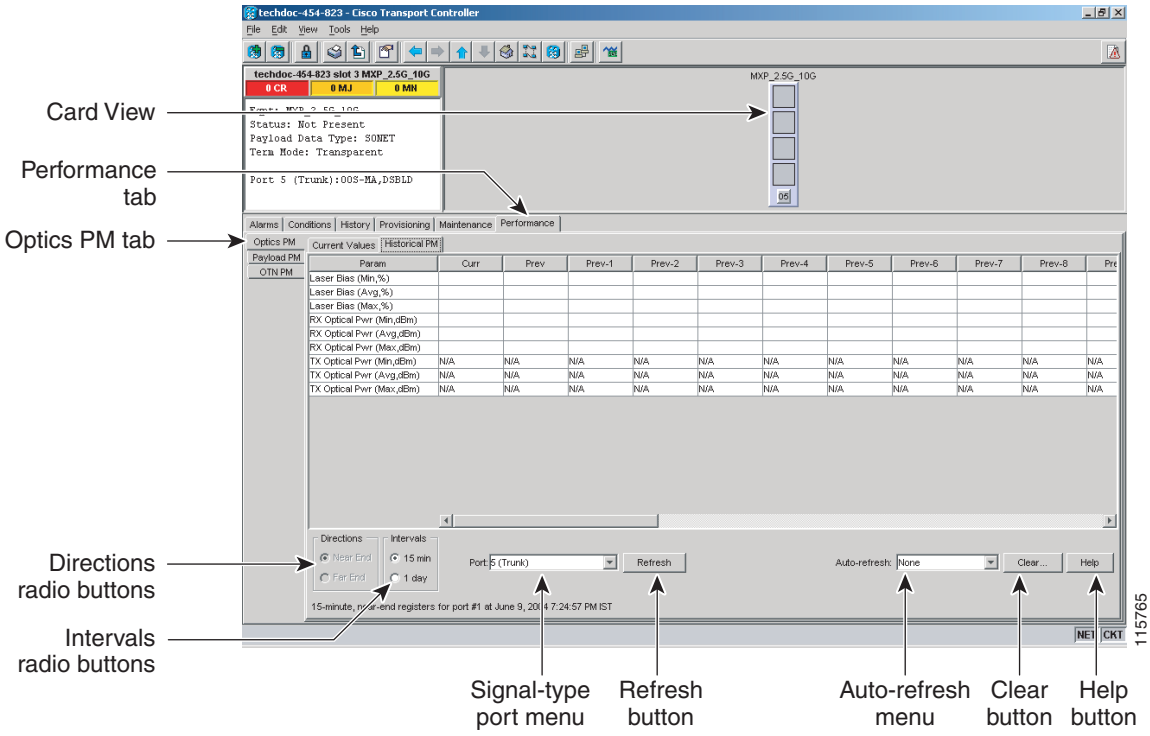
DLP-G146 View Optics PM Parameters

Purpose	This task enables you to view the optics PM counts on a transponder (TXP_MR_10G, TXP_MR_2.5G, TXPP_MR_2.5G, TXP_MR_10E), or a muxponder (MXP_2.5G_10E, MXP_MR_2.5G, MXPP_MR_2.5G, MXP_2.5G_10G) card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the transponder or muxponder card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance > Optics PM** tabs (Figure 9-6).

Figure 9-6 Viewing Optics Performance Monitoring Information



Step 3 View the PM parameter names that appear in the Param column of Current Values and History PM tabs. The PM parameter values appear in the Curr (current) and Prev-*n* (previous) columns. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 4 Return to your originating procedure (NTP).

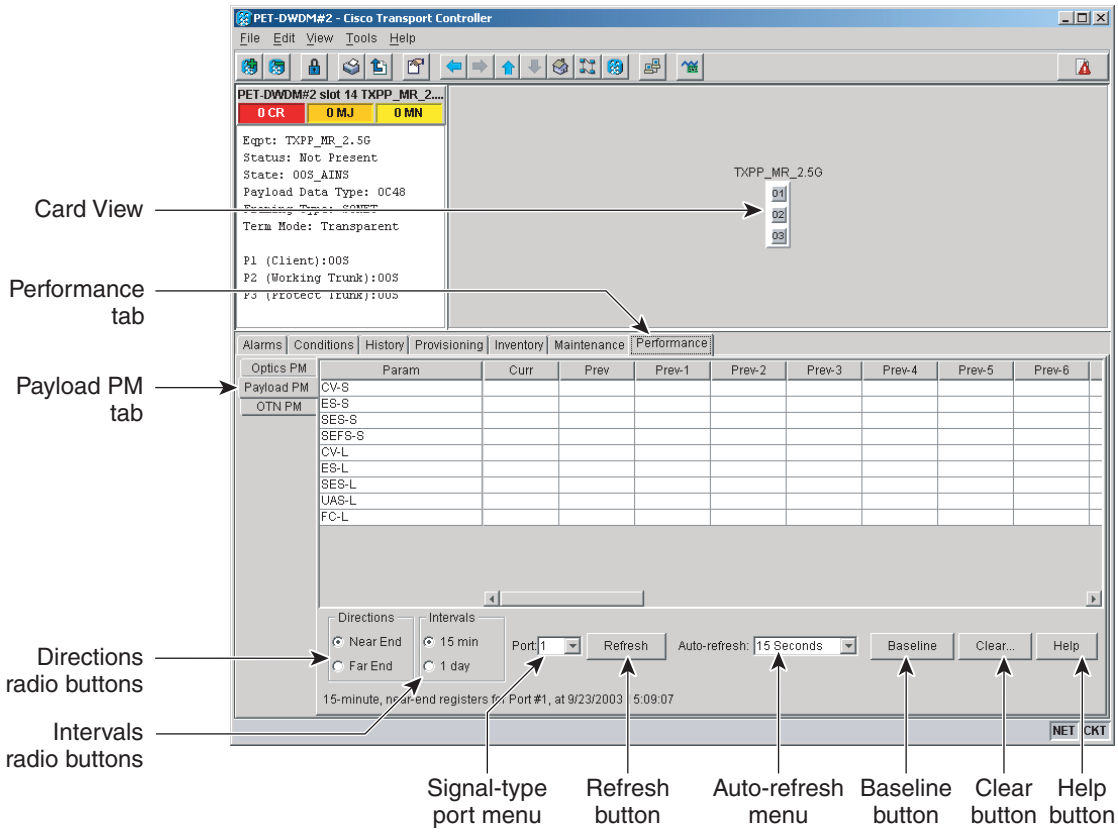
DLP-G147 View Payload PM Parameters

Purpose	This task enables you to view the payload PM counts on a transponder (TXP_MR_10G, TXP_MR_2.5G, TXPP_MR_2.5G, TXP_MR_10E), or a muxponder (MXP_2.5G_10E, MXP_2.5G_10G) card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the transponder or muxponder card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance > Payload PM** tabs (Figure 9-7).

Figure 9-7 Viewing Payload Performance Monitoring Information



Step 3 Click to any of the tabs, subtabs, and ports (found in the Ports: drop-down list where available) for that card where you want to view the payload PM parameters by clicking on the desired subtab, and choosing the port from the Port: drop-down list.

Step 4 View the PM parameter names that appear in the Param column of Current Values and History PM tabs The PM parameter values appear in the Curr (current), and Prev-*n* (previous) columns. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note The Payload PMs for data parameters can be viewed only after creating a pluggable port module (PPM). See the "NTP-G128 Manage Pluggable Port Modules" procedure on page 5-2 for more information about PPMs.

Note The PM parameters that appear depend on the data payload and framing type provisioned on the port. Unframed data payloads such as Enterprise System Connection (ESCON), DV6000, DSI/D1 video, and HDTV do not provide payload performance monitoring information. The PM parameters that appear also depend on the PPM payload configured. The TXP_MR_10E card supports three payloads, the MXP_2.5G_10G and MXP_2.5G_10E cards support the OC48/STM16 payload, and the MXP_MR_2.5G and MXPP_MR_2.5G cards support the 1G FC, 2G FC, 1G FICON, 2G FICON, and 1GE payloads.

Step 5 Return to your originating procedure (NTP).

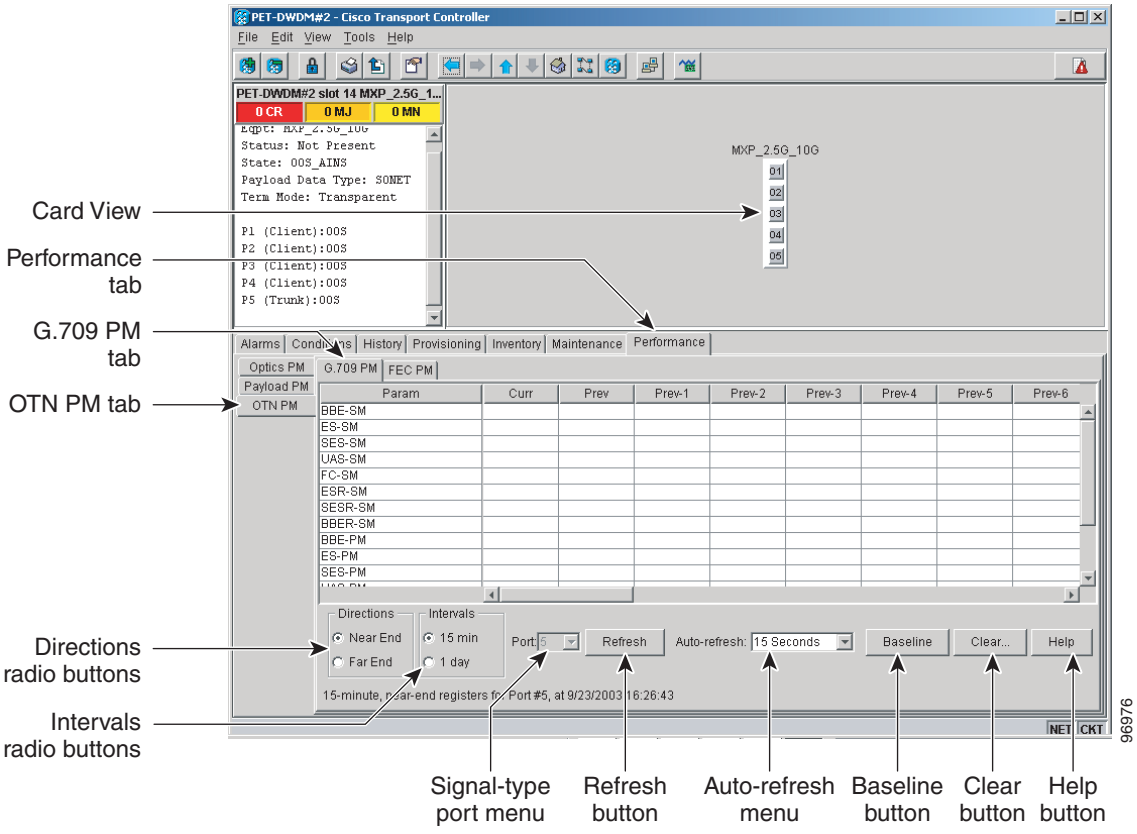
DLP-G148 View OTN PM Parameters

Purpose	This task enables you to view the OTN PM counts on a transponder (TXP_MR_10G, TXP_MR_2.5G, TXPP_MR_2.5G, TXP_MR_10E), or muxponder (MXP_2.5G_10E, MXP_2.5G_10G) card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the TXP or MXP card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance > OTN PM > G.709** tabs (Figure 9-8).

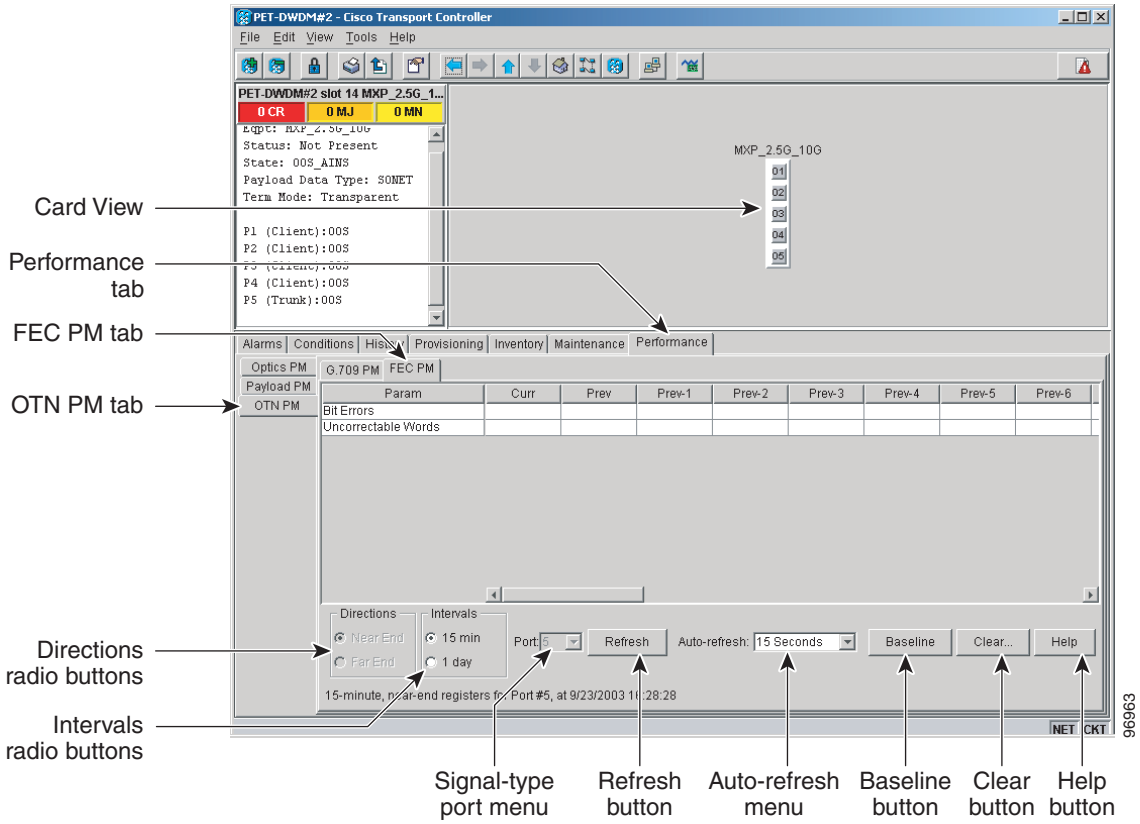
Figure 9-8 Viewing OTN ITU-T G.709 Performance Monitoring Information



Step 3 View the PM parameter names that appear in the Param column. The PM parameter values appear in the Curr (current) and Prev-*n* (previous) columns. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 4 Click the **FEC PM** tab (Figure 9-9).

Figure 9-9 Viewing OTN FEC Performance Monitoring Information



Step 5 View the PM parameter names that appear in the Param column. The PM parameter values appear in the Curr (current) and Prev-*n* (previous) columns. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 6 Return to your originating procedure (NTP).

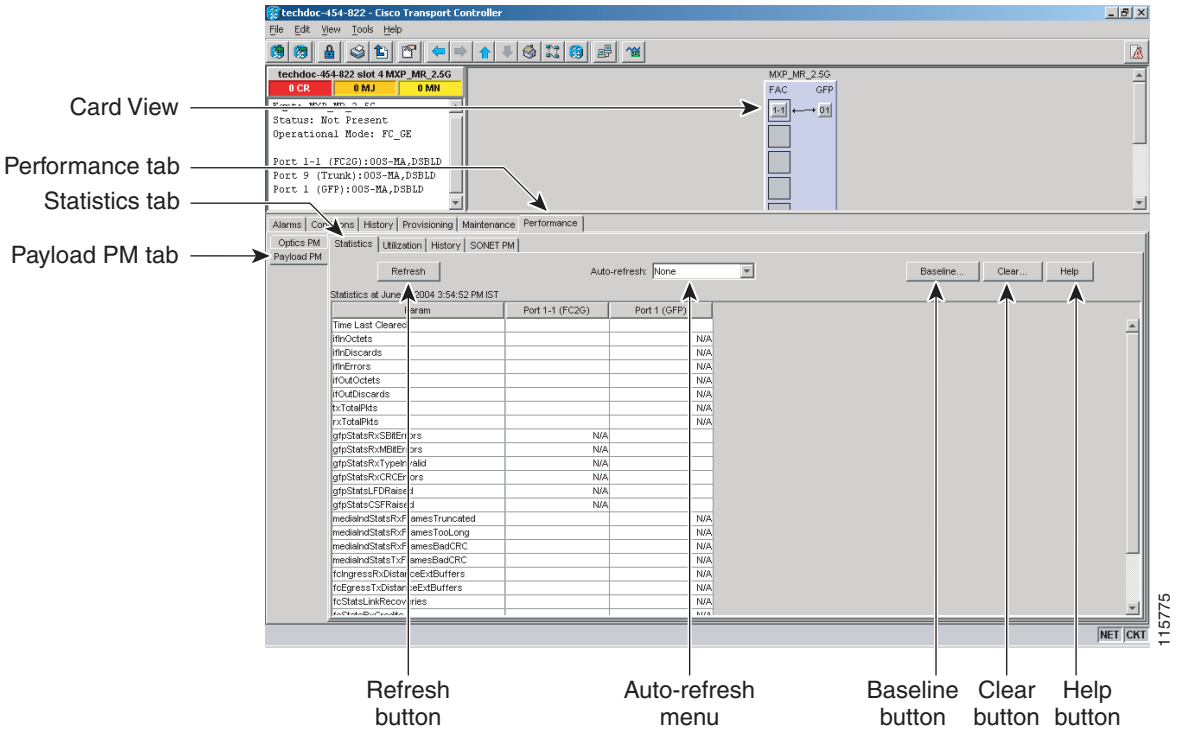
DLP-G149 View Payload Statistics PM Parameters

Purpose	This task enables you to view current statistical PM counts on an MXP_MR_2.5G or MXPP_MR_2.5G card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance > Payload PM > Statistics** tabs (Figure 9-10).

Figure 9-10 Statistics Tab on the Card View Performance Window



Step 3 Click **Refresh**. Performance monitoring statistics appear for each port on the card.

Step 4 View the PM parameter names that appear in the Param column. The current PM parameter values appear in the Port # columns. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note To refresh, reset, or clear PM counts, see the "NTP-G73 Change the PM Display" procedure on page 9-2.

Step 5 Return to your originating procedure (NTP).

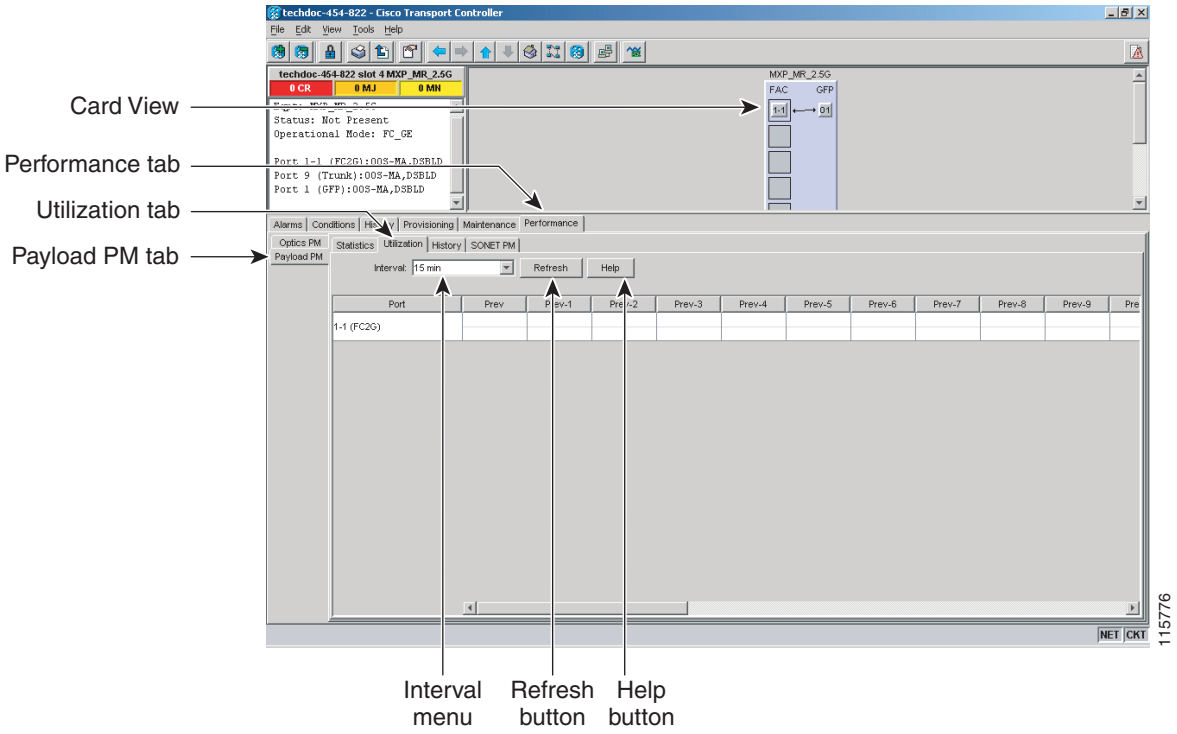
DLP-G150 View Payload Utilization PM Parameters

Purpose	This task enables you to view line utilization PM counts on an MXP_MR_2.5G or MXPP_MR_2.5G card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance > Payload PM > Utilization** tabs (Figure 9-11).

Figure 9-11 Utilization Tab on the Card View Performance Window



Step 3 Click **Refresh**. Performance monitoring utilization values appear for each port on the card.

Step 4 View the Port # column to find the port you want to monitor.

Step 5 The transmit (Tx) and receive (Rx) bandwidth utilization values for the previous time intervals appear in the Prev-*n* columns. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note To refresh, reset, or clear PM counts, see the "NTP-G73 Change the PM Display" procedure on page 9-2.

Step 6 Return to your originating procedure (NTP).

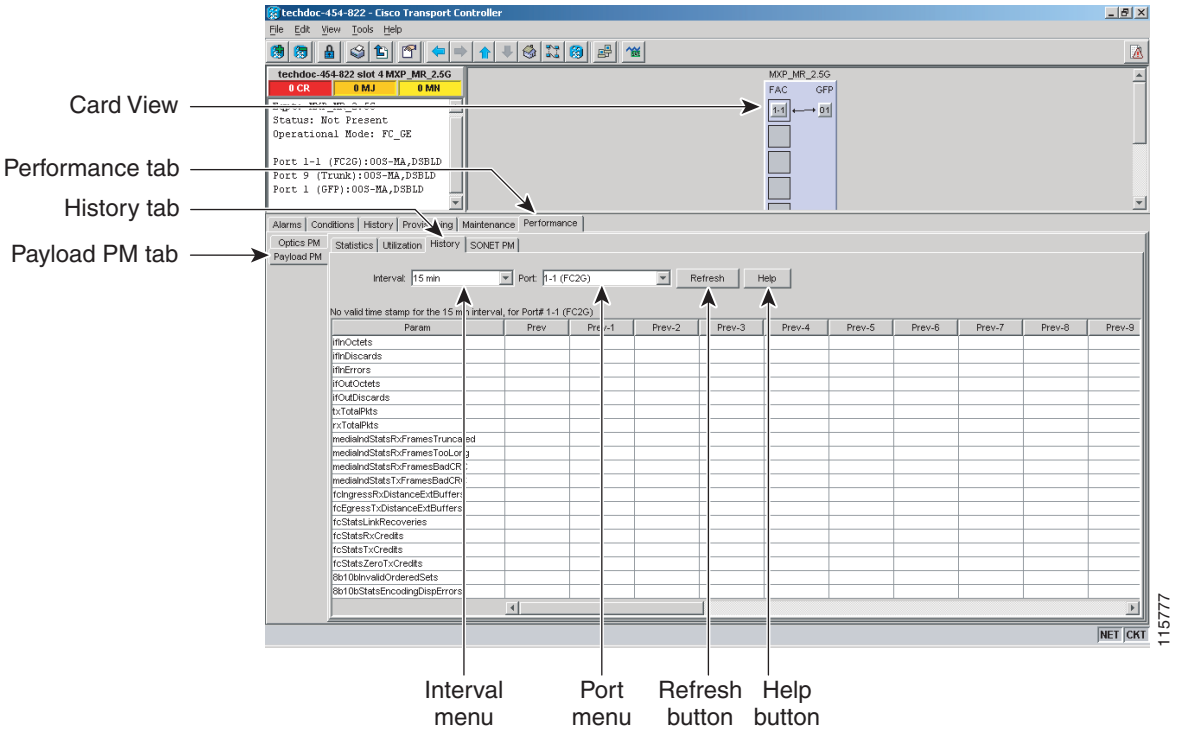
DLP-G151 View Payload History PM Parameters

Purpose	This task enables you to view historical PM counts at selected time intervals on an MXP_MR_2.5G or MXPP_MR_2.5G card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance > Payload PM > History** tabs (Figure 9-12).

Figure 9-12 History Tab on the Card View Performance Window



Step 3 Select the desired port from the Port: drop-down list.

Step 4 Click **Refresh**. Performance monitoring statistics appear for the selected port.

Step 5 View the PM parameter names that appear in the Param column. The PM parameter values appear in the Prev-*n* columns. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note To refresh, reset, or clear PM counts, see the "NTP-G73 Change the PM Display" procedure on page 9-2.

Step 6 Return to your originating procedure (NTP).

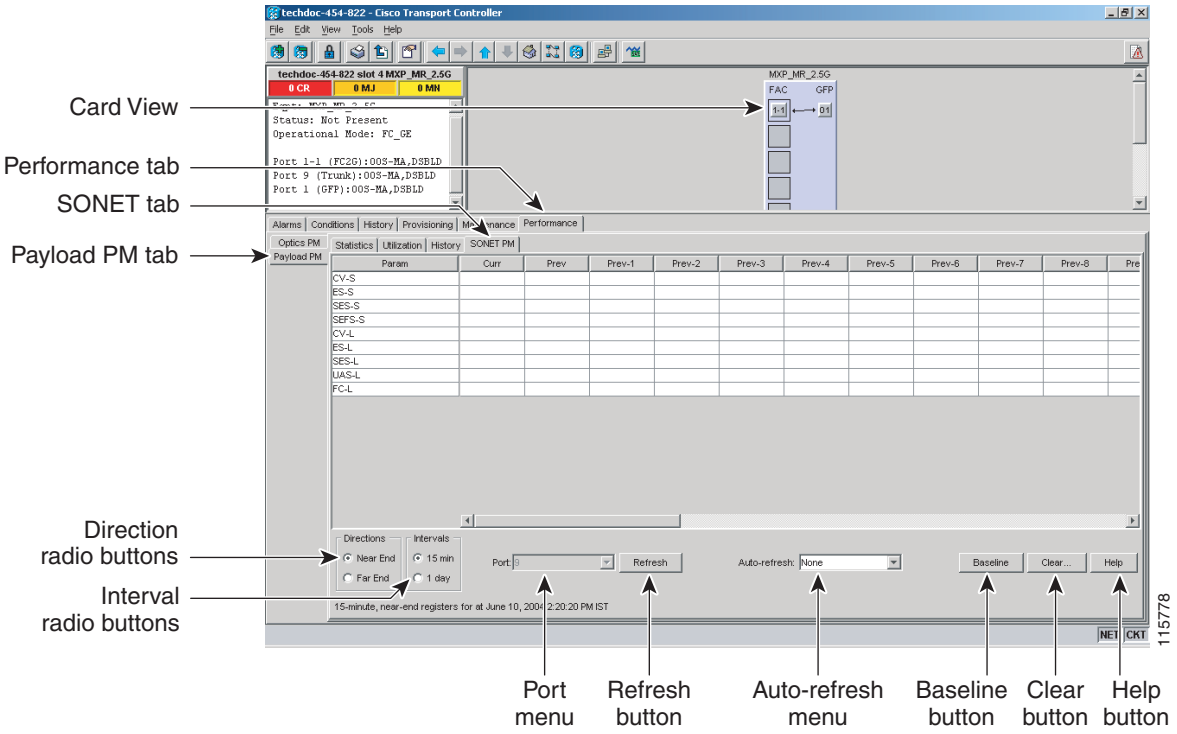
DLP-G152 View Payload SONET PM Parameters

Purpose	This task enables you to view SONET PM counts at selected time intervals on an MXP_MR_2.5G or MXPP_MR_2.5G card and port to detect possible performance problems.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 In node view, double-click the MXP_MR_2.5G or MXPP_MR_2.5G card where you want to view PM counts. The card view appears.

Step 2 Click the **Performance > Payload PM > SONET PM** tabs (Figure 9-13).

Figure 9-13 SONET PM Tab on the Card View Performance Window



Step 3 Click **Refresh**. Performance monitoring statistics appear for the selected port.

Step 4 View the PM parameter names that appear in the Param column. The PM parameter values appear in the Prev-*n* columns. For PM parameter definitions, refer to the "Performance Monitoring" chapter in the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Note The MXP_MR_2.5G and MXPP_MR_2.5G cards support only the OC48/STM16 payload. Each payload has a set of PM parameters.

Note To refresh, reset, or clear PM counts, see the "NTP-G73 Change the PM Display" procedure on page 9-2.

Step 5 Return to your originating procedure (NTP).

DLP-G153 Create RMON Alarm Thresholds

Purpose	This procedure sets up remote monitoring (RMON) to allow network management systems to monitor Ethernet and Fibre Channel ports. This procedure applies to MXP_MR_2.5G, MXPP_MR_2.5G, TXP_MR_2.5G, and TXPP_MR_2.5G cards in GE/FC/FICON/ISC compact mode, and MXP_2.5G_10G, TXP_MR_10G, MXP_2.5G_10E, and TXP_MR_10E cards in Gigabit Ethernet (10GE) mode.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the card where you want to create the RMON alarm thresholds.

Step 2 In card view, click the **Provisioning > Line Thresholds > RMON Thresholds** tabs.

Step 3 Click **Create**. The Create Threshold dialog box appears.

Step 4 From the Slot menu, choose the appropriate card.

Step 5 From the Port: drop-down list, choose the applicable port on the card you selected.

Step 6 From the Variable drop-down list, choose the variable. See Table 9-5 for a list of the MXP_MR_2.5G/MXPP_MR_2.5G threshold variables available in this field.

Table 9-5 MXP_MR_2.5G/MXPP_MR_2.5G Threshold Variables (MIBs)

Variable	Definition
iflnOctets	Total number of octets received on the interface, including framing octets
ifInDiscards	The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol
iflnErrors	Number of inbound packets discarded because they contain errors
ifOutOctets	Total number of transmitted octets, including framing packets
ifOutDiscards	The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted
txTotalPkts	Total number of transmit packets
rxTotalPkts	Total number of receive packets
mediaIndStatsRxFramesTooLong	Number of packets transmitted that are greater than 1548 bytes
mediaIndStatsRxFramesTruncated	Total number of frames received that are less than 5 bytes
mediaIndStatsRxFramesBadCRC	Total number of frames received with a cyclic redundancy check (CRC) error
mediaIndStatsTxFramesBadCRC	Total number of frames transmitted with a CRC error

Table 9-5 MXP_MR_2.5G/MXPP_MR_2.5G Threshold Variables (MIBs) (continued)

Variable	Definition
8b10bInvalidOrderedSets	Total number of ordered sets not complaint to GE/FC (Gigabit Ethernet/Fibre Channel) standard
8b10bStatsEncodingDispErrors	Total number of code groups that violate GE/FC disparity errors

Step 7 From the Alarm Type drop-down list, indicate whether the rising threshold, falling threshold, or both the rising and falling thresholds will trigger the event.

Step 8 From the Sample Type drop-down list, choose either **Relative** or **Absolute**. Relative restricts the threshold to use the number of occurrences in the user-set sample period. Absolute sets the threshold to use the total number of occurrences, regardless of time period.

Step 9 Enter the appropriate number of seconds for the Sample Period.

Step 10 Enter the appropriate number of occurrences for the Rising Threshold.

Note For a rising type of alarm, the measured value must move from below the falling threshold to above the rising threshold. For example, if a network is running below a rising threshold of 1000 collisions every 15 seconds and a problem causes 1001 collisions in 15 seconds, the excess occurrences trigger an alarm.

Step 11 Enter the appropriate number of occurrences in the Falling Threshold field. In most cases, a falling threshold is set lower than the rising threshold.

Note A falling threshold is the counterpart to a rising threshold. When the number of occurrences is above the rising threshold and then drops below a falling threshold, it resets the rising threshold. For example, when the network problem that caused 1001 collisions in 15 minutes subsides and creates only 799 collisions in 15 minutes, occurrences fall below a falling threshold of 800 collisions. This resets the rising threshold so that if network collisions again spike over a 1000 per 15-minute period, an event again triggers when the rising threshold is crossed. An event is triggered only the first time a rising threshold is exceeded (otherwise, a single network problem might cause a rising threshold to be exceeded multiple times and cause a flood of events).

Step 12 Click **OK** to complete the procedure.

Step 13 Return to your originating procedure (NTP).

DLP-G154 Delete RMON Alarm Thresholds

Purpose	This task deletes RMON threshold crossing alarms for Ethernet and Fibre Channel ports.
Tools/Equipment	None
Prerequisite Procedures	DLP-G153 Create RMON Alarm Thresholds, page 9-32 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the card where you want to delete the RMON alarm thresholds.

Step 2 In card view, click the **Provisioning > Line Thresholds > RMON Thresholds** tabs.

Step 3 Click the RMON alarm threshold you want to delete.

Step 4 Click **Delete**. The Delete Threshold dialog box appears.

Step 5 Click **Yes** to delete that threshold.

Step 6 Return to your originating procedure (NTP).

CHAPTER 10

Manage the Node

This chapter explains how to modify node provisioning for the Cisco ONS 15454 and perform common management tasks such as monitoring the dense wavelength division multiplexing (DWDM) automatic power control (APC) and span loss values. To provision a new node, see Chapter 3, "Turn Up a Node." To change default network element settings and to view a list of those settings, refer to the "Network Element Defaults" appendix.

Note Unless otherwise specified, "ONS 15454" refers to both American National Standards Institute (ANSI) and European Telecommunications Standards Institute (ETSI) shelf assemblies.

Before You Begin

Before performing the following procedures, investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* as necessary.

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. NTP-G76 Verify Span Loss, page 10-2—Complete this procedure as needed to view or modify the DWDM span loss values.
2. NTP-G77 Manage Automatic Power Control, page 10-3—Complete this procedure as needed to manage the DWDM APC.
3. NTP-G78 View ROADM Node Power Equalization, page 10-5—Complete this procedure as needed to view and update a reconfigurable optical add/drop multiplexing (ROADM) node's power equalization.
4. NTP-G80 Change Node Management Information, page 10-6—Complete this procedure as needed to change node name, contact information, latitude, longitude, date, time, and login legal disclaimer.
5. NTP-G81 Change CTC Network Access, page 10-9—Complete this procedure as needed to change the IP address, default router, subnet mask, network configuration settings, and static routes.
6. NTP-G82 Customize the CTC Network View, page 10-16—Complete this procedure as needed to create domains and customize the appearance of the network map, including specifying a different default map, creating domains, selecting your own map or image, and changing the background color.
7. NTP-G83 Modify or Delete Card Protection Settings, page 10-21—Complete this procedure as needed.

8. NTP-G84 Initiate and Clear Y-Cable and Splitter External Switching Commands, page 10-24—Complete this procedure as needed.
9. NTP-G85 Modify or Delete OSC Terminations, GCC Terminations, and Provisionable Patchcords, page 10-28—Complete this procedure as needed to modify or delete generic communications channel (GCC) and optical service channel (OSC) terminations, and provisionable patchcords.
10. NTP-G86 Convert a Pass-Through Connection to an Add/Drop Connection, page 10-32—Complete this procedure as needed to convert a pass-through connection to an add/drop connection.
11. NTP-G87 Change Node Timing Parameters, page 10-33—Complete this procedure as needed.
12. NTP-G88 Modify Users and Change Security, page 10-35—Complete this procedure as needed to make changes to user settings, including security level and security policies, and to delete users.
13. NTP-G131 Convert DWDM Nodes to Hybrid Nodes, page 10-43—Complete this procedure as needed to convert a DWDM node to a hybrid node.
14. NTP-G89 Change SNMP Settings, page 10-46—Complete this procedure as needed.

NTP-G76 Verify Span Loss

Purpose	This procedure verifies the span loss between two DWDM nodes using Cisco Transport Controller (CTC). You perform this procedure after a node or network modification has occurred and you want to verify that the span loss between the nodes have not changed.
Tools/Equipment	None
Prerequisite Procedures	All procedures in Chapter 3, "Turn Up a Node" and Chapter 6, "Turn Up Network."
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the "DLP-G155 Verify Optical Span Loss Using CTC" task on page 10-2 to check span loss using CTC. This task is faster than a span loss measurement using an optical time domain reflectometer (OTDR) and does not require fibers to be removed. However, the resolution is not as precise as an OTDR measurement.

Stop. **You have completed this procedure**.

DLP-G155 Verify Optical Span Loss Using CTC

Purpose	This task verifies span loss values between two DWDM nodes using CTC.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24

Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > Comm Channels > OSC** tabs. Verify that two OSC terminations are provisioned and have an In-Service and Normal (IS-NR) (ANSI) or Unlocked-enabled (ETSI) service state.

Step 2 Click the **Maintenance > DWDM > WDM Span Check** tabs.

Step 3 Click **Retrieve Span Loss Values** to retrieve the latest span loss data.

Step 4 View the following information:

- Side—Shows the side to which the span loss values apply, either east or west.
- Min Expected Span Loss (dBm)—Shows the expected minimum span loss (in dBm). You can change the minimum by entering a new value in the field.
- Meas Span Loss (dBm)—Shows the measured span loss (in dBm).
- Max Expected Span Loss (dBm)—Shows the expected maximum span loss (in dBm). You can change the minimum by entering a new value in the field.

Note The minimum and maximum expected span loss values are calculated by Cisco MetroPlanner and imported to the node when you perform the "NTP-G138 Import a Cisco MetroPlanner Configuration File" task on page 3-72.

- Resolution (dBm)—Shows the resolution of the span loss measurement (in dBm):
  - +/– 1.5 dB for measured span losses between 0 and 25 dB
  - +/– 2.5 dB for measured span losses between 25 and 38 dB

If the measured span loss is not between the minimum and maximum expected span loss, contact your site planner for further instructions.

Step 5 Return to your originating procedure (NTP).

NTP-G77 Manage Automatic Power Control

Purpose	This procedure manages the DWDM automatic power control (APC).
Tools/Equipment	None
Prerequisite Procedures	All procedures in the following chapters: Chapter 3, "Turn Up a Node" Chapter 6, "Turn Up Network"
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the following tasks as necessary:

- **DLP-G157 Disable Automatic Power Control, page 10-4**
- **DLP-G158 Enable Automatic Power Control, page 10-4**
- **DLP-G159 Refresh Automatic Power Control Information, page 10-5**

Stop. You have completed this procedure.

DLP-G157 Disable Automatic Power Control

Purpose	This task disables the DWDM APC.
Tools/Equipment	None
Prerequisite Procedures	All procedures in the following chapters: • Chapter 3, "Turn Up a Node" • Chapter 6, "Turn Up Network"
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Caution Disable APC only to perform specific troubleshooting or node provisioning tasks. Always enable APC as soon as the tasks are completed. Leaving APC disabled can cause traffic loss.

Step 1 In node view, click the **Maintenance > DWDM > APC** tabs.

Step 2 Click **Disable APC**.

Step 3 Verify that the APC State in the information window at the top left of the CTC window changes to Disable- user.

Step 4 Return to your originating procedure (NTP).

DLP-G158 Enable Automatic Power Control

Purpose	This task enables the DWDM APC.
Tools/Equipment	None
Prerequisite Procedures	All procedures in the following chapters: Chapter 3, "Turn Up a Node" Chapter 6, "Turn Up Network"
Required/As Needed	As needed

Onsite/Remote	Onsite or remote
Security Level	Superuser

Caution Disable APC only to perform specific troubleshooting or node provisioning tasks. Always enable APC as soon as the tasks are completed. Leaving APC disabled can cause traffic loss.

Step 1 In node view, click the **Maintenance > DWDM > APC** tabs.

Step 2 Click **Enable APC**.

Step 3 Verify that the APC State in the information window at the top left of the CTC window changes to Enable.

Step 4 Return to your originating procedure (NTP).

DLP-G159 Refresh Automatic Power Control Information

Purpose	This task refreshes the DWDM APC information.
Tools/Equipment	None
Prerequisite Procedures	All procedures in the following chapters: Chapter 3, "Turn Up a Node" Chapter 6, "Turn Up Network"
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Maintenance > DWDM > APC** tabs.

Step 2 Click **Refresh.**

Step 3 Return to your originating procedure (NTP).

NTP-G78 View ROADM Node Power Equalization

Purpose	This procedure allows you to view reconfigurable optical add/drop multiplexing (ROADM) node power equalization levels.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 In node view, click the **Maintenance > DWDM > ROADM Power Monitoring** tabs.

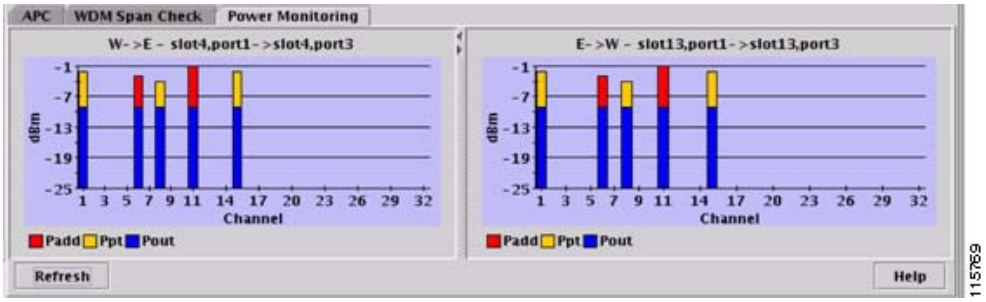
Step 3 On the Power Monitoring tab, view the following east-to-west (E > W) and west-to-east (W > E) power information:

- Padd—Add power. This power level is represented by the red bar.
- Ppt—Pass-through power. This power level is represented by the yellow bar.
- Pout—Output power. This power level is represented by the blue bar. It shows the per-channel (wavelength) power at the 32-WSS output (COM_TX) port.

Note The 32-WSS is designed to handle minor differences in output power. The output power does not need to be exactly the same for all wavelengths.

Figure 10-1 shows an example of ROADM node with equalized output power.

Figure 10-1 Equalized ROADM Power Example



Step 4 If needed, click **Refresh** to update the display.

Stop. You have completed this procedure.

NTP-G80 Change Node Management Information

Purpose	This procedure changes the node name, date, time, contact information, and login legal disclaimer.
Tools/Equipment	None
Prerequisite Procedures	NTP-G24 Set Up Name, Date, Time, and Contact Information, page 3-8
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Complete the "DLP-G160 Change the Node Name, Date, Time, and Contact Information" task on page 10-7, as needed.

Step 4 Complete the "DLP-G161 Change the Login Legal Disclaimer" task on page 10-8, as needed.

Step 5 After confirming the changes, complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G160 Change the Node Name, Date, Time, and Contact Information

Purpose	This task changes basic information such as node name, date, time, and contact information.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Changing the date, time, or time zone might invalidate the node's performance monitoring counters.

Step 1 In node view, click the **Provisioning > General > General** tabs.

Step 2 Change any of the following:

- General: Node Name
- General: Contact
- Location: Latitude
- Location: Longitude
- Location: Description

Note To see changes to longitude or latitude on the network map, you must go to network view and right-click the specified node, then click **Reset Node Position**.

- Time: Use NTP/SNTP Server
- Time: Date (M/D/Y)
- Time: Time (H:M:S)
- Time: Time Zone
- Time: Use Daylight Saving Time
- AIS-V Insertion On STS-1 Signal Degrade - Path: Insert AIS-V on STS-1 SD-P
- AIS-V Insertion On STS-1 Signal Degrade - Path: SD-P BER

See the "NTP-G24 Set Up Name, Date, Time, and Contact Information" procedure on page 3-8 for detailed field descriptions.

Step 3 Click **Apply**.

Step 4 Return to your originating procedure (NTP).

DLP-G161 Change the Login Legal Disclaimer

Purpose	This task modifies the legal disclaimer statement shown in the CTC login dialog box so that it will display customer-specific information when users log into the network.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > Security > Legal Disclaimer > HTML** tabs.

Step 2 The existing statement is a default, non-customer-specific disclaimer. If you want to edit this statement with specifics for your company, you can change the text. Use the HTML commands in Table 10-1 to format the text, as needed.

Table 10-1 HTML Commands for the Legal Disclaimer

Command	Description
	Begins boldface font
	Ends boldface font
	Aligns type in the center of the window
	Ends the center alignment
<font=*n*> (where *n* = font point size)	Changes the font to the new size
	Ends the font size command
<p>	Creates a line break
<sub>	Begins subscript
</sub>	Ends subscript
<sup>	Begins superscript
</sup>	Ends superscript
<u>	Begins underline
</u>	Ends underline

Step 3 If you want to preview your changed statement and formatting, click the **Preview** subtab.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

NTP-G81 Change CTC Network Access

Purpose	This procedure changes or deletes network information, including IP settings, static routes, Open Shortest Path First (OSPF) options, proxy tunnels, and firewall tunnels.
Tools/Equipment	None
Prerequisite Procedures	NTP-G26 Set Up CTC Network Access, page 3-10
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Additional ONS 15454 networking information and procedures, including IP addressing examples, static route scenarios, OSPF protocol, and routing information protocol options are provided in Chapter 20, "CTC Connectivity Reference."

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Perform any of the following tasks as needed:

- DLP-G162 Change IP Settings, page 10-10
- DLP-G265 Lock Node Security, page 10-11
- DLP-G266 Modify Backplane Port IP Settings, page 10-11
- DLP-G267 Disable Node Security Mode, page 10-12
- DLP-G163 Modify a Static Route, page 10-13
- DLP-G164 Delete a Static Route, page 10-14
- DLP-G165 Disable OSPF, page 10-14
- DLP-G59 Set Up or Change Open Shortest Path First Protocol, page 3-18
- DLP-G166 Delete a Proxy Tunnel, page 10-15
- DLP-G167 Delete a Firewall Tunnel, page 10-15

Step 4 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G162 Change IP Settings

Purpose	This task changes the IP address, subnet mask, default router, Dynamic Host Configuration Protocol (DHCP) access, firewall Internet Inter-Object Request Broker Protocol (IIOP) listener port, LCD IP display, and proxy server settings.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G56 Provision IP Settings, page 3-11
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Caution Changing the node IP address, subnet mask, or IIOP listener port causes the TCC2/TCC2Ps to reboot. If Ethernet circuits using Spanning Tree Protocol (STP) originate or terminate on E-Series Ethernet cards installed in the node, circuit traffic will be lost for several minutes while the spanning trees reconverge. Other circuits are not affected by TCC2/TCC2P reboots.

Step 1 In node view, click the **Provisioning > Network > General** tabs.

Step 2 Change any of the following, as required:

- IP Address
- Net/Subnet Mask Length
- Default Router
- LCD IP Setting
- Suppress CTC IP Display
- Forward DHCP Request To
- TCC CORBA (IIOP) Listener Port
- Gateway Settings

See the "DLP-G56 Provision IP Settings" task on page 3-11 for detailed field descriptions.

Step 3 Click **Apply**.

If you changed a network field that will cause the node to reboot, such as the IP address, subnet mask, or TCC Common Object Request Broker Architecture (CORBA) Listener Port, the Change Network Configuration confirmation dialog box appears. If you changed a gateway setting, a confirmation appropriate to the gateway field appears.

Step 4 If a confirmation dialog box appears, click **Yes**.

If you changed an IP address, subnet mask length, or TCC CORBA (IIOP) Listener Port, both ONS 15454 TCC2/TCC2P cards will reboot, one at a time. A TCC2/TCC2P card reboot causes a temporary loss of connectivity to the node, but traffic is unaffected.

Step 5 Confirm that the changes appear on the Provisioning > Network > General tab. If not, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* as necessary.

Step 6 Return to your originating procedure (NTP).

DLP-G265 Lock Node Security

Purpose	This task locks the ONS 15454 security mode. When security mode is locked, two IP addresses must always be provisioned for the node, one for the TCC2P LAN (TCP/IP) port, and one for the backplane LAN port.
Tools/Equipment	TCC2P cards must be installed.
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G264 Enable Node Security Mode, page 3-16
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Caution This task is irreversible. Do not proceed unless you want the node to permanently have two IP addresses.

Note The options in this task are available only when using TCC2P cards.

Step 1 In node view, click the **Provisioning > Security > Data Comm** tabs.

Step 2 Click **Lock**.

Step 3 In the Confirm Lock Secure Mode dialog box, click **Yes**.

Step 4 Return to your originating procedure (NTP).

DLP-G266 Modify Backplane Port IP Settings

Purpose	This task modifies the ONS 15454 backplane IP address, subnet mask, and default router. It also modifies settings that control backplane IP address visibility in CTC and the ONS 15454 LCD. To perform this task, secure mode must be enabled.
Tools/Equipment	TCC2P cards must be installed.
Prerequisite Procedures	NTP-G103 Back Up the Database, page 12-2 DLP-G46 Log into CTC, page 2-24 DLP-G264 Enable Node Security Mode, page 3-16
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Caution Provisioning an IP address that is incompatible with the ONS 15454 network might be service affecting.

Note The options in this task are available only when using the TCC2P cards.

Step 1 Click the **Provisioning > Security > Data Comm** tabs.

Step 2 Modify the following fields, as necessary:

- IP Address
- Subnet Mask
- Default Router
- LCD IP Setting—choose one of the following:
  - **Allow Configuration**—Displays the backplane IP address on the LCD and allows it to be changed using the LCD buttons.
  - **Display only—**Displays the backplane IP address on the LCD but does not allow it to be changed using the LCD buttons.
  - **Suppress Display**—Suppresses the display of the IP address on the LCD.
- Suppress CTC IP Address—If checked, suppresses the IP address from display on the Data Comm subtab, CTC node view information area, and other locations.

Step 3 Click **Apply**.

If you changed the IP address, subnet mask, or default router, the node will reboot. This will take 5 to 10 minutes.

Step 4 Return to your originating procedure (NTP).

DLP-G267 Disable Node Security Mode

Purpose	This task disables the ONS 15454 security mode and allows only one IP address to be provisioned for the backplane LAN port and the TCC2P LAN port.
Tools/Equipment	TCC2P cards must be installed.
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G264 Enable Node Security Mode, page 3-16
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note The node will reboot after you complete this task, causing a temporary disconnection between the CTC computer and the node.

Note The options in this task are available only when using TCC2P cards.

Step 1 Click the **Provisioning > Security > Data Comm** tabs.

Step 2 Click **Change Mode**.

Step 3 Review the information on the Change Secure Mode wizard page, then click **Next**.

Step 4 On the Node IP Address page, choose the address you want to assign to the node:

- **Backplane Ethernet Port**—Assigns the backplane IP address as the node IP address.
- **TCC Ethernet Port**—Assigns the TCC2P port IP address as the node IP address.
- **New IP Address**—Allows you to define a new IP address. If you choose this option, enter the new IP address, subnet mask, and default router IP address.

Step 5 Click **Next**.

Step 6 On the SOCKS Proxy Server Settings page, choose one of the following:

- **External Network Element (ENE)**—If selected, the CTC computer is only visible to the ONS 15454 to which the CTC computer is connected. The computer is not visible to the data communications channel (DCC)-connected nodes. In addition, firewall is enabled, which means that the node prevents IP traffic from being routed between the DCC and the LAN port.
- **Gateway Network Element (GNE)**—If selected, the CTC computer is visible to other DCC-connected nodes. The node prevents IP traffic from being routed between the DCC and the LAN port.
- **Proxy-only**—If selected, the ONS 15454 responds to CTC requests with a list of DCC-connected nodes for which the node serves as a proxy. The CTC computer is visible to other DCC-connected nodes. The node does not prevent traffic from being routed between the DCC and LAN port.

Step 7 Click **Finish**.

Within the next 30 to 40 seconds, the TCC2Ps reboot. CTC switches to network view, and the CTC Alerts dialog box appears. In network view, the node changes to grey and a DISCONNECTED condition appears.

Step 8 In the CTC Alerts dialog box, click **Close**. Wait for the reboot to finish. (This might take several minutes.)

Step 9 Return to your originating procedure (NTP).

DLP-G163 Modify a Static Route

Purpose	This task modifies a static route on an ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G58 Create a Static Route, page 3-17
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Network** tabs.

Step 2 Click the **Static Routing** tab.

Step 3 Click the static route you want to edit.

Step 4 Click **Edit.**

Step 5 In the Edit Selected Static Route dialog box, enter the following:

- Mask
- Next Hop
- Cost

See the "DLP-G58 Create a Static Route" task on page 3-17 for detailed field descriptions.

Step 6 Click **OK**.

Step 7 Return to your originating procedure (NTP).

DLP-G164 Delete a Static Route

Purpose	This task deletes an existing static route on an ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G58 Create a Static Route, page 3-17
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Network > Static Routing** tabs.

Step 2 Click the static route that you want to delete.

Step 3 Click **Delete**. A confirmation dialog box appears.

Step 4 Click **Yes**.

Step 5 Return to your originating procedure (NTP).

DLP-G165 Disable OSPF

Purpose	This task disables the OSPF routing protocol process for an ONS 15454 LAN.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G59 Set Up or Change Open Shortest Path First Protocol, page 3-18

Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Network > OSPF** tabs. The OSPF subtab has several options.

Step 2 In the OSPF on LAN area, uncheck the **OSPF active on LAN** check box.

Step 3 Click **Apply**. Confirm that the changes appear.

Step 4 Return to your originating procedure (NTP).

DLP-G166 Delete a Proxy Tunnel

Purpose	This task removes a proxy tunnel.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G97 Provision a Proxy Tunnel, page 7-14
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Click the **Provisioning > Network > Proxy** subtabs.

Step 2 Click the proxy tunnel that you want to delete.

Step 3 Click **Delete**.

Step 4 Continue with your originating procedure (NTP).

DLP-G167 Delete a Firewall Tunnel

Purpose	This task removes a firewall tunnel.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Click the **Provisioning > Network > Firewall** subtabs.

Step 2 Click the firewall tunnel that you want to delete.

Step 3 Click **Delete**.

Step 4 Return to your originating procedure (NTP).

NTP-G82 Customize the CTC Network View

Purpose	This procedure modifies the CTC network view, including grouping nodes into domains for a less-cluttered display, changing the network view background color, and using a custom image for the network view background.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the following tasks, as needed:

- DLP-G168 Change the Network View Background Color, page 10-16
- DLP-G169 Change the Default Network View Background Map, page 10-17
- DLP-G170 Apply a Custom Network View Background Map, page 10-18
- DLP-G171 Create Domain Icons, page 10-18
- DLP-G172 Manage Domain Icons, page 10-19
- DLP-G173 Enable Dialog Box Do-Not-Display Option, page 10-20
- DLP-G174 Switch Between TDM and DWDM Network Views, page 10-21

Stop. You have completed this procedure.

DLP-G168 Change the Network View Background Color

Purpose	This task changes the network view background color or the domain view background color (the area displayed when you open a domain).
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-24
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Note If you modify background colors, the change is stored in your CTC user profile on the computer. The change does not affect other CTC users.

Step 1 From the View menu in CTC, choose **Go to Network View**.

Step 2 If you want to change a domain background, double-click the domain. If not, continue with Step 3.

Step 3 Right-click the network view or domain map area and choose **Set Background Color** from the shortcut menu.

Step 4 In the Choose Color dialog box, select a background color.

Step 5 Click **OK**.

Step 6 Return to your originating procedure (NTP).

DLP-G169 Change the Default Network View Background Map

Purpose	This task changes the default map of the CTC network view.
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-24
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note If you modify the background image, the change is stored in your CTC user profile on the computer. The change does not affect other CTC users.

Step 1 From the Edit menu, choose **Preferences > Map** and check the **Use Default Map** check box.

Step 2 Click **Apply**.

Step 3 Click OK. Verify that the United States map is displayed.

Step 4 In the network view, double-click on any node on the map.

Step 5 In the node view, click the **Provisioning > Defaults** tabs.

Step 6 In the Defaults Selector area, choose **CTC** and then **network**. (You may have to scroll down on the list to find “network.”)

Step 7 Click the **Default Value** field and choose a default map from the drop-down list. Map choices are Germany, Japan, Netherlands, South Korea, United Kingdom, and the United States.

Step 8 Click **Apply**.

Step 9 Click **OK**.

Step 10 From the View menu, select **Go to Network View**. Confirm that the new map is displayed.

Step 11 If the ONS 15454 icons are not visible, right-click the network view and choose **Zoom Out**. Repeat until all the ONS 15454 icons are visible. (You can also choose **Fit Graph to Window**.)

Step 12 If you need to reposition the node icons, hold down the Ctrl key while you drag and drop them one at a time to a new location on the map.

Step 13 If you want to change the magnification of the network view map and icons, right-click the network view and choose **Zoom In**. Repeat until the ONS 15454 icons are displayed at the magnification you want.

Step 14 Return to your originating procedure (NTP).

DLP-G170 Apply a Custom Network View Background Map

Purpose	This task changes the background image or map of the CTC network view.
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-24
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Note You can replace the network view background image with any JPEG or GIF image that is accessible on a local or network drive. If you apply a custom background image, the change is stored in your CTC user profile on the computer. The change does not affect other CTC users.

Step 1 From the Edit menu, choose **Preferences > Map** and uncheck the **Use Default Map** check box.

Step 2 From the View menu, choose **Go to Network View**.

Step 3 Right-click the network or domain map and choose **Set Background Image**.

Step 4 Click **Browse**. Navigate to the graphic file you want to use as a background.

Step 5 Select the file. Click **Open**.

Step 6 Click **Apply** and then click **OK**.

Step 7 If the ONS 15454 icons are not visible, right-click the network view and choose **Zoom Out**. Repeat this step until all the ONS 15454 icons are visible.

Step 8 If you need to reposition the node icons, hold down the Ctrl key while you drag and drop them one at a time to a new location on the map.

Step 9 If you want to change the magnification of the network view map and icons, right-click the network view and choose **Zoom In**. Repeat until the ONS 15454 icons are displayed at the magnification you want.

Step 10 Return to your originating procedure (NTP).

DLP-G171 Create Domain Icons

Purpose	This task creates a domain, which is an icon that groups ONS 15454 icons in CTC network view.
Tools/Equipment	None

Prerequisite procedures	DLP-G46 Log into CTC, page 2-24
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Domains created by one user are visible to all users who log into the network.

Step 1 From the View menu, choose **Go to Network View**.

Step 2 Right-click the network map and choose **Create New Domain** from the shortcut menu.

Step 3 When the domain icon appears on the map, click the map name and type the domain name.

Step 4 Press **Enter**.

Step 5 Return to your originating procedure (NTP).

DLP-G172 Manage Domain Icons

Purpose	This task manages CTC network view domain icons.
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-24 DLP-G171 Create Domain Icons, page 10-18
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note All domain changes, such as added or removed nodes, are visible to all users who log into the network.

Step 1 From the View menu, choose **Go to Network View**.

Step 2 Locate the domain action that you want to perform in Table 10-2 and complete the appropriate steps.

Table 10-2 Managing Domains

Domain Action	Steps
Move a domain	Press **Ctrl** and drag and drop the domain icon to the new location.
Rename a domain	Right-click the domain icon and choose **Rename Domain** from the shortcut menu. Type the new name in the domain name field.
Add a node to a domain	Drag and drop the node icon to the domain icon.
Move a node from a domain to the network map	Open the domain and right-click a node. Choose **Move Node Back to Parent View**.

Table 10-2 Managing Domains (continued)

Domain Action	Steps
Open a domain	• Double-click the domain icon, or • Right-click the domain and choose **Open Domain**.
Return to network view	Right-click the domain view area and choose **Go to Parent View** from the shortcut menu.
Preview domain contents	Right-click the domain icon and choose **Show Domain Overview**. The domain icon shows a small preview of the nodes in the domain. To turn off the domain overview, right-click the overview and select **Show Domain Overview**.
Remove domain	Right-click the domain icon and choose **Remove Domain**. Any nodes in the domain are returned to the network map.

Step 3 Return to your originating procedure (NTP).

DLP-G173 Enable Dialog Box Do-Not-Display Option

Purpose	This task ensures that a user-selected do-not-display dialog box preference is enabled for subsequent sessions or to disable the do-not-display option.
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-24
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note If any user who has rights to perform an operation (for example, creating a circuit) selects the "Do not show this message again" check box in a dialog box, the dialog box is not displayed for any other users who perform that operation on the network from the same computer unless the command is overridden using the following task. (The preference is stored on the computer, not in the node database.)

Step 1 From the Edit menu, choose **Preferences**.

Step 2 In the Preferences dialog box, click the **General** tab.

The Preferences Management area field lists all dialog boxes where "Do not show this message again" is enabled.

Step 3 Choose one of the following options, or uncheck the individual dialog boxes that you want to appear:

- **Don't Show Any**—Hides all do-not-display check boxes.
- **Show All**—Overrides do-not-display check box selections and displays all dialog boxes.

Step 4 Click **OK**.

Step 5 Return to your originating procedure (NTP).

DLP-G174 Switch Between TDM and DWDM Network Views

Purpose	Use this task to switch between time division multiplexing (TDM) and DWDM network views.
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-24
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Retrieve or higher

Step 1 From the View menu, choose **Go to Network View**.

Step 2 From the Network Scope drop-down list on the toolbar located in the upper right portion of the CTC window, choose one of the following:

- **All**—Displays both TDM and DWDM nodes.
- **TDM**—Displays only ONS 15454s with SONET or SDH cards including the transponder and muxponder cards.
- **DWDM**—Displays only ONS 15454s with DWDM cards, including the transponder and muxponder cards.

Step 3 Return to your originating procedure (NTP).

NTP-G83 Modify or Delete Card Protection Settings

Purpose	This procedure modifies and deletes card protection settings.
Tools/Equipment	None
Prerequisite Procedures	NTP-G33 Create a Y-Cable Protection Group, page 3-36
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Modifying and deleting protection groups can be service affecting.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Perform any of the following tasks as needed:

- DLP-G175 Modify a Y-Cable Protection Group, page 10-22
- DLP-G176 Modify a Splitter Protection Group, page 10-23
- DLP-G177 Delete a Y-Cable Protection Group, page 10-23

Step 3 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G175 Modify a Y-Cable Protection Group

Purpose	This task modifies a Y-cable protection group for any client port on a MXP_2.5G_10G, TXP_MR_2.5G, or TXP_MR_10G card.
Tools/Equipment	None
Prerequisite Procedures	NTP-G33 Create a Y-Cable Protection Group, page 3-36 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > Protection** tabs.

Step 2 In the Protection Groups area, click the Y-cable protection group that you want to modify.

Step 3 Click **Edit**.

Step 4 In the Selected Group area, you can modify the following, as needed:

- Name—Type the changes to the protection group name. The name can have up to 32 alphanumeric characters.
- Revertive—Check this box if you want traffic to revert to the working card after failure conditions stay corrected for the amount of time chosen from the Reversion Time list. Uncheck this box if you do not want traffic to revert.
- Reversion time—If the Revertive check box is selected, choose the reversion time from the Reversion time drop-down list. The range is 0.5 to 12.0 minutes. The default is 5.0 minutes. This is the amount of time that will elapse before the traffic reverts to the working card. Traffic can revert when conditions causing the switch are cleared.

Step 5 Click **OK**. Confirm that the changes appear.

Step 6 Return to your originating procedure (NTP).

DLP-G176 Modify a Splitter Protection Group

Purpose	This task modifies a splitter protection group for any client port on a TXPP_MR_2.5G or MXPP_MR_2.5G card. Splitter protection is automatically created when the TXPP or MXPP card is installed.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning** > **Protection** tabs.

Step 2 In the Protection Groups area, click the splitter protection group that you want to modify.

Step 3 Click **Edit**.

Step 4 In the Selected Group area, you can modify the following, as needed:

- Name—Type the changes to the protection group name. The name can have up to 32 alphanumeric characters.
- Revertive—Check this box if you want traffic to revert to the working card after failure conditions stay corrected for the amount of time chosen from the Reversion Time list. Uncheck this box if you do not want traffic to revert.
- Reversion time—If the Revertive check box is selected, choose the reversion time from the Reversion time drop-down list. The range is 0.5 to 12.0 minutes. The default is 5.0 minutes. This is the amount of time that will elapse before the traffic reverts to the working card. Traffic can revert when conditions causing the switch are cleared.

Step 5 Click **OK**. Confirm that the changes appear.

Step 6 Return to your originating procedure (NTP).

DLP-G177 Delete a Y-Cable Protection Group

Purpose	This task deletes a Y-cable protection group.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning** > **Protection** tabs.

Step 2 In the Protection Groups area, click the protection group you want to delete.

Step 3 Click **Delete**.

Step 4 Click **Yes** in the Delete Protection Group dialog box. Confirm that the changes appear.

Step 5 Return to your originating procedure (NTP).

NTP-G84 Initiate and Clear Y-Cable and Splitter External Switching Commands

Purpose	This procedure describes how to apply and remove Manual and Force protection switches on Y-cable and splitter protection groups. It also describes how to apply and remove a Lock On or Lock Out protection command to a Y-cable protection group.
Tools/Equipment	None
Prerequisite Procedures	NTP-G32 Install the Transponder and Muxponder Cards, page 3-31 NTP-G33 Create a Y-Cable Protection Group, page 3-36
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Superuser

Note Splitter protection groups are automatically created when you install a TXPP_MR_2.5G or MXPP_MR_2.5G card.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 To perform a Manual protection switch, complete the "DLP-G178 Apply a Manual Y-Cable or Splitter Protection Switch" task on page 10-25.

Step 3 To perform a Force protection switch, complete the "DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch" task on page 10-25.

Step 4 To clear a Force or Manual protection switch, complete the "DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch" task on page 10-26.

Step 5 To prevent traffic on a working or protect card from switching to the other card in the pair, complete the "DLP-G181 Apply a Lock-On" task on page 10-26.

Step 6 To prevent traffic from switching to the protect card, complete the "DLP-G182 Apply a Lockout" task on page 10-27.

Step 7 To remove a lock-on or lockout and return a protection group to its usual switching method, complete the "DLP-G183 Clear a Lock-On or Lockout" task on page 10-28.

Stop. You have completed this procedure.

DLP-G178 Apply a Manual Y-Cable or Splitter Protection Switch

Purpose	This task performs a Manual protection switch on a Y-cable or splitter protection group.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Caution A Manual switch will move traffic from the active to the standby card only if network conditions permit it. If conditions change during the switch, CTC will attempt to place traffic back on the original active card.

Step 1 In node view, click the **Maintenance > Protection** tabs.

Step 2 In the Protection Groups list, click the Y-cable or splitter protection group where you want to apply the Manual protection switch.

Step 3 In the Selected Group area, click the active card or port.

Step 4 In the Switch Commands area, click **Manual**.

Step 5 In the Confirm Manual Operation dialog box, click **Yes**.

If conditions permit, the Manual switch will be applied. To clear the Manual switch, see the "DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch" task on page 10-26.

Step 6 Return to your originating procedure (NTP).

DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch

Purpose	This task performs a Force protection switch on a Y-cable or splitter protection group.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Caution A Force switch will move traffic from the active to the standby card or port immediately, regardless of network conditions. The switch will remain in effect until it is cleared.

Step 1 In node view, click the **Maintenance > Protection** tabs.

Step 2 In the Protection Groups list, click the Y-cable or splitter protection group where you want to apply the Force protection switch.

Step 3 In the Selected Group area, click the active card or port.

Step 4 In the Switch Commands drop-down list, click **Force**.

Step 5 In the Confirm Manual Operation dialog box, click **Yes**.

The Force switch will be applied. To clear the Force switch, see the "DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch" task on page 10-26.

Step 6 Return to your originating procedure (NTP).

DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch

Purpose	This task clears a Manual or Force protection switch on a Y-Cable or splitter protection group.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G178 Apply a Manual Y-Cable or Splitter Protection Switch, page 10-25 or DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch, page 10-25
Required/As Needed	As needed
Onsite/Remote	Both
Security Level	Maintenance or higher

Step 1 In node view, click the **Maintenance > Protection** tabs.

Step 2 In the Protection Groups area, click the protection group that contains the card you want to clear.

Step 3 In the Selected Group area, click the card that you want to clear.

Step 4 In the Switch Commands drop-down list, click **Clear**.

Step 5 Click **Yes** in the confirmation dialog box.

The Manual or Force protection switch is cleared.

Step 6 Return to your originating procedure (NTP).

DLP-G181 Apply a Lock-On

Purpose	This task prevents traffic from being switched from the working/active card in a Y-cable protection group or port in a splitter protection group.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed

Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Note You can apply the Lock On command only to the working/active card or port. If the working card or port is standby (traffic is switched), the Lock Out button is grayed.

Step 1 In node view, click the **Maintenance > Protection** tabs.

Step 2 In the Protection Groups area, click the protection group that contains the card (Y-cable) or port (splitter) that you want to lock on.

Step 3 In the Selected Group area, click the working/active card.

Step 4 In the Inhibit Switching drop-down list, click **Lock On**.

Step 5 Click **Yes** in the confirmation dialog box.

The lock on has been applied. Traffic cannot switch to the protect card. To clear the lock on, see the "DLP-G183 Clear a Lock-On or Lockout" task on page 10-28.

Note Provisioning a lock on raises a LOCKON-REQ or an FE-LOCKON condition in CTC. Clearing the lockout switch request clears these conditions.

Step 6 Return to your originating procedure (NTP).

DLP-G182 Apply a Lockout

Purpose	This task keeps traffic from switching to the protect/standby card or port. The Lock Out command overrides the Force and Manual switching commands.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Note You can apply the lockout to the protect/standby card or port. If the protect card or port is active (traffic is switched), the lockout task cannot be performed.

Step 1 In node view, click the **Maintenance > Protection** tabs.

Step 2 In the Protection Groups area, click the protection group that contains the card (Y-cable) or port (splitter) that you want to lock out.

Step 3 In the Selected Group area, click the protect/standby card.

Step 4 In the Inhibit Switching drop-down list, click **Lock Out**.

Step 5 Click **Yes** in the confirmation dialog box.

The lockout has been applied. Traffic cannot switch to the protect card. To clear the lockout, see the "DLP-G183 Clear a Lock-On or Lockout" task on page 10-28.

Note Provisioning a lockout raises a LOCKOUT-REQ or an FE-LOCKOUT condition in CTC. Clearing the lockout switch request clears these conditions.

Step 6 Return to your originating procedure (NTP).

DLP-G183 Clear a Lock-On or Lockout

Purpose	This task clears a lock-on or lockout.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G181 Apply a Lock-On, page 10-26 or DLP-G182 Apply a Lockout, page 10-27
Required/As Needed	As needed
Onsite/Remote	Both
Security Level	Maintenance or higher

Step 1 In node view, click the **Maintenance > Protection** tabs.

Step 2 In the Protection Groups area, click the protection group that contains the card you want to clear.

Step 3 In the Selected Group area, click the card you want to clear.

Step 4 In the Inhibit Switching drop-down list, click **Unlock**.

Step 5 Click **Yes** in the confirmation dialog box.

The lock on or lockout is cleared.

Step 6 Return to your originating procedure (NTP).

NTP-G85 Modify or Delete OSC Terminations, GCC Terminations, and Provisionable Patchcords

Purpose	This procedure modifies GCC terminations, and deletes provisionable patchcords, OSC terminations, and GCC terminations.
Tools/Equipment	None
Prerequisite Procedures	DLP-G76 Provision GCC Terminations, page 7-13 or NTP-G38 Provision OSC Terminations and Ring ID, page 3-74 DLP-G99 Create a Provisionable Patchcord, page 6-10

Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Deleting an OSC termination can cause you to lose visibility of nodes that do not have other OSCs or network connections to the CTC computer.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 In node view, complete the following tasks as needed:

- To modify a GCC termination, complete the "DLP-G184 Change a GCC Termination" task on page 10-29.
- To delete a GCC termination, complete the "DLP-G185 Delete a GCC Termination" task on page 10-30.
- To delete an OSC termination, complete the "DLP-G186 Delete an OSC Termination" task on page 10-30.
- To delete a provisionable patchcord, complete the "DLP-G187 Delete a Provisionable Patchcord" task on page 10-31.

Stop. You have completed this procedure.

DLP-G184 Change a GCC Termination

Purpose	This task modifies a GCC termination. You can enable or disable OSPF and enable or disable the foreign node setting.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Remote
Security Level	Provisioning or higher

Step 1 Click the **Provisioning > Comm Channels > GCC** tabs.

Step 2 Click the GCC that you want to change.

Step 3 Click **Edit**.

Step 4 In the GCC Termination Editor dialog box, complete the following as necessary:

- GCC Rate—(Display only) Indicates the GCC rate.
- Disable OSPF on SDCC Link—If checked, Open Shortest Path First is disabled on the link. OSPF should be disabled only when the slot and port connect to third-party equipment that does not support OSPF.
- Far End is Foreign—Check this box to specify that the GCC termination is a non-ONS node.

- Far end IP—If you checked the Far End is Foreign check box, type the IP address of the far-end node or leave the 0.0.0.0 default. An IP address of 0.0.0.0 means that any address can be used by the far end.

Step 5 Click **OK**.

Step 6 Return to your origination procedure (NTP).

DLP-G185 Delete a GCC Termination

Purpose	This task deletes the DWDM GCC terminations required for network setup when using the TXP_MR_10G, TXP_MR_2.5G, TXPP_MR_2.5G, and MXP_2.5G_10G cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Deleting the GCC termination on a port also deletes any provisionable patchcord links that might exist on the port.

Step 1 Determine if the port where you want to delete GCC is in-service (IS). (Click the **Provisioning > Line** tabs, and observe the Service State column for that port.) If it is IS, perform the "DLP-G108 Change the Service State for a Port" task on page 7-17 for that port. If not, go to Step 2.

Step 2 Click the **Provisioning > Comm Channels > GCC** tabs.

Step 3 Click the GCC that you want to delete.

Step 4 Click **Delete.**

Step 5 Click **Yes**. GCC-EOC alarms appear until all network GCC terminations are deleted and the ports are out of service.

Step 6 Return to your originating procedure (NTP).

DLP-G186 Delete an OSC Termination

Purpose	This task deletes an OSC termination on the ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Deleting a OSC termination might cause node isolation and loss of visibility to nodes that do not have other OSCs or network connections to the CTC computer.

Step 1 Click the **Provisioning > Comm Channels > OSC** tab.

Step 2 If a Ring ID is created, complete the following steps. Otherwise, continue with Step 3.

a. Select the DWDM Ring ID that you want to delete and click **Delete**.

b. In the Delete DWDM Ring ID confirmation box, click **Yes**. Confirm that the changes appear.

Step 3 Click the OSC termination that you want to delete and click **Delete**.

Step 4 In the Delete OSC Termination confirmation box, click **Yes**. Confirm that the changes appear.

Until all network OSC terminations are deleted, loss of signal (LOS) or power failure alarms on the Optical Booster (OPT-BST) amplifier, OSCM card, and OSC-CSM card might appear.

Step 5 Return to your originating procedure (NTP).

DLP-G187 Delete a Provisionable Patchcord

Purpose	This task deletes a provisionable patchcord.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24 DLP-G99 Create a Provisionable Patchcord, page 6-10
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning and higher

Step 1 In node view, click the **Provisioning > Comm Channels > PPC** tabs. If you are in network view, click **Provisioning > Provisionable Patchcords** tabs.

Step 2 Click the provisionable patchcord that you want to delete.

Step 3 Click **Delete**.

Step 4 In the confirmation dialog box, click **Yes**.

Step 5 Return to your originating procedure (NTP).

NTP-G86 Convert a Pass-Through Connection to an Add/Drop Connection

Purpose	This procedure converts a pass-through connection into add/drop connections (one on the add side and the other on the drop side). Use this procedure during a network upgrade. Pass-through channel connections can be provided between channel input and output ports for the Channel OADM (AD-xC-xx.x), 4-Channel Multiplexer/Demultiplexer (4MD-xx.x), 32-Channel Multiplexer (32MUX-O), and 32-Channel Demultiplexer (32DMX-O and 32DMX) cards. You can set up pass-through connections in nodes that might require more add or drop channel capability or configuration.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at an ONS 15454 on the network.

Step 2 In node view, click the **Circuits** tab. Delete the unidirectional or bidirectional pass-through optical channel network connection (OCHNC) that applies to the pass-through connection to be removed.

Step 3 Remove the physical pass-through cabling. Click the **Provisioning > WDM-ANS > Connections** tabs to identify the card ports to be removed. The pass-through connection that you are removing can be connected in both OADM and hub nodes.

- For a hub node—Connect the 32DMX-O or 32DMX output port to the 32MUX-O input port.
- For an OADM node—Connect the AD-xC-xx.x drop (TX) port to the AD-xC-xx.x add (RX) port.

Step 4 Physically connect the proper client interface to the correct add and drop ports.

Step 5 Delete the filter connections related to the pass-through connection that is being converted to an add/drop connection:

a. In node view, click the **Provisioning > WDM-ANS > Port Status** tabs.

b. Highlight the pass-through connections between ITU channel add and drop ports filters.

c. Click **Delete**.

Step 6 Create two new unidirectional OCHNCs (one heading east, the other heading west) to support the new add/drop channels. See the "DLP-G105 Provision DWDM Optical Channel Network Connections" task on page 7-10.

Step 7 As necessary, complete the "DLP-G99 Create a Provisionable Patchcord" task on page 6-10.

Step 8 As necessary, add an optical attenuator between the channel TX port of the OADM, 4MD-xx.x, or 32DMX-O card and the DWDM RX port on the TXP, MXP, or OC-N line card.

Note If the channel is coming from a 32DMX-O, the optical power can be adjusted in CTC by modifying the value of the internal per-channel VOA.

Step 9 (Optional) The following verification steps might be needed for an intermediate node when a pass-through connection is converted:

a. Verify that the received channels are at the specified power level. See the "NTP-G76 Verify Span Loss" procedure on page 10-2 for instructions.

b. Verify that the added channels are equalized with the express channels within +/–1 dB.

c. If the channels are not equalized with the express channels within +/–1 dB, check the attenuation of the VOAs.

d. Check all the fiber adapters to minimize their insertion losses. See the "NTP-G115 Clean Fiber Connectors" procedure on page 12-22 for instructions.

Stop. You have completed this procedure.

NTP-G87 Change Node Timing Parameters

Purpose	This procedure changes the timing parameters for the ONS 15454. To switch the timing reference, see the "NTP-G112 Change the Node Timing Reference" procedure on page 12-14.
Tools/Equipment	None
Prerequisite Procedures	NTP-G53 Set Up Timing, page 6-3
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution The following procedure might be service affecting and should be performed during a scheduled maintenance window.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Click the **Provisioning > Timing > General** tabs.

Step 4 In the General Timing section, change any of the following information:

- Timing Mode

Note Because mixed timing can cause timing loops, Cisco does not recommend using the Mixed Timing option. Use this mode with care.

- SSM Message Set
- Quality of RES
- Revertive
- Revertive Time

See the "NTP-G53 Set Up Timing" task on page 6-3 for field descriptions.

Step 5 In the Reference Lists area, you can change the following information:

Note Reference lists define up to three timing references for the node and up to six BITS Out references. BITS Out references define the timing references used by equipment that can be attached to the node's BITS Out pins on the backplane. If you attach equipment to BITS Out pins, you normally attach it to a node with Line mode because equipment near the external timing reference can be directly wired to the reference.

- NE Reference
- BITS 1 Out
- BITS 2 Out

Step 6 In the BITS In area on the BITS Facilities tab, you can change the following information:

Note The BITS Facilities section sets the parameters for your BITS1 and BITS2 timing references. Many of these settings are determined by the timing source manufacturer. If equipment is timed through BITS Out, you can set timing parameters to meet the requirements of the equipment.

- BITS In State
- Coding
- Framing
- Sync Messaging
- Admin SSM

Step 7 In the BITS Out area, you can change the following information.

Note If Coding, Framing, or AIS Threshold is set in the BITS In area, it cannot be changed here.

- BITS Out State
- Coding
- Framing
- AIS Threshold
- LBO

Step 8 Click **Apply**. Confirm that the changes appear.

Caution Internal timing is Stratum 3 and is not intended for permanent use. All ONS 15454s should be timed to a Stratum 2 or better primary reference source.

Step 9 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

NTP-G88 Modify Users and Change Security

Purpose	This procedure modifies user and security properties for the ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	NTP-G23 Create Users and Assign Security, page 3-5
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Perform any of the following tasks as needed:

- DLP-G188 Change Security Policy for a Single Node, page 10-35
- DLP-G189 Change Security Policy for Multiple Nodes, page 10-37
- DLP-G190 Change Node Access and PM Clearing Privilege, page 10-38
- DLP-G191 Change User Password and Security Level on a Single Node, page 10-39
- DLP-G192 Change User Password and Security Level for Multiple Nodes, page 10-40
- DLP-G193 Delete a User From a Single Node, page 10-40
- DLP-G194 Delete a User From Multiple Nodes, page 10-41
- DLP-G195 Log Out a User on a Single Node, page 10-42
- DLP-G196 Log Out a User on Multiple Nodes, page 10-42

Step 4 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G188 Change Security Policy for a Single Node

Purpose	This task changes the security policy for a single node, including idle user timeouts, user lockouts, password changes, and concurrent login policies.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > Security > Policy** tabs.

Step 2 If you want to modify the idle user timeout period, click the hour (H) and minute (M) arrows in the Idle User Timeout area for the security level that you want to provision: RETRIEVE, MAINTENANCE, PROVISIONING, or SUPERUSER. The idle period time range is 0 and 16 hours, and 0 and 59 minutes. The user is logged out after the idle user timeout period is reached.

Step 3 In the User Lockout area, you can modify the following:

- Failed Logins Before Lockout—The number of failed login attempts a user can make before the user is locked out from the node. You can choose a value between 0 and 10.
- Manual Unlock by Superuser—Allows a user with Superuser privileges to manually unlock a user who has been locked out from a node.
- Lockout Duration—Sets the amount of time the user will be locked out after a failed login. You can choose a value between 0 and 10 minutes, and 0 and 55 seconds (in five-second intervals).

Note Manual Unlock by Superuser and Lockout Duration are mutually exclusive.

Step 4 In the Password Change area, you can modify the following:

- Prevent Reusing Last [ ] Passwords—Choose a value between 1 and 10 to set the number of different passwords that the user must create before they can reuse a password.
- Cannot Change New Password for [ ] days—If checked, prevents users from changing their password for the specified period. The range is 20 to 95 days.
- Require Password Change on First Login to New Account—If checked, requires users to change their password the first time they log into their account.

Step 5 To require users to change their password at periodic intervals, check the Enforce Password Aging check box in the Password Aging area. If checked, provision the following parameters:

- Aging Period—Sets the amount of time that must pass before the user must change his or her password for each security level: RETRIEVE, MAINTENANCE, PROVISIONING, and SUPERUSER. The range is 20 to 95 days.
- Warning Period—Sets the number days the user will be warned to change his or her password for each security level. The range is 2 to 20 days.

Step 6 In the Other area, you can provision the following:

- Single Session Per User—If checked, limits users to one login session at one time.
- Disable Inactive User—If checked, disables users who do not log into the node for the period of time specified in the Inactive Duration box. The Inactive Duration range is 1 to 99 days.

Step 7 Click **Apply**. Confirm that the changes appear.

Step 8 Return to your originating procedure (NTP).

DLP-G189 Change Security Policy for Multiple Nodes

Purpose	This task changes the security policy for multiple nodes including idle user timeouts, user lockouts, password change, and concurrent login policies.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 From the View menu, choose **Go to Network View**.

Step 2 Click the **Provisioning > Security > Policy** tabs. A read-only table of nodes and their policies appears.

Step 3 Click a node on the table that you want to modify, then click **Change**.

Step 4 If you want to modify the idle user timeout period, click the hour (H) and minute (M) arrows in the Idle User Timeout area for the security level that you want to provision: RETRIEVE, MAINTENANCE, PROVISIONING, or SUPERUSER. The idle period time range is 0 and 16 hours, and 0 and 59 minutes. The user is logged out after the idle user timeout period is reached.

Step 5 In the User Lockout area, you can modify the following:

- Failed Logins Before Lockout—The number of failed login attempts a user can make before the user is locked out from the node. You can choose a value between 0 and 10.
- Manual Unlock by Superuser—Allows a user with Superuser privileges to manually unlock a user who has been locked out from a node.
- Lockout Duration—Sets the amount of time the user will be locked out after a failed login. You can choose a value between 0 and 10 minutes, and 0 and 55 seconds (in five-second intervals).

Note Manual Unlock by Superuser and Lockout Duration are mutually exclusive.

Step 6 In the Password Change area, you can modify the following:

- Prevent Reusing Last [ ] Passwords—Choose a value between 1 and 10 to set the number of different passwords that the user must create before they can reuse a password.
- Cannot Change New Password for [ ] days—If checked, prevents users from changing their password for the specified period. The range is 20 to 95 days.
- Require Password Change on First Login to New Account—If checked, requires users to change their password the first time they log into their account.

Step 7 To require users to change their password at periodic intervals, check the Enforce Password Aging check box in the Password Aging area. If checked, provision the following parameters:

- Aging Period—Sets the amount of time that must pass before the user must change his or her password for each security level: RETRIEVE, MAINTENANCE, PROVISIONING, and SUPERUSER. The range is 20 to 95 days.
- Warning Period—Sets the number days the user will be warned to change his or her password for each security level. The range is 2 to 20 days.

Step 8 In the Other area, you can provision the following:

- Single Session Per User—If checked, limits users to one login session at one time.
- Disable Inactive User—If checked, disables users who do not log into the node for the period of time specified in the Inactive Duration box. The Inactive Duration range is 1 to 99 days.

Step 9 In the Select Applicable Nodes area, uncheck any nodes where you do not want to apply the changes.

Step 10 Click **OK**.

Step 11 In the Security Policy Change Results dialog box, confirm that the changes are correct, then click **OK**.

Step 12 Return to your originating procedure (NTP).

DLP-G190 Change Node Access and PM Clearing Privilege

Purpose	This task provisions the physical access points and shell programs used to connect to the ONS 15454 and sets the user security level that can clear node performance monitoring (PM) data.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > Security > Access** tabs.

Step 2 In the Access area, provision the following:

- LAN access—Choose one of the following options to set the access paths to the node:
  - **No LAN Access**—Allows access to the node only through data communications channel (DCC) connections. Access through the TCC2/TCC2P RJ-45 port and backplane is not permitted.
  - **Backplane only**—Allows access through DCC connections and the backplane. Access through the TCC2/TCC2P RJ-45 port is not allowed.
  - **Front and Backplane**—Allows access through DCC, TCC2/TCC2P RJ-45, and backplane connections.
- Restore Timeout—Sets a time delay for enabling of front and backplane access when DCC connections are lost and "DCC only" is chosen in LAN Access. Front and backplane access is enabled after the restore timeout period has passed. Front and backplane access is disabled as soon as DCC connections are restored.

Step 3 In the Shell Access area, set the shell program used to access the node:

- Telnet—If chosen, allows access to the node using Telnet. Telnet is the terminal-remote host Internet protocol developed for the Advanced Agency Research Project Network (ARPANET). If chosen, choose the Telnet port. Port 23 is the default.
- SSH—If chosen, allows access to the node using the Secure Shell (SSH) program. SSH is a terminal-remote host Internet protocol that uses encrypted links. If chosen, Port 22 is the default port. It cannot be changed.

- Enable Shell Password—If checked, enables the SSH password. To disable the password, you must uncheck the check box and click Apply. You must type the password in the confirmation dialog box and click OK to disable it.

Step 4 In the PM Clearing Privilege field, choose the minimum security level that can clear node PM data: PROVISIONING or SUPERUSER.

Step 5 Click **Apply**.

Step 6 Return to your originating procedure (NTP).

DLP-G191 Change User Password and Security Level on a Single Node

Purpose	This task changes settings for an existing user at one node.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > Security > Users** tabs.

Step 2 Click the user whose settings you want to modify, then click **Edit**.

Step 3 In the Change User dialog box, you can:

- Change a user password.
- Modify the user security level.
- Lock out the user.
- Disable the user.
- Force the user to change password on next login.

See the "DLP-G54 Create a New User on a Single Node" procedure on page 3-6 for field descriptions.

Step 4 Click **OK**.

Step 5 Click **OK** in the confirmation dialog box.

Note User settings that you changed during this task will not appear until that user logs off and logs back in.

Step 6 Return to your originating procedure (NTP).

DLP-G192 Change User Password and Security Level for Multiple Nodes

Purpose	This task changes settings for an existing user at multiple nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note You must add the same user name and password to each node that the user will access.

Step 1 From the View menu, choose **Go to Network View**. Verify that you can access all the nodes where you want to change the users.

Step 2 Click the **Provisioning > Security > Users** tabs. Highlight the user's name whose settings you want to change.

Step 3 Click **Change**. The Change User dialog box appears.

Step 4 In the Change User dialog box, you can:

- Change a user's password.
- Modify the user's security level.
- Lock out the user.

See the "DLP-G55 Create a New User on Multiple Nodes" task on page 3-6 for field descriptions.

Step 5 In the Select Applicable Nodes area, uncheck any nodes where you do not want to change the user's settings (all network nodes are selected by default).

Step 6 Click **OK**. A Change Results confirmation dialog box appears.

Step 7 Click **OK** to acknowledge the changes.

Step 8 Return to your originating procedure (NTP).

DLP-G193 Delete a User From a Single Node

Purpose	This task deletes an existing user from a single node.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note You cannot delete a user who is currently logged in. To log out a user, you can complete the "DLP-G195 Log Out a User on a Single Node" task on page 10-42, or you can choose the "Logout before delete" option in the Delete User dialog box.

Note CTC will allow you to delete other Superusers if one Superuser remains. For example, you can delete the CISCO15 user if you have created another Superuser. Use this option with caution.

Step 1 In node view, click the **Provisioning > Security > Users** tabs.

Step 2 Choose the user you want to delete.

Step 3 Click **Delete**.

Step 4 In the Delete User dialog box, verify that the user name displayed is the one you want to delete. Click **Logout before delete** if the user is currently logged in. (You cannot delete users if they are logged in.)

Step 5 Click **OK**.

Step 6 In the User Deletion Results box, click **OK**.

Step 7 Return to your originating procedure (NTP).

DLP-G194 Delete a User From Multiple Nodes

Purpose	This task deletes an existing user from multiple nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note You cannot delete a user who is currently logged in. To log out a user, you can complete the "DLP-G196 Log Out a User on Multiple Nodes" task on page 10-42, or you can choose the "Logout before delete" option in the Delete User dialog box.

Note CTC will allow you to delete other Superusers if one Superuser remains. For example, you can delete the CISCO15 user if you have created another Superuser. Use this option with caution.

Step 1 From the View menu, choose **Go to Network View**.

Step 2 Click the **Provisioning > Security** tabs. Highlight the name of the user you want to delete.

Step 3 Click **Delete**. The Delete User dialog box appears.

Step 4 In the Select Applicable Nodes area, uncheck any nodes where you do not want to delete this user.

Step 5 Click **OK**. A User Deletion Results confirmation dialog box appears.

Step 6 Click **OK** to acknowledge the changes. Confirm that the changes appear.

Step 7 Return to your originating procedure (NTP).

DLP-G195 Log Out a User on a Single Node

Purpose	This task logs out a user from a single node.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > Security > Active Logins** tabs.

Step 2 Choose the user that you want to log out and click **Logout**.

Step 3 In the Logout User dialog box, check **Lockout before Logout** if you want to lock the user out. This prevents the user from logging in after logout based on user lockout parameters provisioned in the Policy tab. A manual unlock by a Superuser is required, or the user is locked out for the amount of time specified in the Lockout Duration field. See the "DLP-G188 Change Security Policy for a Single Node" task on page 10-35 for more information.

Step 4 Click **OK**.

Step 5 Click **OK** to confirm the logout.

Step 6 Return to your originating procedure (NTP).

DLP-G196 Log Out a User on Multiple Nodes

Purpose	This task logs out a user from multiple nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 From the View menu, chose **Go to Network View**.

Step 2 Click the **Provisioning > Security > Active Logins** tabs.

Step 3 Choose the user you want to log out.

Step 4 Click **Logout**.

Step 5 In the Logout User dialog box, check the nodes where you want to log out the user.

Step 6 Check **Lockout before Logout** if you want to lock the user out prior to logout. This prevents the user from logging in after logout based on user lockout parameters provisioned in the Policy tab. A manual unlock by a Superuser is required, or the user is locked out for the amount of time specified in the Lockout Duration field. See the "DLP-G189 Change Security Policy for Multiple Nodes" task on page 10-37 for more information.

Step 7 In the Select Applicable Nodes area, uncheck any nodes where you do not want to change the user's settings (all network nodes are selected by default).

Step 8 Click **OK**.

Step 9 Click **OK** in the confirmation dialog box.

Step 10 Return to your originating procedure (NTP).

NTP-G131 Convert DWDM Nodes to Hybrid Nodes

Purpose	This procedure upgrades an OSCM card to an OSC-CSM card. OSCM cards use Slots 8 and 10, which are required for cross-connect cards in TDM and DWDM hybrid configurations. The OSC-CSM cards use Slots 1 to 6 and 12 to 17.
Tools/Equipment	Two OSC-CSM cards
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Maintenance or higher

Note You cannot perform this upgrade on software released prior to Software Release 4.6.

Note Downgrade procedures from OSC-CSM cards to OSCM cards are not supported. Contact the Cisco Technical Assistance Center (TAC) for more information. See the "Obtaining Technical Assistance" section on page lxxiv.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you will perform the upgrade. If you are already logged in, continue with Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 If you have timing set up on the OSCM card, delete the timing source:

a. In node view, click the **Provisioning > Timing** tabs.

b. Scroll to the Reference Lists area.

c. In the NE Reference column, select **Internal Clock** from the drop-down list for all entries where the selected Clock Source is the OSCM that you are removing.

d. Click **Apply**.

Step 4 If you have overhead circuits on the node, complete the "DLP-G112 Delete Overhead Circuits" task on page 7-21.

Step 5 Delete the DWDM ring ID:

a. In node view, click the **Provisioning > Comm Channels > OSC** tabs.

b. Select the DWDM Ring ID that you want to delete and click **Delete**.

c. In the Delete DWDM Ring ID confirmation box, click **Yes**. Confirm that the changes appear.

Step 6 If you have OSC terminations, refer to the "DLP-G186 Delete an OSC Termination" task on page 10-30 to delete the OSC termination.

Step 7 Delete the OSCM card wavelength division multiplexing-automatic node setup (WDM-ANS) connections:

a. In node view, click the **Provisioning > WDM-ANS > Connections** tabs.

b. Select the connection to be deleted.

c. Click **Delete**.

d. In the Delete Optical Link dialog box, click **Yes**.

Step 8 Delete the card from CTC:

a. In node view, right-click the OSCM card.

b. Select **Delete Card** from the menu.

The card name disappears and the slot turns gray.

Step 9 Remove the cables from the OSCM OSC ports.

Step 10 Physically replace the deleted OSCM card on the ONS 15454 with an OSC-CSM card:

Note The OSCM card and OSC-CSM card do not have the same slot requirements.

a. Open the OSCM card ejectors.

b. Slide the card out of Slot 8 or 10.

c. Open the ejectors on the OSC-CSM card.

d. Slide the OSC-CSM card into the slot along the guide rails. Use ONS 15454 card Slots 1 to 6 or 12 to 17, according to your site plan.

e. Close the ejectors.

Note On the OSC-CSM card, the fail LED above the ACT/STBY LED becomes red, blinks for several seconds, and turns off. The ACT/STBY LED turns green and remains on. In node view, the OSC-CSM appears green.

Step 11 If an OSCM card was removed from Slot 8 and an OSC-CSM card was installed in Slots 12 to 17, modify the OSC-CSM line direction from east-to-west to west-to-east.

Note The Cisco MetroPlanner configuration file labels the OSC-CSM card as west even if it is installed in the east side of the node.

a. To modify the OSC-CSM card line direction, double-click the OSC-CSM card in node view. The card view appears.

a. Click the **Provisioning > Optical Line > Parameter** tabs.

b. In the port number 2 line, click the Line Direction drop-down list and choose **West to East**.

c. Click **Apply**.

Step 12 If an OSCM card was removed from Slot 10 and an OSC-CSM card was installed in Slots 1 to 6, modify the OSC-CSM line direction from west-to-east to east-to-west.

Note The Cisco MetroPlanner configuration file will label the OSC-CSM card as east even if it is installed in the west side of the node.

a. To modify the OSC-CSM card line direction, double-click the OSC-CSM card in node view. The card view appears.

b. Click the **Provisioning > Optical Line > Parameter** tabs.

c. In the port number 2 line, click the Line Direction drop-down list and choose **East to West**.

d. Click **Apply**.

Step 13 Calculate default connections using WDM-ANS:

a. Click the CTC up arrow to get back to node view.

a. In node view, click the **Provisioning > WDM-ANS > Connections** tabs.

b. Click the **Calculate Connections** button.

Step 14 Connect the cables from the OSC-CSM LINE ports to the OPT-BST amplifier OSC ports. Follow the recommended connections that were automatically calculated in the **Connections** tab as described in Step 13.

Step 15 Launch ANS port regulation:

a. In node view, click the **Provisioning > WDM-ANS > Port Status** tabs.

b. Click the **Launch ANS** button.

c. In the Link Status column, the ports change to Regulated.

Step 16 Create OSC terminations starting from the OSC-CSM card. See the *"NTP-G38 Provision OSC Terminations and Ring ID" procedure on page 3-74*.

Step 17 (Optional) If you want to set up timing on the OSC-CSM card, create the timing source:

a. In node view, click the **Provisioning > Timing** tabs.

b. Scroll down to the Reference Lists area.

c. In the NE Reference column, select **Internal Clock** from the drop-down list for all entries where the selected Clock Source is the OSC-CSM that you are adding.

d. Click **Apply**.

Step 18 (Optional) Complete the "NTP-G60 Create Overhead Circuits" procedure on page 7-13.

Step 19 Repeat Steps 3 through 18 for each OSCM card you are replacing in the node.

Step 20 If you are installing cross-connect cards, refer to the *Cisco ONS 15454 Procedure Guide* or the *Cisco ONS 15454 SDH Procedure Guide* for instructions.

Stop. You have completed this procedure.

NTP-G89 Change SNMP Settings

Purpose	This procedure modifies Simple Network Management Protocol (SNMP) settings for the ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	NTP-G28 Set Up SNMP, page 3-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24. If you are already logged in, continue with Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Perform any of the following tasks as needed:

- DLP-G197 Modify SNMP Trap Destinations, page 10-46
- DLP-G198 Delete SNMP Trap Destinations, page 10-47

Step 4 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G197 Modify SNMP Trap Destinations

Purpose	This task modifies the SNMP trap destinations on an ONS 15454 including community name, default User Datagram Protocol (UDP) port, SNMP trap version, and maximum traps per second.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > SNMP** tabs.

Step 2 Select a destination trap from the **Trap Destinations** area.

For a description of SNMP traps, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 3 Highlight the Destination row field entry in the Community column and change the entry to another valid community name.

The community name is a form of authentication and access control. The community name assigned to the ONS 15454 is case-sensitive and must match the community name of the network management system.

Step 4 If needed, modify the UDP port in the UDP Port field. The default UDP port for SNMP is 162.

Step 5 Set the Trap Version field for either SNMPv1 or SNMPv2.

Refer to your network management system (NMS) documentation to determine whether to use SNMPv1 or SNMPv2.

Step 6 If you want the SNMP agent to accept SNMP SET requests on certain MIBs, click the **Allow SNMP Sets** check box. If this box is not checked, SET requests are rejected.

Step 7 If you want to set up the SNMP proxy feature to allow network management, message reporting, and performance statistics retrieval across ONS firewalls, click the **Enable SNMP Proxy** check box located on the SNMP tab.

Step 8 Click **Apply**.

Step 9 SNMP settings are now modified. To view SNMP information for each node, highlight the node IP address in the Trap Destinations area of the Trap Destinations area. Confirm that the changes appear.

Step 10 Return to your originating procedure (NTP).

DLP-G198 Delete SNMP Trap Destinations

Purpose	This task deletes SNMP trap destinations on an ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, click the **Provisioning > SNMP** tabs.

Step 2 In the Trap Destinations area, click the destination trap that you want to delete.

Step 3 Click **Delete**. A confirmation dialog box appears.

Step 4 Click **Yes**. Confirm that the changes appear.

Step 5 Return to your originating procedure (NTP).

Change DWDM Card Settings

This chapter explains how to change line, performance monitoring (PM), and threshold settings on Cisco ONS 15454 optical service, amplifier, multiplexer and demultiplexer, 32WSS, and AIC-I cards. To install DWDM cards, see the "NTP-G30 Install the DWDM Cards" procedure on page 3-27.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

Before performing any of the following procedures, investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* as necessary.

Caution Changing card settings can be service affecting. You should make all changes during a scheduled maintenance window.

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. NTP-G90 Modify OSCM and OSC-CSM Line Settings and PM Parameters and Thresholds, page 11-2—As needed, complete this procedure to change the OSCM and OSC-CSM card settings.
2. NTP-G91 Modify OPT-PRE and OPT-BST Line Settings and PM Parameters and Thresholds, page 11-11—As needed, complete this procedure to change the amplifier card settings.
3. NTP-G92 Modify 32MUX-O, 32DMX-O, 32DMX, and 4MD Line Settings and PM Thresholds, page 11-22—As needed, complete this procedure to change the multiplexer and demultiplexer card settings.
4. NTP-G93 Modify the 32WSS Thresholds and Settings, page 11-31—As needed, complete this procedure to change the 32WSS card settings.
5. NTP-G101 Modify Alarm Interface Controller–International Settings, page 11-41—As needed, complete this procedure to change settings for external alarms, controls, and orderwire for the AIC-I card.
6. NTP-G102 Change Card Service State, page 11-44—As needed, complete this procedure to change the card service state.

NTP-G90 Modify OSCM and OSC-CSM Line Settings and PM Parameters and Thresholds

Purpose	This procedure changes the optical service channel (OC-3/STM-1) and PM parameters and thresholds for the OSCM and OSC-CSM cards.
Tools/Equipment	None
Prerequisite Procedures	NTP-G30 Install the DWDM Cards, page 3-27
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the OSCM or OSC-CSM card settings. If you are already logged in, proceed to Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Perform any of the following tasks as needed:

- DLP-G199 Change the OSCM and OSC-CSM Optical Service Channel Settings, page 11-2
- DLP-G200 Change the OSCM and OSC-CSM Optical Service Channel Thresholds, page 11-5
- DLP-G201 Change Optical Line Parameters for OSCM and OSC-CSM Cards, page 11-6
- DLP-G202 Change the OSCM and OSC-CSM Optical Line Threshold Settings, page 11-8
- DLP-G203 Change the OSCM and OSC-CSM ALS Maintenance Settings, page 11-10

Step 4 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G199 Change the OSCM and OSC-CSM Optical Service Channel Settings

Purpose	This task changes the optical service channel (OC-3/STM-1) optical service channel settings for OSCM and OSC-CSM cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the OSCM or OSC-CSM card where you want to change the OC-3 optical line settings.

Step 2 Click the **Provisioning > OC3 Line > OC3 Line** tabs.

Step 3 Modify any of the settings described in Table 11-1. The provisionable paramenters are listed in the options column in the table.

Table 11-1 OSCM and OSC-CSM Card OC-3 Settings

Parameter	Description	Options
Port #	Displays the port number.	Display only
Port Name	Provides the ability to assign the specified port a name.	User-defined. Name can be up to 32 alphanumeric/special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
SF BER	Sets the signal fail bit error rate.	Under the drop-down list choose from the following. • 1E-3 • 1E-4 • 1E-5
SD BER	Sets the signal degrade bit error rate.	Under the drop-down list choose from the following. • 1E-5 • 1E-6 • 1E-7 • 1E-8 • 1E-9
Provides Synch	(Display only) If checked, the card is provisioned as a network element timing reference.	• Checked • Unchecked
SynMsgIn	Enables synchronization status messages (S1 byte), which allow the node to choose the best timing source.	• Checked • Unchecked
Send Do Not Use	When checked, sends a DUS (do not use) message on the S1 byte.	• Checked • Unchecked
PJSTSMon #	(Display only) Sets the STS that will be used for pointer justification. If set to 0, no STS is monitored. Only one STS can be monitored on each OC-N port.	Display only

Table 11-1 OSCM and OSC-CSM Card OC-3 Settings (continued)

Parameter	Description	Options
Admin State	(Display only) Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	• IS (ANSI) or Unlocked (ETSI)—Puts the port in-service. The port service state changes to IS-NR (ANSI) or Unlocked-enabled (ETSI). • IS,AINS (ANSI) or Unlocked,automaticInService (ETSI)—Puts the port in automatic in-service. The port service state changes to OOS-AU,AINS (ANSI) or Unlocked-disabled,automaticInService (ETSI). • OOS,DSBLD (ANSI) or Locked,disabled (ETSI)—Removes the port from service and disables it. The port service state changes to OOS-MA,DSBLD (ANSI) or Locked-enabled,disabled (ETSI). • OOS,MT (ANSI) or Locked,maintenance (ETSI)—Removes the port from service for maintenance. The port service state changes to OOS-MA,MT (ANSI) or Locked-enabled,maintenance (ETSI).
Service State	(Display only) Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	• IS-NR (In-Service and Normal [ANSI]) or Unlocked-enabled (ETSI)— The port is fully operational and performing as provisioned. • OOS-AU,AINS (Out-Of-Service and Autonomous, Automatic In-Service [ANSI]) or Unlocked-disabled,automaticInService (ETSI)— The port is out-of-service, but traffic is carried. Alarm reporting is suppressed. The ONS node monitors the ports for an error-free signal. After an error-free signal is detected, the port stays in the OOS-AU,AINS/Unlocked-disabled,automaticInService state for the duration of the soak period. After the soak period ends, the port service state changes to IS-NR/Unlocked-enabled. • OOS-MA,DSBLD (Out-of-Service and Management, Disabled [ANSI]) or Locked-enabled,disabled (ETSI)— The port is out-of-service and unable to carry traffic. • OOS-MA,MT (Out-of-Service and Management, Maintenance [ANSI]) or Locked-enabled,maintenance (ETSI)— The port is out-of-service for maintenance. Alarm reporting is suppressed, but traffic is carried and loopbacks are allowed.

Table 11-1 OSCM and OSC-CSM Card OC-3 Settings (continued)

Parameter	Description	Options
AINS Soak	(Display only) Sets the automatic in-service soak period.	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments
Type	Defines the port as SONET or SDH. The Enable Sync Msg field and the Send Do Not Use field must be disabled before the port can be set to SDH.	Under the drop-down list choose from the following. • SONET • SDH

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G200 Change the OSCM and OSC-CSM Optical Service Channel Thresholds

Purpose	This task changes the OC-3 (STM-1) SONET (SDH) thresholds settings for the OSC signal transmitted by the OSCM and OSC-CSM cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the OSCM or OSC-CSM card where you want to change the optical line threshold settings.

Step 2 Click the **Provisioning > OC3 Line > SONET Thresholds** tabs.

Step 3 Modify any of the settings described in Table 11-2. The provisionable paramenters are listed in the options column in the table.

Table 11-2 OSCM and OSC-CSM Cards SONET Threshold Settings

Parameter	Description	Options
Port	Displays the port number	Display only
CV	Coding violations	Numeric. Can be set for 15-minute or one-day intervals for Line or Section (Near and Far End). Select the bullet and click **Refresh**. Double-click the paramenter, enter a value, and press **Enter**.
ES	Errored seconds	Numeric. Can be set for 15-minute or one-day intervals for Line or Section (Near and Far End). Select the bullet and click **Refresh**. Double-click the paramenter, enter a value, and press **Enter**.

Table 11-2 OSCM and OSC-CSM Cards SONET Threshold Settings (continued)

Parameter	Description	Options
SES	Severely errored seconds	Numeric. Can be set for 15-minute or one-day intervals for Line or Section (Near and Far End). Select the bullet and click **Refresh**. Double-click the paramenter, enter a value, and press **Enter**.
SEFS	Severely errored framing seconds	Numeric. Can be set for Far End, for 15-minute or one-day intervals for Section only. Select the bullet and click **Refresh**. Double-click the paramenter, enter a value, and press **Enter**.
FC	Failure count	Numeric. Can be set for 15-minute or one-day intervals for Line or Section. Select the bullet and click **Refresh** or Path (Near and Far End). Double-click the paramenter, enter a value, and press **Enter**.
UAS	Unavailable seconds	Numeric. Can be set for 15-minute or one-day intervals for Line or Section (Near and Far End). Select the bullet and click **Refresh**. Double-click the paramenter, enter a value, and press **Enter**.

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G201 Change Optical Line Parameters for OSCM and OSC-CSM Cards

Purpose	This task changes the optical line parameters for OSCM and OSC-CSM cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the OSCM or OSC-CSM card where you want to change the optical line parameters.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Modify any of the settings described in Table 11-3. The provisionable paramenters are listed in the options column in the table.

Table 11-3 OSCM and OSC-CSM Card Optical Line Parameter Settings

Parameter	Description	Options
Port #	Displays the port number and TX or RX.	Read-only
Port Name	Provides the ability to assign the specified port a name.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	Under the drop-down list choose from the following. • IS/Unlocked • IS,AINS/Unlocked,automaticInService • OOS,DSBLD/Locked,disabled • OOS,MT/Locked,maintenance
Line Direction	Provides the ability to associate a card with the line direction. CTC automatically configures the line direction during node setup. To change this setting, you must change the Cisco MetroPlanner site plan and import it to the node.	Under the drop-down list choose from the following. • East to West • West to East
Service State	(Display only) Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	• IS-NR/Unlocked-enabled • OOS-AU,AINS/Unlocked-disabled, automaticInService • OOS-MA,DSBLD/Locked-enabled,disabled • OOS-MA,MT/Locked-enabled,maintenance
Type	(Display only) Identifies the type of port.	• Input Com • Output Com • Input Line • Output Line • Input OSC • Output OSC
Power	(Display only) Shows the current power level per port.	—
VOA Mode	(Display only) Shows the functional mode of the variable optical attenuator (VOA), when present.	• Constant Attenuation • Constant Power
VOA Power Ref	(Display only) Shows the optical power setpoint that must be reached when a VOA is present and VOA Mode is set to Constant Power. This parameter can only be modified by Automatic Node Setup (ANS).	—
VOA Power Calib	Modifies the optical power value of the VOA when VOA Mode is set to Constant Power.	Numeric, double-click the paramenter, enter a value, and press **Enter**.

Table 11-3 OSCM and OSC-CSM Card Optical Line Parameter Settings (continued)

Parameter	Description	Options
VOA Attenuation Ref	(Display only) Shows the VOA attenuation value when VOA Mode is set to Constant Attenuation. This parameter can only be modified by ANS.	—
VOA Attenuation Calib	Modifies the attenuation value of the VOA when the VOA Mode is set to Constant Attenuation.	Numeric, double-click the paramenter, enter a value, and press **Enter**.

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G202 Change the OSCM and OSC-CSM Optical Line Threshold Settings

Purpose	This task changes the optical line threshold settings for OSCM and OSC-CSM cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the OSCM or OSC-CSM card where you want to change the optical channel threshold settings.

Step 2 Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

Step 3 Under Types, choose the type of threshold you want to change, either **Warning** or **Alarm**.

Caution Warning thresholds are not monitored by CTC. They must be user-provisioned and monitored through custom alarm profiles.

Step 4 Click **Refresh**.

Step 5 Modify any of the warning or alarm threshold settings. Table 11-4 shows the thresholds for warnings. Table 11-5 shows the thresholds for alarms.

Table 11-4 OSCM and OSC-CSM Cards Optical Channel Warning Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	Display only
opwrMin (dBm)	Sets the low power warning level.	Numeric. Can be set for 15-minute or one-day intervals. Default: –50 dBm. Double-click the paramenter, enter a value, and press **Enter**.
opwrMax (dBm)	Sets the high power warning level.	Numeric. Can be set for 15-minute or one-day intervals. Default: 30 dBm. Double-click the paramenter, enter a value, and press **Enter**.

Table 11-5 OSCM and OSC-CSM Cards Optical Channel Alarm Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
Power Failure Low (dBm)	Shows the optical power failure low threshold for the port. The threshold is calculated automatically when you run Automatic Node Setup (ANS). If the VOA Mode is Constant Attenuation, you can manually change the threshold. The value must be within the optical power range that is specified for the card. (See Appendix B, "Hardware Specifications.") If VOA Mode is Constant Power, you cannot change the threshold manually because it is based on the Power setpoint (Optics Thresholds tab). To change the threshold, you must change the VOA Power Calib value. This adjusts the Power setpoint. The threshold is automatically set to a value that is 5 dB higher than the Power setpoint.	Numeric, double-click the paramenter, enter a value, and press **Enter**.
Power Degrade High (dBm)	Shows the power degrade high threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to a port that is associated to a VOA (OSC-VOA). In Constant Power mode, the port is always active and the threshold is automatically linked to the Power Setpoint (VOA Power Ref + VOA Power Calib). To change the threshold, change the Power Setpoint. The threshold will always be 2 dB higher than the Power Setpoint.	Display only Numeric.

Table 11-5 OSCM and OSC-CSM Cards Optical Channel Alarm Thresholds Settings (continued)

Parameter	Description	Options
Power Degrade Low (dBm)	Shows the power degrade low threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to a port associated to a VOA (OSC-VOA) always active in Constant Power mode. In this case the threshold is automatically linked to the Power Setpoint (VOA Power Ref + VOA Power Calib) provisioned: changing the setpoint will result in changing the threshold (always 2dB lower).	Display only Numeric.
VOA Degrade High (dBm)	Does not apply to OSCM and OSC-CSM cards.	—
VOA Degrade Low (dBm)	Does not apply to OSCM and OSC-CSM cards.	—

Step 6 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 7 Return to your originating procedure (NTP).

DLP-G203 Change the OSCM and OSC-CSM ALS Maintenance Settings

Purpose	This task changes the automatic laser shutdown (ALS) maintenance settings for the OSC-CSM, OSCM cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the OSC-CSM or OSCM where you want to change the ALS maintenance settings.

Step 2 Click the **Maintenance > ALS** tabs.

Step 3 Modify any of the settings described in Table 11-6. The provisionable paramenters are listed in the options column in the table.

Table 11-6 OSC-CSM or OSCM Maintenance Settings

Parameter	Description	Options
OSRI	Optical safety remote interlock. When set to On, the OSC TX output power is shut down.	Under the drop-down list choose from the following. On and off
ALS Mode	Automatic laser shutdown. For OSCM cards ALS provides the ability to shut down the OSC TX Laser when the OSC RX detects an LOS. For OSC-CSM cards, ALS provides the same functions as the OSCM card and also enables an optical safety mechanism at DWDM network layer. See the "15.8.5.13 Automatic Laser Shutdown" section on page 15-105 for more information.	Under the drop-down list choose from the following. • Disable—Deactivates ALS. • Auto Restart (default)—ALS is active. The power is automatically shut down when needed and automatically tries to restart using a probe pulse until the cause of the failure is repaired. • Manual Restart • Manual Restart for Test
Recovery Pulse Duration	(Display only) Displays the duration of the optical power pulse that begins when an amplifier restarts.	—
Recovery Pulse Interval	(Display only) Displays the interval between optical power pulses.	—
Currently Shutdown	(Display only) Displays the current status of the laser.	—
Request Laser Restart	If checked, allows you to restart the laser, for maintenance.	Checked or unchecked

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

NTP-G91 Modify OPT-PRE and OPT-BST Line Settings and PM Parameters and Thresholds

Purpose	This procedure changes the line and threshold settings for the OPT-PRE and OPT-BST amplifier cards.
Tools/Equipment	None
Prerequisite Procedures	NTP-G30 Install the DWDM Cards, page 3-27
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the OPT-PRE or OPT-BST amplifier card settings. If you are already logged in, proceed to Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Perform any of the following tasks as needed:

- DLP-G204 Change Optical Line Settings for OPT-PRE and OPT-BST Amplifiers, page 11-12
- DLP-G205 Change Optical Line Threshold Settings for OPT-PRE and OPT-BST Amplifiers, page 11-14
- DLP-G206 Change Optical Amplifier Line Settings for OPT-PRE and OPT-BST Amplifiers, page 11-15
- DLP-G207 Change Optical Channel Threshold Settings for OPT-PRE and OPT-BST Amplifiers, page 11-17
- DLP-G322 Change the OPT-BST ALS Maintenance Settings, page 11-21

Step 4 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G204 Change Optical Line Settings for OPT-PRE and OPT-BST Amplifiers

Purpose	This task changes the optical line settings for OPT-PRE and OPT-BST amplifier cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the OPT-PRE or OPT-BST amplifier where you want to change the optical line settings.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Modify any of the settings described in Table 11-7. The provisionable paramenters are listed in the options column in the table.

Table 11-7 OPT-PRE and OPT-BST Amplifier Optical Line Settings

Parameter	Description	Options
Port #	(Display only) Displays the port number.	Displays port number and TX or RX.
Port Name	Provides the ability to assign the specified port a name.	User-defined. Name can be up to 32 alphanumeric/special characters. Blank by default. Double-click, enter the name, and press **Enter**. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.

Table 11-7 OPT-PRE and OPT-BST Amplifier Optical Line Settings (continued)

Parameter	Description	Options
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	Under the drop-down list choose from the following. • IS/Unlocked • IS,AINS/Unlocked,automaticInService • OOS,DSBLD/Locked,disabled • OOS,MT/Locked,maintenance
Line Direction	Provides the ability to associate a card with the line direction. CTC automatically configures the line direction during node setup. To change this setting, you must change the Cisco MetroPlanner site plan and import it to the node.	Under the drop-down list choose from the following. • East to West • West to East
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	Display only • IS-NR/Unlocked-enabled • OOS-AU,AINS/Unlocked-disabled, automaticInService • OOS-MA,DSBLD/Locked-enabled,disabled • OOS-MA,MT/Locked-enabled,maintenance
Type	(Display only) Identifies the type of port.	For OPT-BST cards: • Input Com • Output Com • Input Line • Output Line • Input OSC • Output OSC For OPT-PRE cards: • Input Com • Input DCU • Output DCU
Power	(Display only) Shows the current power level per port.	—
AINS Soak	(Display only) Shows the soak time.	—

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G205 Change Optical Line Threshold Settings for OPT-PRE and OPT-BST Amplifiers

Purpose	This task changes the optical line threshold settings for OPT-PRE and OPT-BST amplifier cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Warning thresholds are not monitored by CTC. They must be user-provisioned and monitored through custom alarm profiles.

Step 1 In node view, double-click the OPT-PRE or OPT-BST amplifier where you want to change the optical line threshold settings.

Step 2 Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

Step 3 Under Types, choose the type of threshold you want to change, either **Warning** or **Alarm**.

Step 4 Click **Refresh**.

Step 5 Modify any of the warning or alarm threshold settings. Table 11-8 shows the thresholds for warnings. Table 11-9 shows the thresholds for alarms. The provisionable paramenters are listed in the options column in the table.

Table 11-8 OPT-PRE and OPT-BST Cards Optical Channel Warning Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
opwrMin (dBm)	Sets the low power warning level.	Numeric. Can be set for 15-minute or one-day intervals. Default: –50 dBm. Double-click, enter the name, and press **Enter**.
opwrMax (dBm)	Sets the high power warning level.	Numeric. Can be set for 15-minute or one-day intervals. Default: 30 dBm. Double-click, enter the name, and press **Enter**.

Table 11-9 OPT-PRE and OPT-BST Cards Optical Channel Alarm Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
Power Failure Low (dBm)	Shows the optical power failure low threshold for the port. The threshold is calculated automatically when you run Automatic Node Setup (ANS). You can manually change the threshold. The value must be within the optical power range that is specified for the card. (See Appendix B, "Hardware Specifications.") For OPT-BST cards, this parameter applies to Port 2 (Output COM) and Port 4 (Output OSC) are related to Optical Safety mechanism at DWDM Network layer (see Chapter 16: "16.4 Network Optical Safety - Automatic Laser Shutdown" for a detailed description).	Numeric, double-click the paramenter, enter a value, and press **Enter**.
Power Degrade High (dBm)	Does not apply to OPT-BST and OPT-PRE line parameters.	Numeric.
Power Degrade Low (dBm)	Does not apply to OPT-BST and OPT-PRE line parameters.	Numeric.
VOA Degrade High (dBm)	Does not apply to OPT-BST and OPT-PRE line parameters.	—
VOA Degrade Low (dBm)	Does not apply to OPT-BST and OPT-PRE line parameters.	—

Step 6 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 7 Return to your originating procedure (NTP).

DLP-G206 Change Optical Amplifier Line Settings for OPT-PRE and OPT-BST Amplifiers

Purpose	This task changes the optical amplifier line settings for OPT-PRE and OPT-BST amplifier cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the OPT-PRE or OPT-BST amplifier where you want to change the optical amplifier line settings.

Step 2 Click the **Provisioning > Opt. Ampli. Line > Parameters** tabs.

Step 3 Modify any of the settings described in Table 11-10. The provisionable paramenters are listed in the options column in the table.

Table 11-10 OPT-PRE and OPT-BST Optical Amplifier Line Settings

Parameter	Description	Options
Port #	(Display only) Displays the port number.	Displays port number and TX or RX.
Port Name	Provides the ability to assign the specified port a name.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	Under the drop-down list choose from the following. • IS/Unlocked • IS,AINS/Unlocked,automaticInService • OOS,DSBLD/Locked,disabled • OOS,MT/Locked,maintenance
Line Direction	Provides the ability to associate a card with the line direction. CTC automatically configures the line direction during node setup. To change this setting, you must change the Cisco MetroPlanner site plan and import it to the node.	Under the drop-down list choose from the following. • East to West • West to East
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	Display only • IS-NR/Unlocked-enabled • OOS-AU,AINS/Unlocked-disabled, automaticInService • OOS-MA,DSBLD/Locked-enabled,disabled • OOS-MA,MT/Locked-enabled,maintenance
Type	(Display only) Identifies the type of port.	Output Line
Total Output Power	(Display only) Shows the current power level per port.	—
Channel Power Ref.	(Display only) Shows the optical per-channel signal power setpoint that must be reached at the amplifier output when gain control is active.	—
Offset	Adjusts the Total Output Power unless network conditions prevent the adjustment, for example the port is in IS state.	Double-click the paramenter, enter a value, and press **Enter**.
Signal Output Power	Shows the current output power leaving the amplifier, including the ASE contribution.	—
Channel Power Ref	(Display only) Shows the optical power per channel leaving the amplifier.	—

Table 11-10 OPT-PRE and OPT-BST Optical Amplifier Line Settings (continued)

Parameter	Description	Options
Gain	(Display only) The current gain of the amplifiers.	—
Gain Set Point	The value of the gain that the amplifier must achieve. Automatic Power Control (APC) can modify this value based on the number OCHNC circuits that are managed by the amplifier or to compensate fiber aging insertion loss. See the "17.4 Automatic Power Control" section on page 17-17 for more information.	Display only or numeric depending on mode setting. When the system is configured as metro core, this field is display only. When the system is configured as metro access this field can be changed by the user.
Tilt Reference	(Display only) Shows the default value for the amplifier tilt. This field can only be modified by ANS.	—
Tilt Calibration	Allows you to manually change the amplifier tilt.	Numeric, double-click the paramenter, enter a value, and press **Enter**.
Working Mode	(Display only) Shows the working mode of the amplifier.	Control gain Control power
DCU Insertion Loss	(OPT-PRE cards only; display only) Shows the working mode of the amplifier.	Control gain Control power
Output Power Set-point	(Display only) The output power set-point.	Numeric

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G207 Change Optical Channel Threshold Settings for OPT-PRE and OPT-BST Amplifiers

Purpose	This task changes the optical channel threshold settings for OPT-PRE and OPT-BST amplifier cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Warning thresholds are not monitored by CTC. They must be user-provisioned and monitored through custom alarm profiles.

Step 1 In node view, double-click the OPT-PRE or OPT-BST amplifier where you want to change the optical channel threshold settings.

Step 2 Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

Step 3 Under Types, choose the type of threshold you want to change, either **Warning** or **Alarm**.

Step 4 Click **Refresh**.

Step 5 Modify any of the warning or alarm threshold settings. Table 11-11 shows the amplifier line thresholds for warnings. Table 11-12 shows the amplifier line thresholds for alarms. The provisionable paramenters are listed in the options column in the table.

Table 11-11 OPT-PRE and OPT-BST Cards Amplifier Line Warning Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
opwrMin (dBm)	Sets the low power warning level.	Numeric. Can be set for 15-minute or one-day intervals. Default: –50 dBm. Double-click the paramenter, enter a value, and press **Enter**.
opwrMax (dBm)	Sets the high power warning level.	Numeric. Can be set for 15-minute or one-day intervals. Default: 30 dBm. Double-click the paramenter, enter a value, and press **Enter**.

Table 11-12 OPT-PRE and OPT-BST Cards Amplifier Line Alarm Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
Power Failure Low (dBm)	Shows the optical power failure low threshold for the port. The threshold is calculated automatically when you run Automatic Node Setup (ANS). You can manually change the threshold. The value must be within the optical power range that is specified for the card. (See Appendix B, “Hardware Specifications.”)	Numeric, double-click the paramenter, enter a value, and press **Enter**.

Table 11-12 OPT-PRE and OPT-BST Cards Amplifier Line Alarm Thresholds Settings (continued)

Parameter	Description	Options
Power Degrade High (dBm)	Shows the current value of the optical power degrade high threshold. This threshold applies only when the amplifier is active and in constant power mode. Power Degrade High refers to the port's Signal Output Power value and is automatically calculated by the TCC2/TCC2P when the amplifier is turned up. The Power Degrade High threshold is linked to the Output Power Setpoint on the Parameters tab. Changing the setpoint changes the Power Degrade High threshold. The threshold value is always 2 dB higher than the Output Power Setpoint value. APC can modify this value based on the number of OCHNC circuits the amplifier is managing. See the "17.4 Automatic Power Control" section on page 17-17 for more information.	Display only
Power Degrade Low (dBm)	Shows the current value of the optical power degrade high threshold configured in the card. This threshold applies only when the amplifier is active and in constant power mode. Power Degrade Low refers to the port's Signal Output Power value and is automatically calculated by the TCC when the amplifier is turned up. The Power Degrade Low threshold is automatically linked to the Output Power Setpoint on the Parameters tab. Changing the setpoint changes the Power Degrade Low threshold. The threshold value is always 2 dB lower than the Output Power Setpoint. APC can modify this value based on the number of OCHNC circuits the amplifier is managing.	Display only

Table 11-12 OPT-PRE and OPT-BST Cards Amplifier Line Alarm Thresholds Settings (continued)

Parameter	Description	Options
Gain Degrade High (dBm)	Shows the current value of the gain degrade high threshold configured in the card. This threshold applies only when the amplifier is active and in constant gain mode. Gain Degrade High refers to the port's Gain value and is automatically calculated by the TCC and when the amplifier is turned up. The Gain Degrade High threshold is linked to the Gain setpoint. Changing the setpoint changes the Gain Degrade High threshold. The threshold value is always 2 dB higher than the Gain Setpoint value. APC can modify this value based on the number of OCHNC circuits the amplifier is managing and to compensate for insertion loss due to fiber aging.	—
Gain Degrade Low (dBm)	Shows the current value of the gain degrade low threshold configured in the card. This threshold applies only when the amplifier is active and in constant gain mode. Gain Degrade Low refers to the port's Gain value and is automatically calculated by the TCC and when the amplifier is turned up. The Gain Degrade Low threshold is automatically linked to the Gain Setpoint that is provisioned. Changing the setpoint changes the Gain Degrade Low threshold. The threshold value is always 2 dB lower than the Gain Setpoint value. APC can also modify this value based on the number of OCHNC circuits the amplifier is managing.	—

Step 6 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 7 Return to your originating procedure (NTP).

DLP-G322 Change the OPT-BST ALS Maintenance Settings

Purpose	This task changes the automatic laser shutdown (ALS) maintenance settings for the OPT-BST card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the OPT-BST where you want to change the ALS maintenance settings.

Step 2 Click the **Maintenance > ALS** tabs.

Step 3 Modify any of the settings described in Table 11-13. The provisionable paramenters are listed in the options column in the table.

Table 11-13 OPT-BST Maintenance Settings

Parameter	Description	Options
OSRI	Optical safety remote interlock. When set to On, the OPT-BST TX output power is shut down.	Under the drop-down list choose from the following. On and off
ALS Mode	Automatic laser shutdown. For OPT-BST cards ALS provides the ability to shut down the OPT-BST TX Laser when the OPT-BST RX detects an LOS. ALS also enables an optical safety mechanism at the DWDM network layer. See the "15.8.1.2 Automatic Laser Shutdown" section on page 15-83 for more information.	Under the drop-down list choose from the following. • Disable—Deactivates ALS. • Auto Restart (default)—ALS is active. The power is automatically shut down when needed and automatically tries to restart using a probe pulse until the cause of the failure is repaired. • Manual Restart • Manual Restart for Test
Recovery Pulse Duration	(Display only) Displays the duration of the optical power pulse that begins when an amplifier restarts.	—
Recovery Pulse Interval	(Display only) Displays the interval between optical power pulses.	—
Currently Shutdown	(Display only) Displays the current status of the laser.	—
Request Laser Restart	If checked, allows you to restart the laser, for maintenance.	Checked or unchecked

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

NTP-G92 Modify 32MUX-O, 32DMX-O, 32DMX, and 4MD Line Settings and PM Thresholds

Purpose	This procedure changes the line and PM parameter threshold settings for the multiplexer and demultiplexer cards. The cards included in this category are the 32MUX-O,32DMX-O,32DMX, and 4MD-xx.x cards.
Tools/Equipment	None
Prerequisite Procedures	NTP-G30 Install the DWDM Cards, page 3-27
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Complete the "DLP-G141 View Optical Power Statistics for 32MUX-O, 32-WSS, 32-DMX-O, and 32DMX Cards" task on page 9-12 to view multiplexer and demultiplexer optical power statistics.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the 32MUX-O, 32DMX, or 4MD-xx.x card settings. If you are already logged in, proceed to Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Perform any of the following tasks as needed:

- DLP-G208 Change Optical Line Settings for Multiplexer and Demultiplexer Cards, page 11-23
- DLP-G209 Change Optical Line Threshold Settings for Multiplexer and Demultiplexer Cards, page 11-25
- DLP-G210 Change Optical Channel Settings for Multiplexer and Demultiplexer Cards, page 11-26
- DLP-G211 Change Optical Channel Threshold Settings for Multiplexer and Demultiplexer Cards, page 11-29

Step 4 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G208 Change Optical Line Settings for Multiplexer and Demultiplexer Cards

Purpose	This task changes the optical line settings for 32MUX-O, 32DMX-O, 32DMX, and 4MD-xx.x multiplexer and demultiplexer cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the multiplexer or demultiplexer cards where you want to change the optical line settings.

Step 2 Click the **Provisioning > Optical Line > Parameters** tabs.

Step 3 Modify any of the settings described in Table 11-14. In the Options column, the SONET option is followed by the SDH option. The provisionable paramenters are listed in the options column in the table.

Table 11-14 Multiplexer and Demultiplexer Card Optical Line Settings

Parameter	Description	Options
Port #	(Display only) Displays the port number.	Displays port number and TX or RX.
Port Name	Provides the ability to assign the specified port a name.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. Double-click, enter the name, and press **Enter**. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	Under the drop-down list choose from the following. • IS/Unlocked • IS,AINS/Unlocked,automaticInService • OOS,DSBLD/Locked,disabled • OOS,MT/Locked,maintenance
Line Direction	Provides the ability to associate a card with the line direction. CTC automatically configures the line direction during node setup. To change this setting, you must change the Cisco MetroPlanner site plan and import it to the node.	Under the drop-down list choose from the following. • East to West • West to East
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	Display only • IS-NR/Unlocked-enabled • OOS-AU,AINS/Unlocked-disabled, automaticInService • OOS-MA,DSBLD/Locked-enabled,disabled • OOS-MA,MT/Locked-enabled,maintenance

Table 11-14 Multiplexer and Demultiplexer Card Optical Line Settings (continued)

Parameter	Description	Options
Type	(Display only) Identifies the type of port.	Display only • Input Com • Output Com
Power	(Display only) Shows the current power level per port.	—
VOA Mode	(32DMX only; display only) Shows the functional mode of the variable optical attenuator (VOA), when present.	Display only • Constant Attenuation • Constant Power
VOA Power Ref	(32DMX only; display only) Shows the optical power setpoint that must be reached when a VOA is present and VOA Mode is set to Constant Power. This parameter can only be modified by Automatic Node Setup (ANS).	—
VOA Power Calib	(32DMX only) Modifies the optical power value of the VOA when VOA Mode is set to Constant Power.	—
VOA ATTenuation Ref	(32DMX only; display only) Shows the VOA attenuation value when VOA Mode is set to Constant Attenuation. This parameter can only be modified by ANS.	—
VOA Attenuation Calib	(32DMX only) Modifies the attenuation value of the VOA when the VOA Mode is set to Constant Attenuation.	Numeric, double-click the paramenter, enter a value, and press **Enter**.
AINS Soak	(Display only) Sets the automatic in-service soak period.	Display only • Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G209 Change Optical Line Threshold Settings for Multiplexer and Demultiplexer Cards

Purpose	This task changes the optical line threshold settings for 32MUX-O, 32DMX-O, 32DMX, and 4MD-xx.x multiplexer and demultiplexer cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the multiplexer or demultiplexer cards where you want to change the optical line threshold settings.

Step 2 Click the **Provisioning > Optical Line > Optics Thresholds** tabs.

Step 3 Under Types, choose the type of threshold you want to change, either **Warning** or **Alarm**.

Step 4 Click **Refresh**.

Step 5 Modify any of the warning or alarm threshold settings. Table 11-15 shows the amplifier line thresholds for warnings. The provisionable paramenters are listed in the options column in the table.

Table 11-15 Multiplexer and Demultiplexer Cards Amplifier Line Warning Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
opwrMin (dBm)	Sets the low power warning level.	Numeric. Can be set for 15-minute or one-day intervals. Default: –50 dBm. Double-click the paramenter, enter a value, and press **Enter**.
opwrMax (dBm)	Sets the high power warning level.	Numeric. Can be set for 15-minute or one-day intervals. Default: 30 dBm. Double-click the paramenter, enter a value, and press **Enter**.

Caution Warning thresholds are not monitored by CTC. They must be user-provisioned and monitored through custom alarm profiles.

Table 11-16 shows the amplifier line thresholds for alarms.

Table 11-16 Multiplexer and Demultiplexer Amplifier Line Alarm Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
Power Failure Low (dBm)	Shows the optical power failure low threshold for the port. The threshold is calculated automatically when you run Automatic Node Setup (ANS). You can manually change the threshold. The value must be within the optical power range that is specified for the card. (See Appendix B, "Hardware Specifications.")	Numeric, double-click the paramenter, enter a value, and press **Enter**.
Power Degrade High (dBm)	Not applicable to 32MUX-O, 32DMX-O, 32DMX and 4MD cards.	—
Power Degrade Low (dBm)	Not applicable to 32MUX-O, 32DMX-O, 32DMX and 4MD cards.	—
Power Add Failure Low (dBm)	Not applicable to 32MUX-O, 32DMX-O, 32DMX and 4MD cards.	Numeric, double-click the paramenter, enter a value, and press **Enter**.

Step 6 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 7 Return to your originating procedure (NTP).

DLP-G210 Change Optical Channel Settings for Multiplexer and Demultiplexer Cards

Purpose	This task changes the optical channel settings for 32MUX-O, 32DMX-O, 32DMX, and 4MD-xx.x multiplexer and demultiplexer cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the multiplexer or demultiplexer card where you want to change the optical channel settings.

Step 2 Click the **Provisioning > Optical Chn > Parameters** tabs.

Step 3 Modify any of the settings described in Table 11-17. The provisionable paramenters are listed in the options column in the table.

Table 11-17 Multiplexer and Demultiplexer Card Optical Channel Settings

Parameter	Description	Options
Port #	(Display only) Displays the port number.	Displays port number and TX or RX.
Port Name	Provides the ability to assign the specified port a name.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. Double-click, enter the name, and press **Enter**. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	Under the drop-down list choose from the following. • IS/Unlocked • IS,AINS/Unlocked,automaticInService • OOS,DSBLD/Locked,disabled • OOS,MT/Locked,maintenance
Line Direction	Provides the ability to associate a card with the line direction. CTC automatically configures the line direction during node setup. To change this setting, you must change the Cisco MetroPlanner site plan and import it to the node.	Under the drop-down list choose from the following. • East to West • West to East
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	Display only • IS-NR/Unlocked-enabled • OOS-AU,AINS/Unlocked-disabled, automaticInService • OOS-MA,DSBLD/Locked-enabled,disabled • OOS-MA,MT/Locked-enabled,maintenance
Type	Identifies the type of port.	Display only • ADD • DROP
Power	(Display only) Shows the current power level per port.	—
VOA Mode	(32MUX-O, 32DMX-0, 4MD only) Shows the current functional mode of the VOA.	Display only • Constant Power • Constant Attenuation
VOA Power Ref.	(32MUX-O, 32DMX-0, 4MD only) Shows the Power setpoint that must be reached on the path where a VOA is present when the VOA Mode is Constant Power. Demultiplexers show the reference value of the desired optical power going to the client. Multiplexers show the reference value of the desired per-channel optical power. This parameter can only be modified by ANS.	Display only

Table 11-17 Multiplexer and Demultiplexer Card Optical Channel Settings (continued)

Parameter	Description	Options
VOA Power Calib.	(32MUX-O, 32DMX-0, 4MD only) The user can modify the optical output power to the VOA if necessary. The VOA power calibration offsets the VOA power reference. For demultplexers, you can modify the optical output power to the client if necessary. For multiplexers, you can modify the output power per channel. This feature is normally used when the Network Type is configured as Access in Provisioning > WDM-ANS tabs.	Numeric, double-click the parementer, enter a value and press **Enter**.
VOA Attenuation Ref.	(Display only; 32MUX-O, 32DMX-0, 4MD only) Shows the attenuation value of the VOA when the VOA is set in attenuation mode. This parameter can only be modified by ANS and APC.	Display only
VOA Attenuation Calib.	(32MUX-O, 32DMX-0, and 4MD only) Allows the user to modify the attenuation value of the VOA if necessary when the VOA mode is set for constant attenuation.	Numeric, dounle-click the parementer, enter a value and press **Enter**.
Actual Wavelength	(Display only) Shows the wavelength specified by the manufacturing data. This field cannot be set manually.	Display only
Expected Wavelength	Shows the preprovisioned wavelength. This field is used to preprovsion cards.	Numeric, double-click the parementer, enter a value and press **Enter**.
AINS Soak	(Display only) Sets the automatic in-service soak period.	Display only • Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G211 Change Optical Channel Threshold Settings for Multiplexer and Demultiplexer Cards

Purpose	This task changes the optical channel threshold settings for 32MUX-O, 32DMX-O, 32DMX, and 4MD-xx.x multiplexer and demultiplexer cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Warning thresholds are not monitored by CTC. They must be user-provisioned and monitored through custom alarm profiles.

Step 1 In node view, double-click the multiplexer or demultiplexer cards where you want to change the optical threshold settings.

Step 2 Click the **Provisioning > Optical Chn > Optics Thresholds** tabs.

Step 3 Under Types, choose the type of threshold you want to change, either **Warning** or **Alarm**.

Step 4 Click **Refresh**.

Step 5 Modify any of the warning or alarm threshold settings. Table 11-18 shows the amplifier line thresholds for warnings.

Table 11-18 Multiplexer and Demultiplexer Cards Optical Channel Warning Threshold Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
opwrMin (dBm)	Set the low power settings.	Numeric. Can be set for 15-minute or one-day intervals. The default is –50 dBm. Double-click the paramenter, enter a value, and press **Enter**.
opwrMax (dBm)	Set the high power settings.	Numeric. Can be set for 15-minute or one-day intervals. The default is 30 dBm. Double-click the paramenter, enter a value, and press **Enter**.

Table 11-19 shows the amplifier line thresholds for alarms.

Table 11-19 Multiplexer and Demultiplexer Cards Optical Channel Alarm Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
Power Failure Low (dBm)	Shows the power failure low threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to a port associated to a VOA (OSC-VOA) always active in Constant Power mode. The threshold is automatically linked to the Power Setpoint (VOA Power Ref + VOA Power Calib) provisioned: changing the setpoint will result in changing the threshold (always 5 dB lower). The 32DMX is an exception. 32DMX Power Failure Low thresholds apply to ports not associated to a VOA. The threshold is calculated automatically when you run Automatic Node Setup (ANS). You can manually change the threshold. The value must be within the optical power range that is specified for the card. (See Appendix B, "Hardware Specifications.")	Numeric, double-click the paramenter, enter a value, and press **Enter**.

Table 11-19 Multiplexer and Demultiplexer Cards Optical Channel Alarm Thresholds Settings

Parameter	Description	Options
Power Degrade High (dBm)	Shows the power degrade high threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to a port associated to a VOA (OSC-VOA) always active in Constant Power mode. The threshold is automatically linked to the Power Setpoint (VOA Power Ref + VOA Power Calib) provisioned: changing the setpoint will result in changing the threshold (always 3 dB higher). This threshold does not apply to the 32DMX card.	—
Power Degrade Low (dBm)	Shows the power degrade low threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to a port associated to a VOA (OSC-VOA) always active in Constant Power mode. The threshold is automatically linked to the Power Setpoint (VOA Power Ref + VOA Power Calib) provisioned: changing the setpoint will result in changing the threshold (always 2 dB lower). This threshold does not apply to the 32DMX card.	Numeric, double-click the paramenter, enter a value, and press **Enter**.

Step 6 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 7 Return to your originating procedure (NTP).

NTP-G93 Modify the 32WSS Thresholds and Settings

Purpose	This procedure changes the 32WSS card thresholds and settings.
Tools/Equipment	None
Prerequisite Procedures	NTP-G30 Install the DWDM Cards, page 3-27
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the 32WSS card settings. If you are already logged in, continue with Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Perform any of the following tasks as needed:

- DLP-G212 Change Optical Channel Parameters for the 32WSS Card, page 11-32
- DLP-G213 Change the 32WSS Optical Channel Thresholds, page 11-35

Note To use the alarm profile tab, including creating alarm profiles and suppressing alarms, see Chapter 8, "Manage Alarms."

- DLP-G214 Change Optical Line Parameters for the 32WSS Card, page 11-37
- DLP-G215 Change the 32WSS Card Optical Line Thresholds, page 11-39

Step 4 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G212 Change Optical Channel Parameters for the 32WSS Card

Purpose	This task changes the optical channel parameter settings for the 32WSS card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the 32WSS card where you want to change the optical channel parameter settings.

Step 2 Click the **Provisioning > Optical Chn: Optical Connector** tab for one of the four available groups of eight optical channels.

Step 3 Modify any of the settings described in Table 11-20. The provisionable paramenters are listed in the options column in the table.

Table 11-20 32WSS Optical Channel Parameter Settings

Parameter	Description	Options
Port	(Display only) Shows the port number. Each optical channel (wavelength) has two logical ports. However only one is active at a time depending on the operating mode provisioned for the port on the card view Maintenance tab, either Add Drop or Pass Through. Ports 1 through 32 (RX) are assigned to optical channels configured as Add Channels. Ports 33 through 64 (PT) are assigned to optical channels configured as Pass-Through channels.	—
Port Name	Allows a logical name to be assigned for each of the port.	User-defined. Name can be up to 32 alphanumeric/special characters. Blank by default. Double-click, enter the name, and press **Enter**. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	Under the drop-down list choose from the following. • IS/Unlocked • IS,AINS/Unlocked,automaticInService • OOS,DSBLD/Locked,disabled • OOS,MT/Locked,maintenance
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	Display only • IS-NR/Unlocked-enabled • OOS-AU,AINS/Unlocked-disabled,automaticInService • OOS-MA,DSBLD/Locked-enabled,disabled • OOS-MA,MT/Locked-enabled,maintenance
Line Direction	(Display only) Displays the line direction associated with the port. The parameter is automatically configured during ANS.	Under the drop-down list choose from the following. • East to West • West to East
Type	(Display only) Port type	• Add • Passthrough
Power	Power value read by the photodiode located after the VOA associated to the port, and calibrated to the COM_TX port. For more information, see the "15.7.6 32WSS Card" section on page 15-76 and the "B.4.15 32WSS Card Specifications" section on page B-32.	Display only • Numeric value (dB)
VOA Mode	(Display only) Displays the active VOA working mode.	Display only • Constant Power • Constant Attenuation

Table 11-20 32WSS Optical Channel Parameter Settings (continued)

Parameter	Description	Options
VOA Power Reference	(Display only) Shows the value of the optical power setpoint that must be reached on the path where a VOA is present, when VOA Mode is set to Constant Power. This value is the desired per-channel optical power. This parameter can only be modified by ANS.	• Numeric value (dB)
VOA Power Calibration	Allows you to modify the VOA power value when VOA Mode is Constant Power.	Double-click the paramenter, enter a value, and press **Enter**. • Numeric value (dB) • –37 dB to –2 dB
VOA Attenuation Reference	(Display only) Shows the attenuation value of the VOA when the VOA Mode is Constant Attenuation. This parameter can only be modified by ANS.	Display only • Numeric value (dB)
VOA Attenuation Calibration	Allows you to modify the VOA attenuation value when VOA Mode is Constant Attenuation.	Double-click the paramenter, enter a value, and press **Enter**. • Numeric value (dB) • –30 dB to +30 dB
Actual Wavelength	(Display only) Displays the actual wavelength utilized by the channel.	• Actual measured value (nm) • UNKNOWN
Expected Wavelength	(Display only) Displays the expected wavelength assigned for the channel.	Display only • Value (nm) from the ITU-T grid specification • UNKNOWN
Power ADD	(Display only) Displays a measurement of the optical power coming in on the ADD RX port. This is the power transmitted by the TX laser of the TXP/MXP card that is connected to the 32WSS. The measurement is performed by a photodiode before the selector and the VOA. The photodiode validates the power level of the incoming wavelength power.	• Numeric value (dB)
Path Value	(Display only) Displays Path value.	• Standby
AINS Soak	(Display only) Sets the automatic in-service soak period.	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G213 Change the 32WSS Optical Channel Thresholds

Purpose	This task changes the optical channel optics threshold settings for the 32WSS card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Warning thresholds are not monitored by CTC. They must be user-provisioned and monitored through custom alarm profiles.

Step 1 In node view, double-click the 32WSS card where you want to change the optical channel optics threshold settings.

Step 2 Click the **Provisioning > Optical Chn: Optical Connector>Optics threshold** tab for one of the four groups of eight optical channels that are available.

Step 3 Under Types, choose the type of threshold you want to change, either **Warning** or **Alarm**.

Step 4 Click **Refresh**.

Step 5 Modify any of the warning or alarm threshold settings. Table 11-21 shows the 32WSS optical line thresholds for warnings. The provisionable paramenters are listed in the options column in the table.

Table 11-21 32WSS Optical Channel Warning Threshold Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
OpwrMin (dBm)	Set the low power settings.	Numeric. Can be set for 15-minute or one-day intervals. Double-click the paramenter, enter a value, and press **Enter**.
OpwrMax (dBm)	Set the high power settings.	Numeric. Can be set for 15-minute or one-day intervals. Double-click the paramenter, enter a value, and press **Enter**.

Table 11-22 shows the 32WSS optical line thresholds for alarms.

Table 11-22 32WSS Optical Channel Alarm Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number. For each optical channel (wavelength) two "logical" ports are associated but only one port can be active at a time, depending on the port's operating mode. The operating mode, provisioned on the card view Maintenance tab, is either Add Drop or Pass-Through. Ports 1 through 32 (RX) are associated to optical channels configured as Add Drop channels. Ports 33 through 64 (PT) are associated to optical channels configured as Pass-Through Channels.	—
Power Failure Low (dBm)	Shows the power failure low threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to a port associated to a VOA (OSC-VOA) always active in Constant Power mode. The threshold is automatically linked to the Power Setpoint (VOA Power Ref + VOA Power Calib) provisioned: changing the setpoint will result in changing the threshold (always 5 dB lower). The threshold is calculated automatically when you run Automatic Node Setup (ANS). You can manually change the threshold. The value must be within the optical power range that is specified for the card. (See Appendix B, "Hardware Specifications.")	Numeric, double-click the paramenter, enter a value, and press **Enter**..
Power Degrade High (dBm)	Shows the power degrade high threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to a port associated to a VOA (OSC-VOA) always active in Constant Power mode. The threshold is automatically linked to the Power Setpoint (VOA Power Ref + VOA Power Calib) provisioned: changing the setpoint will result in changing the threshold (always 3 dB higher).	Display only

Table 11-22 32WSS Optical Channel Alarm Thresholds Settings (continued)

Parameter	Description	Options
Power Degrade Low (dBm)	Shows the power degrade low threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to a port associated to a VOA (OSC-VOA) always active in Constant Power mode. The threshold is automatically linked to the Power Setpoint (VOA Power Ref + VOA Power Calib) provisioned: changing the setpoint will result in changing the threshold (always 2 dB lower).	Numeric, display only
Power ADD Failure Low (dBm)	Shows the power add failure low threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. This threshold applies to the actual measurement of the optical power on the ADD RX port, that is, the power transmitted by the Trunk-Tx laser of the TXP/MXP card connected to the 32 WSS. The measurement is performed by a photodiode located before the selector and the VOA to validate the incoming wavelength power level. See the "15.7.6 32WSS Card" section on page 15-76 for more information.	Numeric, double-click the paramenter, enter a value, and press **Enter**.

Step 6 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 7 Return to your originating procedure (NTP).

DLP-G214 Change Optical Line Parameters for the 32WSS Card

Purpose	This task changes the optical line parameter settings for the 32WSS card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 In node view, double-click the 32WSS card where you want to change the optical line parameter settings.

Step 2 Click the **Provisioning > Optical Line > Parameters** tab.

Step 3 Modify any of the settings described in Table 11-23. The provisionable paramenters are listed in the options column in the table.

Table 11-23 32WSS Optical Line Parameter Settings

Parameter	Description	Options
Port	(Display only) Port designation information. See "15.7.6 32WSS Card" section on page 15-76 for more information.	—
Port Name	Allows you to assign a logical name for each of the ports shown.	User-defined. Name can be up to 32 alphanumeric/ special characters. Blank by default. Double-click, enter the name, and press **Enter**. See the "DLP-G104 Assign a Name to a Port" task on page 7-9.
Admin State	Sets the port service state unless network conditions prevent the change. For more information about administrative states, see Appendix C, "DWDM Administrative and Service States."	Under the drop-down list choose from the following. • IS/Unlocked • IS,AINS/Unlocked,automaticInService • OOS,DSBLD/Locked,disabled • OOS,MT/Locked,maintenance
Service State	Identifies the autonomously generated state that gives the overall condition of the port. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about service states, see Appendix C, "DWDM Administrative and Service States."	Display only • IS-NR/Unlocked-enabled • OOS-AU,AINS/Unlocked-disabled, automaticInService • OOS-MA,DSBLD/Locked-enabled,disabled • OOS-MA,MT/Locked-enabled,maintenance
Line Direction	Shows the line direction associated with the optical signal that passes through the port. This parameter is automatically configured during ANS.	Under the drop-down list choose from the following. • West to East • East to West
Type	Port type	Display only • Output Express • Input Express • Out Com • Input Com • Drop

Table 11-23 32WSS Optical Line Parameter Settings (continued)

Parameter	Description	Options
Power	Power value read by the photodiode associated with the port.	Display only • Numeric value (dB)
AINS Soak	Sets the automatic in-service soak period.	• Duration of valid input signal, in hh.mm format, after which the card becomes in service (IS) automatically • 0 to 48 hours, 15-minute increments

Step 4 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 5 Return to your originating procedure (NTP).

DLP-G215 Change the 32WSS Card Optical Line Thresholds

Purpose	This task changes the 32WSS card optical line threshold settings.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Warning thresholds are not monitored by CTC. They must be user-provisioned and monitored through custom alarm profiles.

Step 1 In node view, double-click the 32WSS card where you want to change the optical line optics warning threshold settings.

Step 2 Click the **Provisioning > Optical Line > Optical Thresholds** tab for one of the four groups of eight optical channels that are available.

Step 3 Under Types, choose the type of threshold you want to change, either **Warning** or **Alarm**.

Step 4 Click **Refresh**.

Step 5 Modify any of the warning or alarm threshold settings. Table 11-24 shows the 32WSS optical line thresholds for warnings. The provisionable paramenters are listed in the options column in the table.

Table 11-24 32WSS Optical Channel Warning Threshold Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—

Table 11-24 32WSS Optical Channel Warning Threshold Settings (continued)

Parameter	Description	Options
OprMin (dBm)	Set the low power warning level.	Numeric. Can be set for 15-minute or one-day intervals. The default is –50dBm.
OpwMax(dBm)	Set the high power warning level.	Numeric. Can be set for 15-minute or one-day intervals. The default is 30dBm.

Table 11-25 shows the 32WSS optical line thresholds for alarms.

Table 11-25 32WSS Optical Channel Alarm Thresholds Settings

Parameter	Description	Options
Port	(Display only) Displays the port number.	—
Power Failure Low (dBm)	Shows the power failure low threshold. This power value applies to the corresponding port and is automatically calculated when ANS is run. You can manually change the threshold. The value must be within the optical power range that is specified for the card. (See Appendix B, "Hardware Specifications.")	Numeric, double-click the paramenter, enter a value, and press **Enter**.
Power Degrade High (dBm)	Does not apply to 32WSS cards at the optical line level.	—
Power Degrade Low (dBm)	Does not apply to 32WSS cards at the optical line level.	Numeric

Step 6 Click **Apply**. If the change affects traffic a warning message displays, click **Yes** to complete the change.

Step 7 Return to your originating procedure (NTP).

NTP-G101 Modify Alarm Interface Controller–International Settings

Purpose	This procedure provisions the AIC-I card to receive input from or send output to external devices wired to the backplane (called external alarms and controls or environmental alarms), or to change orderwire settings.
Tools/Equipment	None
Prerequisite Procedures	NTP-G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card, page 8-31 DLP-G109 Provision Orderwire, page 7-18
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the AIC-I card settings. If you are already logged in, proceed to Step 2.

Step 2 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Step 3 Perform any of the following tasks as needed:

- DLP-G245 Change External Alarms Using the AIC-I Card, page 11-41
- DLP-G246 Change External Controls Using the AIC-I Card, page 11-42
- DLP-G247 Change AIC-I Card Orderwire Settings, page 11-43

Step 4 Complete the "NTP-G103 Back Up the Database" procedure on page 12-2.

Stop. You have completed this procedure.

DLP-G245 Change External Alarms Using the AIC-I Card

Purpose	This task changes external alarm settings on the AIC-I card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note The procedure is the same if you are using the alarm expansion panel (AEP). In this case, the number of contacts that are shown on the screen is changed accordingly.

Step 1 Confirm that external-device relays are wired to the ENVIR ALARMS IN pins. See the "DLP-G20 Install Alarm Wires on the MIC-A/P (ETSI Only)" task on page 1-47 (ETSI) or "DLP-G23 Install Alarm Wires on the Backplane (ANSI Only)" task on page 1-52 (ANSI) for more information.

Step 2 Double-click the AIC-I card to display it in card view.

Step 3 Click the **Provisioning > External Alarms** tabs.

Step 4 Modify any of the following fields for each external device wired to the ONS 15454 backplane. For definitions of these fields, see the "NTP-G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card" procedure on page 8-31.

- Enabled
- Alarm Type
- Severity
- Virtual Wire
- Raised When
- Description

Step 5 To provision additional devices, complete Step 4 for each additional device.

Step 6 Click **Apply**.

Step 7 Return to your originating procedure (NTP).

DLP-G246 Change External Controls Using the AIC-I Card

Purpose	This task changes external control settings on the AIC-I card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note The task is the same if you are using the AEP. In this case, the number of contacts that are shown on the screen is changed accordingly.

Step 1 Verify the external control relays to the ENVIR ALARMS OUT backplane pins. See the "DLP-G20 Install Alarm Wires on the MIC-A/P (ETSI Only)" task on page 1-47 (ETSI) or "DLP-G23 Install Alarm Wires on the Backplane (ANSI Only)" task on page 1-52 (ANSI) for more information.

Step 2 In node view, double-click the AIC-I card to display it in card view.

Step 3 On the External Controls subtab, modify any of the following fields for each external control wired to the ONS 15454 backplane. For definitions of these fields, see the "NTP-G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card" procedure on page 8-31.

- Enabled
- Trigger Type
- Control Type
- Description

Step 4 To provision additional controls, complete Step 3 for each additional device.

Step 5 Click **Apply**.

Step 6 Return to your originating procedure (NTP).

DLP-G247 Change AIC-I Card Orderwire Settings

Purpose	This task changes orderwire settings on the AIC-I card.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution When provisioning orderwire for ONS 15454s residing in a ring, do not provision a complete orderwire loop. For example, a four-node ring typically has east and west ports provisioned at all four nodes. However, to prevent orderwire loops, provision two orderwire ports (east and west) at all but one of the ring nodes.

Tip Before you begin, make a list of the ONS 15454 slots and ports that require orderwire communication.

Step 1 In node view, double-click the AIC-I card to display it in card view.

Step 2 Click the **Provisioning > Local Orderwire** tabs or the **Provisioning > Express Orderwire** tabs, depending on the orderwire path that you want to change. Provisioning steps are the same for both types of orderwire.

Step 3 If needed, adjust the Tx and Rx dBm values by moving the slider to the right or left for the headset type (four-wire or two-wire) that you will use. In general, you should not need to adjust the dBm values.

Step 4 If you want to turn on the audible alert (buzzer) for the orderwire, check the **Buzzer On** check box.

Step 5 Click **Apply**.

Step 6 Return to your originating procedure (NTP).

NTP-G102 Change Card Service State

Purpose	This procedure changes a card service state.
Tools/Equipment	None
Prerequisite Procedures	NTP-G30 Install the DWDM Cards, page 3-27 or NTP-G32 Install the Transponder and Muxponder Cards, page 3-31
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to change the card service state.

Step 2 Click the **Inventory** tab.

Step 3 Click **Admin State** for the card you want to change, and choose an Admin state from the drop-down list:

- **IS** (In-Service [ANSI]) or **Unlocked** (ETSI)
- **OOS,MT** (Out-of-Service,Maintenance [ANSI]) or **Locked-enabled** (ETSI)

Step 4 Click **Apply**.

Step 5 If an error message appears indicating that the card state cannot be changed from its current state, click **OK**.

For information about the enhanced state model and card state transitions, refer to the "DWDM Administrative and Service States" section on page C-1.

Stop. You have completed this procedure.

CHAPTER 12

Maintain the Node

This chapter provides procedures for maintaining the Cisco ONS 15454, including database backups and restoration, removing and replacing cards, viewing the ONS 15454 audit trail, and hardware maintenance procedures such as cleaning fibers, changing the fan tray filter, and other maintenance procedures.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Before You Begin

Before performing any of the following procedures, investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or *Cisco ONS 15454 SDH Troubleshooting Guide* as necessary for general troubleshooting information and alarm or error descriptions.

This section lists the chapter procedures (NTPs). Turn to a procedure to view its tasks (DLPs).

1. NTP-G103 Back Up the Database, page 12-2—Complete as needed.
2. NTP-G104 Restore the Database, page 12-3—Complete as needed.
3. NTP-G105 Restore the Node to Factory Configuration, page 12-4—Complete as needed to clear the database and upload a blank database and the latest software.
4. NTP-G106 Reset Cards Using CTC, page 12-9—Complete as needed to reset the Advanced Timing, Communications, and Control (TCC2/TCC2P) and dense wavelength division multiplexing (DWDM) cards.
5. NTP-G108 Viewing the Audit Trail Records, page 12-11—Complete as needed.
6. NTP-G109 Off-Load the Audit Trail Record, page 12-13—Complete as needed.
7. NTP-G110 Off-Load the Diagnostics File, page 12-13—Complete as needed.
8. NTP-G112 Change the Node Timing Reference, page 12-14—Complete as needed.
9. NTP-G113 View the ONS 15454 Timing Report, page 12-16—Complete as needed.
10. NTP-G114 Inspect, Clean, and Replace the Air Filter, page 12-19—Complete as needed.
11. NTP-G115 Clean Fiber Connectors, page 12-22—Complete as needed.
12. NTP-G40 Replace the Front Door, page 12-25—Complete as needed.
13. NTP-G116 Replace the Fan-Tray Assembly, page 12-27—Complete as needed.

14. NTP-G117 Replace the ANSI Shelf Alarm Interface Panel, page 12-32—Complete as needed.
15. NTP-G118 Replace the ANSI Shelf Plastic Lower Backplane Cover, page 12-36—Complete as needed.
16. NTP-G135 Edit Network Element Defaults, page 12-38—Complete as needed to edit the factory-configured (default) network element settings for the Cisco ONS 15454.
17. NTP-G136 Import Network Element Defaults, page 12-39—Complete as needed to import the factory-configured (default) network element settings for the Cisco ONS 15454.
18. NTP-G137 Export Network Element Defaults, page 12-40—Complete as needed to export the factory-configured (default) network element settings for the Cisco ONS 15454.

NTP-G103 Back Up the Database

Purpose	This procedure stores a backup version of the TCC2/TCC2P (software) database on the workstation running Cisco Transport Controller (CTC) or on a network server.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	Required. Cisco recommends performing a database backup at approximately weekly intervals and prior to and after configuration changes.
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Note You must back up and restore the database for each node on a circuit path in order to maintain a complete circuit.

Note The following parameters are not backed up and restored: node name, IP address, subnet mask and gateway, and Internet Inter-ORB Protocol (IIOP) port. If you change the node name and then restore a backed up database with a different node name, the circuits map to the new node name. Cisco recommends keeping a record of the old and new node names.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node you want to back up. If you are already logged in, continue with Step 2.

Step 2 Click the **Maintenance > Database** tabs.

Step 3 Click **Backup**.

Step 4 Save the database on the workstation's hard drive or on network storage. Use an appropriate file name with the db file extension; for example, database.db.

Step 5 Click **Save**.

Step 6 Click **OK** in the confirmation dialog box.

Stop. You have completed this procedure.

NTP-G104 Restore the Database

Purpose	This procedure restores the TCC2/TCC2P card software database.
Tools/Equipment	None
Prerequisite Procedures	NTP-G103 Back Up the Database, page 12-2
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note The following parameters are not backed up and restored: node name, IP address, subnet mask and gateway, and IIOP port. If you change the node name and then restore a backed up database with a different node name, the circuits map to the new renamed node. Cisco recommends keeping a record of the old and new node names.

Caution If you are restoring the database on multiple nodes, wait approximately one minute after the TCC2/TCC2P card reboot has completed on each node before proceeding to the next node.

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you are restoring the database. If you are already logged in, continue with Step 2.

Step 2 Click the **Circuits** tab. Verify that no OCHNC circuits have a PARTIAL_OOS state. If so, investigate and resolve the partial state before continuing.

Step 3 Complete the "DLP-G157 Disable Automatic Power Control" task on page 10-4.

Step 4 In node view, click the **Maintenance > Database** tabs.

Step 5 Click **Restore**.

Step 6 Locate the database file stored on the workstation hard drive or on network storage.

To clear all existing provisioning, locate and upload the database found on the latest ONS 15454 software CD.

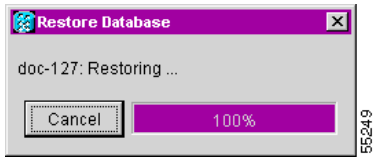
Step 7 Click the database file to highlight it.

Step 8 Click **OK**. The DB Restore dialog box appears. Opening a restore file from another node or from an earlier backup might affect traffic on the login node

Step 9 Click **Yes**.

The Restore Database dialog box monitors the file transfer (Figure 12-1).

Figure 12-1 Restoring the Database—In-Process Notification



Step 10 Wait for the file to complete the transfer to the TCC2/TCC2P card.

Step 11 Click **OK** when the "Lost connection to node, changing to Network View" dialog box appears. Wait for the node to reconnect.

Step 12 Complete the "DLP-G158 Enable Automatic Power Control" task on page 10-4.

Stop. You have completed this procedure.

NTP-G105 Restore the Node to Factory Configuration

Purpose	This procedure reinitializes the ONS 15454 using the CTC reinitialization tool. Reinitialization uploads a new software package to the TCC2/TCC2P cards, clears the node database, and restores the factory default parameters.
Tools/Equipment	ONS 15454 System Software CD, Version 5.0 JRE 1.4.2 must be installed on the computer to log into the node at the completion of the reinitialization. The reinitialization tool can run on JRE 1.3.1_02 or JRE 1.4.2.
Prerequisite Procedures	NTP-G103 Back Up the Database, page 12-2 NTP-G17 Set Up Computer for CTC, page 2-1 One of the following: • NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454, page 2-9, or • NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454, page 2-21
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Superuser

Caution Cisco strongly recommends that you keep different node databases in separate folders. This is because the reinit tool chooses the first product-specific software package in the specified directory if you use the Search Path field instead of the Package and Database fields. You might accidentally copy an incorrect database if multiple databases are kept in the specified directory.

Caution Restoring a node to the factory configuration deletes all cross-connects on the node.

Caution Cisco recommends that you save the node database to safe location if you will not be restoring the node using the database provided on the software CD.

Note The following parameters are not backed up and restored when you delete the database and restore the factory settings: node name, IP address, subnet mask and gateway, and IIOP port. If you change the node name and then restore a backed up database with a different node name, the circuits map to the new renamed node. Cisco recommends keeping a record of the old and new node names.

Step 1 If you need to install or replace one or more TCC2/TCC2P cards, see the "DLP-G33 Install the TCC2 or TCC2P Card" task on page 1-70.

Step 2 If you are using Microsoft Windows, complete the "DLP-G248 Use the Reinitialization Tool to Clear the Database and Upload Software (Windows)" task on page 12-5.

Step 3 If you are using UNIX, complete the "DLP-G249 Use the Reinitialization Tool to Clear the Database and Upload Software (UNIX)" task on page 12-7.

Stop. You have completed this procedure.

DLP-G248 Use the Reinitialization Tool to Clear the Database and Upload Software (Windows)

Purpose	This task reinitializes the ONS 15454 using the CTC reinitialization tool on a Windows computer. Reinitialization uploads a new software package to the TCC2/TCC2P cards, clears the node database, and restores the factory default parameters.
Tools/Equipment	ONS 15454 System Software CD, Version 5.0 JRE 1.4.2 must be installed on the computer to log into the node at the completion of the reinitialization. The reinitialization tool can run on JRE 1.3.1_02 or JRE 1.4.2.
Prerequisite Procedures	NTP-G103 Back Up the Database, page 12-2 NTP-G17 Set Up Computer for CTC, page 2-1 One of the following: • NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454, page 2-9, or • NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454, page 2-21
Required/As Needed	As needed to clear the existing database from a TCC2/TCC2P and restore the node default settings.
Onsite/Remote	Onsite
Security Level	Superuser

Caution Restoring a node to the factory configuration deletes all cross-connects on the node.

Note The ONS 14545 Software CD is required if the Reinit.jar file, the CISCO 15454 package file, and the NE default file are not stored on your computer.

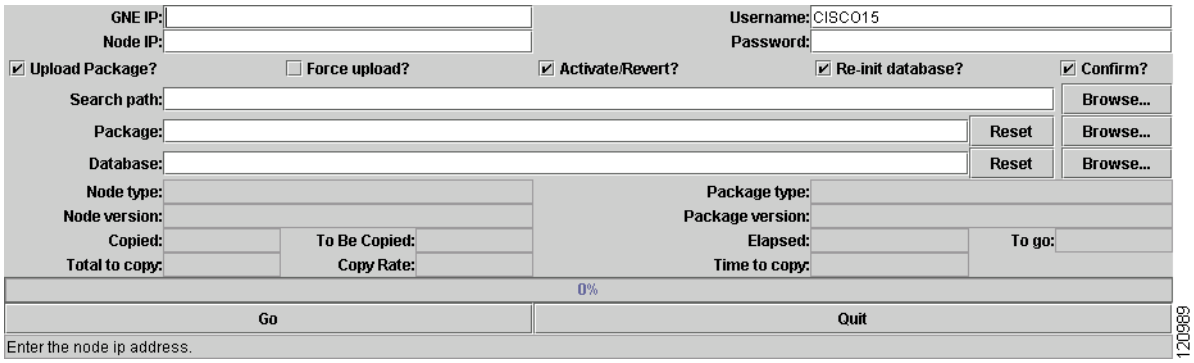
Step 1 Insert the ONS 15454 System Software CD, Version 5.0, into the computer CD-ROM drive. If the CTC Installation Wizard appears, click **Cancel**.

Step 2 From the Windows Start menu, choose **Run.** In the Run dialog box, click **Browse** and navigate to the CISCO15454 or CISCO15454SDH folder on the software CD.

Step 3 In the Browse dialog box Files of Type field, choose **All Files**.

Step 4 Choose the RE-INIT.jar file and click **Open**. The NE Re-Initialization window appears (Figure 12-2).

Figure 12-2 Reinitialization Tool



Step 5 Complete the following fields:

- GNE IP—If the node you are reinitializing is accessed through another node configured as a gateway network element (GNE), enter the GNE IP address. If you have a direct connection to the node, leave this field blank.
- Node IP—Enter the node name or IP address of the node that you are reinitializing.
- User ID—Enter the user ID needed to access the node.
- Password—Enter the password for the user ID.
- Upload Package—Check this box to send the software package file to the node. If unchecked, the software stored on the node is not modified.
- Force Upload—Check this box to send the software package file to the node even if the node is running the same software version. If unchecked, reinitialization will not send the software package if the node is already running the same version.
- Activate/Revert—Check this box to activate the uploaded software (if the software is a later than the installed version) or revert to the uploaded software (if the software is earlier than the installed version) as soon as the software file is uploaded. If unchecked, the software is not activated or reverted after the upload, allowing you to initiate the functions later from the node view Maintenance > Software tabs.
- Re-init Database—Check this box to send a new database to the node. (This is equivalent to the CTC database restore operation.) If unchecked, the node database is not modified.
- Confirm—Check this box if you want a warning message displayed before any operation is performed. If unchecked, reinitialization does not display a warning message.

- Search Path—Enter the path to the CISCO15454 folder on the CD drive.

Step 6 Click **Go**.

Caution Before continuing with the next step, verify that the database to upload is correct. You cannot reverse the upload process after you click Yes.

Step 7 Review the information on the Confirm NE Re-Initialization dialog box, then click **Yes** to start the reinitialization.

The reinitialization begins. After the software is downloaded and activated, and the database is uploaded to the TCC2/TCC2P cards, "Complete" appears in the status bar and the TCC2/TCC2P cards will reboot. Wait a few minutes for the reboot to complete.

Step 8 After the reboot is complete, log into the node using the "DLP-G46 Log into CTC" task on page 2-24.

Step 9 Complete the "NTP-G24 Set Up Name, Date, Time, and Contact Information" procedure on page 3-8 and "NTP-G26 Set Up CTC Network Access" procedure on page 3-10.

Step 10 Return to your originating procedure (NTP).

DLP-G249 Use the Reinitialization Tool to Clear the Database and Upload Software (UNIX)

Purpose	This task reinitializes the ONS 15454 using the CTC reinitialization tool on a UNIX computer. Reinitialization uploads a new software package to the TCC2/TCC2P cards, clears the node database, and restores the factory default parameters.
Tools/Equipment	ONS 15454 SONET System Software CD, Version 5.0.x JRE 1.4.2 must be installed on the computer to log into the node at the completion of the reinitialization. The reinitialization tool can run on JRE 1.3.1_02 or JRE 1.4.2.
Prerequisite Procedures	NTP-G103 Back Up the Database, page 12-2 NTP-G17 Set Up Computer for CTC, page 2-1 One of the following: • NTP-G18 Set Up CTC Computer for Local Craft Connection to the ONS 15454, page 2-9, or • NTP-G19 Set Up a CTC Computer for a Corporate LAN Connection to the ONS 15454, page 2-21
Required/As Needed	As needed to clear the existing database from a TCC2/TCC2P and restore the node default settings.
Onsite/Remote	Onsite
Security Level	Superuser

Caution Restoring a node to the factory configuration deletes all cross-connects on the node.

Step 1 Insert the system software CD containing the reinit tool, software, and defaults database into the computer CD-ROM drive. If the CTC Installation Wizard appears, click **Cancel**.

Step 2 To find the recovery tool file, go to the CISCO15454 directory on the CD (usually /cdrom/cdrom0/CISCO15454 or /cdrom/cdrom0/CISCO15454SDH).

Step 3 If you are using a file explorer, double-click the **RE-INIT.jar** file. If you are working with a command line, run **java -jar RE-INIT.jar**. The NE Re-Initialization window appears (Figure 12-2).

Step 4 Complete the following fields:

- GNE IP—If the node you are reinitializing is accessed through another node configured as a gateway network element (GNE), enter the GNE IP address. If you have a direct connection to the node, leave this field blank.
- Node IP—Enter the node name or IP address of the node that you are reinitializing.
- User ID—Enter the user ID needed to access the node.
- Password—Enter the password for the user ID.
- Upload Package—Check this box to send the software package file to the node. If unchecked, the software stored on the node is not modified.
- Force Upload—Check this box to send the software package file to the node even if the node is running the same software version. If unchecked, reinitialization will not send the software package if the node is already running the same version.
- Activate/Revert—Check this box to activate the uploaded software (if the software is a later than the installed version) or revert to the uploaded software (if the software is earlier than the installed version) as soon as the software file is uploaded. If unchecked, the software is not activated or reverted after the upload, allowing you to initiate the functions later from the node view Maintenance > Software tabs.
- Re-init Database—Check this box to send a new database to the node. (This is equivalent to the CTC database restore operation.) If unchecked, the node database is not modified.
- Confirm—Check this box if you want a warning message displayed before any operation is performed. If unchecked, reinitialization does not display a warning message.
- Search Path—Enter the path to the CISCO15454 or CISCO15454SDH folder on the CD drive.

Step 5 Click **Go**.

Caution Before continuing with the next step, verify that the database to upload is correct. You cannot reverse the upload process after you click Yes.

Step 6 Review the information on the Confirm NE Re-Initialization dialog box, then click **Yes** to start the reinitialization.

The reinitialization begins. After the software is downloaded and activated and the database is uploaded to the TCC2/TCC2P cards, "Complete" appears in the status bar and the TCC2/TCC2P cards will reboot. Wait a few minutes for the reboot to complete.

Step 7 After the reboot is complete, log into the node using the "DLP-G46 Log into CTC" task on page 2-24.

Step 8 Complete the "NTP-G24 Set Up Name, Date, Time, and Contact Information" procedure on page 3-8 and "NTP-G26 Set Up CTC Network Access" procedure on page 3-10.

Step 9 Return to your originating procedure (NTP).

NTP-G106 Reset Cards Using CTC

Purpose	This procedure resets the TCC2/TCC2P and DWDM cards using CTC.
Tools/Equipment	None
Prerequisite Procedures	DLP-G33 Install the TCC2 or TCC2P Card, page 1-70
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you are performing the TCC2/TCC2P reset. If you are already logged in, continue with Step 2.

Step 2 As needed, complete the "DLP-G250 Reset the TCC2/TCC2P Card" task on page 12-9.

Step 3 As needed, complete the "DLP-G251 Reset DWDM Cards Using CTC" task on page 12-10.

Stop. You have completed this procedure.

DLP-G250 Reset the TCC2/TCC2P Card

Purpose	This task resets the TCC2/TCC2P card and switches the node to the redundant TCC2/TCC2P.
Tools/Equipment	None
Prerequisite Procedures	DLP-G33 Install the TCC2 or TCC2P Card, page 1-70 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Warning **Do not reach into a vacant slot or chassis while you install or remove a module or a fan. Exposed circuitry could constitute an energy hazard.** Statement 206

Note Before you reset the TCC2/TCC2P, you should wait at least 60 seconds after the last provisioning change you made to avoid losing any changes to the database.

Note When a software reset is performed on an active TCC2/TCC2P, the AIC-I card goes through an initialization process and also resets. The AIC-I card reset is normal and happens each time an active TCC2/TCC2P card goes through a software-initiated reset.

Step 1 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-G128 Disable Alarm Filtering" task on page 8-27 as necessary.

b. Verify that no unexplained alarms appear on the network. If alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Step 2 In node view, right-click the TCC2/TCC2P card to reveal a drop-down list.

Step 3 Click **Reset Card**.

Step 4 Click **Yes** when the confirmation dialog box appears.

Step 5 Click **OK** when the "Lost connection to node, changing to Network View" dialog box appears.

Note For LED behavior during a TCC2/TCC2P reboot, see Table 3-2 on page 3-13.

Step 6 Confirm that the TCC2/TCC2P card LED is amber (standby).

Step 7 Return to your originating procedure (NTP).

DLP-G251 Reset DWDM Cards Using CTC

Purpose	This task resets the OSCM, OSC-CSM, 32MUX-O, 32DMX-O, 32DMX, 32WSS, OPT-BST, OPT-PRE, AD-xC.xx.x, AD-xB.xx.x, TXP, and MXP cards using CTC.
Tools/Equipment	None
Prerequisite Procedures	NTP-G30 Install the DWDM Cards, page 3-27 NTP-G32 Install the Transponder and Muxponder Cards, page 3-31 DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Warning **Do not reach into a vacant slot or chassis while you install or remove a module or a fan. Exposed circuitry could constitute an energy hazard.** Statement 206

Note ONS 15454 cards normally do not need to be reset. However, you may occasionally need to reset a card for testing or as an initial trouble-clearing step. For additional information, see the *Cisco ONS 15454 Troubleshooting Guide* or *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 1 If you will switch an active TXP or MXP card that is in a Y-Cable protection group, complete the "DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch" task on page 10-25. If not, continue with Step 2.

Step 2 Right-click the card you want to reset to reveal a drop-down list.

Step 3 Click **Reset Card**.

Step 4 Click **Yes** when the confirmation dialog box appears.

The card LED on the ONS 15454 shelf graphic will go through the following sequence: Fail (white LED), Ldg (white LED), and Act (green LED). The reset should complete within 1 to 2 minutes.

Step 5 If you performed a Y-Cable protection group switch in Step 1, complete the "DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch" task on page 10-26. If not, continue with Step 6.

Step 6 Return to your originating procedure (NTP).

NTP-G108 Viewing the Audit Trail Records

Purpose	This procedure explains how to view audit trail records. Audit trail records are useful for maintaining security, recovering lost transactions, and enforcing accountability. Accountability refers to tracing user activities; that is, associating a process or action with a specific user.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

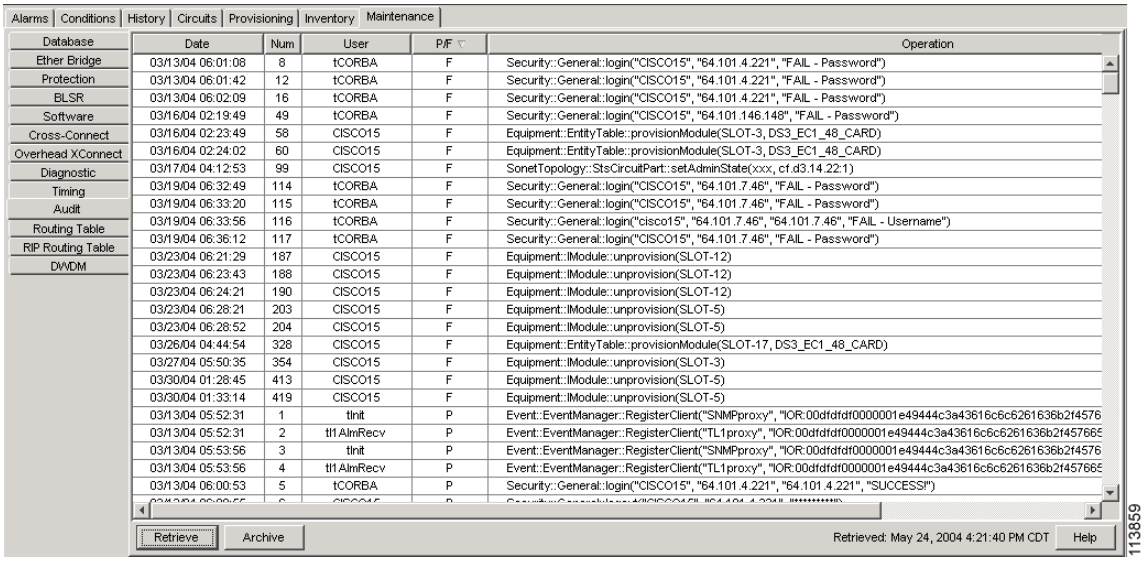
Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to view the audit trail log. If you are already logged in, continue with Step 2.

Step 2 In the node view, click the **Maintenance > Audit** tabs.

Step 3 Click **Retrieve**.

A window containing the most recent audit trail records appears as shown in Figure 12-3.

Figure 12-3 Viewing the Audit Trail Records



A definition of each column in the audit trail log is listed in Table 12-1.

Table 12-1 Audit Trail Column Definitions

Column	Definition
Date	Date when the action occurred in the format MM/dd/yy HH:mm:ss
Num	Incrementing count of actions
User	User ID that initiated the action
P/F	Pass/Fail (that is, whether or not the action was executed)
Operation	Action that was taken

Right-click on the column headings to display the list in ascending-to-descending or descending-to-ascending order.

Left-click on the column heading to display the following options:

- Reset Sorting—Resets the column to the default setting
- Hide Column—Hides the column from view
- Reset Columns Order/Visibility—Displays all hidden columns
- Row Count—Provides a numerical count of log entries

Shift-click on the column heading for an incremental sort of the list.

Stop. You have completed this procedure.

NTP-G109 Off-Load the Audit Trail Record

Purpose	This procedure describes how to off-load up to 640 audit trail log entries in a local or network drive file to maintain a record of actions performed for the node. If the audit trail log is not off-loaded, the oldest entries are overwritten after the log reaches capacity.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to off-load the audit trail log. If you are already logged in, continue with Step 2.

Step 2 In the node view, click the **Maintenance > Audit** tabs.

Step 3 Click **Retrieve**.

Step 4 Click **Archive**.

Step 5 In the Archive Audit Trail dialog box, navigate to the directory (local or network) where you want to save the file.

Step 6 Enter a name in the File Name field.

You do not have to give the archive file a particular extension. It is readable in any application that supports text files, such as WordPad, Microsoft Word (imported), etc.

Step 7 Click **Save**. Click **OK**

The 640 entries are saved in this file. The next entries continue with the next number in the sequence, rather than starting over.

Note Archiving does not delete entries from the CTC audit trail log. However, entries can be self-deleted by the system after the log maximum is reached. If you archived the entries, you cannot reimport the log file back into CTC and will have to view the log in a different application.

Stop. You have completed this procedure.

NTP-G110 Off-Load the Diagnostics File

Purpose	This procedure describes how to off-load a diagnostic file. The diagnostic file contains a set of debug commnds run on a node and its results. This file is useful to TAC when troubleshooting problems with the node.
Tools/Equipment	None
Prerequisite Procedures	None

Purpose	This procedure describes how to off-load a diagnostic file. The diagnostic file contains a set of debug commnds run on a node and its results. This file is useful to TAC when troubleshooting problems with the node.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to off-load the diagnostics file. If you are already logged in, continue with Step 2.

Step 2 In the node view, click the **Maintenance > Diagnostic** tabs.

Step 3 Click **Retrieve Tech Support Log**.

Step 4 In the Saving Diagnostic File dialog box, navigate to the directory (local or network) where you want to save the file.

Step 5 Enter a name in the File Name field.

You do not have to give the archive file a particular extension. It is a compressed file (gzip) that can be unzipped and read by Cisco Technical Support.

Step 6 Click **Save**.

The Get Diagnostics status window shows a progress bar indicating the percentage of the file being saved, then shows "Get Diagnostics Complete."

Step 7 Click **OK**.

Stop. You have completed this procedure.

NTP-G112 Change the Node Timing Reference

Purpose	This procedure enables automatic timing reference switching or returns the node timing to normal operation.
Tools/Equipment	None
Prerequisite Procedures	NTP-G53 Set Up Timing, page 6-3
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to enable timing switching. If you are already logged in, continue with Step 2.

Step 2 Complete the "DLP-G259 Manual or Force Switch the Node Timing Reference" task on page 12-15 as needed.

Step 3 Complete the "DLP-G260 Clear a Manual or Force Switch on a Node Timing Reference" task on page 12-15 as needed.

Stop. You have completed this procedure.

DLP-G259 Manual or Force Switch the Node Timing Reference

Purpose	This task commands the node to switch to the timing reference you have selected.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Step 1 In node view, click the **Maintenance > Timing > Source** tabs.

Step 2 From the Reference drop-down list for the desired Clock, choose the desired reference.

Step 3 From the Operation drop-down list for the desired Clock, choose one of the following options:

- **Manual**—This operation commands the node to switch to the reference you have selected if the SSM quality of the reference is not lower than the current timing reference.
- **Force**—This operation commands the node to switch to the reference you have selected, regardless of the SSM quality (if the reference is valid).

Note For information about the Clear option, see the "DLP-G260 Clear a Manual or Force Switch on a Node Timing Reference" task on page 12-15.

Step 4 Click **Apply** next to the timing source.

Step 5 Click **Yes** in the confirmation dialog box. If the selected timing reference is an acceptable valid reference, the node switches to the selected timing reference. If the selected timing reference is invalid, a warning dialog box appears. Click **OK**; the node will not switch to the new timing reference.

Step 6 Return to your originating procedure (NTP).

DLP-G260 Clear a Manual or Force Switch on a Node Timing Reference

Purpose	This task clears a Manual or Force switch on a node timing reference and reverts the timing reference to its provisioned reference.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Step 1 In node view, click the **Maintenance > Timing > Source** tabs.

Step 2 Find the Clock reference that is currently set to Manual or Force in the Operation menu.

Step 3 From the Operation drop-down list, choose **Clear**.

Step 4 Click **Apply**.

Step 5 Click **Yes** in the confirmation dialog box. If the normal timing reference is an acceptable valid reference, the node switches back to the normal timing reference as defined by the system configuration. If the normal timing reference is invalid or has failed, a warning dialog box appears. Click **OK**; the timing reference will not revert.

Step 6 Return to your originating procedure (NTP).

NTP-G113 View the ONS 15454 Timing Report

Purpose	This procedure displays the current status of the ONS 15454 timing references.
Tools/Equipment	None
Prerequisite Procedures	NTP-G53 Set Up Timing, page 6-3
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Maintenance or higher

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to view the node timing status. If you are already logged in, continue with Step 2.

Step 2 Click the **Maintenance > Timing > Report** tabs.

Step 3 In the Timing Report area, you can view node timing information. The date and time of the report appear at the top of the report. The time stamp is the same as the alarms time stamp and can be configured using the "DLP-G118 Display Alarms and Conditions Using Time Zone" task on page 8-10. Table 12-2 describes the report fields and entries.

Step 4 To update the report, click **Refresh**.

Table 12-2 ONS 15454 Timing Report

Item	Description	Option	Option Description
Clock	Indicates the timing clock. The report section that follows applies to the timing clock indicated.	NE	The node timing clock.
		BITS-1 Out	The BITS-1 Out timing clock.
		BITS-2 Out	The BITS-2 Out timing clock.

Table 12-2 ONS 15454 Timing Report (continued)

Item	Description	Option	Option Description
Status	Indicates the status of the timing clock.	INIT_STATE	The timing reference has not been provisioned. For an NE reference, this status appears just before the first provisioning messages when the TCC2/TCC2P card is booting. Timing is provisioned to the internal clock of the node.
		HOLDOVER_STATE	The clock was locked onto a valid timing reference for more than 140 seconds when a failure occurred. Holdover state timing is a computation based on timing during normal state combined with the node's internal clock. The node holds onto this frequency until the valid reference is restored. This status appears for NE references only.
		FREERUN_STATE	The node is running off its internal clock without any modification except the calibrated value to bring timing to 0 PPM. Freerun state can occur when a Force switch to the Internal clock is initiated, when all references fail without the 140 seconds of holdover data, or when only Internal timing references are defined. This status appears for NE references only.
		NO_SYNC_STATE	A synchronization timing reference is not defined. BITS-1 Out or BITS-2 Out default to this status until an OC-N card is defined as its reference on the Provisioning > Timing tab. This status appears for external references only.
		NE_SYNCH_STATE	BITS-1 Out and BITS-2 Out use the same timing source as the NE. This is displayed when NE Reference is selected in the BITS-1 Out and BITS-2 Out Reference List on the Provisioning > Timing tab.
		NORMAL_STATE	The timing reference is locked onto one of its provisioned references. The reference cannot be Internal or NO SYNC STATE.
		FAST_START_STATE	The node has switched references, but the reference is too far away to reach NORMAL_STATE within an acceptable amount of time. FAST_START_STATE is a fast acquisition mode to allow the node to quickly acquire the reference. After it achieves this goal, the node progresses to the normal state.
		FAST_START_FAILED_STATE	A timing reference is too far away to reach in normal state. The FAST_START_STATE could not acquire sufficient timing information within the allowable amount of time.
Status Changed At	Date and time of the last status change.	—	—
Switch Type	Type of switch.	AUTOMATIC	The timing switch was system-generated.
		Manual	The timing switch was a user-initiated Manual switch.
		Force	The timing switch was user-initiated Force switch.

Table 12-2 ONS 15454 Timing Report (continued)

Item	Description	Option	Option Description
Reference	Indicates the timing reference.	Three timing references are available on the Provisioning > Timing tab.	—
Selected	Indicates whether the reference is selected.	Selected references are indicated with an X.	—
Facility	Indicates the timing facility provisioned for the reference on the Provisioning > Timing tab.	BITS-1	The timing facility is a building integrated timing supply (BITS) clock attached to the node's BITS-1 pins.
		BITS-2	The timing facility is a BITS clock attached to the node's BITS-2 pins.
		OC-N/STM-N card with port number	If the node is set to line timing, this is the OC-N /STM-N card and port provisioned as the timing reference.
		Internal clock	The node is using its internal clock.
State	Indicates the timing reference state.	IS	The timing reference is in service.
		OOS	The timing reference is out of service.
Condition	Indicates the timing reference state.	OKAY	The reference is valid to use as a timing reference.
		OOB	Out of bounds; the reference is not valid and cannot be used as a timing reference, for example, a BITS clock is disconnected.
Condition Changed	Indicates the date and time of the last status change in MM/DD/YY HH:MM:SS format.	—	—
SSM	Indicates whether SSM is enabled for the timing reference.	Enabled	SSM is enabled.
		Disabled	SSM is not enabled.
SSM Quality	Indicates the SSM timing quality.	8 to 10 SSM quality messages might be displayed.	For a list of SSM message sets, see the "19.2.2 Synchronization Status Messaging" section on page 19-8.
SSM Changed	Indicates the date and time of the last SSM status change in MM/DD/YY HH:MM:SS format.	—	—

Stop. You have completed this procedure.

NTP-G114 Inspect, Clean, and Replace the Air Filter

Purpose	This procedure ensures that the air filter is free from dirt and dust, which allows optimum air flow and prevents dirt and dust from entering the shelf.
Tools/Equipment	Vacuum or detergent and water faucet, spare filter, pinned hex key tool
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Warning **Do not reach into a vacant slot or chassis while you install or remove a module or a fan. Exposed circuitry could constitute an energy hazard.** Statement 206

Caution Cisco recommends that you inspect the air filter monthly, and clean the filter every three to six months. Replace the air filter every two to three years. Avoid cleaning the air filter with harsh cleaning agents or solvents.

Note Although the filter can work if it is installed with either side facing up, Cisco recommends that you install it with the metal bracing facing up to preserve the surface of the filter.

Step 1 Verify that you are replacing a reusable air filter. The reusable filter is made of a gray, open-cell, polyurethane foam that is specially coated to provide fire and fungi resistance. NEBS 3E and later versions of the ONS 15454 use a reusable air filter.

Step 2 If the air filter is installed in the external filter brackets, slide the filter out of the brackets while being careful not to dislodge any dust that might have collected on the filter and proceed to Step 9. Figure 12-4 shows the reusable fan-tray air filter in an external filter bracket on an ANSI shelf. Figure 12-5 shows the reusable fan-tray air filter in an external filter bracket on an ETSI shelf.

Step 3 If the filter is installed below the fan tray and not in the external filter brackets, open the front door of the shelf assembly. If the front door is already open, proceed to Step 4.

a. Open the front door lock.

The ONS 15454 comes with a pinned hex key for locking and unlocking the front door. Turn the key counterclockwise to unlock the door and clockwise to lock it.

b. Press the door button to release the latch.

c. Swing the door open.

Step 4 Remove the front door (optional). If you do not want to remove the door or it is already removed, proceed to Step 5.

a. Detach the ground strap from either the door or the chassis by removing one of the Kepnuts.

b. Place the Kepnut back on the stud after the ground strap is removed to avoid misplacement.

c. Secure the dangling end of the ground strap to the door or chassis with tape.

Figure 12-4 ANSI Shelf Fan-Tray Air Filter in an External Filter Bracket (Front Door Removed)

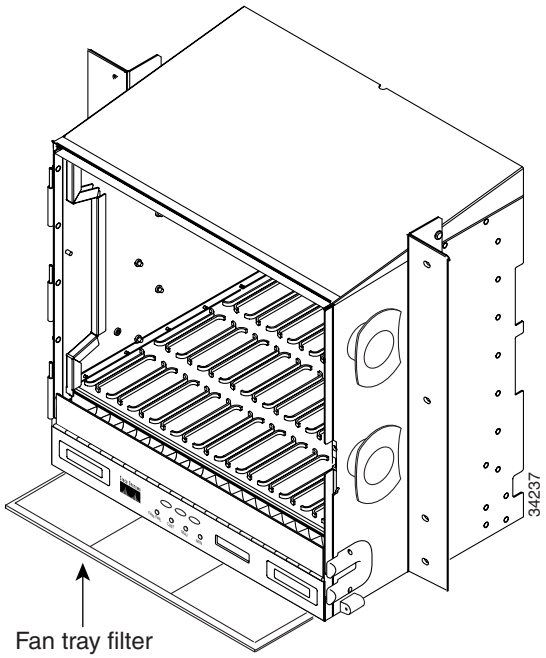
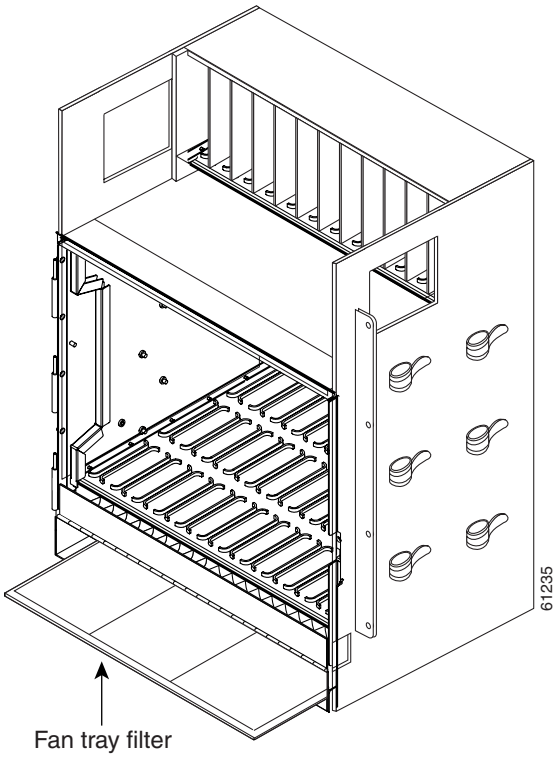


Figure 12-5 ETSI Shelf Fan-Tray Air Filter in an External Filter Bracket (Front Door Removed)



Step 5 Push the outer side of the handles on the fan-tray assembly to expose the handles.

Step 6 Pull the handles and slide the fan-tray assembly one inch (25.4 mm) out of the shelf assembly and wait until the fans stop.

Step 7 When the fans have stopped, pull the fan-tray assembly completely out of the shelf assembly.

Step 8 Gently remove the air filter from the shelf assembly. Be careful not to dislodge any dust that might have collected on the filter.

Step 9 Visually inspect the air filter material for dirt and dust.

Step 10 If the reusable air filter contains a concentration of dirt and dust, replace the dirty air filter with a clean air filter (spare filters should be kept in stock) and reinsert the fan-tray assembly. Then, vacuum the dirty air filter or wash it under a faucet with a light detergent.

Caution Do not leave the fan tray out of the chassis for an extended period of time because excessive heat can damage the ONS 15454 cards.

Note Cleaning should take place outside of the operating environment to avoid releasing dirt and dust near the equipment.

Step 11 If you washed the filter, allow it to completely air dry for at least eight hours.

Caution Do not put a damp filter back in the ONS 15454.

Step 12 Replace the clean filter:

a. If the air filter is installed in the external filter brackets, slide the dry air filter all the way to the back of the brackets to complete the procedure, continue to step 16.

b. If the filter is installed below the fan-tray assembly, remove the fan-tray assembly and slide the dry/clean air filter into the recessed compartment at the bottom of the shelf assembly. Put the front edge of the air filter flush against the front edge of the recessed compartment. Push the fan tray back into the shelf assembly.

Caution If the fan tray does not slide all the way to the back of the shelf assembly, pull the fan tray out and readjust the position of the reusable filter until the fan tray fits correctly.

Note On a powered-up ONS 15454, the fans start immediately after the fan-tray assembly is correctly inserted.

Step 13 To verify that the tray is plugged into the backplane, ensure that the LCD on the front of the fan-tray assembly is activated and displays node information.

Step 14 Rotate the retractable handles back into their compartments.

Step 15 If you replace the door, also reattach the ground strap.

Step 16 Close and lock the door.

Stop. You have completed this procedure.

NTP-G115 Clean Fiber Connectors

Purpose	This procedure cleans the fiber connectors.
Tools/Equipment	Inspection microscope Compressed air/duster Type A Fiber Optic Connector Cleaner (CLETOP reel) Isopropyl alcohol 70 percent or higher Optical swab Optical receiver cleaning stick
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Warning **Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.** Statement 1056

Step 1 Using an inspection microscope, inspect each fiber connector for dirt, cracks, or scratches.

Step 2 Replace any damaged fiber connectors.

Note Replace all dust caps whenever the equipment is unused for 30 minutes or more.

Step 3 Complete the "DLP-G261 Scope and Clean Fiber Connectors and Adapters with Alcohol and Dry Wipes" task on page 12-23 as necessary.

Step 4 Complete the "DLP-G262 Clean Fiber Connectors with CLETOP" task on page 12-23 as necessary.

Step 5 Complete the "DLP-G263 Clean the Fiber Adapters" task on page 12-24 as necessary.

Stop. You have completed this procedure.

DLP-G261 Scope and Clean Fiber Connectors and Adapters with Alcohol and Dry Wipes

Purpose	This task cleans the fiber connectors and adapters with alcohol and dry wipes.
Tools/Equipment	Compressed air/duster
	Isopropyl alcohol 70 percent or higher
	Optical swab
	Optical receiver cleaning stick
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Warning **Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.** Statement 1056

Step 1 Remove the dust cap from the fiber connector.

Step 2 Wipe the connector tip with the premoistened alcohol wipe.

Step 3 Blow-dry using filtered air.

Step 4 Use an inspection microscope to inspect each fiber connector for dirt, cracks, or scratches. If the connector is not clean, repeat Steps 1 to 3.

Step 5 Insert the fiber connector into the applicable adapter or attach a dust cap to the fiber connector.

If you must replace a dust cap on a connector, first verify that the dust cap is clean. To clean the dust cap, wipe the outside of the cap using a dry, lint-free wipe and the inside of the dust cap using a CLETOP stick swab (14100400).

Step 6 Return to your originating procedure (NTP).

DLP-G262 Clean Fiber Connectors with CLETOP

Purpose	This task cleans the fiber connectors with CLETOP.
Tools/Equipment	Type A Fiber Optic Connector Cleaner (CLETOP reel)
	Optical receiver cleaning stick
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Remove the dust cap from the fiber connector.

Step 2 Press the lever down to open the shutter door. Each time you press the lever, you expose a clean wiping surface.

Step 3 Insert the connector into the CLETOP cleaning cassette slot, rotate one quarter turn, and gently swipe downwards.

Step 4 Use an inspection microscope to inspect each fiber connector for dirt, cracks, or scratches. If the connector is not clean, repeat Steps 1 to 3.

Step 5 Insert the fiber connector into the applicable adapter or attach a dust cap to the fiber connector.

Note If you must replace a dust cap on a connector, first verify that the dust cap is clean. To clean the dust cap, wipe the outside of the cap using a dry, lint-free wipe and the inside of the dust cap using a CLETOP stick swab (14100400).

Step 6 Return to your originating procedure (NTP).

DLP-G263 Clean the Fiber Adapters

Purpose	This task cleans the fiber adapters.
Tools/Equipment	CLETOP stick swab
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Remove the dust plug from the fiber adapter.

Step 2 Insert a CLETOP stick swab (14100400) into the adapter opening and rotate the swab.

Step 3 Place dust plugs on the fiber adapters when not in use.

Step 4 Return to your originating procedure (NTP).

NTP-G40 Replace the Front Door

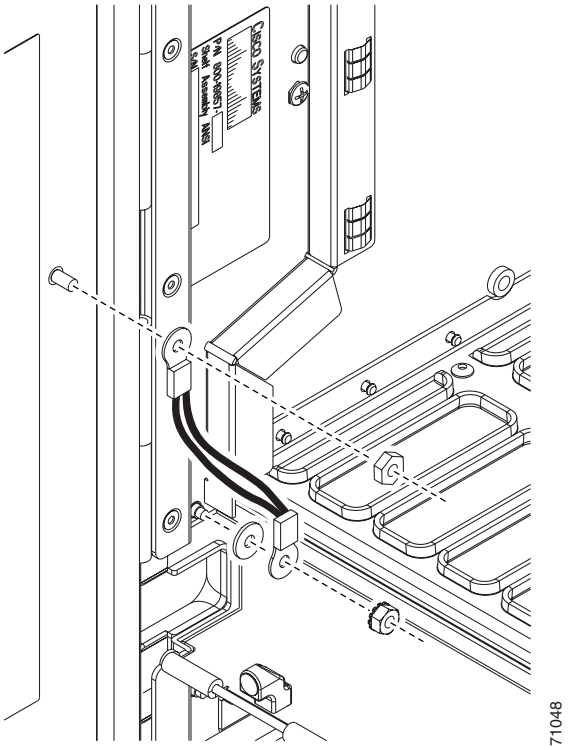
Purpose	This procedure replaces the front door and door ground strap after installing cards and fiber-optic cables.
Tools/Equipment	#2 Phillips screwdriver Medium slot-head screwdriver Small slot-head screwdriver
Prerequisite Procedures	NTP-G3 Open and Remove the Front Door, page 1-20
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Note Be careful not to crimp any fiber cables that are connected to the MXP/TXP cards or DWDM cards. Some might not have the fiber boot attached.

Step 1 Insert the front door into the hinges on the shelf assembly.

Step 2 Attach one end of the ground strap terminal lug (72-3622-01) to the male stud on the inside of the door. Attach and tighten the #6 Kepnut (49-0600-01) using the open-end wrench (Figure 12-6).

Figure 12-6 Installing the Door Ground Strap Retrofit Kit



Step 3 Attach the other end of the ground strap to the longer screw on the fiber guide.

a. Attach the lock washer.

b. Attach the terminal lug.

c. Using the open-end wrench, attach and tighten the #4 Kepnut (49-0337-01) on the terminal lug.

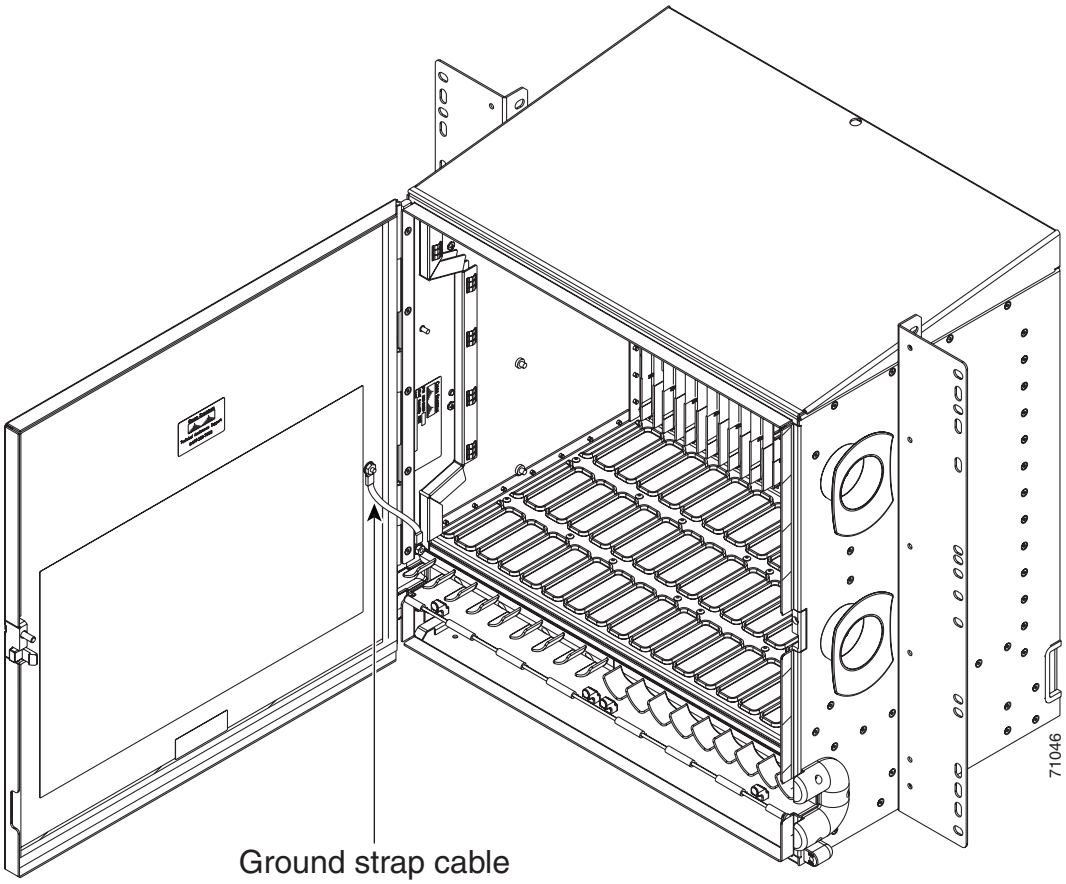
Note To avoid interference with the traffic (line) card, make sure the ground strap is in a flat position when the door is open. To move the ground strap into a flat position, rotate the terminal lug counterclockwise before tightening the Kepnut.

Step 4 Replace the left cable-routing channel.

Step 5 Using a Phillips screwdriver, insert and tighten the screws for the cable-routing channel.

Figure 12-7 shows the shelf assembly with the front door and ground strap installed.

Figure 12-7 Shelf Assembly with Door Ground Strap Retrofit Kit Installed



Step 6 Swing the door closed.

Note The ONS 15454 comes with a pinned hex key tool for locking and unlocking the front door. Turn the key counterclockwise to unlock the door and clockwise to lock it.

Stop. You have completed this procedure.

NTP-G116 Replace the Fan-Tray Assembly

Purpose	This procedure replaces a malfunctioning fan-tray assembly.
Tools/Equipment	None
Prerequisite Procedures	NTP-G8 Install the Fan-Tray Assembly
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Caution The 15454-FTA3 fan-tray assembly can only be installed in ONS 15454 R3.1 and later shelf assemblies (15454-SA-ANSI, P/N: 800-19857; 15454-SA-HD, P/N: 800-24848). The fan-tray assembly includes a pin that prevents it from being installed in ONS 15454 shelf assemblies released before ONS 15454 R3.1 (15454-SA-NEBS3E, 15454-SA-NEBS3, and 15454-SA-R1, P/N: 800-07149). Equipment damage can result from attempting to install the 15454-FTA3 in a incompatible shelf assembly.

Caution Do not force a fan-tray assembly into place. Doing so can damage the connectors on the fan tray and/or the connectors on the backplane.

Note To replace the fan-tray assembly, it is not necessary to move any of the cable management facilities.

Step 1 Review Table 12-3 (ANSI) or Table 12-4 (ETSI) to ensure that you have compatible components when replacing the fan-tray assembly. Note the alarms that will be generated when an incompatibility occurs.

Note If you need to determine the hardware that has been installed on a node, click the Inventory tab in node view.

Table 12-3 Incompatibility Alarms for ONS 15454 ANSI

Shelf Assembly[1]	Fan Tray[2]	AIP[3]	10G Cards[4]	Ethernet Cards[5]	Alarms
—	—	No fuse	—	—	Mismatch of Equipment Attributes (MEA) on alarm interface panel (AIP)
NEBS3E or NEBS3	2A	2A	No	—	None
NEBS3E or NEBS3	2A	2A	Yes	—	MEA on 10G
NEBS3E or NEBS3	2A	5A	No	—	None
NEBS3E or NEBS3	2A	5A	Yes	—	MEA on 10G
ANSI or HD	2A	2A	No	—	None
ANSI or HD	2A	2A	Yes	2.5G compatible	MEA on fan tray, AIP, and Ethernet

Table 12-3 Incompatibility Alarms for ONS 15454 ANSI (continued)

Shelf Assembly[1]	Fan Tray[2]	AIP[3]	10G Cards[4]	Ethernet Cards[5]	Alarms
ANSI or HD	2A	2A	Yes	10G compatible	MEA on fan tray and AIP
ANSI or HD	2A	5A	No	Either	None
ANSI or HD	2A	5A	Yes	2.5G compatible	MEA on fan tray and Ethernet
ANSI or HD	2A	5A	Yes	10G compatible	MEA on fan tray
ANSI or HD	5A	2A	No	Either	MEA on AIP
ANSI or HD	5A	2A	Yes	2.5G compatible	MEA on AIP and Ethernet
ANSI or HD	5A	2A	Yes	10G compatible	MEA on AIP
ANSI or HD	5A	5A	No	Either	None
ANSI or HD	5A	5A	Yes	Either	None

1. 15454-SA-NEBS3E (P/N: 800-07149-xx) or 15454-SA-NEBS3 (P/N: 800-06741-xx) = shelf assemblies released before ONS 15454 Release 3.1
   15454-SA-ANSI (P/N: 800-19857-01) = ONS 15454 Release 3.1 and later shelf assembly
   15454-SA-HD (P/N: 800-24848) = ONS 15454 Release 3.1 and later shelf assembly
2. 5A Fan Tray = 15454-FTA3 (P/N: 800-19858-xx) or 15454-FTA3-T (P/N: 800-21448-xx)
   2A Fan Tray = 15454-FTA2 (P/Ns: 800-07145-xx, 800-07385-xx, 800-19591-xx, 800-19590-xx)
3. 5A AIP (P/N: 73-7665-01), 2A AIP (P/N: 73-5262-01)
4. 10G cards include the XC10G, OC192, and OC48AS.
5. 2.5G indicates cards that are compatible with the XCVT cross-connect card. 10G indicates cards that are compatible with the XC10G and XC-VXC-10G cross-connect cards.

Table 12-4 Incompatibility Alarms for ONS 15454 ETSI

Shelf Assembly [1]	Fan Tray[2]	10G Cards[3]	Ethernet Cards	Alarms
15454E-SA-ETSI	2A	No	—	None
15454E-SA-ETSI	2A	Yes	—	MEA on 10G
15454E-SA-ETSI	2A	No	—	None
15454E-SA-ETSI	2A	Yes	—	MEA on 10G
15454E-SA-ETSI	5A	No	—	MEA on fan tray
15454E-SA-ETSI	5A	Yes	—	MEA on fan tray and 10G cards
15454E-SA-ETSI	5A	No	—	None
15454E-SA-ETSI	5A	Yes	—	MEA on 10G
ETSI	2A	No	—	None
ETSI	2A	Yes	2.5G compatible	MEA on fan tray or Ethernet
ETSI	2A	Yes	10G compatible	MEA on fan tray
ETSI	2A	No	Either	None
ETSI	2A	Yes	2.5G compatible	MEA on fan tray, Ethernet

Table 12-4 Incompatibility Alarms for ONS 15454 ETSI (continued)

Shelf Assembly [1]	Fan Tray[2]	10G Cards[3]	Ethernet Cards	Alarms
ETSI	2A	Yes	10G compatible	MEA on fan tray
ETSI	5A	Yes	2.5G compatible	MEA on Ethernet
ETSI	5A	No	Either	None
ETSI	5A	Yes	Either	None

1. 15454-SA-ETSI (P/N: 800-08708-XX) = ONS 15454 SDH Release 3.3 and later shelf assembly
2. 5A Fan Tray = 15454E-FTA-60V
   2A Fan Tray = 15454E-FTA-48V
3. 10G cards = XC-10G, XC-VXL-10G, XC-VXC-10G

Step 2 Open the front door of the shelf assembly. If the shelf assembly does not have a front door, continue with Step 4.

- **a.** Open the front door lock.

  The ONS 15454 comes with a pinned hex key for locking and unlocking the front door. Turn the key counterclockwise to unlock the door and clockwise to lock it.
- **b.** Press the door button to release the latch.
- **c.** Swing the door open.

Step 3 Remove the front door (optional). If you do not want to remove the door, proceed to Step 4.

- **a.** Detach the ground strap from either the door or the chassis by removing one of the Kepnuts.
- **b.** Place the Kepnut back on the stud after the ground strap is removed to avoid misplacement.
- **c.** Secure the dangling end of the ground strap to the door or chassis with tape.

Step 4 Push the outer side of the handles on the fan-tray assembly to expose the handles.

Step 5 Fold out the retractable handles at the outside edges of the fan tray.

Step 6 Pull the handles and slide the fan-tray assembly one inch (25.4 mm) out of the shelf assembly and wait until the fans stop.

Step 7 When the fans have stopped, pull the fan-tray assembly completely out of the shelf assembly. Figure 12-8 shows the location of the fan tray on the ONS 15454 ANSI shelf.

Figure 12-8 Removing or Replacing the Fan-Tray Assembly (Front Door Removed) (ANSI)

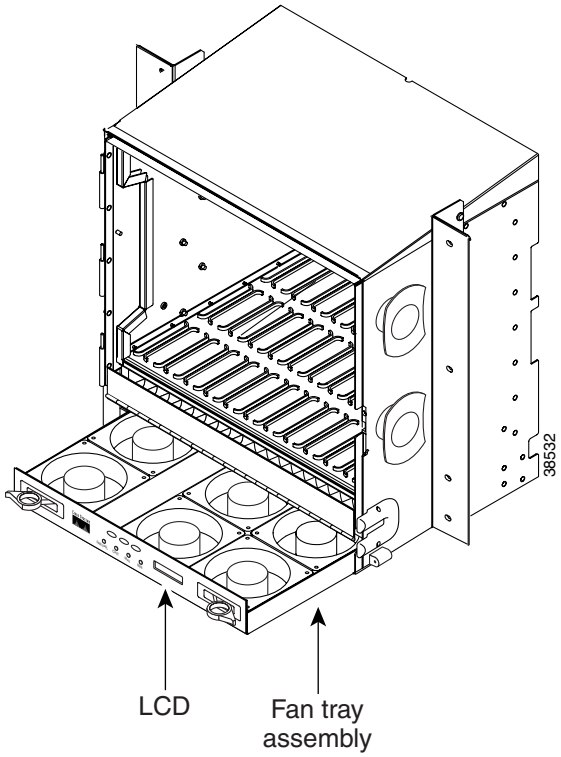
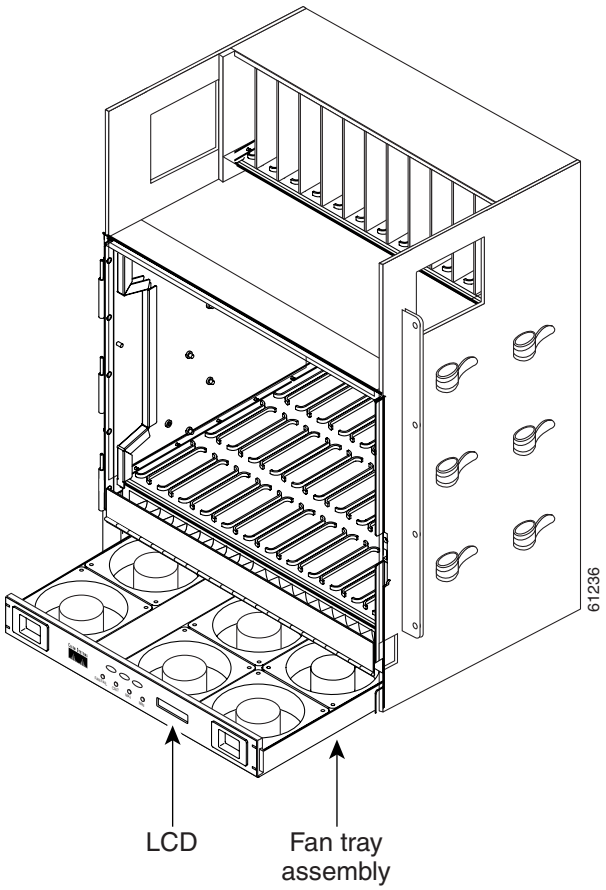


Figure 12-9 shows the location of the fan tray on the ONS 15454 ETSI shelf.

Figure 12-9 Removing or Replacing the Fan-Tray Assembly (Front Door Removed) (ETSI)



Step 8 If you are replacing the fan-tray air filter and it is installed beneath the fan-tray assembly, slide the existing air filter out of the shelf assembly and replace it before replacing the fan-tray assembly.

If you are replacing the fan-tray air filter and it is installed in the external bottom bracket (ANSI shelf only), you can slide the existing air filter out of the bracket and replace it at anytime. For more information on the fan-tray air filter, see the "NTP-G114 Inspect, Clean, and Replace the Air Filter" procedure on page 12-19.

Step 9 Slide the new fan tray into the shelf assembly until the electrical plug at the rear of the tray plugs into the corresponding receptacle on the backplane.

Step 10 To verify that the tray has plugged into the backplane, check that the LCD on the front of the fan tray is activated.

Step 11 If you replace the door on an ANSI shelf, be sure to reattach the ground strap.

Stop. You have completed this procedure.

NTP-G117 Replace the ANSI Shelf Alarm Interface Panel

Purpose	This procedure replaces the alarm interface panel (AIP) on the ONS 15454 ANSI shelf assembly.
Tools/Equipment	#2 Phillips screwdriver
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution Do not use a 2A AIP with a 5A fan-tray assembly; doing so will cause a blown fuse on the AIP.

Caution Always use the supplied ESD wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

Caution Do not perform this procedure on a node with live traffic. Hot-swapping the AIP can affect traffic and result in a loss of data. For assistance with AIP replacement, contact the Cisco Technical Assistance Center. See the "Obtaining Technical Assistance" section on page lxxiv.

Step 1 Review Table 12-3 on page 12-27 to ensure that you have compatible components when replacing the fan-tray assembly and note the alarms that will occur when an incompatibility occurs.

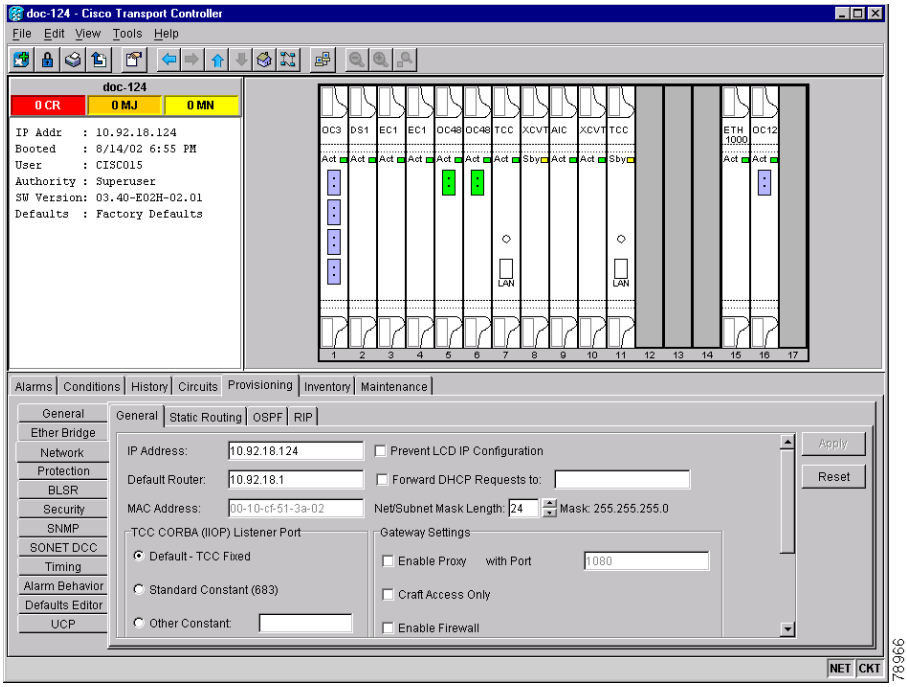
Step 2 Ensure that all nodes in the affected network are running the same software version before replacing the AIP and repairing circuits:

- **a.** In network view, click the **Maintenance > Software** tabs. The working software version for each node is listed in the Working Version column.
- **b.** If you need to upgrade the software on a node, refer to the release-specific software upgrade document. No hardware should be changed or circuit repair performed until after the software upgrade is complete. If you do not need to upgrade software or have completed the software upgrade, proceed to Step 3.

Step 3 Record the MAC address of the old AIP:

- **a.** Log into the node where you will replace the AIP. See the "DLP-G46 Log into CTC" task on page 2-24.
- **b.** In node view, click the **Provisioning > Network** tabs.
- **c.** Record the MAC address shown in the General tab (Figure 12-10).

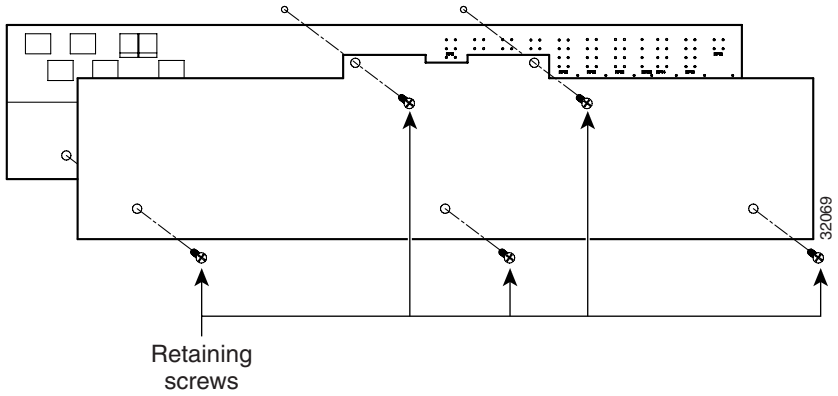
Figure 12-10 Find the MAC Address



Step 4 Call Cisco TAC for assistance in replacing the AIP and maintaining the original MAC address. See the "Obtaining Technical Assistance" section on page lxxiv.

Step 5 Unscrew the five screws that hold the lower backplane cover in place (Figure 12-11).

Figure 12-11 Lower Backplane Cover



Step 6 Grip the lower backplane cover and gently pull it away from the backplane.

Step 7 Unscrew the two screws that hold the AIP cover in place.

Step 8 Grip the cover and gently pull away from the backplane.

Note On the 15454-SA-HD (P/N: 800-24848), 15454-SA-NEBS3E, 15454-SA-NEBS3, and 15454-SA-R1 (P/N: 800-07149) shelves, the AIP cover is clear plastic. On the 15454-SA-ANSI shelf (P/N: 800-19857), the AIP cover is metal.

Step 9 Grip the AIP and gently pull it away from the backplane.

Step 10 Disconnect the fan-tray assembly power cable from the AIP.

Step 11 Set the old AIP aside for return to Cisco.

Caution The type of shelf the AIP resides in determines the version of AIP that should replace the failed AIP. The 15454-SA-ANSI shelf (P/N: 800-19857) and 15454-SA-HD (P/N: 800-24848) currently use the 5A AIP, (P/N: 73-7665-01). The 15454-SA-NEBS3E, 15454-SA-NEBS3, and 15454-SA-R1 (P/N: 800-07149) shelves and earlier use the 2A AIP (P/N: 73-5262-01).

Caution Do not put a 2A AIP (P/N: 73-5262-01) into a 15454-SA-ANSI (P/N: 800-19857) or 15454-SA-HD (P/N: 800-24848) shelf; doing so will cause a blown fuse on the AIP.

Step 12 Attach the fan-tray assembly power cable to the new AIP.

Step 13 Place the new AIP on the backplane by plugging the panel into the backplane using the DIN connector.

Step 14 Replace the AIP cover over the AIP and secure the cover with the two screws.

Step 15 Replace the lower backplane cover and secure the cover with the five screws.

Step 16 In node view, click the **Provisioning > Network** tabs.

Caution Cisco recommends that TCC2/TCC2P card resets be performed in a maintenance window to avoid any potential service disruptions.

Step 17 Reset the standby TCC2/TCC2P card:

- **a.** Right-click the standby TCC2/TCC2P card and choose **Reset Card**.
- **b.** Click **Yes** in the Resetting Card dialog box. As the card resets, a loading (Ldg) indication appears on the card in CTC.

Note The reset takes approximately five minutes. Do not perform any other steps until the reset is complete.

Step 18 Complete the "DLP-G250 Reset the TCC2/TCC2P Card" task on page 12-9 to reset the active TCC2/TCC2P card.

Step 19 From the **File** drop-down list, choose **Exit** to exit the CTC session.

Step 20 Log back into the node. At the Login dialog box, choose **(None)** from the Additional Nodes drop-down list.

Step 21 Record the new MAC address:

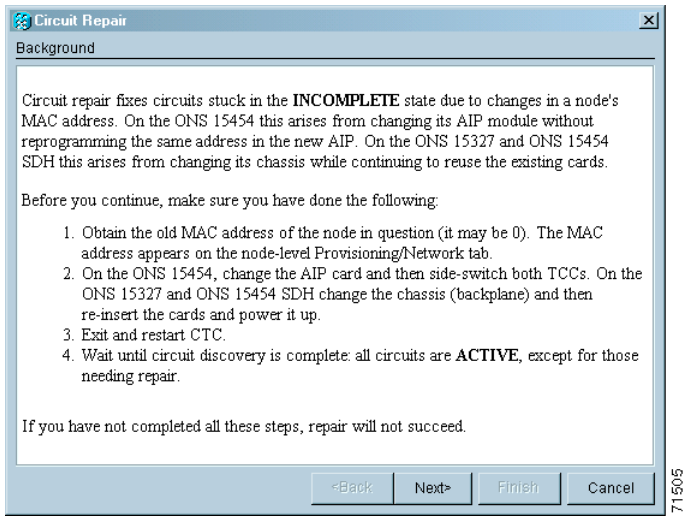
- **a.** In node view, click the **Provisioning > Network** tabs.
- **b.** Record the MAC address shown in the General tab.

Step 22 In node view, click the **Circuits** tab. Note that all circuits listed have a status of PARTIAL.

Step 23 In node view, choose **Repair Circuits** from the **Tools** drop-down list. The Circuit Repair dialog box appears.

Step 24 Read the instructions in the Circuit Repair dialog box (Figure 12-12). If all the steps in the dialog box have been completed, click **Next**. Ensure that you have the old and new MAC addresses.

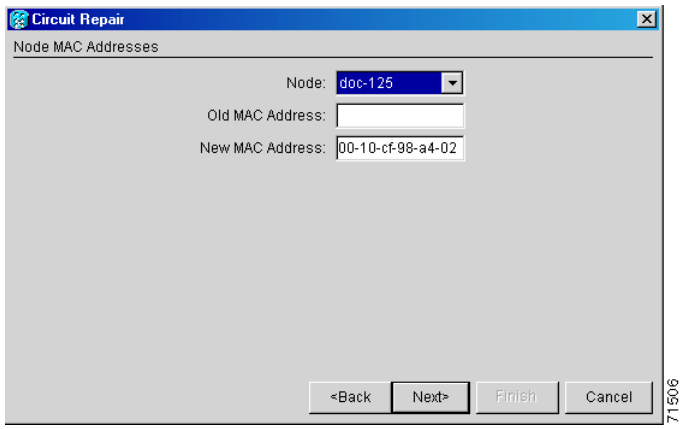
Figure 12-12 Repairing Circuits



Step 25 The Node MAC Addresses dialog box appears (Figure 12-13):

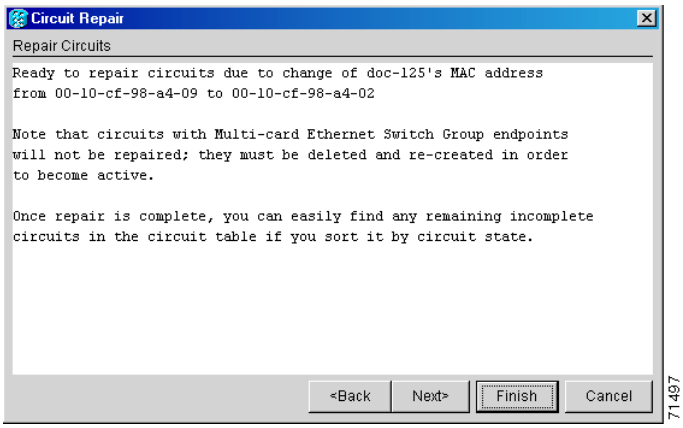
- **a.** From the Node drop-down list, choose the name of the node where you replaced the AIP.
- **b.** In the Old MAC Address field, enter the old MAC address that was recorded in Step 3.
- **c.** Click **Next**.

Figure 12-13 Recording the Old MAC Address Before Replacing the AIP



Step 26 The Repair Circuits dialog box appears (Figure 12-14). Read the information in the dialog box and click **Finish**.

Figure 12-14 Circuit Repair Information



Note The CTC session freezes until all circuits are repaired. Circuit repair can take up to five minutes or more depending on the number of circuits provisioned.

When the circuit repair is complete, the Circuits Repaired dialog box appears.

Step 27 Click **OK**.

Step 28 In the node view of the new node, click the **Circuits** tab. Check to ensure that all circuits listed have a status of DISCOVERED. If all circuits listed are not DISCOVERED, call the Cisco TAC at (800) 553-2447 to open a Return Material Authorization (RMA).

Stop. You have completed this procedure.

NTP-G118 Replace the ANSI Shelf Plastic Lower Backplane Cover

Purpose	This procedure replaces the plastic cover located at the bottom rear of the ONS 15454 ANSI shelf.
Tools/Equipment	Phillips screwdriver
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

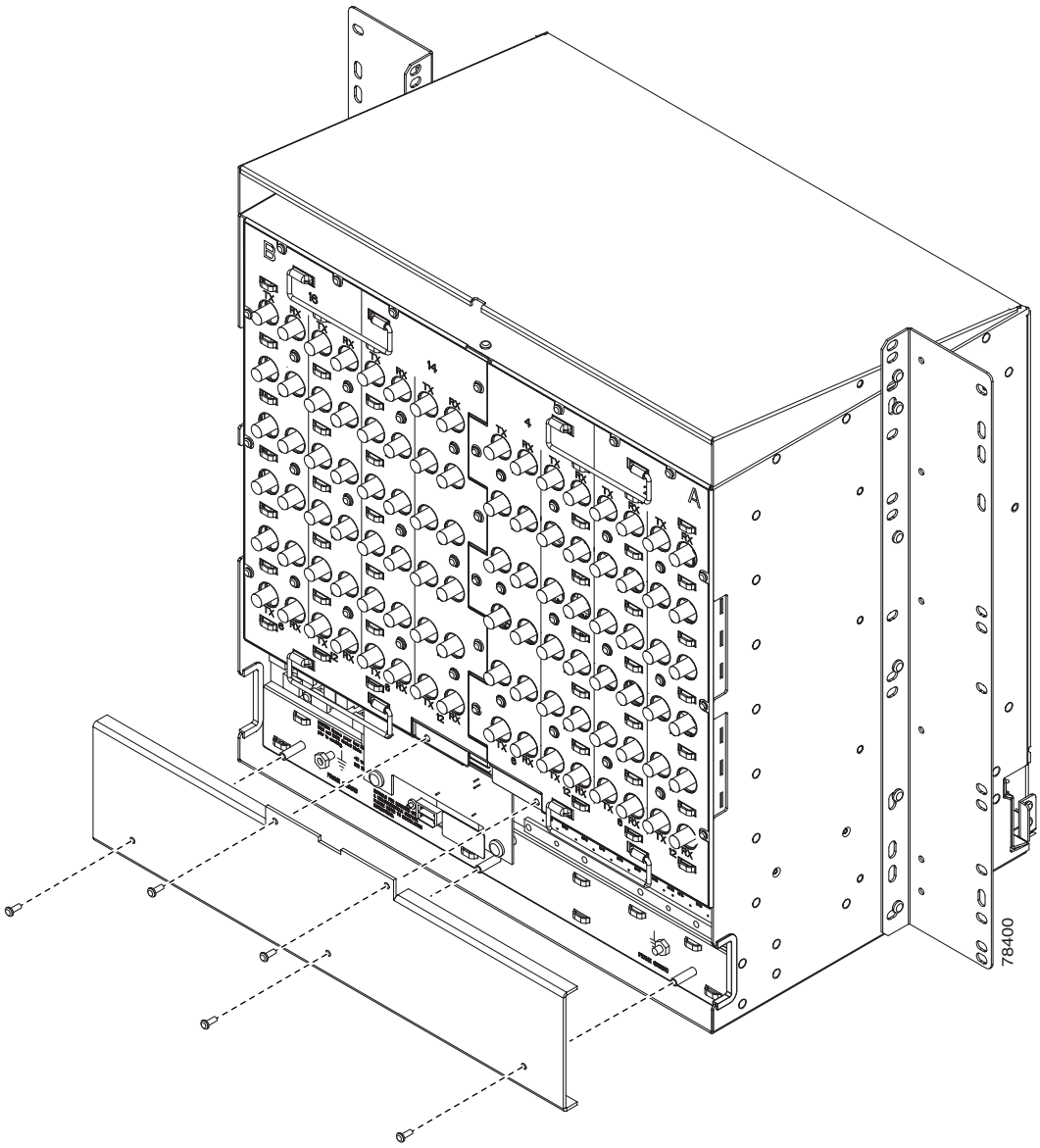
Step 1 Use the Phillips screwdriver to unscrew the five retaining screws that hold the metal cover in place.

Step 2 Grasp the metal cover on each side.

Step 3 Gently pull the metal cover away from the backplane.

Step 4 Place the plastic cover against the shelf assembly and align the screw holes on the cover and the shelf assembly (Figure 12-15).

Figure 12-15 Attaching Plastic Lower Backplane Cover



Step 5 Tighten the five retaining screws that hold the plastic cover in place.

Stop. You have completed this procedure.

NTP-G135 Edit Network Element Defaults

Purpose	This procedure edits the factory-configured network element (NE) defaults using the NE Defaults editor. The new defaults can be applied to the node where they are edited or exported to a file and imported for use on other nodes.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note For a list of network element defaults, see Appendix D, "Network Element Defaults."

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to edit NE defaults.

Step 2 Click the **Provisioning > Defaults** tabs.

Step 3 Under Defaults Selector, choose either a card (if editing card-level defaults) or NODE (if editing node-level defaults). Clicking on the node name (at the top of the Defaults Selector column) lists all available NE defaults (both node- and card-level) under Default Name.

Step 4 Locate a default you want to change under Default Name.

Step 5 Click in the **Default Value** column for the default property you are changing and either choose a value from the drop-down menu (when available), or type in the desired new value.

Note If you click **Reset** before you click **Apply**, all values will return to their original settings.

Step 6 Click **Apply** (click in the **Default Name** column to activate the Apply button if it is unavailable). You can modify multiple default values before applying the changes.

A pencil icon will appear next to any default value that will be changed as a result of editing the defaults file.

Step 7 If you are modifying node-level defaults, a dialog box appears telling you that defaults were successfully applied to the node. Click **OK**.

If you are modifying the IIOP Listener Port setting, a dialog box appears warning you that the node will reboot and asks if you want to continue. Click **Yes**.

Note Changes to most node defaults reprovision the node when you click Apply. Changes made to card settings using the Defaults Editor do not change the settings for cards that are already installed or slots that are preprovisioned for cards, but rather, change only cards that are installed or preprovisioned thereafter. To change settings for installed cards or preprovisioned slots, see Chapter 11, "Change DWDM Card Settings." To change settings for transponder or muxponder cards see Chapter 5, "Provision Transponder and Muxponder Cards."

Note Changing some NE defaults can cause CTC disconnection or a reboot of the node in order for the default to take effect. Before you change a default, view the Side Effects column of the Defaults editor (right-click a column header and select **Show Column > Side Effects**) and be prepared for the occurrence of any side effects listed for that default.

Stop. You have completed this procedure.

NTP-G136 Import Network Element Defaults

Purpose	This procedure imports the NE defaults using the NE Defaults editor. The defaults can either be imported from the CTC software CD (factory defaults) or from a customized file exported and saved from a node.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note For a list of network element defaults, see Appendix D, "Network Element Defaults."

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to import NE defaults.

Step 2 Click the **Provisioning > Defaults** tabs.

Step 3 Click **Import**.

Step 4 Click **Browse** and browse to the file you are importing if the correct file name and location of the desired file do not appear in the Import Defaults from File dialog box.

Step 5 When the correct file name and location appear in the dialog box click **OK**. The correct file name is 15454-defaults.txt for ANSI shelves and 15454SDH-defaults.txt for ETSI shelves if you are importing the factory defaults.

A pencil icon will appear next to any default value that will be changed as a result of importing the new defaults file.

Step 6 Click **Apply**.

Step 7 If the imported file fails to pass all edits, the problem field shows the first encountered problem default value that must be fixed. Change the problem default value and click **Apply**. Repeat until the imported file passes all edits successfully.

Step 8 If you are modifying node-level defaults, a dialog box appears telling you that defaults were successfully applied to the node. Click **Yes**.

If you are modifying the IIOP Listener Port setting, a dialog box appears warning you that the node will reboot and asks if you want to continue. Click **Yes**.

Note Changes to most node defaults reprovision the node when you click Apply. Changes made to card settings using the Defaults Editor do not change the settings for cards that are already installed or slots that are preprovisioned for cards, but rather, change only cards that are installed or preprovisioned thereafter. To change settings for installed cards or pre-provisioned slots, see Chapter 11, "Change DWDM Card Settings." To change settings for transponder or muxponder cards see Chapter 5, "Provision Transponder and Muxponder Cards."

Note Changing some NE defaults can cause CTC disconnection or a reboot of the node in order for the default to take effect. Before you change a default, view the Side Effects column of the Defaults editor (right-click a column header and select **Show Column > Side Effects**) and be prepared for the occurrence of any side effects listed for that default.

Stop. You have completed this procedure.

NTP-G137 Export Network Element Defaults

Purpose	This procedure exports the NE defaults using the NE Defaults editor. The exported defaults can be imported to other nodes.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Note The defaults currently displayed are exported whether or not they have been applied to the current node.

Note The NE defaults can also be exported from the File > Export menu. These exported defaults are for reference only and cannot be imported.

Note For a list of network element defaults, see Appendix D, "Network Element Defaults."

Step 1 Complete the "DLP-G46 Log into CTC" task on page 2-24 at the node where you want to export NE defaults.

Step 2 Click the **Provisioning > Defaults** editor tabs.

Step 3 Click **Export**.

Step 4 Click **Browse** and browse to the location where you want to export the file if it does not appear in the Export Defaults to File dialog box.

Step 5 Change the file name to something easy to remember (the file name has no extension).

Step 6 Click **OK**.

Stop. You have completed this procedure.

CHAPTER 13

Power Down a Node

This chapter explains how to power down a node and stop all node activity on the Cisco ONS 15454 ANSI or ETSI.

NTP-G119 Power Down the Node

Purpose	This procedure stops all node activity.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Warning **Do not reach into a vacant slot or chassis while you install or remove a module or a fan. Exposed circuitry could constitute an energy hazard.** Statement 206

Caution The following procedure is designed to minimize traffic outages when powering down nodes, but traffic will be lost if you delete and recreate circuits that passed through a working node.

Note Always use the supplied ESD wristband when working with the Cisco ONS 15454. Plug the wristband into the ESD jack located on the fan-tray assembly or on the lower right outside edge of the shelf on the NEBS 3 shelf assembly. To access the ESD plug on the NEBS 3 shelf assembly, open the front door of the Cisco ONS 15454. The front door is grounded to prevent electrical shock.

Step 1 Identify the node that you want to power down. If no cards are installed, go to Step 16. If cards are installed, log into the node. See the "DLP-G46 Log into CTC" task on page 2-24 for instructions.

Step 2 In node view, choose **Go to Network View** from the View menu.

Step 3 Verify that the node is not connected to a network. If the node is not connected to a working network and the current configurations are no longer required, proceed to Step 4.

Note Before the power-down of a DWDM node, the fiber spans connected around it must be disconnected from the network. This is to prevent the accidental disconnection of wavelengths that pass through the shelf. A good indication that the shelf has been disconnected from the network is optical service channel (OSC) alarms, or no OSC channels provisioned.

Note Current configurations will be saved if Steps 4 to 16 are skipped.

Step 4 In node view, click the **Circuits** tab and verify that no circuits appear, then proceed to Step 5. If circuits appear, delete all the circuits that originate or terminate in the node. Complete the "DLP-G106 Delete Optical Channel Network Connections" task on page 7-12 or the "DLP-G112 Delete Overhead Circuits" task on page 7-21 as needed.

Note When deleting circuits from a node, make sure that the node is not connected to any network.

Step 5 In node view, click the **Provisioning > Protection** tabs and delete all protection groups:

a. Click the protection group that needs to be deleted and click **Delete**.

b. Click **Yes**.

Repeat until no protection groups appear.

Step 6 In node view, click the **Provisioning > Comm Channels** tabs and delete all communications channel terminations:

a. Click the section data communications channel (SDCC), line data communications channel (LDCC), generic communications channel (GCC), or OSC termination that needs to be deleted and click **Delete**.

b. Click **Yes**.

Repeat until no SDCC, LDCC, GCC, or OSC terminations are present.

Note Before deleting the OSC termination, make sure the Ring ID is deleted. Click the **Provisioning > Comm Channels > OSC** tabs. Select the Ring ID and click **Delete**.

Step 7 Before deleting any installed DWDM cards, the optical patch cords have to be deleted. In the node view, click **Provisioning > WDM-ANS > Connections** tabs.

a. Select all the connections and click **Delete**.

b. Click **Yes**.

Step 8 For each installed MSTP channel-bearing card (AD-1C-xx.x, AD-2C-xx.x, and AD-4C-xx.x, where xx.x refers to the specific wavelengths), make sure all lines and bands are not in IS-NR (ANSI) or Unlocked-Enabled (ETSI) service state:

a. In the card view, click the **Provisioning > Optical Line > Parameters** tabs.

b. In the Admin State column for each line, make sure that the default state IS, AINS (ANSI) or Unlocked,automaticInservice (ETSI) is selected.

c. Click the **Provisioning > Optical Chn > Parameters** tabs.

d. In the Admin State column for each line, make sure that the default state IS, AINS (ANSI) or Unlocked,automaticInservice (ETSI) is selected.

Step 9 For each installed DWDM band-bearing card (AD-1B-xx.x and AD-4B-xx.x, where xx.x refers to the specific wavelengths), make sure all lines and bands are not in the IS-NR (ANSI) or Unlocked-Enabled (ETSI) service state:

a. In the card view, click the **Provisioning > Optical Line > Parameters** tabs.

b. In the Admin State column for each line, make sure that the default state IS, AINS (ANSI) or Unlocked,automaticInservice (ETSI) is selected.

c. Click the **Provisioning > Optical Band > Parameters** tabs.

d. In the Admin State column for each line, make sure that the default state IS, AINS (ANSI) or Unlocked,automaticInservice (ETSI) is selected.

Step 10 For each installed DWDM transponder (TXP), muxponder (MXP), multiplexer, demultiplexer or amplifier card (32MUX-O, 32DMX-0, 32DMX, 32WSS, 4MD-xx.x, OPT-BST, OPT-PRE, TXP_MR_10G, TXP_MR_10E, TXP_MR_2.5G, TXPP_MR_2.5G, MXP_2.5G_10G, MXP_2.5G_10E, MXP_MR_2.5G, MXPP_MR_2.5G), make sure all lines are not in the IS-NR (ANSI) or Unlocked-enabled (ETSI) service state:

a. In card view, click the appropriate tab depending on the card:

- For MXP_2.5G_10G, TXP_MR_10G, TXP_MR_10E cards, click the **Provisioning > Line > SONET** tabs if the card was provisioned for a SONET payload, or the **Provisioning > Line > SDH** tabs if the card was provisioned for an SDH payload.
- For TXP_MR_2.5G, TXPP_MR_2.5G, and MXPP_MR_2.5G cards, click the **Provisioning > Line > OC48** tabs.
- For MXP_2.5G_10E cards, click the **Provisioning > Line > Trunk** tabs.
- For MXP_MR_2.5G cards, click the **Provisioning > Line > Client** tabs.
- For 32MUX-O, 32DMX-0, 32DMX, 32WSS, OPT-BST, OPT-PRE cards, click the **Provisioning > Optical Line > Parameters** tabs.
- For 32DMX and 32DMX-O cards, click the **Provisioning > Optical Chn > Parameters** tabs.
- For 4MD-xx.x cards, click the **Provisioning > Optical Band > Parameters** tabs.
- For OPT-BST and OPT-PRE cards, click the **Provisioning > Optical Ampli Line > Parameters** tabs.

b. In the Admin State column for each line, make sure that the default state IS, AINS (ANSI) or Unlocked,automaticInservice (ETSI) is selected.

c. Repeat Steps a and b for each installed DWDM card.

Note Ports are put in service when circuits are provisioned, and put out of service when circuits are deleted. When circuits are deleted the Admin State displays as IS, AINS (ANSI) or Unlocked,automaticInservice (ETSI) and the Service State displays OOS-AU,AINS (ANSI) or Unlocked-disabled,automaticInService (ETSI).

Step 11 Remove all fiber connections to the cards.

Step 12 In node view, right-click an installed card and click **Delete**.

Step 13 Click **Yes**.

Step 14 After you have deleted the card, open the card ejectors and remove it from the node.

Step 15 Repeat Step 11 through Step 14 for each installed card.

Note You cannot delete a TCC2 or TCC2P card in Cisco Transport Controller (CTC). Physically remove it after all the other cards have been deleted and removed.

Step 16 Shut off the power from the power supply that feeds the node.

Step 17 Disconnect the node from its external fuse source.

Step 18 Store all of the cards that you removed and update inventory records according to local site practice.

Stop. You have completed this procedure.

Shelf Hardware Reference

This chapter provides a description of Cisco ONS 15454 hardware for the ANSI and ETSI shelf assemblies. For card descriptions, see Chapter 15, "Card Reference." To install equipment, see Chapter 1, "Install the Shelf and Common Control Cards."

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Chapter topics include:

- 14.1 Overview, page 14-2
- 14.2 ONS 15454 ANSI Rack Installation, page 14-3
- 14.3 ONS 15454 ETSI Rack Installation, page 14-6
- 14.4 FlexLayer and Y-Cable Protection, page 14-9
- 14.5 Typical DWDM Rack Layouts, page 14-16
- 14.6 Front Door, page 14-19
- 14.7 ONS 15454 ANSI Backplane Covers, page 14-26
- 14.8 ONS 15454 ETSI Front Mount Electrical Connection, page 14-30
- 14.9 ONS 15454 ANSI Alarm Expansion Panel, page 14-30
- 14.10 Filler Card, page 14-35
- 14.11 Cable Routing and Management, page 14-36
- 14.12 Fan-Tray Assembly, page 14-41
- 14.13 Power and Ground Description, page 14-43
- 14.14 ONS 15454 ANSI Alarm, Timing, LAN, and Craft Pin Connections, page 14-44
- 14.15 Cards and Slots, page 14-48

Note The Cisco ONS 15454 shelf assemblies are intended for use with telecommunications equipment only.

Caution Unused card slots should be filled with a blank faceplate (Cisco P/N 15454-BLANK for ANSI shelves and 15454E-BLANK for ETSI shelves). The blank faceplate ensures proper airflow when operating the ONS 15454 without the front door attached, although Cisco recommends that the front door remain attached.

14.1 Overview

This section provides an introduction to the Cisco ONS 15454 ANSI and the Cisco ONS 15454 ETSI.

Install the ONS 15454 in compliance with your local and national electrical codes:

- United States: National Fire Protection Association (NFPA) 70; United States National Electrical Code.
- Canada: Canadian Electrical Code, Part I, CSA C22.1.
- Other countries: If local and national electrical codes, are not available, refer to IEC 364, Part 1 through Part 7.

14.1.1 Cisco ONS 15454 ANSI

When installed in an equipment rack, the ONS 15454 ANSI assembly is typically connected to a fuse and alarm panel to provide centralized alarm connection points and distributed power for the ONS 15454 ANSI. Fuse and alarm panels are third-party equipment and are not described in this documentation. If you are unsure about the requirements or specifications for a fuse and alarm panel, consult the user documentation for the related equipment. The front door of the ONS 15454 ANSI allows access to the shelf assembly, fan-tray assembly, and fiber-storage area. The backplanes provide access to alarm contacts, external interface contacts, power terminals, and BNC/SMB connectors.

You can mount the ONS 15454 ANSI in a 19- or 23-inch rack (482.6 or 584.2 mm). The shelf assembly weighs approximately 55 pounds (24.94 kg) with no cards installed.

The ONS 15454 ANSI is powered using –48 VDC power. Negative, return, and ground power terminals are accessible on the backplane.

Note The ONS 15454 ANSI is designed to comply with Telcordia GR-1089-CORE Type 2 and Type 4. Install and operate the ONS 15454 ANSI only in environments that do not expose wiring or cabling to the outside plant. Acceptable applications include Central Office Environments (COEs), Electronic Equipment Enclosures (EEEs), Controlled Environment Vaults (CEVs), huts, and Customer Premise Environments (CPEs).

14.1.2 Cisco ONS 15454 ETSI

When installed in an equipment rack, the ONS 15454 ETSI assembly is typically connected to a fuse and alarm panel to provide centralized alarm connection points and distributed power for the ONS 15454 ETSI. Fuse and alarm panels are third-party equipment and are not described in this documentation. If you are unsure about the requirements or specifications for a fuse and alarm panel, consult the user documentation for the related equipment. The front door of the ONS 15454 ETSI allows access to the shelf assembly, fan-tray assembly, and fiber-storage area. The FMEC cover at the top of the shelf allows access to power connectors, external alarms and controls, timing input and output, and craft interface terminals.

You can mount the ONS 15454 ETSI in an ETSI rack. The shelf assembly weighs approximately 26 kg (57 pounds) with no cards installed. The shelf assembly includes a front door and a Front Mount Electrical Connection (FMEC) cover for added security, a fan tray module for cooling, and extensive fiber-storage space.

The ONS 15454 ETSI is powered using –48 VDC power. Negative, return, and ground power terminals are connected via the MIC-A/P and the MIC-C/T/P FMECs.

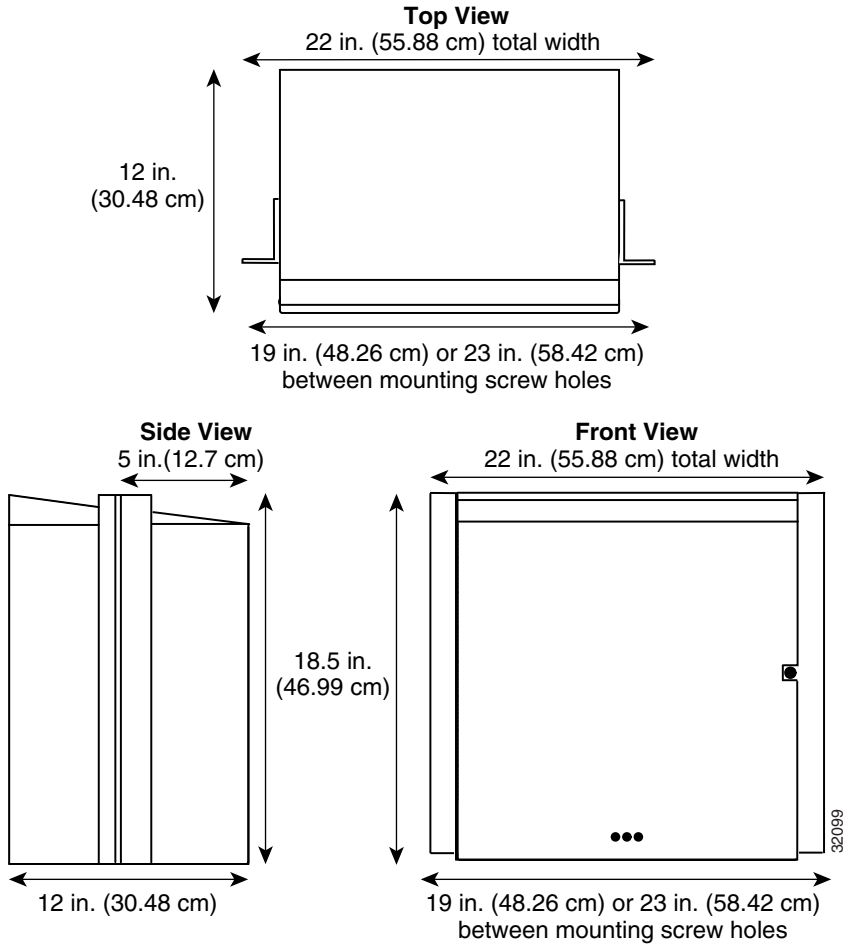
14.2 ONS 15454 ANSI Rack Installation

The ONS 15454 ANSI is mounted in a 19- or 23-in. (482.6- or 584.2-mm) equipment rack. The shelf assembly projects five inches (127 mm) from the front of the rack. It mounts in both Electronic Industries Alliance (EIA) standard and Telcordia-standard racks. The shelf assembly is a total of 17 inches (431.8 mm) wide with no mounting ears attached. Ring runs are not provided by Cisco and might hinder side-by-side installation of shelves where space is limited.

The ONS 15454 ANSI measures 18.5 inches (469.9 mm) high, 19 or 23 inches (482.6 or 584.2 mm) wide (depending on which way the mounting ears are attached), and 12 inches (304.8 mm) deep. You can install up to four ONS 15454 ANSIs in a seven-foot (2133.6 mm) equipment rack. The ONS 15454 ANSI must have one inch (25.4 mm) of airspace below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 ANSI is installed underneath the shelf assembly, the air ramp on top of the lower shelf assembly provides the air spacing needed and should not be modified in any way. Figure 14-1 shows the dimensions of the ONS 15454 ANSI.

Note A 10-Gbps-compatible shelf assembly (15454-SA-ANSI or 15454-SA-HD) and fan-tray assembly (15454-FTA3 or 15454-FTA3-T) are required if ONS 15454 ANSI 10-Gbps Cross-Connect (XC10G) cards are installed in the shelf.

Figure 14-1 Cisco ONS 15454 ANSI Dimensions



14.2.1 Reversible Mounting Bracket

Caution Use only the fastening hardware provided with the ONS 15454 ANSI shelf to prevent loosening, deterioration, and electromechanical corrosion of the hardware and joined material.

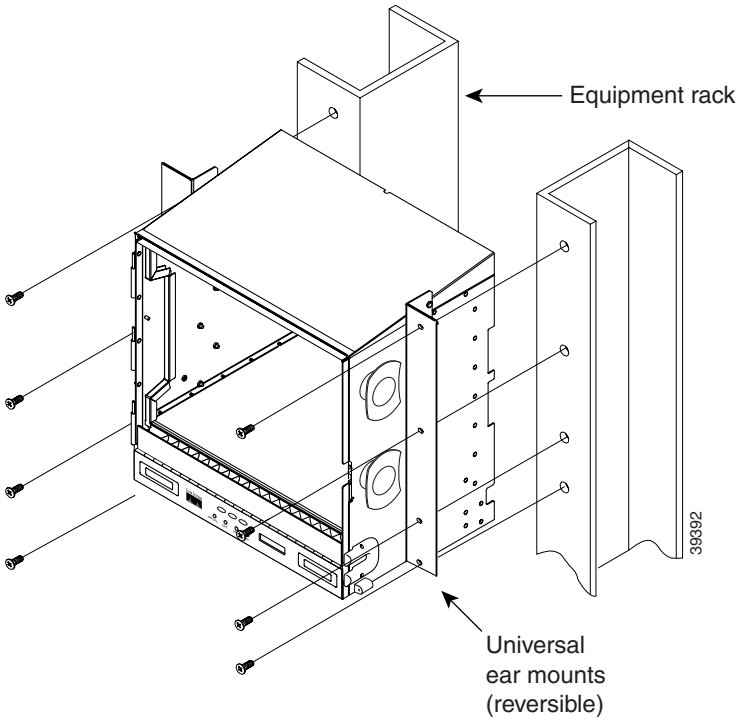
Caution When mounting the ONS 15454 ANSI shelf in a frame with a nonconductive coating (such as paint, lacquer, or enamel) either use the thread-forming screws provided with the ONS 15454 ANSI shipping kit, or remove the coating from the threads to ensure electrical continuity.

The shelf assembly comes preset for installation in a 23-inch (584.2 mm) rack, but you can reverse the mounting bracket to fit the smaller 19-inch (482.6 mm) rack.

14.2.2 Mounting a Single Node

Mounting the ONS 15454 ANSI shelf in a rack requires a minimum of 18.5 inches (469.9 mm) of vertical rack space and one additional inch (25.4 mm) for air flow. To ensure the mounting is secure, use two to four #12-24 mounting screws for each side of the shelf assembly. Figure 14-2 shows the rack mounting position for the ONS 15454 ANSI shelf.

Figure 14-2 Mounting an ONS 15454 ANSI Shelf in a Rack



Two people should install the shelf assembly; however, one person can install it using the temporary set screws included. The shelf assembly should be empty for easier lifting. The front door can also be removed to lighten the shelf assembly.

14.2.3 Mounting Multiple Nodes

Most standard (Telcordia GR-63-CORE, 19-inch [482.6-mm] or 23-inch [584.2-mm]) seven-foot (2.133-m) racks can hold four ONS 15454 ANSI shelves and a fuse and alarm panel. However, unequal flange racks are limited to three ONS 15454 ANSI shelves and a fuse and alarm panel, or four ONS 15454 ANSI shelves using a fuse and alarm panel from an adjacent rack.

If you are using the external (bottom) brackets to install the fan-tray air filter, you can install three shelf assemblies in a standard seven-foot (2.133-m) rack. If you are not using the external (bottom) brackets, you can install four shelf assemblies in a rack. The advantage of using the bottom brackets is that you can replace the filter without removing the fan tray.

14.2.4 ONS 15454 ANSI Bay Assembly

The Cisco ONS 15454 ANSI bay assembly simplifies ordering and installing the ONS 15454 ANSI shelf because it allows you to order shelf assemblies preinstalled in a seven-foot (2,133 mm) rack. The bay assembly is available in a three- or four-shelf configuration. The three-shelf configuration includes three ONS 15454 ANSI shelf assemblies, a prewired fuse and alarm panel, and two fiber-storage trays. The four-shelf configuration includes four ONS 15454 ANSI shelf assemblies and a prewired fuse and alarm panel. You can order optional fiber channels with either configuration. Installation procedures are included in the *Unpacking and Installing the Cisco ONS 15454 Four-Shelf and Zero-Shelf Bay Assembly* document that ships with the bay assembly.

14.3 ONS 15454 ETSI Rack Installation

The ONS 15454 ETSI (15454-SA-ETSI) is mounted in a 600 x 600-mm (23-inch) or 600 x 300-mm (11.8-inch) equipment cabinet/rack. The shelf assembly projects 240 mm (9.45 inches) from the front of the rack. It mounts in ETSI-standard racks. The shelf assembly is a total of 435 mm (17.35 inches) wide with no mounting ears attached. Ring runs are not provided by Cisco and might hinder side-by-side installation of shelves where space is limited.

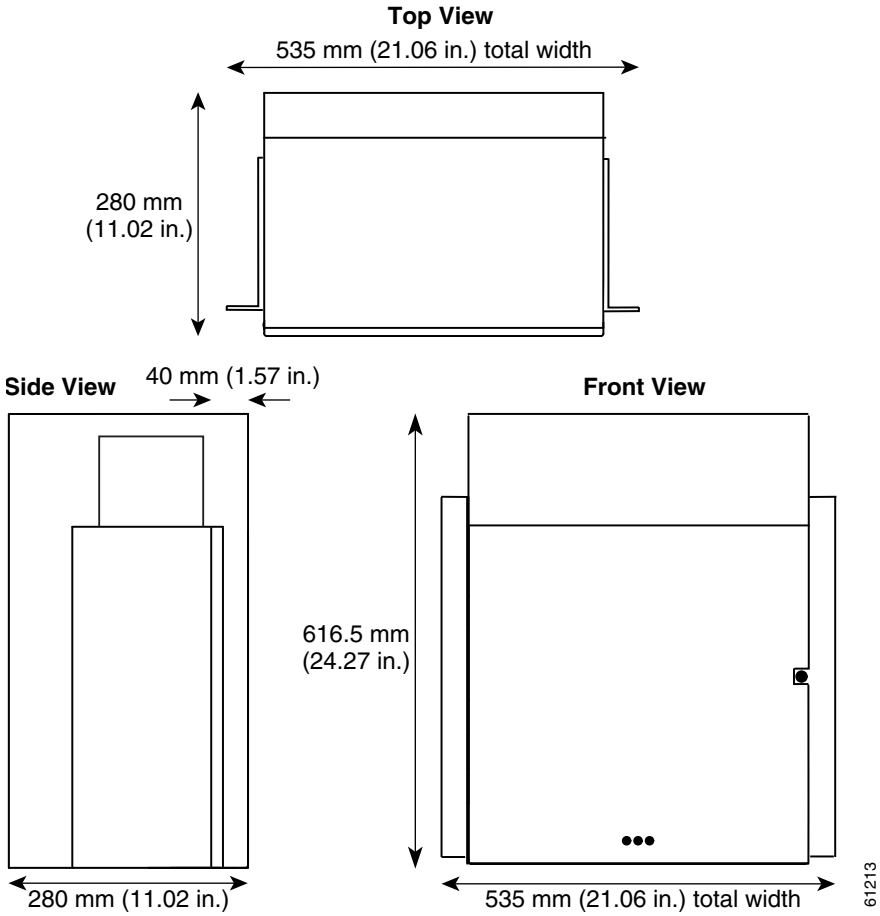
The ONS 15454 ETSI measures 616.5 mm (24.27 inches) high, 535 mm (21.06 inches) wide, and 280 mm (11.02 inches) deep. You can install up to three ONS 15454 ETSI shelves in a seven-foot (2133.6 mm) equipment rack. The ONS 15454 ETSI must have one inch (25.4 mm) of airspace below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 ETSI is installed below the first shelf assembly, an ETSI air ramp unit must be assembled between the two shelves to ensure adequate air flow.

Figure 14-3 provides the dimensions of the ONS 15454 ETSI.

Caution The standard ETSI racks can hold three ONS 15454 ETSI shelf assemblies and two air ramps. When mounting a shelf assembly in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack. If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Caution The ONS 15454 ETSI must have 1 inch (25.4 mm) of airspace below the installed shelf assembly to allow air flow to the fan intake. The air ramp (the angled piece of sheet metal on top of the shelf assembly) provides this spacing and should not be modified in any way.

Figure 14-3 ONS 15454 ETSI Dimensions

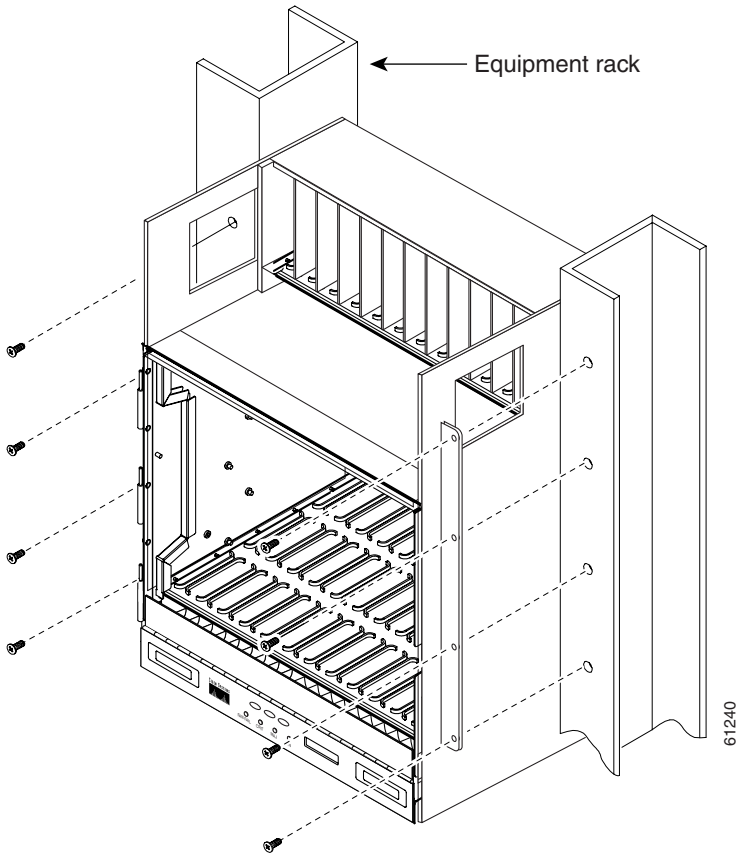


14.3.1 Mounting a Single Node

The ONS 15454 ETSI requires 616.5 mm (24.24 inch) minimum of vertical rack space and 25 mm (1 inch) below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 ETSI is installed above a shelf assembly, the air ramp between the shelves provides space for air flow. To ensure the mounting is secure, use two to four M6 mounting screws for each side of the shelf assembly. A shelf assembly should be mounted at the bottom of the rack if it is the only unit in the rack.

Figure 14-4 shows the rack mounting position for the ONS 15454 ETSI shelf.

Figure 14-4 Mounting an ONS 15454 ETSI Shelf in a Rack

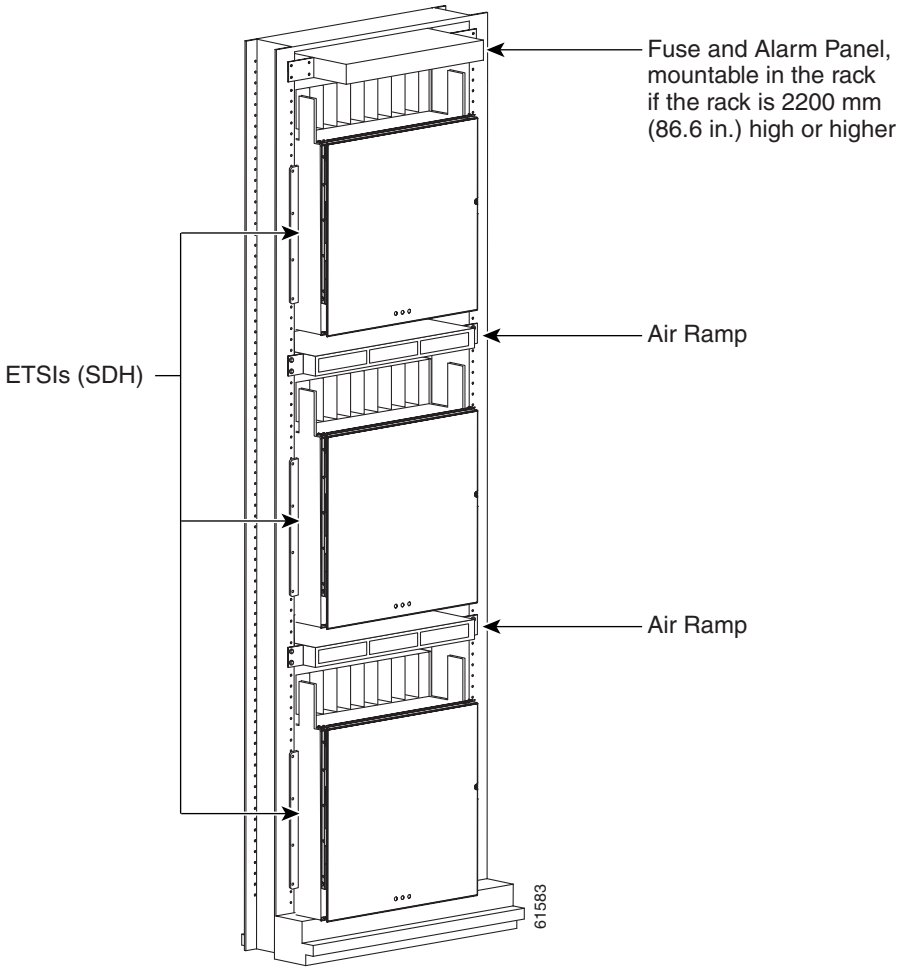


Two people should install the shelf assembly; however, one person can install it using the temporary set screws included. The shelf assembly should be empty for easier lifting. The front door can also be removed to lighten the shelf assembly.

14.3.2 Mounting Multiple Nodes

Most standard (Telcordia GR-63-CORE, 23-inch [584.2 mm]) seven-foot (2,133 mm) racks can hold three ONS 15454 ETSI shelves, two air ramps, and a fuse and alarm panel. Figure 14-5 shows a three-shelf ONS 15454 ETSI bay assembly.

Figure 14-5 Three-Shelf ONS 15454 ETSI Bay Assembly



14.4 FlexLayer and Y-Cable Protection

The Cisco ONS 15454 FlexLayer DWDM system includes the following components:

- Two-channel add or drop flex module
- FlexLayer shelf assembly
- Y-cable FlexLayer module

The FlexLayer shelf assembly is 1 rack unit (RU) high and can be mounted in a 19-inch (482.6-mm) or 23-inch (584.2-mm) rack (two-way mounting brackets). The FlexLayer shelf assembly is used to house the FlexLayer and Y-Cable modules.

14.4.1 FlexLayer Modules

The two-channel add/drop FlexLayer module is a completely passive unidirectional component that allows the insertion or the extraction of two channels within the ONS 15454 channel plan. This module is used only in point-to-point, one-channel, amplified system configurations.

Sixteen specific modules are available to cover the whole 32-channel bandwidth. Table 14-1 shows how the FlexLayer add/drop modules are grouped in relation to the supported channels.

Table 14-1 ONS 15454 100-GHz Channel Plan

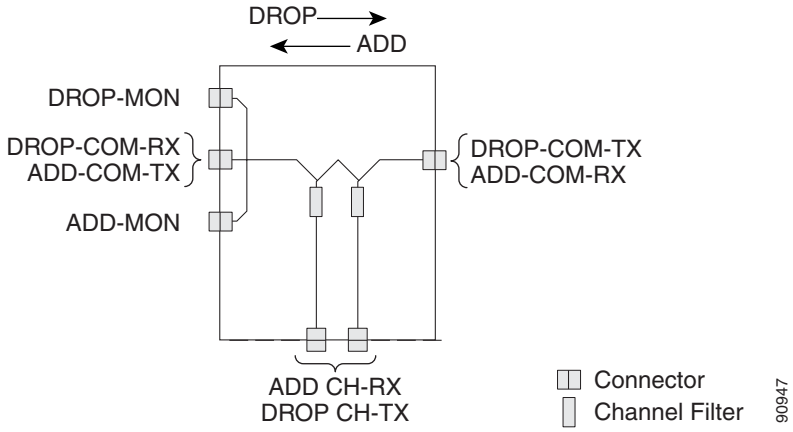
ITU	Channel ID	Frequency (THz)	Wavelength (nm)	Two-Channel A/D Flex Module
59	30.3	195.9	1530.33	15216-FLB-2-31.1=
58	31.1	195.8	1531.12	
57	31.9	195.7	1531.90	15216-FLB-2-32.6=
56	32.6	195.6	1532.68	
54	34.2	195.4	1534.25	15216-FLB-2-35.0=
53	35.0	195.3	1535.04	
52	35.8	195.2	1535.82	15216-FLB-2-36.6=
51	36.6	195.1	1536.61	
49	38.1	194.9	1538.19	15216-FLB-2-38.9=
48	38.9	194.8	1538.98	
47	39.7	194.7	1539.77	15216-FLB-2-40.5=
46	40.5	194.6	1540.56	
44	42.1	194.4	1542.14	15216-FLB-2-42.9=
43	42.9	194.3	1542.94	
42	43.7	194.2	1543.73	15216-FLB-2-44.5=
41	44.5	194.1	1544.53	
39	46.1	193.9	1546.12	15216-FLB-2-46.9=
38	46.9	193.8	1546.92	
37	47.7	193.7	1547.72	15216-FLB-2-48.5=
36	48.5	193.6	1548.51	
34	50.1	193.4	1550.12	15216-FLB-2-50.9=
33	50.9	193.3	1550.92	
32	51.7	193.2	1551.72	15216-FLB-2-52.5=
31	52.5	193.1	1552.52	
29	54.1	192.9	1554.13	15216-FLB-2-54.9=
28	54.9	192.8	1554.94	
27	55.7	192.7	1555.75	15216-FLB-2-56.5=
26	56.5	192.6	1556.55	

Table 14-1 ONS 15454 100-GHz Channel Plan (continued)

ITU	Channel ID	Frequency (THz)	Wavelength (nm)	Two-Channel A/D Flex Module
24	58.1	192.4	1558.17	15216-FLB-2-58.9=
23	58.9	192.3	1558.98	
22	59.7	192.2	1559.79	15216-FLB-2-60.6=
21	60.6	192.1	1560.61	

Figure 14-6 shows the module functional block diagram. In Figure 14-6, the signal flows from left to right when the card is used as a drop component and from right to left when the module is used as an add component.

Figure 14-6 Two-Channel Add/Drop FlexLayer Module Block Diagram

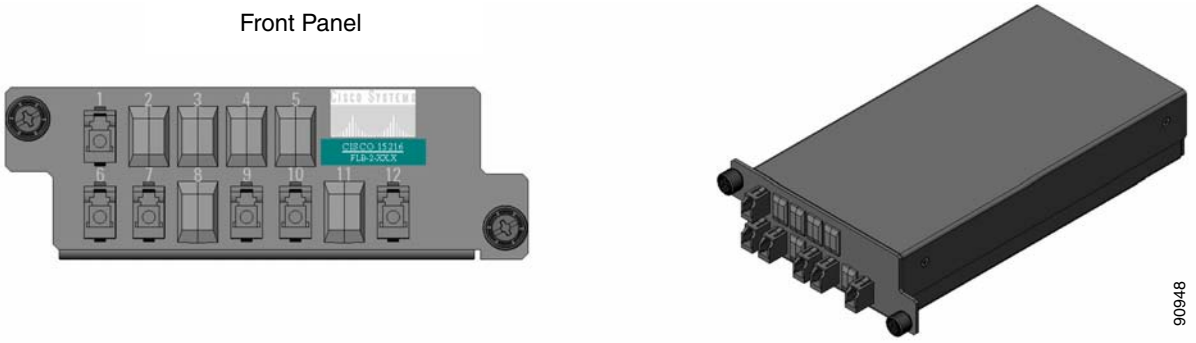


When the module is used as a drop component, the wave-division multiplexing (WDM) composite signal coming from the DROP-COM-RX port is filtered sequentially by two filters and the filtered channels are dropped at the two DROP-CH-TX ports. The rest of the WDM composite signal is sent to the DROP-COM-TX port. A two-percent tap coupler, DROP-MON, is used to monitor the input WDM composite signal.

When the module is used as an add component, the added channels coming from the two ADD-CH-RX ports are combined with the WDM composite signal coming from the ADD-COM-RX port. The multiplexed WDM composite signal is sent to the ADD-COM-TX port. A two-percent tap coupler, ADD-MON, is used to monitor the multiplexed WDM composite signal.

Figure 14-7 shows the physical appearance of the ONS 15454 two-channel add/drop FlexLayer module.

Figure 14-7 ONS 15454 Two-Channel Optical Add/Drop FlexLayer Module



Labels are provided to show how the module ports are mapped. It is the end user's responsibility to label the module for its intended use (drop or add component).

Figure 14-8 shows how the connectors are mapped and labeled on the front panel when the component is used as a drop component. The COM-RX is mapped to Port 1, the COM-TX is mapped to Port 12, and the two dropped channel TX ports are mapped to Ports 9 and 10. The two-percent tap MON port is mapped to Port 6. Port 7 is not active.

Figure 14-8 Two-Channel Drop Component Connector Mapping and Labeling

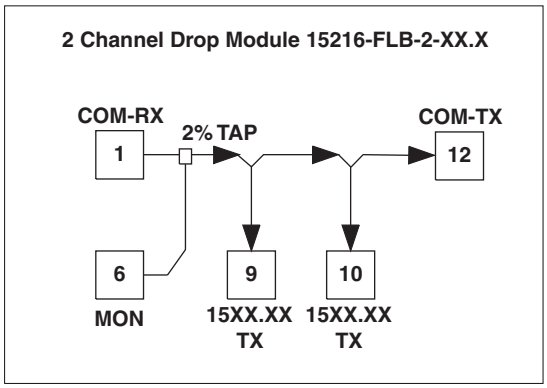
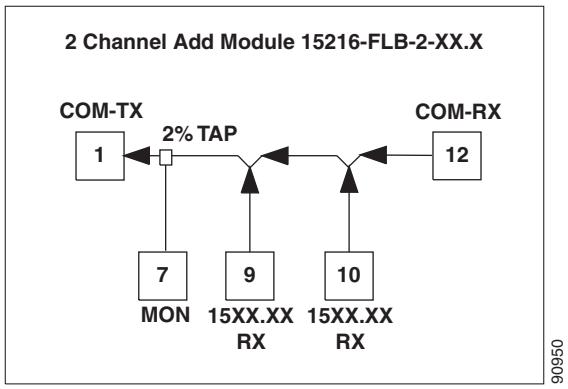


Figure 14-9 shows how the connectors are mapped and labeled in the front panel when the component is used as an add component. The COM-TX is mapped to Port 1, the COM-RX is mapped to Port 12, and the added channels are mapped to the two RX Ports 9 and 10. The two-percent tap MON port is mapped to Port 7. Port 6 is not active.

Figure 14-9 Two-Channel Add Component Connector Mapping and Labeling



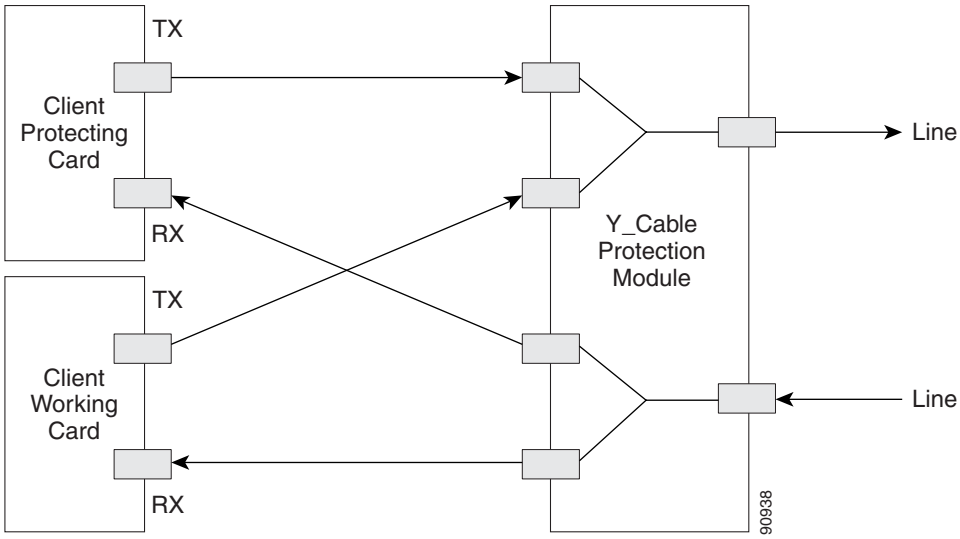
14.4.2 Y-Cable Protection Module

The Y-cable protection module is a bidirectional module. It is equipped with two passive star couplers: one that is used as a splitter and one that is used as a coupler.

Note None of the modules in this equipment release can be used for video on demand (VoD) applications.

The purpose of this module is to provide Y-cable protection on the CLIENT side of transponder (TXP) cards such as the TXP_MR_10G, XP_MR_10E, or TXP_MR_2.5G (Figure 14-10). There are two versions of this module, one for multimode applications (CS-MM-Y) and one for single-mode applications (CS-SM-Y).

Figure 14-10 Typical Y-Cable Protection Module Configuration



When the module is used in the coupler direction, the individual signals enter the module from the CPL-RX*n* ports and pass through a passive star coupler to the CPL-TX port.

The coupler is not meant to combine both the protect and working client card signals. The module allows a path for the working client transmit interface to connect to the network in the event the opposite interface in the protection pair should fail (the protect interface switches to the working interface).

When the module is used in the splitter direction, the signal enters the module from the SPL-RX port and is split through a passive star coupler to the SPL-TX*n* ports. This module, although designed to pass wavelengths associated with the ONS 15454 32-channel plan, is not selective to specific wavelengths (modules do not filter wavelengths).

Figure 14-11 shows the block diagram of the Y-cable protection module.

Figure 14-11 1:2 Splitter and 2:1 Coupler (Y-Cable Protection) Module Block Diagram

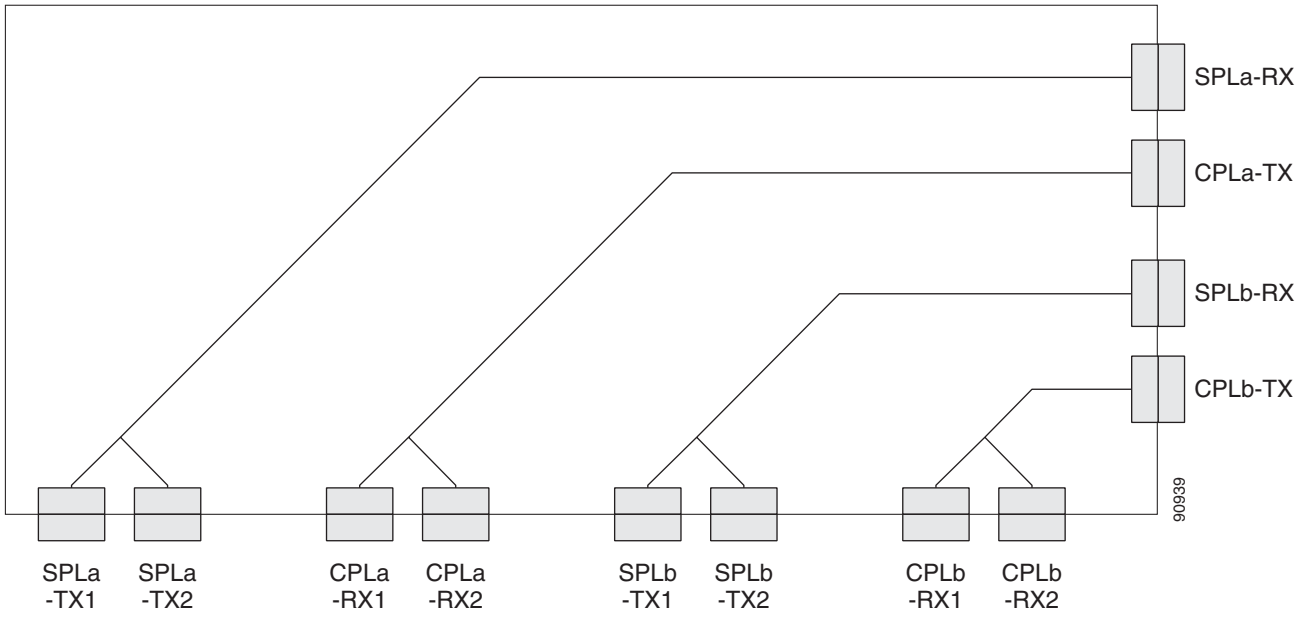


Figure 14-12 and Figure 14-13 show the physical appearance of the ONS 15454 Y-Cable Protection FlexLayer Module. This module has two versions, one for single-mode applications and the other for multimode applications.

Figure 14-12 ONS 15454 Y-Cable Protection FlexLayer Module (Single-Mode)

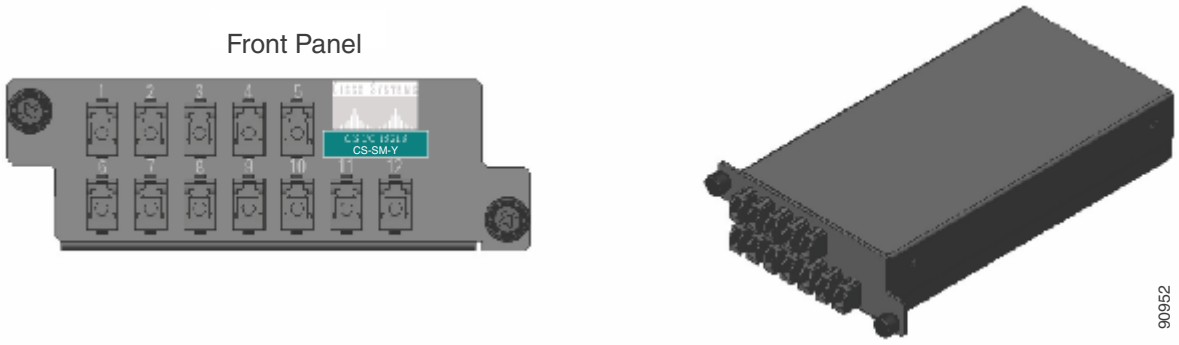


Figure 14-13 ONS 15454 Y-Cable Protection FlexLayer Module (Multimode)

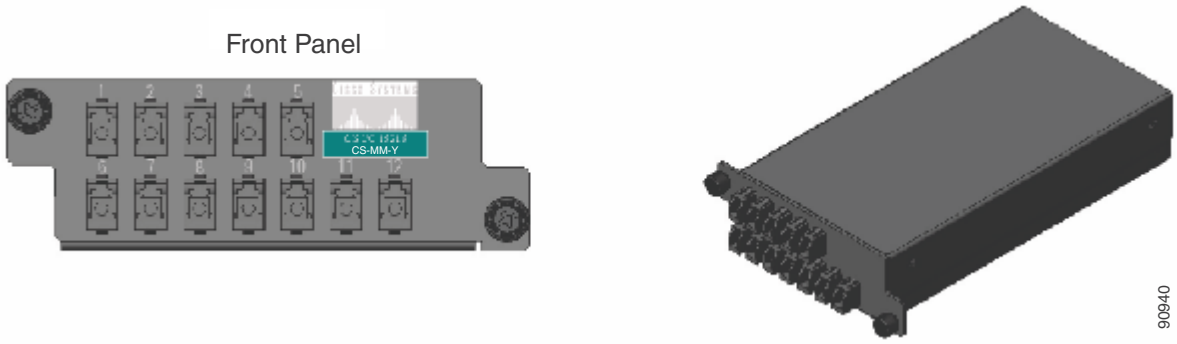


Figure 14-14 shows how the module front panel ports are mapped and labeled. The multimode module is mapped and labeled the same as the single-mode module.

Figure 14-14 Y-Cable Protection Component Connector Mapping and Labeling

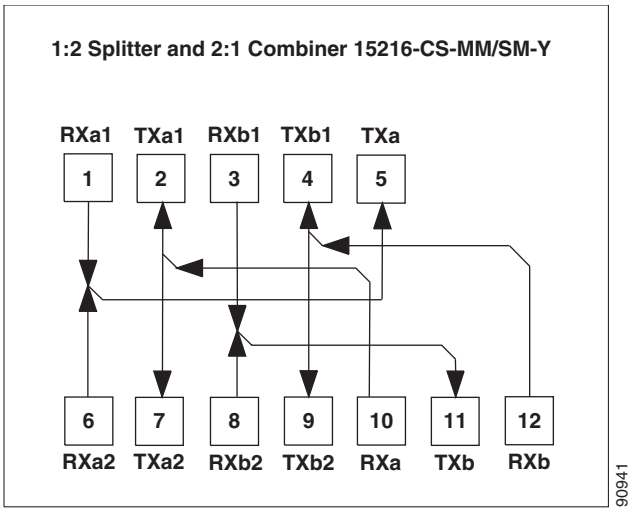


Table 14-2 details the single-mode and multimode front panel Protection A mapping. It shows how two DWDM receive inputs (client working and protect) provide one output signal to the equipment, using the module combiner function.

Table 14-2 Protection A (TXP 1 and 2) Port Mapping: Combiner from DWDM

Receive Port Number	Receive (RX) Signal Names	Signal Sources
1	RXa1 (TXP1-W)	Client TX
6	RXa2 (TXP2-P)	Client TX
Transmit Port Number	**Transmit (TX) Signal Name**	**Signal Destination**
5	TXa (customer client)	Customer client equipment RX

Table 14-3 details the single-mode and multimode front panel Protection A mapping. It shows how the module splits a single receive input from the equipment into two DWDM output signals (working and protect) to the client.

Table 14-3 Protection A (TXP 1 and 2) Port Mapping: Splitter to DWDM

Receive Port Number	Receive (RX) Signal Name	Signal Source
10	RXa (customer client)	Customer client equipment TX
Transmit Port Number	**Transmit (TX) Signal Names**	**Signal Destinations**
2	TXa1 (TXP1-W)	Client RX
7	TXa2 (TXP2-P)	Client RX

Table 14-4 details the single-mode and multimode front panel Protection B mapping. It shows how two DWDM receive inputs (client working and protect) provide one output signal to the equipment, using the module combiner function.

Table 14-4 Protection B (TXP 3 and 4) Port Mapping: Combiner from DWDM

Receive Port Number	Receive (RX) Signal Names	Signal Sources
3	RXb1 (TXP3-W)	Client TX
8	RXb2 (TXP4-P)	Client TX
Transmit Port Number	**Transmit (TX) Signal Name**	**Signal Destination**
11	TXb (customer client)	Customer client equipment RX

Table 14-5 details the single-mode and multimode front panel Protection B mapping. It shows how the module splits a single receive input from the equipment into two DWDM output signals (working and protect) to the client.

Table 14-5 Protection B (TXP 3 and 4) Port Mapping: Splitter to DWDM

Receive Port Number	Receive (RX) Signal Name	Signal Source
12	RXb (customer client)	Customer client equipment TX
Transmit Port Number	**Transmit (TX) Signal Names**	**Signal Destinations**
4	TXb1 (TXP3-W)	Client RX
9	TXb2 (TXP4-P)	Client RX

The following muxponder (MXP) and transponder (TXP) cards can use Y-cable protection:

- MXP_2.5_10G
- MXP_2.5_10E
- MXP_MR_2.5G
- TXP_MR_10G
- TXP_MR_10E
- TXP_MR_2.5G

14.5 Typical DWDM Rack Layouts

Typical dense wavelength division multiplexing (DWDM) applications might include:

- 3 ONS 15454 shelves
- 1 Dispersion Compensating Unit (DCU)
- 7 patch panels (or fiber-storage trays)

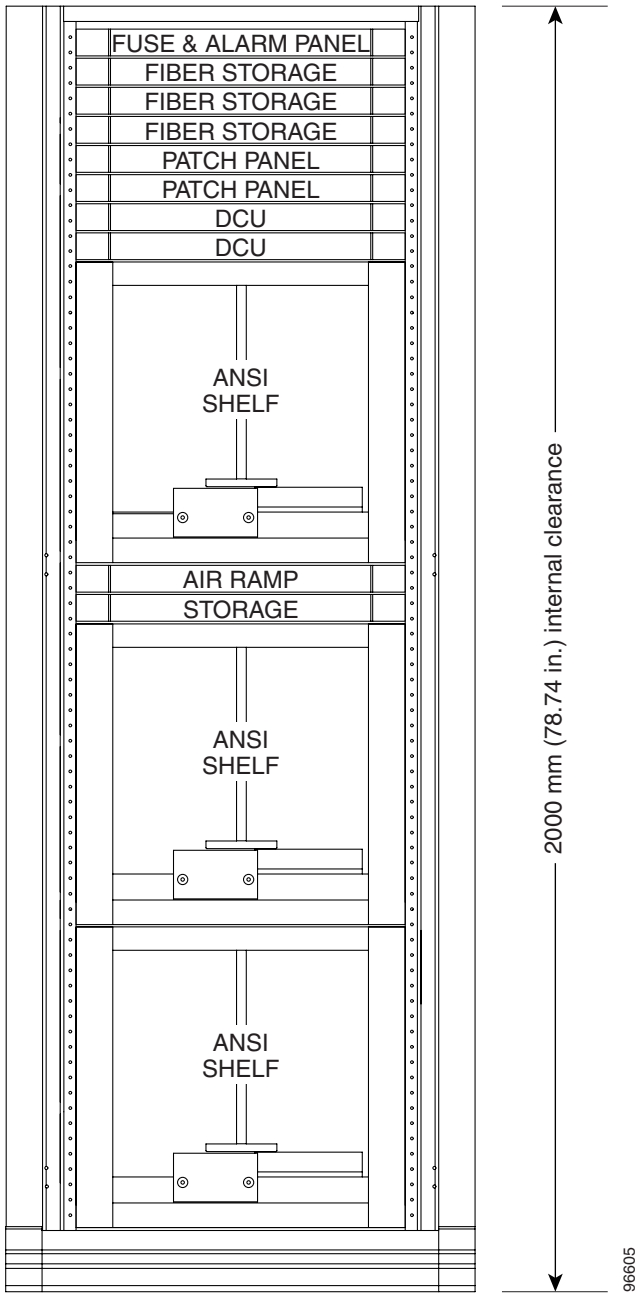
Or, alternatively:

- 3 ONS 15454 shelves
- 2 DCUs
- 6 patch panels (or fiber-storage trays)

See Figure 14-15 for a typical rack layout.

Note Use the rack layout generated by Cisco MetroPlanner to determine your exact shelf layout.

Figure 14-15 Typical DWDM Equipment Layout in an ONS 15454 ANSI Rack



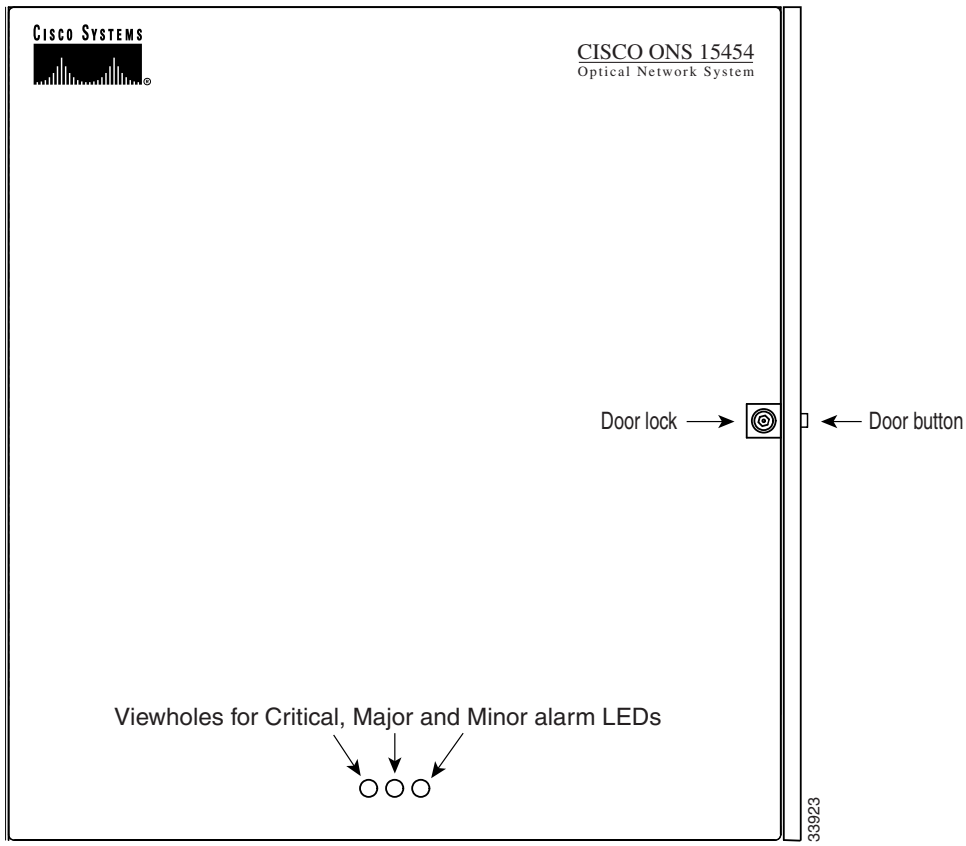
ANSI 23 in. (584.2 mm) or 19 in. (482.6 mm)

If you are installing a patch panel or fiber-storage tray below the ONS 15454 shelf, you must install the air ramp between the shelf and patch-panel tray/fiber-management tray, or leave one rack unit (RU) space open.

14.6 Front Door

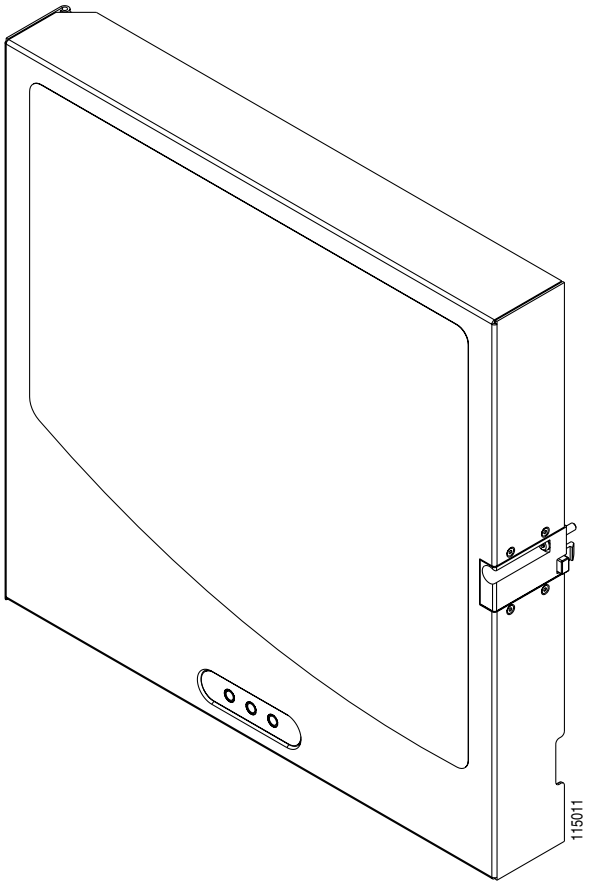
The Critical, Major, and Minor alarm LEDs visible through the front door indicate whether a critical, major, or minor alarm is present anywhere on the ONS 15454 shelf. These LEDs must be visible so technicians can quickly determine if any alarms are present on the ONS 15454 shelf or the network. You can use the LCD to further isolate alarms. The front door (Figure 14-16) provides access to the shelf assembly, fiber-storage tray, fan-tray assembly, and LCD screen.

Figure 14-16 The ONS 15454 Front Door



The ONS 15454 ANSI ships with a standard door but can also accommodate a deep door and extended fiber clips (15454-DOOR-KIT) to provide additional room for cabling (Figure 14-17). The ONS 15454 ETSI does not support the deep door.

Figure 14-17 Cisco ONS 15454 ANSI Deep Door



The ONS 15454 door locks with a pinned hex key that ships with the shelf assembly. A button on the right side of the shelf assembly releases the door. You can remove the front door to provide unrestricted access to the front of the shelf assembly.

Before you remove the ONS 15454 front door, you must remove the ground strap of the front door (Figure 14-18).

Figure 14-18 ONS 15454 ANSI Front Door Ground Strap

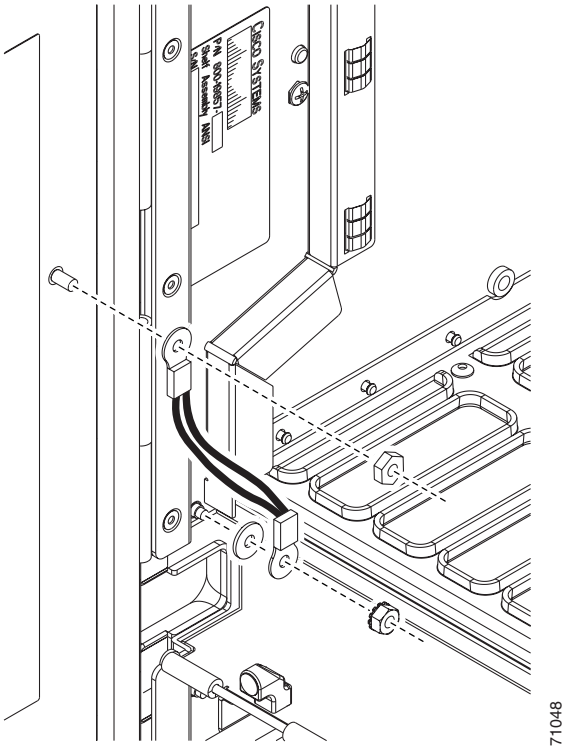


Figure 14-19 shows how to remove the ONS 15454 ANSI front door.

Figure 14-19 Removing the ONS 15454 ANSI Front Door

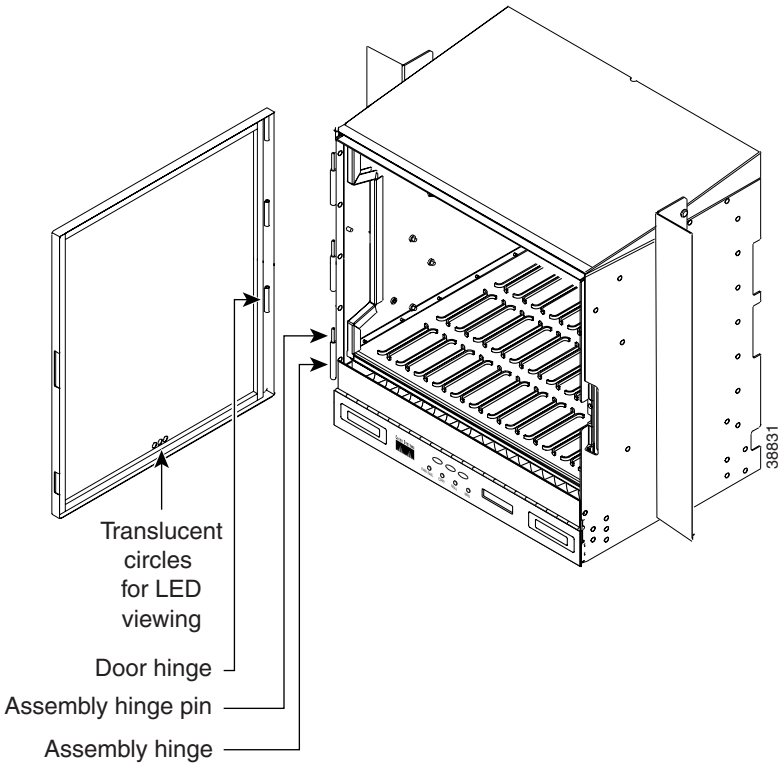
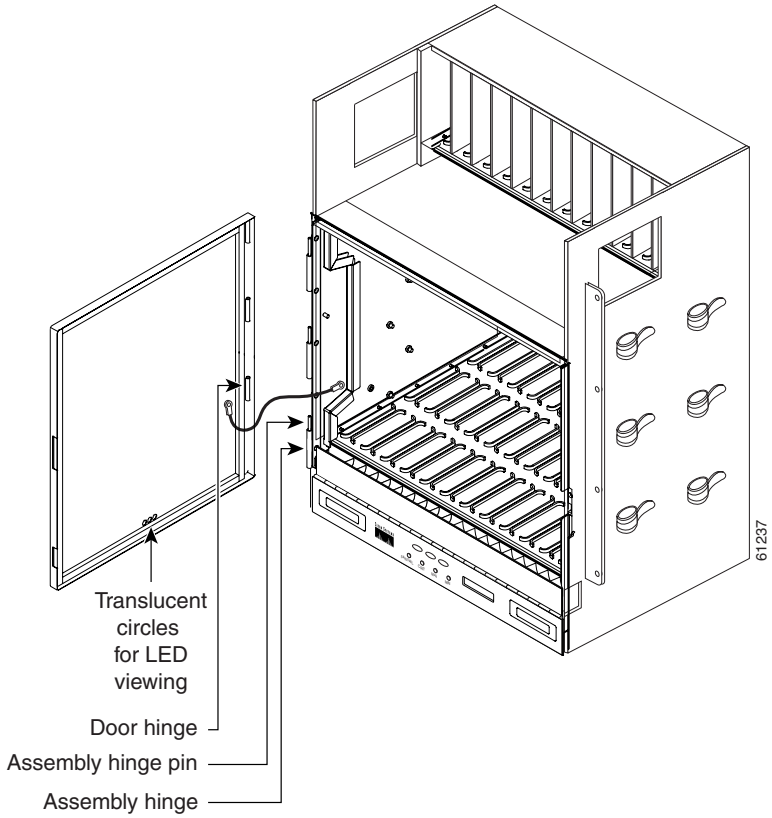


Figure 14-20 shows how to remove the ONS 15454 ETSI front door.

Figure 14-20 Removing the ONS 15454 ETSI Front Door



An erasable label is pasted on the inside of the front door. You can use the label to record slot assignments, port assignments, card types, node ID, rack ID, and serial number for the ONS 15454.

Figure 14-21 shows the erasable label on the ONS 15454 ANSI shelf.

Figure 14-21 ONS 15454 ANSI Front-Door Erasable Label

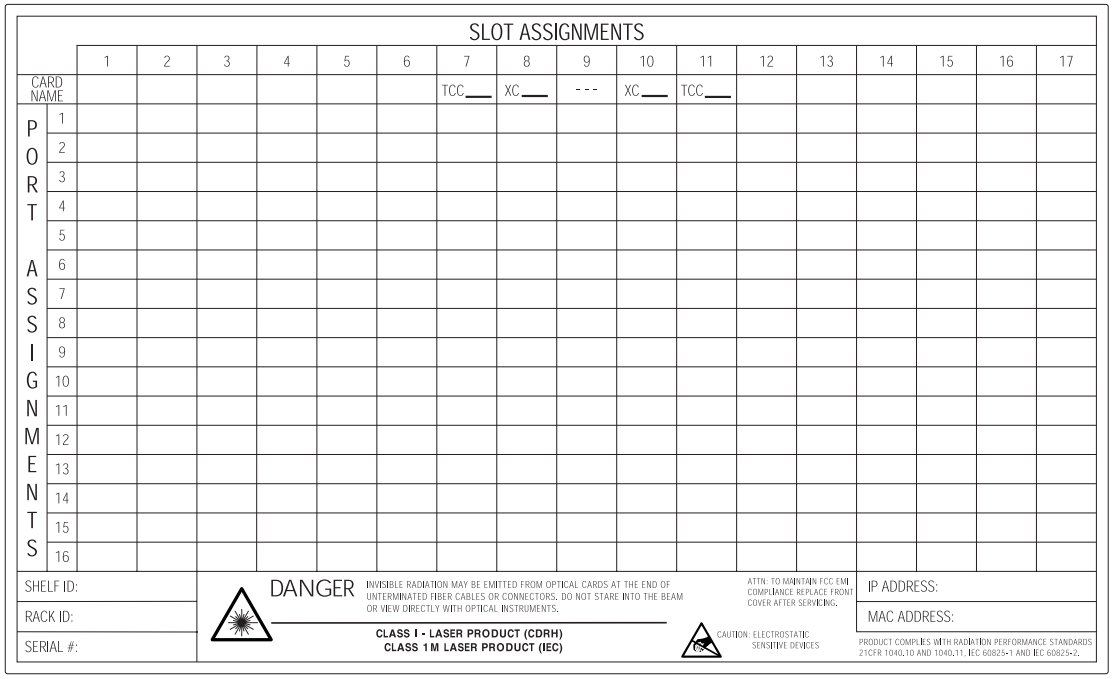
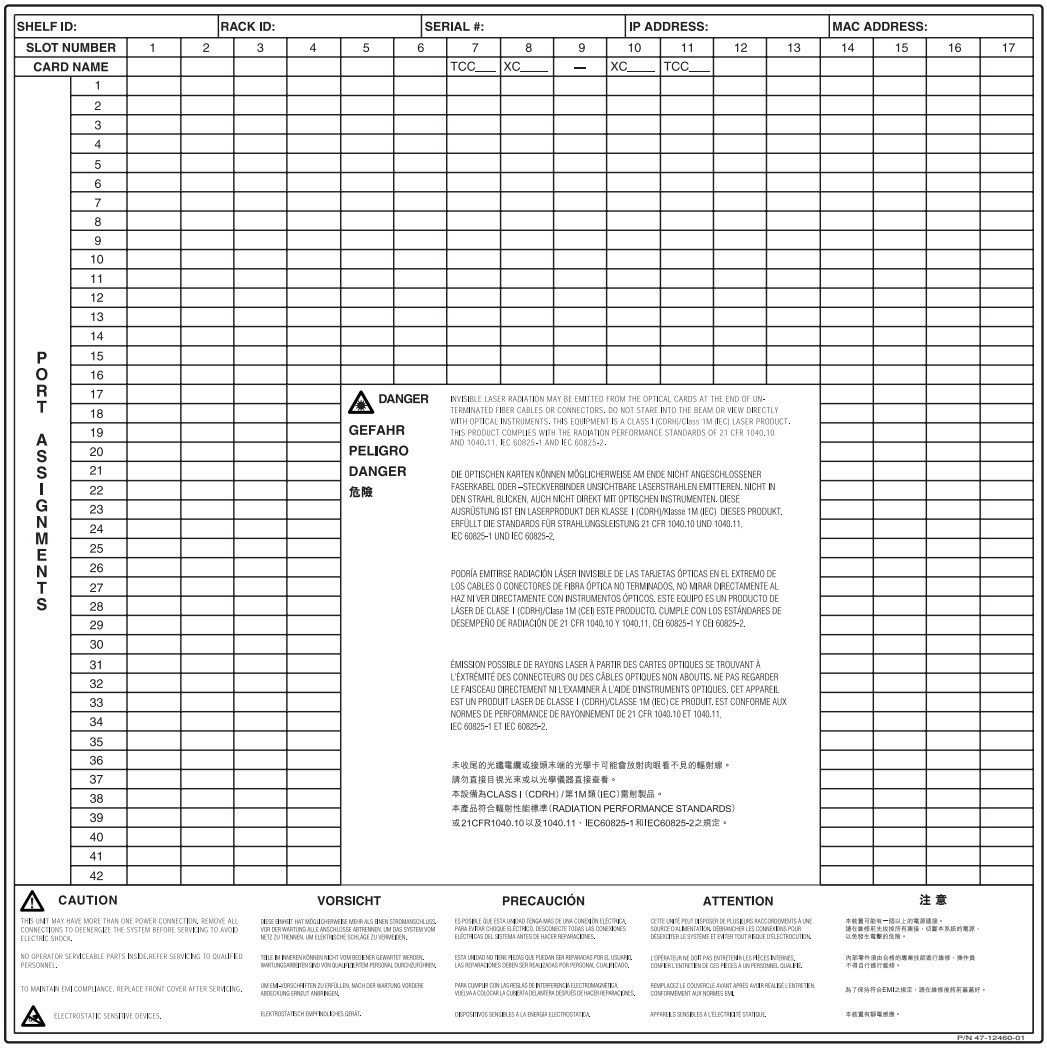


Figure 14-22 shows the erasable label on the ONS 15454 ETSI shelf.

Figure 14-22 ONS 15454 ETSI Front-Door Erasable Label



The front door label also includes the Class I and Class 1M laser warning. Figure 14-23 shows the ONS 15454 ANSI laser warning.

Figure 14-23 Laser Warning on the ONS 15454 ANSI Front-Door Label

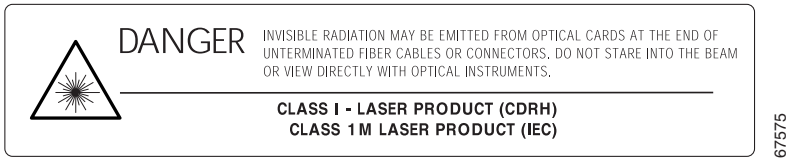
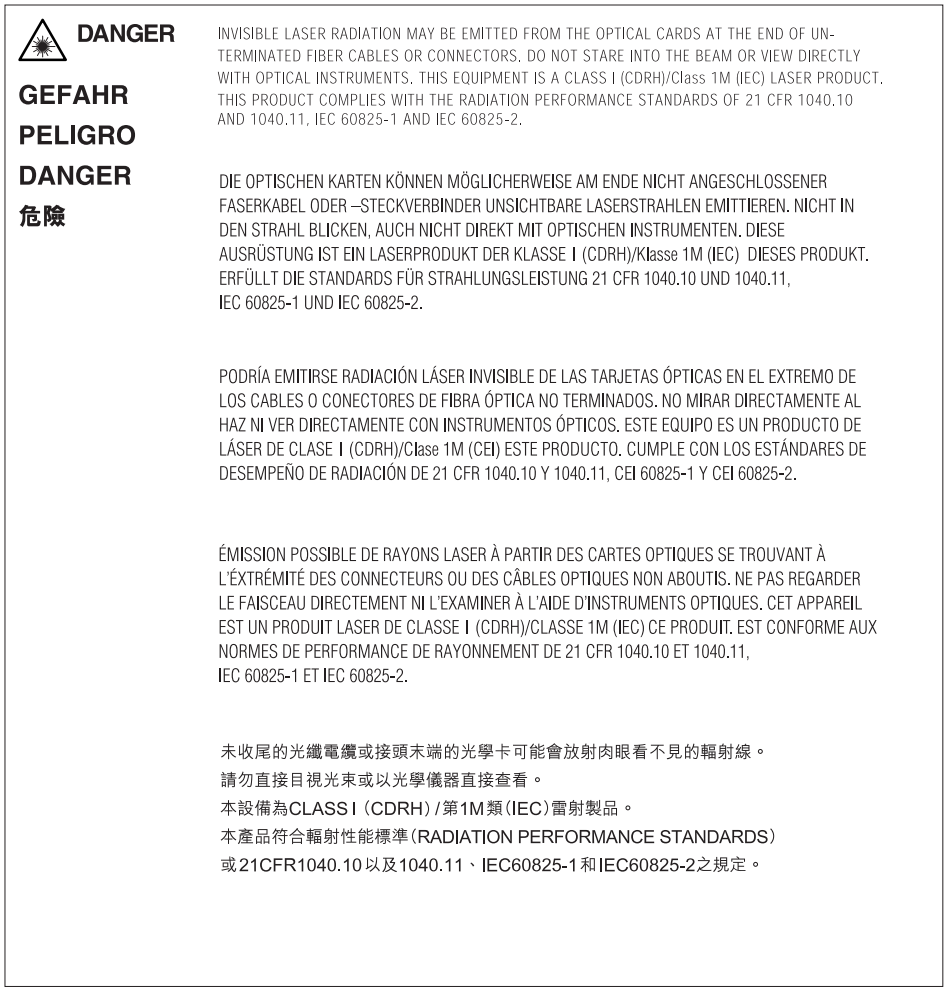


Figure 14-24 shows the ONS 15454 ETSI laser warning.

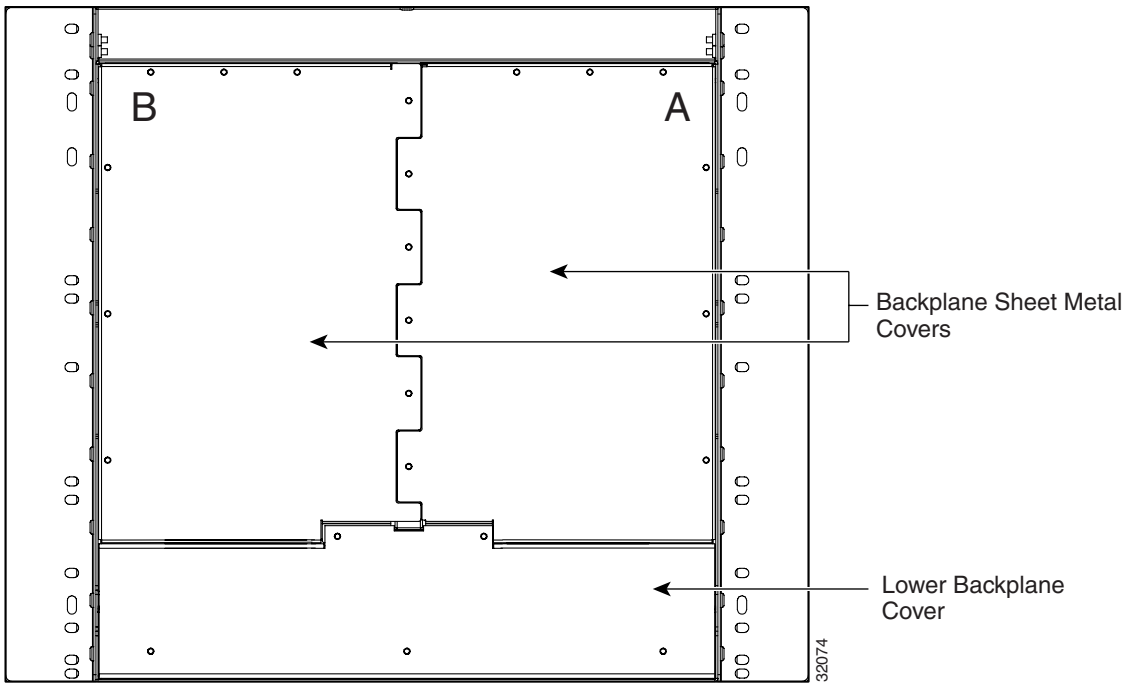
Figure 14-24 Laser Warning on the ONS 15454 ETSI Front-Door Label



14.7 ONS 15454 ANSI Backplane Covers

If a backplane does not have an electrical interface assembly (EIA) panel installed, it should have two sheet metal backplane covers (one on each side of the backplane). See Figure 14-25. Each cover is held in place with nine 6-32 x 3/8 inch Phillips screws.

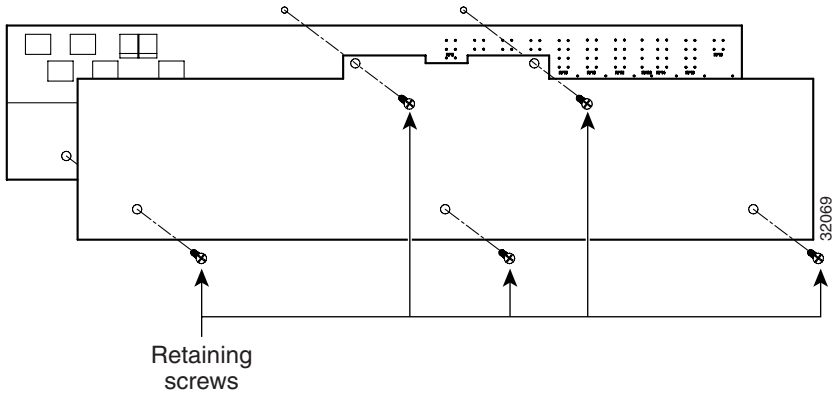
Figure 14-25 Backplane Covers



14.7.1 Lower Backplane Cover

The lower section of the ONS 15454 ANSI backplane is covered by either a clear plastic protector (15454-SA-ANSI) or a sheet metal cover (15454-SA-HD), which is held in place by five 6-32 x 1/2 inch screws. Remove the lower backplane cover to access the alarm interface panel (AIP), alarm pin fields, frame ground, and power terminals (Figure 14-26).

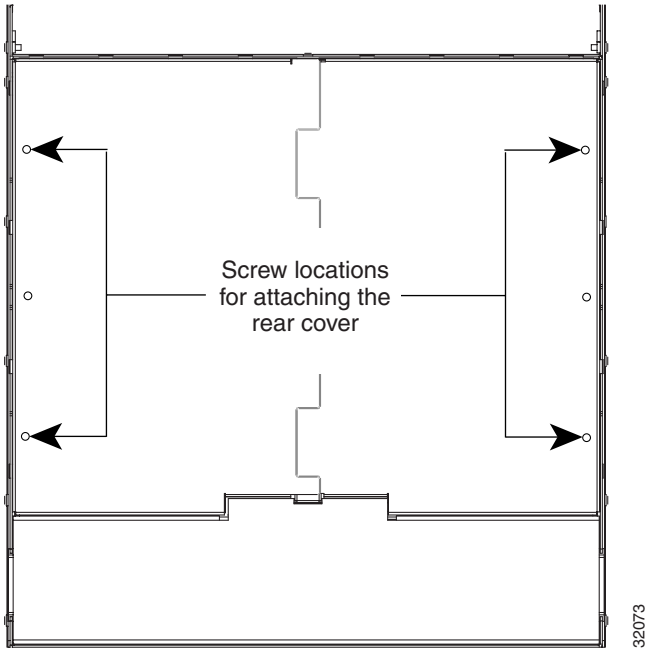
Figure 14-26 Removing the Lower Backplane Cover



14.7.2 Rear Cover

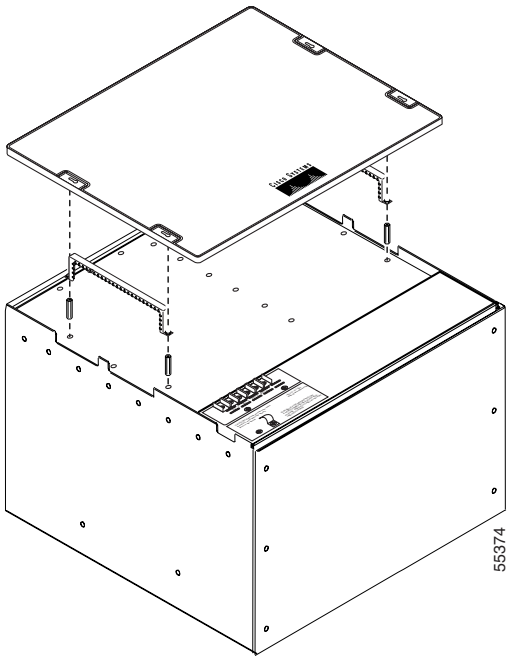
The ONS 15454 ANSI has an optional clear plastic rear cover. This clear plastic cover provides additional protection for the cables and connectors on the backplane. Figure 14-27 shows the rear cover screw locations.

Figure 14-27 Backplane Attachment for Cover



You can also install the optional spacers if more space is needed between the cables and rear cover (Figure 14-28).

Figure 14-28 Installing the Plastic Rear Cover with Spacers



14.7.3 Alarm Interface Panel

The AIP is located above the alarm contacts on the lower section of the backplane. The AIP provides surge protection for the ONS 15454 ANSI. It also provides an interface from the backplane to the fan-tray assembly and LCD. The AIP plugs into the backplane using a 96-pin DIN connector and is held in place with two retaining screws. The panel has a nonvolatile memory chip that stores the unique node address (MAC address). The MAC address identifies the nodes that support circuits. It allows Cisco Transport Controller (CTC) to determine circuit sources, destinations, and spans. The TCC2/TCC2P cards in the ONS 15454 ANSI also use the MAC address to store the node database.

Note The 5-A AIP (73-7665-XX) is required when installing the new fan-tray assembly (15454-FTA3), which comes preinstalled on the shelf assembly (15454-SA-ANSI or 15454-SA-HD).

Note A blown fuse on the AIP board can cause the LCD display to go blank.

14.7.4 Alarm Interface Panel Replacement

If the AIP fails, a MAC Fail alarm appears on the CTC Alarms menu and/or the LCD display on the fan-tray assembly goes blank. To perform an in-service replacement of the AIP, you must contact the Cisco Technical Assistance Center (Cisco TAC). For contact information, see the "Obtaining Technical Assistance" section on page lxxiv.

You can replace the AIP on an in-service system without affecting traffic (except Ethernet traffic on nodes running a software release earlier than Release 4.0). The circuit repair feature allows you to repair circuits affected by MAC address changes on one node at a time. Circuit repair works when all nodes are running the same software version. Each individual AIP upgrade requires an individual circuit repair; if AIPs are replaced on two nodes, the circuit repair must be performed twice. Always replace an AIP during a maintenance window.

Caution Do not use a 2-A AIP with a 5-A fan-tray assembly; doing so causes a blown fuse on the AIP.

Note Ensure that all nodes in the affected network are running the same software version before replacing the AIP and repairing circuits. If you need to upgrade nodes to the same software version, no hardware should be changed or circuit repair performed until after the software upgrade is complete.

14.8 ONS 15454 ETSI Front Mount Electrical Connection

The ONS 15454 ETSI positive and negative power terminals are located on FMEC cards in the Electrical Facility Connection Assembly (EFCA). The ground connection is the grounding receptacle on the side panel of the shelf.

The ONS 15454 ETSI EFCA at the top of the shelf has 12 FMEC slots numbered sequentially from left to right (18 to 29). Slots 18 to 22 and 25 to 29 provide electrical connections. Slots 23 and 24 host the MIC-A/P and MIC-C/T/P cards, respectively. The MIC-A/P and the MIC-C/T/P cards also connect alarm, timing, LAN, and craft connections to the ONS 15454 ETSI.

For more information about the MIC-A/P and MIC-C/T/P, see Chapter 15, “Card Reference.”

14.9 ONS 15454 ANSI Alarm Expansion Panel

The optional ONS 15454 ANSI alarm expansion panel (AEP) can be used with the Alarm Interface Controller–International card (AIC-I) card to provide an additional 48 dry alarm contacts for the ONS 15454 ANSI: 32 inputs and 16 outputs. The AEP is a printed circuit board assembly that is installed on the backplane. Figure 14-29 shows the AEP board; the left connector is the input connector and the right connector is the output connector.

The AIC-I without an AEP already contains direct alarm contacts. These direct AIC-I alarm contacts are routed through the backplane to wire-wrap pins accessible from the back of the shelf. If you install an AEP, you cannot use the alarm contacts on the wire-wrap pins. For more information about the AIC-I, see Chapter 15, “Card Reference.”

Figure 14-29 AEP Printed Circuit Board Assembly

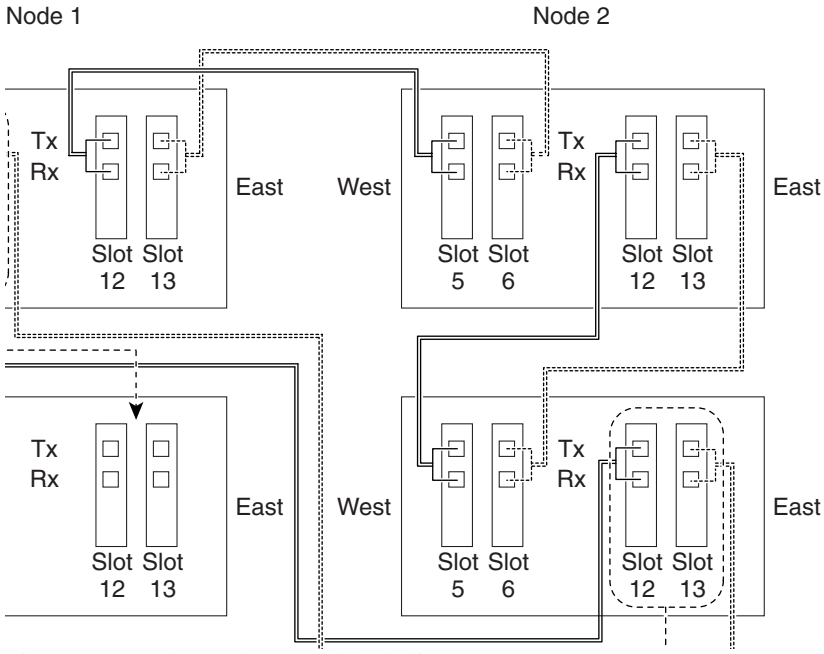
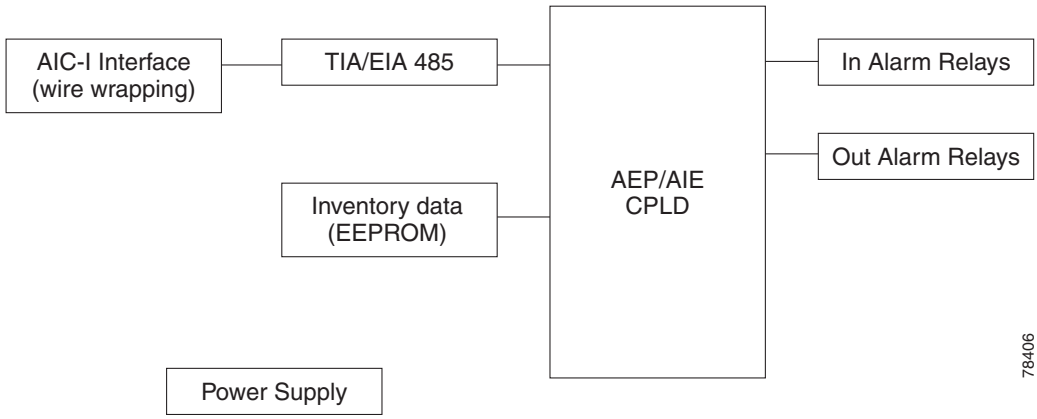


Figure 14-30 shows the AEP block diagram.

Figure 14-30 AEP Block Diagram



Each AEP alarm input port has provisionable label and severity. The alarm inputs have optocoupler isolation. They have one common 32-VDC output and a maximum of 2 mA per input. Each opto-metal oxide semiconductor (MOS) alarm output can operate by definable alarm condition, a maximum open circuit voltage of 60 VDC, and a maximum current of 100 mA. See the "21.7 External Alarms and Controls" section on page 21-12 for further information.

Figure 14-31 shows the wire-wrapping connections on the shelf backplane used to connect to the AEP.

Figure 14-31 AEP Wire-Wrap Connections to Backplane Pins

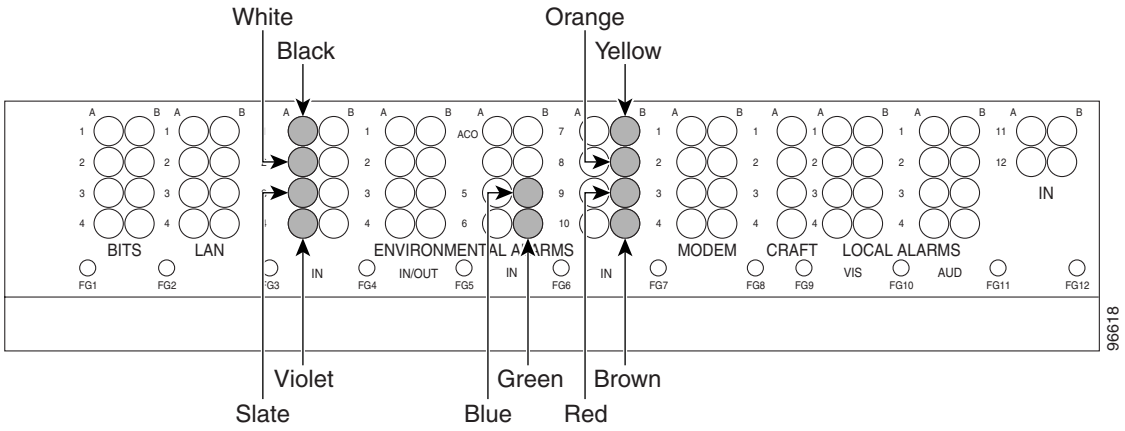


Table 14-6 shows the backplane pin assignments and corresponding signals on the AIC-I and AEP.

Table 14-6 Pin Assignments for the AEP

AEP Cable Wire	Backplane Pin	AIC-I Signal	AEP Signal
Black	A1	GND	AEP_GND
White	A2	AE_+5	AEP_+5
Slate	A3	VBAT–	VBAT–
Violet	A4	VB+	VB+
Blue	A5	AE_CLK_P	AE_CLK_P
Green	A6	AE_CLK_N	AE_CLK_N
Yellow	A7	AE_DIN_P	AE_DOUT_P
Orange	A8	AE_DIN_N	AE_DOUT_N
Red	A9	AE_DOUT_P	AE_DIN_P
Brown	A10	AE_DOUT_N	AE_DIN_N

Figure 14-32 is a circuit diagram of the alarm inputs. (Inputs 1 and 32 are shown in the example.)

Figure 14-32 Alarm Input Circuit Diagram

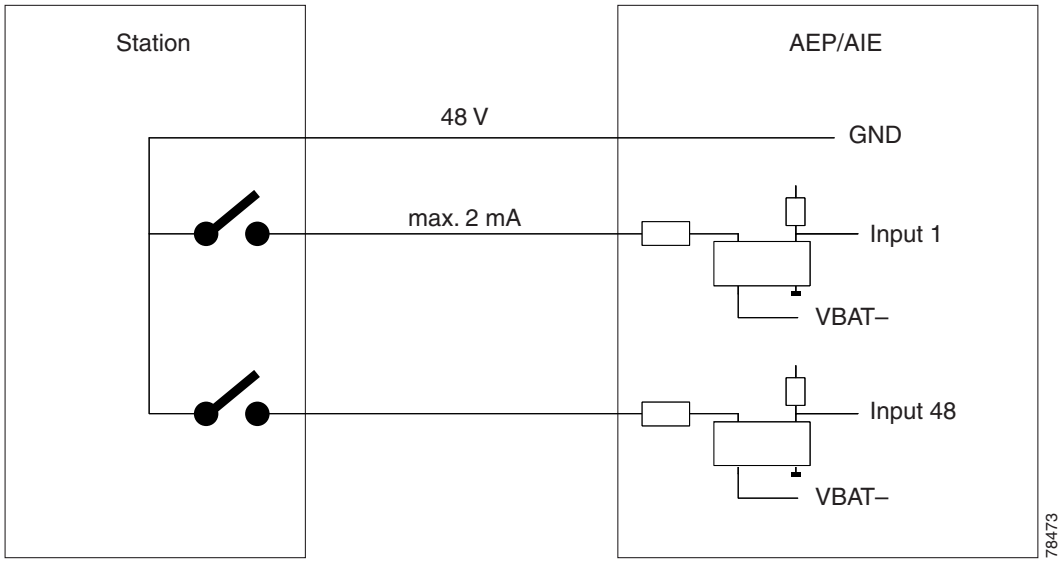


Table 14-7 lists the connections to the external alarm sources.

Table 14-7 Alarm Input Pin Association

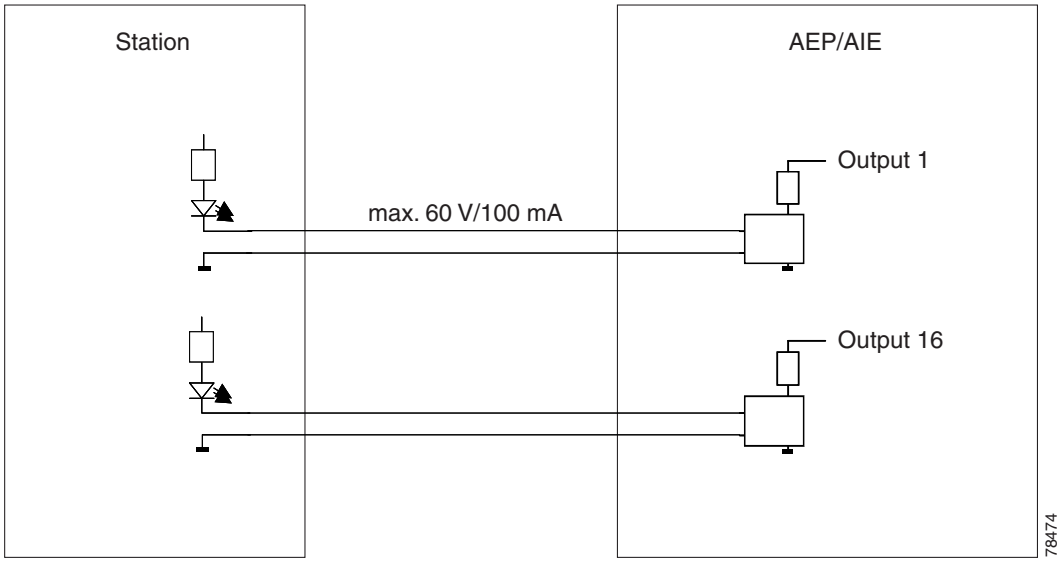
AMP Champ Pin Number	Signal Name	AMP Champ Pin Number	Signal Name
1	ALARM_IN_1–	27	GND
2	GND	28	ALARM_IN_2–
3	ALARM_IN_3–	29	ALARM_IN_4–
4	ALARM_IN_5–	30	GND
5	GND	31	ALARM_IN_6–
6	ALARM_IN_7–	32	ALARM_IN_8–
7	ALARM_IN_9–	33	GND
8	GND	34	ALARM_IN_10–
9	ALARM_IN_11–	35	ALARM_IN_12–
10	ALARM_IN_13–	36	GND
11	GND	37	ALARM_IN_14–
12	ALARM_IN_15–	38	ALARM_IN_16–
13	ALARM_IN_17–	39	GND
14	GND	40	ALARM_IN_18–
15	ALARM_IN_19–	41	ALARM_IN_20–
16	ALARM_IN_21–	42	GND
17	GND	43	ALARM_IN_22–

Table 14-7 Alarm Input Pin Association (continued)

AMP Champ Pin Number	Signal Name	AMP Champ Pin Number	Signal Name
18	ALARM_IN_23–	44	ALARM_IN_24–
19	ALARM_IN_25–	45	GND
20	GND	46	ALARM_IN_26–
21	ALARM_IN_27–	47	ALARM_IN_28–
22	ALARM_IN_29–	48	GND
23	GND	49	ALARM_IN_30–
24	ALARM_IN_31–	50	—
25	ALARM_IN_+	51	GND1
26	ALARM_IN_0–	52	GND2

Figure 14-33 is a circuit diagram of the alarm outputs. (Outputs 1 and 16 are shown in the example.)

Figure 14-33 Alarm Output Circuit Diagram



Use the pin numbers in Table 14-8 to connect to the external elements being switched by external controls.

Table 14-8 Pin Association for Alarm Output Pins

AMP Champ Pin Number	Signal Name	AMP Champ Pin Number	Signal Name
1	—	27	COM_0
2	COM_1	28	—
3	NO_1	29	NO_2
4	—	30	COM_2

Table 14-8 Pin Association for Alarm Output Pins (continued)

AMP Champ Pin Number	Signal Name	AMP Champ Pin Number	Signal Name
5	COM_3	31	—
6	NO_3	32	NO_4
7	—	33	COM_4
8	COM_5	34	—
9	NO_5	35	NO_6
10	—	36	COM_6
11	COM_7	37	—
12	NO_7	38	NO_8
13	—	39	COM_8
14	COM_9	40	—
15	NO_9	41	NO_10
16	—	42	COM_10
17	COM_11	43	—
18	NO_11	44	NO_12
19	—	45	COM_12
20	COM_13	46	—
21	NO_13	47	NO_14
22	—	48	COM_14
23	COM_15	49	—
24	NO_15	50	—
25	—	51	GND1
26	NO_0	52	GND2

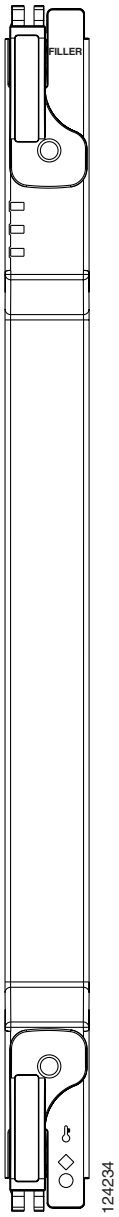
14.10 Filler Card

The filler card is designed to occupy empty multiservice and AIC-I slots in the Cisco ONS 15454 (Slots 1 – 6, 9, and 12 – 17). The filler card cannot operate in the XC slots (Slots 8 and 10) or TCC slots (Slots 7 and 11). The filler card is detected by CTC.

When installed, the filler card aids in maintaining proper air flow and EMI requirements.

Figure 14-34 shows the card faceplate. The filler card has no card-level LED indicators.

Figure 14-34 Filler Card Faceplate



14.11 Cable Routing and Management

The ONS 15454 cable management facilities include the following:

- Fiber patch panels
- A cable-routing channel (behind the fold-down door) that runs the width of the shelf assembly (Figure 14-35 on page 14-37)
- Plastic horseshoe-shaped fiber guides at each side opening of the cable-routing channel that ensure that the proper bend radius is maintained in the fibers (Figure 14-36 on page 14-38)

Note You can remove the fiber guide, if necessary, to create a larger opening (if you need to route CAT-5 Ethernet cables out the side, for example). To remove the fiber guide, take out the three screws that anchor it to the side of the shelf assembly.

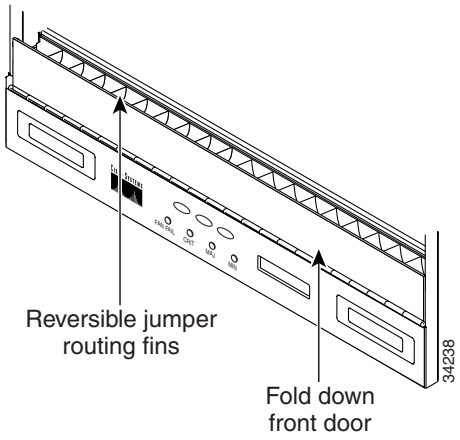
- Cable tie-wrap facilities on EIAs that secure cables to the cover panel (ANSI only)
- Reversible jumper routing fins that enable you to route cables out either side by positioning the fins as desired
- Jumper slack storage reels (2) on each side panel that reduce the amount of slack in cables that are connected to other devices

Note To remove the jumper slack storage reels, take out the screw in the center of each reel.

- Optional fiber-storage tray (recommended for DWDM nodes)
- Optional tie-down bar (ANSI only)

Figure 14-35 shows the cable management facilities that you can access through the fold-down front door, including the cable-routing channel and the jumper routing fins.

Figure 14-35 Managing Cables on the Front Panel



14.11.1 Fiber Management

The jumper routing fins are designed to route fiber jumpers out of both sides of the shelf. Slots 1 to 6 exit to the left, and Slots 12 to 17 exit to the right. Figure 14-36 shows fibers routed from cards in the left slots, down through the fins, then exiting out the fiber channel to the left. The maximum capacity of the fiber routing channel depends on the size of the fiber jumpers.

Figure 14-36 Fiber Capacity

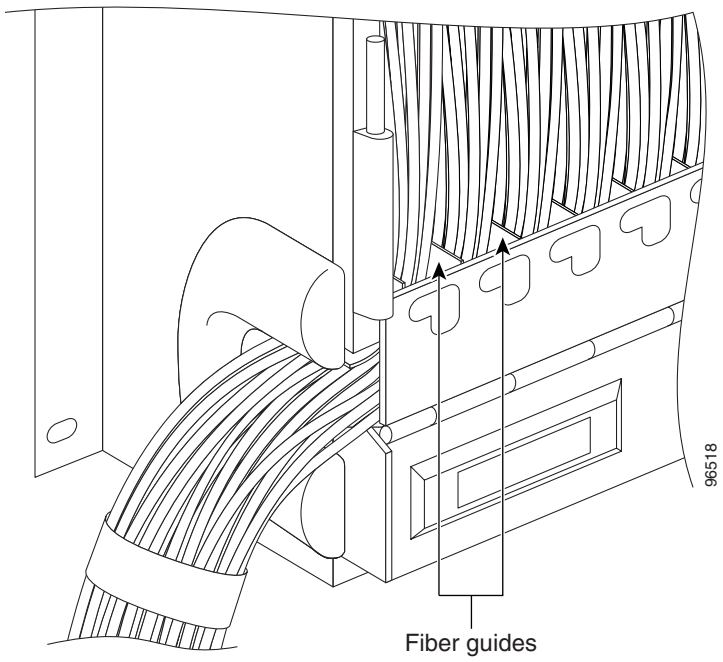


Table 14-9 provides the maximum capacity of the fiber channel for one side of an ANSI shelf, depending on fiber size and number of Ethernet cables running through that fiber channel.

Table 14-9 ANSI Fiber Channel Capacity (One Side of the Shelf)

	Maximum Number of Fibers Exiting Each Side		
Fiber Diameter	**No Ethernet Cables**	**One Ethernet Cable**	**Two Ethernet Cables**
1.6 mm (0.6 inch)	144	127	110
2 mm (0.7 inch)	90	80	70
3 mm (0.11 inch)	40	36	32

Table 14-10 provides the maximum capacity of the fiber channel for one side of an ETSI shelf, depending on fiber size and number of Ethernet cables running through that fiber channel.

Table 14-10 ETSI Fiber Channel Capacity (One Side of the Shelf)

	Maximum Number of Fibers Exiting Each Side		
Fiber Diameter	**No Ethernet Cables**	**One Ethernet Cable**	**Two Ethernet Cables**
1.6 mm (0.6 inch)	126	110	94
2 mm (0.7 inch)	80	70	60
3 mm (0.11 inch)	36	31	26

Determine your fiber size according to the number of cards/ports installed in each side of the shelf. For example, if your port combination requires 36 fibers, 3-mm (0.11-inch) fiber is adequate. If your port combination requires 68 fibers, you must use 2-mm (0.7-inch) or smaller fibers.

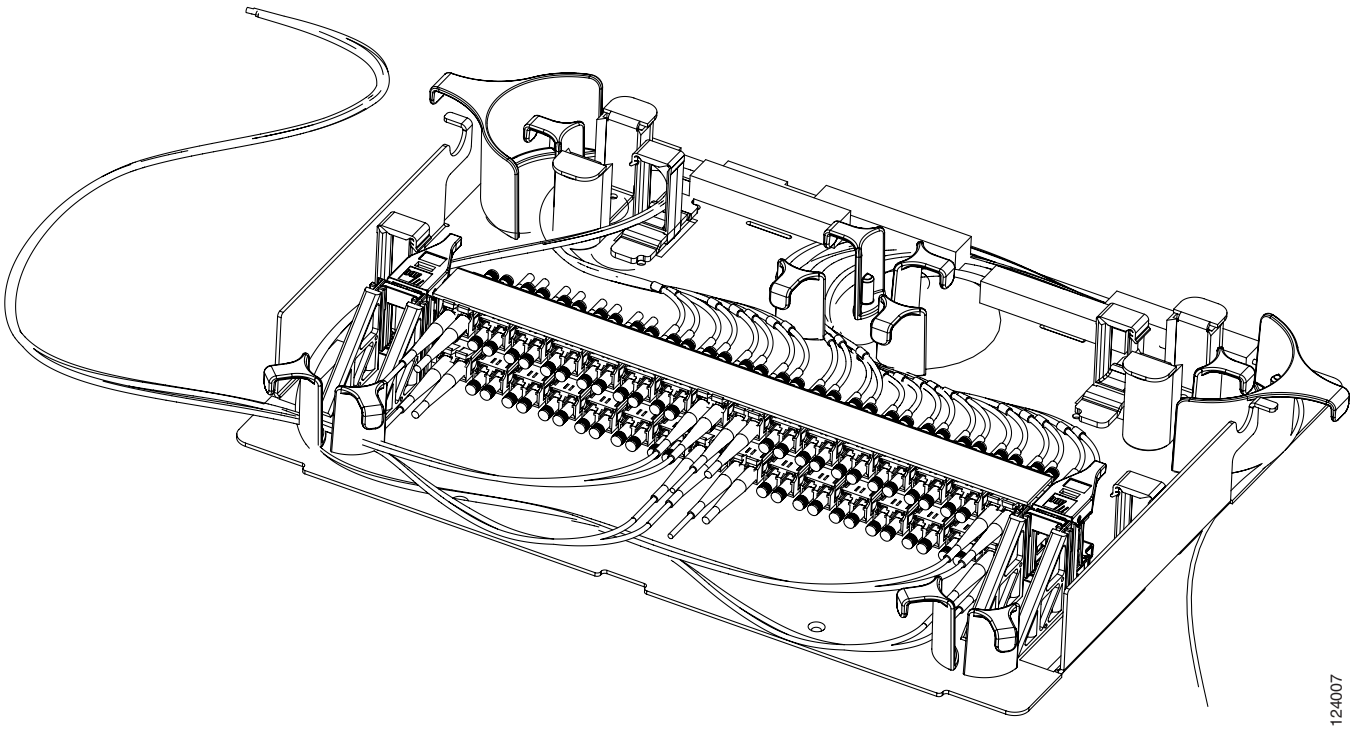
14.11.2 Fiber Management Using the Patch-Panel Tray

The optional patch-panel tray manages the connections between multiplexer/demultiplexer and TXP cards by splitting patch cords into single connections. The patch-panel tray consists of a metal shelf, pull-out drawer, and drop-in patch-panel module. It can host up to eight ribbon cables (with eight fibers each) entering the drawer or 64 cables (with a maximum outer diameter of 2 mm [0.079 inches]).

Because the patch-panel tray can host 64 connections, hub and ROADM nodes will typically require two patch-panel modules each, and other DWDM nodes typically require one. The module fits 19- and 23-inch (482.6-mm and 584.2-mm) ANSI racks and 600 mm (23.6 inch) x 300 mm (11.8 inch) ETSI racks, using reversible brackets.

Figure 14-37 shows a partially fibered patch-panel tray.

Figure 14-37 Patch-Panel Tray



14.11.3 Fiber Management Using the Fiber-Storage Tray

Cisco recommends installing at lease one fiber-storage tray in multinode racks to facilitate fiber-optic cable management for DWDM applications. This tray is usually used to store slack cable from cables installed between cards within a single node. See Figure 14-15 on page 14-18 for typical mounting locations.

Table 14-11 provides the fiber capacity for each tray.

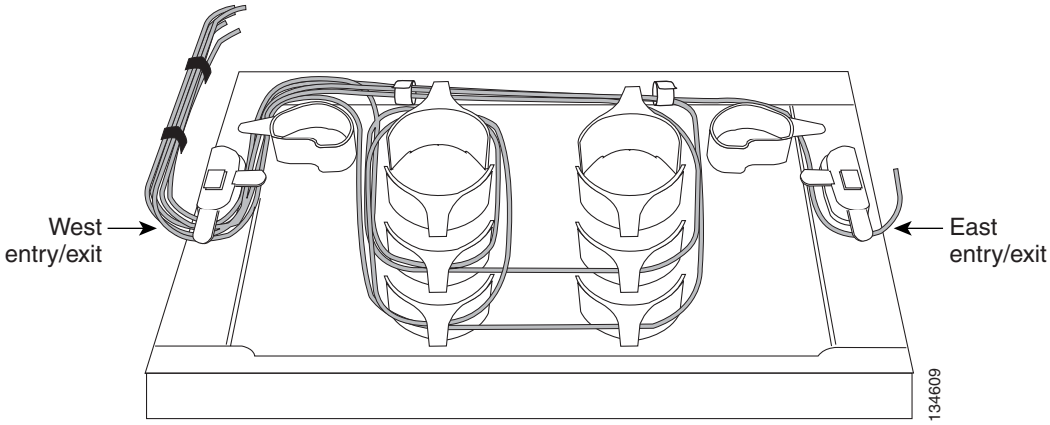
Table 14-11 Fiber-Storage Tray Capacity

Fiber Diameter	Maximum Number of Fibers Exiting Each Side
1.6 mm (0.6 inch)	62
2 mm (0.7 inch)	48
3 mm (0.11 inch)	32

Figure 14-38 shows a fiber-management tray with fiber-optic cables routed through it. You can route cables around the cable rounders, entering and exiting from either side, as necessary.

Note Figure 14-38 shows one example of how to route fibers through the fiber-storage tray. Route fibers as necessary for your site configuration.

Figure 14-38 Fiber-Storage Tray

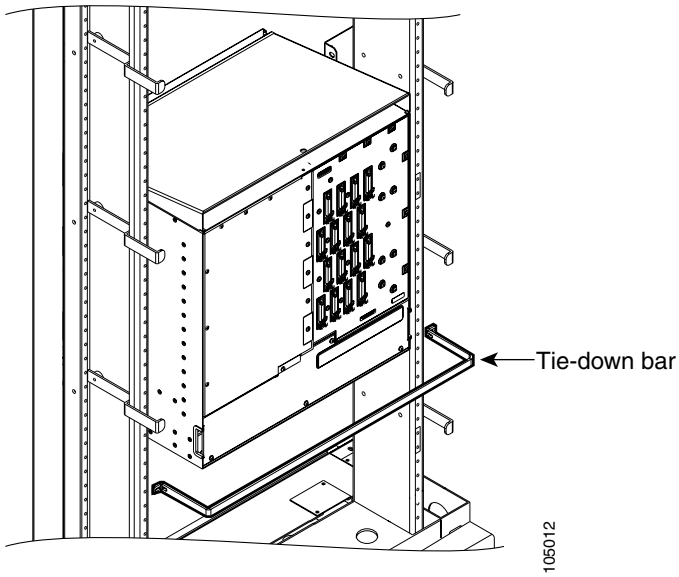


14.11.4 Fiber Management Using the Optional ANSI Tie-Down Bar

You can install a 5-inch (127-mm) tie-down bar on the rear of the ANSI chassis. You can use tie-wraps or other site-specific material to bundle the cabling and attach it to the bar so that you can more easily route the cable away from the rack.

Figure 14-39 shows the tie-down bar, the ONS 15454 ANSI, and the rack.

Figure 14-39 Tie-Down Bar on the Cisco ONS 15454 ANSI Shelf Assembly



14.12 Fan-Tray Assembly

The fan-tray assembly is located at the bottom of the ONS 15454 shelf assembly. The fan tray is a removable drawer that holds fans and fan-control circuitry for the ONS 15454. The front door can be left in place or removed before installing the fan-tray assembly. After you install the fan tray, you should only need to access it if a fan failure occurs or if you need to replace or clean the fan-tray air filter. Refer to Chapter 12, "Maintain the Node" to clean and replace the fan-tray assembly.

The front of the fan-tray assembly has an LCD screen that provides slot- and port-level information for all card slots, including the number of Critical, Major, and Minor alarms.

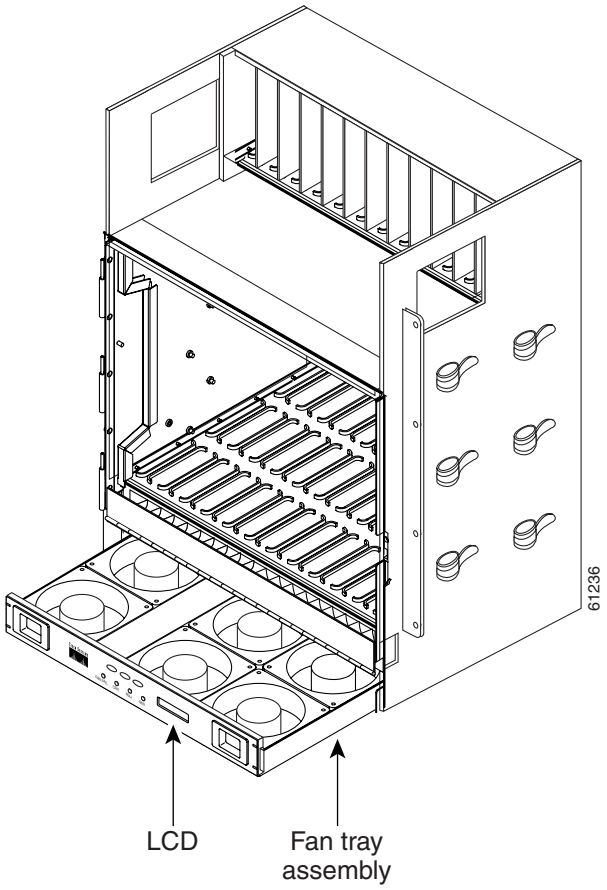
The fan-tray assembly features an air filter at the bottom of the tray that you can install and remove by hand. Remove and visually inspect this filter every 30 days and keep spare filters in stock. Refer to Chapter 12, "Maintain the Node," for information about cleaning and maintaining the fan-tray air filter.

Caution Do not operate an ONS 15454 without the mandatory fan-tray air filter.

Caution The 15454-FTA3-T fan-tray assembly can only be installed in ONS 15454 Release 3.1 and later shelf assemblies (15454-SA-ANSI, P/N: 800-19857; 15454-SA-HD, P/N: 800-24848). The fan-tray assembly includes a pin that prevents it from being installed in ONS 15454 shelf assemblies released before ONS 15454 Release 3.1 (15454-SA-NEBS3E, 15454-SA-NEBS3, and 15454-SA-R1). Equipment damage can result from attempting to install the 15454-FTA3 in a noncompatible shelf assembly.

See Figure 14-40 for the position of the ONS 15454 ETSI fan-tray assembly.

Figure 14-40 Position of the ONS 15454 ETSI Fan-Tray Assembly



14.12.1 Fan Speed and Power Requirements

Fan speed is controlled by the TCC2/TCC2P card's temperature sensors. The sensors measure the input air temperature at the fan-tray assembly. Fan speed options are low, medium, and high. If the TCC2/TCC2P card fails, the fans automatically shift to high speed. The temperature measured by the TCC2/TCC2P sensors appears on the LCD screen.

Table 14-12 lists power requirements for the fan-tray assembly.

Table 14-12 Fan Tray Assembly Power Requirements

Fan Tray Assembly	Watts	Amps	BTU/Hr
FTA2	53	1.21	198
FTA3 -T	86.4	1.8	295

14.12.2 Fan Failure

If one or more fans fail on the fan-tray assembly, replace the entire assembly. You cannot replace individual fans. The red Fan Fail LED on the front of the fan tray illuminates when one or more fans fail. For fan-tray replacement instructions, see the "NTP-G116 Replace the Fan-Tray Assembly" procedure on page 12-27. The red Fan Fail LED clears after you install a working fan tray.

14.12.3 Air Filter

The ONS 15454 contains a reusable air filter (for ANSI: 15454-FTF2; for ETSI: 15454E-ETSI-FTF) that is installed either below the fan-tray assembly or, for the ONS 15454 ANSI, in the optional external filter brackets.

The reusable filter is made of a gray, open-cell, polyurethane foam that is specially coated to provide fire and fungi resistance. All versions of the ONS 15454 can use the reusable air filter. Spare filters should be kept in stock. Inspect the air filter every 30 days, and clean the filter every three to six months. Replace the air filter every two to three years. Avoid cleaning the air filter with harsh cleaning agents or solvents.

Earlier versions of the ONS 15454 ANSI shelf used a disposable air filter that is installed beneath the fan-tray assembly only. However, the reusable air filter is backward compatible.

14.13 Power and Ground Description

Ground the equipment according to Telcordia standards or local practices. The following sections describe power and ground for the ONS 15454 shelves.

14.13.1 ONS 15454 ANSI Power and Ground

Cisco recommends the following wiring conventions, but customer conventions prevail:

- Red wire for battery connections (–48 VDC).
- Black wire for battery return connections (0 VDC).
- The battery return connection is treated as DC-I, as defined in Telcordia GR-1089-CORE, Issue 3.

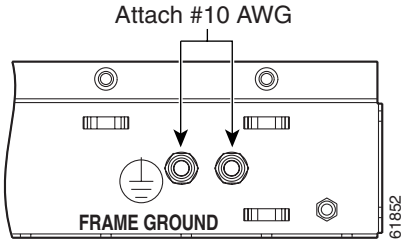
The ONS 15454 ANSI has redundant –48 VDC #8 power terminals on the shelf-assembly backplane. The terminals are labeled BAT1, RET1, BAT2, and RET2 and are located on the lower section of the backplane behind a clear plastic cover.

To install redundant power feeds, use four power cables and one ground cable. For a single power feed, only two power cables (#10 AWG, 2.588 mm² [0.1018 inch], copper conductor, 194°F [90°C]) and one ground cable (#6 AWG, 4.115 mm² [0.162 inch]) are required. Use a conductor with low impedance to ensure circuit overcurrent protection. However, the conductor must have the capability to safely conduct any faulty current that might be imposed.

Note If you are installing power on a Release 3.0 ONS 15454 ANSI shelf assembly (15454-SA-NEBS3E, 15454-SA-NEBS3, and 15454-SA-R1), the #12 to #14 AWG (2.053 to 1.628 mm²) power cable and #14 AWG (1.628 mm²) ground cable are required.

The existing ground post is a #10-32 bolt. The nut provided for a field connection is also a #10 AWG (2.588 mm² [0.1018 inch]), with an integral lock washer. The lug must be a dual-hole type and rated to accept the #6 AWG (4.115 mm² [0.162 inch]) cable. Two posts are provided on the ONS 15454 ANSI to accommodate the dual-hole lug. Figure 14-41 shows the location of the ground posts.

Figure 14-41 Ground Posts on the ONS 15454 ANSI Backplane



14.13.2 ONS 15454 ETSI Power and Ground

The ONS 15454 ETSI has redundant –48 VDC power connectors on the MIC-A/P and MIC-C/T/P faceplates.

To install redundant power feeds, use the two power cables shipped with the ONS 15454 ETSI and one ground cable.

For details, see the "15.3.1 MIC-A/P FMEC" section on page 15-21 and the "15.3.2 MIC-C/T/P FMEC" section on page 15-24.

Caution Only use the power cables shipped with the ONS 15454 ETSI.

14.14 ONS 15454 ANSI Alarm, Timing, LAN, and Craft Pin Connections

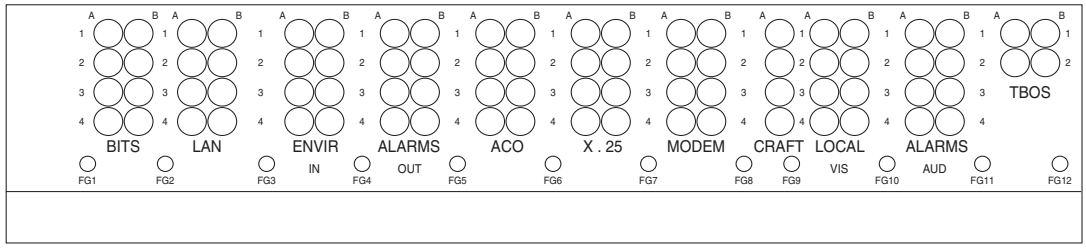
Pin connections are provided on the ONS 15454 ANSI backplane. For information about ONS 15454 ETSI connections, see the "14.8 ONS 15454 ETSI Front Mount Electrical Connection" section on page 14-30.

Caution Always use the supplied ESD wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

The ONS 15454 ANSI has a backplane pin field located at the bottom of the backplane. The backplane pin field provides 0.045 inch^2 (29 mm^2) wire-wrap pins for enabling external alarms, timing input and output, and craft interface terminals. This section describes the backplane pin field and the pin assignments for the field. Figure 14-42 shows the wire-wrap pins on the backplane pin field. Beneath each wire-wrap pin is a frame ground pin. Frame ground pins are labeled FG1, FG2, FG3, etc. Install the ground shield of the cables connected to the backplane to the ground pin that corresponds to the pin field used.

Note The AIC-I requires a shelf assembly running Software Release 3.4.0 or later. The backplane of the ANSI shelf contains a wire-wrap field with pin assignment according to the layout in Figure 1-21 on page 1-53. The shelf assembly might be an existing shelf that has been upgraded to R3.4 or later. In this case the backplane pin labeling appears as indicated in Figure 14-42 on page 14-45, but you must use the pin assignments provided by the AIC-I as shown in Figure 1-21 on page 1-53.

Figure 14-42 ONS 15454 ANSI Backplane Pinouts



Field	Pin	Function
BITS	A1	BITS Output 2 negative (-)
	B1	BITS Output 2 positive (+)
	A2	BITS Input 2 negative (-)
	B2	BITS Input 2 positive (+)
	A3	BITS Output 1 negative (-)
	B3	BITS Output 1 positive (+)
	A4	BITS Input 1 negative (-)
	B4	BITS Input 1 positive (+)
LAN	Connecting to a hub, or switch	
	A1	RJ-45 pin 6 RX-
	B1	RJ-45 pin 3 RX+
	A2	RJ-45 pin 2 TX-
	B2	RJ-45 pin 1 TX+
	Connecting to a PC/Workstation or router	
	A1	RJ-45 pin 2 RX-
	B1	RJ-45 pin 1 RX+
	A2	RJ-45 pin 6 TX-
	B2	RJ-45 pin 3 TX+
ENVIR ALARMS IN	A1	Alarm input pair number 1: Reports closure on connected wires.
	B1	
	A2	Alarm input pair number 2: Reports closure on connected wires.
	B2	
	A3	Alarm input pair number 3: Reports closure on connected wires.
	B3	
	A4	Alarm input pair number 4: Reports closure on connected wires.
	B4	

Field	Pin	Function
ENVIR ALARMS OUT N/O	A1	Normally open output pair number 1
	B1	
	A2	Normally open output pair number 2
	B2	
	A3	Normally open output pair number 3
	B3	
	A4	Normally open output pair number 4
	B4	
ACO	A1	Normally open ACO pair
	B1	
CRAFT	A1	Receive (PC pin #2)
	A2	Transmit (PC pin #3)
	A3	Ground (PC pin #5)
	A4	DTR (PC pin #4)
LOCAL ALARMS AUD (Audible) N/O	A1	Alarm output pair number 1: Remote audible alarm.
	B1	
	A2	Alarm output pair number 2: Critical audible alarm.
	B2	
	A3	Alarm output pair number 3: Major audible alarm.
	B3	
	A4	Alarm output pair number 4: Minor audible alarm.
	B4	
LOCAL ALARMS VIS (Visual) N/O	A1	Alarm output pair number 1: Remote visual alarm.
	B1	
	A2	Alarm output pair number 2: Critical visual alarm.
	B2	
	A3	Alarm output pair number 3: Major visual alarm.
	B3	
	A4	Alarm output pair number 4: Minor visual alarm.
	B4	

38533

14.14.1 Alarm Contact Connections

The alarm pin field supports up to 17 alarm contacts, including four audible alarms, four visual alarms, one alarm cutoff (ACO), and four user-definable alarm input and output contacts.

Audible alarm contacts are in the LOCAL ALARM AUD pin field and visual contacts are in the LOCAL ALARM VIS pin field. Both of these alarms are in the LOCAL ALARMS category. User-definable contacts are in the ENVIR ALARM IN (external alarm) and ENVIR ALARM OUT (external control) pin fields. These alarms are in the ENVIR ALARMS category; you must have the AIC-I card installed to use the ENVIR ALARMS. Alarm contacts are Normally Open (N/O), meaning that the system closes the alarm contacts when the corresponding alarm conditions are present. Each alarm contact consists of two wire-wrap pins on the shelf assembly backplane. Visual and audible alarm contacts are classified as Critical, Major, Minor, and Remote. Figure 14-42 on page 14-45 shows alarm pin assignments.

Visual and audible alarms are typically wired to trigger an alarm light or bell at a central alarm collection point when the corresponding contacts are closed. You can use the ACO pins to activate a remote ACO for audible alarms. You can also activate the ACO function by pressing the ACO button on the TCC2/TCC2P card faceplate. The ACO function clears all audible alarm indications. After clearing the audible alarm indication, the alarm is still present and viewable in the Alarms tab in CTC.

14.14.2 Timing Connections

The ONS 15454 ANSI backplane supports two building integrated timing supply (BITS) clock pin fields. The first four BITS pins, rows 3 and 4, support output and input from the first external timing device. The last four BITS pins, rows 1 and 2, perform the identical functions for the second external timing device. Table 14-13 lists the pin assignments for the BITS timing pin fields.

Note For timing connection, use 100-ohm shielded BITS clock cable pair #22 or #24 AWG (0.51 mm² [0.020 inch] or 0.64 mm² [0.0252 inch]), twisted-pair T1-type.

Table 14-13 BITS External Timing Pin Assignments

External Device	Contact	Tip and Ring	Function
First external device	A3 (BITS 1 Out)	Primary ring (–)	Output to external device
	B3 (BITS 1 Out)	Primary tip (+)	Output to external device
	A4 (BITS 1 In)	Secondary ring (–)	Input from external device
	B4 (BITS 1 In)	Secondary tip (+)	Input from external device
Second external device	A1 (BITS 2 Out)	Primary ring (–)	Output to external device
	B1 (BITS 2 Out)	Primary tip (+)	Output to external device
	A2 (BITS 2 In)	Secondary ring (–)	Input from external device
	B2 (BITS 2 In)	Secondary tip (+)	Input from external device

Note Refer to Telcordia SR-NWT-002224 for rules about provisioning timing references.

14.14.3 LAN Connections

Use the LAN pins on the ONS 15454 ANSI backplane to connect the ONS 15454 ANSI to a workstation or Ethernet LAN, or to a LAN modem for remote access to the node. You can also use the LAN port on the TCC/TCC2P faceplate to connect a workstation or to connect the ONS 15454 ANSI to the network. Table 14-14 shows the LAN pin assignments.

Before you can connect an ONS 15454 ANSI to other ONS 15454 ANSI shelves or to a LAN, you must change the default IP address that is shipped with each ONS 15454 ANSI (192.1.0.2).

Table 14-14 LAN Pin Assignments

Pin Field	Backplane Pins	RJ-45 Pins
LAN 1 Connecting to data circuit-terminating equipment (DCE[1], a hub or switch)	B2	1
	A2	2
	B1	3
	A1	6
LAN 1 Connecting to data terminal equipment (DTE) (a PC/workstation or router)	B1	1
	A1	2
	B2	3
	A2	6

1. The Cisco ONS 15454 ANSI is DCE.

14.14.4 TL1 Craft Interface Installation

You can use the craft pins on the ONS 15454 ANSI backplane or the EIA/TIA-232 port on the TCC2/TCC2P faceplate to create a VT100 emulation window to serve as a TL1 craft interface to the ONS 15454 ANSI. Use a straight-through cable to connect to the EIA/TIA-232 port. Table 14-15 shows the pin assignments for the CRAFT pin field.

Note You cannot use the craft backplane pins and the EIA/TIA-232 port on the TCC2/TCC2P card simultaneously.

Table 14-15 Craft Interface Pin Assignments

Pin Field	Contact	Function
Craft	A1	Receive
	A2	Transmit
	A3	Ground
	A4	DTR

14.15 Cards and Slots

ONS 15454 cards have electrical plugs at the back that plug into electrical connectors on the shelf assembly backplane. When the ejectors are fully closed, the card plugs into the assembly backplane. Figure 14-43 shows card installation for an ONS 15454 ANSI shelf.

Figure 14-43 Installing Cards in the ONS 15454 ANSI

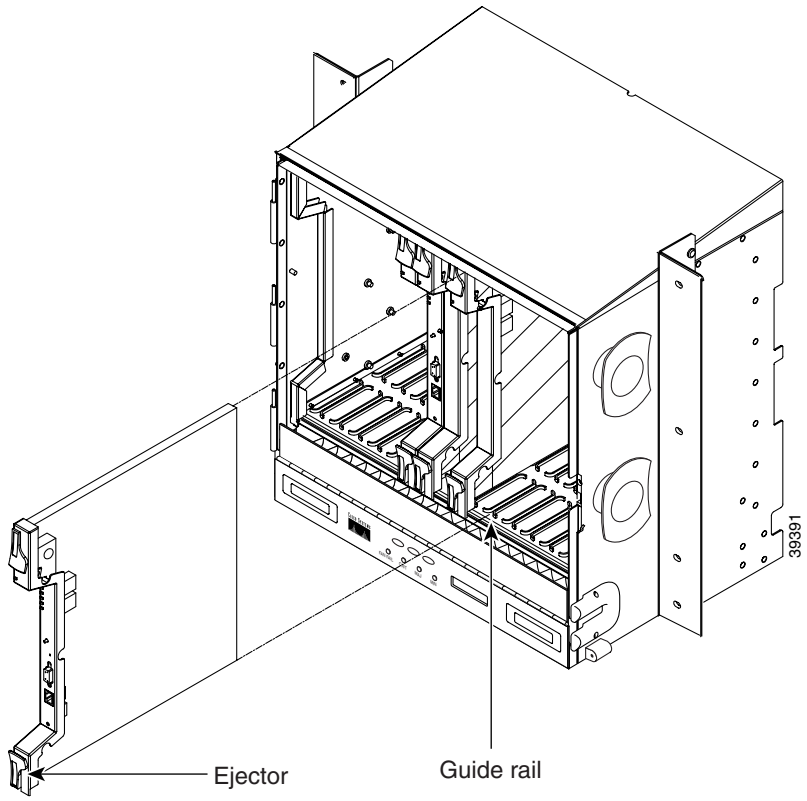
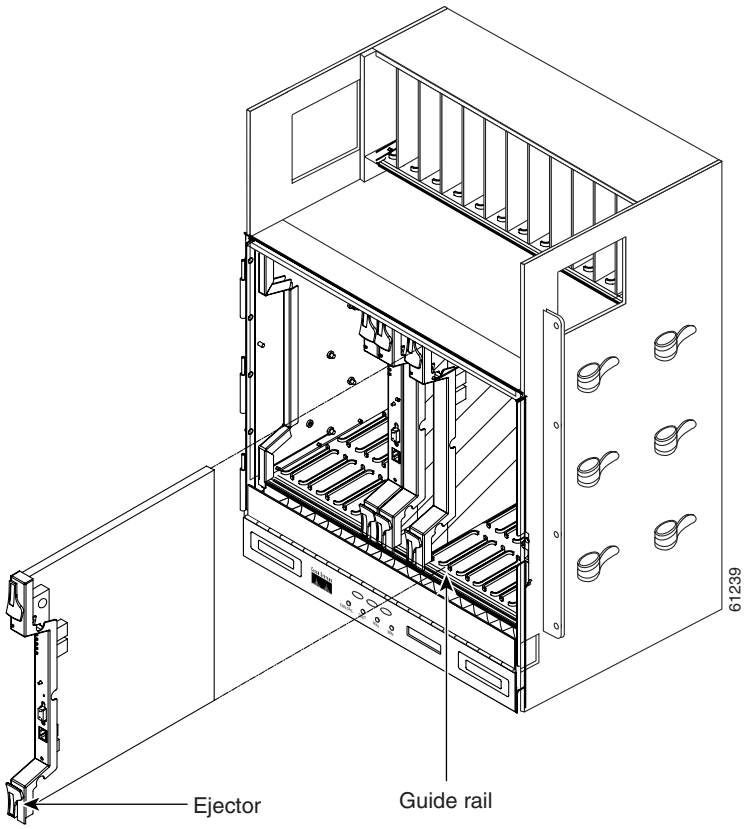


Figure 14-44 shows card installation in the ONS 15454 ETSI shelf.

Figure 14-44 Installing Cards in the ONS 15454 ETSI Shelf



14.15.1 Card Slot Requirements

The ONS 15454 shelf assemblies have 17 card slots numbered sequentially from left to right. Slots 7 and 11 are dedicated to TCC2/TCC2P cards. Slot 9 is reserved for the optional AIC-I card.

Caution Do not operate the ONS 15454 with a single TCC2/TCC2P card. Always operate the shelf assembly with one working and one protect card of the same type.

Shelf assembly slots have symbols indicating the type of cards that you can install in them. Each ONS 15454 card has a corresponding symbol. The symbol on the card must match the symbol on the slot.

Table 14-16 shows the slot and card symbol definitions.

Table 14-16 Slot and Card Symbols

Symbol Color/Shape	Definition
Orange/Circle	Slots 1 to 6 and 12 to 17. Only install cards with a circle symbol on the faceplate.
Blue/Triangle	Slots 5, 6, 12, and 13. Only install cards with circle or a triangle symbol on the faceplate.
Purple/Square	TCC2/TCC2P slot, Slots 7 and 11. Only install cards with a square symbol on the faceplate.
Green/Cross	Cross-connect (XC/XCVT/XC10G) slot, Slots 8 and 10. Only install ONS 15454 cards with a cross symbol on the faceplate.
Red/P	Protection slot in 1:N protection schemes.
Red/Diamond	AIC/AIC-I slot, Slot 9. Only install cards with a diamond symbol on the faceplate.
Gold/Star	Slots 1 to 4 and 14 to 17. Only install cards with a star symbol on the faceplate.
Blue/Hexagon	(Only used with the 15454-SA-HD shelf assembly.) Slots 3 and 15. Only install ONS 15454 ANSI cards with a blue hexagon symbol on the faceplate.

14.15.2 Card Replacement

To replace an ONS 15454 card with another card of the same type, you do not need to make any changes to the database; remove the old card and replace it with a new card. To replace a card with a card of a different type, physically remove the card and replace it with the new card, then delete the original card from CTC. For specifics, see Chapter 12, "Maintain the Node."

Caution Removing any active card from the ONS 15454 can result in traffic interruption. Use caution when replacing cards and verify that only inactive or standby cards are being replaced. If the active card needs to be replaced, switch it to standby prior to removing the card from the node. For traffic switching procedures, refer to the "DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch" task on page 10-25.

Note An improper removal (IMPROPRMVL) alarm is raised whenever a card pull (reseat) is performed, unless the card is deleted in CTC first. The alarm clears after the card replacement is complete.

14.16 Ferrites (ANSI Only)

Place third-party ferrites on certain cables to dampen electromagnetic interference (EMI) from the ONS 15454 ANSI. Ferrites must be added to meet the requirements of Telcordia GR-1089-CORE. Refer to the ferrite manufacturer documentation for proper use and installation of the ferrites. Ferrite placements on the ONS 15454 ANSI can include power cables, AMP Champ connectors, baluns, BNC/SMB connectors, and the wire-wrap pin field.

CHAPTER 15

Card Reference

Note The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This chapter describes Cisco ONS 15454 dense wavelength division multiplexing (DWDM) card and client card features and functions. It also describes the common control cards needed to support them as well as the optical plug-in modules (Small Form-factor Pluggables [SFPs]). For installation and card turn-up procedures, refer to Chapter 3, "Turn Up a Node." For card safety and compliance information, refer to the *Cisco Optical Transport Products Safety and Compliance Information* document.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Chapter topics include:

- 15.1 Card Overview, page 15-2
- 15.2 Common Control Cards, page 15-9
- 15.3 Front Mount Electrical Connections, page 15-21
- 15.4 Optical Service Channel Cards, page 15-25
- 15.5 Optical Amplifier Cards, page 15-34
- 15.6 Multiplexer and Demultiplexer Cards, page 15-45
- 15.7 Optical Add/Drop Multiplexer Cards, page 15-59
- 15.8 Transponder and Muxponder Cards, page 15-82
- 15.9 Transponder and Muxponder Protection, page 15-114
- 15.10 Far-End Laser Control (FELC), page 15-116
- 15.11 Jitter Considerations, page 15-116
- 15.12 Termination Modes, page 15-117
- 15.13 SFP and XFP Modules, page 15-118

15.1 Card Overview

The card overview section lists the cards described in this chapter and summarizes card functions, power consumption, and temperature ranges of the optical cards covered in this reference section.

Note Each card is marked with a symbol that corresponds to a slot (or slots) on the ONS 15454 shelf assembly. The cards are then installed into slots displaying the same symbols. See the "14.15.1 Card Slot Requirements" section on page 14-49 for a list of slots and symbols.

15.1.1 Common Control Cards

The following common control cards are needed to support the functions of the DWDM, transponder, and muxponder cards:

- TCC2 or TCC2P
- AIC-I (optional)

15.1.2 Front Mount Electrical Connections (ETSI only)

The following Front Mount Electrical Connections (FMECs) are needed to support the functions of the DWDM, transponder, and muxponder cards:

- MIC-A/P
- MIC-C/T/P

15.1.3 DWDM Cards

ONS 15454 DWDM cards are grouped into the following categories:

- Optical service channel cards—These cards provide channels that connect ONS 15454 DWDM nodes and transport general-purpose information (including Cisco Transport Controller [CTC] management) without affecting the client traffic. ONS 15454 optical service channel cards include the Optical Service Channel Module (OSCM) and the Optical Service Channel and Combiner/Separator Module (OSC-CSM).
- Optical amplifier cards—These cards are used in amplified DWDM nodes, including hub nodes, amplified OADM nodes, and line amplified nodes. Optical amplifier cards include the Optical Preamplifier (OPT-PRE), Optical Booster (OPT-BST), and Optical Booster Enhanced (OPT-BST-E) amplifier.
- Dispersion compensation units—These cards are installed in the ONS 15454 dispersion compensation shelf when optical preamplifier cards are installed in the DWDM node. Each dispersion compensation unit (DCU) module is designed to compensate a specific fiber length, up to a maximum (per-module) of 65 km of standard single-mode fiber (SMF-28). DCUs can be cascaded to extend the compensation to 130 km.
- Multiplexer and demultiplexer cards—These cards multiplex and demultiplex DWDM optical channels. ONS 15454 multiplexer and demultiplexer cards include the 32-Channel Multiplexer (32MUX-O), the 32-Channel Demultiplexer (32DMX-O), the single-slot 32-Channel Demultiplexer (32DMX), and the 4-Channel Multiplexer/Demultiplexer (4MD-xx.x).

- Optical Add/Drop Multiplexer (OADM) cards—These cards are mainly divided into two groups: band OADM and channel OADM cards. Band OADM cards add and drop one or four bands of adjacent channels; they include the 4-Band OADM (AD-4B-xx.x) and the 1-Band OADM (AD-1B-xx.x). Channel OADM cards add and drop one, two, or four adjacent channels; they include the 4-Channel OADM (AD-4C-xx.x), the 2-Channel OADM (AD-2C-xx.x), and the 1-Channel OADM (AD-1C-xx.x). This section also covers the 32-Channel Wavelength Selective Switch (32WSS) used to implement Reconfigurable OADM (ROADM) functionality.

15.1.4 Transponder and Muxponder Cards

The purpose of a transponder (TXP) or muxponder (MXP) card is to convert the "gray" optical client interface signals into trunk signals that operate in the "colored" DWDM wavelength range[1]. Transponding or muxponding is the process of converting the signals between the client and trunk wavelengths.

A muxponder generally handles several client signals. It aggregates, or multiplexes, lower rate client signals together and sends them out over a higher rate trunk port. Likewise, it demultiplexes optical signals coming in on a trunk and sends them out to individual client ports. A transponder converts a single client signal to a single trunk signal and converts a single incoming trunk signal to a single client signal.

All of the TXP and MXP cards perform optical to electrical to optical (OEO) conversion. As a result, they are not optically transparent cards. The reason for this is that the cards must operate on the signals passing through them, so it is necessary to do an OEO conversion.

On the other hand, the termination mode for all of the TXPs and MXPs, which is done at the electrical level, can be configured to be transparent. In this case, neither the Line nor the Section overhead is terminated. The cards can also be configured so that either Line or Section overhead can be terminated, or both can be terminated.

Note The MXP_2.5G_10G card, by design, when configured in the transparent termination mode, actually does terminate some of the bytes. See Table 15-68 on page 15-117 for details.

15.1.5 Card Summary

Table 15-1 lists and summarizes the functions of each Cisco ONS 15454 DWDM and client card.

Table 15-1 DWDM and Client Cards for the ONS 15454

Card	Port Description	For Additional Information
Optical Service Channel Cards		
OSCM	The OSCM has one set of optical ports and one Ethernet port located on the faceplate. It operates in Slots 8 and 10.	See the "15.4.1 OSCM Card" section on page 15-26.

1. Client-facing gray optical signals generally operate at shorter wavelengths, whereas DWDM colored optical signals are in the longer wavelength range (for example, 1490 nm = violet; 1510 nm = blue; 1530 nm = green; 1550 nm = yellow; 1570 nm = orange; 1590 nm = red; 1610 nm = brown). Some of the newer client-facing SFPs, however, operate in the colored region.

Table 15-1 DWDM and Client Cards for the ONS 15454 (continued)

Card	Port Description	For Additional Information
OSC-CSM	The OSC-CSM has three sets of optical ports and one Ethernet port located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.4.2 OSC-CSM Card" section on page 15-29.
Optical Amplifier Cards		
OPT-PRE	The OPT-PRE amplifier has five optical ports (three sets) located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.5.1 OPT-PRE Amplifier" section on page 15-35.
OPT-BST	The OPT-BST amplifier has four sets of optical ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.5.2 OPT-BST Amplifier Card" section on page 15-38.
OPT-BST-E	The OPT-BST-E amplifier has four sets of optical ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.5.3 OPT-BST-E Amplifier Card" section on page 15-41.
Multiplexer and Demultiplexer Cards		
32MUX-O	The 32MUX-O has five sets of ports located on the faceplate. It operates in Slots 1 to 5 and 12 to 16.	See the "15.6.1 32MUX-O Card" section on page 15-45.
32DMX-O	The 32DMX-O has five sets of ports located on the faceplate. It operates in Slots 1 to 5 and 12 to 16.	See the "15.6.2 32DMX-O Card" section on page 15-49.
32DMX	The 32DMX has five sets of ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.6.3 32DMX Card" section on page 15-52
4MD-xx.x	The 4MD-xx.x card has five sets of ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.6.4 4MD-xx.x Card" section on page 15-55.
Optical Add/Drop Multiplexer Cards		
AD-1C-xx.x	The AD-1C-xx.x card has three sets of ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.7.1 AD-1C-xx.x Card" section on page 15-59.
AD-2C-xx.x	The AD-2C-xx.x card has four sets of ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.7.2 AD-2C-xx.x Card" section on page 15-62.
AD-4C-xx.x	The AD-4C-xx.x card has six sets of ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.7.3 AD-4C-xx.x Card" section on page 15-66.
AD-1B-xx.x	The AD-1B-xx.x card has three sets of ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.7.4 AD-1B-xx.x Card" section on page 15-70.
AD-4B-xx.x	The AD-4B-xx.x card has six sets of ports located on the faceplate. It operates in Slots 1 to 6 and 12 to 17.	See the "15.7.5 AD-4B-xx.x Card" section on page 15-73.
32WSS	The 32WSS card has seven sets of ports located on the faceplate. It operates in Slots 1 to 5 and 12 to 16.	See the "15.7.6 32WSS Card" section on page 15-76
Transponder and Muxponder Cards		

Table 15-1 DWDM and Client Cards for the ONS 15454 (continued)

Card	Port Description	For Additional Information
TXP_MR_10G	The TXP_MR_10G card has two sets of ports located on the faceplate.	See the "15.8.1 TXP_MR_10G Card" section on page 15-82
TXP_MR_10E	The TXP_MR_10E card has two sets of ports located on the faceplate.	See the "15.8.2 TXP_MR_10E Card" section on page 15-84
TXP_MR_2.5G	The TXP_MR_2.5G card has two sets of ports located on the faceplate.	See the "15.8.3 TXP_MR_2.5G and TXPP_MR_2.5G Cards" section on page 15-88
TXPP_MR_2.5G	The TXPP_MR_2.5G card has three sets of ports located on the faceplate.	See the "15.8.3 TXP_MR_2.5G and TXPP_MR_2.5G Cards" section on page 15-88
MXP_2.5G_10G	The MXP_2.5G_10G card has 9 sets of ports located on the faceplate.	See the "15.8.4 MXP_2.5G_10G Card" section on page 15-95.
MXP_2.5G_10E	The MXP_2.5G_10E card has 9 sets of ports located on the faceplate.	See the "15.8.5 MXP_2.5G_10E Card" section on page 15-99
MXP_MR_2.5G	The MXP_MR_2.5G card has 9 sets of ports located on the faceplate.	See the "15.8.6 MXP_MR_2.5G and MXPP_MR_2.5G Cards" section on page 15-106
MXPP_MR_2.5G	The MXPP_MR_2.5G card has ten sets of ports located on the faceplate.	See the "15.8.6 MXP_MR_2.5G and MXPP_MR_2.5G Cards" section on page 15-106

15.1.6 Card Compatibility

Table 15-2 lists the CTC software compatibility for each DWDM and client card.

Table 15-2 DWDM and Client Card CTC Software Release Compatibility

	Compatibility			
Card Type	**R4.5**	**R4.6**	**R4.7**	**R5.0**
Optical Service Channel Cards	Yes	Yes	Yes	Yes
OSCM	Yes	Yes	Yes	Yes
OSC-CSM	Yes	Yes	Yes	Yes
Optical Amplifier Cards	Yes	Yes	Yes	Yes
OPT-PRE	Yes	Yes	Yes	Yes
OPT-BST	Yes	Yes	Yes	Yes
OPT-BST-E	Yes	Yes	Yes	Yes
Multiplexer and Demultiplexer Cards	Yes	Yes	Yes	Yes
32MUX-O	Yes	Yes	Yes	Yes

Table 15-2 DWDM and Client Card CTC Software Release Compatibility (continued)

	Compatibility			
Card Type	**R4.5**	**R4.6**	**R4.7**	**R5.0**
32DMX-O	Yes	Yes	Yes	Yes
32DMX	No	No	Yes	Yes
4MD-xx.x	Yes	Yes	Yes	Yes
Optical Add/Drop Multiplexer Cards	Yes	Yes	Yes	Yes
AD-1C-xx.x	Yes	Yes	Yes	Yes
AD-2C-xx.x	Yes	Yes	Yes	Yes
AD-4C-xx.x	Yes	Yes	Yes	Yes
AD-1B-xx.x	Yes	Yes	Yes	Yes
AD-4B-xx.x	Yes	Yes	Yes	Yes
32WSS	No	No	Yes	Yes
Transponder and Muxponder Cards	Yes	Yes	Yes	Yes
TXP_MR_10G	Yes	Yes	Yes	Yes
TXP_MR_10E	No	No	Yes	Yes
TXP_MR_2.5G	Yes	Yes	Yes	Yes
TXPP_MR_2.5G	Yes	Yes	Yes	Yes
MXP_2.5G_10G	Yes	Yes	Yes	Yes
MXP_2.5G_10E	No	No	Yes	Yes
MXP_MR_2.5G	No	No	Yes	Yes
MXPP_MR_2.5G	No	No	Yes	Yes

15.1.7 Multiplexer, Demultiplexer, and OADM Card Interface Classes

The 32MUX-O, 32WSS, 32DMX, 32DMX-O, 4MD-xx.x, AD-1C-xx.x, AD-2C-xx.x, and AD-4C-xx.x cards have different input and output optical channel signals depending upon the interface card where the input signal originates. The input interface cards have been grouped in classes listed in Table 15-3. The subsequent tables list the optical performances and output power of each interface class.

Table 15-3 ONS 15454 Card Interfaces Assigned to Input Power Classes

Input Power Class	Card
A	10-Gbps multirate transponder (TXP_MR_10G or TXP_MR_10E) with forward error correction (FEC) enabled or 10-Gbps muxponder (MXP_2.5G_10G or MXP_2.5G_10E) with FEC enabled
B	10-Gbps multirate transponder (TXP_MR_10G) without FEC or 10-Gbps muxponder (MXP_2.5G_10G) with FEC disabled
C	OC-192 LR ITU, TXP_MR_10E without FEC
D	2.5-Gbps multirate transponder (TXP_MR_2.5G), both protected and unprotected, with FEC enabled

Table 15-3 ONS 15454 Card Interfaces Assigned to Input Power Classes (continued)

Input Power Class	Card
E	2.5-Gbps multirate transponder (TXP_MR_2.5G), both protected and unprotected, with FEC disabled and reshape, regenerate, and retime (3R) mode enabled, or OC-48 100-GHz DWDM muxponder (MXP_MR_2.5G)
F	2.5-Gbps multirate transponder (TXP_MR_2.5G), both protected and unprotected, in regenerate and reshape (2R) mode
G	OC-48 ELR 100 GHz
H	2/4 port GbE transponder (GBIC WDM 100GHz)
I	TXP_MR_10E with extended FEC (E-FEC) or MXP_2.5G_10E with E-FEC enabled

10-Gbps cards that provide signal input to OADM cards have the optical performance parameters listed in Table 15-4. 2.5-Gbps card interface performance parameters are listed in Table 15-5 on page 15-8.

Table 15-4 10-Gbps Interface Optical Performance

Parameter	Class A		Class B		Class C	Class I	
Type	Power Limited	OSNR[1] Limited	Power Limited	OSNR Limited	OSNR Limited	Power Limited	OSNR Limited
Maximum bit rate	10 Gbps		10 Gbps		10 Gbps	10 Gbps	
Regeneration	3R		3R		3R	3R	
FEC	Yes		No		No	Yes (E-FEC)	
Threshold	Optimum		Average		Average	Optimum	
Maximum BER[2]	10^{-15}		10^{-12}		10^{-12}	10^{-15}	
OSNR[1] sensitivity	23 dB	9 dB	23 dB	19 dB	19 dB	20 dB	8 dB
Power sensitivity	–24 dBm	–18 dBm	–21 dBm	–20 dBm	–22 dBm	–26 dBm	–18 dBm
Power overload	–8 dBm		–8 dBm		–9 dBm	–8 dBm	
Transmitted Power Range[3]							
10-Gbps multirate transponder/10-Gbps FEC transponder (TXP_MR_10G)	+2.5 to 3.5 dBm		+2.5 to 3.5 dBm		—	—	
OC-192 LR ITU	—		—		+3.0 to 6.0 dBm	—	
10-Gbps multirate transponder/10-Gbps FEC transponder (TXP_MR_10E)	+3.0 to 6.0 dBm		+3.0 to 6.0 dBm		—	+3.0 to 6.0 dBm	
Dispersion compensation tolerance	+/–800 ps/nm		+/–1,000 ps/nm		+/–1,000 ps/nm	+/–800 ps/nm	

1. OSNR = optical signal-to-noise ratio
2. BER = bit error rate

3. These values, decreased by patch cord and connector losses, are also the input power values for the OADM cards.

Table 15-5 2.5-Gbps Interface Optical Performance

Parameter	Class D		Class E		Class F	Class G		Class H		Class J
Type	Power Limited	OSNR Limited	Power Limited	OSNR Limited	OSNR Limited	Power Limited	OSNR Limited	Power Limited	OSNR Limited	Power Limited
Maximum bit rate	2.5 Gbps		2.5 Gbps		2.5 Gbps	2.5 Gbps		1.25 Gbps		2.5 Gbps
Regeneration	3R		3R		2R	3R		3R		3R
FEC	Yes		No		No	No		No		No
Threshold	Average		Average		Average	Average		Average		Average
Maximum BER	10^{-15}		10^{-12}		10^{-12}	10^{-12}		10^{-12}		10^{-12}
OSNR sensitivity	14 dB	6 dB	14 dB	10 dB	15 dB	14 dB	11 dB	13 dB	8 dB	12 dB
Power sensitivity	–31 dBm	–25 dBm	–30 dBm	–23 dBm	–24 dBm	–27 dBm	–33 dBm	–28 dBm	–18 dBm	–26 dBm
Power overload	–9 dBm		–9 dBm		–9 dBm	–9 dBm		–7 dBm		–17dBm
Transmitted Power Range[1]										
TXP_MR_2.5G	–1.0 to 1.0 dBm		–1.0 to 1.0 dBm		–1.0 to 1.0 dBm	–2.0 to 0 dBm				
TXPP_MR_2.5G	–4.5 to –2.5 dBm		–4.5 to –2.5 dBm		–4.5 to –2.5 dBm					
MXP_MR_2.5G	—		+2.0 to +4.0 dBm		—					
MXPP_MR_2.5G	—		–1.5 to +0.5 dBm		—					
2/4 port GbE Transponder (GBIC WDM 100GHz)								+2.5 to 3.5 dBm		—
Dispersion compensation tolerance	–1200 to +5400 ps/nm		–1200 to +5400 ps/nm		–1200 to +3300 ps/nm	–1200 to +3300 ps/nm		–1000 to +3600 ps/nm		–1000 to +3200 ps/nm

1. These values, decreased by patchcord and connector losses, are also the input power values for the OADM cards.

15.1.8 DWDM Card Channel Allocation Plan

ONS 15454 DWDM multiplexers, demultiplexers, channel OADM, and band OADM cards are designed for use with specific channels. In most cases, the channels for these cards are either numbered (1 to 32) or delimited (odd or even). Client interfaces must comply with these channel assignments to be compatible with the ONS 15454 system.

Table 15-6 lists the channel IDs and wavelengths assigned to the DWDM channels.

Table 15-6 DWDM Channel Allocation Plan

Channel Number	Channel ID	Frequency (THz)	Wavelength (nm)
1	30.3	195.9	1530.33
2	31.2	195.8	1531.12
3	31.9	195.7	1531.90
4	32.6	195.6	1532.68
5	34.2	195.4	1534.25
6	35.0	195.3	1535.04
7	35.8	195.2	1535.82
8	36.6	195.1	1536.61
9	38.1	194.9	1538.19
10	38.9	194.8	1538.98
11	39.7	194.7	1539.77
12	40.5	194.6	1540.56
13	42.1	194.4	1542.14
14	42.9	194.3	1542.94
15	43.7	194.2	1543.73
16	44.5	194.1	1544.53
17	46.1	193.9	1546.12
18	46.9	193.8	1546.92
19	47.7	193.7	1547.72
20	48.5	193.6	1548.51
21	50.1	193.4	1550.12
22	50.9	193.3	1550.92
23	51.7	193.2	1551.72
24	52.5	193.1	1552.52
25	54.1	192.9	1554.13
26	54.9	192.8	1554.94
27	55.7	192.7	1555.75
28	56.5	192.6	1556.55
29	58.1	192.4	1558.17
30	58.9	192.3	1558.98
31	59.7	192.2	1559.79
32	60.6	192.1	1560.61

15.2 Common Control Cards

This section describes the common control cards (TCC2, TCC2P, and AIC-I).

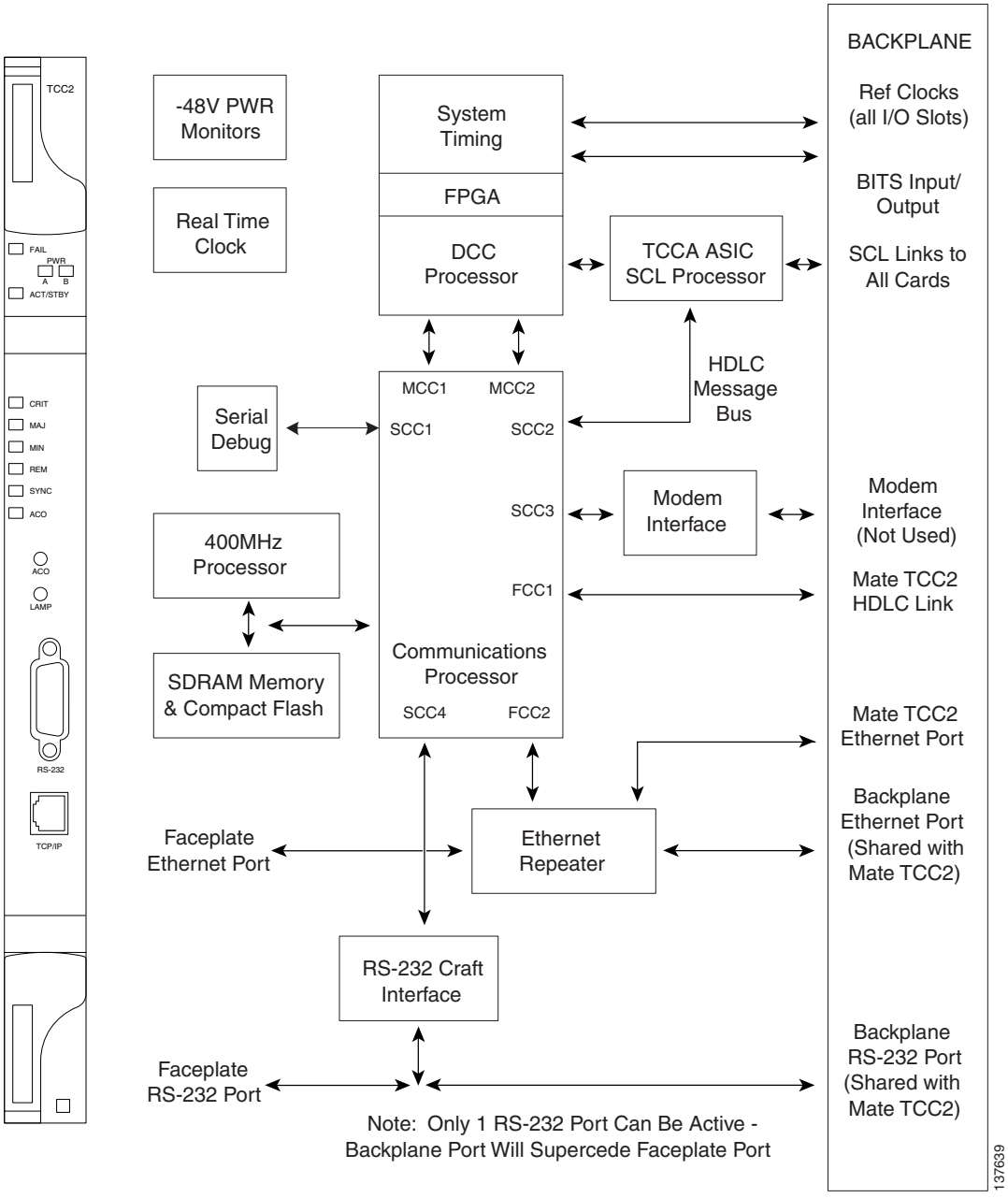
15.2.1 TCC2 Card

The Advanced Timing, Communications, and Control (TCC2) card performs system initialization, provisioning, alarm reporting, maintenance, diagnostics, IP address detection/resolution, SONET section overhead (SOH) data communications channel/generic communications channel (DCC/GCC) termination, optical service channel (OSC) DWDM data communications network (DCN) termination, and system fault detection for the ONS 15454. The TCC2 also ensures that the system maintains Stratum 3 (Telcordia GR-253-CORE) timing requirements. It monitors the supply voltage of the system.

Note The LAN interface of the TCC2 card meets the standard Ethernet specifications by supporting a cable length of 328 ft (100 m) at temperatures from 32 to 149 degrees Fahrenheit (0 to 65 degrees Celsius).

Figure 15-1 shows the faceplate and block diagram for the TCC2.

Figure 15-1 TCC2 Faceplate and Block Diagram



15.2.1.1 TCC2 Functionality

The TCC2 card terminates up to 32 DCCs. The TCC2 hardware is prepared for up to 84 DCCs, which will be available in a future software release.

The node database, IP address, and system software are stored in TCC2 nonvolatile memory, which allows quick recovery in the event of a power or card failure.

The TCC2 performs all system-timing functions for each ONS 15454. The TCC2 monitors the recovered clocks from each traffic card and two building integrated timing supply (BITS) ports for frequency accuracy. The TCC2 selects a recovered clock, a BITS, or an internal Stratum 3 reference as the system-timing reference. You can provision any of the clock inputs as primary or secondary timing sources. A slow-reference tracking loop allows the TCC2 to synchronize with the recovered clock, which provides holdover if the reference is lost.

The TCC2 monitors both supply voltage inputs on the shelf. An alarm is generated if one of the supply voltage inputs has a voltage out of the specified range.

Install TCC2 cards in Slots 7 and 11 for redundancy. If the active TCC2 fails, traffic switches to the protect TCC2.

The TCC2 card has two built-in interface ports for accessing the system: an RJ-45 10BaseT LAN interface and an EIA/TIA-232 ASCII interface for local craft access. It also has a 10BaseT LAN port for user interfaces via the backplane.

15.2.1.2 Redundant TCC2 Card Installation

Cisco does not support operation of the ONS 15454 with only one TCC2 card. For full functionality and to safeguard your system, always operate with two TCC2 cards.

When a second TCC2 card is inserted into a node, it synchronizes its software, its backup software, and its database with the active TCC2. If the software version of the new TCC2 does not match the version on the active TCC2, the newly inserted TCC2 copies from the active TCC2, taking about 15 to 20 minutes to complete. If the backup software version on the new TCC2 does not match the version on the active TCC2, the newly inserted TCC2 copies the backup software from the active TCC2 again, taking about 15 to 20 minutes. Copying the database from the active TCC2 takes about 3 minutes. Depending on the software version and backup version the new TCC2 started with, the entire process can take between 3 and 40 minutes.

15.2.1.3 TCC2 Card-Level Indicators

The TCC2 faceplate has eight LEDs. Table 15-7 describes the two card-level LEDs on the TCC2 faceplate.

Table 15-7 TCC2 Card-Level Indicators

Card-Level LEDs	Definition
Red FAIL LED	This LED is on during reset. The FAIL LED flashes during the boot and write process. Replace the card if the FAIL LED persists.
ACT/STBY LED Green (Active) Yellow (Standby)	Indicates the TCC2 is active (green) or in standby (yellow) mode. The ACT/STBY LED also provides the timing reference and shelf control. When the active TCC2 is writing to its database or to the standby TCC2 database, the card LEDs blink. To avoid memory corruption, do not remove the TCC2 when the active or standby LED is blinking.

15.2.1.4 Network-Level Indicators

Table 15-8 describes the six network-level LEDs on the TCC2 faceplate.

Table 15-8 TCC2 Network-Level Indicators

System-Level LEDs	Definition
Red CRIT LED	Indicates critical alarms in the network at the local terminal.
Red MAJ LED	Indicates major alarms in the network at the local terminal.
Yellow MIN LED	Indicates minor alarms in the network at the local terminal.
Red REM LED	Provides first-level alarm isolation. The remote (REM) LED turns red when an alarm is present in one or more of the remote terminals.
Green SYNC LED	Indicates that node timing is synchronized to an external reference.
Green ACO LED	After pressing the alarm cutoff (ACO) button, the ACO LED turns green. The ACO button opens the audible alarm closure on the backplane. ACO is stopped if a new alarm occurs. After the originating alarm is cleared, the ACO LED and audible alarm control are reset.

15.2.2 TCC2P Card

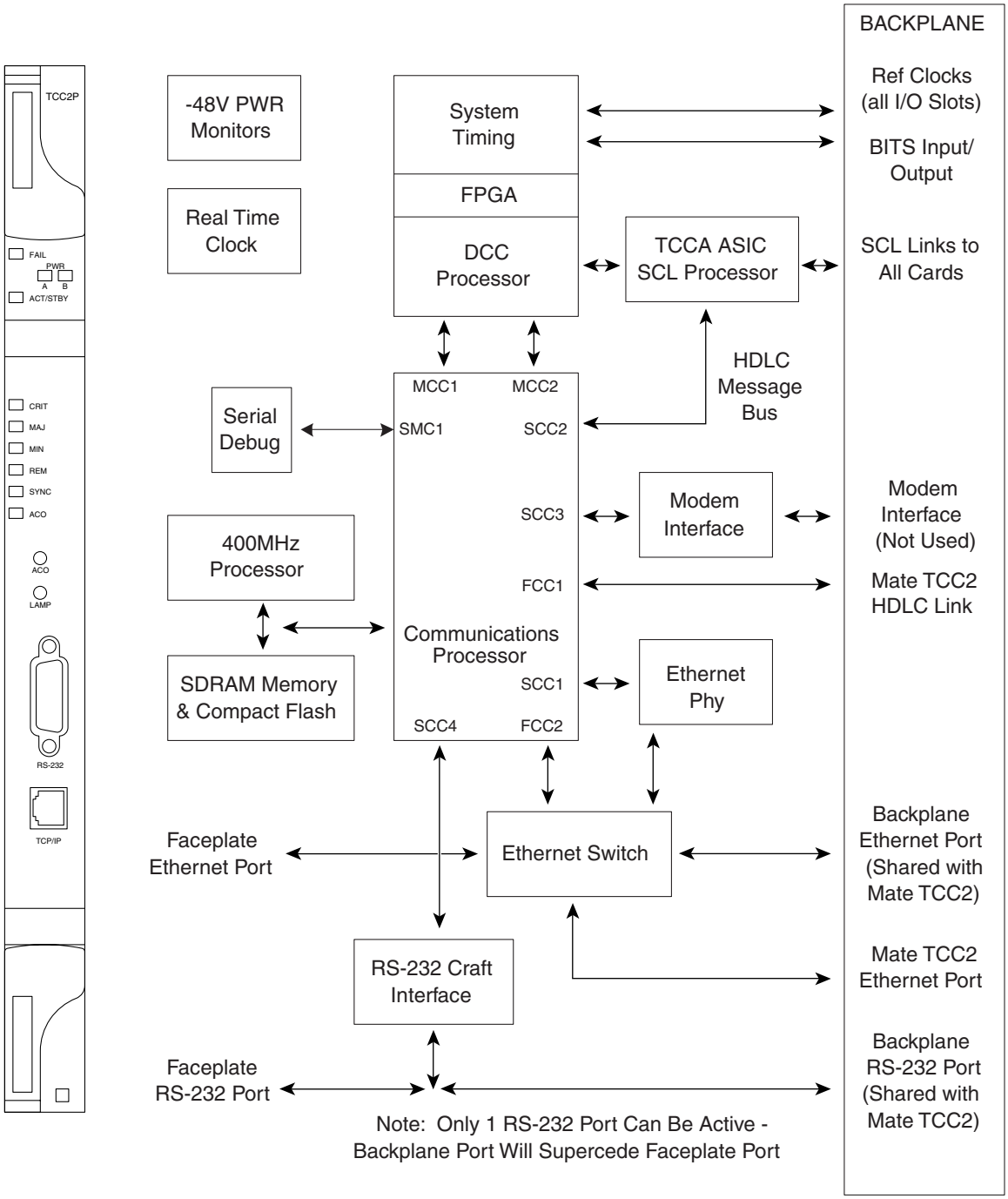
The Advanced Timing, Communications, and Control Plus (TCC2P) card is an enhanced version of the TCC2 card. The primary enhancements are Ethernet security features and 64K composite clock BITS timing.

The TCC2P card performs system initialization, provisioning, alarm reporting, maintenance, diagnostics, IP address detection/resolution, SONET SOH DCC/GCC termination, and system fault detection for the ONS 15454. The TCC2P also ensures that the system maintains Stratum 3 (Telcordia GR-253-CORE) timing requirements. It monitors the supply voltage of the system.

Note The LAN interface of the TCC2P card meets the standard Ethernet specifications by supporting a cable length of 328 ft (100 m) at temperatures from 32 to 149 degrees Fahrenheit (0 to 65 degrees Celsius). The interfaces can operate with a cable length of 32.8 ft (10 m) maximum at temperatures from –40 to 32 degrees Fahrenheit (–40 to 0 degrees Celsius).

Figure 15-2 shows the faceplate and block diagram for the TCC2P card.

Figure 15-2 TCC2P Faceplate and Block Diagram



15.2.3 TCC2P Functionality

The TCC2P card supports multichannel, high-level data link control (HDLC) processing for the DCC. Up to 84 DCCs can be routed over the TCC2P card and up to 84 section DCCs can be terminated at the TCC2P card (subject to the available optical digital communication channels). The TCC2P selects and processes 84 DCCs to facilitate remote system management interfaces.

The TCC2P card also originates and terminates a cell bus carried over the module. The cell bus supports links between any two cards in the node, which is essential for peer-to-peer communication. Peer-to-peer communication accelerates protection switching for redundant cards.

The node database, IP address, and system software are stored in TCC2P card nonvolatile memory, which allows quick recovery in the event of a power or card failure.

The TCC2P card performs all system-timing functions for each ONS 15454. The TCC2P card monitors the recovered clocks from each traffic card and two BITS ports for frequency accuracy. The TCC2P card selects a recovered clock, a BITS, or an internal Stratum 3 reference as the system-timing reference. You can provision any of the clock inputs as primary or secondary timing sources. A slow-reference tracking loop allows the TCC2P card to synchronize with the recovered clock, which provides holdover if the reference is lost.

The TCC2P card supports 64/8K composite clock and 6.312 MHz timing output.

The TCC2P card monitors both supply voltage inputs on the shelf. An alarm is generated if one of the supply voltage inputs has a voltage out of the specified range.

Install TCC2P cards in Slots 7 and 11 for redundancy. If the active TCC2P card fails, traffic switches to the protect TCC2P card. All TCC2P card protection switches conform to protection switching standards when the bit error rate (BER) counts are not in excess of 1 * 10 exp – 3 and completion time is less than 50 ms.

The TCC2P card has two built-in Ethernet interface ports for accessing the system: one built-in RJ-45 port on the front faceplate for on-site craft access and a second port on the backplane. The rear Ethernet interface is for permanent LAN access and all remote access via TCP/IP as well as for Operations Support System (OSS) access. The front and rear Ethernet interfaces can be provisioned with different IP addresses using CTC.

Two EIA/TIA-232 serial ports, one on the faceplate and a second on the backplane, allow for craft interface in TL1 mode.

15.2.3.1 Redundant TCC2P Card Installation

Cisco does not support operation of the ONS 15454 with only one TCC2P card. For full functionality and to safeguard your system, always operate with two TCC2P cards.

When a second TCC2P card is inserted into a node, it synchronizes its software, its backup software, and its database with the active TCC2P card. If the software version of the new TCC2P card does not match the version on the active TCC2P card, the newly inserted TCC2P card copies from the active TCC2P card, taking about 15 to 20 minutes to complete. If the backup software version on the new TCC2P card does not match the version on the active TCC2P card, the newly inserted TCC2P card copies the backup software from the active TCC2P card again, taking about 15 to 20 minutes. Copying the database from the active TCC2P card takes about 3 minutes. Depending on the software version and backup version the new TCC2P card started with, the entire process can take between 3 and 40 minutes.

15.2.3.2 TCC2P Card-Level Indicators

The TCC2P faceplate has eight LEDs. Table 15-9 describes the two card-level LEDs on the TCC2P faceplate.

Table 15-9 TCC2P Card-Level Indicators

Card-Level LEDs	Definition
Red FAIL LED	This LED is on during reset. The FAIL LED flashes during the boot and write process. Replace the card if the FAIL LED persists.
ACT/STBY LED Green (Active) Amber (Standby)	Indicates the TCC2P is active (green) or in standby (amber) mode. The ACT/STBY LED also provides the timing reference and shelf control. When the active TCC2P is writing to its database or to the standby TCC2P database, the card LEDs blink. To avoid memory corruption, do not remove the TCC2P when the active or standby LED is blinking.

15.2.3.3 Network-Level Indicators

Table 15-10 describes the six network-level LEDs on the TCC2P faceplate.

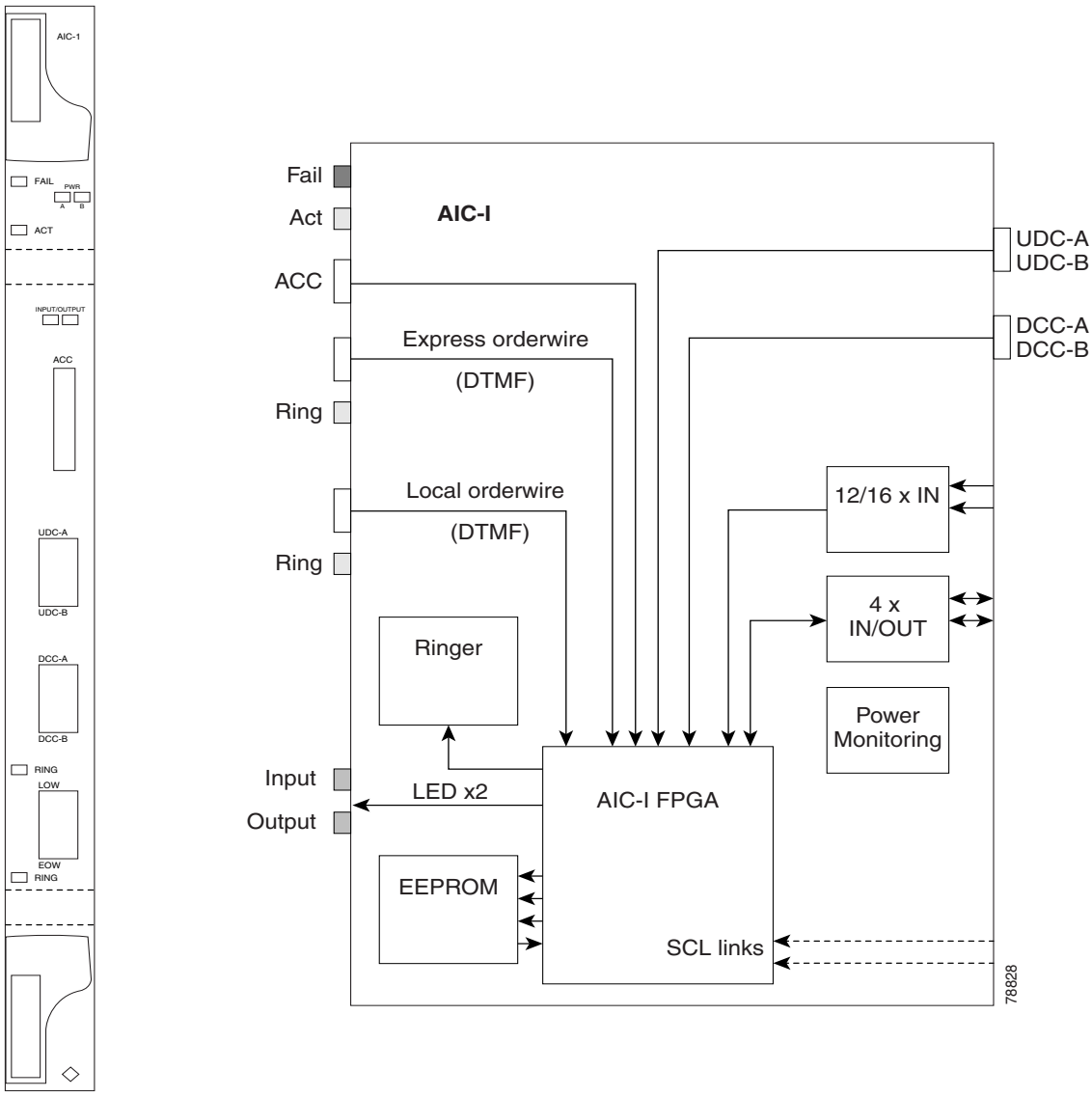
Table 15-10 TCC2P Network-Level Indicators

System-Level LEDs	Definition
Red CRIT LED	Indicates critical alarms in the network at the local terminal.
Red MAJ LED	Indicates major alarms in the network at the local terminal.
Amber MIN LED	Indicates minor alarms in the network at the local terminal.
Red REM LED	Provides first-level alarm isolation. The remote (REM) LED turns red when an alarm is present in one or more of the remote terminals.
Green SYNC LED	Indicates that node timing is synchronized to an external reference.
Green ACO LED	After pressing the ACO button, the ACO LED turns green. The ACO button opens the audible alarm closure on the backplane. ACO is stopped if a new alarm occurs. After the originating alarm is cleared, the ACO LED and audible alarm control are reset.

15.2.4 AIC-I Card

The optional Alarm Interface Controller–International (AIC-I) card provides customer-defined (environmental) alarms and controls and supports local and express orderwire. It provides 12 customer-defined input and 4 customer-defined input/output contacts. The physical connections are via the backplane wire-wrap pin terminals. If you use the additional alarm expansion panel (AEP), the AIC-I card can support up to 32 inputs and 16 outputs, which are connected on the AEP connectors. The AEP is compatible with ANSI shelves only. A power monitoring function monitors the supply voltage (–48 VDC). Figure 15-3 shows the AIC-I faceplate and a block diagram of the card.

Figure 15-3 AIC-I Faceplate and Block Diagram



15.2.4.1 AIC-I Card-Level Indicators

Table 15-11 describes the eight card-level LEDs on the AIC-I card faceplate.

Table 15-11 AIC-I Card-Level Indicators

Card-Level LEDs	Description
Red FAIL LED	Indicates that the card's processor is not ready. The FAIL LED is on during reset and flashes during the boot process. Replace the card if the red FAIL LED persists.
Green ACT LED	Indicates the AIC-I card is provisioned for operation.

Table 15-11 AIC-I Card-Level Indicators (continued)

Card-Level LEDs	Description
Green/red PWR A LED	The PWR A LED is green when a supply voltage within a specified range has been sensed on supply input A. It is red when the input voltage on supply input A is out of range.
Green/red PWR B LED	The PWR B LED is green when a supply voltage within a specified range has been sensed on supply input B. It is red when the input voltage on supply input B is out of range.
Yellow INPUT LED	The INPUT LED is yellow when there is an alarm condition on at least one of the alarm inputs.
Yellow OUTPUT LED	The OUTPUT LED is yellow when there is an alarm condition on at least one of the alarm outputs.
Green RING LED	The RING LED on the local orderwire (LOW) side is flashing green when a call is received on the LOW.
Green RING LED	The RING LED on the express orderwire (EOW) side is flashing green when a call is received on the EOW.

15.2.4.2 External Alarms and Controls

The AIC-I card provides input/output alarm contact closures. You can define up to 12 external alarm inputs and 4 external alarm inputs/outputs (user configurable). The physical connections are made using the backplane wire-wrap pins or FMEC connections. See the "14.9 ONS 15454 ANSI Alarm Expansion Panel" section on page 14-30 for information about increasing the number of input/output contacts.

LEDs on the front panel of the AIC-I indicate the status of the alarm lines, one LED representing all of the inputs and one LED representing all of the outputs. External alarms (input contacts) are typically used for external sensors such as open doors, temperature sensors, flood sensors, and other environmental conditions. External controls (output contacts) are typically used to drive visual or audible devices such as bells and lights, but they can control other devices such as generators, heaters, and fans.

You can program each of the twelve input alarm contacts separately. You can program each of the sixteen input alarm contacts separately. Choices include:

- Alarm on Closure or Alarm on Open
- Alarm severity of any level (Critical, Major, Minor, Not Alarmed, Not Reported)
- Service Affecting or Non-Service Affecting alarm-service level
- 63-character alarm description for CTC display in the alarm log.

You cannot assign the fan-tray abbreviation for the alarm; the abbreviation reflects the generic name of the input contacts. The alarm condition remains raised until the external input stops driving the contact or you provision the alarm input.

The output contacts can be provisioned to close on a trigger or to close manually. The trigger can be a local alarm severity threshold, a remote alarm severity, or a virtual wire:

- Local NE alarm severity: A hierarchy of Not Reported, Not Alarmed, Minor, Major, or Critical alarm severities that you set to cause output closure. For example, if the trigger is set to Minor, a Minor alarm or above is the trigger.
- Remote NE alarm severity: Same as the local NE alarm severity but applies to remote alarms only.

- Virtual wire entities: You can provision any environmental alarm input to raise a signal on any virtual wire on external outputs 1 through 4 when the alarm input is an event. You can provision a signal on any virtual wire as a trigger for an external control output.

You can also program the output alarm contacts (external controls) separately. In addition to provisionable triggers, you can manually force each external output contact to open or close. Manual operation takes precedence over any provisioned triggers that might be present.

Note For ANSI shelves, the number of inputs and outputs can be increased using the AEP. The AEP is connected to the shelf backplane and requires an external wire-wrap panel.

15.2.4.3 Orderwire

Orderwire allows a craftsperson to plug a phoneset into an ONS 15454 and communicate with craftspeople working at other ONS 15454s or other facility equipment. The orderwire is a pulse code modulation (PCM) encoded voice channel that uses E1 or E2 bytes in section/line overhead.

The AIC-I allows simultaneous use of both local (section overhead signal) and express (line overhead channel) orderwire channels on a SONET/SDH ring or particular optics facility. Express orderwire also allows communication via regeneration sites when the regenerator is not a Cisco device.

You can provision orderwire functions with CTC similar to the current provisioning model for DCC/GCC channels. In CTC, you provision the orderwire communications network during ring turn-up so that all NEs on the ring can reach one another. Orderwire terminations (that is, the optics facilities that receive and process the orderwire channels) are provisionable. Both express and local orderwire can be configured as on or off on a particular SONET/SDH facility. The ONS 15454 supports up to four orderwire channel terminations per shelf. This allows linear, single ring, dual ring, and small hub-and-spoke configurations. Orderwire is not protected in ring topologies such as BLSR/MS-SPRing and path protection/SNCP.

Caution Do not configure orderwire loops. Orderwire loops cause feedback that disables the orderwire channel.

The ONS 15454 implementation of both local and express orderwire is broadcast in nature. The line acts as a party line. Anyone who picks up the orderwire channel can communicate with all other participants on the connected orderwire subnetwork. The local orderwire party line is separate from the express orderwire party line. Up to four OC-N/STM-N facilities for each local and express orderwire are provisionable as orderwire paths.

The AIC-I supports selective dual tone multifrequency (DTMF) dialing for telephony connectivity, which causes one AIC-I card or all ONS 15454 AIC-I cards on the orderwire subnetwork to “ring.” The ringer/buzzer resides on the AIC-I. There is also a “ring” LED that mimics the AIC-I ringer. It flashes when a call is received on the orderwire subnetwork. A party line call is initiated by pressing ***0000** on the DTMF pad. Individual dialing is initiated by pressing ***** and the individual four-digit number on the DTMF pad.

Table 15-12 shows the pins on the orderwire connector that correspond to the tip and ring orderwire assignments.

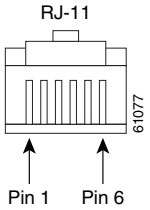
Table 15-12 Orderwire Pin Assignments

RJ-11 Pin Number	Description
1	Four-wire receive ring
2	Four-wire transmit tip
3	Two-wire ring
4	Two-wire tip
5	Four-wire transmit ring
6	Four-wire receive tip

When provisioning the orderwire subnetwork, make sure that an orderwire loop does not exist. Loops cause oscillation and an unusable orderwire channel.

Figure 15-4 shows the standard RJ-11 connectors used for orderwire ports.

Figure 15-4 RJ-11 Connector



15.2.4.4 Power Monitoring

The AIC-I card provides a power monitoring circuit that monitors the supply voltage of –48 VDC for presence, undervoltage, and overvoltage.

15.2.4.5 User Data Channel

The user data channel (UDC) features a dedicated data channel of 64 kbps (F1 byte) between two nodes in an ONS 15454 network. Each AIC-I card provides two user data channels, UDC-A and UDC-B, through separate RJ-11 connectors on the front of the AIC-I card. Each UDC can be routed to an individual optical interface in the ONS 15454. For instructions, see the "DLP-G110 Create a User Data Channel Circuit" task on page 7-19.

The UDC ports are standard RJ-11 receptacles. Table 15-13 lists the UDC pin assignments.

Table 15-13 UDC Pin Assignments

RJ-11 Pin Number	Description
1	For future use
2	TXN
3	RXN
4	RXP

Table 15-13 UDC Pin Assignments (continued)

RJ-11 Pin Number	Description
5	TXP
6	For future use

15.2.4.6 Data Communications Channel

The DCC features a dedicated data channel of 576 kbps (D4 to D12 bytes) between two nodes in an ONS 15454 network. Each AIC-I card provides two data communications channels, DCC-A and DCC-B, through separate RJ-45 connectors on the front of the AIC-I card. Each DCC can be routed to an individual optical interface in the ONS 15454. For instructions, see the "DLP-G110 Create a User Data Channel Circuit" task on page 7-19.

The DCC ports are standard RJ-45 receptacles. Table 15-14 lists the DCC pin assignments.

Table 15-14 DCC Pin Assignments

RJ-45 Pin Number	Description
1	TCLKP
2	TCLKN
3	TXP
4	TXN
5	RCLKP
6	RCLKN
7	RXP
8	RXN

15.3 Front Mount Electrical Connections

This section describes the MIC-A/P and MIC-C/T/P FMECs, which provide power, external alarm, and timing connections for the ONS 15454 ETSI shelf.

15.3.1 MIC-A/P FMEC

The MIC-A/P FMEC provides connection for the BATTERY B input, one of the two possible redundant power supply inputs. It also provides connection for eight alarm outputs (coming from the TCC2/TCC2P card), sixteen alarm inputs, and four configurable alarm inputs/outputs. Its position is in Slot 23 in the center of the subrack Electrical Facility Connection Assembly (EFCA) area.

The MIC-A/P FMEC has the following features:

- Connection for one of the two possible redundant power supply inputs
- Connection for eight alarm outputs (coming from the TCC2/TCC2P card)
- Connection for four configurable alarm inputs/outputs
- Connection for sixteen alarm inputs

- Storage of manufacturing and inventory data

For proper system operation, both the MIC-A/P and MIC-C/T/P FMECs must be installed in the ONS 15454 ETSI shelf. Figure 15-5 shows the MIC-A/P faceplate.

Figure 15-5 MIC-A/P Faceplate

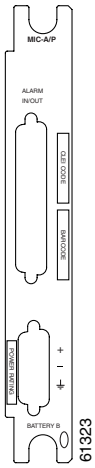


Figure 15-6 shows a block diagram of the MIC-A/P.

Figure 15-6 MIC-A/P Block Diagram

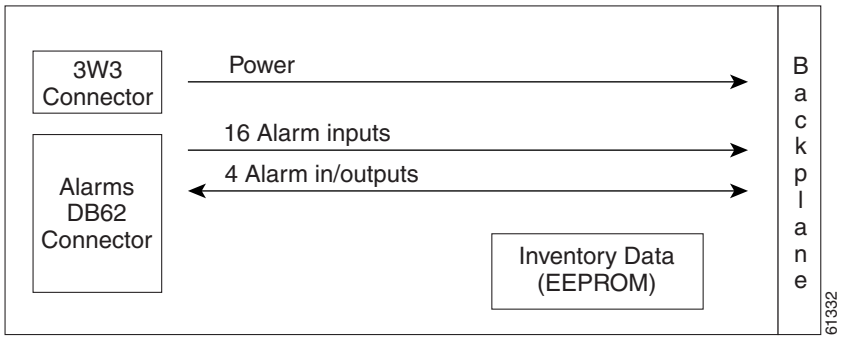


Table 15-15 shows the alarm interface pinouts on the MIC-A/P DB-62 connector.

Table 15-15 Alarm Interface Pinouts on the MIC-A/P DB-62 Connector

Pin No.	Signal Name	Signal Description
1	ALMCUTOFF N	Alarm cutoff, normally open ACO pair
2	ALMCUTOFF P	Alarm cutoff, normally open ACO pair
3	ALMINP0 N	Alarm input pair 1, reports closure on connected wires
4	ALMINP0 P	Alarm input pair 1, reports closure on connected wires
5	ALMINP1 N	Alarm input pair 2, reports closure on connected wires
6	ALMINP1 P	Alarm input pair 2, reports closure on connected wires
7	ALMINP2 N	Alarm input pair 3, reports closure on connected wires

Table 15-15 Alarm Interface Pinouts on the MIC-A/P DB-62 Connector (continued)

Pin No.	Signal Name	Signal Description
8	ALMINP2 P	Alarm input pair 3, reports closure on connected wires
9	ALMINP3 N	Alarm input pair 4, reports closure on connected wires
10	ALMINP3 P	Alarm input pair 4, reports closure on connected wires
11	EXALM0 N	External customer alarm 1
12	EXALM0 P	External customer alarm 1
13	GND	Ground
14	EXALM1 N	External customer alarm 2
15	EXALM1 P	External customer alarm 2
16	EXALM2 N	External customer alarm 3
17	EXALM2 P	External customer alarm 3
18	EXALM3 N	External customer alarm 4
19	EXALM3 P	External customer alarm 4
20	EXALM4 N	External customer alarm 5
21	EXALM4 P	External customer alarm 5
22	EXALM5 N	External customer alarm 6
23	EXALM5 P	External customer alarm 6
24	EXALM6 N	External customer alarm 7
25	EXALM6 P	External customer alarm 7
26	GND	Ground
27	EXALM7 N	External customer alarm 8
28	EXALM7 P	External customer alarm 8
29	EXALM8 N	External customer alarm 9
30	EXALM8 P	External customer alarm 9
31	EXALM9 N	External customer alarm 10
32	EXALM9 P	External customer alarm 10
33	EXALM10 N	External customer alarm 11
34	EXALM10 P	External customer alarm 11
35	EXALM11 N	External customer alarm 12
36	EXALM11 P	External customer alarm 12
37	ALMOUP0 N	Normally open output pair 1
38	ALMOUP0 P	Normally open output pair 1
39	GND	Ground
40	ALMOUP1 N	Normally open output pair 2
41	ALMOUP1 P	Normally open output pair 2
42	ALMOUP2 N	Normally open output pair 3
43	ALMOUP2 P	Normally open output pair 3

Table 15-15 Alarm Interface Pinouts on the MIC-A/P DB-62 Connector (continued)

Pin No.	Signal Name	Signal Description
44	ALMOUP3 N	Normally open output pair 4
45	ALMOUP3 P	Normally open output pair 4
46	AUDALM0 N	Normally open Minor audible alarm
47	AUDALM0 P	Normally open Minor audible alarm
48	AUDALM1 N	Normally open Major audible alarm
49	AUDALM1 P	Normally open Major audible alarm
50	AUDALM2 N	Normally open Critical audible alarm
51	AUDALM2 P	Normally open Critical audible alarm
52	GND	Ground
53	AUDALM3 N	Normally open Remote audible alarm
54	AUDALM3 P	Normally open Remote audible alarm
55	VISALM0 N	Normally open Minor visual alarm
56	VISALM0 P	Normally open Minor visual alarm
57	VISALM1 N	Normally open Major visual alarm
58	VISALM1 P	Normally open Major visual alarm
59	VISALM2 N	Normally open Critical visual alarm
60	VISALM2 P	Normally open Critical visual alarm
61	VISALM3 N	Normally open Remote visual alarm
62	VISALM3 P	Normally open Remote visual alarm

15.3.2 MIC-C/T/P FMEC

The MIC-C/T/P FMEC provides connection for the BATTERY A input, one of the two possible redundant power supply inputs. It also provides connection for system management serial port, system management LAN port, modem port (for future use), and system timing inputs and outputs. Install the MIC-C/T/P in Slot 24.

The MIC-C/T/P FMEC has the following features:

- Connection for one of the two possible redundant power supply inputs
- Connection for two serial ports for local craft/modem (for future use)
- Connection for one LAN port
- Connection for two system timing inputs
- Connection for two system timing outputs
- Storage of manufacturing and inventory data

For proper system operation, both the MIC-A/P and MIC-C/T/P FMECs must be installed in the shelf.

Figure 15-7 shows the MIC-C/T/P FMEC faceplate.

Figure 15-7 MIC-C/T/P Faceplate

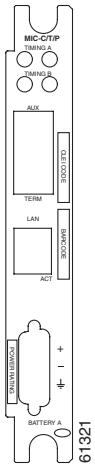
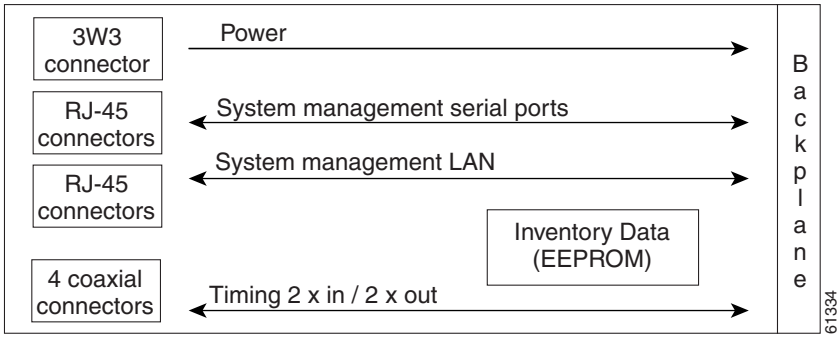


Figure 15-8 shows a block diagram of the MIC-C/T/P.

Figure 15-8 MIC-C/T/P Block Diagram



The MIC-C/T/P FMEC has one pair of LEDs located on the RJ45 LAN connector. The green LED is on when a link is present, and the amber LED is on when data is being transferred.

15.4 Optical Service Channel Cards

This section describes the optical service channel cards. An optical service channel (OSC) is a bidirectional channel connecting two adjacent nodes in a DWDM ring. For every DWDM node (except terminal nodes), two different OSC terminations are present, one for the West side and another for the East side. The channel transports OSC overhead that is used to manage ONS 15454 DWDM networks. An OSC signal uses the 1510-nm wavelength and does not affect client traffic. The primary purpose of this channel is to carry clock synchronization and orderwire channel communications for the DWDM network. It also provides transparent links between each node in the network. The OSC is an OC-3/STM-1 formatted signal.

There are two versions of the OSC modules: the OSCM, and the OSC-CSM, which contains the OSC wavelength combiner and separator component in addition to the OSC module.

15.4.1 OSCM Card

The OSCM card is used in amplified nodes that include the OPT-BST or OPT-BST-E booster amplifier. The OPT-BST and OPT-BST-E include the required OSC wavelength combiner and separator component. The OSCM cannot be used in nodes where you use OC-N/STM-N cards, electrical cards, or cross-connect cards. The OSCM uses Slots 8 and 10, which are also cross-connect card slots.

The OSCM supports the following features:

- OC-3/STM-1 formatted OSC
- Supervisory data channel (SDC) forwarded to the TCC2/TCC2P cards for processing
- Distribution of the synchronous clock to all nodes in the ring
- 100BaseT far-end (FE) UDC
- Monitoring functions such as orderwire support and optical safety

The OC-3/STM-1 section data communications channel (SDCC) overhead bytes are used for network communications. An optical transceiver terminates the OC-3/STM-1, then it is regenerated and converted into an electrical signal. The SDCC bytes are forwarded to the active and standby TCC2/TCC2P cards for processing via the system communication link (SCL) bus on the backplane. Orderwire bytes (E1, E2, F1) are also forwarded via the SCL bus to the TCC2/TCC2P for forwarding to the AIC-I card.

The payload portion of the OC-3/STM-1 is used to carry the fast Ethernet UDC. The frame is sent to a packet-over-SONET/SDH (POS) processing block that extracts the Ethernet packets and makes them available at the RJ-45 connector.

The OSCM distributes the reference clock information by removing it from the incoming OC-3/STM-1 signal and then sending it to the DWDM cards. The DWDM cards then forward the clock information to the active and standby TCC2/TCC2P cards.

Figure 15-9 shows the OSCM faceplate.

Figure 15-9 OSCM Card Faceplate

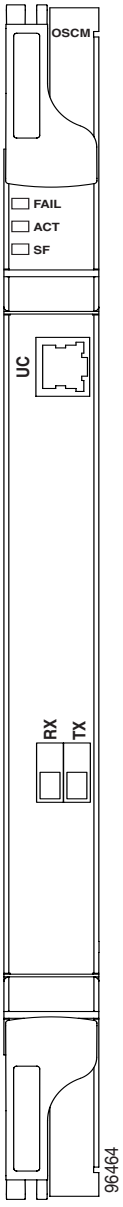


Figure 15-10 shows a block diagram of the OSCM card.

Figure 15-10 OSCM Block Diagram

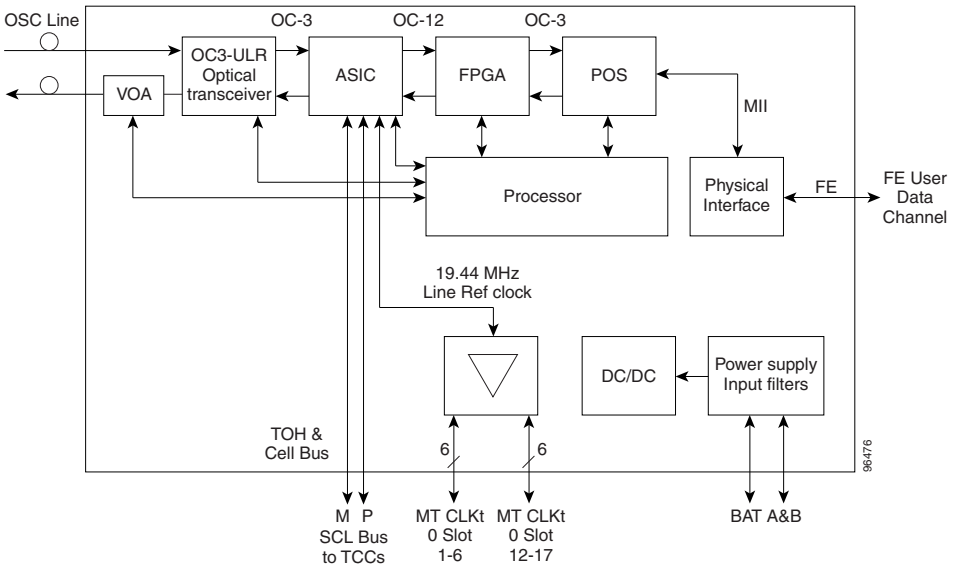
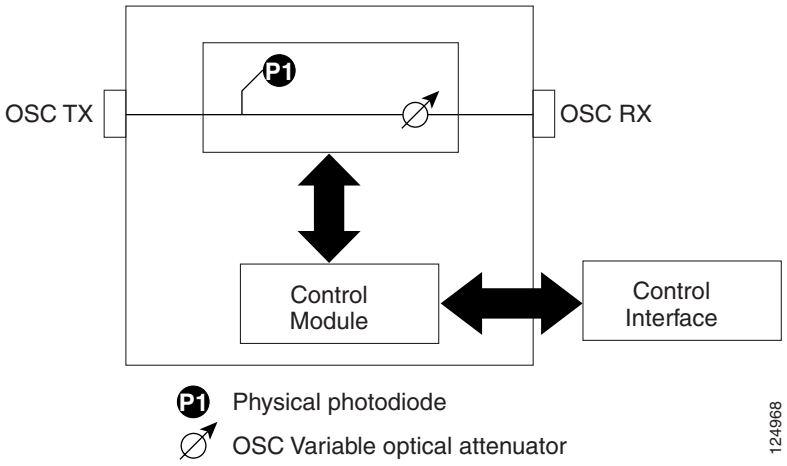


Figure 15-11 shows the block diagram of the variable optical attenuator (VOA) within the OSCM.

Figure 15-11 OSCM VOA Optical Module Functional Block Diagram



15.4.1.1 Power Monitoring

Physical photodiode P1 monitors the power for the OSCM card. The returned power level value is calibrated to the OSC TX port (Table 15-16).

Table 15-16 OSCM VOA Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1	Output OSC	OSC TX

15.4.1.2 OSCM Card-Level Indicators

The OSCM card has three card-level LED indicators, described in Table 15-17.

Table 15-17 OSCM Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the OSCM is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as loss of signal (LOS), loss of frame alignment (LOF), line alarm indication signal (AIS-L), or high BER on one or more of the card's ports. The amber signal fail (SF) LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.4.1.3 OSCM Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The OSCM has one OC-3/STM-1 optical port located on the faceplate. One long-reach OSC transmits and receives the OSC to and from another DWDM node. Both data communications network (DCN) data and FE payload are carried on this link.

15.4.2 OSC-CSM Card

The OSC-CSM card is used in unamplified nodes. This means that the booster amplifier with the OSC wavelength combiner and separator is not required for OSC-CSM operation. The OSC-CSM can be installed in Slots 1 to 6 and 12 to 17. To operate in hybrid mode, the OSC-CSM cards must be accompanied by cross-connect cards. The cross-connect cards enable functionality on the OC-N/STM-N cards and electrical cards.

The OSC-CSM supports the following features:

- Optical combiner and separator module for multiplexing and demultiplexing the optical service channel to or from the wavelength division multiplexing (WDM) signal
- OC-3/STM-1 formatted OSC
- SDC forwarded to the TCC2/TCC2P cards for processing
- Distribution of the synchronous clock to all nodes in the ring
- 100BaseT FE UDC
- Monitoring functions such as orderwire support
- Optical safety: Signal loss detection and alarming, fast transmitted power shut down by means of an optical 1x1 switch
- Optical safety remote interlock (OSRI), a feature capable of shutting down the optical output power
- Automatic laser shutdown (ALS), a safety mechanism used in the event of a fiber cut

The WDM signal coming from the line is passed through the OSC combiner and separator, where the OSC signal is extracted from the WDM signal. The WDM signal is sent along with the remaining channels to the COM port (label on the front panel) for routing to the OADM or amplifier units, while the OSC signal is sent to an optical transceiver.

The OSC is an OC-3/STM-1 formatted signal. The OC-3/STM-1 SDCC overhead bytes are used for network communications. An optical transceiver terminates the OC-3/STM-1, and then it is regenerated and converted into an electrical signal. The SDCC bytes are forwarded to the active and standby TCC2/TCC2P cards for processing via the SCL bus on the backplane. Orderwire bytes (E1, E2, F1) are also forwarded via the SCL bus to the TCC2/TCC2P for forwarding to the AIC-I card.

The payload portion of the OC-3/STM-1 is used to carry the fast Ethernet UDC. The frame is sent to a POS processing block that extracts the Ethernet packets and makes them available at the RJ-45 front panel connector.

The OSC-CSM distributes the reference clock information by removing it from the incoming OC-3/STM-1 signal and then sending it to the active and standby TCC2/TCC2P cards. The clock distribution is different from the OSCM card because the OSC-CSM does not use Slot 8 or 10 (cross-connect card slots).

Note S1 and S2 (Figure 15-14 on page 15-33) are optical splitters with a splitter ratio of 2:98. The result is that the power at the MON TX port is about 17 dB lower than the relevant power at the COM RX port, and the power at the MON RX port is about 20 dB lower than the power at the COM TX port. The difference is due to the presence of a tap coupler for the P1 photodiode.

Figure 15-12 shows the OSC-CSM faceplate.

Figure 15-12 OSC-CSM Faceplate

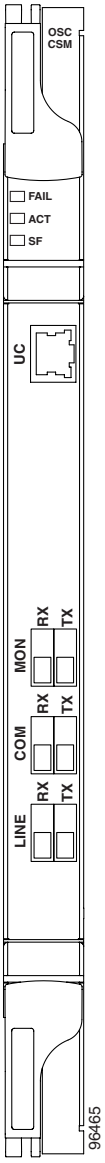


Figure 15-13 shows a block diagram of the OSC-CSM card.

Figure 15-13 OSC-CSM Block Diagram

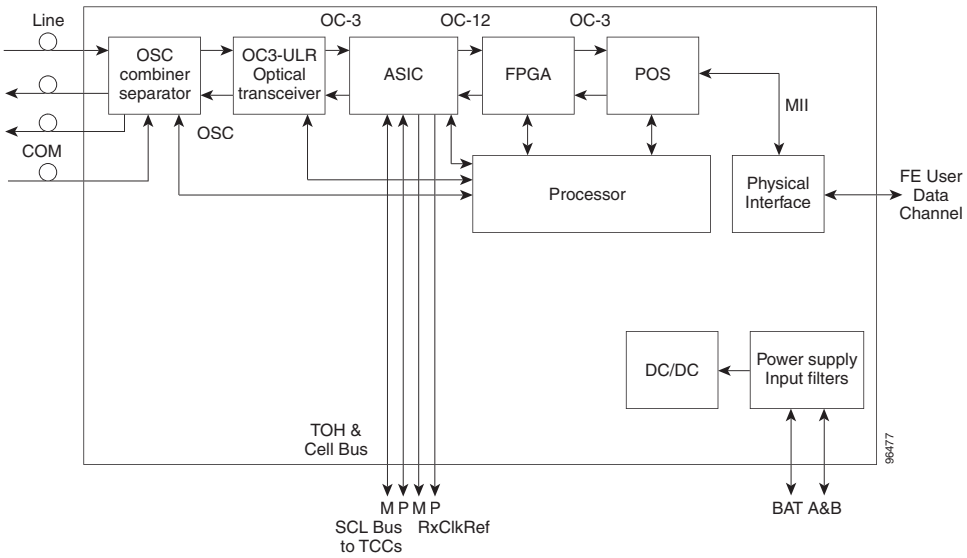
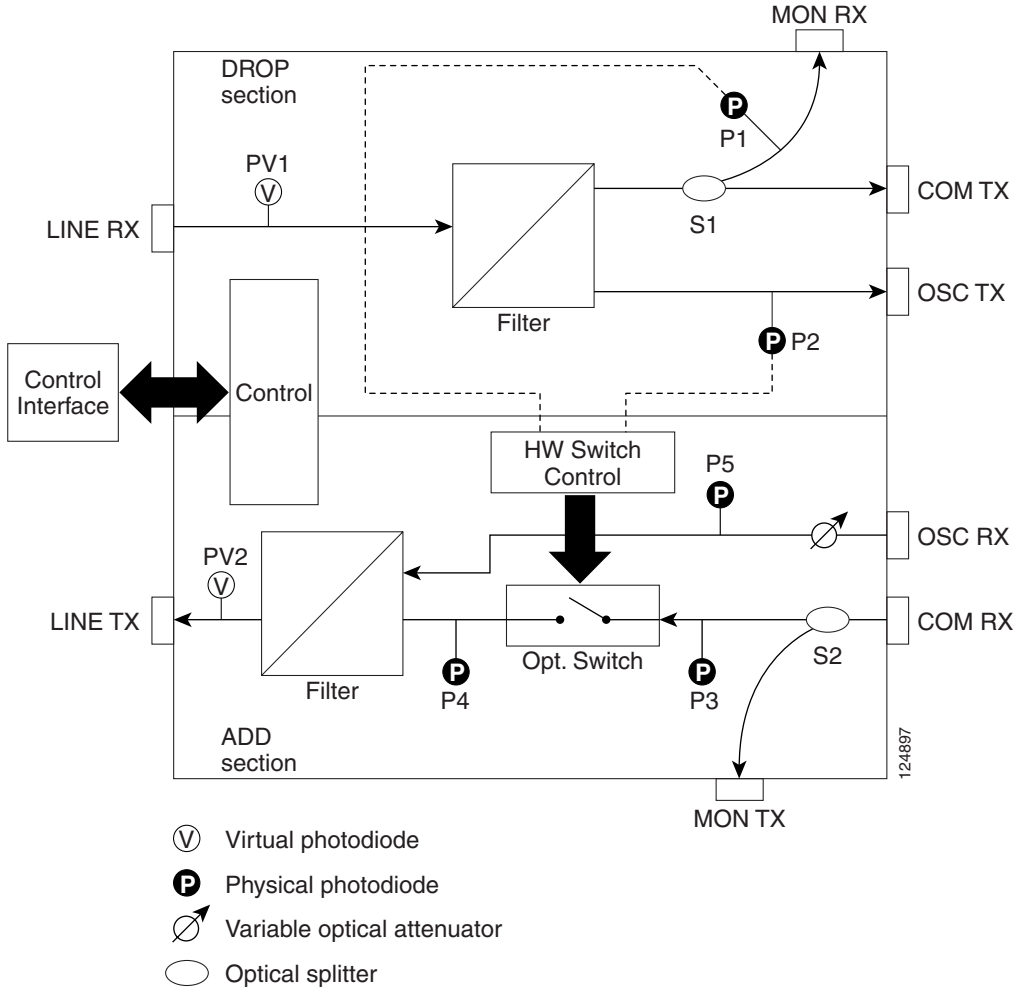


Figure 15-14 shows the OSC-CSM optical module functional block diagram.

Figure 15-14 OSC-CSM Optical Module Functional Block Diagram



15.4.2.1 Power Monitoring

Physical photodiodes P1, P2, P3, and P5 monitor the power for the OSC-CSM card. Their function is as follows:

- P1 and P2: The returned power value is calibrated to the LINE RX port, including the insertion loss of the previous filter (the reading of this power dynamic range has been brought backward towards the LINE RX output).
- P3: The returned value is calibrated to the COM RX port.
- P5: The returned value is calibrated to the LINE TX port, including the insertion loss of the subsequent filter.

The returned power level values are calibrated to the ports as shown in Table 15-18.

Table 15-18 OSC-CSM Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1	Out Com	LINE RX
P2	Input OSC	LINE RX
P3	In Com	COM RX
P5	Output Osc	LINE TX

15.4.2.2 OSC-CSM Card-Level Indicators

The OSC-CSM card has three card-level LED indicators, described in Table 15-19.

Table 15-19 OSC-CSM Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the OSC-CSM is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS, LOF, AIS-L, or high BER on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.4.2.3 OSC-CSM Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The OSC-CSM has a OC3 port and three other sets of ports located on the faceplate.

15.5 Optical Amplifier Cards

This section describes the optical amplifier cards. Optical amplifiers are used in amplified nodes, such as hub nodes, amplified OADM nodes, and line amplifier nodes. There are three forms of amplifiers, the Optical Preamplifier (OPT-PRE), the Optical Booster (OPT-BST) amplifier, and the Optical Booster Enhanced (OPT-BST-E) amplifier. The optical amplifier card architecture includes an optical plug-in module with a controller that manages optical power, laser current, and temperature control loops. The amplifier also manages communication with the TCC2/TCC2P card, and operations, administration, maintenance, and provisioning (OAM&P) functions such as provisioning, controls, and alarms.

Optical amplifiers have a linear power feature that enables them to be kept in the constant gain mode if the gain is less than 28 dB. However, for longer span solutions it is necessary to place the amplifier in constant power mode. In constant power mode, automatic power control (APC) requirements change. This is because span loss degradation does not affect the system and amplifiers are not able to automatically modify the output power for variations in the number of channels when provisioning changes and a failure occurs.

15.5.1 OPT-PRE Amplifier

This section describes the OPT-PRE amplifier card. The OPT-PRE is designed to support 64 channels at 50-GHz channel spacing, but is currently limited to 32 channels at 100 GHz. The OPT-PRE is a C-band DWDM, two-stage erbium-doped fiber amplifier (EDFA) with mid-amplifier loss (MAL) for allocation to a DCU. To control the gain tilt, the OPT-PRE is equipped with a built-in VOA. The VOA can also be used to pad the DCU to a reference value. You can install the OPT-PRE in Slots 1 to 6 and 12 to 17.

The OPT-PRE features:

- Fixed gain mode with programmable tilt
- True variable gain
- Fast transient suppression
- Nondistorting low-frequency transfer function
- Settable maximum output power
- Fixed output power mode (mode used during provisioning)
- MAL for fiber-based DCU
- Amplified spontaneous emissions (ASE) compensation in fixed gain mode
- Full monitoring and alarm handling with settable thresholds
- Four signal photodiodes to monitor the input and output optical power of the two amplifier stages through CTC
- An optical output port for external monitoring

Note The optical splitter has a ratio of 1:99. The result is that the power at the MON port is about 20 dB lower than the power at the COM TX port.

Figure 15-15 shows the OPT-PRE amplifier faceplate.

Figure 15-15 OPT-PRE Faceplate

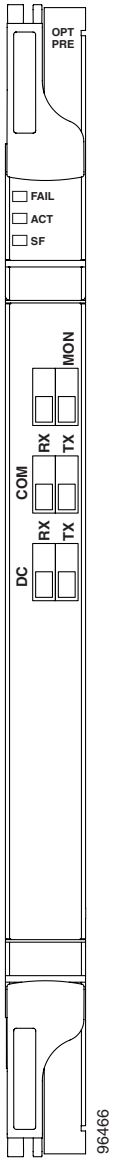


Figure 15-16 shows a block diagram of the OPT-PRE card.

Figure 15-16 OPT-PRE Block Diagram

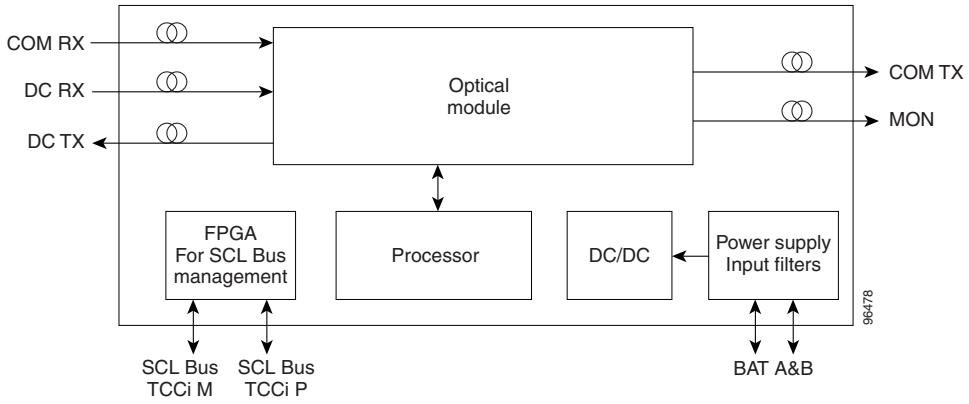
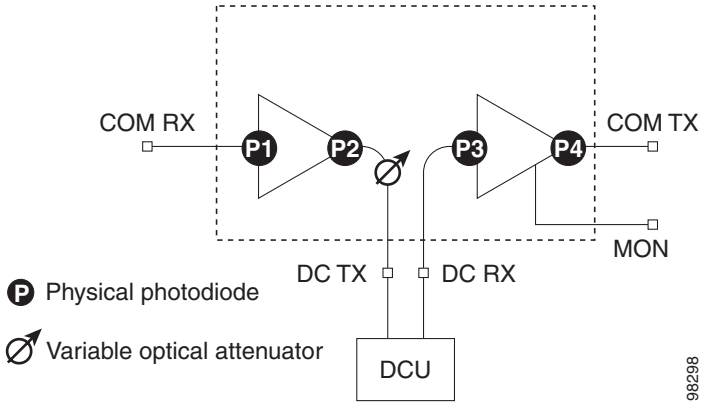


Figure 15-17 shows the OPT-PRE optical module functional block diagram.

Figure 15-17 OPT-PRE Optical Module Functional Block Diagram



15.5.1.1 Power Monitoring

Physical photodiodes P1, P2, P3, and P4 monitor the power for the OPT-PRE card. The returned power level values are calibrated to the ports as shown in Table 15-20.

Table 15-20 OPT-PRE Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1	Input Com	COM RX
P2	Output DC	DC TX
P3	Input DC	DC RX
P4	Output COM (Total Output)	COM TX
	Output COM (Signal Output)	

15.5.1.2 OPT-PRE Amplifier Card-Level Indicators

The OPT-PRE amplifier has three card-level LED indicators, described in Table 15-21.

Table 15-21 OPT-PRE Amplifier Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the OPT-PRE is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.5.1.3 OPT-PRE Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The OPT-PRE amplifier has five optical ports located on the faceplate. MON is the output monitor port. COM RX (receive) is the input signal port. COM TX (transmit) is the output signal port. DC Rx is the MAL input signal port. DC Tx is the MAL output signal port.

15.5.2 OPT-BST Amplifier Card

This section describes the OPT-BST amplifier card. The OPT-BST gain range is 5 to 20 dB in constant gain mode and output power mode. The OPT-BST is designed to support 64 channels at 50-GHz channel spacing, but currently is limited to 32 channels at 100 GHz. The OPT-BST is a C-band DWDM EDFA with OSC add-and-drop capability. When an ONS 15454 has an OPT-BST installed, it is only necessary to have the OSCM to process the OSC. You can install the OPT-BST in Slots 1 to 6 and 12 to 17. To control the gain tilt, the OPT-BST is equipped with a built-in VOA.

The OPT-BST features include:

- Fixed gain mode (with programmable tilt)
- True variable gain
- Fast transient suppression
- Nondistorting low-frequency transfer function
- Settable maximum output power
- Fixed output power mode (mode used during provisioning)
- ASE compensation in fixed gain mode
- Full monitoring and alarm handling with settable thresholds
- OSRI, which is a software feature capable (through CTC) of shutting down the optical output power or reducing the power to a safe level (automatic power reduction)
- ALS, which is a safety mechanism used in the event of a fiber cut

Note The optical splitters each have a ratio of 1:99. The result is that the power at the MON TX and MON RX ports is about 20 dB lower than the power at the COM TX and COM RX ports.

Figure 15-18 shows the OPT-BST amplifier faceplate.

Figure 15-18 OPT-BST Faceplate

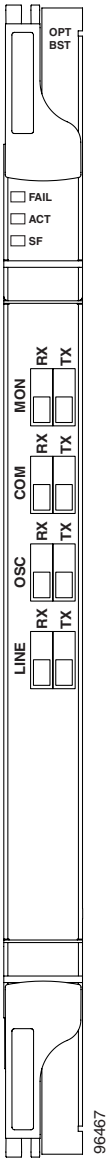


Figure 15-19 shows a block diagram of the OPT-BST card.

Figure 15-19 OPT-BST Block Diagram

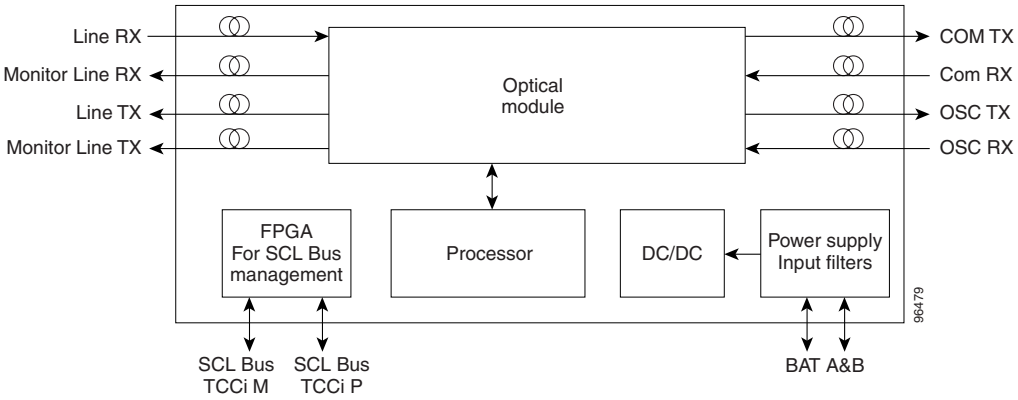
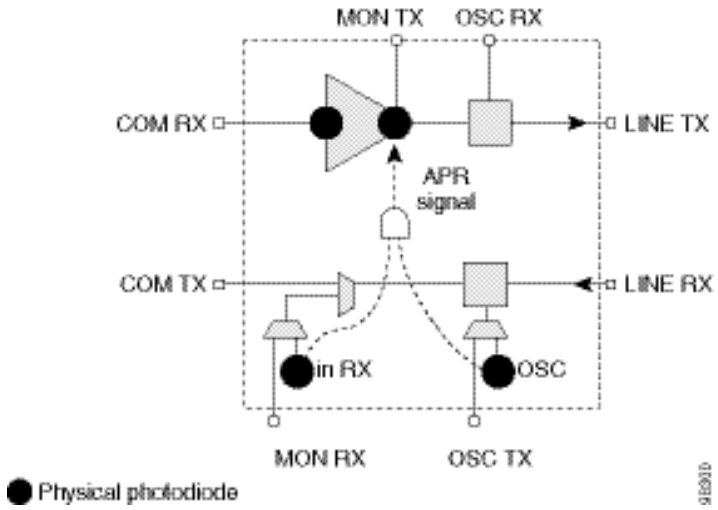


Figure 15-20 shows the OPT-BST optical module functional block diagram.

Figure 15-20 OPT-BST Optical Module Functional Block Diagram



15.5.2.1 Power Monitoring

Physical photodiodes P1, P2, P3, and P4 monitor the power for the OPT-BST card. The returned power level values are calibrated to the ports as shown in Table 15-22.

Table 15-22 OPT-BST Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1	Input Com	COM RX
P2	Output Line (Total Output)	LINE TX
	Output Line (Signal Output)	
P3	Output COM	LINE RX
P4	Output OSC	

15.5.2.2 OPT-BST Amplifier Card-Level Indicators

The OPT-BST amplifier has three card-level LED indicators, described in Table 15-23.

Table 15-23 OPT-BST Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the OPT-BST is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.5.2.3 OPT-BST Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The OPT-BST amplifier has eight optical ports located on the faceplate. MON RX is the output monitor port (receive section). MON TX is the output monitor port. COM RX is the input signal port. LINE TX is the output signal port. LINE RX is the input signal port (receive section). COM TX is the output signal port (receive section). OSC RX is the OSC add input port. OSC TX is the OSC drop output port.

15.5.3 OPT-BST-E Amplifier Card

This section describes the OPT-BST-E amplifier card. The OPT-BST-E gain range is 8 to 23 dBm with the tilt managed at 0 dBm in constant gain mode and output power mode. However, an extended gain range of 23 to 26 dBm is available with the tilt unmanaged. See Appendix B, "Hardware Specifications" for detailed specification information. The OPT-BST-E is designed to support 64 channels at 50-GHz channel spacing, but currently is limited to 32 channels at 100 GHz. The OPT-BST-E is a C-band DWDM EDFA with OSC add-and-drop capability. When an ONS 15454 has an OPT-BST-E installed, it is only necessary to have the OSCM to process the OSC. You can install the OPT-BST-E in Slots 1 to 6 and 12 to 17. To control the gain tilt, the OPT-BST-E is equipped with a built-in VOA.

The OPT-BST-E features include:

- Fixed gain mode (with programmable tilt)
- True variable gain
- Extended gain (with unmanaged tilt)
- Fast transient suppression
- Nondistorting low-frequency transfer function
- Settable maximum output power
- Fixed output power mode (mode used during provisioning)
- ASE compensation in fixed gain mode

- Full monitoring and alarm handling with settable thresholds
- OSRI, which is a software feature capable (through CTC) of shutting down the optical output power or reducing the power to a safe level (automatic power reduction)
- ALS, which is a safety mechanism used in the event of a fiber cut

Note The optical splitters each have a ratio of 1:99. The result is that the power at the MON TX and MON RX ports is about 20 dB lower than the power at the COM TX and COM RX ports.

Figure 15-21 shows the OPT-BST-E amplifier faceplate.

Figure 15-21 OPT-BST-E Faceplate

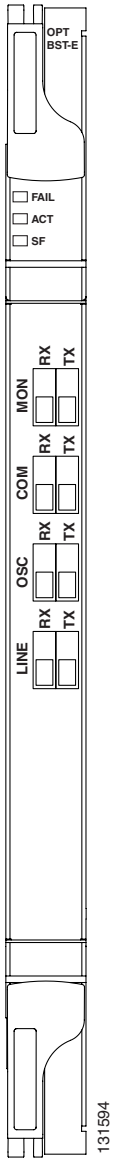


Figure 15-22 shows a block diagram of the OPT-BST-E card.

Figure 15-22 OPT-BST-E Block Diagram

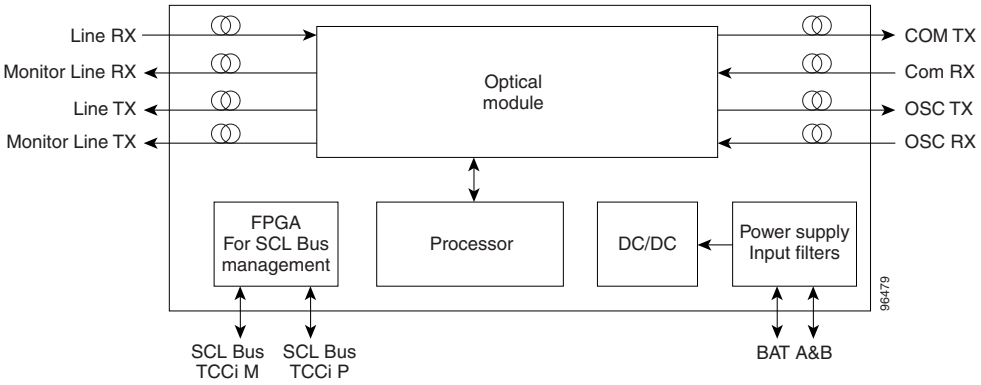
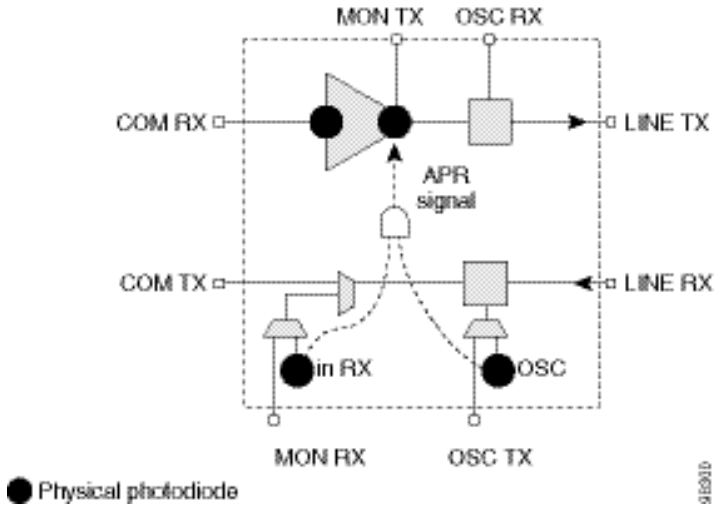


Figure 15-23 shows the OPT-BST-E optical module functional block diagram.

Figure 15-23 OPT-BST-E Optical Module Functional Block Diagram



15.5.3.1 Power Monitoring

Physical photodiodes P1, P2, P3, and P4 monitor the power for the OPT-BST-E card. The returned power level values are calibrated to the ports as shown in Table 15-24.

Table 15-24 OPT-BST-E Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1	Input Com	COM RX
P2	Output Line (Total Output)	LINE TX
	Output Line (Signal Output)	
P3	Output COM	LINE RX
P4	Output OSC	

15.5.3.2 OPT-BST-E Amplifier Card-Level Indicators

The OPT-BST-E amplifier has three card-level LED indicators, described in Table 15-25.

Table 15-25 OPT-BST-E Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the OPT-BST-E is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.5.3.3 OPT-BST-E Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The OPT-BST-E amplifier has eight optical ports located on the faceplate. MON RX is the output monitor port (receive section). MON TX is the output monitor port. COM RX is the input signal port. LINE TX is the output signal port. LINE RX is the input signal port (receive section). COM TX is the output signal port (receive section). OSC RX is the OSC add input port. OSC TX is the OSC drop output port.

15.6 Multiplexer and Demultiplexer Cards

This section describes the multiplexer and demultiplexer cards.

15.6.1 32MUX-O Card

The 32-Channel Multiplexer (32MUX-O) card multiplexes 32 100-GHz-spaced channels identified in the channel plan. The 32MUX-O card takes up two slots in an ONS 15454 and can be installed in Slots 1 to 5 and 12 to 16.

The 32MUX-O features include:

- Arrayed waveguide grating (AWG) device that enables full multiplexing functions for the channels.
- Each single-channel port is equipped with VOAs for automatic optical power regulation prior to multiplexing. In the case of electrical power failure, the VOA is set to its maximum attenuation for safety purposes. A manual VOA setting is also available.
- Each single-channel port is monitored using a photodiode to enable automatic power regulation.

An additional optical monitoring port with 1:99 splitting ratio is available.

Figure 15-24 shows the 32MUX-O faceplate.

Figure 15-24 32MUX-O Faceplate

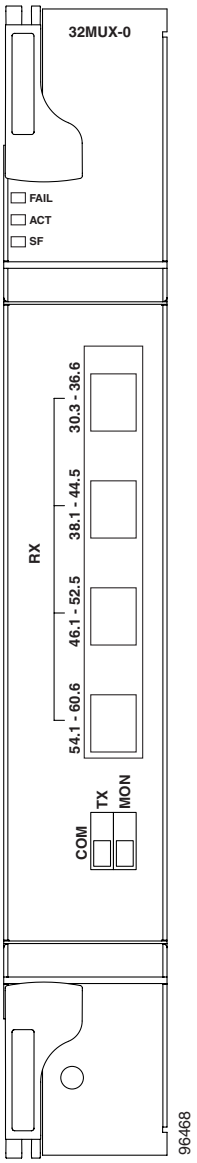
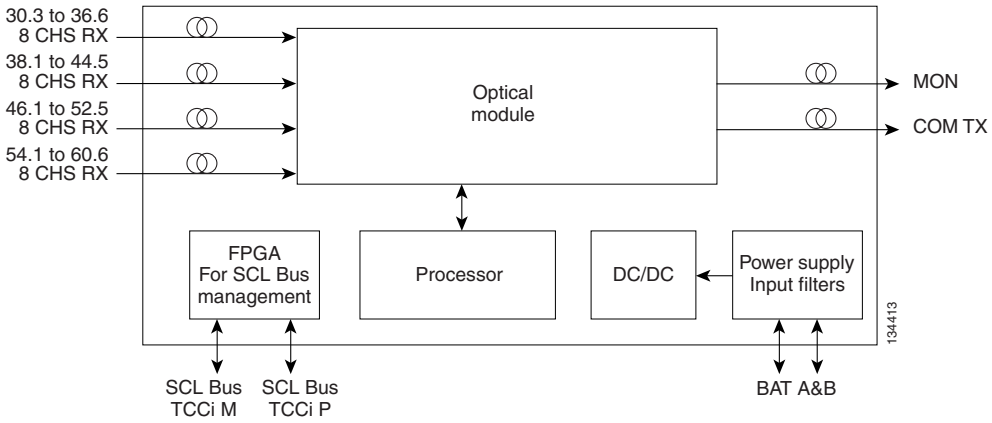


Figure 15-25 shows a block diagram of the 32MUX-O card.

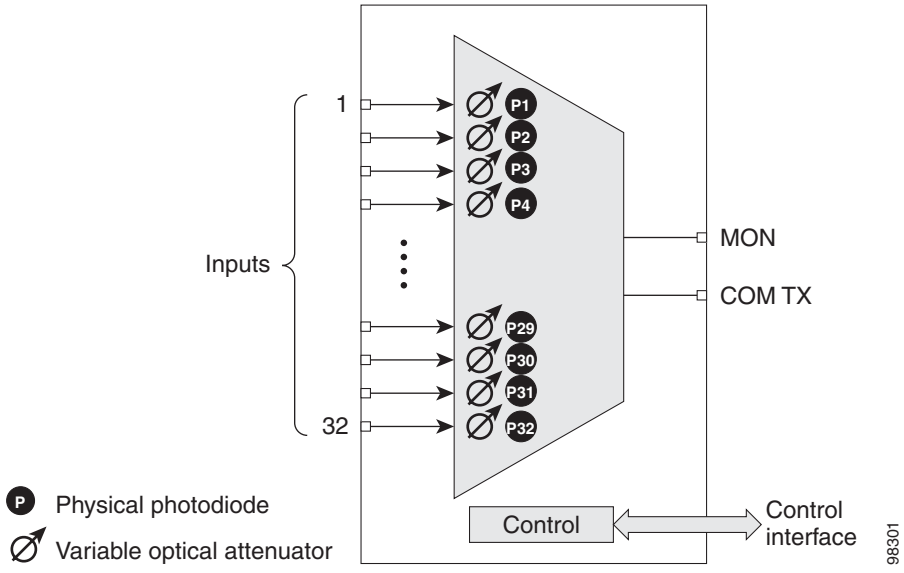
Figure 15-25 32MUX-O Block Diagram



The 32MUX-O has four receive connectors that accept multifiber push-on (MPO) cables, which break out into eight separate cables, on its front panel for the client input interfaces. The 32MUX-O also has two LC-PC-II optical connectors, one for the main output and the other for the monitor port.

Figure 15-26 shows the 32MUX-O optical module functional block diagram.

Figure 15-26 32MUX-O Optical Module Functional Block Diagram



15.6.1.1 Channel Plan

The 32MUX-O is typically used in hub nodes and provides the multiplexing of 32 channels, spaced at 100 GHz, into one fiber before their amplification and transmission along the line. The channel plan is shown in Table 15-26.

Table 15-26 32MUX-O Channel Plan

Channel Number[1]	Channel ID	Frequency (GHz)	Wavelength (nm)
1	30.3	195.9	1530.33
2	31.2	195.8	1531.12
3	31.9	195.7	1531.90
4	32.6	195.6	1532.68
5	34.2	195.4	1534.25
6	35.0	195.3	1535.04
7	35.8	195.2	1535.82
8	36.6	195.1	1536.61
9	38.1	194.9	1538.19
10	38.9	194.8	1538.98
11	39.7	194.7	1539.77
12	40.5	194.6	1540.56
13	42.1	194.4	1542.14
14	42.9	194.3	1542.94
15	43.7	194.2	1543.73
16	44.5	194.1	1544.53
17	46.1	193.9	1546.12
18	46.9	193.8	1546.92
19	47.7	193.7	1547.72
20	48.5	193.6	1548.51
21	50.1	193.4	1550.12
22	50.9	193.3	1550.92
23	51.7	193.2	1551.72
24	52.5	193.1	1552.52
25	54.1	192.9	1554.13
26	54.9	192.8	1554.94
27	55.7	192.7	1555.75
28	56.5	192.6	1556.55
29	58.1	192.4	1558.17
30	58.9	192.3	1558.98
31	59.7	192.2	1559.79
32	60.6	192.1	1560.61

1. The Channel Number column is only for reference purposes. The channel ID is consistent with ONS 15454 and will be used in unit identification.

15.6.1.2 Power Monitoring

Physical photodiodes P1 through P32 monitor the power for the 32MUX-O card. The returned power level values are calibrated to the ports as shown in Table 15-27.

Table 15-27 32MUX-O Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1–P32	ADD	COM TX

15.6.1.3 32MUX-O Card-Level Indicators

The 32MUX-O card has three card-level LED indicators, described in Table 15-28.

Table 15-28 32MUX-O Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the 32MUX-O is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.6.1.4 32MUX-O Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The 32MUX-O card has five sets of ports located on the faceplate.

COM Tx is the line output. MON is the optical monitoring port. The xx.x-yy.y RX ports represent the four groups of eight channels ranging from xx.x wavelength to yy.y wavelength according to the channel plan.

15.6.2 32DMX-O Card

The 32-Channel Demultiplexer (32DMX-O) card demultiplexes 32 100-GHz-spaced channels identified in the channel plan. The 32DMX-O takes up two slots in an ONS 15454 and can be installed in Slots 1 to 5 and 12 to 16.

The 32DMX-O features include:

- AWG that enables channel demultiplexing functions.
- Each single-channel port is equipped with VOAs for automatic optical power regulation after demultiplexing. In the case of electrical power failure, the VOA is set to its maximum attenuation for safety purposes. A manual VOA setting is also available.

- The 32DXM-O has four physical receive connectors that accept multifiber push-on (MPO) cables, which break out into eight separate cables, on its front panel for the client input interfaces.

Note In contrast, the single-slot 32DMX card does not have VOAs on each drop port for optical power regulation. The 32DMX optical demultiplexer module is used in conjunction with the 32-Channel Wavelength Selective Switch (32WSS) card in ONS 15454 Multiservice Transport Platform (MSTP) nodes.

- Each single-channel port is monitored using a photodiode to enable automatic power regulation.

Figure 15-27 shows the 32DMX-O card faceplate.

Figure 15-27 32DMX-O Faceplate

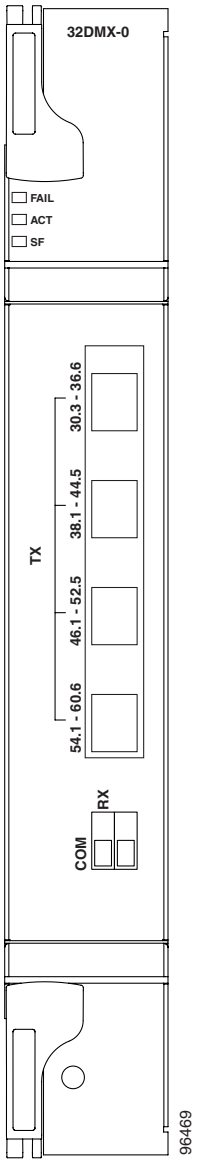


Figure 15-28 shows a block diagram of the 32DMX-O card.

Figure 15-28 32DMX-O Block Diagram

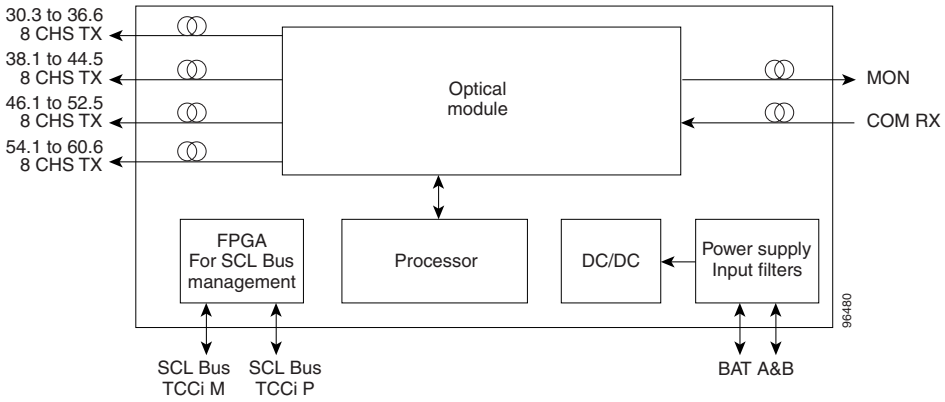
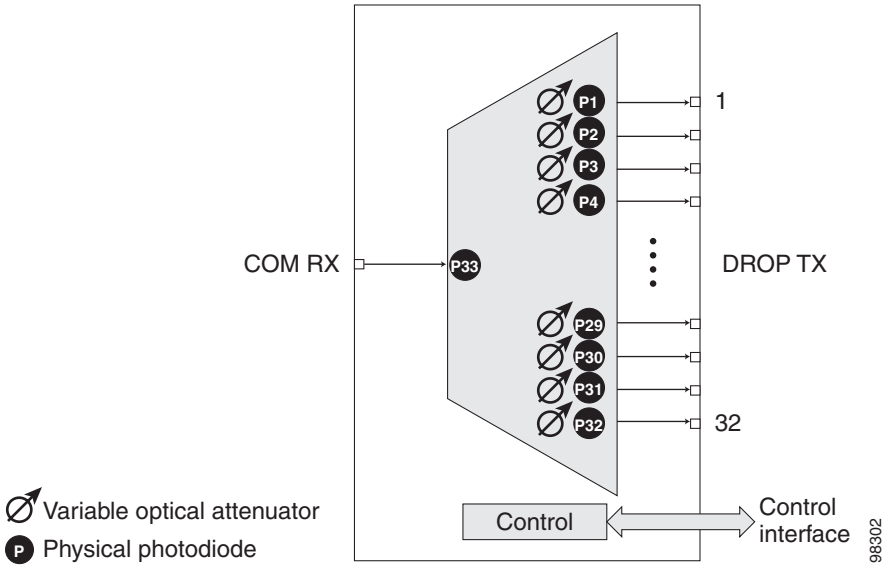


Figure 15-29 shows the 32DMX-O optical module functional block diagram.

Figure 15-29 32DMX-O Optical Module Functional Block Diagram



15.6.2.1 Power Monitoring

Physical photodiodes P1 through P32 and P33 monitor the power for the 32DMX-O card. The returned power level values are calibrated to the ports as shown in Table 15-29.

Table 15-29 32DMX-O Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1–P32	DROP	DROP TX
P33	INPUT COM	COM RX

15.6.2.2 32DMX-O Card-Level Indicators

The 32DMX-O card has three card-level LED indicators, described in Table 15-30.

Table 15-30 32DMX-O Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the 32DMX-O is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.6.2.3 32DMX-O Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The 32DMX-O card has five sets of ports located on the faceplate. MON is the output monitor port. COM RX is the line input. The xx.x-yy.y Tx ports represent the four groups of eight channels ranging from xx.x wavelength to yy.y wavelength according to the channel plan.

15.6.3 32DMX Card

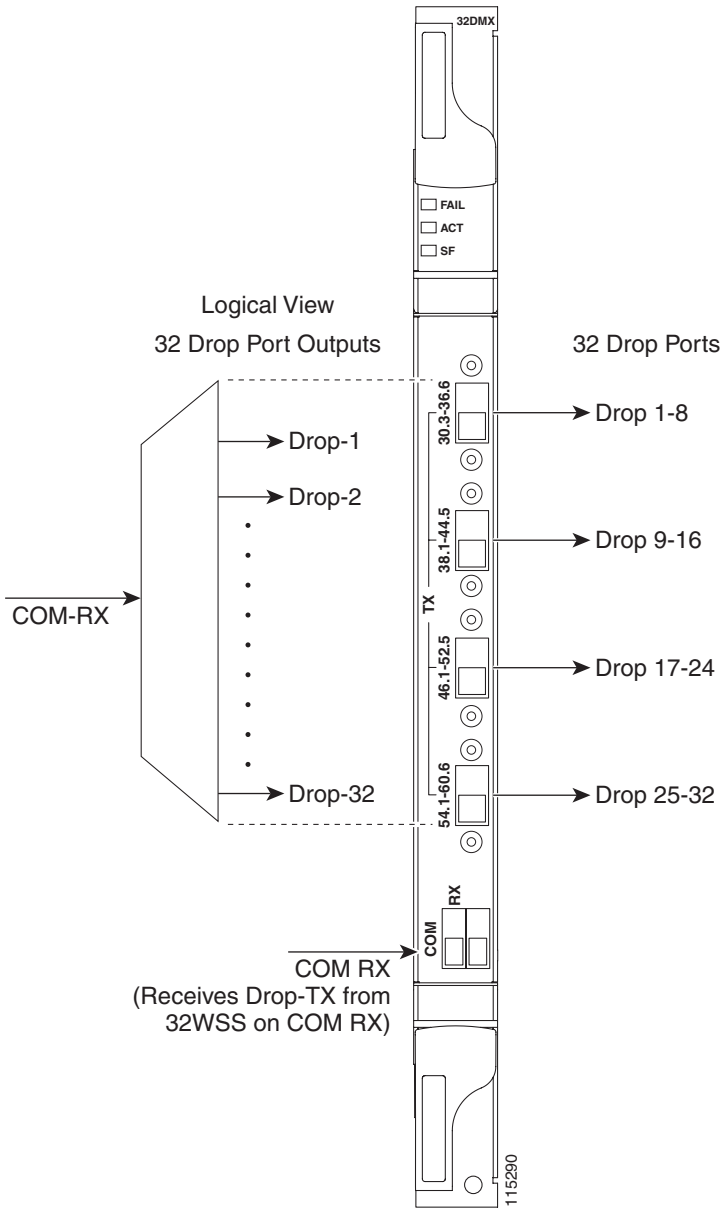
The 32-Channel Demultiplexer card (32DMX) is a single-slot optical demultiplexer. The card receives an aggregate optical signal on its COM RX port and demultiplexes it into to 32 100-GHz-spaced channels. The 32DMX card can be installed in Slots 1 to 6 and in Slots 12 to 17.

The 32DMX includes these high-level features:

- COM RX port: COM RX is the input port for the aggregate optical signal being demultiplexed. This port is supported by both a VOA for optical power regulation and a photodiode for optical power monitoring.
- DROP ports (1 to 32): On its output, the 32DMX provides 32 drop ports that are typically used for dropping channels within the ROADM node. Each drop port has a photodiode for optical power monitoring. Unlike the two-slot 32DMX-O demultiplexer, the drop ports on the 32DMX do not have a VOA per channel for optical power regulation.
- A terminal site can be configured using only a 32WSS card and a 32DMX card plugged into the east or west side of the shelf.

Figure 15-30 shows the 32DMX card front panel and the basic traffic flow through the ports.

Figure 15-30 32DMX Faceplate and Ports



The 32DMX front panel has connectors for 32 DROP TX ports. These ports are connected using four 8-fiber multifiber push-on (MPO) ribbon connectors. The incoming optical signal to the demultiplexer comes into the COM RX. This input port is connected using a single LC duplex optical connector.

A block diagram of the 32DMX card is shown in Figure 15-31.

Figure 15-31 32DMX Block Diagram

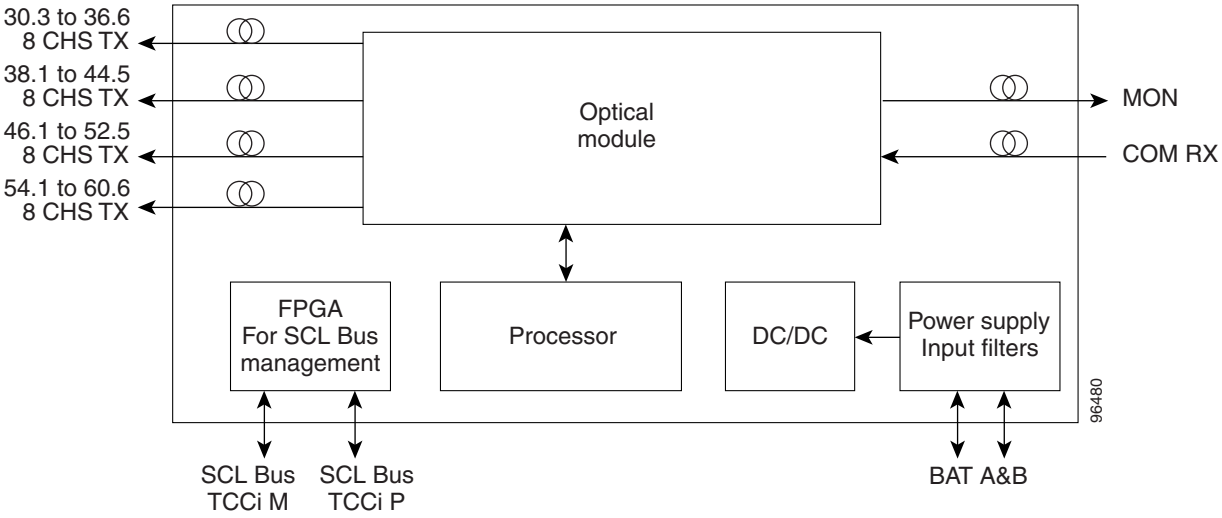
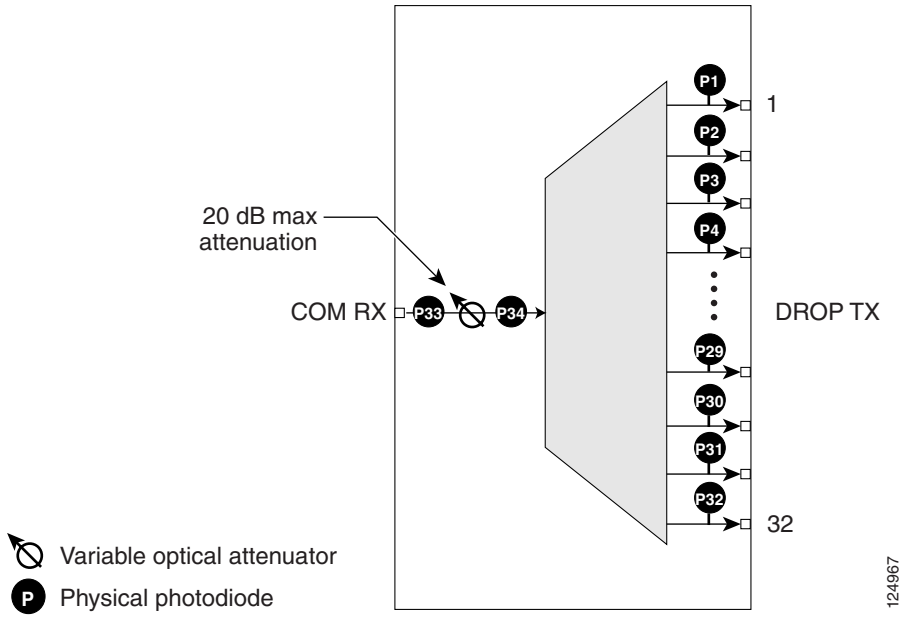


Figure 15-32 shows the 32DMX optical module functional block diagram.

Figure 15-32 32DMX Optical Module Functional Block Diagram



15.6.3.1 ROADM

The 32DMX card works in conjunction with the 32WSS card to create a software-controlled network element with ROADM functionality. ROADM functionality requires two 32DMX single-slot cards and two 32WSS double-slot cards (six slots in the ONS 15454 chassis).

Equipped with ROADM functionality, ONS 15454 MSTP nodes can be configured at the optical channel level using CTC, Cisco MetroPlanner, and Cisco Transport Manager (CTM). Both the 32DMX card and 32WSS card utilize planar lightwave circuit (PLC) technology to perform wavelength-level processing.

15.6.3.2 Power Monitoring

Physical photodiodes P1 through P32 and P33 monitor the power for the 32DMX card. The returned power level values are calibrated to the ports as shown in Table 15-31.

Table 15-31 32DMX Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1–P32	DROP	DROP TX
P33	INPUT COM	COM RX

15.6.3.3 32DMX Card-Level Indicators

Table 15-32 describes the three card-level LED indicators on the 32DMX card.

Table 15-32 32DMX Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the 32DMX card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.6.3.4 32DMX Port-Level Indicators

You can find the status of the 32DMX ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot.

The 32DMX card has five ports located on the faceplate. The port labeled COM RX is the line input (it typically receives DROP TX from the 32WSS module). The TX ports are 32 drop ports. The connectors provide four groups of eight channels ranging from xx.x wavelength to yy.y wavelength according to the channel plan.

15.6.4 4MD-xx.x Card

The 4-Channel Multiplexer/Demultiplexer (4MD-xx.x) card multiplexes and demultiplexes four 100-GHz-spaced channels identified in the channel plan. The 4MD-xx.x card is designed to be used with band OADMs (both AD-1B-xx.x and AD-4B-xx.x).

The card is bidirectional. The demultiplexer and multiplexer functions are implemented in two different sections of the same card. In this way, the same card can manage signals flowing in opposite directions.

There are eight versions of this card that correspond with the eight sub-bands specified in Table 15-33. The 4MD-xx.x can be installed in Slots 1 to 6 and 12 to 17.

The 4MD-xx.x has the following features implemented inside a plug-in optical module:

- Passive cascade of interferential filters perform the channel multiplex/demultiplex function.
- Software-controlled VOAs at every port of the multiplex section regulate the optical power of each multiplexed channel.
- Software-monitored photodiodes at the input and output multiplexer and demultiplexer ports for power control and safety purposes.
- Software-monitored "virtual photodiodes" at the common DWDM output and input ports. A "virtual photodiode" is a firmware calculation of the optical power at that port. This calculation is based on the single channel photodiode reading and insertion losses of the appropriated paths.

Figure 15-33 shows the 4MD-xx.x faceplate.

Figure 15-33 4MD-xx.x Faceplate

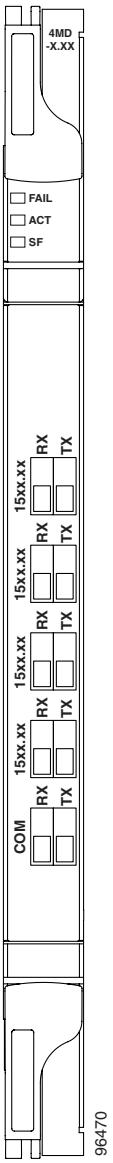


Figure 15-34 shows a block diagram of the 4MD-xx.x card.

Figure 15-34 4MD-xx.x Block Diagram

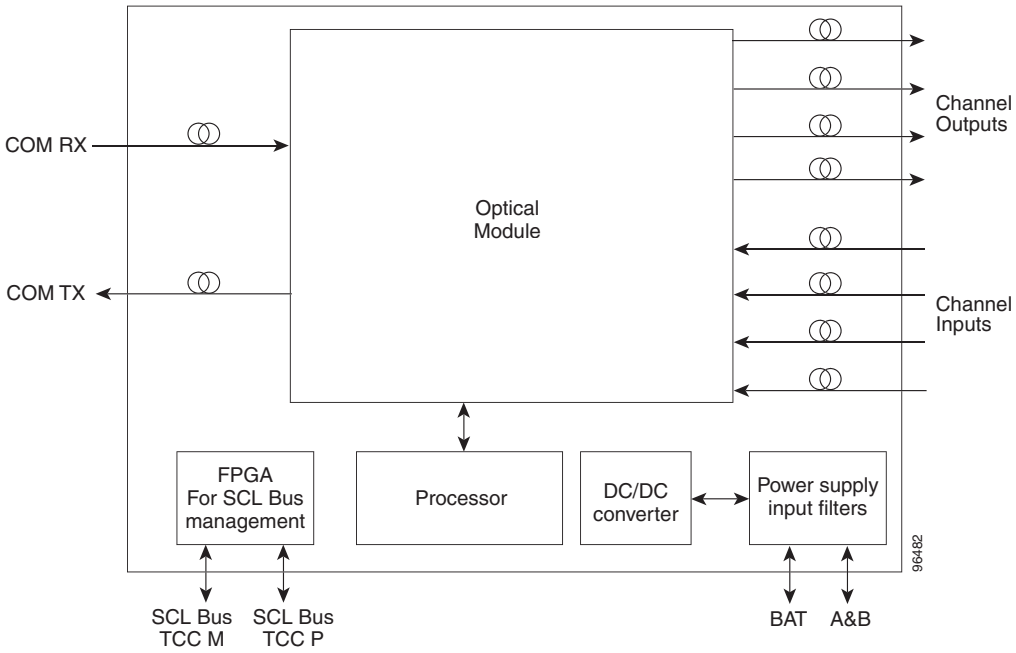
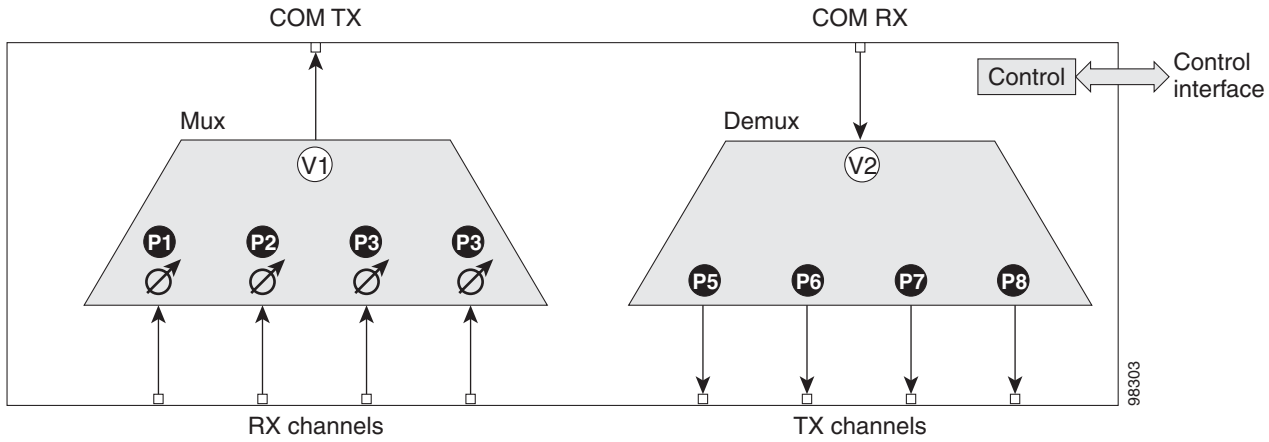


Figure 15-35 shows the 4MD-xx.x optical module functional block diagram.

Figure 15-35 4MD-xx.x Optical Module Functional Block Diagram



Ⓥ Virtual photodiode
Ⓟ Physical photodiode
Variable optical attenuator

The optical module shown in Figure 15-35 is optically passive and consists of a cascade of interferential filters that perform the channel multiplexing and demultiplexing functions.

VOAs are present in every input path of the multiplex section in order to regulate the optical power of each multiplexed channel. Some optical input and output ports are monitored by means of photodiodes implemented both for power control and for safety purposes. An internal control manages VOA settings and functionality as well as photodiode detection and alarm thresholds. The power at the main output and input ports is monitored through the use of virtual photodiodes. A virtual photodiode is implemented in the firmware of the plug-in module. This firmware calculates the power on a port, summing the measured values from all single channel ports (and applying the proper path insertion loss) and then providing the TCC2/TCC2P card with the obtained value.

15.6.4.1 Wavelength Pairs

Table 15-33 shows the band IDs and the add/drop channel IDs for the 4MD-xx.x card.

Table 15-33 4MD-xx.x Channel Sets

Band ID	Add/Drop Channel IDs
Band 30.3 (A)	30.3, 31.2, 31.9, 32.6
Band 34.2 (B)	34.2, 35.0, 35.8, 36.6
Band 38.1 (C)	38.1, 38.9, 39.7, 40.5
Band 42.1 (D)	42.1, 42.9, 43.7, 44.5
Band 46.1 (E)	46.1, 46.9, 47.7, 48.5
Band 50.1 (F)	50.1, 50.9, 51.7, 52.5
Band 54.1 (G)	54.1, 54.9, 55.7, 56.5
Band 58.1 (H)	58.1, 58.9, 59.7, 60.6

15.6.4.2 Power Monitoring

Physical photodiodes P1 through P8 and virtual photodiodes V1 and V2 monitor the power for the 4MD-xx.x card. The returned power level values are calibrated to the ports as shown in Table 15-34.

Table 15-34 4MD-xx.x Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1–P4	ADD	COM TX
P5–P8	DROP	DROP TX
V1	OUT COM	COM TX
V2	IN COM	COM RX

15.6.4.3 4MD-xx.x Card-Level Indicators

The 4MD-xx.x card has three card-level LED indicators, described in Table 15-35.

Table 15-35 4MD-xx.x Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the 4MD-xx.x card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.6.4.4 4MD-xx.x Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The 4MD-xx.x card has five sets of ports located on the faceplate. COM RX is the line input. COM TX is the line output. The 15xx.x TX ports represent demultiplexed channel outputs 1 to 4. The 15xx.x RX ports represent multiplexed channel inputs 1 to 4.

15.7 Optical Add/Drop Multiplexer Cards

This section discusses the optical add/drop multiplexer cards.

15.7.1 AD-1C-xx.x Card

The 1-Channel OADM (AD-1C-xx.x) card passively adds or drops one of the 32 channels utilized within the 100-GHz-spacing of the DWDM card system. Thirty-two versions of this card—each designed only for use with one wavelength—are used in the ONS 15454 DWDM system. Each wavelength version of the card has a different part number. The AD-1C-xx.x can be installed in Slots 1 to 6 and 12 to 17.

The AD-1C-xx.x has the following internal features:

- Two cascaded passive optical interferential filters perform the channel add and drop functions.
- One software-controlled VOA regulates the optical power of the inserted channel.
- Software-controlled VOA regulates the insertion loss of the express optical path.
- Internal control of the VOA settings and functions, photodiode detection, and alarm thresholds.
- Software-monitored virtual photodiodes (firmware calculations of port optical power) at the common DWDM output and input ports.

Figure 15-36 shows the AD-1C-xx.x faceplate.

Figure 15-36 AD-1C-xx.x Faceplate

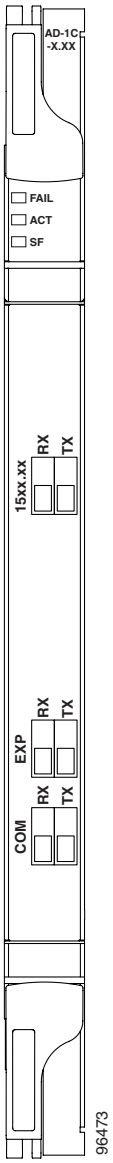


Figure 15-37 shows a block diagram of the AD-1C-xx.x card.

Figure 15-37 AD-1C-xx.x Block Diagram

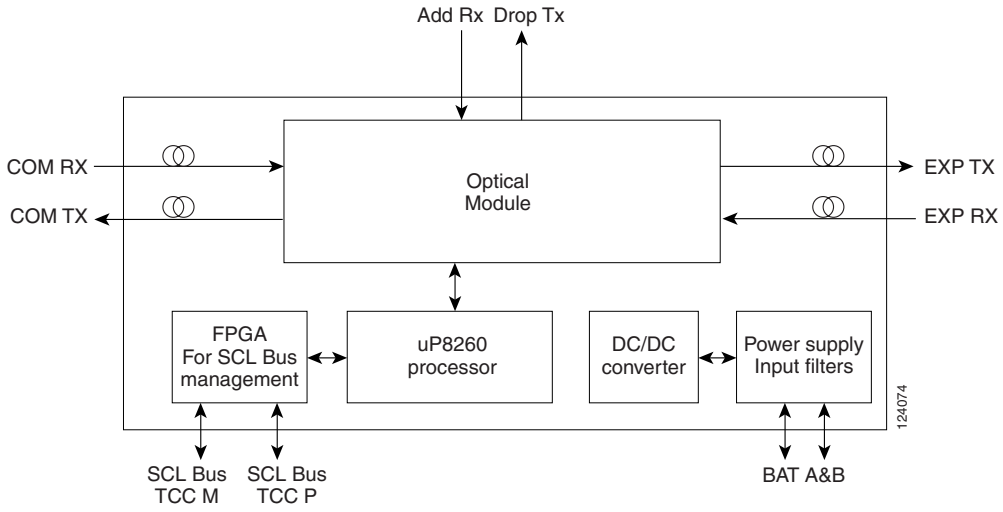
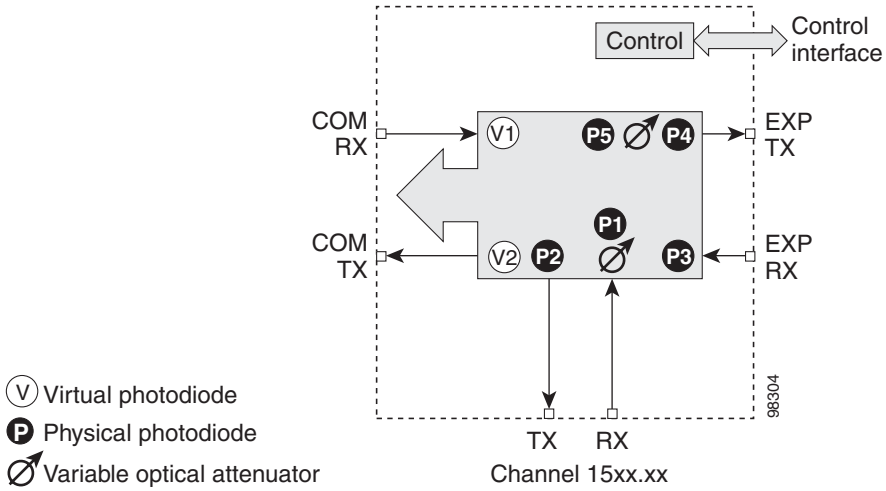


Figure 15-38 shows the AD-1C-xx.x optical module functional block diagram.

Figure 15-38 AD-1C-xx.x Optical Module Functional Block Diagram



15.7.1.1 Power Monitoring

Physical photodiodes P1 through P4 and virtual photodiodes V1 and V2 monitor the power for the AD-1C-xx.x card. The returned power level values are calibrated to the ports as shown in Table 15-36

Table 15-36 AD-1C-xx.x Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1	ADD	COM TX
P2	DROP	DROP TX
P3	IN EXP	EXP RX

Table 15-36 AD-1C-xx.x Port Calibration (continued)

Photodiode	CTC Type Name	Calibrated to Port
P4	OUT EXP	EXP TX
V1	IN COM	COM RX
V2	OUT COM	COM TX

15.7.1.2 AD-1C-xx.x Card-Level Indicators

The AD-1C-xx.x card has three card-level LED indicators, described in Table 15-37.

Table 15-37 AD-1C-xx.x Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the AD-1C-xx.x card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure. The SF LED also illuminates when the transmitting and receiving fibers are incorrectly connected. When the fibers are properly connected, the LED turns off.

15.7.1.3 AD-1C-xx.x Port-Level Indicators

You can find the status of the card port using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The AD-1C-xx.x has six LC-PC-II optical ports: two for add/drop channel client input and output, two for express channel input and output, and two for communication.

15.7.2 AD-2C-xx.x Card

The 2-Channel OADM (AD-2C-xx.x) card passively adds or drops two adjacent 100-GHz channels within the same band. Sixteen versions of this card—each designed for use with one pair of wavelengths—are used in the ONS 15454 DWDM system. The card bidirectionally adds and drops in two different sections on the same card to manage signal flow in both directions. Each version of the card has a different part number.

The AD-2C-xx.x has the following features:

- Passive cascade of interferential filters perform the channel add and drop functions.
- Two software-controlled VOAs in the add section, one for each add port, regulate the optical power of inserted channels.
- Software-controlled VOAs regulate insertion loss on express channels.
- Internal control of the VOA settings and functions, photodiode detection, and alarm thresholds.
- Software-monitored virtual photodiodes (firmware calculation of port optical power) at the common DWDM output and input ports.

Figure 15-39 shows the AD-2C-xx.x faceplate.

Figure 15-39 AD-2C-xx.x Faceplate

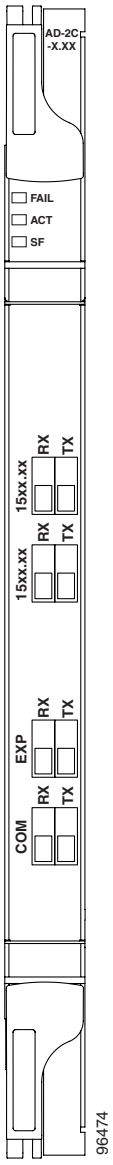


Figure 15-40 shows a block diagram of the AD-2C-xx.x card.

Figure 15-40 AD-2C-xx.x Block Diagram

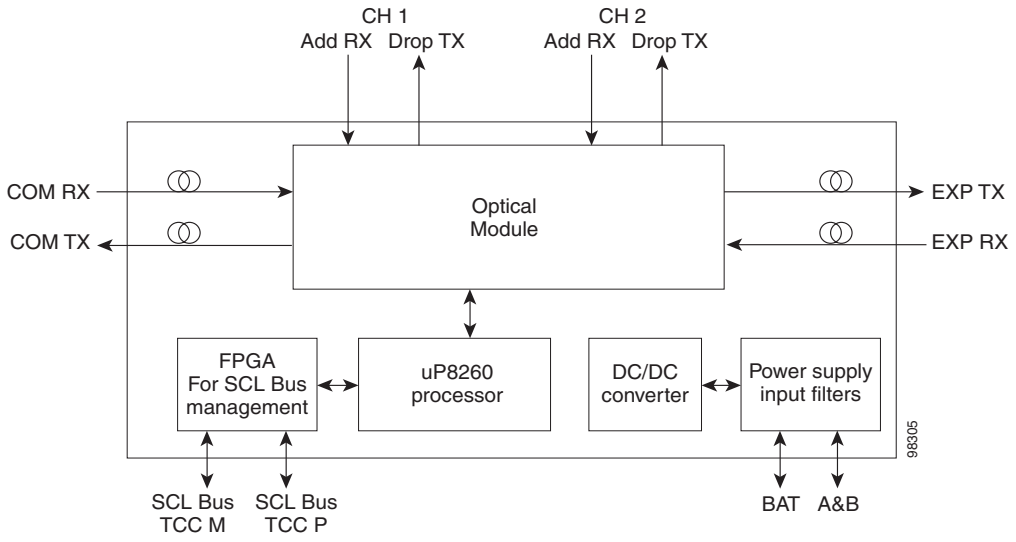
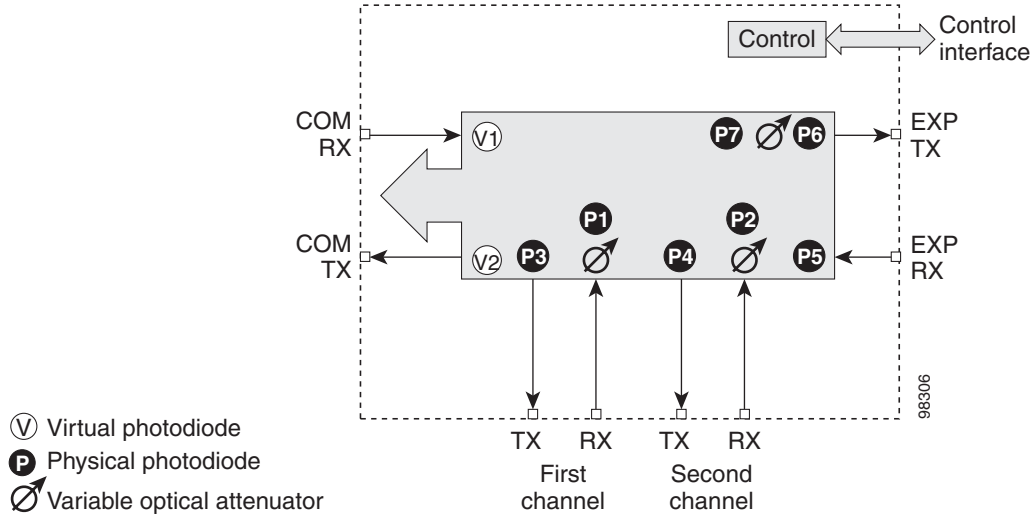


Figure 15-41 shows the AD-2C-xx.x optical module functional block diagram.

Figure 15-41 AD-2C-xx.x Optical Module Functional Block Diagram



15.7.2.1 Wavelength Pairs

The AD-2C-xx.x cards are provisioned for the wavelength pairs in Table 15-38. In this table, channel IDs are given rather than wavelengths. To compare channel IDs with the actual wavelengths they represent, see Table 15-6 on page 15-9.

Table 15-38 AD-2C-xx.x Channel Pairs

Band ID	Add/Drop Channel ID
Band 30.3 (A)	30.3, 31.2
	31.9, 32.6
Band 34.2 (B)	34.2, 35.0
	35.8, 36.6
Band 38.1 (C)	38.1, 38.9
	39.7, 40.5
Band 42.1 (D)	42.1, 42.9
	43.7, 44.5
Band 46.1 (E)	46.1, 46.9
	47.7, 48.5
Band 50.1 (F)	50.1, 50.9
	51.7, 52.5
Band 54.1 (G)	54.1, 54.9
	55.7, 56.5
Band 58.1 (H)	58.1, 58.9
	59.7, 60.6

15.7.2.2 Power Monitoring

Physical photodiodes P1 through P10, and virtual photodiodes V1 and V2 monitor the power for the AD-2C-xx.x card. The returned power level values are calibrated to the ports as shown in Table 15-39.

Table 15-39 AD-2C-xx.x Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1–P4	ADD	COM TX
P5–P8	DROP	DROP TX
P9	IN EXP	EXP RX
P10	OUT EXP	EXP TX
V1	IN COM	COM RX
V2	OUT COM	COM TX

15.7.2.3 AD-2C-xx.x Card-Level Indicators

The AD-2C-xx.x card has three card-level LED indicators, described in Table 15-40.

Table 15-40 AD-2C-xx.x Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the AD-2C-xx.x card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.7.2.4 AD-2C-xx.x Port-Level Indicators

You can find the status of the card port using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The AD-2C-xx.x card has eight LC-PC-II optical ports: four for add/drop channel client input and output, two for express channel input and output, and two for communication.

15.7.3 AD-4C-xx.x Card

The 4-Channel OADM (AD-4C-xx.x) card passively adds or drops all four 100-GHz-spaced channels within the same band. Eight versions of this card—each designed for use with one band of wavelengths—are used in the ONS 15454 DWDM system. The card bidirectionally adds and drops in two different sections on the same card to manage signal flow in both directions. There are eight versions of this card with eight part numbers.

The AD-4C-xx.x has the following features:

- Passive cascade of interferential filters perform the channel add and drop functions.
- Four software-controlled VOAs in the add section, one for each add port, regulate the optical power of inserted channels.
- Two software-controlled VOAs regulate insertion loss on express and drop path, respectively.
- Internal control of the VOA settings and functions, photodiode detection, and alarm thresholds.
- Software-monitored virtual photodiodes (firmware calculation of port optical power) at the common DWDM output and input ports.

Figure 15-42 shows the AD-4C-xx.x faceplate.

Figure 15-42 AD-4C-xx.x Faceplate

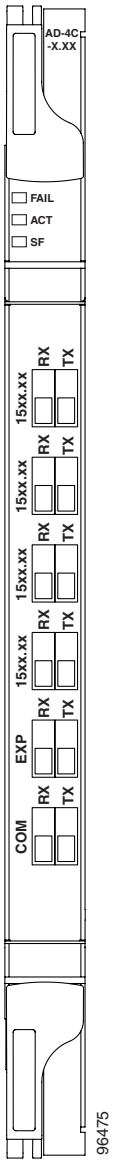


Figure 15-43 shows a block diagram of the AD-4C-xx.x card.

Figure 15-43 AD-4C-xx.x Block Diagram

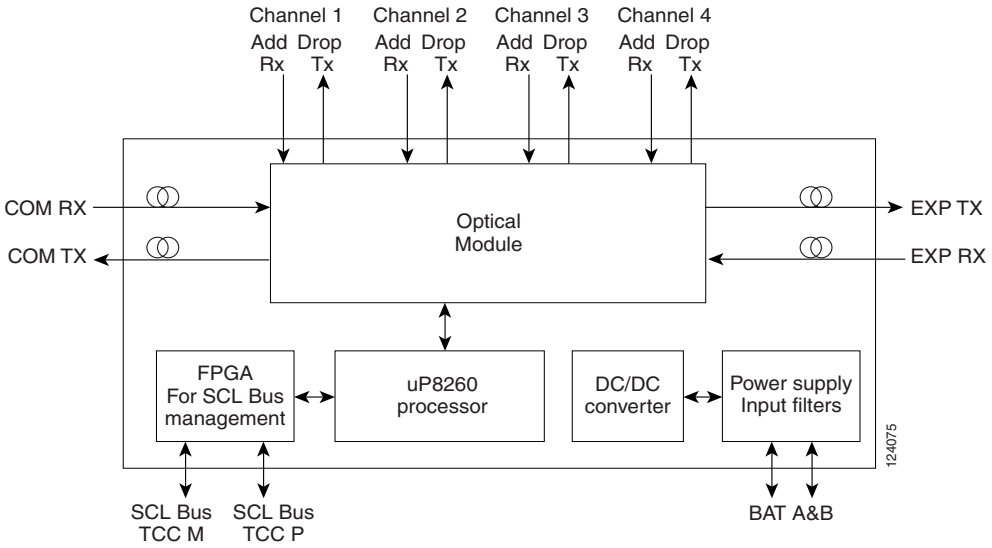
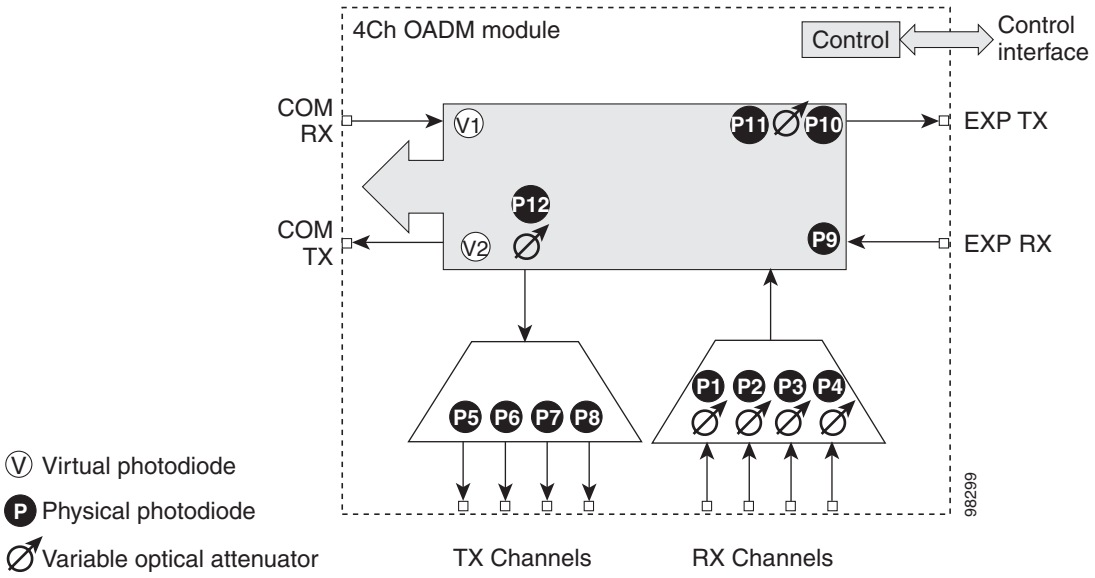


Figure 15-44 shows the AD-4C-xx.x optical module functional block diagram.

Figure 15-44 AD-4C-xx.x Optical Module Functional Block Diagram



15.7.3.1 Wavelength Pairs

The AD-4C-xx.x cards are provisioned for the wavelength pairs in Table 15-41 on page 15-69. In this table, channel IDs are given rather than wavelengths. To compare channel IDs with the actual wavelengths they represent, see Table 15-6 on page 15-9.

Table 15-41 AD-4C-xx.x Channel Sets

Band ID	Add/Drop Channel IDs
Band 30.3 (A)	30.3, 31.2, 31.9, 32.6
Band 34.2 (B)	34.2, 35.0, 35.8, 36.6
Band 38.1 (C)	38.1, 38.9, 39.7 40.5
Band 42.1 (D)	42.1, 42.9, 43.7, 44.5
Band 46.1 (E)	46.1, 46.9, 47.7, 48.5
Band 50.1 (F)	50.1, 50.9, 51.7, 52.5
Band 54.1 (G)	54.1, 54.9, 55.7, 56.5
Band 58.1 (H)	58.1, 58.9, 59.7, 60.6

15.7.3.2 Power Monitoring

Physical photodiodes P1 through P10, and virtual photodiodes V1 and V2 monitor the power for the AD-4C-xx.x card. The returned power level values are calibrated to the ports as shown in Table 15-42.

Table 15-42 AD-4C-xx.x Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1–P4	ADD	COM TX
P5–P8	DROP	DROP TX
P9	IN EXP	EXP RX
P10	OUT EXP	EXP TX
V1	IN COM	COM RX
V2	OUT COM	COM TX

15.7.3.3 AD-4C-xx.x Card-Level Indicators

The AD-4C-xx.x card has three card-level LED indicators, described in Table 15-43.

Table 15-43 AD-4C-xx.x Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the AD-4C-xx.x card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure or condition. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.7.3.4 AD-4C-xx.x Port-Level Indicators

You can find the status of the card port using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The AD-4C-xx.x card has 12 LC-PC-II optical ports: eight for add/drop channel client input and output, two for express channel input and output, and two for communication.

15.7.4 AD-1B-xx.x Card

The 1-Band OADM (AD-1B-xx.x) card passively adds or drops a single band of four adjacent 100-GHz-spaced channels. Eight versions of this card with eight different part numbers—each version designed for use with one band of wavelengths—are used in the ONS 15454 DWDM system. The card bidirectionally adds and drops in two different sections on the same card to manage signal flow in both directions. This card can be used when there is asymmetric adding and dropping on each side (east or west) of the node; a band can be added or dropped on one side but not on the other.

The AD-1B xx.x can be installed in Slots 1 to 6 and 12 to17 and has the following features:

- Passive cascaded interferential filters perform the channel add and drop functions.
- Two software-controlled VOAs regulate the optical power flowing in the express and drop OADM paths (drop section).
- Output power of the dropped band is set by changing the attenuation of the VOA drop.
- The VOA express is used to regulate the insertion loss of the express path.
- Internal controlled VOA settings and functions, photodiode detection, and alarm thresholds.
- Software-monitored virtual photodiode (firmware calculation of port optical power) at the common DWDM output.

Figure 15-45 shows the AD-1B-xx.x faceplate.

Figure 15-45 AD-1B-xx.x Faceplate

Figure 15-46 shows a block diagram of the AD-1B-xx.x card.

Figure 15-46 AD-1B-xx.x Block Diagram

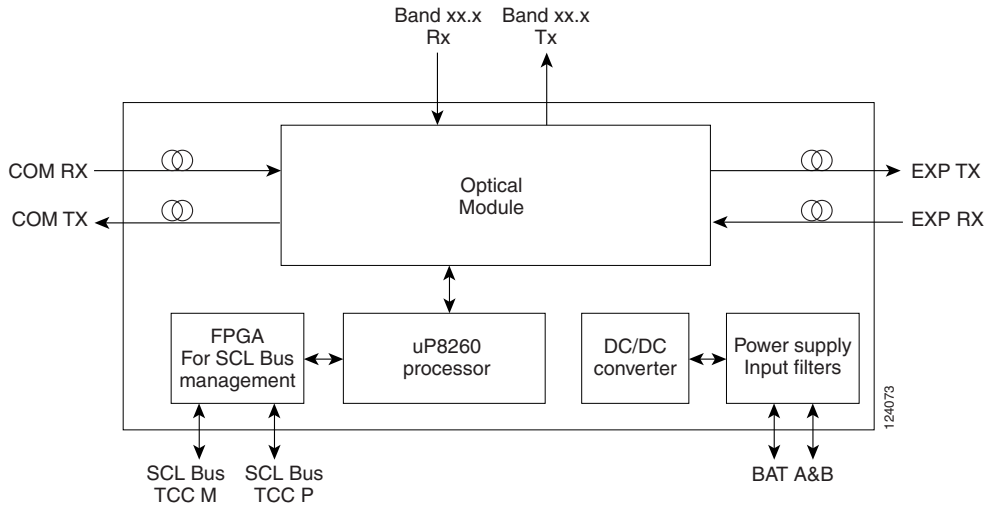
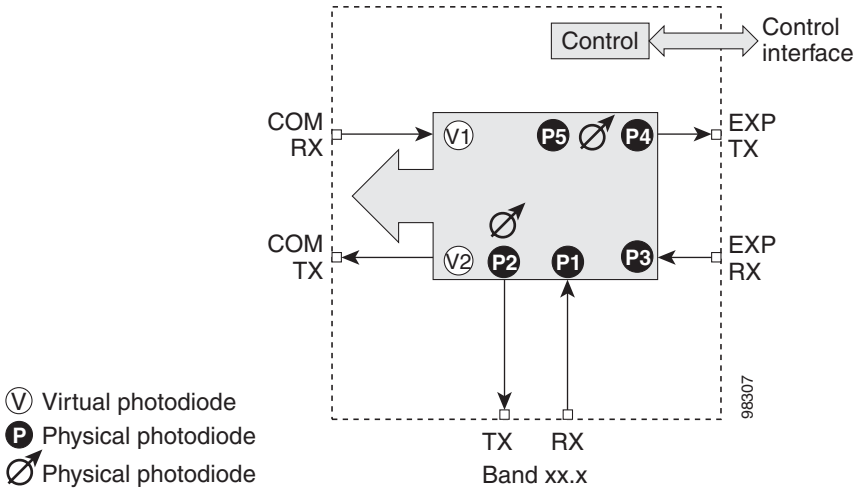


Figure 15-47 shows the AD-1B-xx.x optical module functional block diagram.

Figure 15-47 AD-1B-xx.x Optical Module Functional Block Diagram



15.7.4.1 Power Monitoring

Physical photodiodes P1 through P4, and virtual photodiodes V1 and V2 monitor the power for the AD-1B-xx.x card. The returned power level values are calibrated to the ports as shown in Table 15-44.

Table 15-44 AD-1B-xx.x Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1	ADD	BAND RX
P2	DROP	BAND TX
P3	IN EXP	EXP RX

Table 15-44 AD-1B-xx.x Port Calibration (continued)

Photodiode	CTC Type Name	Calibrated to Port
P4	OUT EXP	EXP TX
V1	IN COM	COM RX
V2	OUT COM	COM TX

15.7.4.2 AD-1B-xx.x Card-Level Indicators

The AD-1B-xx.x card has three card-level LED indicators, described in Table 15-45.

Table 15-45 AD-1B-xx.x Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the AD-1B-xx.x card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.7.4.3 AD-1B-xx.x Port-Level Indicators

You can find the status of the card port using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The AD-1B-xx.x has six LC-PC-II optical ports: two for add/drop channel client input and output, two for express channel input and output, and two for communication.

15.7.5 AD-4B-xx.x Card

The 4-Band OADM (AD-4B-xx.x) card passively adds or drops four bands of four adjacent 100-GHz-spaced channels. Two versions of this card with different part numbers—each version designed for use with one set of bands—are used in the ONS 15454 DWDM system. The card bidirectionally adds and drops in two different sections on the same card to manage signal flow in both directions. This card can be used when there is asymmetric adding and dropping on each side (east or west) of the node; a band can be added or dropped on one side but not on the other.

The AD1B-xx.x can be installed in Slots 1 to 6 and 12 to 17 and has the following features:

- Five software-controlled VOAs regulate the optical power flowing in the OADM paths.
- Output power of each dropped band is set by changing the attenuation of each VOA drop.
- The VOA express is used to regulate the insertion loss of the express path.
- Internal controlled VOA settings and functions, photodiode detection, and alarm thresholds.
- Software-monitored virtual photodiode (firmware calculation of port optical power) at the common DWDM output port.

Figure 15-48 shows the AD-4B-xx.x faceplate.

Figure 15-48 AD-4B-xx.x Faceplate

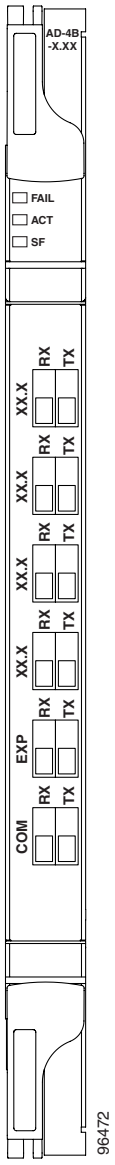


Figure 15-49 shows a block diagram of the 4D-4B-xx.x card.

Figure 15-49 AD-4B-xx.x Block Diagram

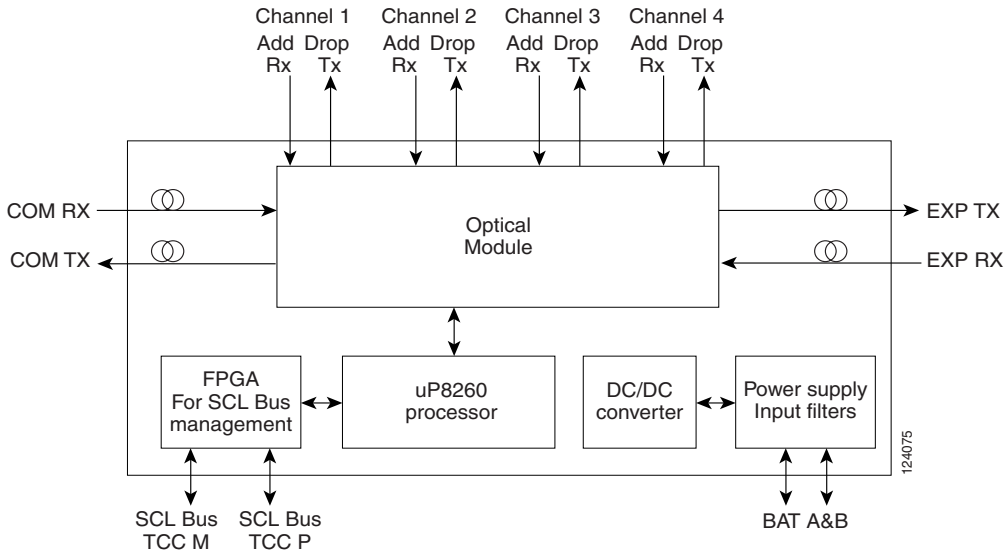
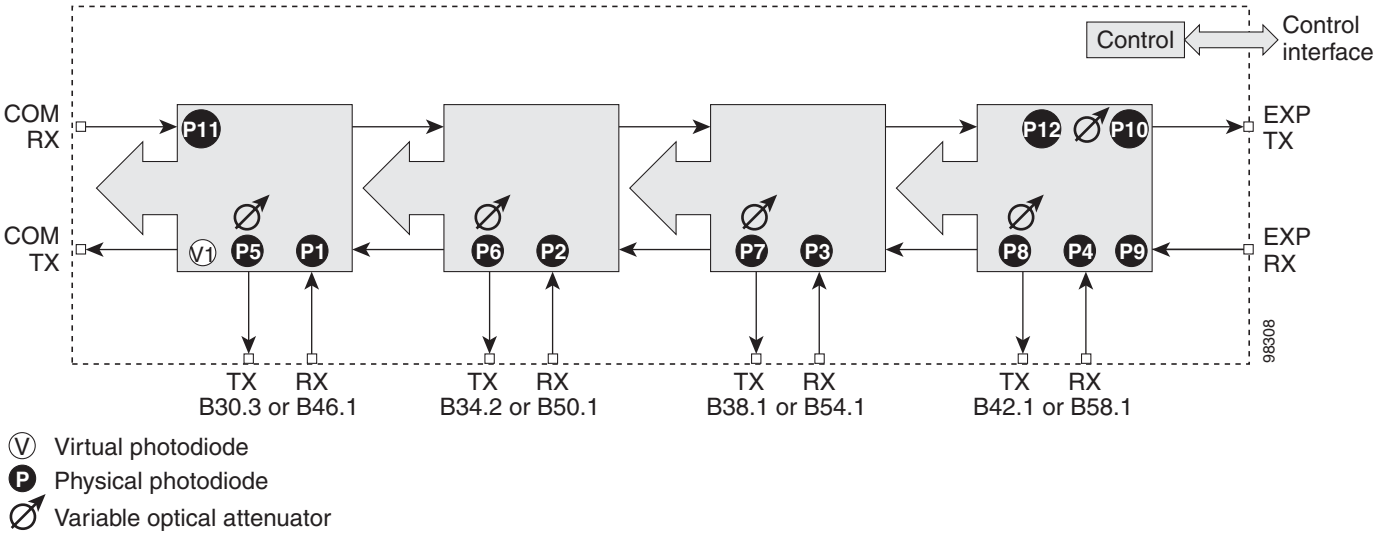


Figure 15-50 shows the AD-4B-xx.x optical module functional block diagram.

Figure 15-50 AD-4B-xx.x Optical Module Functional Block Diagram



15.7.5.1 Power Monitoring

Physical photodiodes P1 through P11, and virtual photodiode V1 monitor the power for the AD-4B-xx.x card. The returned power level values are calibrated to the ports as shown in Table 15-46.

Table 15-46 AD-4B-xx.x Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1–P4	ADD	COM TX
P5–P8	DROP	DROP TX
P9	IN EXP	EXP RX
P10	OUT EXP	EXP TX
P11	IN COM	COM RX
V1	OUT COM	COM TX

15.7.5.2 AD-4B-xx.x Card-Level Indicators

The AD-4B-xx.x card has three card-level LED indicators, described in Table 15-47.

Table 15-47 AD-4B-xx.x Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the AD-4B-xx.x card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.7.5.3 AD-4B-xx.x Port-Level Indicators

You can find the status of the card port using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The AD-4B-xx.x has 12 LC-PC-II optical ports: eight for add/drop band client input and output, two for express channel input and output, and two for communication.

15.7.6 32WSS Card

The 32-Channel Wavelength Selective Switch (32WSS) card performs channel add/drop processing within the ONS 15454 DWDM node. The 32WSS works in conjunction with the 32DMX to implement ROADM functionality. Equipped with ROADM functionality, the ONS 15454 DWDM can be configured to add or drop individual optical channels using CTC, Cisco MetroPlanner, and CTM.

An ROADM network element utilizes two 32WSS cards (two slots each) and two 32DMX cards (one slot each), for a total of six slots in the chassis. For a diagram of a typical ROADM configuration, see the "16.1.4 ROADM Node" section on page 16-8. The 32WSS card can be installed in Slots 1 and 2, 3 and 4, 5 and 6, 12 and 13, 14 and 15, or 16 and 17.

The 32WSS has six types of ports:

- ADD RX ports (1 to 32): These ports are used for adding channels. Each add channel is associated with an individual switch element that selects whether an individual channel is added. Each add port has optical power regulation provided by a VOA. The 32WSS has four physical receive connectors that accept multifiber push-on (MPO) cables, which break out into eight separate cables, on its front panel for the client input interfaces.
- EXP RX port: The EXP RX port receives an optical signal from another 32WSS module in the same network element.
- EXP TX port: The EXP TX port sends an optical signal to the other 32WSS module within the network element.
- COM TX port: The COM TX port sends an aggregate optical signal to a booster amplifier card (for example, OPT-BST) for transmission outside of the network element.
- COM RX port: The COM RX port receives the optical signal from a preamplifier and sends it to the optical splitter.
- DROP TX port: The DROP TX port sends the split off optical signal that contains drop channels to the 32DMX card where the channels are further processed and dropped.

A terminal site can be configured using only a 32WSS card and a 32DMX card plugged into the east or west side of the shelf.

Figure 15-51 shows the 32WSS module front panel and identifies the traffic flow through the ports.

Figure 15-51 32WSS Faceplate and Ports

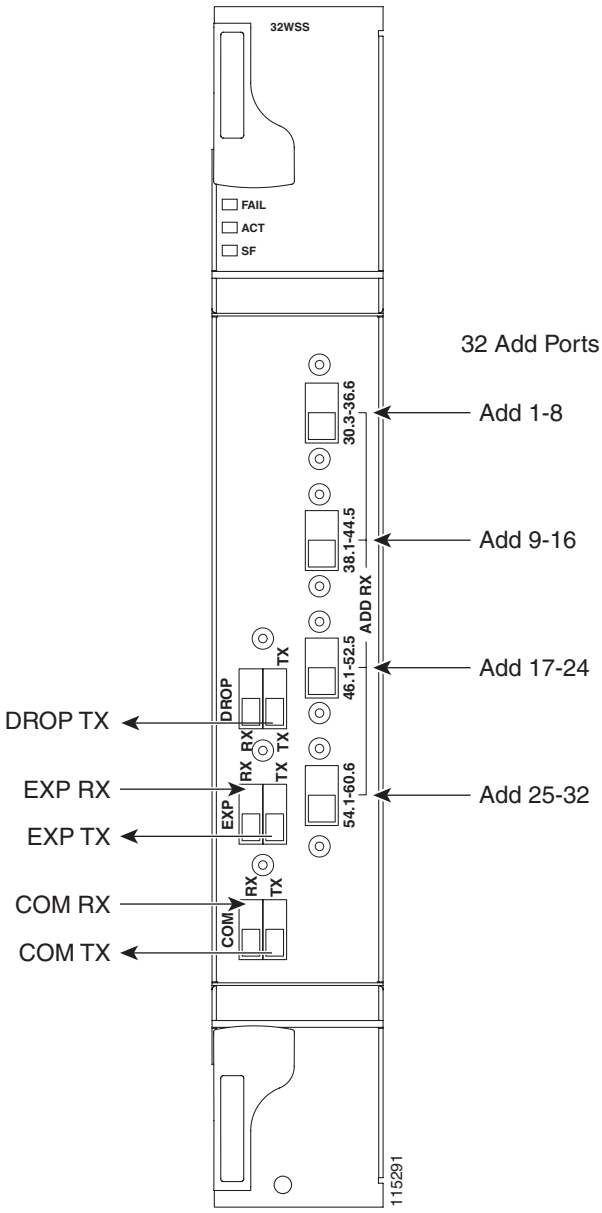
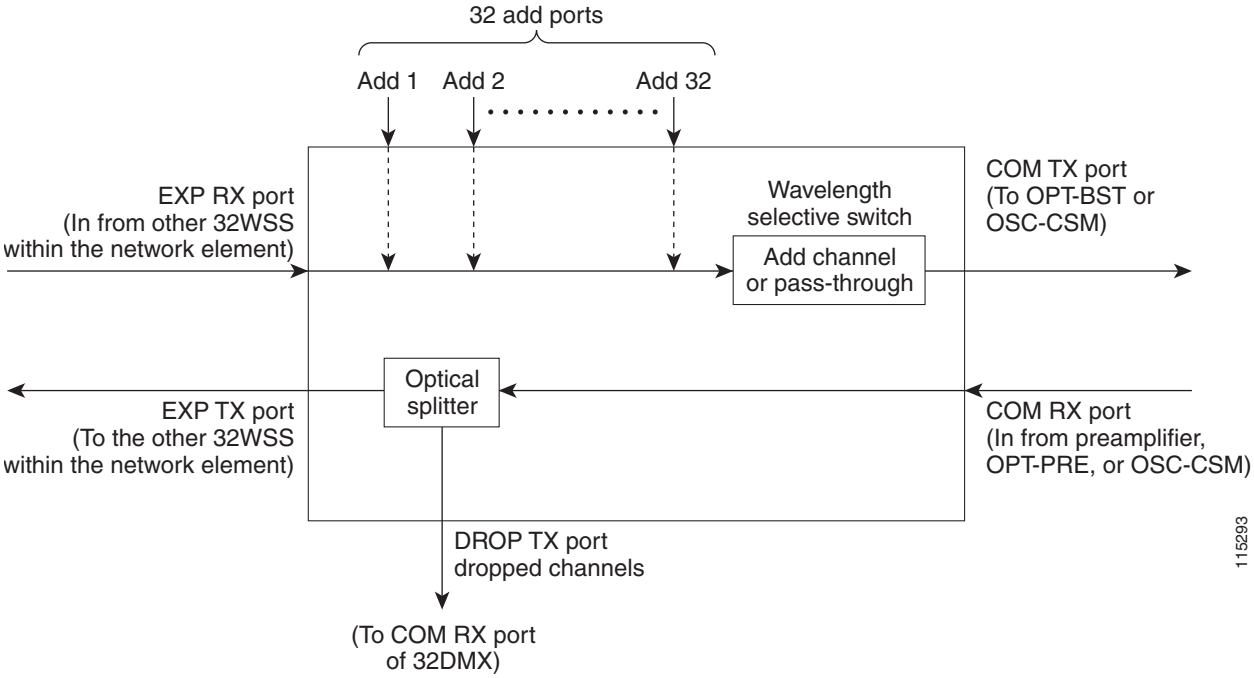


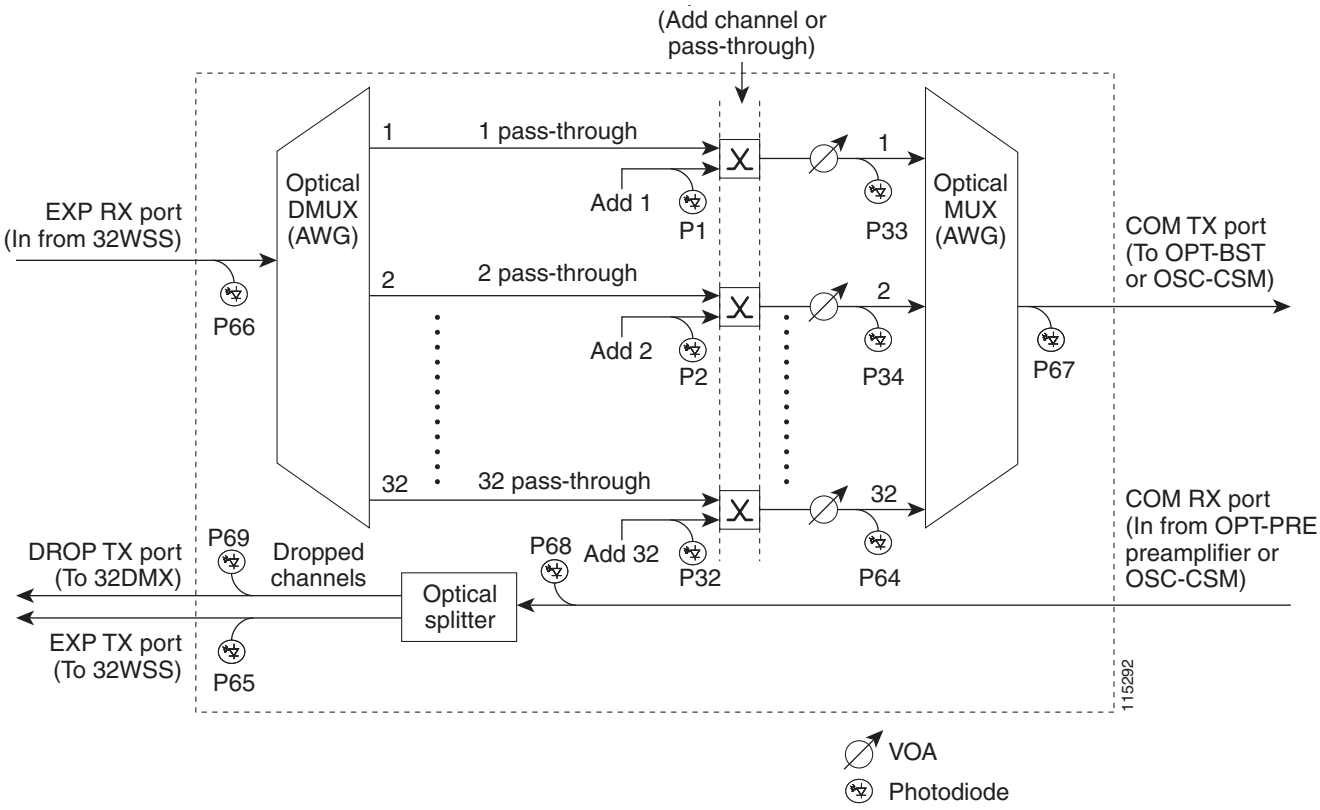
Figure 15-52 provides a high-level functional block diagram of the 32WSS card.

Figure 15-52 32WSS Block Diagram



Aggregate optical signals that enter the EXP RX and COM RX port are processed in two ways. The optical processing stages are shown in Figure 15-53, which provides a detailed optical functional diagram of the 32WSS card.

Figure 15-53 32WSS Optical Block Diagram



The EX PORT and COM PORT operate as follows:

- EXP RX Port Add Channel/Pass-through Processing

  The incoming optical signal is received at the EXP RX port from the other 32WSS module within the network element. The incoming aggregate optical signal is demultiplexed into 32 individual wavelength components, or channels. Then each channel is individually processed by the optical switch, which does add/pass-through processing. Under software control, the switch either selects the optical channel coming in from the demultiplexer (the pass-through channel) or it selects the external ADD channel. If the ADD port channel is selected, the optical signal coming from the demultiplexer is blocked, and the ADD channel is transmitted in its place.

  After the optical switch stage, all of the channels are multiplexed together into an aggregate optical signal, which is sent out on the COM TX port. The output is typically connected to an OPT-BST or OPT-BST-E (in the event a booster amplifier is needed) or to an OSC-CSM (if no amplification is needed).

- COM RX Port Optical Splitter Processing

  The incoming optical signal received at the COM RX port and is applied to the optical splitter within the 32WSS. Channels that are designated to be dropped are diverted optically to the DROP TX port by the splitter. The DROP TX port on the 32WSS is typically connected to the COM RX port of the 32DMX where the drop channels are dropped. Channels that are not dropped pass through the optical splitter and flow out of the EXP TX port of the 32WSS. This optical signal is typically connected to the other 32WSS module within the network element.

15.7.6.1 Power Monitoring

Physical photodiodes P1 through P69 monitor the power for the 32WSS card. The returned power level values are calibrated to the ports as shown in Table 15-48.

Table 15-48 32WSS Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1–P32	ADD (Power)	COM TX
	ADD (Power ADD)	ADD RX
P33–P64	PASS THROUGH	COM TX
P65	OUT EXP	EXP TX
P66	IN EXP	EXP RX
P67	OUT COM	COM TX
P68	IN COM	COM RX
P69	DROP	DROP TX

15.7.6.2 32WSS Card-Level Indicators

Table 15-49 describes the three card-level LED indicators on the 32WSS card.

Table 15-49 32WSS Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the 32WSS card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

15.7.6.3 32WSS Port-Level Indicators

You can find the status of the 32WSS card's ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot. The 32WSS card has five sets of ports located on the faceplate. COM RX is the line input, COM TX is the line output, EXP RX is the port where a channel can be added or passed through, EXP TX is the port that passes through the channels that are not dropped, and DROP TX is the port for the dropped channels. The xx.x-yy.y TX ports represent the four groups of eight channels ranging from xx.x wavelength to yy.y wavelength according to the channel plan.

15.8 Transponder and Muxponder Cards

This section describes the transponder (TXP) and muxponder (MXP) cards. See the "NTP-G32 Install the Transponder and Muxponder Cards" procedure on page 3-31 as needed. Detailed specifications for the cards are found in Appendix B, "Hardware Specifications."

TXP and MXP cards detect SF, LOS, or LOF conditions on the optical facility. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for a description of these conditions. The cards also count section and line BIP errors from B1 and B2 byte registers in the section and line overhead.

15.8.1 TXP_MR_10G Card

The 10-Gbps Transponder–100-GHz–Tunable xx.xx-xx.xx card (TXP_MR_10G) processes one 10-Gbps signal (client side) into one 10-Gbps, 100-GHz DWDM signal (trunk side). It provides one 10-Gbps port per card that can be provisioned for an STM-64/OC-192 short reach (1310-nm) signal, compliant with ITU-T G.707, G.709, ITU-T G.691, and Telcordia GR-253-CORE, or a 10GBASE-LR signal compliant with IEEE 802.3.

The TXP_MR_10G card is tunable over two neighboring wavelengths in the 1550-nm, ITU 100-GHz range. It is available in 16 different versions, each of which covers two wavelengths, for a total coverage of 32 different wavelengths in the 1550-nm range.

Note ITU-T G.709 specifies a form of FEC that uses a "wrapper" approach. The digital wrapper lets you transparently take in a signal on the client side, wrap a frame around it and restore it to its original form. FEC enables longer fiber links because errors caused by the optical signal degrading with distance are corrected.

The trunk port operates at 9.95328 Gbps (or 10.70923 Gbps with ITU-T G.709 Digital Wrapper/FEC) and at 10.3125 Gbps (or 11.095 Gbps with ITU-T G.709 Digital Wrapper/FEC) over unamplified distances up to 80 km (50 miles) with different types of fiber such as C-SMF or dispersion compensated fiber limited by loss and/or dispersion.

Caution Because the transponder has no capability to look into the payload and detect circuits, a TXP_MR_10G card does not display circuits under card view.

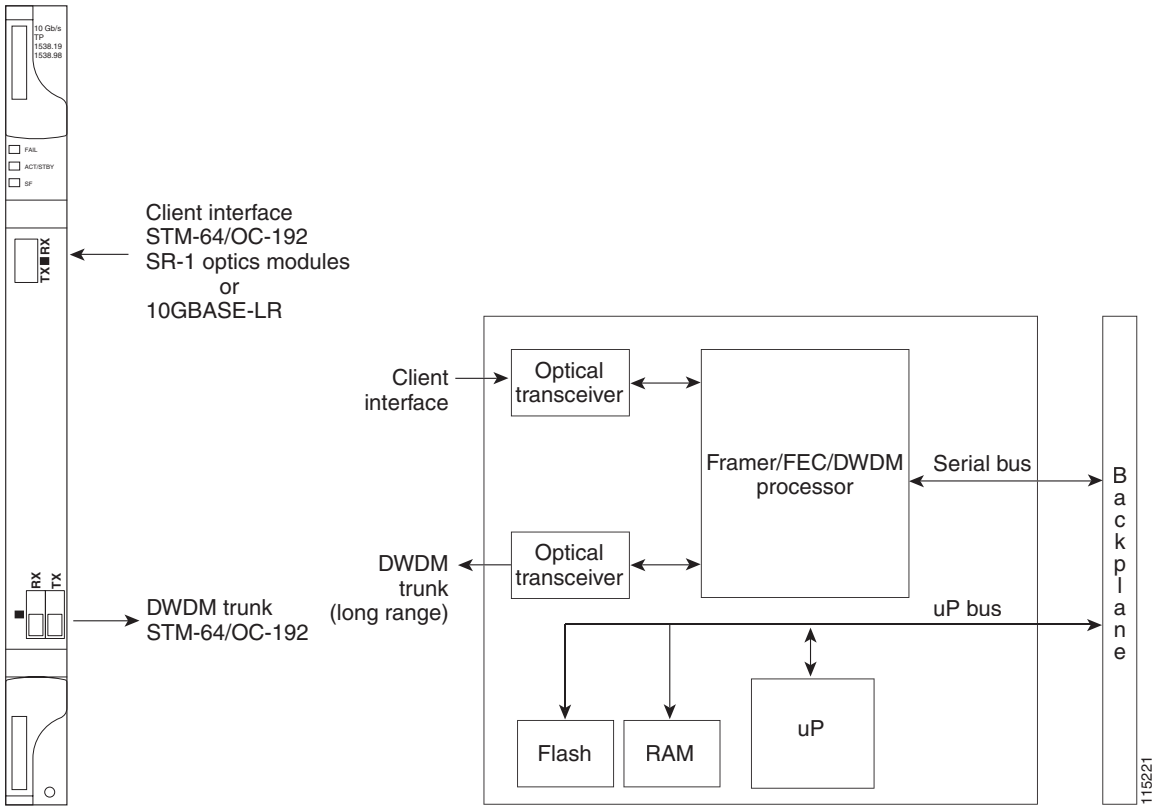
Caution You must use a 15-dB fiber attenuator (10 to 20 dB) when working with the TXP_MR_10G card in a loopback on the trunk port. Do not use direct fiber loopbacks with the TXP_MR_10G card. Using direct fiber loopbacks causes irreparable damage to the TXP_MR_10G card.

You can install TXP_MR_10G cards in Slots 1 to 6 and 12 to 17 and provision this card in a linear configuration. TXP_MR_10G cards cannot be provisioned as a BLSR/MS-SPRing, a path protection/SNCP, or a regenerator. They can only be used in the middle of BLSR/MS-SPRing and 1+1 spans when the card is configured for transparent termination mode.

The TXP_MR_10G port features a 1550-nm laser for the trunk port and a 1310-nm laser for the for the client port and contains two transmit and receive connector pairs (labeled) on the card faceplate.

Figure 15-54 shows the TXP_MR_10G faceplate and block diagram.

Figure 15-54 TXP_MR_10G Faceplate and Block Diagram



15.8.1.1 Y-Cable Protection

Two TXP_MR_10G cards can be joined in a Y-cable protection group. In Y-cable protection, the client ports of the two cards are joined by Y-cables. A single incoming receive (Rx) client signal is injected into the Rx Y-cable port and is split between the two TXP_MR_10G cards (connected to the Rx client ports) in the protection group. The transmit (Tx) client signals from the two protection group TXP_MR_10G cards are connected to the correspondent ports of the Tx Y-cable. Only the Tx client port of the active TXP_MR_10G card is turned on and transmits the signal toward the receiving client equipment. See the "15.9 Transponder and Muxponder Protection" section on page 15-114 for more information.

Note If you create a GCC on either card of the protection group, the trunk (span) port stays permanently active, regardless of the switch state. When you provision a GCC, you are provisioning unprotected overhead bytes. The GCC is not protected by the protect group.

15.8.1.2 Automatic Laser Shutdown

The ALS procedure is supported on both client and trunk interfaces. On the client interface, ALS is compliant with ITU-T G.664 (6/99). On the data application and trunk interface, the switch on and off pulse duration is greater than 60 seconds. The on and off pulse duration is user-configurable. For ALS provisioning information, see the "DLP-G217 Change Line Settings for TXP_MR_10G and TXP_MR_10E Cards" section on page 5-10.

15.8.1.3 TXP_MR_10G Card-Level Indicators

Table 15-50 lists the three card-level LEDs on the TXP_MR_10G card.

Table 15-50 TXP_MR_10G Card-Level Indicators

Card-Level LED	Description
FAIL LED (Red)	Red indicates that the card's processor is not ready. This LED is on during reset. The FAIL LED flashes during the boot process. Replace the card if the red FAIL LED persists.
ACT/STBY LED Green (Active) Amber (Standby)	Green indicates that the card is operational (one or both ports active) and ready to carry traffic. Amber indicates that the card is operational and in standby (protect) mode.
SF LED (Amber)	Amber indicates a signal failure or condition such as LOS, LOF, or high BERs on one or more of the card's ports. The amber SF LED is also illuminated if the transmit and receive fibers are incorrectly connected. If the fibers are properly connected and the link is working, the LED turns off.

15.8.1.4 TXP_MR_10G Port-Level Indicators

Table 15-51 lists the four port-level LEDs in the TXP_MR_10G card.

Table 15-51 TXP_MR_10G Port-Level Indicators

Port-Level LED	Description
Green Client LED	The green Client LED indicates that the client port is in service and that it is receiving a recognized signal.
Green DWDM LED	The green DWDM LED indicates that the DWDM port is in service and that it is receiving a recognized signal.
Green Wavelength 1 LED	Each port supports two wavelengths on the DWDM side. Each wavelength LED matches one of the wavelengths. This LED indicates that the card is configured for Wavelength 1.
Green Wavelength 2 LED	Each port supports two wavelengths on the DWDM side. Each wavelength LED matches one of the wavelengths. This LED indicates that the card is configured for Wavelength 2.

15.8.2 TXP_MR_10E Card

The 10-Gbps Transponder–100-GHz–Tunable xx.xx-xx.xx (TXP_MR_10E) card is a multirate transponder for the ONS 15454 platform. The card is fully backward compatible with the TXP_MR_10G card. It processes one 10-Gbps signal (client side) into one 10-Gbps, 100-GHz DWDM signal (trunk side) that is tunable over four wavelength channels (spaced at 100 GHz on the ITU grid) in the C-band and tunable over eight wavelength channels (spaced at 50 GHz on the ITU grid) in the L-band. There are eight versions of the C-band card, with each version covering four wavelengths, for a total coverage of 32 wavelengths. There are five versions of the L-band card, with each version covering eight wavelengths, for a total coverage of 40 wavelengths.

You can install TXP_MR_10E cards in Slots 1 to 6 and 12 to 17 and provision the cards in a linear configuration, BLSR/MS-SPRing, path protection/SNCP, or a regenerator. The card can be used in the middle of BLSR/MS-SPRing or 1+1 spans when the card is configured for transparent termination mode.

The TXP_MR_10E card features a 1550-nm tunable laser (C-band) or a 1580-nm tunable laser (L-band) for the trunk port and a separately orderable ONS-XC-10G-S1 1310-nm laser XFP module for the client port. On its faceplate, the TXP_MR_10E card contains two transmit and receive connector pairs, one for the trunk port and one for the client port. Each connector pair is labeled.

15.8.2.1 Key Features

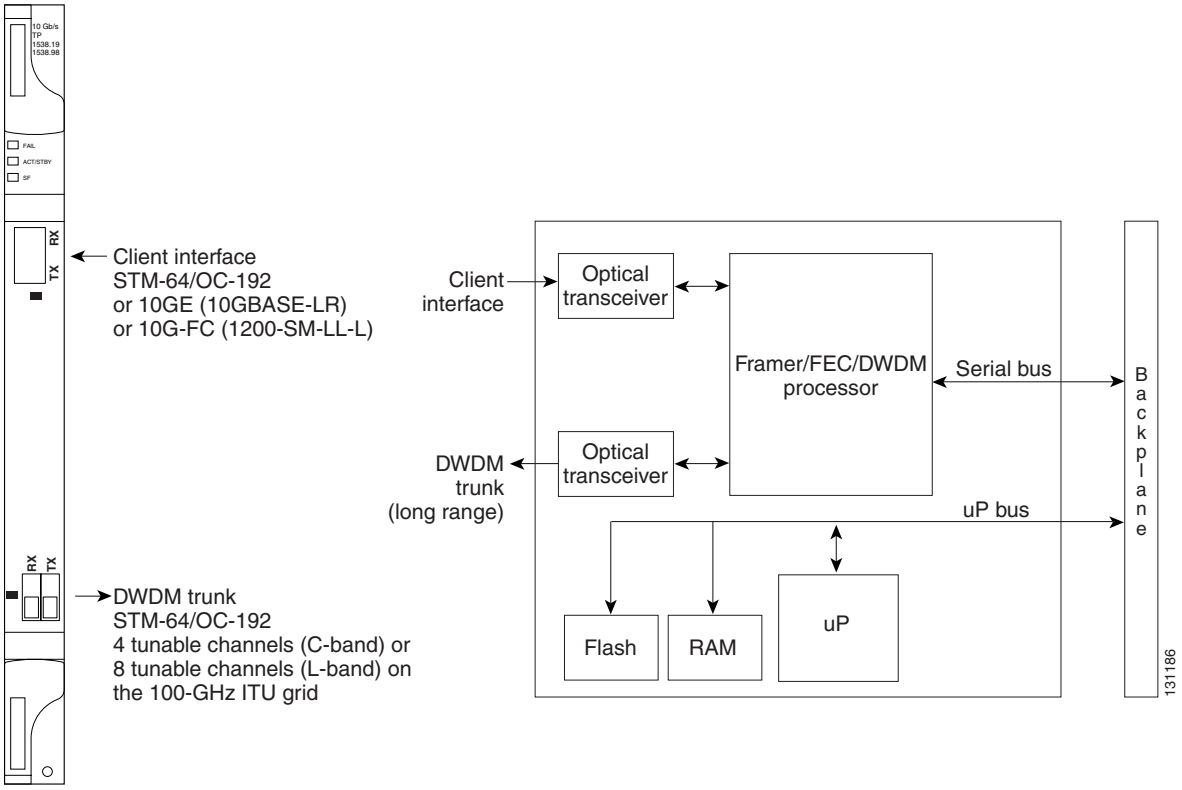
The key features of the TXP_MR_10E card are:

- A tri-rate client interface (available through the ONS-XC-10G-S1 XFP, ordered separately)
  - OC-192 (SR1)
  - 10GE (10GBASE-LR)
  - 10G-FC (1200-SM-LL-L)
- OC-192 to ITU-T G.709 OTU2 provisionable synchronous and asynchronous mapping

15.8.2.2 Faceplate and Block Diagram

Figure 15-55 shows the TXP_MR_10E faceplate and block diagram.

Figure 15-55 TXP_MR_10E Faceplate and Block Diagram



Caution You must use a 15-dB fiber attenuator (10 to 20 dB) when working with the TXP_MR_10E card in a loopback on the trunk port. Do not use direct fiber loopbacks with the TXP_MR_10E card. Using direct fiber loopbacks causes irreparable damage to the TXP_MR_10E card.

15.8.2.3 Client Interface

The client interface is implemented with a separately orderable XFP module. The module is a tri-rate transceiver, providing a single port that can be configured in the field to support an OC-192 SR-1 (Telcordia GR-253-CORE) or STM-64 I-64.1 (ITU-T G.691) optical interface, as well as 10GE LAN PHY (10GBASE-LR), 10GE WAN PHY (10GBASE-LW), or 10G FC signals.

The client side XFP pluggable module supports LC connectors and is equipped with a 1310-nm laser.

15.8.2.4 DWDM Trunk Interface

On the trunk side, the TXP_MR_10E card provides a 10-Gbps STM-64/OC-192 interface. There are four tunable channels available in the 1550-nm band or eight tunable channels available in the 1580-nm band on the 50-GHz ITU grid for the DWDM interface. The TXP_MR_10E card provides 3R transponder functionality for this 10-Gbps trunk interface. Therefore, the card is suited for use in long-range amplified systems. The DWDM interface is complaint with ITU-T G.707, ITU-T G.709, and Telcordia GR-253-CORE standards.

The DWDM trunk port operates at a rate that is dependent on the input signal and the presence or absence of the ITU-T G.709 Digital Wrapper/FEC. The possible trunk rates are:

- OC192 (9.95328 Gbps)
- OTU2 (10.70923 Gbps)
- 10GE (10.3125 Gbps) or 10GE into OTU2 (nonstandard 11.0957 Gbps)
- 10G FC (10.51875 Gbps) or 10G FC into OTU2 (nonstandard 11.31764 Gbps).

The maximum system reach in filterless applications without the use of optical amplification or regenerators is nominally rated at 23 dB over C-SMF fiber. This rating is not a product specification, but is given for informational purposes. It is subject to change.

15.8.2.5 Y-Cable Protection

The TXP_MR_10E card supports Y-cable protection, which provides transponder equipment protection without client terminal equipment interface protection. A single client interface can be split between two transponder cards using a Y-protection device.

With Y-cable protection, two TXP_MR_10E transponder cards can be joined in a Y-cable protection group. In Y-cable protection, the client ports of the two cards are joined by Y cables. An incoming client signal is injected into the Rx Y-cable port and is split between the two TXP_MR_10E cards (connected to Rx client ports) in the protection group. The Tx client signals from the two protection group TXP_MR_10E cards are connected to the correspondent ports of the Tx Y cable. Only the Tx client port of the active TXP_MR_10E card is turned on and transmits the signal towards the receiving client equipment. See the "15.9.1 Y-Cable Protection" section on page 15-114 for more details.

Note If you create a GCC using a digital wrapper and apply it to either card of the Y-cable protect group, the DWDM trunk (span) port stays permanently active, regardless of the switch's state. When you provision a GCC, you are provisioning unprotected overhead (OH) bytes. The GCC is not protected by the protection group.

15.8.2.6 Enhanced FEC (E-FEC) Feature

A key feature of the TXP_MR_10E is the availability to configure the forward error correction in three modes: NO FEC, FEC, and E-FEC. The output bit rate is always 10.7092 Gbps as defined in ITU-T G.709, but the error coding performance can be provisioned as follows:

- NO FEC—No forward error correction
- FEC—Standard ITU-T G.975 Reed-Solomon algorithm
- E-FEC—Standard ITU-T G.975.1 algorithm, which is a super FEC code.

15.8.2.7 FEC and E-FEC Modes

As client side traffic passes through the TXP_MR_10E card, it can be digitally wrapped using FEC mode, E-FEC mode, or no error correction at all. The FEC mode setting provides a lower level of error detection and correction than the E-FEC mode setting of the card. As a result, using E-FEC mode allows higher sensitivity (lower OSNR) with a lower bit error rate than FEC mode. E-FEC enables longer distance trunk-side transmission than with FEC.

The E-FEC feature is one of three basic modes of FEC operation. FEC can be turned off, FEC can be turned on, or E-FEC can be turned on to provide greater range and lower BER. The default mode is FEC on and E-FEC off. E-FEC is provisioned using CTC.

Caution Because the transponder has no visibility into the data payload and detect circuits, the TXP_MR_10E card does not display circuits under the card view.

15.8.2.8 Client-to-Trunk Mapping

The TXP_MR_10E card can perform ODU2-to-OCh mapping, which allows operators to provision data payloads in a standard way across 10-Gbps optical links.

Digital wrappers that define client side interfaces are called Optical Data Channel Unit 2 (ODU2) entities in ITU-T G.709. Digital wrappers that define trunk side interfaces are called Optical Channels (OCh) in ITU-T G.709. ODU2 digital wrappers can include Generalized Multiprotocol Label Switching (G-MPLS) signaling extensions to ITU-T G.709 (such as Least Significant Part [LSP] and Generalized Payload Identifier [G-PID] values) to define client interfaces and payload protocols.

15.8.2.9 Automatic Laser Shutdown

The ALS procedure is supported on both client and trunk interfaces. On the client interface, ALS is compliant with ITU-T G.664 (6/99). On the data application and trunk interface, the switch on and off pulse duration is greater than 60 seconds. The on and off pulse duration is user-configurable. For ALS provisioning information, see the "DLP-G217 Change Line Settings for TXP_MR_10G and TXP_MR_10E Cards" section on page 5-10.

15.8.2.10 TXP_MR_10E Card-Level Indicators

Table 15-52 lists the three card-level LEDs on the TXP_MR_10E card.

Table 15-52 TXP_MR_10E Card-Level Indicators

Card-Level LED	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready. This LED is on during reset. The FAIL LED flashes during the boot process. Replace the card if the red FAIL LED persists.
ACT/STBY LED Green (Active) Amber (Standby)	If the ACT/STBY LED is green, the card is operational (one or both ports active) and ready to carry traffic. If the ACT/STBY LED is amber, the card is operational and in standby (protect) mode.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS, LOF, or high BERs on one or more of the card's ports. The amber SF LED is also on if the transmit and receive fibers are incorrectly connected. If the fibers are properly connected and the link is working, the light turns off.

15.8.2.11 TXP_MR_10E Port-Level Indicators

Table 15-53 lists the two port-level LEDs in the TXP_MR_10E card.

Table 15-53 TXP_MR_10E Port-Level Indicators

Port-Level LED	Description
Green Client LED	The green Client LED indicates that the client port is in service and that it is receiving a recognized signal.
Green DWDM LED	The green DWDM LED indicates that the DWDM port is in service and that it is receiving a recognized signal.

15.8.3 TXP_MR_2.5G and TXPP_MR_2.5G Cards

The 2.5-Gbps Multirate Transponder–100-GHz–Tunable xx.xx-xx.xx (TXP_MR_2.5G) card processes one 8-Mbps to 2.488-Gbps signal (client side) into one 8-Mbps to 2.5-Gbps, 100-GHz DWDM signal (trunk side). It provides one long-reach STM-16/OC-48 port per card, compliant with ITU-T G.707, ITU-T G.709, ITU-T G.957, and Telcordia GR-253-CORE.

The 2.5-Gbps Multirate Transponder–Protected–100-GHz–Tunable xx.xx-xx.xx (TXPP_MR_2.5G) card processes one 8-Mbps to 2.488-Gbps signal (client side) into two 8-Mbps to 2.5-Gbps, 100-GHz DWDM signals (trunk side). It provides two long-reach STM-16/OC-48 ports per card, compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE.

The TXP_MR_2.5G and TXPP_MR_2.5G cards are tunable over four wavelengths in the 1550-nm, ITU 100-GHz range. They are available in eight versions, each of which covers four wavelengths, for a total coverage of 32 different wavelengths in the 1550-nm range.

Note ITU-T G.709 specifies a form of FEC that uses a "wrapper" approach. The digital wrapper lets you transparently take in a signal on the client side, wrap a frame around it, and restore it to its original form. FEC enables longer fiber links because errors caused by the optical signal degrading with distance are corrected.

The trunk/line port operates at up to 2.488 Gbps (or up to 2.66 Gbps with ITU-T G.709 Digital Wrapper/FEC) over unamplified distances up to 360 km (223.7 miles) with different types of fiber such as C-SMF or higher if dispersion compensation is used.

Caution Because the transponder has no capability to look into the payload and detect circuits, a TXP_MR_2.5G or TXPP_MR_2.5G card does not display circuits under card view.

The TXP_MR_2.5G and TXPP_MR_2.5G cards support 2R and 3R modes of operation where the client signal is mapped into a ITU-T G.709 frame. The mapping function is simply done by placing a digital wrapper around the client signal. Only OC-48/STM-16 client signals are fully ITU-T G.709 compliant, and the output bit rate depends on the input client signal. Table 15-54 shows the possible combinations of client interfaces, input bit rates, 2R and 3R modes, and ITU-T G.709 monitoring.

Table 15-54 2R and 3R Mode and ITU-T G.709 Compliance by Client Interface

Client Interface	Input Bit Rate	3R vs. 2R	ITU-T G.709
OC-48/STM-16	2.488 Gbps	3R	On or Off
DV-6000	2.38 Gbps	2R	—
2 Gigabit Fibre Channel (2G-FC)/fiber connection (FICON)	2.125 Gbps	3R[1]	On or Off
High-Definition Television (HDTV)	1.48 Gbps	2R	—
Gigabit Ethernet (GE)	1.25 Gbps	3R	On or Off
1 Gigabit Fibre Channel (1G-FC)/FICON	1.06 Gbps	3R	On or Off
OC-12/STM-4	622 Mbps	3R	On or Off
OC-3/STM-1	155 Mbps	3R	On or Off
Enterprise System Connection (ESCON)	200 Mbps	2R	—
SDI/D1 video	270 Mbps	2R	—
ISC-1 Compact	1.06 Gbps	3R	Off
ISC-3	1.06 or 2.125 Gbps	2R	—
ETR_CLO	16 Mbps	2R	—

1. No monitoring

The output bit rate is calculated for the trunk bit rate by using the 255/238 ratio as specified in ITU-T G.709 for OTU1. Table 15-55 lists the calculated trunk bit rates for the client interfaces with ITU-T G.709 enabled.

Table 15-55 Trunk Bit Rates With ITU-T G.709 Enabled

Client Interface	ITU-T G.709 Disabled	ITU-T G.709 Enabled
OC-48/STM-16	2.488 Gbps	2.66 Gbps
2G-FC	2.125 Gbps	2.27 Gbps
GE	1.25 Gbps	1.34 Gbps
1G-FC	1.06 Gbps	1.14 Gbps
OC-12/STM-3	622 Mbps	666.43 Mbps
OC-3/STM-1	155 Mbps	166.07 Mbps

For 2R operation mode, the TXP_MR_2.5G and TXPP_MR_2.5G cards have the ability to pass data through transparently from client side interfaces to a trunk side interface, which resides on an ITU grid. The data might vary at any bit rate from 200-Mbps up to 2.38-Gbps, including ESCON and video signals. In this pass-through mode, no performance monitoring (PM) or digital wrapping of the incoming signal is provided, except for the usual PM outputs from the SFPs. Similarly, this card has the ability to pass data through transparently from the trunk side interfaces to the client side interfaces with bit rates varying from 200-Mbps up to 2.38-Gbps. Again, no performance monitoring or digital wrapping of received signals is available in this pass-through mode.

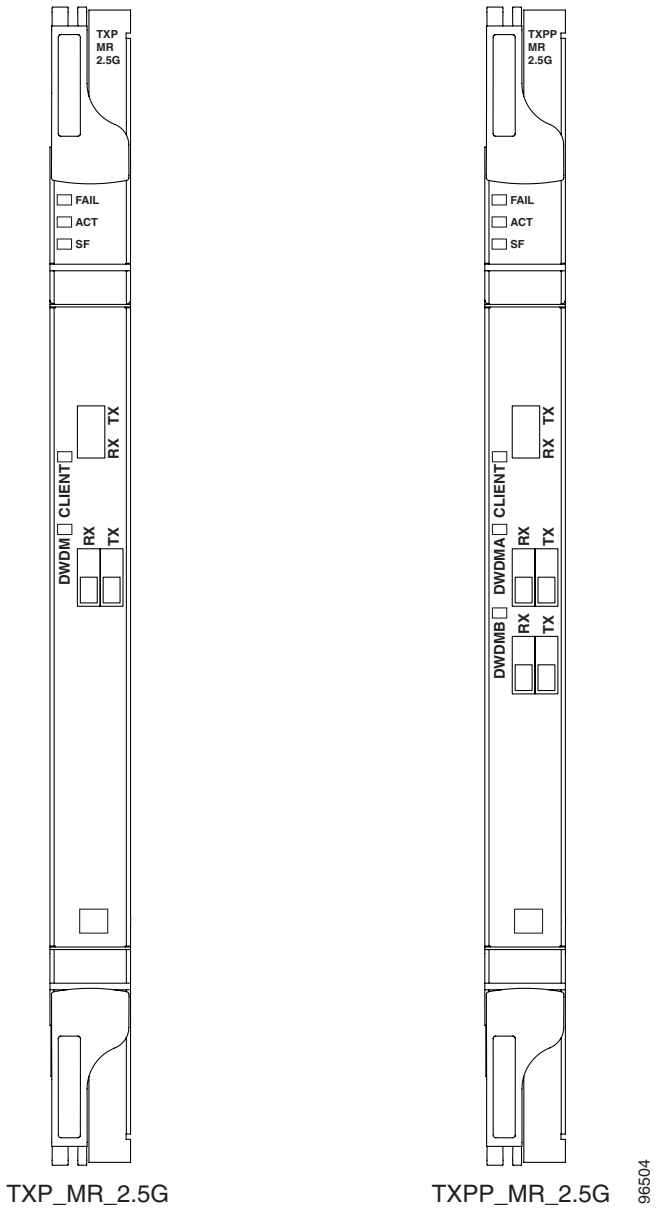
For 3R operation mode, the TXP_MR_2.5G and TXPP_MR_2.5G cards apply a digital wrapper to the incoming client interface signals (OC-N/STM-N, 1G-FC, 2G-FC, GE). Performance monitoring is available on all of these signals except for 2G-FC, and varies depending upon the type of signal. For client inputs other than OC-48/STM-16, a digital wrapper might be applied but the resulting signal is not ITU-T G.709 compliant. The card applies a digital wrapper that is scaled to the frequency of the input signal.

The TXP_MR_2.5G and TXPP_MR_2.5G card has the ability to take digitally wrapped signals in from the trunk interface, remove the digital wrapper, and send the unwrapped data through to the client interface. Performance monitoring of the ITU-T G.709 OH and SONET/SDH OH is implemented.

15.8.3.1 Faceplate

Figure 15-56 shows the TXP_MR_2.5G and TXPP_MR_2.5G faceplates.

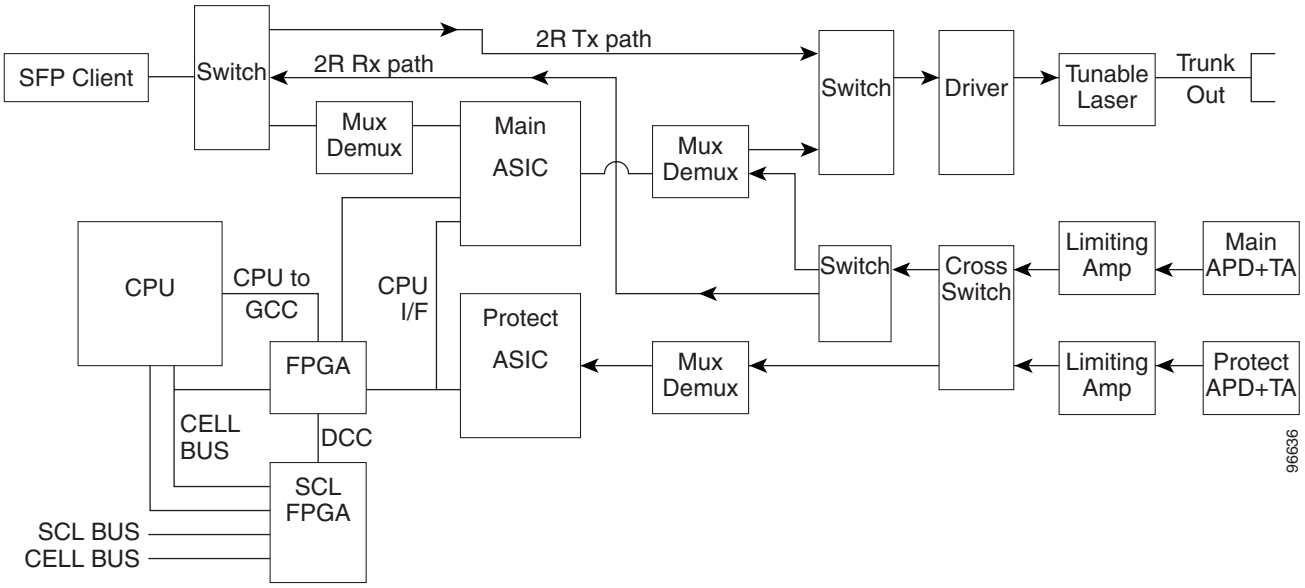
Figure 15-56 TXP_MR_2.5G and TXPP_MR_2.5G Faceplates



15.8.3.2 Block Diagram

Figure 15-57 shows a block diagram of the TXP_MR_2.5G and TXPP_MR_2.5G cards.

Figure 15-57 TXP_MR_2.5G and TXPP_MR_2.5G Block Diagram



Caution You must use a 20-dB fiber attenuator (15 to 25 dB) when working with the TXP_MR_2.5G and TXPP_MR_2.5G cards in a loopback on the trunk port. Do not use direct fiber loopbacks with the TXP_MR_2.5G and TXPP_MR_2.5G cards. Using direct fiber loopbacks causes irreparable damage to the TXP_MR_2.5G and TXPP_MR_2.5G cards.

You can install TXP_MR_2.5G and TXPP_MR_2.5G cards in Slots 1 to 6 and 12 to 17. You can provision this card in a linear configuration. TXP_MR_10G and TXPP_MR_2.5G cards cannot be provisioned as a BLSR/MS-SPRing, a path protection/SNCP, or a regenerator. They can be used in the middle of BLSR/MS-SPRing or 1+1 spans only when the card is configured for transparent termination mode.

The TXP_MR_2.5G card features a 1550-nm laser for the trunk/line port and a 1310-nm laser for the client port. It contains two transmit and receive connector pairs (labeled) on the card faceplate. The card uses dual LC connectors for optical cable termination.

The TXPP_MR_2.5G card features a 1550-nm laser for the trunk/line port and a 1310-nm or 850-nm laser (depending on the SFP) for the client port and contains three transmit and receive connector pairs (labeled) on the card faceplate. The card uses dual LC connectors for optical cable termination.

15.8.3.3 Y-Cable Protection

For the TXP_MR_2.5G card, protection is done using Y-cable protection. In Y-cable protection, the client ports of two TXP_MR_2.5G cards can be joined by Y cables in a Y-cable protection group. A single incoming Rx client signal is injected into the Rx Y-cable port and is split between the two TXP_MR_2.5G cards (connected to the Rx client ports) in the protection group. The Tx client signals from the two protection group TXP_MR_2.5G cards are connected to the correspondent ports of the Tx Y-cable. Only the Tx client port of the active TXP_MR_2.5G card is turned on and transmits the signal towards the receiving client equipment. See the "15.9 Transponder and Muxponder Protection" section on page 15-114 for more information.

Note If you create a GCC on either card of the protect group, the trunk (span) port stays permanently active, regardless of the switch state. When you provision a GCC, you are provisioning unprotected overhead bytes. The GCC is not protected by the protect group.

15.8.3.4 Splitter Protection

For the TXPP_MR_2.5G card, protection is done using splitter protection. In splitter protection, the single client signal is injected into the client Rx port. It is then split into two separate signals on the two trunk Tx ports. The two signals are transmitted over diverse paths. The far-end TXPP_MR_2.5G card chooses one of the two trunk Rx port signals and injects it into the Tx client port. The TXPP_MR_2.5G card switches the selected trunk Rx port signal in case of failure. See the "15.9 Transponder and Muxponder Protection" section on page 15-114 for more details.

15.8.3.5 Automatic Laser Shutdown

The ALS procedure is supported on both client and trunk interfaces. On the client interface, ALS is compliant with ITU-T G.664 (6/99). On the data application and trunk interface, the switch on and off pulse duration is greater than 60 seconds. The on and off pulse duration is user-configurable. For ALS provisioning information, see the "DLP-G230 Change Line Settings for TXP_MR_2.5G and TXPP_MR_2.5G Cards" section on page 5-42.

15.8.3.6 TXP_MR_2.5G and TXPP_MR_2.5G Safety Labels

The TXP_MR_2.5G and TXPP_MR_2.5G cards have several safety labels that provide laser radiation and electrical shock warnings.

Figure 15-58 shows the laser radiation warning hazard level label. The faceplate of these cards are clearly labeled with warnings about the equipment radiation level. Personnel must understand all warning labels before working with these cards. The hazard level label warns the personnel against exposure to laser radiation of Class 1M limits calculated in accordance with IEC60825-1 Ed.1.2.

Figure 15-58 Laser Radiation Warning—Hazard Level Label

Figure 15-59 shows the laser source connector label. This label indicates a laser source at the optical connectors where it has been placed.

Figure 15-59 Laser Radiation Warning—Laser Source Connector Label

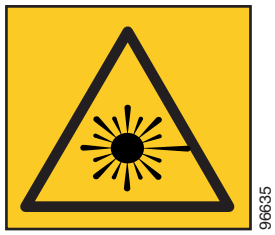


Figure 15-60 shows the FDA compliance label. This label shows the statement of compliance to FDA standards and that the hazard level classification is in accordance with IEC60825-1 Am.2 or Ed.1.2.

Figure 15-60 FDA Compliance Statement Label

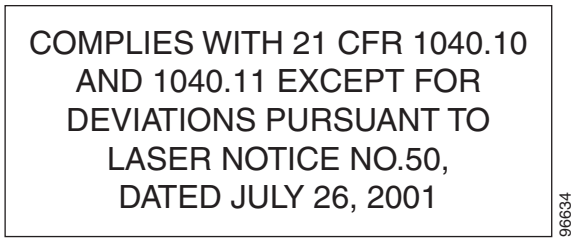
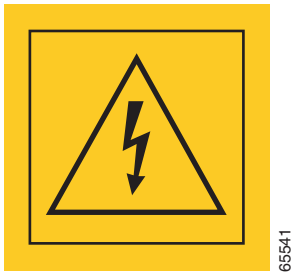


Figure 15-61 shows the electrical energy hazard label. This label alerts personnel to electrical hazards within the card. The potential of shock hazard exists when adjacent cards are removed during maintenance and touching exposed electrical circuitry on the card itself.

Figure 15-61 Electrical Energy Hazard Label



15.8.3.7 TXP_MR_2.5G and TXPP_MR_2.5G Card-Level Indicators

Table 15-56 lists the three card-level LEDs on the TXP_MR_2.5G and TXPP_MR_2.5G cards.

Table 15-56 TXP_MR_2.5G and TXPP_MR_2.5G Card-Level Indicators

Card-Level LED	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready. This LED is on during reset. The FAIL LED flashes during the boot process. Replace the card if the red FAIL LED persists.
ACT/STBY LED Green (Active) Amber (Standby)	If the ACT/STBY LED is green, the card is operational (one or both ports active) and ready to carry traffic. If the ACT/STBY LED is amber, the card is operational and in standby (protect) mode.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS, LOF, or high BERs on one or more of the card's ports. The amber SF LED is also on if the transmit and receive fibers are incorrectly connected. If the fibers are properly connected and the link is working, the light turns off.

15.8.3.8 TXP_MR_2.5G and TXPP_MR_2.5G Port-Level Indicators

Table 15-57 lists the four port-level LEDs on the TXP_MR_2.5G and TXPP_MR_2.5G cards.

Table 15-57 TXP_MR_2.5G and TXPP_MR_2.5G Port-Level Indicators

Port-Level LED	Description
Green Client LED	The green Client LED indicates that the client port is in service and that it is receiving a recognized signal.
Green DWDM LED	The green DWDM LED indicates that the DWDM port is in service and that it is receiving a recognized signal.
Green TX LED	The green TX LED indicates that indicated the DWDM port is in service and that it is currently transmitting a recognized signal.
Green RX LED	The green RX LED indicates that the indicated DWDM port is in service and that it is currently receiving a recognized signal.

15.8.4 MXP_2.5G_10G Card

The 2.5-Gbps–10-Gbps Muxponder–100 GHz–Tunable xx.xx-xx.xx (MXP_2.5G_10G) card multiplexes/demultiplexes four 2.5-Gbps signals (client side) into one 10-Gbps, 100-GHz DWDM signal (trunk side). It provides one extended long-range STM-64/OC-192 port per card on the trunk side (compliant with ITU-T G.707, ITU-T G.709, ITU-T G.957, and Telcordia GR-253-CORE) and four intermediate- or short-range OC-48/STM-16 ports per card on the client side. The port operates at 9.95328 Gbps over unamplified distances up to 80 km (50 miles) with different types of fiber such as C-SMF or dispersion compensated fiber limited by loss and/or dispersion.

Client ports on the MXP_2.5G_10G card are also interoperable with OC-1 (STS-1) fiber optic signals defined in Telcordia GR-253-CORE. An OC-1 signal is the equivalent of one DS-3 channel transmitted across optical fiber. OC-1 is primarily used for trunk interfaces to phone switches in the United States. There is no SDH equivalent for OC-1.

The MXP_2.5G_10G card is tunable over two neighboring wavelengths in the 1550-nm, ITU 100-GHz range. It is available in 16 different versions, each of which covers two wavelengths, for a total coverage of 32 different wavelengths in the 1550-nm range.

Note ITU-T G.709 specifies a form of FEC that uses a "wrapper" approach. The digital wrapper lets you transparently take in a signal on the client side, wrap a frame around it and restore it to its original form. FEC enables longer fiber links because errors caused by the optical signal degrading with distance are corrected.

The port can also operate at 10.70923 Gbps in ITU-T G.709 Digital Wrapper/FEC mode.

Caution Because the transponder has no capability to look into the payload and detect circuits, an MXP_2.5G_10G card does not display circuits under card view.

Caution You must use a 20-dB fiber attenuator (15 to 25 dB) when working with the MXP_2.5G_10G card in a loopback on the trunk port. Do not use direct fiber loopbacks with the MXP_2.5G_10G card. Using direct fiber loopbacks causes irreparable damage to the MXP_2.5G_10G card.

You can install MXP_2.5G_10G cards in Slots 1 to 6 and 12 to 17.

Caution Do not install an MXP_2.5G_10G card in Slot 3 if you have installed a DS3/EC1-48 card in Slots 1or 2. Likewise, do not install an MXP_2.5G_10G card in Slot 17 if you have installed a DS3/EC1-48 card in Slots 15 or 16. If you do, the cards will interact and cause DS-3 bit errors.

You can provision this card in a linear configuration. MXP_2.5G_10G cards cannot be provisioned as a BLSR/MS-SPRing, a path protection/SNCP, or a regenerator. They can be used in the middle of BLSR/MS-SPRing or 1+1 spans only when the card is configured for transparent termination mode.

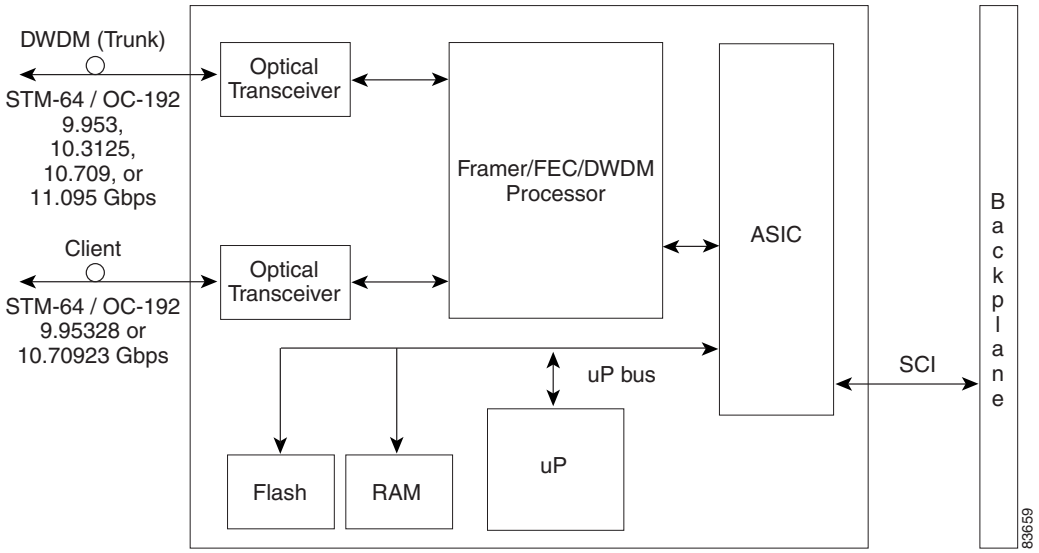
The MXP_2.5G_10G port features a 1550-nm laser on the trunk port and four 1310-nm lasers on the client ports and contains five transmit and receive connector pairs (labeled) on the card faceplate. The card uses a dual LC connector on the trunk side and SFP connectors on the client side for optical cable termination.

Figure 15-62 shows the MXP_2.5G_10G faceplate.

Figure 15-62 MXP_2.5G_10G Faceplate

Figure 15-63 shows a block diagram of the MXP_2.5G_10G card.

Figure 15-63 MXP_2.5G_10G Card Block Diagram



15.8.4.1 Y-Cable Protection

For the MXP_2.5G_10G card, protection is done using Y-cable protection. In Y-cable protection, the client ports of two MXP_2.5G_10G cards can be joined by Y cables in a Y-cable protection group. A single Rx client signal is injected into the Rx Y-cable and is split between the two MXP_2.5G_10G cards in the protection group. The Tx client signals from the two protection group MXP_2.5G_10G cards are connected via the TX Y cable with only the active card signal passing through as the single TX client signal. See the "15.9.1 Y-Cable Protection" section on page 15-114 for more details.

Note If you create a GCC on either card of the protect group, the trunk port stays permanently active, regardless of the switch state. When you provision a GCC, you are provisioning unprotected overhead bytes. The GCC is not protected by the protect group.

15.8.4.2 Automatic Laser Shutdown

The ALS procedure is supported on both client and trunk interfaces. On the client interface, ALS is compliant with ITU-T G.664 (6/99). On the data application and trunk interface, the switch on and off pulse duration is greater than 60 seconds. The on and off pulse duration is user-configurable. For ALS provisioning information, see the "DLP-G223 Change Line Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards" section on page 5-28.

15.8.4.3 Timing Synchronization

The MXP_2.5G_10G card is synchronized to the TCC2/TCC2P clock during normal conditions and transmits the ITU-T G.709 frame using this clock. The TCC2/TCC2P card can operate from an external BITS clock, an internal Stratum 3 clock, or from clock recovered from one of the four valid client clocks. If clocks from both TCC2/TCC2P cards are not available, the MXP_2.5G_10G card switches automatically (with errors, not hitless) to an internal 19.44 MHz clock that does not meet SONET clock requirements. This will result in a clock alarm.

15.8.4.4 MXP_2.5G_10G Card-Level Indicators

Table 15-58 describes the three card-level LEDs on the MXP_2.5G_10G card.

Table 15-58 MXP_2.5G_10G Card-Level Indicators

Card-Level LED	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready. This LED is on during reset. The FAIL LED flashes during the boot process. Replace the card if the red FAIL LED persists.
ACT/STBY LED Green (Active) Amber (Standby)	If the ACT/STBY LED is green, the card is operational (one or more ports active) and ready to carry traffic. If the ACT/STBY LED is amber, the card is operational and in standby (protect) mode.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS, LOF, or high BERs on one or more of the card's ports. The amber SF LED is also on if the transmit and receive fibers are incorrectly connected. If the fibers are properly connected and the link is working, the light turns off.

15.8.4.5 MXP_2.5G_10G Port-Level Indicators

Table 15-59 describes the four port-level LEDs on the MXP_2.5G_10G card.

Table 15-59 MXP_2.5G_10G Port-Level Indicators

Port-Level LED	Description
Green Client LED (four LEDs)	The green Client LED indicates that the client port is in service and that it is receiving a recognized signal. The card has four client ports, and so has four Client LEDs.
Green DWDM LED	The green DWDM LED indicates that the DWDM port is in service and that it is receiving a recognized signal.
Green Wavelength 1 LED	Each port supports two wavelengths on the DWDM side. Each wavelength LED matches one of the wavelengths. This LED indicates that the board is configured for Wavelength 1.
Green Wavelength 2 LED	Each port supports two wavelengths on the DWDM side. Each wavelength LED matches one of the wavelengths. This LED indicates that the board is configured for Wavelength 2.

15.8.5 MXP_2.5G_10E Card

The 2.5-Gbps–10-Gbps Muxponder–100 GHz–Tunable xx.xx-xx.xx (MXP_2.5G_10E) card is a DWDM muxponder for the ONS 15454 platform that supports full optical transparency on the client side. The card multiplexes four 2.5 Gbps client signals (4 x OC48/STM-16 SFP) into a single 10-Gbps DWDM optical signal on the trunk side. The MXP_2.5G_10E provides wavelength transmission service for the four incoming 2.5 Gbps client interfaces. The MXP_2.5G_10E muxponder passes all SONET/SDH overhead bytes transparently.

The digital wrapper function (ITU-T G.709 compliant) formats the DWDM wavelength so that it can be used to set up GCCs for data communications, enable FEC, or facilitate performance monitoring.

The MXP_2.5G_10E works with OTN devices defined in ITU-T G.709. The card supports ODU1 to OTU2 multiplexing, an industry standard method for asynchronously mapping a SONET/SDH payload into a digitally wrapped envelope. See the "15.8.5.5 Multiplexing Function" section on page 15-102.

The MXP_2.5G_10E card is not compatible with the MXP_2.5G_10G card, which does not support full optical transparency. The faceplate designation of the card is "4x2.5G 10E MXP."

You can install MXP_2.5G_10E cards in Slots 1 to 6 and 12 to 17. You can provision this card in a linear configuration, as a BLSR/MS-SPRing, a path protection/SNCP, or a regenerator. The card can be used in the middle of BLSR/MS-SPRing or 1+1 spans when the card is configured for transparent termination mode.

The MXP_2.5G_10E features a 1550-nm laser on the trunk port and four 1310-nm lasers on the client ports and contains five transmit and receive connector pairs (labeled) on the card faceplate. The card uses a dual LC connector on the trunk side and uses SFP modules on the client side for optical cable termination. The SFP pluggable modules are short reach (SR) or intermediate reach (IR) and support an LC fiber connector.

15.8.5.1 Key Features

The MXP_2.5G_10E card has the following high level features:

- Four 2.5 Gbps client interfaces (OC-48/STM-16) and one 10 Gbps trunk. The four OC-48 signals are mapped into a ITU-T G.709 OTU2 signal using standard ITU-T G.709 multiplexing.
- Onboard E-FEC processor: The processor supports both standard RS (specified in ITU-T G.709) and E-FEC, which allows an improved gain on trunk interfaces with a resultant extension of the transmission range on these interfaces. The E-FEC functionality increases the correction capability of the transponder to improve performance, allowing operation at a lower OSNR compared to the standard RS (237,255) correction algorithm. A new BCH algorithm implemented in E-FEC allows recovery of an input BER up to 1E-3.
- Pluggable client interface optic modules: The MXP_MP_10E card has modular interfaces. Two types of optics modules can be plugged into the card. These include an OC-48/STM 16 SR-1 interface with a 7 km nominal range (for short range and intra-office applications) and an IR-1 interface with a range up to 40 km. SR-1 is defined in Telcordia GR-253-CORE and in I-16 (ITU-T G.957). IR-1 is defined in Telcordia GR-253-CORE and in S-16-1 (ITU-T G.957).
- High level provisioning support: The MXP_MP_10E card is initially provisioned using Cisco MetroPlanner software. Subsequently, the card can be monitored and provisioned using CTC software.
- Link monitoring and management: The MXP_MP_10E card uses standard OC-48 OH (overhead) bytes to monitor and manage incoming interfaces. The card passes the incoming SDH/SONET data stream and its overhead bytes transparently.
- Control of layered SONET/SDH transport overhead: The card is provisionable to terminate regenerator section overhead. This is used to eliminate forwarding of unneeded layer overhead. It can help reduce the number of alarms and help isolate faults in the network.
- Automatic timing source synchronization: The MXP_MP_10E normally synchronizes from the TCC2/TCC2P card. If for some reason, such as maintenance or upgrade activity, the TCC2/TCC2P is not available, the MXP_MP_10E automatically synchronizes to one of the input client interface clocks.
- Configurable squelching policy: The card can be configured to squelch the client interface output if there is LOS at the DWDM receiver or if there is a remote fault. In the event of a remote fault, the card manages multiplex section alarm indication signal (MS-AIS) insertion.

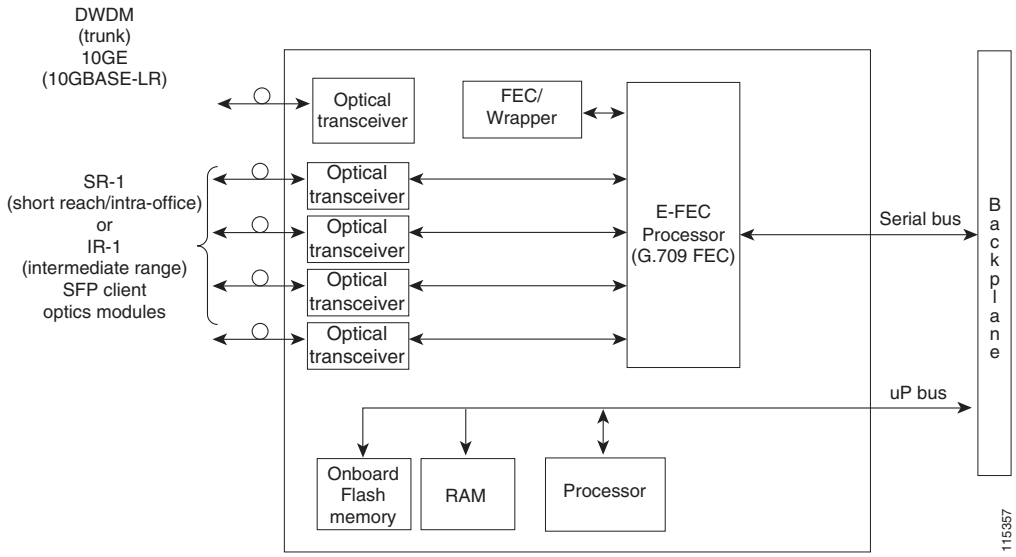
15.8.5.2 Faceplate

Figure 15-64 shows the MXP_2.5G_10E faceplate.

Figure 15-64 MXP_2.5G_10E Faceplate

Figure 15-65 shows a block diagram of the MXP_2.5G_10E card.

Figure 15-65 MXP_2.5G_10E Block Diagram



15.8.5.3 Client Interfaces

The MXP_2.5G_10E provides four intermediate- or short-range OC-48/STM-16 ports per card on the client side. Both SR-1 or IR-1 optics can be supported and the ports use SFP connectors. The client interfaces use four wavelengths in the 1310-nm, ITU 100-MHz-spaced, channel grid.

15.8.5.4 DWDM Interface

The MXP_MP_10E serves as an OTN multiplexer, transparently mapping four OC-48 channels asynchronously to ODU1 into one 10-Gbps trunk. The DWDM trunk is tunable for transmission over four wavelengths in the 1550-nm, ITU 100-GHz spaced channel grid.

Caution You must use a 20-dB fiber attenuator (15 to 25 dB) when working with the MXP_MP_10E card in a loopback on the trunk port. Do not use direct fiber loopbacks with the MXP_MP_10E card. Using direct fiber loopbacks causes irreparable damage to the MXP_MP_10E card.

15.8.5.5 Multiplexing Function

The muxponder is an integral part of the optically transparent ROADM network in which data payload channels and wavelengths are processed exclusively at the optical level without electrical to optical (E-O) conversion. The key function of MXP_MP_10E is to multiplex 4 OC-48/STM16 signals onto one ITU-T G.709 OTU2 optical signal (DWDM transmission). The multiplexing mechanism allows the signal to be terminated at a far-end node by another MXP_2.5G_10E card.

Optical transparency on the muxponder is configured using OTUx and ODUx OH bytes. The ITU-T G.709 specification defines OH byte formats that are used to configure, set, and monitor frame alignment, FEC mode, section monitoring, tandem connection monitoring, and optical transparency.

The MXP_2.5G_10E card performs ODU to OTU multiplexing as defined in ITU-T G.709. The ODU is the framing structure and byte definition (ITU-T G.709 digital wrapper) used to define the data payload coming into one of the SONET/SDH client interfaces on MXP_2.5G_10E. The term ODU1 refers to an ODU that operates at 2.5-Gbps line rate. On the MXP_2.5G_10E, there are four client interfaces that can be defined using ODU1 framing structure and format by asserting a ITU-T G.709 digital wrapper.

The output of the muxponder is a single 10-Gbps DWDM trunk interface defined using OTU2. It is within the OTU2 framing structure that FEC or E-FEC information is appended to enable error checking and correction.

15.8.5.6 Timing Synchronization

The MXP_2.5G_10E card is synchronized to the TCC2/TCC2P clock during normal conditions and transmits the ITU-T G.709 frame using this clock. No holdover function is implemented. If neither TCC2/TCC2P clock is available, the MXP_2.5G_10E switches automatically (hitless) to the first of the four valid client clocks with no time restriction as to how long it can run on this clock. The MXP_2.5G_10E continues to monitor the TCC2/TCC2P card. If a TCC2/TCC2P card is restored to working order, the MXP_2.5G_10E reverts to the normal working mode of running from the TCC2/TCC2P clock. If there is no valid TCC2/TCC2P clock and all of the client channels become invalid, the card waits (no valid frames processed) until one of the TCC2/TCC2P cards supplies a valid clock. In addition, the card is allowed to select the recovered clock from one active and valid client channel and supply that clock to the TCC2/TCC2P card.

15.8.5.7 Y-Cable Protection

The MXP_2.5G_10E card supports Y-cable protection. Two MXP_2.5G_10E cards can be joined in a Y-cable protection group with one card assigned as the working card and the other defined as the protection card. This protection mechanism provides redundant bidirectional paths. See the "15.9.1 Y-Cable Protection" section on page 15-114 for more detailed information.

The Y-protection mechanism is provisionable and can be set ON or OFF (OFF is the default mode). When a signal fault is detected (LOS, LOF, signal degrade [SD], or SF on the DWDM receiver port in the case of ITU-T G.709 mode) the protection mechanism software automatically switches between paths.

Note If you create a GCC on either card of the protect group, the trunk port stays permanently active, regardless of the switch state. When you provision a GCC, you are provisioning unprotected overhead bytes. The GCC is not protected by the protect group.

15.8.5.8 Enhanced FEC (E-FEC) Capability

The MXP_2.5G_10E can configure the FEC in three modes: NO FEC, FEC, and E-FEC. The output bit rate is always 10.7092 Gbps as defined in ITU-T G.709, but the error coding performance can be provisioned as follows:

- NO FEC—No FEC
- FEC—Standard ITU-T G.975 Reed-Solomon algorithm
- E-FEC—Standard ITU-T G.975.1, two orthogonally concatenated BCH super FEC code. This FEC scheme contains three parameterizations of the same scheme of two orthogonally interleaved block codes (BCH). The constructed code is decoded iteratively to achieve the expected performance.

15.8.5.9 FEC and E-FEC Modes

As client side traffic passes through the MXP_2.5G_10E card, it can be digitally wrapped using FEC mode error correction or E-FEC mode error correction (or no error correction at all). The FEC mode setting provides a lower level of error detection and correction than the E-FEC mode setting of the card. As a result, using E-FEC mode allows higher sensitivity (lower OSNR) with a lower BER than FEC mode. E-FEC enables longer distance trunk-side transmission than with FEC.

The E-FEC feature is one of three basic modes of FEC operation. FEC can be turned off, FEC can be turned on, or E-FEC can be turned on to provide greater range and lower BER. The default mode is FEC on and E-FEC off. E-FEC is provisioned using CTC.

15.8.5.10 SONET/SDH Overhead Byte Processing

The card passes the incoming SONET/SDH data stream and its overhead bytes for the client signal transparently. The card can be provisioned to terminate regenerator section overhead. This is used to eliminate forwarding of unneeded layer overhead. It can help reduce the number of alarms and help isolate faults in the network.

15.8.5.11 Client Interface Monitoring

The following parameters are monitored on the MXP_2.5G_10E card:

- Laser bias current is measured as a PM parameter
- LOS is detected and signaled
- Rx and Tx power are monitored

The following parameters are monitored in real time mode (one second):

- Optical power transmitted (client)
- Optical power received (client)

In case of loss of communication (LOC) at the DWDM receiver or far-end LOS, the client interface behavior is configurable. AIS can be invoked or the client signal can be squelched.

15.8.5.12 Wavelength Identification

The card uses trunk lasers that are wave-locked, which allows the trunk transmitter to operate on the ITU grid effectively. Table 15-60 describes the required trunk transmit laser wavelengths. The laser is tunable over eight wavelengths at 50-GHz spacing or four at 100-GHz spacing.

Table 15-60 MXP_2.5G_10E Trunk Wavelengths

Band	Wavelength (nm)
30.3	1530.33
30.3	1531.12
30.3	1531.90
30.3	1532.68
34.2	1534.25
34.2	1535.04

Table 15-60 MXP_2.5G_10E Trunk Wavelengths (continued)

Band	Wavelength (nm)
34.2	1535.82
34.2	1536.61
38.1	1538.19
38.1	1538.98
38.1	1539.77
38.1	1540.56
42.1	1542.14
42.1	1542.94
42.1	1543.73
42.1	1544.53
46.1	1546.12
46.1	1546.92
46.1	1547.72
46.1	1548.51
50.1	1550.12
50.1	1550.92
50.1	1551.72
50.1	1552.52
54.1	1554.13
54.1	1554.94
54.1	1555.75
54.1	1556.55
58.1	1558.17
58.1	1558.98
58.1	1559.79
58.1	1560.61

15.8.5.13 Automatic Laser Shutdown

The ALS procedure is supported on both client and trunk interfaces. On the client interface, ALS is compliant with ITU-T G.664 (6/99). On the data application and trunk interface, the switch on and off pulse duration is greater than 60 seconds. The on and off pulse duration is user-configurable. For ALS provisioning information, see the "DLP-G223 Change Line Settings for MXP_2.5G_10G and MXP_2.5G_10E Cards" section on page 5-28.

15.8.5.14 Jitter

For SONET and SDH signals, the MXP_2.5G_10E card complies to GR-253-CORE, ITU-T G.825, and ITU-T G.873 for jitter generation, jitter tolerance, and jitter transfer.

15.8.5.15 Lamp Test

The MXP_2.5G_10E card supports a lamp test function that is activated from the ONS 15454 front panel or through CTC to ensure that all LEDs are functional.

15.8.5.16 Onboard Traffic Generation

The MXP_2.5G_10E card provides internal traffic generation for testing purposes according to pseudo-random bit sequence (PRBS), SONET/SDH, or ITU-T G.709.

15.8.5.17 MXP_2.5G_10E Card-Level Indicators

Table 15-61 describes the three card-level LEDs on the MXP_2.5G_10E card.

Table 15-61 MXP_2.5G_10E Card-Level Indicators

Card-Level LED	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready. This LED is on during reset. The FAIL LED flashes during the boot process. Replace the card if the red FAIL LED persists.
ACT/STBY LED Green (Active) Amber (Standby)	If the ACT/STBY LED is green, the card is operational (one or more ports active) and ready to carry traffic. If the ACT/STBY LED is amber, the card is operational and in standby (protect) mode.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS, LOF, or high BERs on one or more of the card's ports. The amber SF LED is also on if the transmit and receive fibers are incorrectly connected. If the fibers are properly connected and the link is working, the light turns off.

15.8.5.18 MXP_2.5G_10E Port-Level Indicators

Table 15-62 describes the port-level LEDs on the MXP_2.5G_10E card.

Table 15-62 MXP_2.5G_10E Port-Level Indicators

Port-Level LED	Description
Green Client LED (four LEDs)	The green Client LED indicates that the client port is in service and that it is receiving a recognized signal. The card has four client ports, and so has four Client LEDs.
Green DWDM LED	The green DWDM LED indicates that the DWDM port is in service and that it is receiving a recognized signal.

15.8.6 MXP_MR_2.5G and MXPP_MR_2.5G Cards

The 2.5-Gbps Multirate Muxponder-100 GHz-Tunable 15xx.xx-15yy.yy (MXP_MR_2.5G) card aggregates a mix and match of client Storage Area Network (SAN) service client inputs (GE, FICON, and Fibre Channel) into one 2.5 Gbps STM-16/OC-48 DWDM signal on the trunk side. It provides one long-reach STM-16/OC-48 port per card and is compliant with Telcordia GR-253-CORE.

The 2.5-Gbps Multirate Muxponder–Protected–100 GHz–Tunable 15xx.xx-15yy.yy (MXPP_MR_2.5G) card aggregates various client SAN service client inputs (GE, FICON, and Fibre Channel) into one 2.5 Gbps STM-16/OC-48 DWDM signal on the trunk side. It provides two long-reach STM-16/OC-48 ports per card and is compliant with ITU-T G.957 and Telcordia GR-253-CORE.

Because the cards are tunable to one of four adjacent grid channels on a 100-GHz spacing, each card is available in eight versions, with 15xx.xx representing the first wavelength and 15yy.yy representing the last wavelength of the four available on the board. In total, 32 DWDM wavelengths are covered in accordance with the ITU-T 100-GHz grid standard, G.692, and Telcordia GR-2918-CORE, Issue 2. The card versions along with their corresponding wavelengths are shown in Table 15-63.

Table 15-63 Card Versions

Card Version	Frequency Channels at 100 GHz (0.8 nm) Spacing			
1530.33–1532.68	1530.33 nm	1531.12 nm	1531.90 nm	1532.68 nm
1534.25–1536.61	1534.25 nm	1535.04 nm	1535.82 nm	1536.61 nm
1538.19–1540.56	1538.19 nm	1538.98 nm	1539.77 nm	1540.56 nm
1542.14–1544.53	1542.14 nm	1542.94 nm	1543.73 nm	1544.53 nm
1546.12–1548.51	1546.12 nm	1546.92 nm	1547.72 nm	1548.51 nm
1550.12–1552.52	1550.12 nm	1550.92 nm	1551.72 nm	1552.52 nm
1554.13–1556.55	1554.13 nm	1554.94 nm	1555.75 nm	1556.55 nm
1558.17–1560.61	1558.17 nm	1558.98 nm	1559.79 nm	1560.61 nm

The muxponders are intended to be used in applications with long DWDM metro or regional unregenerated spans. Long transmission distances are achieved through the use of flat gain optical amplifiers.

The client interface supports the following payload types:

- GE
- 1G FC
- 2G FC
- 1G FICON
- 2G FICON

Note Because the client payload cannot oversubscribe the trunk, a mix of client signals can be accepted, up to a maximum limit of 2.5 Gbps.

Table 15-64 shows the input data rate for each client interface, and the encapsulation method. The current version of the Transparent Generic Framing Procedure (GFP-T) G.7041 supports transparent mapping of 8B/10B block-coded protocols, including Gigabit Ethernet, Fibre Channel, and FICON.

In addition to the GFP mapping, 1-Gbps traffic on Port 1 or 2 of the high-speed SERDES is mapped to an STS-24c channel. If two 1-Gbps client signals are present at Port 1 and Port 2 of the high-speed serializer/deserializer (SERDES), the Port 1 signal is mapped into the first STS-24c channel and the Port 2 signal into the second STS-24c channel. The two channels are then mapped into an OC-48 trunk channel.

Table 15-64 MXP_MR_2.5G and MXPP_MR_2.5G Client Interface Data Rates and Encapsulation

Client Interface	Input Data Rate	GFP-T G.7041 Encapsulation
GE	1.25 Gbps	Yes
1G FC	1.06 Gbps	Yes
2G FC	2.125 Gbps	Yes
1G FICON	1.06 Gbps	Yes
2G FICON	2.125 Gbps	Yes

Table 15-65 shows some of the mix and match possibilities on the various client ports. The table is intended to show the full client payload configurations for the card.

Table 15-65 Client Data Rates and Ports

Mode	Port(s)	Aggregate Data Rate
GE	1, 2	2.5 Gbps
1G FC	1, 2	2.125 Gbps
2G FC	1	2.125 Gbps
1G FICON	1, 2	2.125 Gbps
2G FICON	1	2.125 Gbps

For the MXP_MR_2.5G card, protection is done using Y-cable protection. Two MXP_MR_2.5G cards can be joined in a Y-cable protection group, which provides protection against failures both on the fiber and in the muxponders.

For the MXPP_MR_2.5G card, protection is done using splitter protection, which provides protection against failures due to fiber cuts or unacceptable signal degradation on the trunk side. See the "15.9 Transponder and Muxponder Protection" section on page 15-114 for more detailed information.

Note Switching is performed only if the protect line is error free.

GFP-T performance monitoring (GFP-T PM) is available via remote monitoring (RMON), and trunk PM is managed according to Telcordia GR-253-CORE and ITU G.783/826. Client PM is achieved through RMON for FC and GE.

A buffer-to-buffer credit management scheme provides FC flow control. With this feature enabled, a port indicates the number of frames that can be sent to it (its buffer credit), before the sender is required to stop transmitting and wait for the receipt of a "ready" indication The MXP_MR_2.5G and MXPP_MR_2.5 cards support FC credit-based flow control with a buffer-to-buffer credit extension of up to 1600 km for 1G FC and up to 800 km for 2G FC. The feature can be enabled or disabled.

You can install MXP_MR_2.5G and MXPP_MR_2.5G cards in Slots 1 to 6 and 12 to 17. The TCC2/TCC2P card is the only other card required to be used with these muxponder cards. Cross-connect cards do not affect the operation of the muxponder cards.

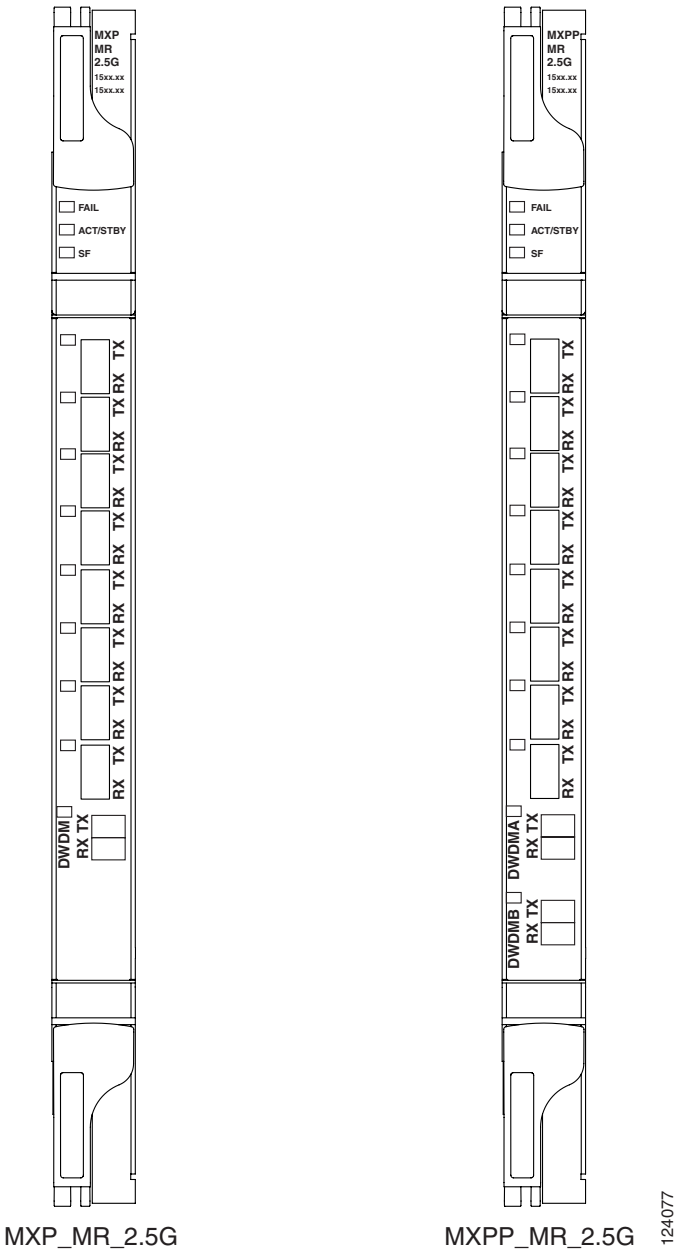
The MXP_MR_2.5G card features a 1550-nm laser for the trunk/line port and a 1310-nm or 850-nm laser (depending on the SFP) for the client ports. The card contains eight 12.5 degree downward tilt SFP modules for the client interfaces. For optical termination, each SFP uses two LC connectors, which are labeled TX and RX on the faceplate. The trunk port is a dual-LC connector with a 45 degree downward angle.

The MXPP_MR_2.5G card features a 1550-nm laser for the trunk/line port and a 1310-nm or 850-nm laser (depending on the SFP) for the client port. The card contains eight 12.5 degree downward tilt SFP modules for the client interfaces. For optical termination, each SFP uses two LC connectors, which are labeled TX and RX on the faceplate. There are two trunk port connectors (one for working and one for protect). Each is a dual-LC connector with a 45-degree downward angle.

15.8.6.1 Faceplates

Figure 15-66 shows the MXP_MR_2.5G and MXPP_MR_2.5G faceplates.

Figure 15-66 MXP_MR_2.5G and MXPP_MR_2.5G Faceplates



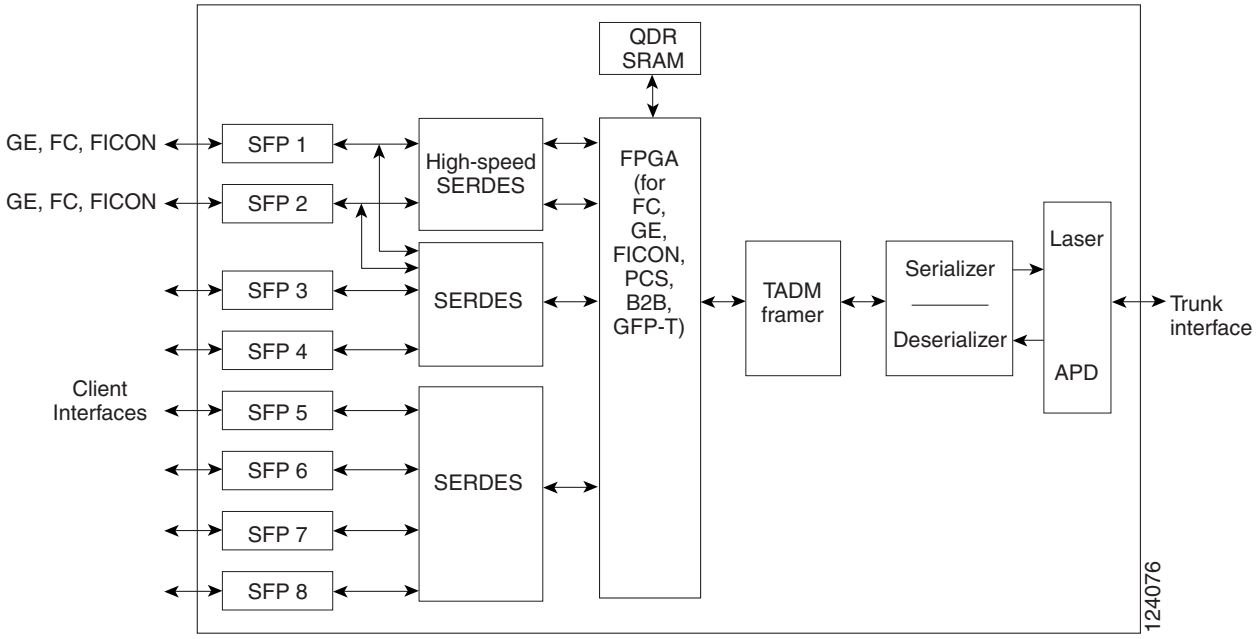
15.8.6.2 Block Diagram

Figure 15-67 shows a block diagram of the MXP_MR_2.5G card. The card has eight SFP client interfaces. Ports 1 and 2 can be used for GE, FC, or FICON. Ports 3 through 8 are for future use. There are two SERDES blocks dedicated to the high-speed interfaces (GE, FC, and FICON) and two SERDES blocks for future interfaces. A field programmable gate array (FPGA) is provided to support different configurations for different modes of operation. This FPGA has a Universal Test and Operations Physical Interface for ATM (UTOPIA) interface. A transceiver add-drop multiplexer (TADM) chip

supports framing. Finally, the output signal is serialized and connected to the trunk front end with a direct modulation laser. The trunk receive signal is converted into an electrical signal with an avalanche photodiode (APD), is deserialized, and is then sent to the TADM framer and FPGA.

The MXPP_MR_2.5G is the same, except a 50/50 splitter divides the power at the trunk interface. In the receive direction, there are two APDs, two SERDES blocks, and two TADM framers. This is necessary to monitor both the working and protect paths. A switch selects one of the two paths to connect to the client interface.

Figure 15-67 MXP_MR_2.5G and MXPP_MR_2.5G Block Diagram



Caution You must use a 20-dB fiber attenuator (15 to 25 dB) when working with the MXP_MR_2.5G and MXPP_MR_2.5G cards in a loopback configuration on the trunk port. Do not use direct fiber loopbacks with the MXP_MR_2.5G and MXPP_MR_2.5G cards. Using direct fiber loopbacks causes irreparable damage to the MXP_MR_2.5G and MXPP_MR_2.5G cards.

15.8.6.3 Automatic Laser Shutdown

The ALS procedure is supported on both client and trunk interfaces. On the client interface, ALS is compliant with ITU-T G.664 (6/99). On the data application and trunk interface, the switch on and off pulse duration is greater than 60 seconds. The on and off pulse duration is user-configurable. For ALS provisioning information, see the "DLP-G236 Change Client Line Settings for MXP_MR_2.5G and MXPP_MR_2.5G Cards" section on page 5-55.

15.8.6.4 MXP_MR_2.5G and MXPP_MR_2.5G Safety Labels

The MXP_MR_2.5G and MXPP_MR_2.5G cards have several safety labels that provide laser radiation and electrical shock warnings.

Figure 15-68 shows the laser radiation warning hazard level label. The faceplate of these cards are clearly labeled with warnings about the equipment radiation level. Personnel must understand all warning labels before working with these cards. The hazard level label warns the personnel against exposure to laser radiation of Class 1M limits calculated in accordance with IEC60825-1 Ed.1.2.

Figure 15-68 Laser Radiation Warning—Hazard Level Label

Figure 15-69 shows the laser source connector label. This label indicates a laser source at the optical connectors where it has been placed.

Figure 15-69 Laser Radiation Warning—Laser Source Connector Label

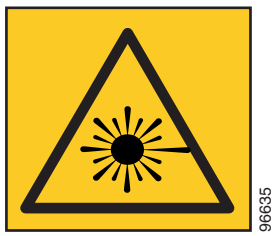


Figure 15-70 shows the FDA compliance label. This label shows the statement of compliance to FDA standards and that the hazard level classification is in accordance with IEC60825-1 Am.2 or Ed.1.2.

Figure 15-70 FDA Compliance Statement Label

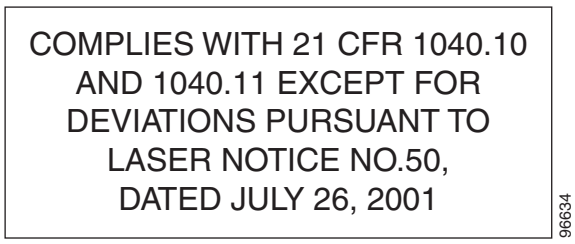


Figure 15-71 shows the electrical energy hazard label. This label alerts personnel to electrical hazards within the card. The potential of shock hazard exists when adjacent cards are removed during maintenance and touching exposed electrical circuitry on the card itself.

Figure 15-71 Electrical Energy Hazard Label

15.8.6.5 MXP_MR_2.5G and MXPP_MR_2.5G Card-Level Indicators

Table 15-66 lists the four card-level LEDs on the MXP_MR_2.5G and MXPP_MR_2.5G cards.

Table 15-66 MXP_MR_2.5G and MXPP_MR_2.5G Card-Level Indicators

Card-Level LED	Description
FAIL LED (Red)	Red indicates that the card's processor is not ready. This LED is on during reset. The FAIL LED flashes during the boot process. Replace the card if the red FAIL LED persists.
ACT/STBY LED Green (Active) Amber (Standby)	Green indicates that the card is operational (one or both ports active) and ready to carry traffic. Amber indicates that the card is operational and in standby (protect) mode.
SF LED (Amber)	Amber indicates a signal failure or condition such as LOS, LOF, or high BERs on one or more of the card's ports. The amber SF LED is also illuminated if the transmit and receive fibers are incorrectly connected. If the fibers are properly connected and the link is working, the LED turns off.
DWDM LED Green (Active) Amber (Protect Traffic) Red (LOS)	Green indicates that the board is carrying traffic (active) on the interface. When the LED is amber, it indicates that the interface is carrying protect traffic in a splitter protection card (MXPP_MR_2.5G). A red LED indicates that the interface has detected an LOS or LOC.

15.8.6.6 MXP_MR_2.5G and MXPP_MR_2.5G Port-Level Indicators

Table 15-67 lists the eight port-level LEDs on the MXP_MR_2.5G and MXPP_MR_2.5G cards.

Table 15-67 MXP_MR_2.5G and MXPP_MR_2.5G Port-Level Indicators

Port-Level LED	Description
Client LEDs (eight LEDs)	Green indicates that the port is carrying traffic (active) on the interface. Amber indicates that the port is carrying protect traffic (MXPP_MR_2.5G). Red indicates that the port has detected a loss of signal.

15.9 Transponder and Muxponder Protection

Two types of protection are available:

- Y-cable protection
- Splitter protection

15.9.1 Y-Cable Protection

Y-cable protection is available for the following ONS 15454 transponder and muxponder cards:

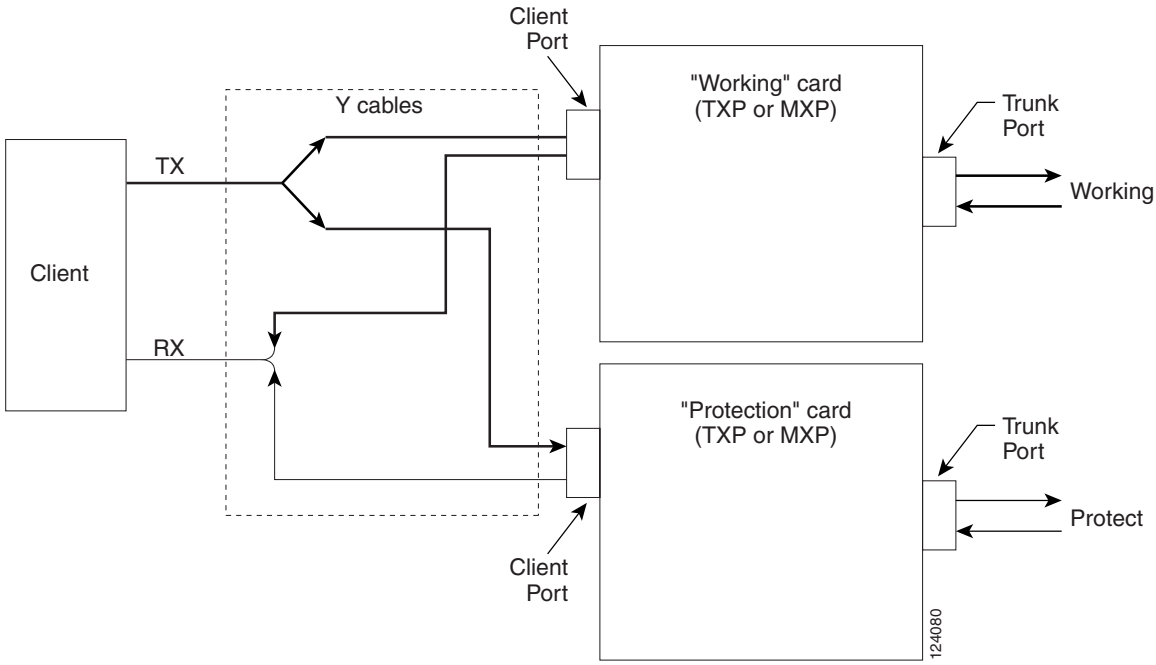
- TXP_MR_10G
- TXP_MR_2.5G
- MXP_MR_2.5G
- MXP_2.5G_10G

To create Y-cable protection, you create a Y-cable protection group for two TXP or MXP cards using the CTC software, then connect the client ports of the two cards physically with a Y-cable. The single client signal is sent into the Rx Y-cable and is split between the two TXP or MXP cards. The two Tx signals from the client side of the TXP or MXP cards are combined in the TX Y-cable into a single client signal. Only the active card signal passes through as the single TX client signal. The other card must have its laser turned off to avoid signal degradation where the Y-cable joins. See the "NTP-G33 Create a Y-Cable Protection Group" procedure on page 3-36 as needed.

Figure 15-72 shows the Y-cable signal flow.

Note Loss of Signal–Payload (LOS-P) alarms, also called Incoming Payload Signal Absent alarms, can occur on a split signal if the ports are not in a Y-cable protection group.

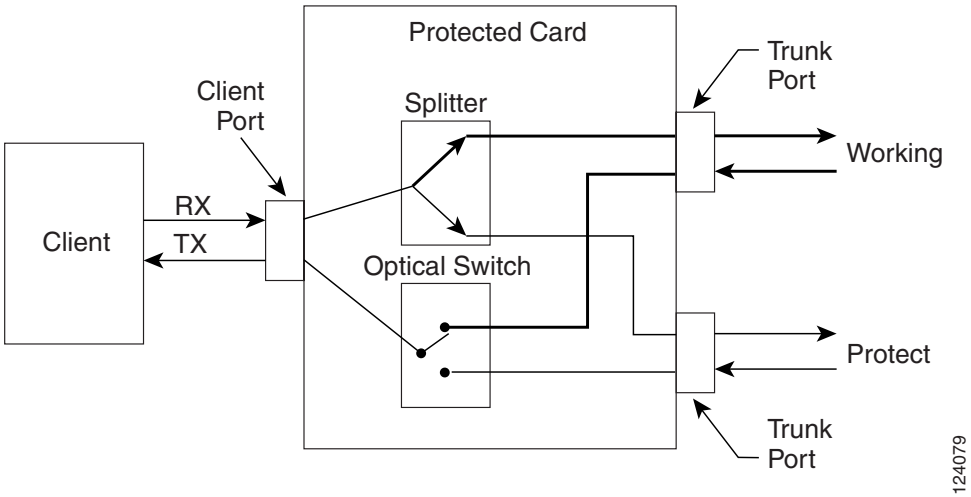
Figure 15-72 Y-Cable Protection



15.9.2 Splitter Protection

Splitter protection, shown in Figure 15-73, is provided with TXPP and MXPP cards. To implement splitter protection, a client injects a single signal into the client Rx port. An optical splitter internal to the card then splits the signal into two separate signals and routes them to the two trunk Tx ports. The two signals are transmitted over diverse optical paths. The far-end MXPP or TXPP card uses an optical switch to choose one of the two trunk Rx port signals and injects it into the Tx client port. When using splitter protection with two MXPP or TXPP cards, there are two different optical signals that flow over diverse paths in each direction. In case of failure. the far-end switch must choose the appropriate signal using its built-in optical switch. The triggers for a protection switch are LOS, LOF, SF, or SD.

Figure 15-73 Splitter Protection



You create and modify protection schemes using CTC software.

15.10 Far-End Laser Control (FELC)

The 15454 DWDM cards provide a transparent mode that accurately conveys the client input signal to the far-end client output signal. The client signal is normally carried as payload over the DWDM signals. Certain client signals, however, cannot be conveyed as payload. In particular, client LOS or LOF cannot be carried. Far-end laser control is the ability to convey an LOS or LOF from the near-end client input to the far-end client output.

If an LOS is detected on the near-end client input, the near-end trunk sets the appropriate bytes in the OTN overhead of the DWDM line. These bytes are received by the far-end trunk, and cause the far-end client laser to be turned off. When the laser is turned off, it is said to be squelched. If the near-end LOS clears, the near-end trunk clears the appropriate bytes in the OTN overhead, the far-end detects the changed bytes, and the far-end client squelch is removed.

FELC also covers the situation in which the trunk port detects that it has an invalid signal; the client is squelched so as not to propagate the invalid signal.

Payload types with the 2R mode preclude the use of OTN overhead bytes. In 2R mode, an LOS on the client port causes the trunk laser to turn off. The far end detects the LOS on its trunk receiver and squelches the client.

FELC is not provisionable. It is always enabled when the DWDM card is in Transparent mode. However, FELC signaling to the far-end is only possible when ITU-T G.709 is enabled on both ends of the trunk span.

15.11 Jitter Considerations

Jitter introduced by the SFPs used in the transponders and muxponders must be considered when cascading several cards. With TXP_MR_2.5G, TXPP_MR_2.5G, MXP_MR_2.5G, MXPP_MR_2.5G, and TXP_MR_10E cards, several transponders can be cascaded before the cumulative jitter violates the jitter specification. The recommended limit is 20 cards. With TXP_MR_10G cards, you can also cascade several cards, although the recommended limit is 12 cards. With MXP_2.5G_10G and MXP_2.5G_10E

cards, any number of cards can be cascaded as long as the maximum reach between any two is not exceeded. This is because any time the signal is demultiplexed, the jitter is eliminated as a limiting factor.

The maximum reach between one transponder and the other must be halved if a Y cable is used. For more information on Y-cable operation, see the "15.9.1 Y-Cable Protection" section on page 15-114.

15.12 Termination Modes

Transponder and muxponder cards have various SONET and SDH termination modes that can be configured using CTC (see Chapter 11, "Change DWDM Card Settings"). The termination modes are summarized in Table 15-68.

Table 15-68 Termination Modes

Card	Termination Modes	Description
All TXP and MXP cards, with the exception of the MXP_2.5G_10G card (see next section of this table)	Transparent Termination	All the bytes of the payload pass transparently through the ca
	Section Termination	The SONET Transport Overhead (TOH) section bytes and the regenerator section overhead bytes are terminated. None of the overhead bytes are passed through. They are all regenerated, i the SONET TOH section data communication channel (SDCC the SDH data communications channel regenerator (DCCr) by section termination mode, the SONET TOH line and SDH mu section overhead bytes are passed transparently.
	Line Termination	In line termination mode, the section and line overhead bytes f and the overhead bytes for the SDH multiplex and regenerator are terminated. None of the overhead bytes are passed through all regenerated, including the SONET SDCC and line data communication channel (LDCC) bytes and the SDH DCCr an communications channel multiplexer (DCCm) bytes.
MXP_2.5G_10G[1]	Transparent Termination	All of the client bytes of the clients passes transparently throu the following: B1 is rebuilt, S1 is rewritten, A1 to A2 are regene H1 to H3 are regenerated.
	Section Termination	The SONET TOH section bytes and the SDH regenerator sect overhead bytes are terminated. None of these section overhead passed through. They are all regenerated, including the SONE section DCC bytes and the SDH DCCr bytes. In the section te mode, the SONET TOH line and SDH multiplex section overh are passed transparently.
	Line Termination	In the line termination mode, the section and line overhead by SONET and the overhead bytes for the SDH multiplex and reg sections are terminated. None of the overhead bytes are passe They are all regenerated, including the SONET SDCC and LD and the SDH DCCr and DCCm bytes.

1. The clients operating at rates of OC48/STM16 are multiplexed into an OC192/STM64 frame before going to OTN or DWDM.

15.13 SFP and XFP Modules

This section describes the SFPs and 10-Gbps SFPs (XFPs) that can be used with some transponder and muxponder cards. To install SFPs or XFPs, see the "DLP-G63 Install an SFP or XFP" task on page 3-34. In CTC, SFPs/XFPs are called pluggable port modules (PPMs). To provision SFPs/XFPs and change the line rate for multirate PPMs, see the "NTP-G128 Manage Pluggable Port Modules" procedure on page 5-2.

15.13.1 Compatibility by Card

Table 15-65 lists the transponder and muxponder cards and their compatible SFPs/XFPs.

Caution Only use SFPs/XFPs certified for use in Cisco Optical Networking Systems (ONSs). The qualified Cisco SFP/XFP pluggable module's top assembly numbers (TANs) are provided in Table 15-65.

Table 15-69 SFP/XFP Card Compatibility

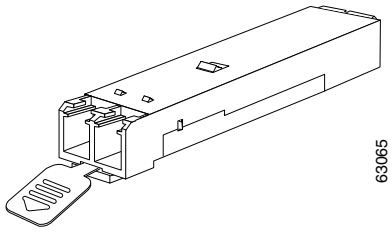
Card	ANSI Compatible SFP (Cisco Product ID)	ETSI Compatible SFP (Cisco Product ID)	Cisco Top Assembly Number (TAN)
MXP_2.5G_10G (ONS 15454 SONET/SDH)	15454-SFP-OC48-IR=	15454E-SFP-L.16.1=	10-1975-01
MXP_2.5G_10E (ONS 15454 SONET/SDH)	ONS-SE-2G-S1=	ONS-SE-2G-S1=	10-2017-01
MXP_MR_2.5G	15454-SFP-GE+-LX=	15454E-SFP-GE+-LX=	10-1832-03
MXPP_MR_2.5G	15454-SFP-GEFC-SX=	N/A	10-1833-01
	N/A	15454E-SFP-GEFC-S=	10-1833-02
TXP_MR_2.5G (ONS 15454 SONET/SDH)	15454-SFP3-1-IR=	15454E-SFP-L.1.1=	10-1828-01
TXPP_MR_2.5G (ONS 15454 SONET/SDH)	15454-SFP12-4-IR=	15454E-SFP-L.4.1=	10-1976-01
	15454-SFP-OC48-IR=	15454E-SFP-L.16.1=	10-1975-01
	ONS-SE-2G-S1=	ONS-SE-2G-S1=	10-2017-01
	15454-SFP-200=	15454E-SFP-200=	10-1750-01
	15454-SFP-GEFC-SX=	N/A	10-1833-01
	N/A	15454E-SFP-GEFC-S=	10-1833-02
	15454-SFP-GE+-LX=	N/A	10-1832-01
	N/A	15454E-SFP-GE+-LX=	10-1832-02
TXP_MR_10E (ONS 15454 SONET/SDH)	ONS-XC-10G-S1	ONS-XC-10G-S1	10-2012-01

15.13.2 SFP and XFP Description

SFPs and XFPs are integrated fiber optic transceivers that provide high-speed serial links from a port or slot to the network. Various latching mechanisms can be utilized on the SFP modules. There is no correlation between the type of latch to the model type (such as SX or LX/LH) or technology type (such as Gigabit Ethernet). See the label on the SFP or XFP for technology type and model.

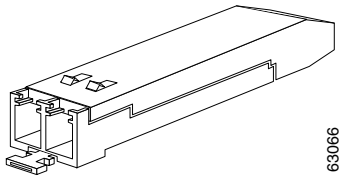
The SFPs use the latches show in the following figures. One type of latch is a mylar tab (Figure 15-74).

Figure 15-74 Mylar Tab SFP



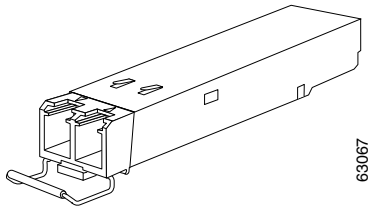
A second type of latch is an actuator/button (Figure 15-75).

Figure 15-75 Actuator/Button SFP



A third type of latch is a bail clasp (Figure 15-76).

Figure 15-76 Bail Clasp SFP



SFP dimensions are:

- Height 0.03 in. (8.5 mm)
- Width 0.53 in. (13.4 mm)
- Depth 2.22 in. (56.5 mm)

SFP temperature ranges are:

- COM—Commercial operating temperature range –5 to 70 degrees Celsius (23 to 158 degrees Fahrenheit)

- EXT—Extended operating temperature range –5 to 85 degrees Celsius (23 to 185 degrees Fahrenheit)
- IND—Industrial operating temperature range –40 to 85 degrees Celsius (–40 to 185 degrees Fahrenheit)

The XFPs uses the bail clasp latching mechanism as shown unlatched in Figure 15-77 and latched in Figure 15-78. See the label on the XFP for technology type and model.

Figure 15-77 Bail Clasp XFP (Unlatched)

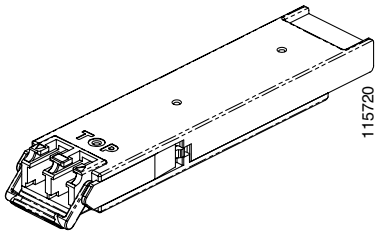
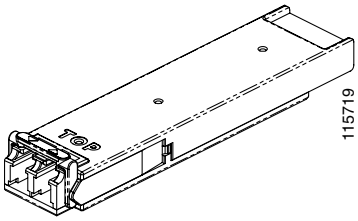


Figure 15-78 Bail Clasp XFP (Latched)



XFP dimensions are:

- Height 0.33 in. (8.5 mm)
- Width 0.72 in. (18.3 mm)
- Depth 3.1 in. (78 mm)

XFP temperature ranges are:

- COM—Commercial operating temperature range –5 to 70 degrees Celsius (23 to 158 degrees Fahrenheit)
- EXT—Extended operating temperature range –5 to 85 degrees Celsius (23 to 185 degrees Fahrenheit)
- IND—Industrial operating temperature range –40 to 85 degrees Celsius (–40 to 185 degrees Fahrenheit)

Node Reference

This chapter explains the ONS 15454 dense wavelength division multiplexing (DWDM) node types that are available for the ONS 15454. The DWDM node type is determined by the type of amplifier and filter cards that are installed in an ONS 15454. The chapter also explains the DWDM automatic power control, ROADM power equalization, span loss verification, and automatic node setup functions.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Chapter topics include:

- 16.1 DWDM Node Configurations, page 16-1
- 16.2 DWDM and TDM Hybrid Node Types, page 16-14
- 16.3 Automatic Node Setup, page 16-29

16.1 DWDM Node Configurations

The ONS 15454 supports the following DWDM node configurations: hub, terminal, OADM, reconfigurable OADM, anti-ASE, line amplifier, and OSC regeneration line.

Note The Cisco MetroPlanner tool creates a plan for amplifier placement and proper node equipment.

16.1.1 Hub Node

A hub node is a single ONS 15454 node equipped with two TCC2/TCC2P (Timing Control Card) cards and one of the following combinations:

- Two 32MUX-O (32-Channel Multiplexer) and two 32DMX-O (32-Channel Demultiplexer) or 32DMX cards
- Two 32WSS (32-Channel Wavelength Selective Switch) and two 32DMX or 32DMX-O cards

Note The 32WSS and 32DMX are normally installed in reconfigurable OADM (ROADM) nodes, but they can be installed in hub and terminal nodes. If the cards are installed in a hub node, the 32WSS express (EXP RX and EXP TX) ports are not cabled.

A Dispersion Compensation Unit (DCU) can also be added, if necessary. The hub node does not support both DWDM and time-division multiplexing (TDM) applications since the DWDM slot requirements do not leave room for TDM cards. Figure 16-1 shows a hub node configuration with 32MUX-O and 32DMX-O cards installed.

Note The optical add/drop multiplexing (OADM) AD-xC-xx.x or AD-xB-xx.x cards are not part of a hub node because the 32MUX-O and 32DMX-O cards drop and add all 32 channels; therefore, no other cards are necessary.

Figure 16-1 Hub Node Configuration Example

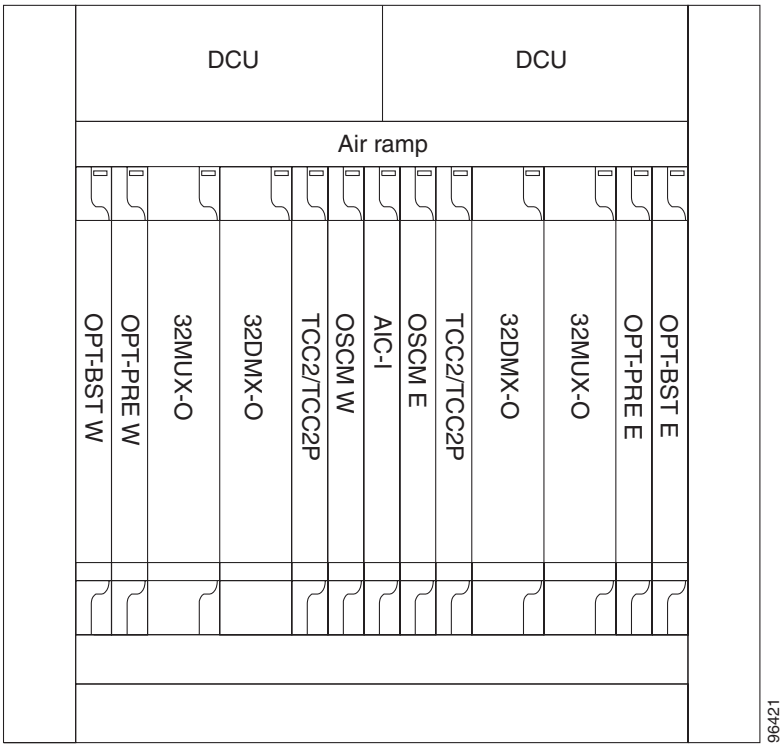
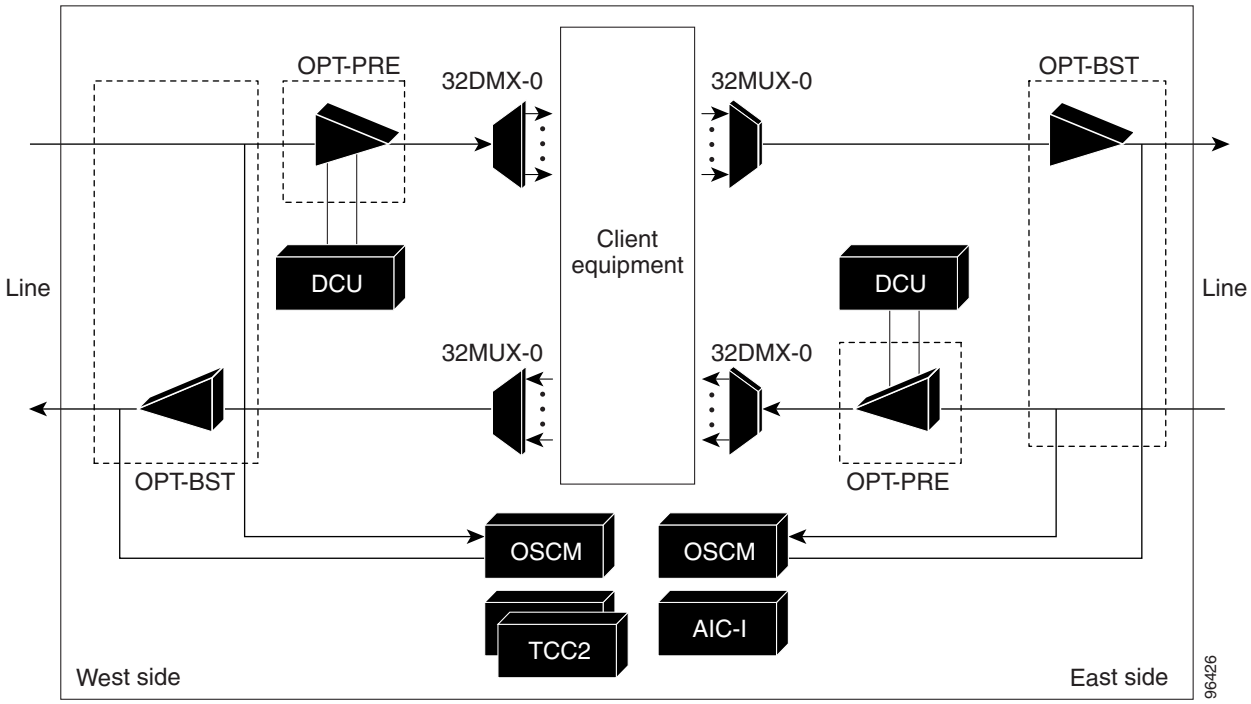


Figure 16-2 shows the channel flow for a hub node. Up to 32-channels from the client ports are multiplexed and equalized onto one fiber using the 32MUX-O card. Then, multiplexed channels are transmitted on the line in the eastward direction and fed to the Optical Booster (OPT-BST) amplifier. The output of this amplifier is combined with an output signal from the Optical Service Channel Modem (OSCM) card and transmitted toward the east line.

Received signals from the east line port are split between the OSCM card and an Optical Preamplifier (OPT-PRE). Dispersion compensation is applied to the signal received by the OPT-PRE amplifier, and it is then sent to the 32DMX-O card, which demultiplexes and attenuates the input signal. The west receive fiber path is identical through the west OPT-BST amplifier, the west OPT-PRE amplifier, and the west 32DMX-O card.

Figure 16-2 Hub Node Channel Flow Example



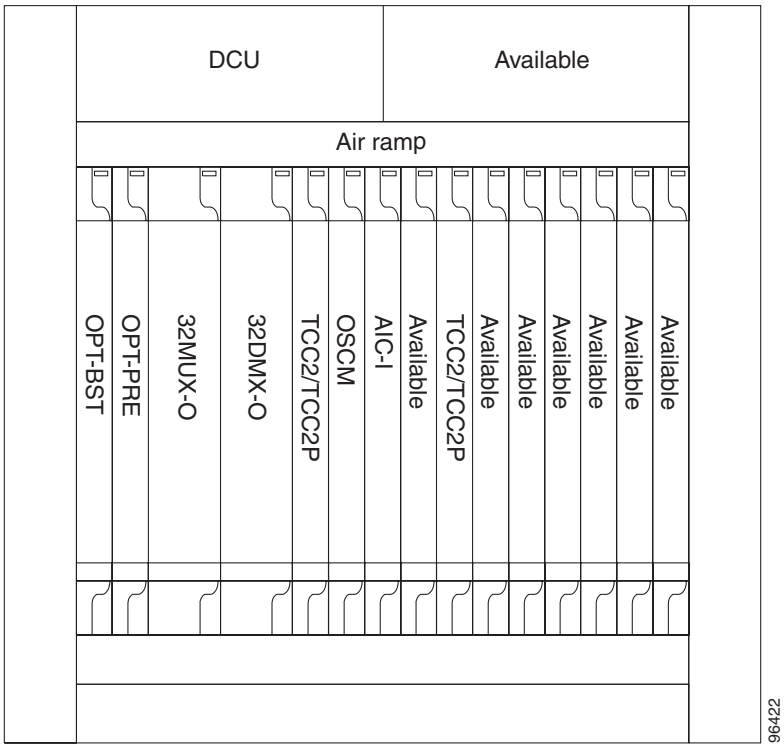
16.1.2 Terminal Node

A terminal node is a single ONS 15454 node equipped with two TCC2/TCC2P cards and one of the following combinations:

- One 32MUX-O card and one 32DMX-O card
- One 32WSS and either a 32DMX or a 32DMX-O cards

Terminal nodes can be either east or west. In west terminal nodes, the cards are installed in the east slots (Slots 1 through 6). In east terminal nodes, cards are installed in the west slots (Slots 12 through 17). Figure 16-3 shows an example of an east terminal configuration with a 32MUX-O and 32DMX-O cards installed. The channel flow for a terminal node is the same as the hub node (Figure 16-2).

Figure 16-3 Terminal Node Configuration Example



16.1.3 OADM Node

An OADM node is a single ONS 15454 node equipped with cards installed on both sides and at least one AD-xC-xx.x card or one AD-xB-xx.x card and two TCC2/TCC2P cards. 32MUX-O or 32DMX-O cards cannot be installed in an OADM node. In an OADM node, channels can be added or dropped independently from each direction, and then passed through the reflected bands of all OADMs in the DWDM node (called express path). They can also be passed through one OADM card to another OADM card without using a TDM ITU line card (called optical passthrough) if an external patch cord is installed.

Unlike express path, an optical passthrough channel can be converted later to an add/drop channel in an altered ring without affecting another channel. OADM amplifier placement and required card placement is determined by the Cisco MetroPlanner tool or your site plan.

OADM nodes can be amplified or passive. In amplified OADMs, the OPT-PRE and the OPT-BST amplifiers are installed on the east and west sides of the node. Figure 16-4 shows an example of an amplified OADM node configuration.

Figure 16-4 Amplified OADM Node Configuration Example

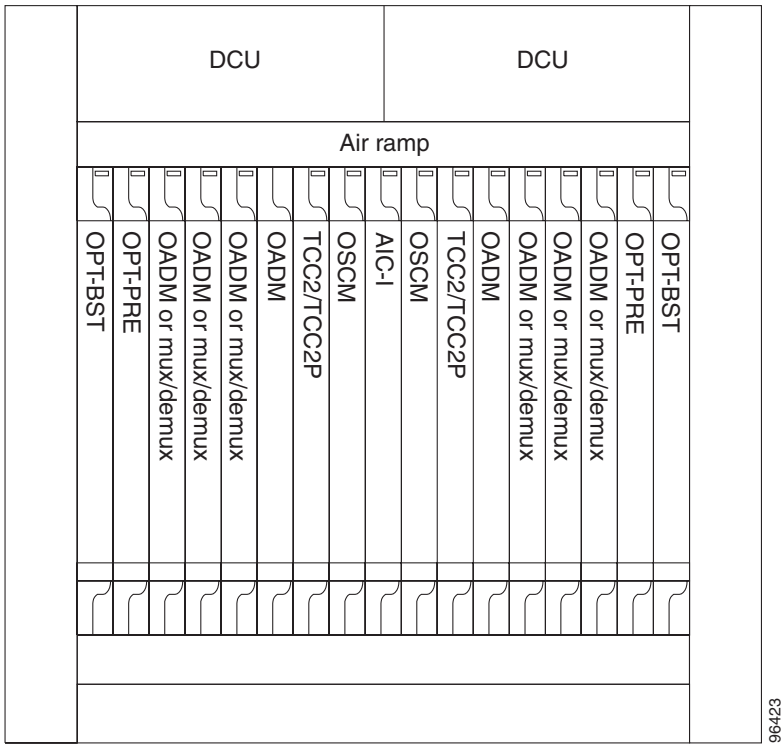


Figure 16-5 shows an example of the channel flow on the amplified OADM node. Since the 32-wavelength plan is based on eight bands (each band contains four channels), optical adding and dropping can be performed at the band level and/or at the channel level (meaning individual channels can be dropped).

Figure 16-5 Amplified OADM Node Channel Flow Example

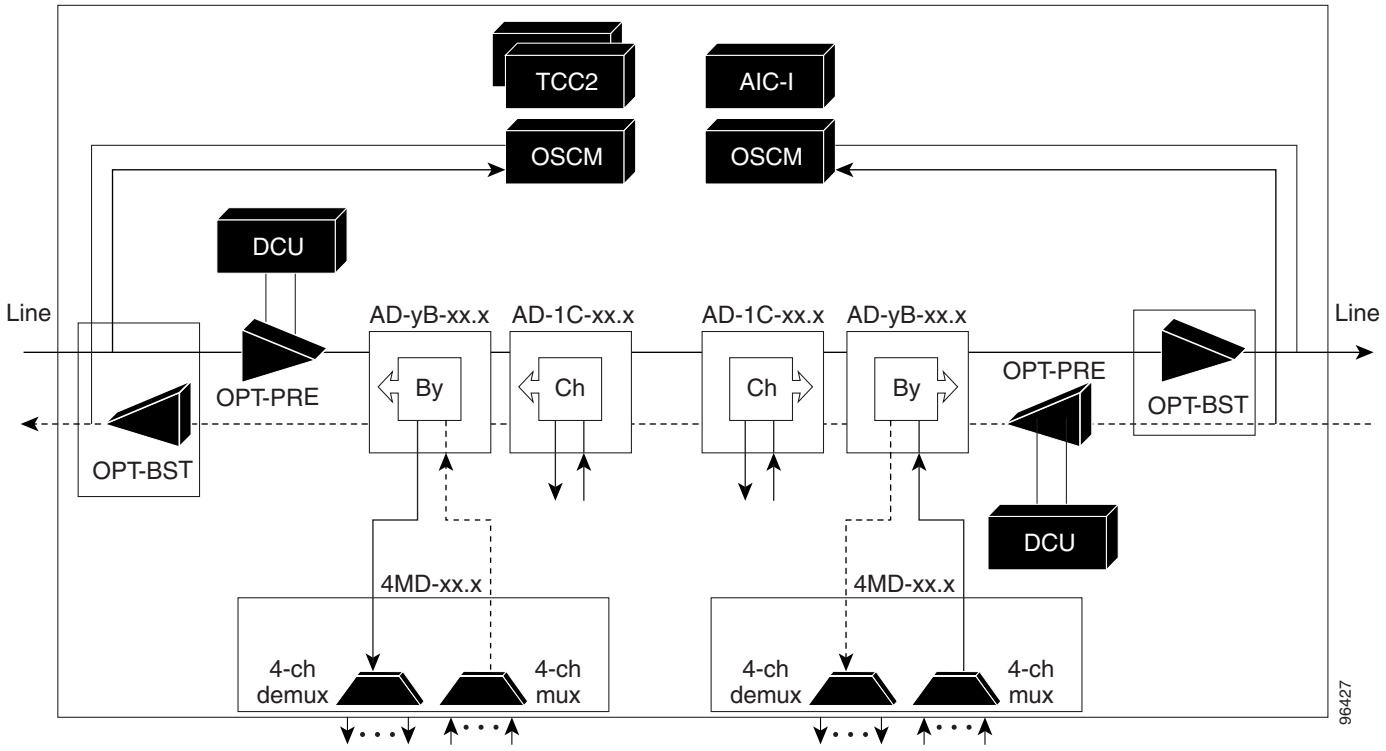


Figure 16-6 shows an example of a passive OADM node configuration. The passive OADM node is equipped with a band filter, one four-channel multiplexer/demultiplexer, and a channel filter on each side of the node.

Figure 16-6 Passive OADM Node Configuration Example

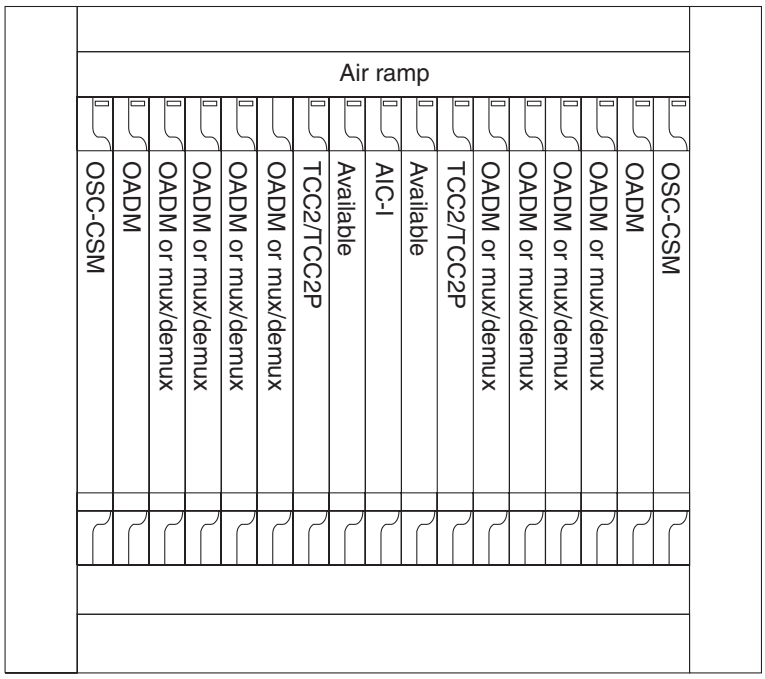
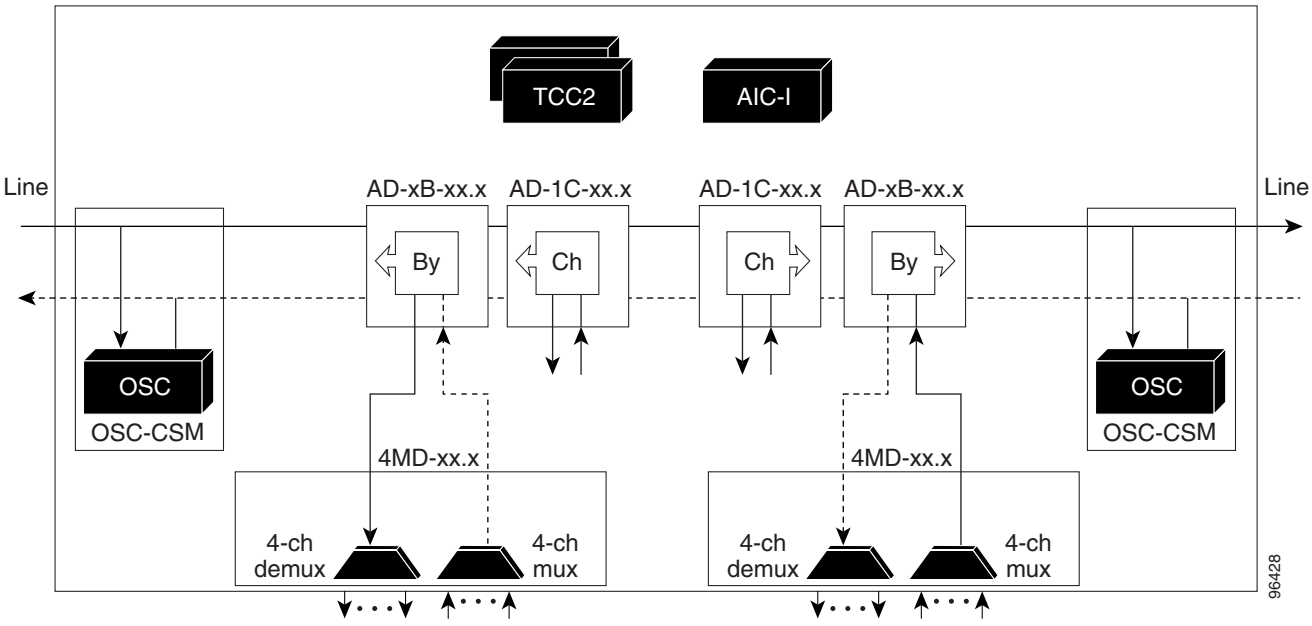


Figure 16-7 shows an example of traffic flow on the passive OADM node. The signal flow of the channels is the same as the amplified OADM, except that the Optical Service Channel and Combiner/Separator Module (OSC-CSM) card is used instead of the OPT-BST amplifier and the OSCM card.

Figure 16-7 Passive OADM Node Channel Flow Example



16.1.4 ROADM Node

A reconfigurable OADM (ROADM) node allows you to add and drop wavelengths without changing the physical fiber connections. ROADM nodes are equipped with two 32WSS cards. 32DMX or 32DMX-O demultiplexers are typically installed, but are not required. Transponders (TXPs) and muxponders (MXPs) can be installed in Slots 6 and 12 and, if amplification is not used, in any open slot. Figure 16-8 shows an example of an amplified ROADM node configuration.

Both 32DMX-O and 32-DMX cards can be used in ROADM nodes. Cisco MetroPlanner automatically determines at ROADM Node level which Demultiplexer to use based on the overall Network design.

Note Both 32DMX-O and 32DMX cards can be used in an ROADM node. Cisco Metroplanner automatically chooses the demultiplexer to use for the ROADM node based on the overall network requirements.

Figure 16-8 ROADM Node with BST-PRE, OPT-BST, and 32DMX Cards Installed

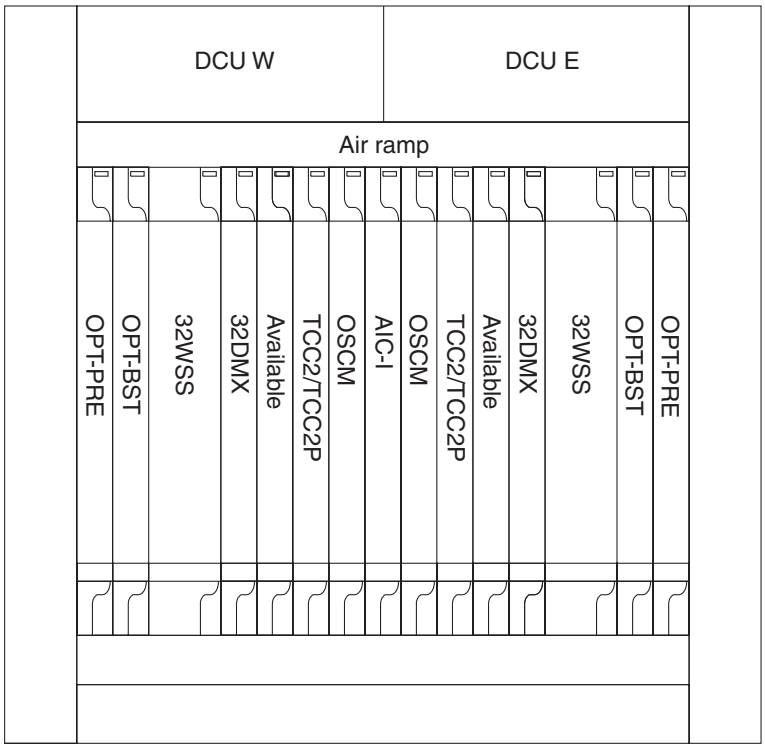


Figure 16-9 shows an example of an ROADM with 32DMX-O cards installed.

Figure 16-9 ROADM Node with BST-PRE, OPT-BST, and 32DMX-O Cards Installed

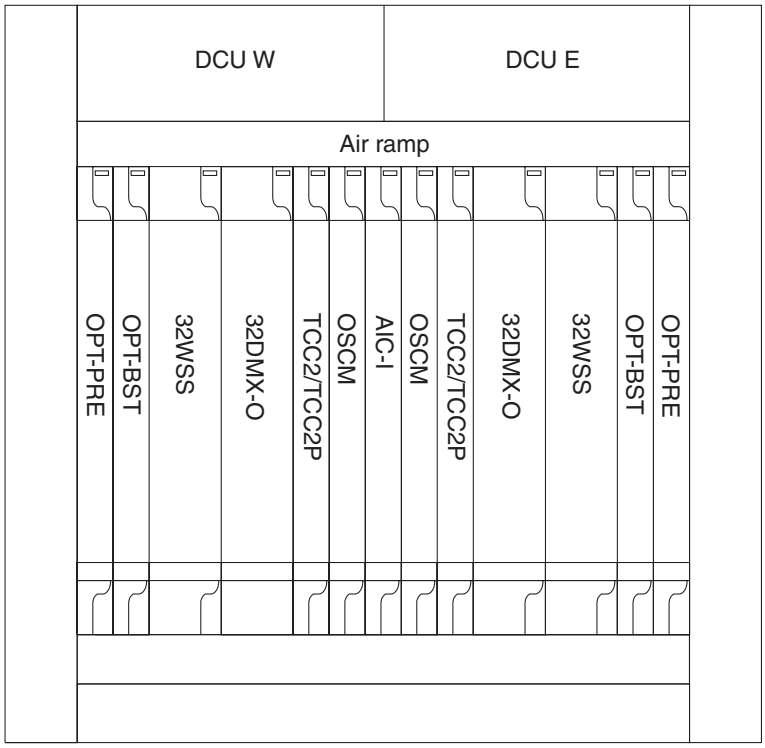
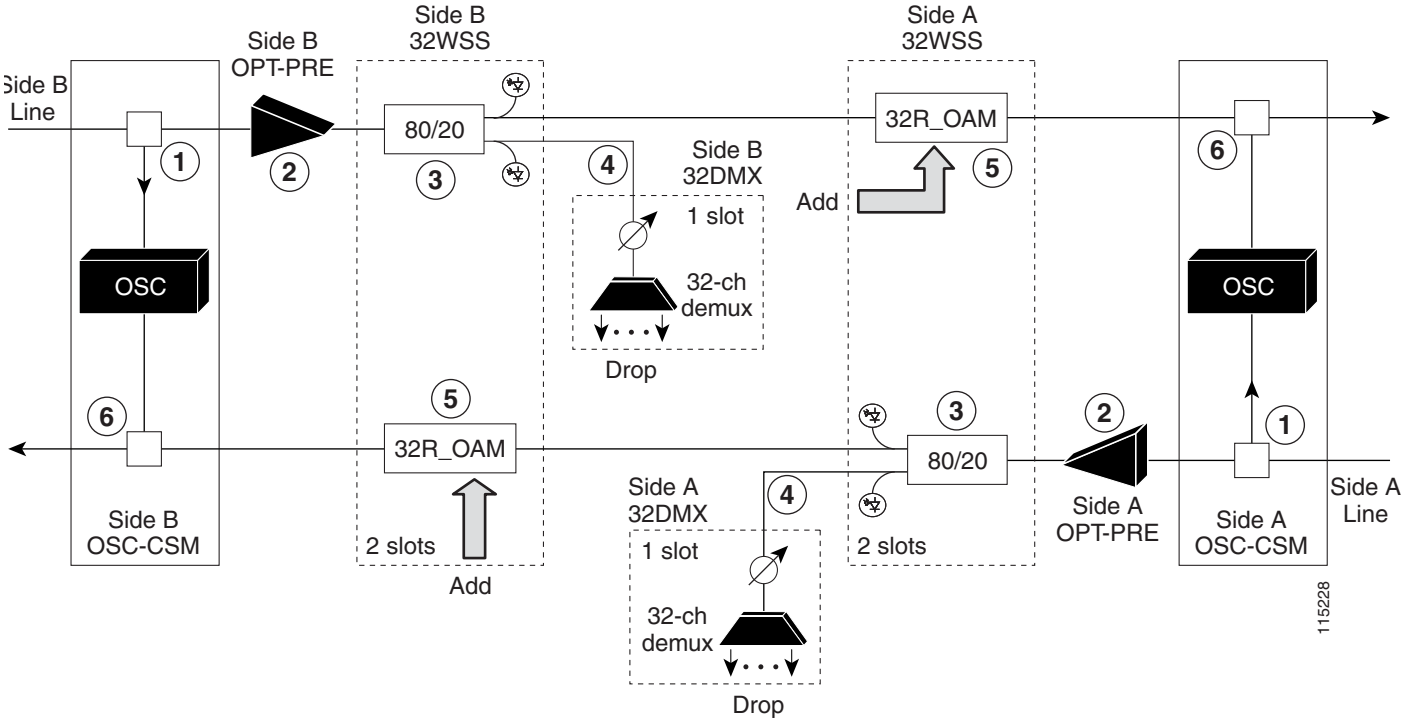


Figure 16-10 shows an example of a reconfigurable OADM east-to-west optical signal flow. The west-to-east optical signal flow follows an identical path through the west OSC-CSM and west 32WSS modules. In this example, OSC-CSM modules are installed so OPT-BST modules are not needed.

Figure 16-10 ROADM Optical Signal Flow Example



1	The OSC-CSM receives the optical signal. It separates the optical service channel from the optical payload and sends the payload to the OPT-PRE module.
2	The OPT-PRE compensates for chromatic dispersion, amplifies the optical payload, and sends it to the 32WSS.
3	The 32WSS splits the signal into two components. The 80% component is sent to the DROP-TX port and the 20% component is sent to the EXP-TX port.
4	The drop component goes to the 32DMX where it is de-multiplexed and dropped.
5	The express wavelength aggregate signal goes to the 32WSS on the other side where it is de-multiplexed. Channels are stopped or forwarded based upon their switch states. Forwarded wavelengths are merged with those coming from the ADD path and sent to the OSC-CSM module.
6	The OSC-CSM combines the multiplexed payload with the OSC and sends the signal out the transmission line.

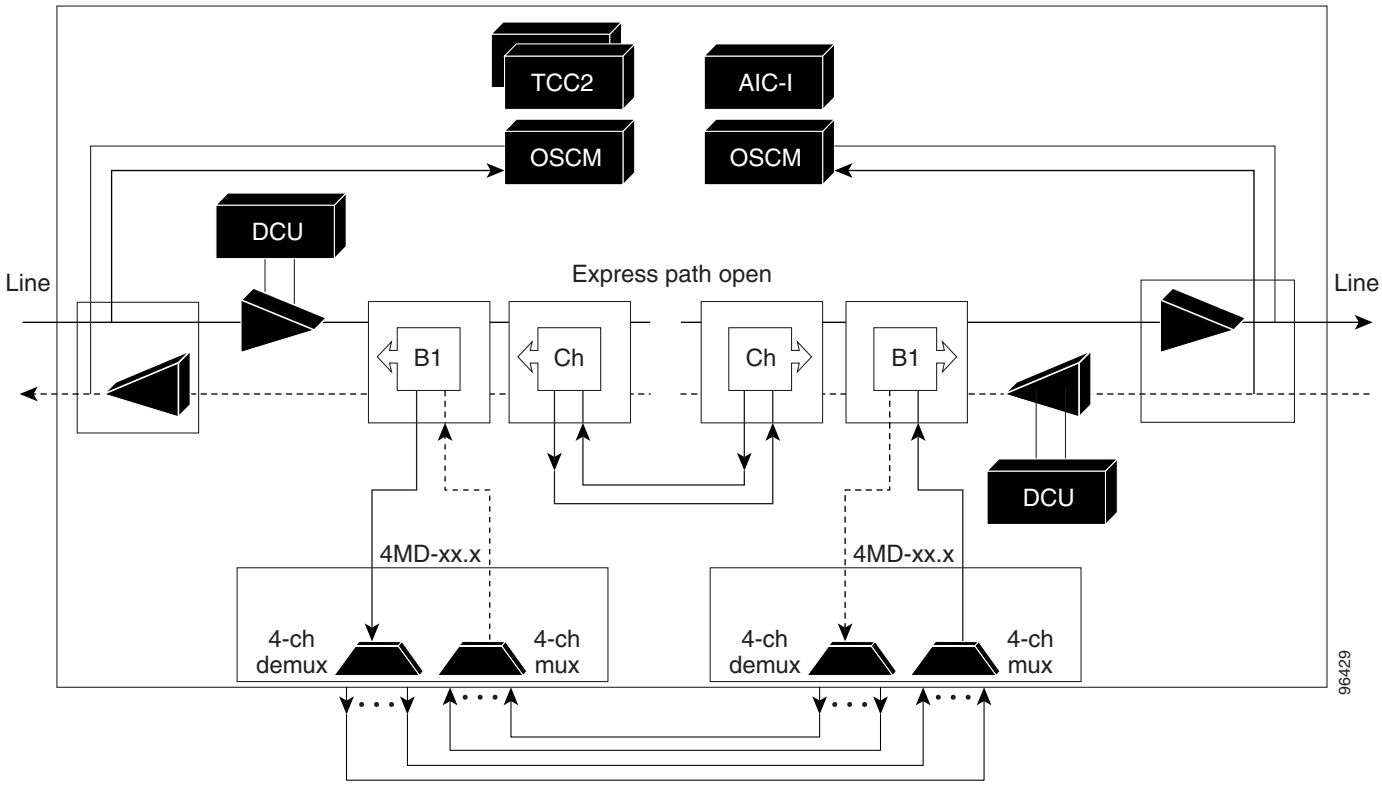
16.1.5 Anti-ASE Node

In a meshed ring network, the ONS 15454 requires a node configuration that prevents amplified spontaneous emission (ASE) accumulation and lasing. An anti-ASE node can be created by configuring a hub node or an OADM node with some modifications. No channels can travel through the express path, but they can be demultiplexed and dropped at the channel level on one side and added and multiplexed on the other side.

The hub node is the preferred node configuration when some channels are connected in passthrough mode. For rings that require a limited number of channels, combine AD-xB-xx.x and 4MD-xx.x cards, or cascade AD-xC-xx.x cards. See Figure 16-5 on page 16-6.

Figure 16-11 shows an anti-ASE node that uses all wavelengths in the passthrough mode. Use Cisco MetroPlanner to determine the best configuration for anti-ASE nodes.

Figure 16-11 Anti-ASE Node Channel Flow Example

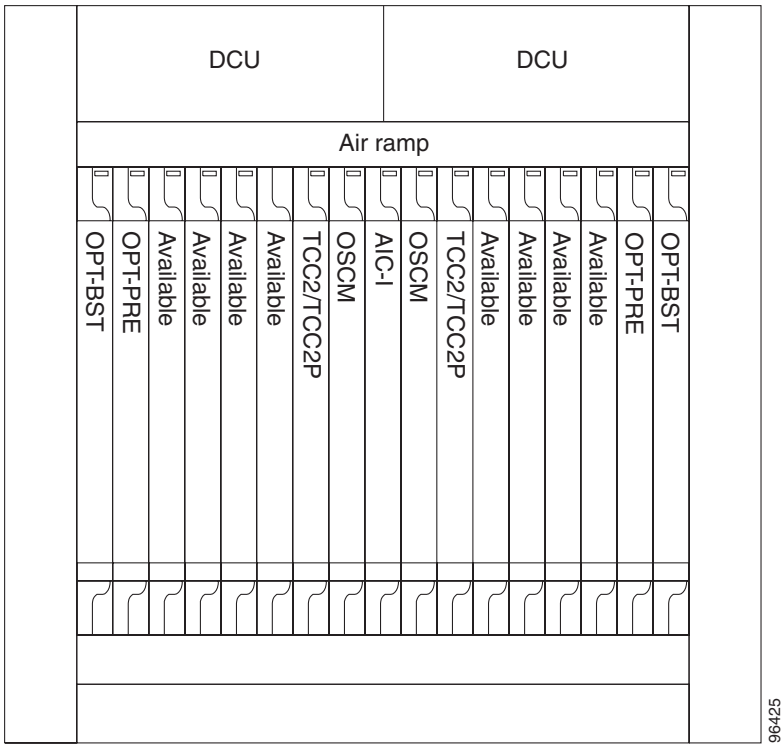


16.1.6 Line Amplifier Node

A line amplifier node is a single ONS 15454 node equipped with OPT-PRE amplifiers or OPT-BST amplifiers and TCC2/TCC2P cards. Attenuators might also be required between each preamplifier and booster amplifier to match the optical input power value and to maintain the amplifier gain tilt value.

Two OSCM cards are connected to the east or west ports of the booster amplifiers to multiplex the optical service channel (OSC) signal with the pass-though channels. If the node does not contain OPT-BST amplifiers, you must use OSC-CSM cards rather than OSCM cards in your configuration. Figure 16-12 shows an example of a line node configuration.

Figure 16-12 Line Amplifier Node Configuration Example



16.1.7 OSC Regeneration Node

The OSC regeneration node is added to the DWDM networks for two purposes:

- To electrically regenerate the OSC channel whenever the span links are 37 dB or longer and payload amplification and add/drop capabilities are not present. Cisco MetroPlanner places an OSC regeneration node in spans longer than 37 dB. 31 dB is the longest span between the OSC regeneration node and the next DWDM network site.
- To add data communications network (DCN) capability wherever needed within the network.

OSC regeneration nodes require two OSC-CSM cards, as shown in Figure 16-13.

Figure 16-13 OSC Regeneration Line Node Configuration Example

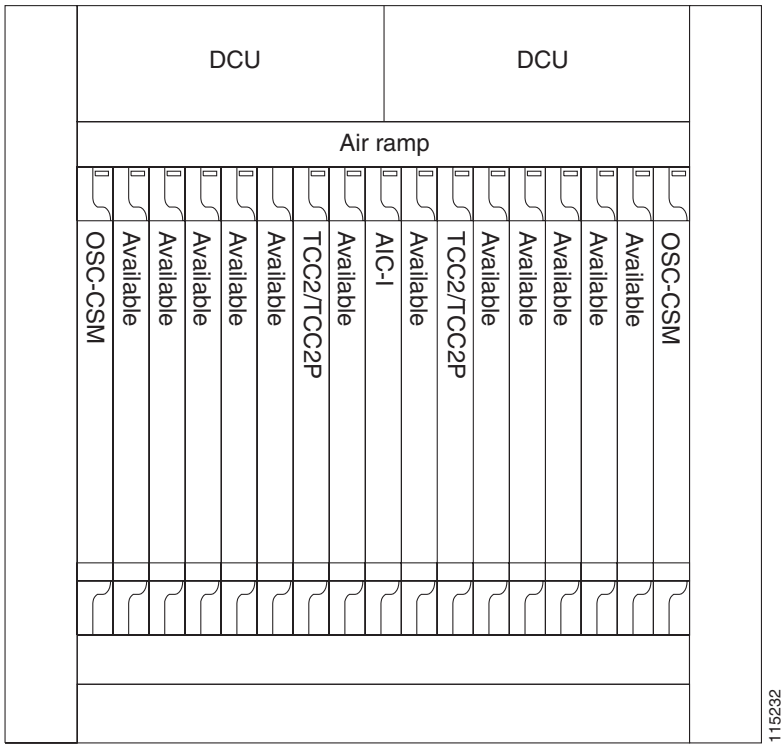
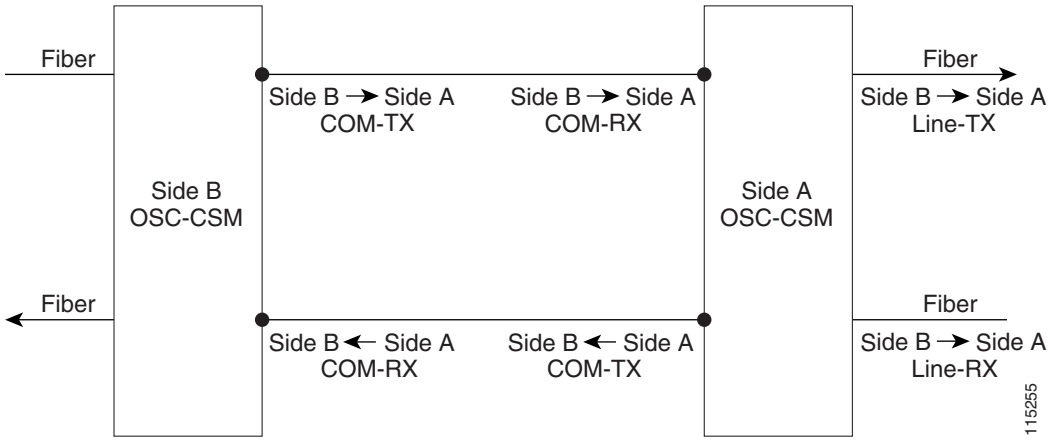


Figure 16-14 shows the OSC regeneration line node OSC signal flow.

Figure 16-14 OSC Regeneration Line Node Flow



16.2 DWDM and TDM Hybrid Node Types

The node type in a network configuration is determined by the type of card that is installed in an ONS 15454 hybrid node. The ONS 15454 supports the following hybrid DWDM and TDM node types: 1+1 protected flexible terminal, scalable terminal, hybrid terminal, hybrid OADM, hybrid line amplifier, and amplified TDM.

Note The MetroPlanner tool creates a plan for amplifier placement and proper equipment for DWDM node configurations. Although TDM cards can be used with DWDM node configuration, the MetroPlanner tool does not create a plan for TDM card placement. MetroPlanner will support TDM configurations in a future release.

16.2.1 1+1 Protected Flexible Terminal Node

The 1+1 protected flexible terminal node is a single ONS 15454 node equipped with a series of OADM cards acting as a hub node configuration. This configuration uses a single hub or OADM node connected directly to the far-end hub or OADM node through four fiber links. This node type is used in a ring configured with two point-to-point links. The advantage of the 1+1 protected flexible terminal node configuration is that it provides path redundancy for 1+1 protected TDM networks (two transmit paths and two receive paths) using half of the DWDM equipment that is usually required. In the following example (Figure 16-15), one node transmits traffic to the other node on both east and west sides of the ring for protection purposes. If the fiber is damaged on one side of the ring, traffic still arrives safely through fiber on the other side of the ring.

Figure 16-15 Double Terminal Protection Configuration

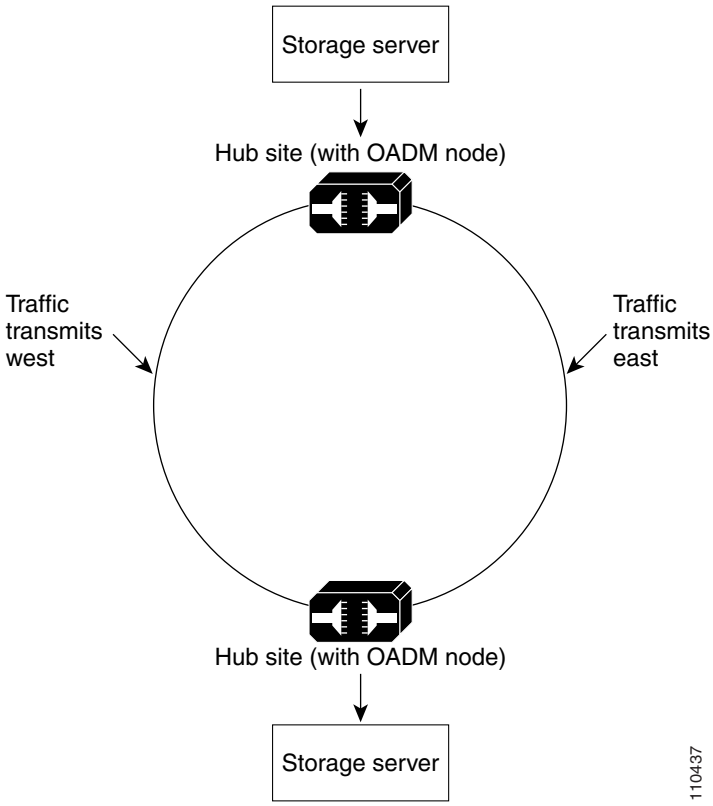


Figure 16-16 shows a 1+1 protected single-span link with hub nodes. This node type cannot be used in a hybrid configuration.

Figure 16-16 1+1 Protected Single-Span Link with Hub Nodes

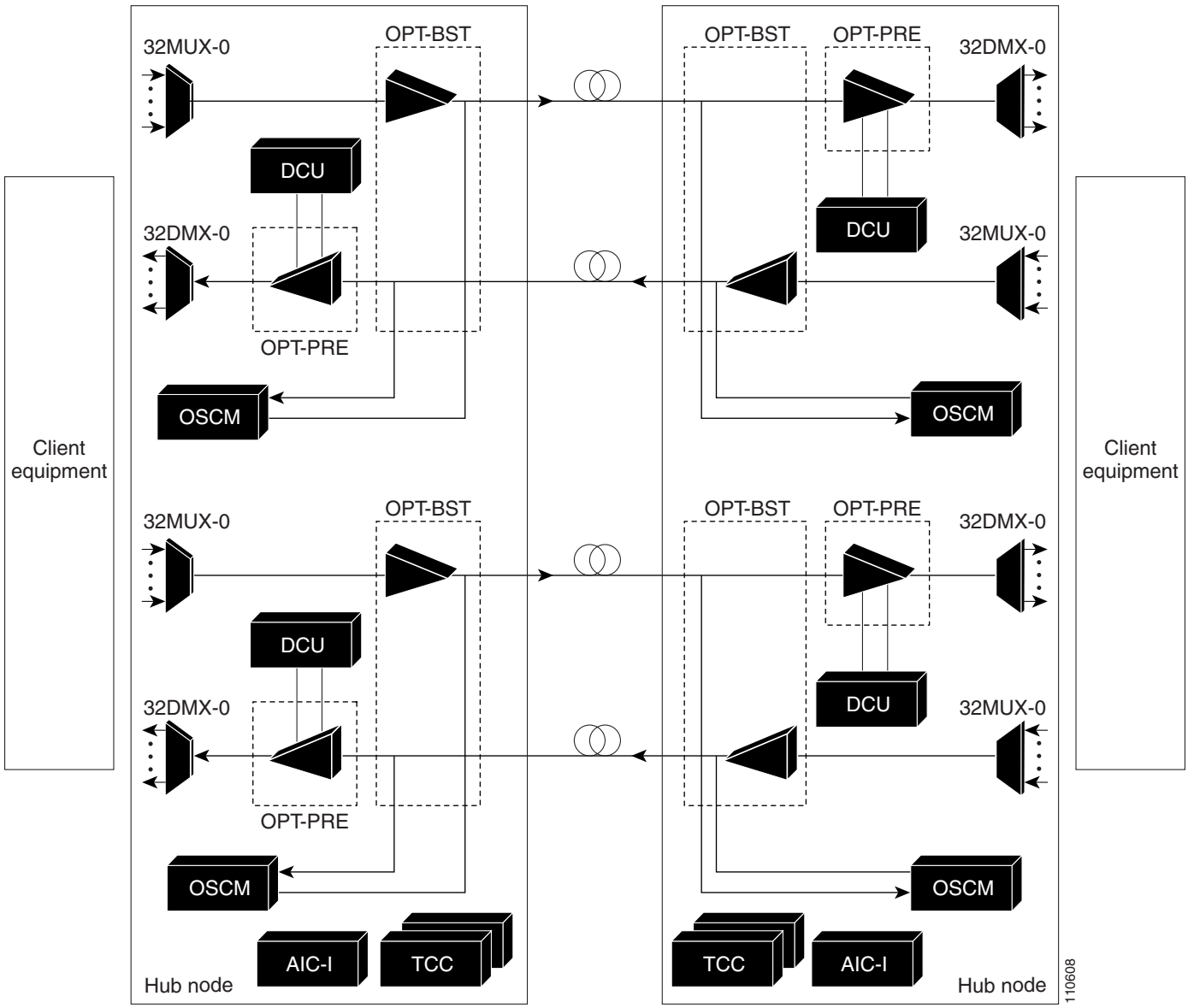


Figure 16-17 shows a 1+1 protected single-span link with active OADM nodes. This node type can be used in a hybrid configuration.

Figure 16-17 1+1 Protected Single-Span Link with Active OADM Nodes

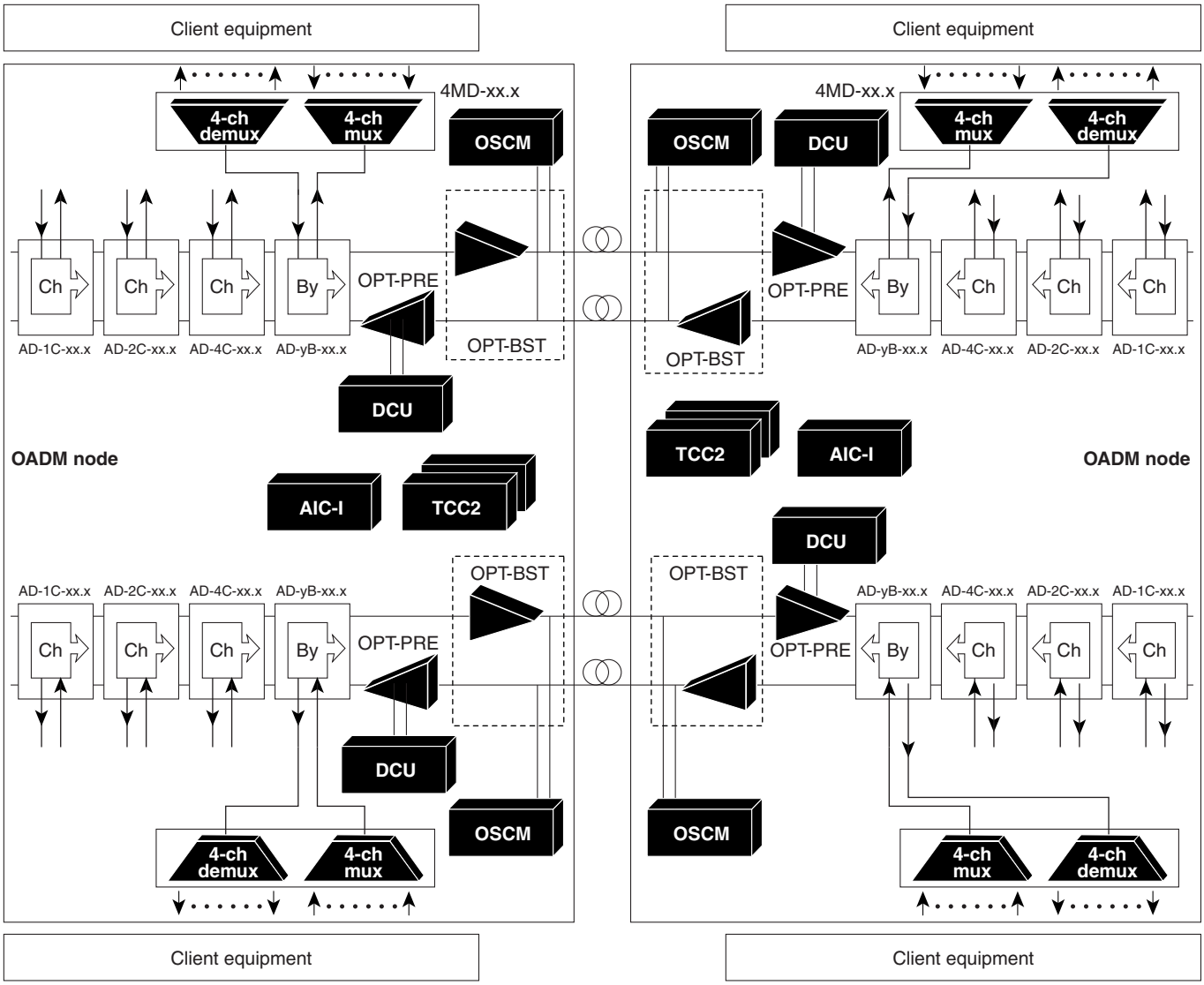
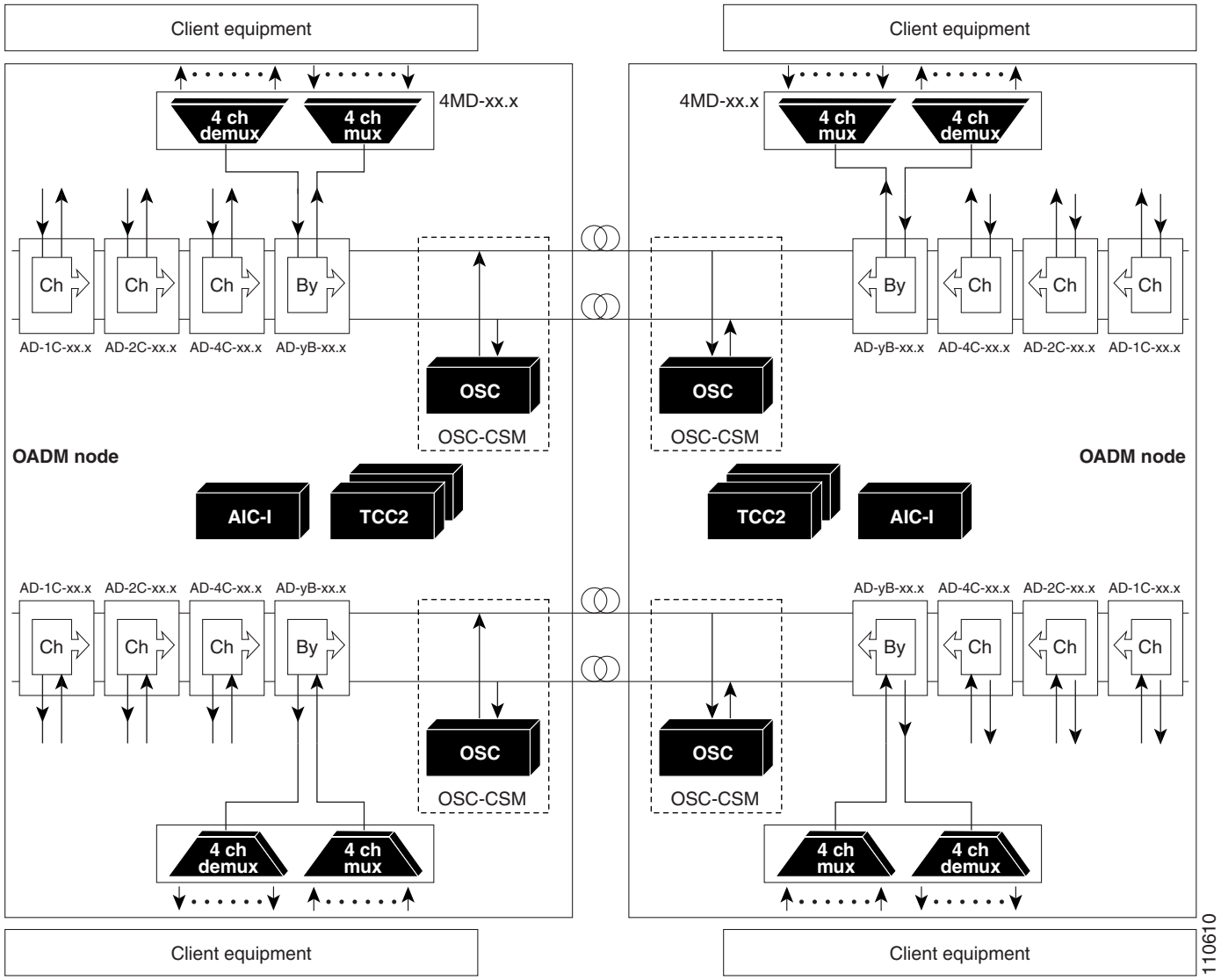


Figure 16-18 shows a 1+1 protected single-span link with passive OADM nodes. This node type can be used in a hybrid configuration.

Figure 16-18 1+1 Protected Single-Span Link with Passive OADM Nodes



16.2.2 Scalable Terminal Node

The scalable terminal node is a single ONS 15454 node equipped with a series of OADM cards and amplifier cards. This node type is more cost effective if a maximum of 16 channels are used (Table 16-1). This node type does not support a terminal configuration exceeding 16 channels because the 32-channel terminal site is more cost effective for 17 channels and beyond.

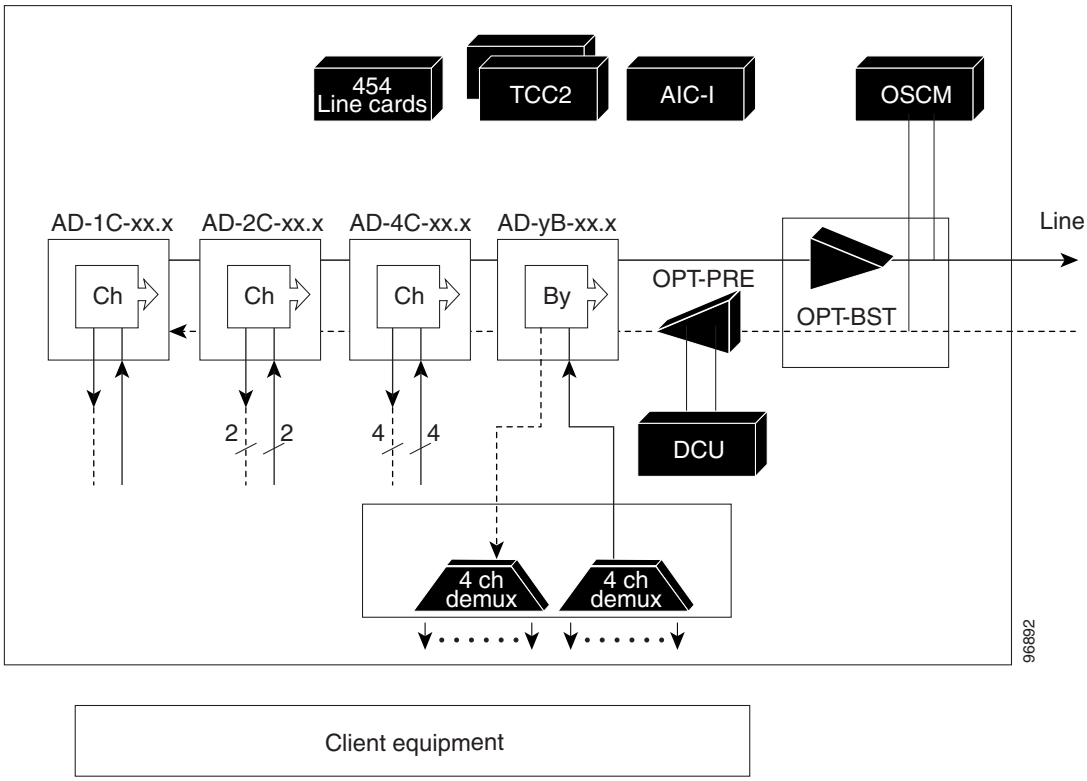
Note The dash (—) in the following table below means not applicable.

Table 16-1 Typical AD Configurations for Scalable Terminal Nodes

Number of Channels	Terminal Configuration	
	Option 1	Option 2
1	AD-1C-xx.x	—
2	AD-2C-xx.x	—
3	AD-4C-xx.x	AD-1B-xx.x + 4MD-xx.x
4	AD-4C-xx.x	AD-1B-xx.x + 4MD-xx.x
5	AD-1C-xx.x + AD-4C-xx.x	AD-1C-xx.x + AD-1B-xx.x + 4MD-xx.x
6	AD-2C-xx.x + AD-4C-xx.x	AD-2C-xx.x + AD-1B-xx.x + 4MD-xx.x
7	2 x AD-4C-xx.x	2 x (AD-1B-xx.x + 4MD-xx.x)
8	2 x AD-4C-xx.x	2 x (AD-1B-xx.x + 4MD-xx.x)
9	AD-1C-xx.x + (2 x AD-4C-xx.x)	AD-1C-xx.x + 2 x (AD-1B-xx.x + 4MD-xx.x)
10	AD-2C-xx.x + (2 x AD-4C-xx.x)	AD-2C-xx.x + 2 x (AD-1B-xx.x + 4MD-xx.x)
11	3 x AD-4C-xx.x	AD-4B-xx.x + (3 x 4MD-xx.x)
12	3 x AD-4C-xx.x	AD-4B-xx.x + (3 x 4MD-xx.x)
13	AD-4B-xx.x + (3 x 4MD-xx.x) + AD-1C-xx.x	AD-4B-xx.x + (4 x 4MD-xx.x)
14	AD-4B-xx.x + (3 x 4MD-xx.x) + AD-1C-xx.x	AD-4B-xx.x + (4 x 4MD-xx.x)
15	—	AD-4B-xx.x + (4 x 4MD-xx.x)
16	—	AD-4B-xx.x + (4 x 4MD-xx.x)

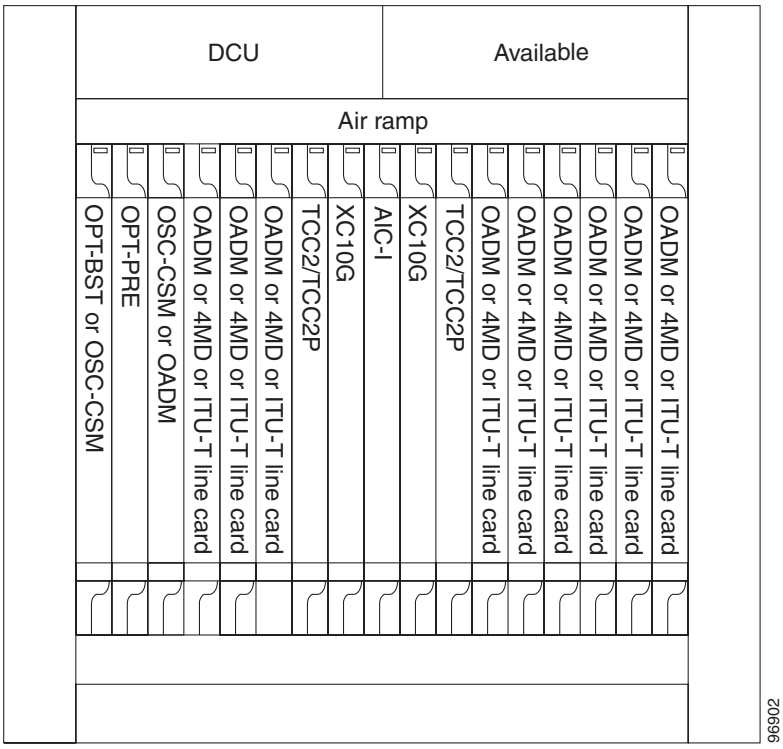
The OADM cards that can be used in this type of node are: AD-1C-xx.x, AD-2C-xx.x, AD-4C-xx.x, and AD-1B-xx.x. You can also use AD-4B-xx.x and up to four 4MD-xx.x cards. The OPT-PRE and/or OPT-BST amplifiers can be used. The OPT-PRE or OPT-BST configuration depends on the node loss and the span loss. When the OPT-BST is not installed, the OSC-CSM must be used instead of the OSCM card. Figure 16-19 on page 16-20 shows a channel flow example of a scalable terminal node configuration.

Figure 16-19 Scalable Terminal Channel Flow Example



A scalable terminal node can be created by using band and/or channel OADM filter cards. This node type is the most flexible of all node types because the OADM filter cards can be configured to accommodate node traffic. If the node does not contain amplifiers, it is considered a passive hybrid terminal node. Figure 16-20 shows an example of a scalable terminal node configuration. This node type can be used without add or drop cards.

Figure 16-20 Scalable Terminal Example



16.2.3 Hybrid Terminal Node

A hybrid terminal node is a single ONS 15454 node equipped with at least one 32 MUX-O card, one 32 DMX-O card, two TCC2/TCC2P cards, and TDM cards. If the node is equipped with OPT-PRE or OPT-BST amplifiers, it is considered an amplified terminal node. The node becomes passive if the amplifiers are removed. The hybrid terminal node type is based on the DWDM terminal node type described in the "16.1.2 Terminal Node" section on page 16-3. Figure 16-21 shows an example of an amplified hybrid terminal node configuration.

Figure 16-21 Amplified Hybrid Terminal Example

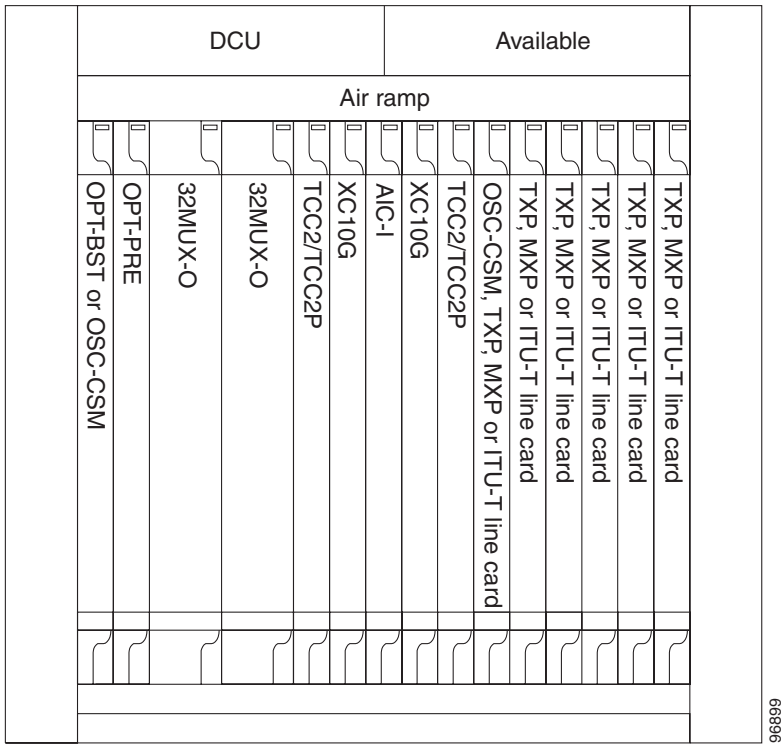
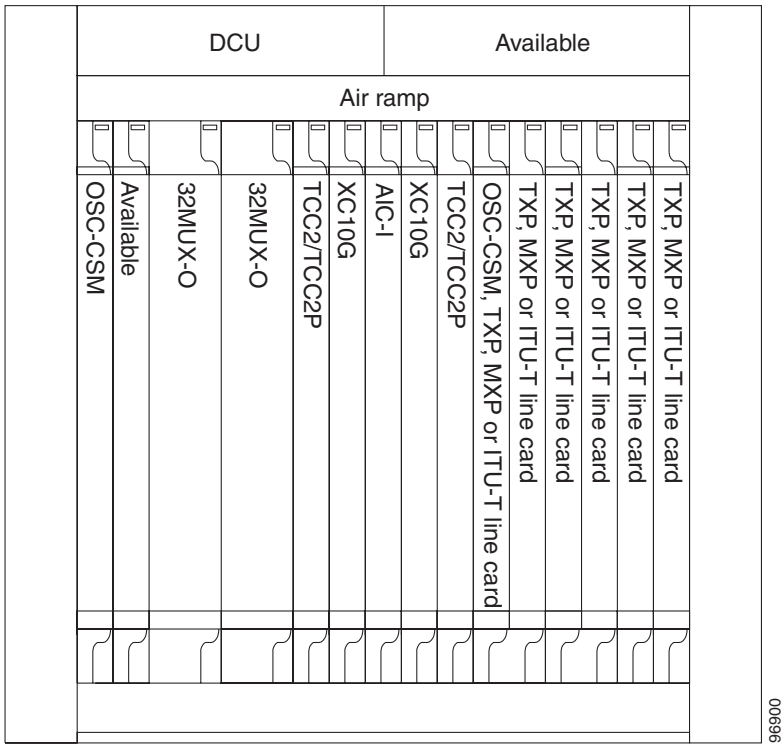


Figure 16-22 shows an example of a passive hybrid terminal node configuration.

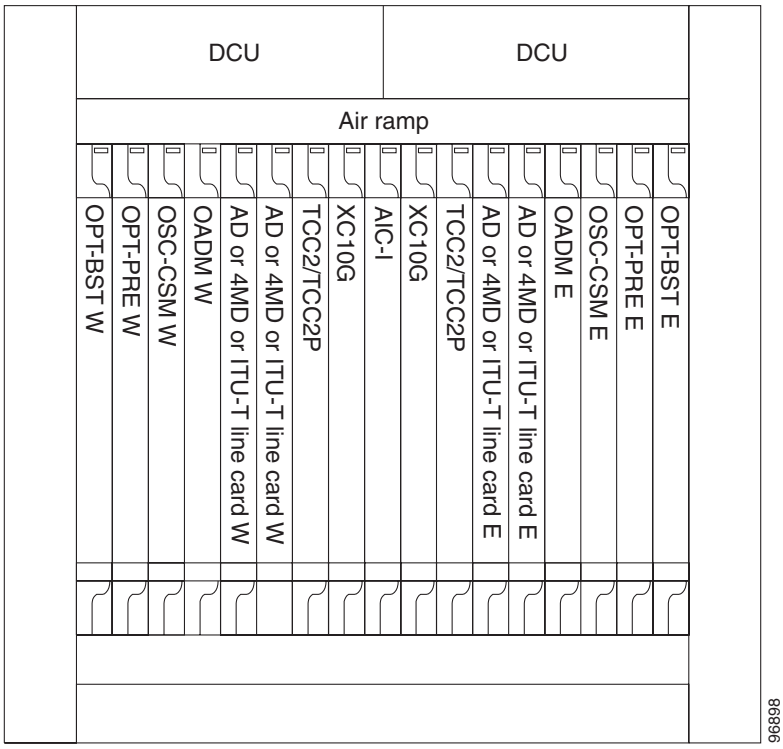
Figure 16-22 Passive Hybrid Terminal Example



16.2.4 Hybrid OADM Node

A hybrid OADM node is a single ONS 15454 node equipped with at least one AD-xC-xx.x card or one AD-xB-xx.x card, and two TCC2/TCC2P cards. The hybrid OADM node type is based on the DWDM OADM node type described in the "16.1.3 OADM Node" section on page 16-4. TDM cards can be installed in any available slot. Review the plan produced by MetroPlanner to determine slot availability. Figure 16-23 shows an example of an amplified hybrid OADM node configuration. The hybrid OADM node can also become passive by removing the amplifier cards.

Figure 16-23 Hybrid Amplified OADM Example



16.2.5 Hybrid Line Amplifier Node

A hybrid line amplifier node is a single ONS 15454 node with open slots for both TDM and DWDM cards. Figure 16-24 shows an example of a hybrid line amplifier node configuration. Figure 16-25 on page 16-26 shows a channel flow example of a hybrid line node configuration. Since this node contains both TDM and DWDM rings, both TDM and DWDM rings should be terminated even if no interactions are present between them.

Note For DWDM applications, if the OPT-BST is not installed within the node, the OSC-CSM card must be used instead of the OSCM card.

Figure 16-24 Hybrid Line Amplifier Example

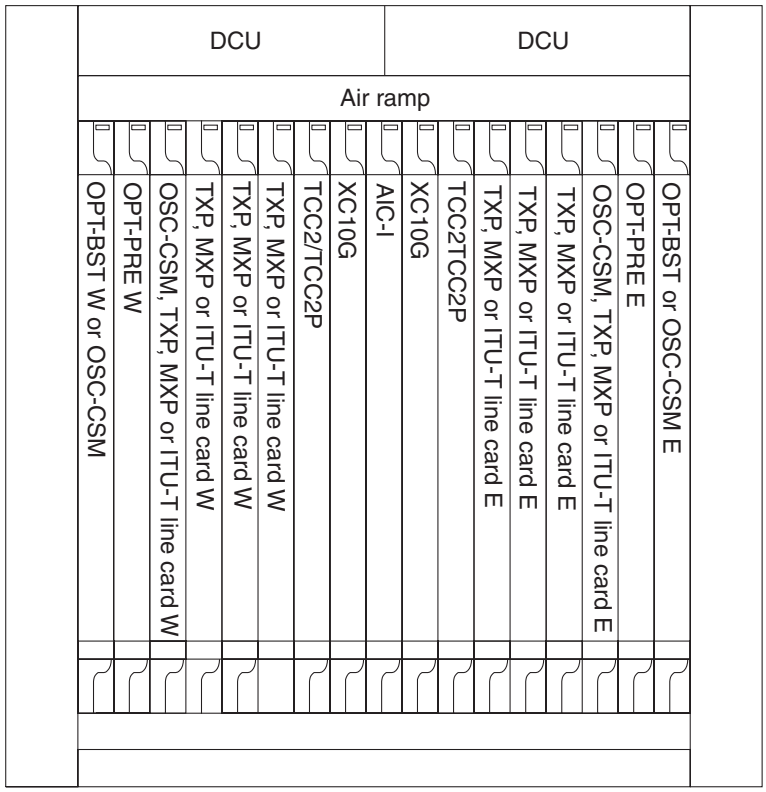
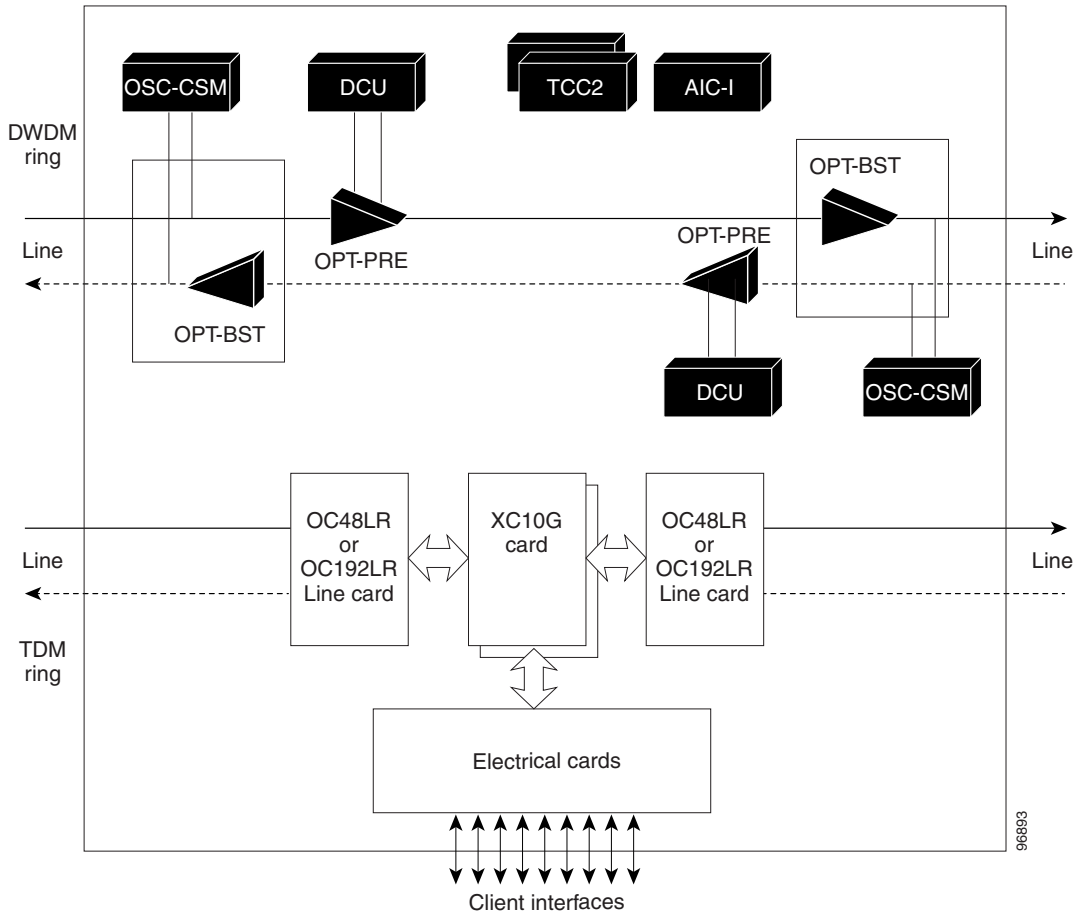


Figure 16-25 Hybrid Line Amplifier Channel Flow Example



A hybrid line node is another example of the hybrid line amplifier OADM node. A hybrid line node is single ONS 15454 node equipped with OPT-PRE amplifiers, OPT-BST amplifiers, and TCC2/TCC2P cards for each line direction. Both types of amplifiers can be used or just one type of amplifier. Attenuators might also be required between each preamplifier and booster amplifier to match the optical input power value and to maintain the amplifier gain tilt value. TDM cards can be installed in any available slot. Review the plan produced by MetroPlanner to determine slot availability.

16.2.6 Amplified TDM Node

An amplified TDM node is a single ONS 15454 node that increases the span length between two ONS 15454 nodes that contain TDM cards and optical amplifiers. There are three possible installation configurations for an amplified TDM node. Scenario 1 uses client cards and OPT-BST amplifiers. Scenario 2 uses client cards, OPT-BST amplifiers, OPT-PRE amplifiers, and FlexLayer filters. Scenario 3 uses client cards, OPT-BST amplifiers, OPT-PRE amplifiers, AD-1C-xx.x cards, and OSC-CSM cards.

The client cards that can be used in an amplified TDM node are: TXP_MR_10G, MXP_2.5G_10G, TXP_MR_2.5G, TXPP_MR_2.5G, OC-192 LR/STM 64 ITU 15xx.xx, and OC-48 ELR/STM 16 EH 100 GHz.

Figure 16-26 shows the first amplified TDM node scenario with an OPT-BST amplifier.

Figure 16-26 Amplified TDM Example with an OPT-BST Amplifier

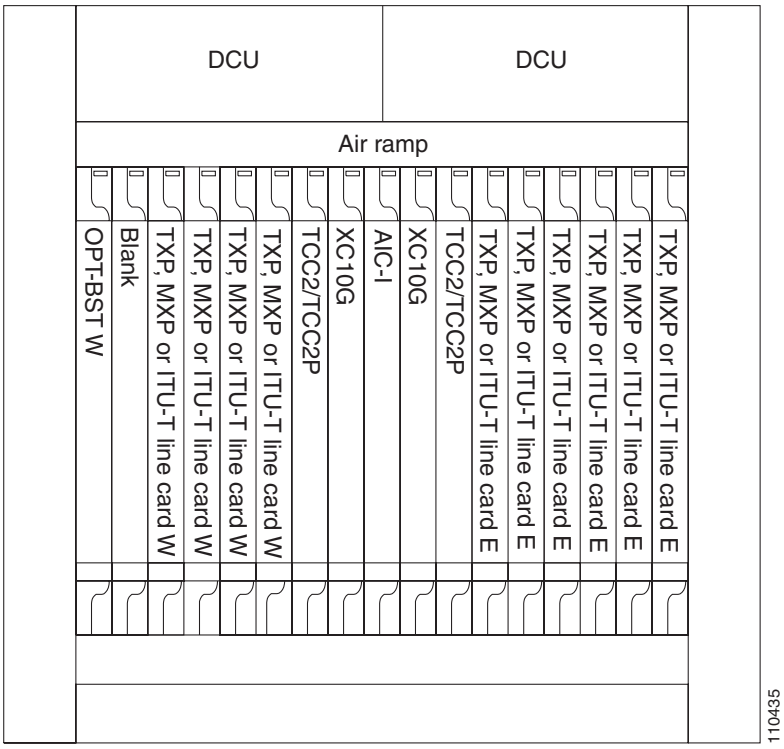


Figure 16-27 shows the first amplified TDM node channel flow scenario configured with OPT-BST amplifiers.

Figure 16-27 Amplified TDM Channel Flow Example With OPT-BST Amplifiers

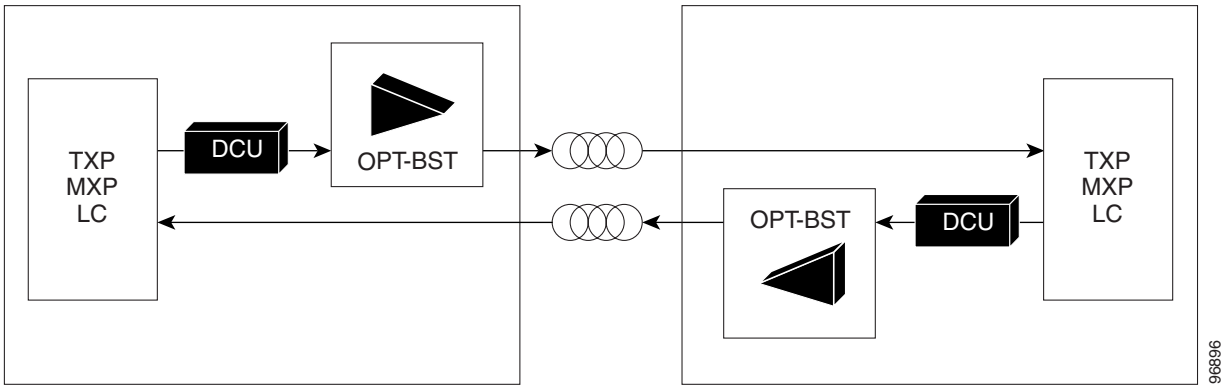


Figure 16-28 shows the second amplified TDM node configuration scenario with client cards, AD-1C-xx.x cards, OPT-BST amplifiers, OPT-PRE amplifiers, and FlexLayer filters.

Figure 16-28 Amplified TDM Example with FlexLayer Filters

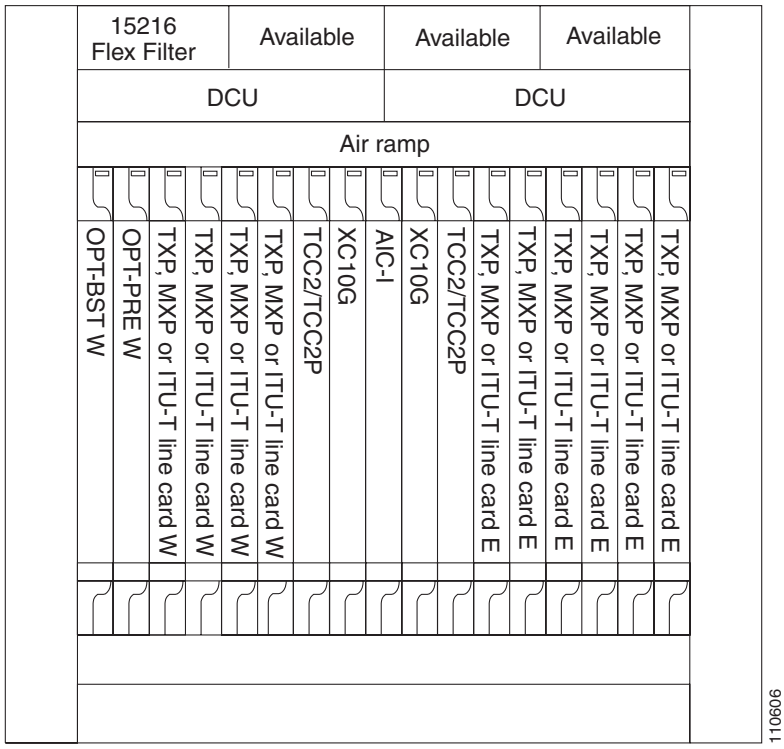


Figure 16-29 shows the second amplified TDM node channel flow configuration scenario with client cards, OPT-BST amplifiers, OPT-PRE amplifiers, and FlexLayer filters.

Figure 16-29 Amplified TDM Channel Flow Example With FlexLayer Filters

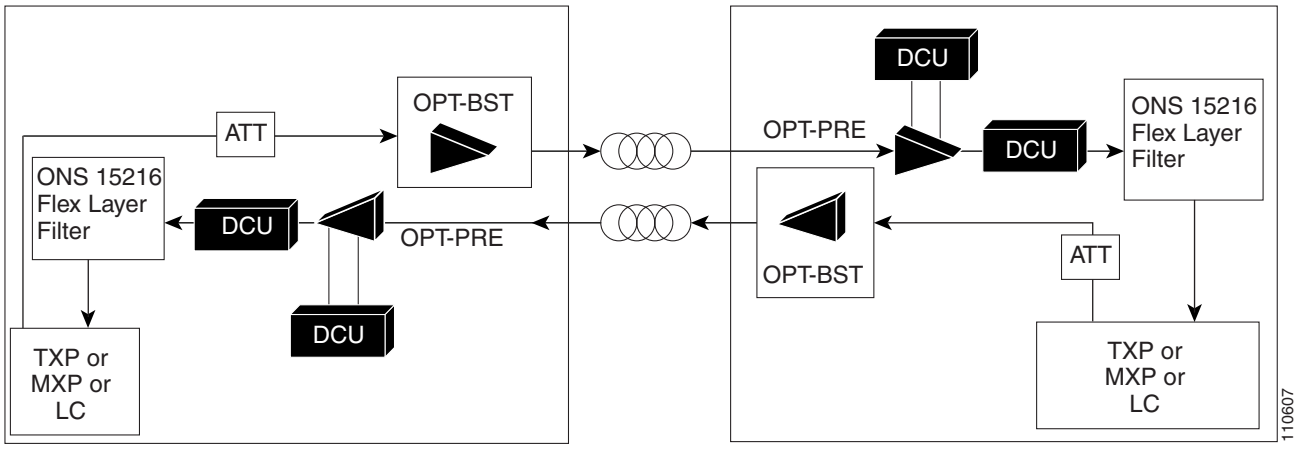
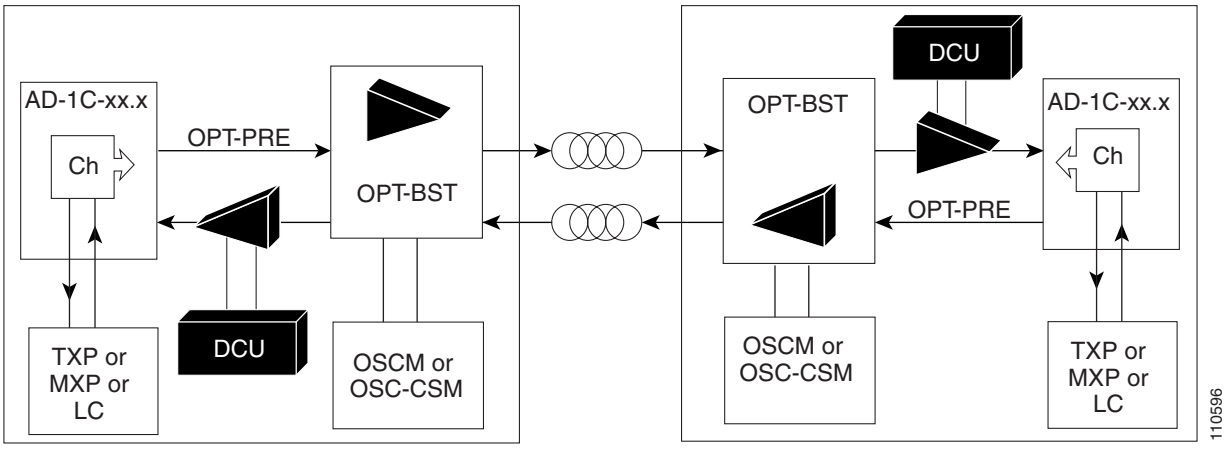


Figure 16-30 shows the third amplified TDM channel flow configuration scenario with client cards, OPT-BST amplifiers, OPT-PRE amplifiers, AD-1C-xx.x cards, and OSC-CSM cards.

Figure 16-30 Amplified TDM Channel Flow Example With Amplifiers, AD-1C-xx.x Cards, and OSC-CSM Cards



16.3 Automatic Node Setup

Automatic node setup (ANS) is a TCC2/TCC2P function that adjusts values of the VOAs on the DWDM channel paths to equalize the per-channel power at the amplifier input. This power equalization means that at launch, all the channels have the same amplifier power level, independent from the input signal on the client interface and independent from the path crossed by the signal inside the node. This equalization is needed for two reasons:

- Every path introduces a different penalty on the signal that crosses it.
- Client interfaces add their signal to the ONS 15454 DWDM ring with different power levels.

To support ANS, the integrated VOAs and photodiodes are provided in the following ONS 15454 DWDM cards:

- OADM band cards (AD-xB-xx.x) express and drop path
- OADM channel cards (AD-xC-xx.x) express and add path
- 4-Channel Terminal Multiplexer/Demultiplexer (4MD-xx.x) input port
- 32-Channel Terminal Multiplexer (32MUX-O) input port
- 32-Channel Wavelength Selective Switch (32WSS) input port
- 32-Channel Terminal Demultiplexer (32DMX-O and 32DMX) output port

Optical power is equalized by regulating the VOAs. Based on the expected per-channel power, ANS automatically calculates the VOA values by:

- Reconstructing the different channels paths
- Retrieving the path insertion loss (stored in each DWDM transmission element)

VOAs operate in one of three working modes:

- Automatic VOA Shutdown—In this mode, the VOA is set at maximum attenuation value. Automatic VOA shutdown mode is set when the channel is not provisioned to ensure system reliability in the event that power is accidentally inserted.

- Constant Attenuation Value—In this mode, the VOA is regulated to a constant attenuation independent from the value of the input signal. Constant attenuation value mode is set on the following VOAs:
  - OADM band card VOAs on express and drop paths (as operating mode)
  - OADM channel card VOAs during power insertion startup
  - The multiplexer/demultiplexer card VOAs during power insertion startup
- Constant Power Value—In this mode, the VOA values are automatically regulated to keep a constant output power when changes occur to the input power signal. This working condition is set on OADM channel card VOAs as "operating" and on 32MUX-O, 32WSS, 32DMX-O, and 32DMX card VOAs as "operating mode."

In the normal operating mode, OADM band card VOAs are set to a constant attenuation, while OADM channel card VOAs are set to a constant power. ANS requires the following VOA provisioning parameters to be specified:

- Target attenuation (OADM band card VOA and OADM channel card startup)
- Target power (channel VOA)

To allow you to modify ANS values based on your DWDM deployment, provisioning parameters are divided into two contributions:

- Reference Contribution (read only)—Set by ANS.
- Calibration Contribution (read and write)—Set by user.

The ANS equalization algorithm requires the following knowledge of the DWDM transmission element layout:

- The order in which the DWDM elements are connected together on the express paths
- Channels that are dropped and added
- Channels or bands that have been configured as passthrough

ANS assumes that every DWDM port has a line direction parameter that is either west to east (W-E) or east to west (E-W). ANS automatically configures the mandatory optical connections according to following main rules:

- Cards equipped in Slots 1 to 6 have a drop section facing west.
- Cards equipped in Slots 12 to 17 have a drop section facing east.
- Contiguous cards are cascaded on the express path.
- 4MD-xx.x and AD-xB-xx.x are always optically coupled.
- A 4MD-xx.x absence forces an optical passthrough connection.
- Transmit (Tx) ports are always connected to receive (Rx) ports.

Optical patch cords are passive devices that are not autodiscovered by ANS. However, optical patch cords are used to build the alarm correlation graph. From CTC or TL1 you can:

- Calculate the default connections on the NE.
- Retrieve the list of existing connections.
- Retrieve the list of free ports.
- Create new connections or modify existing ones.
- Launch ANS.

After you launch ANS, the following status are provided for each ANS parameter:

- Success - Changed—The parameter setpoint was recalculated successfully.
- Success - Unchanged—The parameter setpoint did not need recalculation.
- Not Applicable—The parameter setpoint does not apply to this node type.
- Fail - Out of Range—The calculated setpoint is outside the expected range.
- Fail - Port in IS State—The parameter could not be calculated because the port is in-service.

Optical connections are identified by the two termination points, each with an assigned slot and port. ANS checks that a new connection is feasible (according to embedded connection rules) and returns a denied message in the case of a violation.

ANS requires provisioning of the expected wavelength. When provisioning the expected wavelength, the following rules apply:

- The card name is generically characterized by the card family, and not the particular wavelengths supported (for example, AD-2C for all 2-channel OADMs).
- At the provisioning layer, you can provision a generic card for a specific slot using CTC or TL1.
- Wavelength assignment is done at the port level.
- An equipment mismatch alarm is raised when a mismatch between the identified and provisioned value occurs. The default value for the provisioned attribute is AUTO.

16.3.1 Automatic Node Setup Parameters

All ONS 15454 ANS parameters are calculated by Cisco MetroPlanner for nodes configured for metro core networks. (Parameters must be configured manually for metro access nodes.) Cisco MetroPlanner exports the calculated parameters to an ASCII file called “NE Update.” In CTC, you can import the NE Update file to automatically provision the node. Table 16-2 shows ANS parameters arranged in east and west, transmit and receive groups.

Table 16-2 ANS Parameters

Direction	ANS Parameters
West Side - Receive	• West Side Rx Max Expected Span Loss • West Side Rx Min Expected Span Loss • West Side Rx Amplifier Working Mode • West Side Rx Amplifier Ch Power • West Side Rx Amplifier Gain • West Side Rx Amplifier Tilt • West Side OSC LOS Threshold • West Side Channel LOS Threshold • West Side Rx Amplifier Input Power Fail Th • West Side Add and Drop Stage Input Power • West Side Add and Drop Stage Drop Power • West Side Add and Drop Stage Band (i) Drop Power (i = 1 through 8) • West Side Add and Drop Stage Channel (i) Drop Power (i = 1 through 32)
East Side - Receive	• East Side Rx Max Expected Span Loss • East Side Rx Min Expected Span Loss • East Side Rx Amplifier Working Mode • East Side Rx Amplifier Ch Power • East Side Rx Amplifier Gain • East Side Rx Amplifier Tilt • East Side OSC LOS Threshold • East Side Channel LOS Threshold • East Side Rx Amplifier Input Power Fail Th • East Side Add and Drop Stage Input Power • East Side Add and Drop Stage Drop Power • East Side Add and Drop Stage Band (i) Drop Power (i = 1 through 8 • East Side Add and Drop Stage Channel (i) Drop Power (i = 1 through 32)

Table 16-2 ANS Parameters (continued)

Direction	ANS Parameters
West Side - Transmit	• West Side Tx Amplifier Working Mode • West Side Tx Amplifier Ch Power • West Side Tx Amplifier Gain • West Side Tx Amplifier Tilt • West Side Fiber Stage Input Threshold • West Side Add and Drop Stage Output Power • West Side Add and Drop Stage By-Pass Power
East Side - Transmit	• East Side Tx Amplifier Working Mode • East Side Tx Amplifier Ch Power • East Side Tx Amplifier Gain • East Side Tx Amplifier Tilt • East Side Fiber Stage Input Threshold • East Side Add and Drop Stage Output Power • East Side Add and Drop Stage By-Pass Power

16.3.2 View and Provision ANS Parameters

All ANS parameters can be viewed and provisioned from the node view Provisioning > WDM-ANS > Provisioning subtab, shown in Figure 16-31. The WDM-ANS > Provisioning > Provisioning subtab presents the parameters in the following tree view:

root

+/– East

- +/– Receiving
  - +/– Amplifier
  - +/– Power
  - +/– Threshold
- +/– Transmitting
  - +/– Amplifier
  - +/– Power
  - +/– Threshold

+/– West

- +/– Receiving
  - +/– Amplifier
  - +/– Power
  - +/– Threshold
- +/– Transmitting

- +/– Amplifier
- +/– Power
- +/– Threshold

Figure 16-31 WDM-ANS Provisioning

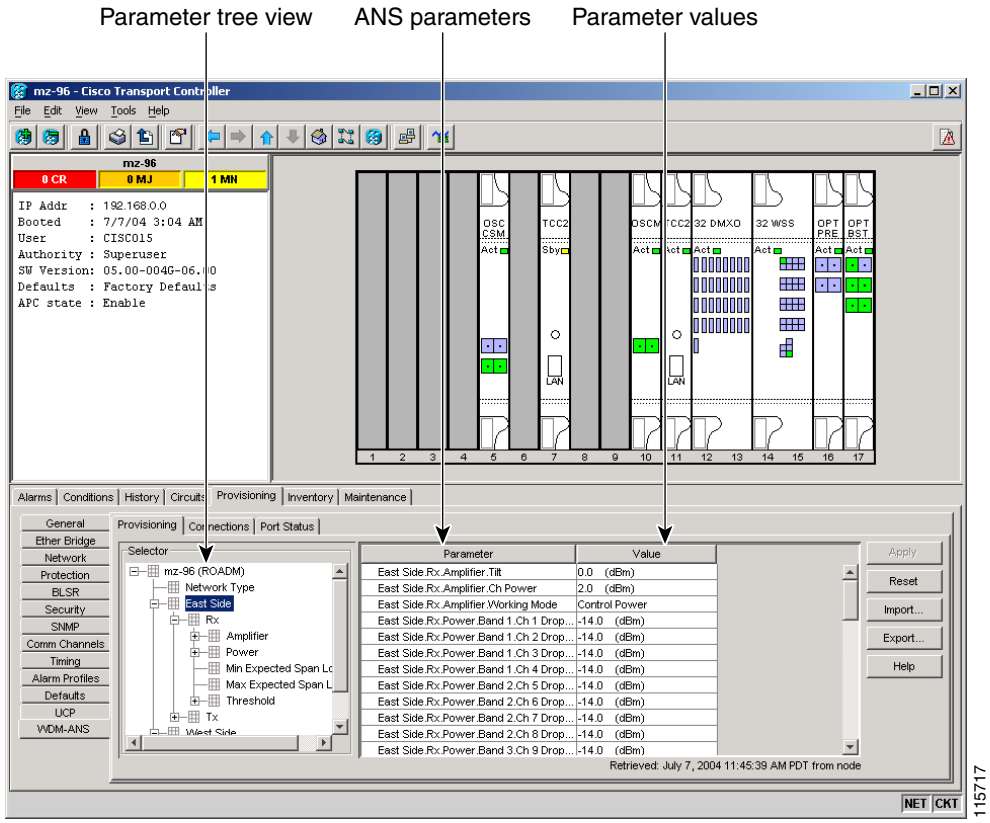


Table 16-3 shows the parameter IDs based on platform, line-direction, and functional group.

Table 16-3 ANS-WDM > Provisioning Subtab Parameters

Tree Element	Parameters
root	Network Type (dwdm)
root +/– East +/– Receiving	East Side Rx Max Expected Span Loss East Side Rx Min Expected Span Loss
root +/– East +/– Receiving +/– Amplifier	East Side Rx Amplifier Working Mode East Side Rx Amplifier Ch Power East Side Rx Amplifier Gain East Side Rx Amplifier Tilt

Table 16-3 ANS-WDM > Provisioning Subtab Parameters (continued)

Tree Element	Parameters
root +/– East +/– Receiving +/– Power	East Side Add and Drop Input Power
	East Side Add and Drop Drop Power
	East Side Band n Drop Power (n = 1-8)
	East Side Channel n Drop Power East (n = 1-32)
root +/– East +/– Receiving +/– Thresholds	East Side OSC LOS Threshold
	East Side Channel LOS Threshold
	East Side Rx Amplifier In Power Fail Th
root +/– East +/– Transmitting +/– Amplifier	East Side Tx Amplifier Working Mode
	East Side Tx Amplifier Ch Power
	East Side Tx Amplifier Gain
	East Side Tx Amplifier Tilt
root +/– East +/– Transmitting +/– Power	East Side Add and Drop Output Power
	East Side Add and Drop By-Pass Power
root +/– East +/– Transmitting +/– Thresholds	East Side Fiber Stage Input Threshold
root +/– West +/– Receiving	West Side Rx Max Expected Span Loss
	West Side Rx Min Expected Span Loss
root +/– West +/– Receiving +/– Amplifier	West Side Rx Amplifier Working Mode
	West Side Rx Amplifier Ch Power
	West Side Rx Amplifier Gain
	West Side Rx Amplifier Tilt
root +/– West +/– Receiving +/– Power	West Side Add and Drop Input Power
	West Side Add and Drop Drop Power
	West Side Band n Drop Power (n = 1-8)
	West Side Channel n Drop Power (n = 1-32)
root +/– West +/– Receiving +/– Thresholds	West Side OSC LOS Threshold
	West Side Channel LOS Threshold
	West Side Rx Amplifier In Power Fail Th
root +/– West +/– Transmitting +/– Amplifier	West Side Tx Amplifier Working Mode
	West Side Tx Amplifier Ch Power
	West Side Tx Amplifier Gain
	West Side Tx Amplifier Tilt
root +/– East +/– Transmitting +/– Power	West Side Add and Drop Output Power
	West Side Add and Drop By-Pass Power
root +/– West +/– Transmitting +/– Thresholds	West Side Fiber Stage Input Threshold

The ANS parameters that appear in the WDM-ANS > Provisioning subtab depend on the node type. Table 16-4 shows the DWDN node types and their ANS parameters.

Table 16-4 ANS Parameters By Node Type

Node Type	Parameter Group	Parameters
Hub	Network	Network Type
	Span Loss	East and West Expected Span Loss
	Amplifier Tx	East and West Side Transmit Amplifier Working Mode
		East and West Side Transmit Amplifier Channel Power
		East and West Side Transmit Amplifier Gain
		East and West Side Transmit Amplifier Tilt
	Amplifier Rx	East and West Side Receive Amplifier Working Mode
		East and West Side Receive Amplifier Channel Power
		East and West Side Receive Amplifier Gain
		East and West Side Receive Amplifier Tilt
	Thresholds Tx	East and West Side Fiber Stage Input Threshold
	Thresholds Rx	East and West Side Osc Los Threshold
		East and West Side Channel Los Threshold
		East and West Side Receive Amplifier Input Power Fail
	Power	East and West Side Add and Drop Input Power
		East and West Side Add and Drop Output Power
		East and West Side Add and Drop By-Pass Power
		East and West Side Channel (n) Drop Power

Table 16-4 ANS Parameters By Node Type (continued)

Node Type	Parameter Group	Parameters
Terminal	Network	Network Type
	Span Loss	East or West Expected Span Loss
	Amplifier Tx	East or West Side Transmit Amplifier Working Mode
		East or West Side Transmit Amplifier Channel Power
		East or West Side Transmit Amplifier Gain
		East or West Side Transmit Amplifier Tilt
	Amplifier Rx	East or West Side Receive Amplifier Working Mode
		East or West Side Receive Amplifier Channel Power
		East or West Side Receive Amplifier Gain
		East or West Side Receive Amplifier Tilt
	Thresholds Tx	East or West Side Fiber Stage Input Threshold
	Thresholds Rx	East or West Side Osc Los Threshold
		East or West Side Channel Los Threshold
		East or West Side Receive Amplifier Input Power Fail
	Power	East or West Side Add and Drop Input Power
		East or West Side Add and Drop Output Power
		East or West Side Channel (n) Drop Power (n = 1-32)
Flexible Channel Count Terminal	Network	Network Type
	Span Loss	East and West Expected Span Loss
	Amplifier Tx	East and West Side Transmit Amplifier Working Mode
		East and West Side Transmit Amplifier Channel Power
		East and West Side Transmit Amplifier Gain
		East and West Side Transmit Amplifier Tilt
	Amplifier Rx	East and West Side Receive Amplifier Working Mode
		East and West Side Receive Amplifier Channel Power
		East and West Side Receive Amplifier Gain
		East and West Side Receive Amplifier Tilt
	Thresholds Tx	East and West Side Fiber Stage Input Threshold
	Thresholds Rx	East and West Side Osc Los Threshold
		East and West Side Channel Los Threshold
		East and West Side Receive Amplifier Input Power Fail
	Power	East and West Side Add and Drop Input Power
		East and West Side Add and Drop Output Power
		East and West Side Band (n) Drop Power (n = 1-8)

Table 16-4 ANS Parameters By Node Type (continued)

Node Type	Parameter Group	Parameters
OADM	Network	Network Type
	Span Loss	East and West Expected Span Loss
	Amplifier Tx	East and West Side Transmit Amplifier Working Mode
		East and West Side Transmit Amplifier Channel Power
		East and West Side Transmit Amplifier Gain
		East and West Side Transmit Amplifier Tilt
	Amplifier Rx	East and West Side Receive Amplifier Working Mode
		East and West Side Receive Amplifier Channel Power
		East and West Side Receive Amplifier Gain
		East and West Side Receive Amplifier Tilt
	Thresholds Tx	East and West Side Fiber Stage Input Threshold
	Thresholds Rx	East and West Side Osc Los Threshold
		East and West Side Channel Los Threshold
		East and West Side Receive Amplifier Input Power Fail
	Power	East and West Side Add and Drop Input Power
		East and West Side Add and Drop Output Power
		East and West Side Band (n) Drop Power (n = 1-8)
Line Amplifier	Network	Network Type
	Span Loss	East and West Expected Span Loss
	Amplifier Tx	East and West Side Transmit Amplifier Working Mode
		East and West Side Transmit Amplifier Channel Power
		East and West Side Transmit Amplifier Gain
		East and West Side Transmit Amplifier Tilt
	Amplifier Rx	East and West Side Receive Amplifier Working Mode
		East and West Side Receive Amplifier Channel Power
		East and West Side Receive Amplifier Gain
		East and West Side Receive Amplifier Tilt
	Thresholds Tx	East and West Side Fiber Stage Input Threshold
	Thresholds Rx	East and West Side Osc Los Threshold
		East and West Side Channel Los Threshold
		East and West Side Receive Amplifier Input Power Fail

Table 16-4 ANS Parameters By Node Type (continued)

Node Type	Parameter Group	Parameters
ROADM	Network	Network Type
	Span Loss	East and West Expected Span Loss
	Amplifier Tx	East and West Side Transmit Amplifier Working Mode
		East and West Side Transmit Amplifier Channel Power
		East and West Side Transmit Amplifier Gain
		East and West Side Transmit Amplifier Tilt
	Amplifier Rx	East and West Side Receive Amplifier Working Mode
		East and West Side Receive Amplifier Channel Power
		East and West Side Receive Amplifier Gain
		East and West Side Receive Amplifier Tilt
	Thresholds Tx	East and West Side Fiber Stage Input Threshold
	Thresholds Rx	East and West Side Osc Los Threshold
		East and West Side Channel Los Threshold
		East and West Side Receive Amplifier Input Power Fail
	Power	East and West Side Add and Drop Input Power (if 32DMX East/West is installed)
		East and West Side Add and Drop Output Power
		East and West Side Add and Drop Drop Power (if 32DMX East/West is installed)
		East and West Side Channel (n) Drop Power (if 32DMX-O East/West is installed)

Table 16-5 shows the following information for all ONS 15454 ANS parameters:

- Min—Minimum value in decibels.
- Max—Maximum value in decibels.
- Def—Default value in decibels. Other defaults include MC (metro core), CG (control gain), U (unknown).
- Group—Group(s) to which the parameter belongs: ES (east side), WS (west side), Rx (receive), Tx (transmit), Amp (amplifier), P (power), DB (drop band), DC (drop channel), A (attenuation), Th (threshold).
- Network Type—Parameter network type: MC (metro core), MA (metro access), ND (not DWDM)
- Optical Type—Parameter optical type: TS (32 channel terminal), FC (flexible channel count terminal), O (OADM), H (hub), LS (line amplifier), R (ROADM), U (unknown)

Table 16-5 ANS Parameters Summary

General Name	Min	Max	Def	Group	Network Type	Optical Type
Network Type	–	–	MC	Root	MC, MA, ND	U, TS, FC, O, H, LS, R
West Side Rx Max Expected Span Loss	0	60	60	WS, Rx	MC, MA	TS, FC, O, H, LS, R

Table 16-5 ANS Parameters Summary (continued)

General Name	Min	Max	Def	Group	Network Type	Optical Type
East Side Rx Max Expected Span Loss	0	60	60	ES, Rx	MC, MA	TS, FC, O, H, LS, R
West Side Rx Min Expected Span Loss	0	60	60	WS, Rx	MC, MA	TS, FC, O, H, LS, R
East Side Rx Min Expected Span Loss	0	60	60	ES, Rx	MC, MA	TS, FC, O, H, LS, R
West Side Tx Amplifier Working Mode	–	–	CG	WS, Tx, Amp	MC, MA, ND	TS, FC, O, H, LS, R
East Side Tx Amplifier Working Mode	–	–	CG	ES, Rx	MC, MA	TS, FC, O, H, LS, R
West Side Rx Amplifier Working Mode	–	–	CG	WS, Tx, Amp	MC, MA, ND	TS, FC, O, H, LS, R
East Side Rx Amplifier Working Mode	–	–	CG	ES, Rx	MC, MA	TS, FC, O, H, LS, R
West Side Tx Amplifier Ch Power	–10	17	2	WS, Tx, Amp	MC, MA, ND	TS, FC, O, H, LS, R
East Side Tx Amplifier Ch Power	–10	17	2	WS, Tx, Amp	MC, MA, ND	TS, FC, O, H, LS, R
West Side Rx Amplifier Ch Power	–10	17	2	WS, Tx, Amp	MC, MA, ND	TS, FC, O, H, LS, R
East Side Rx Amplifier Ch Power	–10	17	2	WS, Tx, Amp	MC, MA, ND	TS, FC, O, H, LS, R
West Side Tx Amplifier Gain	0	30	0	WS, Tx, Amp	MA	TS, FC, O, H, LS, R
East Side Tx Amplifier Gain	0	30	0	WS, Tx, Amp	MA	TS, FC, O, H, LS. R
West Side Rx Amplifier Gain	0	30	0	WS, Tx, Amp	MA	TS, FC, O, H, LS, R
East Side Rx Amplifier Gain	0	30	0	WS, Tx, Amp	MA	TS, FC, O, H, LS, R
West Side Tx Amplifier Tilt	0	30	0	WS, Tx, Amp	MC, MA	TS, FC, O, H, LS, R
East Side Tx Amplifier Tilt	0	30	0	WS, Tx, Amp	MC, MA	TS, FC, O, H, LS, R
West Side Rx Amplifier Tilt	0	30	0	WS, Rx, Amp	MC, MA	TS, FC, O, H, LS, R
East Side Rx Amplifier Tilt	0	30	0	WS, Rx, Amp	MC, MA	TS, FC, O, H, LS, R
West Side OSC LOS Threshold	–50	30	U	WS, Rx, Th	MC, MA	TS, FC, O, H, LS, R
East Side OSC LOS Threshold	–50	30	U	WS, Rx, Th	MC, MA	TS, FC, O, H, LS, R
West Side Channel LOS Threshold	–50	30	U	WS, Rx, Th	MC, MA	TS, FC, O, H, LS, R
East Side Channel LOS Threshold	–50	30	U	ES, Rx, Th	MC, MA, ND	TS, FC, O, H, LS, R
West Side Fiber State Input Threshold	–50	30	U	WS, Tx, Th	MC, MA, ND	TS, FC, O, H, LS, R
East Side Fiber State Input Threshold	–50	30	U	ES, Tx, Th	MC, MA, ND	TS, FC, O, H, LS, R
West Side Add and Drop Output Power	–50	30	–14	WS, Tx, P	MC	TS, FC, O, H, R
East Side Add and Drop Output Power	–50	30	–14	ES, Tx, P	MC	TS, FC, O, H, R
West Side Add and Drop Input Power	–50	30	–14	WS, Rx, P	MC	TS, FC, O, H, R
East Side Add and Drop Input Power	–50	30	–14	ES, Rx, P	MC	TS, FC, O, H, R
West Side Add and Drop By-Pass Power	–50	30	–14	WS, Tx, P	MC	H
East Side Add and Drop By-Pass Power	–50	30	–14	ES, Tx, P	MC	H
West Side Add and Drop Drop Power	–50	30	–14	WS, Tx, P	MC	R
East Side Add and Drop Drop Power	–50	30	–14	ES, Tx, P	MC	R
West Side Band 1...8 Drop Power	–50	30	–14	WS, Rx, P, DB	MC	FC, O
East Side Band 1...8 Drop Power	–50	30	–14	ES, Rx, P, DB	MC	FC, O

Table 16-5 ANS Parameters Summary (continued)

General Name	Min	Max	Def	Group	Network Type	Optical Type
West Side Channel 1...32 Drop Power	–50	30	–14	WS, Rx, P, DC, B1	MC, MA	TS, H, R
East Side Channel 1...32 Drop Power	–50	30	–14	ES, Rx, P, DC, B1	MC, MA	TS, H, R

Network Reference

This chapter explains the ONS 15454 dense wavelength division multiplexing (DWDM) network applications and topologies. The chapter also provides network-level optical performance references.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Chapter topics include:

- 17.1 Network Applications, page 17-1
- 17.2 Network Topologies, page 17-2
- 17.3 Optical Performance, page 17-6
- 17.4 Automatic Power Control, page 17-17
- 17.5 ROADM Power Equalization Monitoring, page 17-22
- 17.6 Span Loss Verification, page 17-23
- 17.7 Network Optical Safety—Automatic Laser Shutdown, page 17-24
- 17.8 Network-Level Gain—Tilt Management of Optical Amplifiers, page 17-28

17.1 Network Applications

Cisco ONS 15454s can be provisioned for metro access and metro core DWDM network applications. Metro access networks are 60 km or less in size. Channels are not equalized and dispersion compensation is not applied. Metro access networks have few spans and very low span loss, so the signal link budget is the limiting factor for performance. Metro core networks can be up to 400 km in size. The channel power is equalized and dispersion compensation is applied. Metro core networks often include multiple spans and amplifiers, so the optical signal-to-noise ratio (OSNR) is the limiting factor for channel performance in metro core networks.

Within DWDM networks, the ONS 15454 uses a communications protocol, called node services protocol (NSP), to communicate with other nodes. NSP automatically updates nodes whenever a change in the network occurs. Each ONS 15454 DWDM node can:

- Identify other ONS 15454 DWDM nodes in the network.
- Identify the different types of DWDM networks.
- Identify when the DWDM network is complete and when it is incomplete.

17.2 Network Topologies

The ONS 15454 DWDM network topologies include hubbed, multihubbed, and meshed rings, and linear and single-span networks.

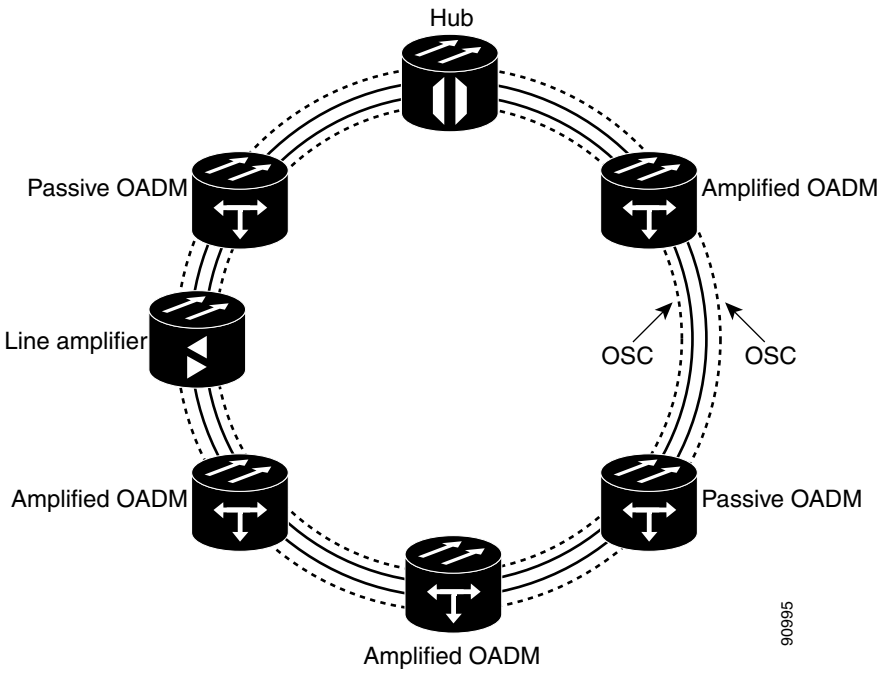
17.2.1 Hubbed Rings

In the hubbed ring topology (Figure 17-1), a hub node terminates all the DWDM channels. A channel can be provisioned to support protected traffic between the hub node and any node in the ring. Both working and protected traffic use the same wavelength on both sides of the ring. Protected traffic can also be provisioned between any pair of optical add/drop multiplexing (OADM) nodes, except that either the working or the protected path must be regenerated in the hub node.

Protected traffic saturates a channel in a hubbed ring, that is, no channel reuse is possible. However, the same channel can be reused in different sections of the ring by provisioning unprotected multihop traffic. From a transmission point of view, this network topology is similar to two bidirectional point-to-point links with OADM nodes.

For more information about hub nodes, see the "16.1.1 Hub Node" section on page 16-1.

Figure 17-1 Hubbed Ring

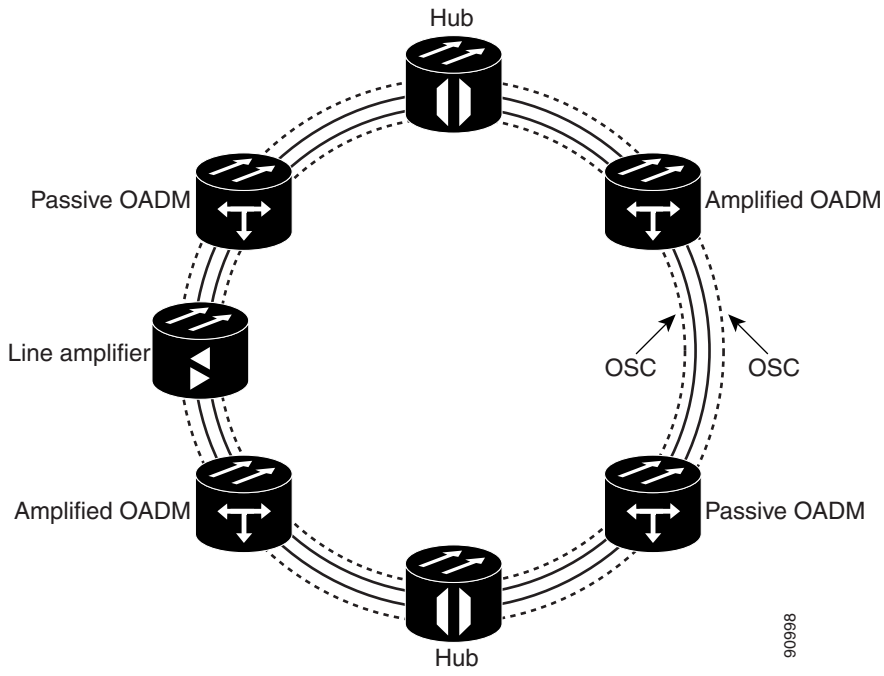


17.2.2 Multihubbed Rings

A multihubbed ring (Figure 17-2) is based on the hubbed ring topology, except that two or more hub nodes are added. Protected traffic can only be established between the two hub nodes. Protected traffic can be provisioned between a hub node and any OADM node only if the allocated wavelength channel

is regenerated through the other hub node. Multihop traffic can be provisioned on this ring. From a transmission point of view, this network topology is similar to two or more point-to-point links with OADM nodes.

Figure 17-2 Multihubbed Ring

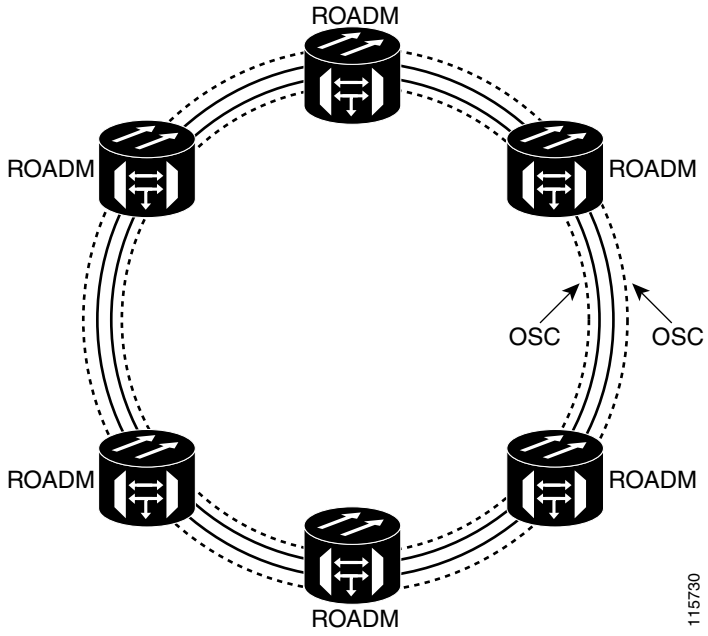


17.2.3 Any-to-Any Rings

The any-to-any ring topology (Figure 17-3) contains only reconfigurable OADM (ROADM) nodes, or ROADM nodes with Optical Service Channel (OSC) regeneration or amplifier nodes. This topology potentially allows you to route every wavelength from any source to any destination node inside the network.

See the "16.1.4 ROADM Node" section on page 16-8 for more information.

Figure 17-3 Any-to-Any Ring



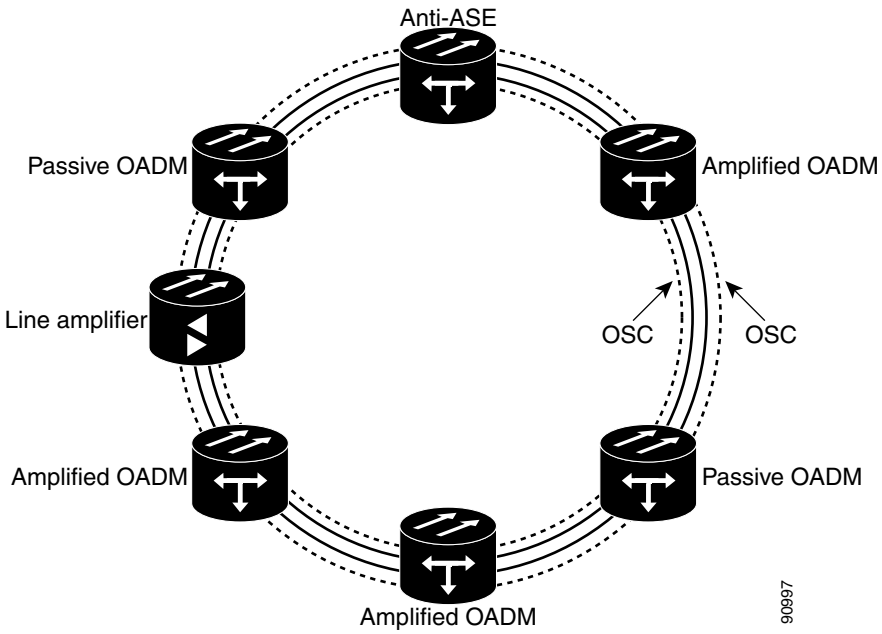
17.2.4 Meshed Rings

The meshed ring topology (Figure 17-4) does not use hubbed nodes; only amplified and passive OADM nodes are present. Protected traffic can be provisioned between any two nodes; however, the selected channel cannot be reused in the ring. Unprotected multihop traffic can be provisioned in the ring. A meshed ring must be designed to prevent amplified spontaneous emission (ASE) lasing. This is done by configuring a particular node as an anti-ASE node. An anti-ASE node can be created in two ways:

- Equip an OADM node with 32MUX-O cards and 32DMX-O cards. This solution is adopted when the total number of wavelengths deployed in the ring is higher than ten. OADM nodes equipped with 32MUX-O cards and 32DMX-O cards are called full OADM nodes.
- When the total number of wavelengths deployed in the ring is lower than ten, the anti-ASE node is configured by using an OADM node where all the channels that are not terminated in the node are configured as "optical pass-through." In other words, no channels in the anti-ASE node can travel through the express path of the OADM node.

For more information about OADM nodes, see the "16.1.3 OADM Node" section on page 16-4. For more information about anti-ASE nodes, see the "16.1.5 Anti-ASE Node" section on page 16-10.

Figure 17-4 Meshed Ring



17.2.5 Linear Configurations

Linear configurations are characterized by the use of two terminal nodes (west and east). The terminal nodes can be equipped with a 32MUX-O card and a 32DMX-O card, or a 32WSS card with a 32DMX or 32DMX-O card. OADM or line amplifier nodes can be installed between the two terminal nodes. Only unprotected traffic can be provisioned in a linear configuration. Figure 17-5 shows five ONS 15454 nodes in a linear configuration with an amplified and a passive OADM node.

Figure 17-5 Linear Configuration with an OADM Node

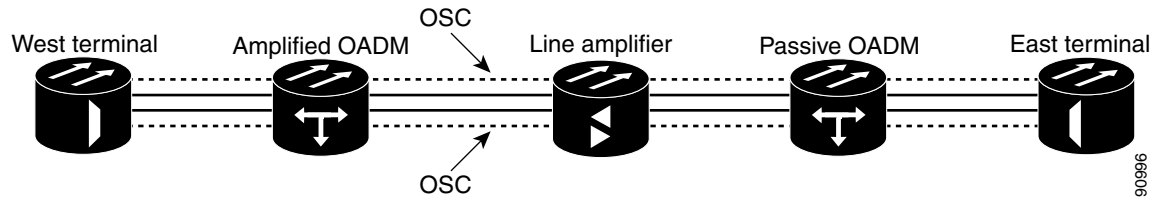
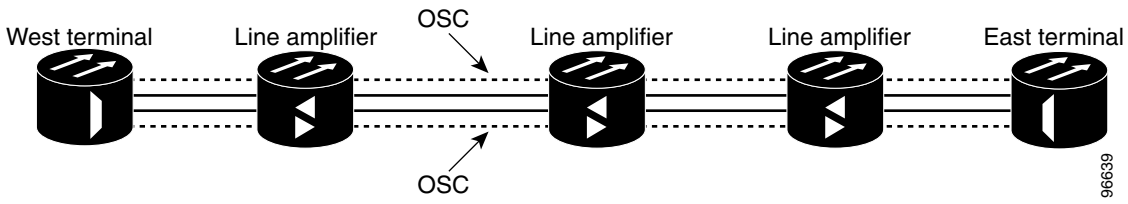


Figure 17-6 shows five ONS 15454 nodes in a linear configuration without an OADM node.

See the "16.1.2 Terminal Node" section on page 16-3 for more information.

Figure 17-6 Linear Configuration without an OADM Node

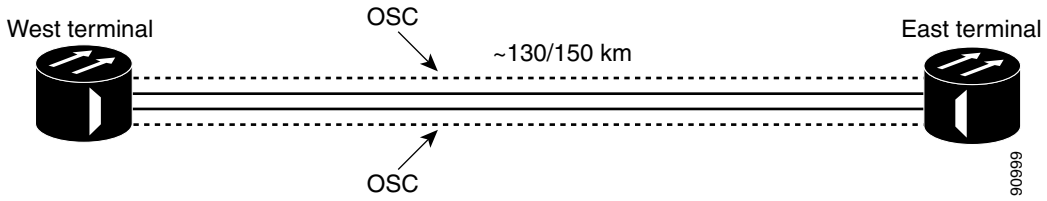


17.2.6 Single-Span Link

Single-span link is a type of linear configuration characterized by a single-span link with pre-amplification and post-amplification. A single-span link is also characterized by the use of two terminal nodes (west and east). The terminal nodes are usually equipped with a 32MUX-O card and a 32DMX-O card. However, a 32WSS card and a 32DMX or a 32DMX-O card can be installed. Software R4.7 and later also supports single-span links with AD-4C-xx.x cards. Only unprotected traffic can be provisioned on a single-span link.

Figure 17-7 shows ONS 15454s in a single-span link. Eight channels are carried on one span. Single-span link losses apply to OC-192 LR ITU cards. The optical performance values are valid assuming that the sum of the OADM passive node insertion losses and the span losses does not exceed 35 dB.

Figure 17-7 Single-Span Link



17.3 Optical Performance

This section provides optical performance information for ONS 15454 DWDM networks. The performance data is a general guideline based upon the network topology, node type, client cards, fiber type, number of spans, and number of channels. The maximum number of nodes that can be in an ONS 15454 DWDM network is 16. The DWDM topologies and node types that are supported are shown in Table 17-1.

Table 17-1 Supported Topologies and Node Types

Number of Channels	Fiber	Topologies	Node Type
32 channels	SMF-28[1]	Ring	Hub
	E-LEAF[2]	Linear	Active OADM
	TW-RS[3]	Linear without OADM	Passive OADM
			Terminal
			Line
			OSC regeneration
16 channels	SMF-28	Ring	Hub
		Linear	Active OADM
		Linear without OADM	Passive OADM
			Terminal
			Line
			OSC regeneration
8 channels	SMF-28	Linear without OADM	Terminal
			Line

1. SMF-28 = single-mode fiber 28
2. E-LEAF = enhanced large effective area fiber
3. TW-RS = TrueWave reduced slope fiber

DWDM client cards are grouped into nine classes, shown in Table 17-2. Span loss estimates are based on the number of spans in the network and the client card class. Some cards belong to more than one class depending on whether forward error correction (FEC) is enabled and on the payload data type provisioned for the card.

Table 17-2 ONS 15454 Client Card Classes

Class	Rate	Clients
A	10 Gbps	TXP_2.5G_10G—FEC enabled
		TXP_2.5G_10E—FEC enabled
		TXP_MR_10G—FEC enabled
		TXP_MR_10E—FEC enabled
B	10 Gbps	TXP_2.5G_10G—FEC not enabled
		TXP_MR_10G—FEC not enabled
C	10 Gbps	OC-192 LR ITU
		TXP_2.5G_10E—FEC not enabled
D	2.5 Gbps	TXP_MR_2.5G—FEC enabled
		TXPP_MR_2.5G—FEC enabled

Table 17-2 ONS 15454 Client Card Classes (continued)

Class	Rate	Clients
E	2.5 Gbps	TXP_MR_2.5G—3R payload data type; FEC disabled
		TXPP_MR_2.5G—3R payload data type; FEC disabled
		MXP_MR_2.5G
		MXPP_MR_2.5G
F	2.5 Gbps	TXP_MR_2.5G—2R payload data type
		TXPP_MR_2.5G—2R payload data type
G	2.5 Gbps	OC-48 ELR ITU
H	2.5 Gbps	2/4 port Gigabit Ethernet Transponder (GBIC WDM 100 GHz)
I	10 Gbps	TXP_2.5G_10E—E-FEC[1] enabled
		TXP_MR_10E—E-FEC enabled

1. Forward error correction

17.3.1 Optical Performance for Rings and Linear Networks with OADM Nodes

The following tables provide optical performance estimates for open and closed ONS 15454 rings and linear networks with OADM nodes.

Table 17-3 shows the optical performance for 32-channel networks using SMF fiber. Span losses shown in the table assume:

- OADM nodes have a loss of 16 dB and equal span losses.
- The DCU loss is 9 dB.
- Optical Preamplifier (OPT-PRE) and Optical Booster (OPT-BST/OPT-BST-E) amplifiers are installed in all nodes.
- The OPT-PRE amplifier switches to control power whenever the span loss is higher than 27 dB.

See Table 17-2 for a list of cards in each class. A dash (—) indicates spans that are not supported.

Table 17-3 Span Loss for 32-Channel Ring and Linear Networks with OADM Nodes Using SMF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	35 dB	25 dB	25 dB	37 dB	37 dB	33 dB	30 dB	32 dB	34 dB	30 dB
2	29 dB	21 dB	20 dB	30 dB	31 dB	27 dB	25 dB	26 dB	28 dB	25 dB
3	26 dB	17 dB	15 dB	28 dB	29 dB	25 dB	23 dB	24 dB	26 dB	23 dB
4	24 dB	—	—	25 dB	26 dB	23 dB	20 dB	22 dB	24 dB	20 dB
5	23 dB	—	—	24 dB	25 dB	22 dB	16 dB	20 dB	23 dB	16 dB
6	21 dB	—	—	23 dB	24 dB	19 dB	—	17 dB	21 dB	—
7	20[1] dB	—	—	22 dB	23 dB	16 dB	—	—	19 dB	—

1. 0.5 dB of OSNR impairment recovered by FEC margin @ BER > 10-6

Table 17-4 shows the optical performance for 16-channel networks using SMF fiber. Span loss values assume the following:

- OADM nodes have a loss of 16 dB and equal span losses.
- The DCU loss is 9 dB.
- All nodes have OPT-PRE and OPT-BST/OPT-BST-E amplifiers installed.
- The OPT-PRE amplifier switches to control power whenever the span loss is higher than 27 dB.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-4 Span Loss for 16-Channel Ring and Linear Networks with OADM Nodes Using SMF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	37 dB	29 dB	28 dB	37 dB	37 dB	36 dB	33 dB	35 dB	37 dB	33 dB
2	32 dB	24 dB	24 dB	34 dB	35 dB	31 dB	28 dB	30 dB	32 dB	28 dB
3	29 dB	22 dB	21 dB	31 dB	32 dB	28 dB	25 dB	27 dB	29 dB	25 dB
4	27 dB	19 dB	17 dB	29 dB	30 dB	26 dB	23 dB	25 dB	27 dB	23 dB
5	26 dB	—	—	27 dB	28 dB	24 dB	22 dB	24 dB	25 dB	22 dB
6	25 dB	—	—	26 dB	27 dB	23 dB	21 dB	23 dB	24 dB	21 dB
7	24 dB	—	—	25 dB	256dB	23 dB	19 dB	22 dB	23 dB	19 dB

Table 17-5 shows the optical performance for 32-channel networks using TW-RS fiber. Span loss values assume the following:

- OADM nodes have a loss of 16 dB and equal span losses.
- The DCU is 550 ps with 4 dB loss.
- All nodes have OPT-PRE and OPT-BST/OPT-BST-E amplifiers installed.
- The OPT-PRE amplifier switches to control power whenever the span loss is higher than 27 dB.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-5 Span Loss for 32-Channel Ring and Linear Networks with OADM Nodes Using TW-RS Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	35 dB	25 dB	25 dB	37 dB	37 dB	33 dB	30 dB	32 dB	34 dB	30 dB
2	29 dB	21 dB	20 dB	31 dB	32 dB	28 dB	26 dB	27 dB	29 dB	26 dB
3	27 dB	17 dB	15 dB	29 dB	30 dB	26 dB	23 dB	25 dB	27 dB	23 dB
4	25 dB	—	—	27 dB	28 dB	23 dB	20 dB	22 dB	24 dB	20 dB
5	23 dB	—	—	26 dB	27 dB	22 dB	16 dB	20 dB	23 dB	16 dB
6	21 dB	—	—	24 dB	25 dB	19 dB	—	17 dB	21 dB	—
7	20 dB	—	—	22 dB	24 dB	16 dB	—	—	19 dB	—

Table 17-6 shows the optical performance for 32-channel networks using E-LEAF fiber. Span loss values assume the following:

- OADM nodes have a loss of 16 dB and equal span losses.
- The DCU is 550 ps with 4 dB loss.
- All nodes have OPT-PRE and OPT-BST/OPT-BST-E amplifiers installed.
- The OPT-PRE amplifier switches to control power whenever the span loss is higher than 27 dB.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-6 Span Loss for 32-Channel Ring and Linear Networks with OADM Nodes Using E-LEAF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	35 dB	25 dB	25 dB	37 dB	37 dB	33 dB	30 dB	32 dB	34 dB	30 dB
2	29 dB	21 dB	20 dB	31 dB	32 dB	28 dB	26 dB	27 dB	29 dB	26 dB
3	27 dB	17 dB	15 dB	29 dB	30 dB	26 dB	23 dB	25 dB	27 dB	23 dB
4	24 dB	—	—	26 dB	28 dB	23 dB	20 dB	22 dB	24 dB	20 dB
5	22 dB	—	—	24 dB	27 dB	22 dB	16 dB	20 dB	23 dB	16 dB
6	20 dB	—	—	22 dB	25 dB	19 dB	—	17 dB	21 dB	—
7	17 dB	—	—	20 dB	24 dB	16 dB	—	—	19 dB	—

17.3.2 Optical Performance for Linear Networks Without OADM Nodes

The following tables list the reference optical performances for linear networks without OADM nodes. Table 17-7 shows the optical performance for 32-channel linear networks using SMF fiber. Span loss values assume the following:

- No OADM nodes are installed and span losses are equal.
- The DCU loss is 9 dB.
- Only OPT-PRE amplifiers are installed.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-7 Span Loss for 32-Channel Linear Networks without OADM Nodes Using SMF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	35 dB	25 dB	25 dB	37 dB	37 dB	33 dB	30 dB	32 dB	34 dB	30 dB
2	27 dB	20 dB	19 dB	29 dB	30 dB	26 dB	23 dB	25 dB	26 dB	23 dB
3	24 dB	17 dB	17 dB	25 dB	26 dB	23 dB	20 dB	22 dB	23 dB	20 dB
4	22 dB	15 dB	14 dB	23 dB	24 dB	21 dB	19 dB	20 dB	22 dB	19 dB
5	21 dB	—	—	22 dB	22 dB	20 dB	18 dB	19 dB	20 dB	18 dB
6	20 dB	—	—	21 dB	21 dB	19 dB	17 dB	18 dB	19 dB	17 dB
7	19 dB	—	—	20 dB	20 dB	18 dB	16 dB	18 dB	19 dB	16 dB

Table 17-8 shows the optical performance for 32-channel linear networks using TW-RS fiber. Span loss values assume the following:

- No OADM nodes are installed and span losses are equal.
- The DCU is 550 ps with 4 dB loss.
- Only OPT-PRE amplifiers are installed.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-8 Span Loss for 32-Channel Linear Networks without OADM Nodes Using TW-RS Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	35 dB	25 dB	25 dB	37 dB	37 dB	33 dB	30 dB	32 dB	34 dB	30 dB
2	28 dB	20 dB	20 dB	30 dB	31 dB	27 dB	24 dB	26 dB	27 dB	24 dB
3	26 dB	18 dB	17 dB	27 dB	28 dB	24 dB	22 dB	23 dB	25 dB	22 dB
4	24 dB	15 dB	14 dB	25 dB	26 dB	23 dB	21 dB	22 dB	24 dB	20 dB
5	23 dB	—	—	24 dB	25 dB	22 dB	19 dB	21 dB	22 dB	19 dB
6	22 dB	—	—	23 dB	24 dB	20 dB	17 dB	19 dB	21 dB	17 dB
7	21 dB	—	—	23 dB	23 dB	19 dB	16 dB	18 dB	20 dB	16 dB

Table 17-9 shows the optical performance for 32-channel linear networks using E-LEAF fiber. Span loss values assume the following:

- No OADM nodes are installed and span losses are equal.
- The DCU is 550 ps with 4 dB loss.
- Only OPT-PRE amplifiers are installed.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-9 Span Loss for 32-Channel Linear Networks without OADM Nodes Using E-LEAF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	35 dB	25 dB	25 dB	37 dB	37 dB	33 dB	30 dB	32 dB	34 dB	30 dB
2	28 dB	20 dB	20 dB	30 dB	31 dB	27 dB	24 dB	26 dB	27 dB	24 dB
3	25 dB	18 dB	17 dB	27 dB	28 dB	24 dB	22 dB	23 dB	25 dB	22 dB
4	24 dB	15 dB	14 dB	25 dB	26 dB	23 dB	21 dB	22 dB	24 dB	20 dB
5	23 dB	—	—	24 dB	25 dB	22 dB	19 dB	21 dB	22 dB	19 dB
6	21 dB	—	—	22 dB	24 dB	20 dB	17 dB	19 dB	21 dB	17 dB
7	20 dB	—	—	21 dB	23 dB	19 dB	16 dB	18 dB	20 dB	16 dB

Table 17-10 shows the optical performance for 16-channel linear networks using SMF fiber. Span loss values assume the following:

- No OADM nodes are installed and span losses are equal.
- The DCU loss is 9 dB.
- Only OPT-PRE amplifiers are installed.

- The minimum channel power is 4 dBm.
- Wavelengths are picked up without any restriction from Bands 4 and 5 (1542.14 to 1545.51 nm).

See Table 17-2 for a list of cards in each class.

Table 17-10 Span Loss for 16-Channel Linear Networks without OADM Nodes Using SMF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	37 dB	29 dB	28 dB	37 dB	37 dB	36 dB	33 dB	35 dB	37 dB	33 dB
2	32 dB	23 dB	23 dB	33 dB	34 dB	30 dB	27 dB	29 dB	31 dB	27 dB
3	28 dB	21 dB	20 dB	30 dB	30 dB	26 dB	24 dB	26 dB	27 dB	24 dB
4	26 dB	19 dB	18 dB	27 dB	28 dB	24 dB	22 dB	23 dB	25 dB	22 dB
5	24 dB	18 dB	17 dB	26 dB	26 dB	23 dB	21 dB	22 dB	24 dB	21 dB
6	23 dB	17 dB	17 dB	24 dB	25 dB	22 dB	20 dB	21 dB	22 dB	20 dB
7	22 dB	16 dB	15 dB	23 dB	24 dB	21 dB	19 dB	20 dB	21 dB	19 dB

Table 17-11 shows the optical performance for 8-channel linear networks with 8 dBm per channel using SMF fiber. Span loss values assume the following:

- No OADM nodes are installed and span losses are equal.
- The DCU loss is 9 dB.
- Only OPT-PRE amplifiers are installed.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-11 Span Loss for Eight-Channel Linear Networks without OADM Nodes Using SMF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	37 dB	31 dB	30 dB	37 dB	37 dB	37 dB	35 dB	37 dB	37 dB	35 dB
2	34 dB	26 dB	25 dB	34 dB	34 dB	32 dB	30 dB	31 dB	33 dB	30 dB
3	31 dB	23 dB	22 dB	33 dB	34 dB	29 dB	26 dB	28 dB	30 dB	26 dB
4	29 dB	—	—	30 dB	31 dB	27 dB	24 dB	26 dB	28 dB	24 dB
5	27 dB	—	—	29 dB	30 dB	26 dB	23 dB	25 dB	26 dB	23 dB
6	—	—	—	27 dB	—	—	—	—	—	—

17.3.3 Optical Performance for ROADM Rings and Linear Networks

The following tables list the reference optical performances for ROADM rings and linear networks. Table 17-12 shows the optical performance for 32-channel linear or ring networks using SMF fiber with only ROADM nodes installed. Span loss values assume the following:

- All nodes in the ring or linear network are ROADM with equal span losses.
- The DCU loss is 9 dB.
- OPT-PRE and OPT-BST/OPT-BST-E amplifiers are installed.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-12 Span Loss for 32-Channel Linear or Ring Networks with all ROADM Nodes Using SMF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	35 dB	25 dB	25 dB	36 dB	37 dB	33 dB	30 dB	32 dB	34 dB	—
2	30 dB	21 dB	20 dB	32 dB	34 dB	28 dB	25 dB	26 dB	29 dB	—
3	28 dB	18 dB	17 dB	30 dB	32 dB	26 dB	23 dB	24 dB	27 dB	—
4	26 dB	—	—	28 dB	30 dB	24 dB	21 dB	22 dB	25 dB	—
5	25 dB	—	—	27 dB	29 dB	23 dB	20 dB	20 dB	23 dB	—
6	24 dB	—	—	26 dB	28 dB	22 dB	18 dB	19 dB	22 dB	—
7	23 dB	—	—	25 dB	27 dB	21 dB	14 dB	17 dB	20 dB	—
8	22 dB	—	—	24 dB	26 dB	20 dB	—	—	18 dB	—
9	21 dB	—	—	23 dB	25 dB	19 dB	—	—	—	—
10	21 dB	—	—	23 dB	25 dB	18 dB	—	—	—	—
11	18[1] dB	—	—	22 dB	24 dB	17 dB	—	—	—	—
12	17[1]	—	—	21 dB	24 dB	15 dB	—	—	—	—
13	15[1]	—	—	21 dB	23 dB	—	—	—	—	—
14	—	—	—	20 dB	23 dB	—	—	—	—	—
15	—	—	—	20 dB	22 dB	—	—	—	—	—

1. If the number of boosters is greater than 10 and power per channel is = to +1 dBm.

Table 17-13 shows the optical performance for 32-channel linear or ring network with ROADM and OADM nodes using SMF fiber. Span loss values assume the following:

- All nodes in the ring or linear network are ROADM or OADM.
- OPT-PRE and OPT-BST/OPT-BST-E amplifiers are installed.
- Span losses are equal.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-13 Span Loss for 32-Channel Ring and Linear Networks with ROADM and OADM Nodes Using SMF Fiber

Number of Spans	10 Gbps				2.5 Gbps					
	Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	30 dB	23 dB	24 dB	31 dB	34 dB	31 dB	28 dB	29 dB	30 dB	28 dB
2	26 dB	19 dB	19 dB	27 dB	27 dB	26 dB	23 dB	26 dB	27 dB	23 dB
3	23 dB	—	—	25 dB	26 dB	23 dB	21 dB	23 dB	24 dB	21 dB
4	21 dB	—	—	23 dB	24 dB	22 dB	18 dB	21 dB	22 dB	18 dB
5	20 dB	—	—	22 dB	23 dB	20 dB	13 dB	20 dB	21 dB	13 dB
6	17 dB	—	—	19 dB	22 dB	18 dB	—	17 dB	18 dB	—
7	15[1] dB	—	—	17 dB	21 dB	16 dB	—	15[1]	16 dB	—

1. 0.5 dB of OSNR impairment recovered by FEC margin @ BER>10-6

The following tables show the pass/fail criteria for eight and sixteen ROADM nodes. Table 17-14 shows the pass/fail criteria for eight ROADM nodes (seven spans) required for any-to-any node circuit reconfigurations:

- All nodes in the ring are ROADM.
- Span losses are equal.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-14 Pass/Fail Criteria for 32-Channel, Eight-Node ROADM Rings Using SMF Fiber

Span Loss (dB)	Amplifiers Installed	10 Gbps				2.5 Gbps					
		Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	OPT-PRE only	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—
2	OPT-PRE only	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—
3	OPT-PRE only	Yes	<7	<7	Yes	Yes	Yes	<7	Yes	Yes	—
4	OPT-PRE only	Yes	<7	<7	Yes	Yes	Yes	<7	Yes	Yes	—
5	OPT-PRE only	Yes	<7	<7	Yes	Yes	Yes	<7	Yes	Yes	—
6	OPT-PRE only	Yes	<7	<7	Yes	Yes	Yes	<7	Yes	Yes	—
7	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	<7	Yes	Yes	—
8	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	<7	Yes	Yes	—
9	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—
10	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—
11	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—
12	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—
13	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—

Table 17-14 Pass/Fail Criteria for 32-Channel, Eight-Node ROADM Rings Using SMF Fiber (continued)

Span Loss (dB)	Amplifiers Installed	10 Gbps				2.5 Gbps					
		Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
14	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—
15	OPT-PRE and OPT-BST/ OPT-BST-E	Yes	<7	<7	Yes	Yes	Yes	Yes	Yes	Yes	—

Table 17-15 shows the pass/fail criteria for 16 ROADM nodes (15 spans) required for any-to-any node circuit reconfigurations.

- All nodes in the ring are ROADM.
- Span losses are equal.

See Table 17-2 for a list of cards in each class. A dash (—) indicates the spans that are not supported.

Table 17-15 Pass/Fail Criteria for 32-Channel, 16-Node ROADM Rings Using SMF Fiber

Span Loss (dB)	Amplifiers Installed	10 Gbps				2.5 Gbps					
		Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
1	OPT-PRE only	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
2	OPT-PRE only	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
3	OPT-PRE only	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
4	OPT-PRE only	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
5	OPT-PRE only	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
6	OPT-PRE only	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
7	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
8	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
9	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
10	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
11	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
12	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—

Table 17-15 Pass/Fail Criteria for 32-Channel, 16-Node ROADM Rings Using SMF Fiber (continued)

Span Loss (dB)	Amplifiers Installed	10 Gbps				2.5 Gbps					
		Class A	Class B	Class C	Class I	Class D	Class E	Class F	Class G	Class H	Class J
13	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
14	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—
15	OPT-PRE and OPT-BST/ OPT-BST-E	<15[1]	<15[1]	<15[1]	Yes	Yes	<15[1]	<15[1]	<15[1]	<15[1]	—

1. Cisco MetroPlanner calculates the maximum ring circumference and number of nodes that can be supported.

17.3.4 Optical Performance for Single-Span Networks

Table 17-16 lists the span loss for a single-span link configuration with eight channels. The optical performance for this special configuration is given only for Classes A and C. This configuration assumes a maximum channel capacity of eight channels (8-dBm nominal channel power) used without any restrictions on the 32 available channels.

Table 17-16 Span Loss for Single-Span Link with Eight Channels

Node Configuration	Number of Spans	10 Gbps			2.5 Gbps			
		Class A	Class B	Class C	Class D	Class E	Class F	Class G
With OSCM card	1	37 dB	—	37 dB	—	—	—	—
With OSC-CSM card	1	35 dB	—	35 dB	—	—	—	—

Table 17-17 lists the span loss for a single-span link configuration with 16 channels. The optical performance for this special configuration is given only for Class A and Class C. This configuration assumes a maximum channel capacity of 16 channels (5-dBm nominal channel power) used without any restrictions on the 32 available channels.

Table 17-17 Span Loss for Single-Span Link with 16 Channels

Node Configuration	Number of Spans	10 Gbps			2.5 Gbps			
		Class A	Class B	Class C	Class D	Class E	Class F	Class G
With OSCM or OSC-SCM cards	1	35 dB	—	35 dB	—	—	—	—

Table 17-18 lists the span loss for a single-span link configuration with AD-1C-x.xx cards, OPT-PRE amplifiers, and OPT-BST/OPT-BST-E amplifiers. The single-span link with a flexible channel count is used both for transmitting and receiving. If dispersion compensation is required, a DCU can be used with an OPT-PRE amplifier. The optical performance for this special configuration is given for Classes A through G (8-dBm nominal channel power) used without any restrictions on the 32 available channels.

Table 17-18 Span Loss for Single-Span Link with AD-1C-xx.x Cards, OPT-PRE Amplifiers, and OPT-BST/OPT-BST-E Amplifiers

Node Configuration	Number of Spans	10 Gbps			2.5 Gbps			
		Class A	Class B	Class C	Class D	Class E	Class F	Class G
With OSCM cards[1]	1	37 dB	31 dB	31 dB	37 dB	37 dB	37 dB	37 dB
Hybrid with OSC-CSM cards[2]	1	35 dB	31 dB	31 dB	35 dB	35 dB	35 dB	35 dB

1. OSCM sensitivity limits the performance to 37 dB.
2. OSC-CSM sensitivity limits the performance to 35 dB when it replaces the OSCM.

Table 17-19 lists the span loss for a single-span link configuration with one channel and OPT-BST/OPT-BST-E amplifiers. The optical performance for this special configuration is given for Classes A through G. Classes A, B, and C use 8-dBm nominal channel power. Classes D, E, F, and G use 12-dBm nominal channel power. There are no restriction on the 32 available channels. That is, a line card, transponder, or muxponder wavelength can be extracted from the 32 available wavelengths. Also, the optical service channel is not required.

Table 17-19 Span Loss for Single-Span Link with One Channel and OPT-BST Amplifiers

Number of Spans	10 Gbps			2.5 Gbps			
	Class A	Class B	Class C	Class D	Class E	Class F	Class G
1	20 to 30 dB	17 to 26 dB	17 to 28 dB	Unprotected from 29 to 41 dB Protected from 25 to 41 dB	Unprotected from 28 to 37 dB Protected from 24 to 40 dB	Unprotected from 21 to 34 dB Protected from 18 to 34 dB	From 23 to 36 dB

Table 17-20 lists the span loss for a single-span link configuration with one channel, OPT-BST/OPT-BST-E amplifiers, OPT-PRE amplifiers, and ONS 15216 FlexLayer filters. ONS 15216 FlexLayer filters are used instead of the AD-1C-xx.x cards to reduce equipment costs and increase the span length, since the optical service channel is not necessary. The optical performance for this special configuration is given for Classes A through G. Classes A, B, and C use 8-dBm nominal channel power. Classes D, E, F, and G use 12-dBm nominal channel power. There are no restriction on the first 16 available wavelengths (from 1530.33 to 1544.53 nm).

Table 17-20 Span Loss for Single-Span Link with One Channel, OPT-BST/OPT-BST-E Amplifiers, OPT-PRE Amplifiers, and ONS 15216 FlexLayer Filters

Number of Spans	10 Gbps			2.5 Gbps			
	Class A	Class B[1]	Class C[1]	Class D[1]	Class E[1]	Class F[1]	Class G[1]
1x	38 dB	30 dB	30 dB	44 dB	40 dB	38 dB	40 dB

17.4 Automatic Power Control

The ONS 15454 automatic power control (APC) feature performs the following functions:

- Maintains constant per-channel power when changes to the number of channels occur.

- Compensates for optical network degradation (aging effects).
- Simplifies the installation and upgrade of DWDM optical networks by automatically calculating the amplifier setpoints.

Note APC functions are performed by software algorithms on the OPT-BST, OPT-PRE, and TCC2/TCC2P cards.

Amplifier software uses a control gain loop with fast transient suppression to keep the channel power constant regardless of any changes in the number of channels. Amplifiers monitor the changes to the input power and change the output power according to the calculated gain setpoint. The shelf controller software emulates the control output power loop to adjust for fiber degradation. To perform this function, the TCC2/TCC2P needs to know the channel distribution, which is provided by a signaling protocol, and the expected per-channel power, which you can provision. The TCC2/TCC2P compares the actual amplifier output power with the expected amplifier output power and modifies the setpoints if any discrepancies occur.

17.4.1 APC at the Amplifier Card Level

In constant gain mode, the amplifier power out control loop performs the following input and output power calculations, where G represents the gain and t represents time.

Pout (t) = G * Pin (t) (mW)

Pout (t) = G + Pin (t) (dB)

In a power-equalized optical system, the total input power is proportional to the number of channels. The amplifier software compensates for any variation of the input power due to changes in the number of channels carried by the incoming signal.

Amplifier software identifies changes in the read input power in two different instances, t1 and t2 as a change in the carried traffic. The letters m and n in the following formula represent two different channel numbers. Pin/ch represents the per-channel input power:

Pin (t1)= nPin/ch

Pin (t2) = mPin/ch

Amplifier software applies the variation in the input power to the output power with a reaction time that is a fraction of a millisecond. This keeps the power constant on each channel at the output amplifier, even during a channel upgrade or a fiber cut.

Amplifier parameters are configured using east and west conventions for ease of use. Selecting west provisions parameters for the preamplifier receiving from the west and the booster amplifier transmitting to the west. Selecting east provisions parameters for the preamplifiers receiving from the east and the booster amplifier transmitting to the east.

Starting from the expected per-channel power, the amplifiers automatically calculate the gain setpoint after the first channel is provisioned. An amplifier gain setpoint is calculated in order to make it equal to the loss of the span preceding the amplifier itself. After the gain is calculated, the setpoint is no longer changed by the amplifier. Amplifier gain is recalculated every time the number of provisioned channels returns to zero. If you need to force a recalculation of the gain, move the number of channels back to zero.

17.4.2 APC at the Node and Network Levels

The amplifier adjusts the gain to compensate for span loss. Span loss changes due to aging fiber and components, or changes in operating conditions. To correct the gain or express variable optical attenuator (VOA) setpoints, APC calculates the difference between the power value read by the photodiodes and the expected power value. The expected power values is calculated using:

- Provisioned per-channel power value
- Channel distribution (the number of express, add, and drop channels in the node)
- ASE estimation

Channel distribution is determined by the sum of the provisioned and failed channels. Information about provisioned wavelengths is sent to APC on the applicable nodes during circuit creation. Information about failed channels is collected through a signaling protocol that monitors alarms on ports in the applicable nodes and distributes that information to all the other nodes in the network.

ASE calculations purify the noise from the power level reported from the photodiode. Each amplifier can compensate for its own noise, but cascaded amplifiers cannot compensate for ASE generated by preceding nodes. The ASE effect increases when the number of channels decreases; therefore, a correction factor must be calculated in each amplifier of the ring to compensate for ASE build-up.

APC is a network-level feature. The APC algorithm designates a master node that is responsible for starting APC hourly or every time a new circuit is provisioned or removed. Every time the master node signals for APC to start, gain and VOA setpoints are evaluated on all nodes in the network. If corrections are needed in different nodes, they are always performed sequentially following the optical paths starting from the master node.

APC corrects the power level only if the variation exceeds the hysteresis thresholds of +/– 0.5 dB. Any power level fluctuation within the threshold range is skipped since it is considered negligible. Because APC is designed to follow slow time events, it skips corrections greater than 3 dB. This is the typical total aging margin that is provisioned during the network design phase. After you provision the first channel or the amplifiers are turned up for the first time, APC does not apply the 3 dB rule. In this case, APC corrects all the power differences to turn up the node.

Note Software R5.0 does not report corrections that are not performed and exceed the 3 dB correction factor to Cisco Transport Controller (CTC), Cisco Transport Manager (CTM), and Transaction Language One (TL1) management interfaces.

To avoid large power fluctuations, APC adjusts power levels incrementally. The maximum power correction is +/– 0.5 dB. This is applied to each iteration until the optimal power level is reached. For example, a gain deviation of 2 dB is corrected in four steps. Each of the four steps requires a complete APC check on every node in the network. APC can correct up to a maximum of 3 dB on an hourly basis. If degradation occurs over a longer time period, APC will compensate for it by using all margins that you provision during installation.

When no margin is available, adjustments cannot be made because setpoints exceed ranges. APC communicates the event to CTC, CTM, and TL1 through an APC Fail condition. APC will clear the APC fail condition when the setpoints return to the allowed ranges.

APC automatically disables itself when:

- A HW FAIL alarm is raised by any card in any of the network nodes.
- A Mismatch Equipment Alarm (MEA) is raised by any card in any of the network nodes.
- An Improper Removal alarm is raised by any card in any of the network nodes.

- Gain Degrade, Power Degrade, and Power Fail Alarms are raised by the output port of any amplifier card in any of the network nodes.
- A VOA degrade or fail alarm is raised by any of the cards in any of the network nodes.

The APC state (Enable/Disable) is located on every node and can be retrieved by the CTC or TL1 interfaces. If an event that disables APC occurs in one of the network nodes, APC is disabled on all the others and the APC state changes to DISABLE - INTERNAL. The disabled state is raised only by the node where the problem occurred to simplify troubleshooting.

APC raises the following standing conditions at the port level in CTC, TL1, and SNMP:

- APC Out of Range—APC cannot assign a new setpoint for a parameter this is allocated to a port because the new setpoint exceeds the parameter range.
- APC Correction Skipped—APC skipped a correction to one parameter allocated to a port because the difference between the expected and current values exceeds the +/– 3 dB security range.

After the error condition is cleared, signaling protocol enables APC on the network and the APC DISABLE - INTERNAL condition is cleared. Because APC is required after channel provisioning to compensate for ASE effects, all optical channel network connection (OCHNC) circuits that you provision during the disabled APC state are kept in the Out-of-Service and Autonomous, Automatic In-Service (OOS-AU,AINS [ANSI]) or Unlocked-disabled,automaticInService (ETSI) service state until APC is enabled. OCHNCs automatically go into the In-Service and Normal (IS-NR [ANSI]) or Unlocked-enabled (ETSI) service state only after APC is enabled.

17.4.3 Managing APC

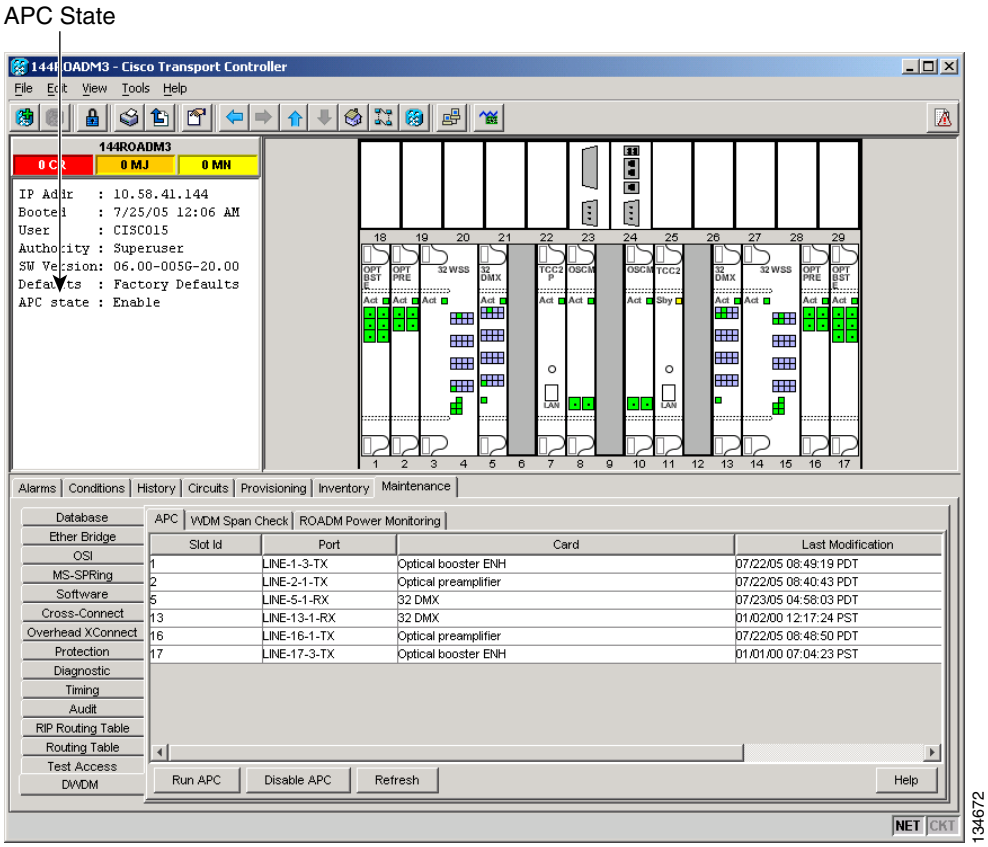
The automatic power control status is indicated by four APC states shown in the node view status area:

- Enable—APC is enabled.
- Disable - Internal—APC has been automatically disabled for an internal cause.
- Disable - User—APC was disabled manually by a user.
- Not Applicable—The node is provisioned to Metro Access or Not DWDM, which do not support APC.

You can view the automatic power control information and disable and enable APC manually on the Maintenance > DWDM > APC subtab (Figure 17-8).

Caution When APC is disabled, aging compensation is not applied and circuits cannot be activated. Do not disable APC unless it is required for specific maintenance or troubleshooting tasks. Always enable APC as soon as the tasks are completed.

Figure 17-8 Automatic Power Control



The APC subtab provides the following information:

- Slot ID—The ONS 15454 slot number for which APC information is shown.
- Port—The port number for which APC information is shown.
- Card—The card for which power control information is shown.
- Last Modification—Date and time APC last modified a setpoint for the parameters shown in Table 17-21.
- Last Check—Date and time APC last verified the setpoints for the parameters shown in Table 17-21.

Table 17-21 APC-Managed Parameters

Card	Port	Parameters
OPT-BST	LINE-3-TX	• Gain • Total Signal Output Power
OPT-PRE	LINE-1-TX	• Gain • Total Signal Output Power
AD-xB-xx.x	LINE-1-TX BAND-i-TX	VOA Target Attenuation

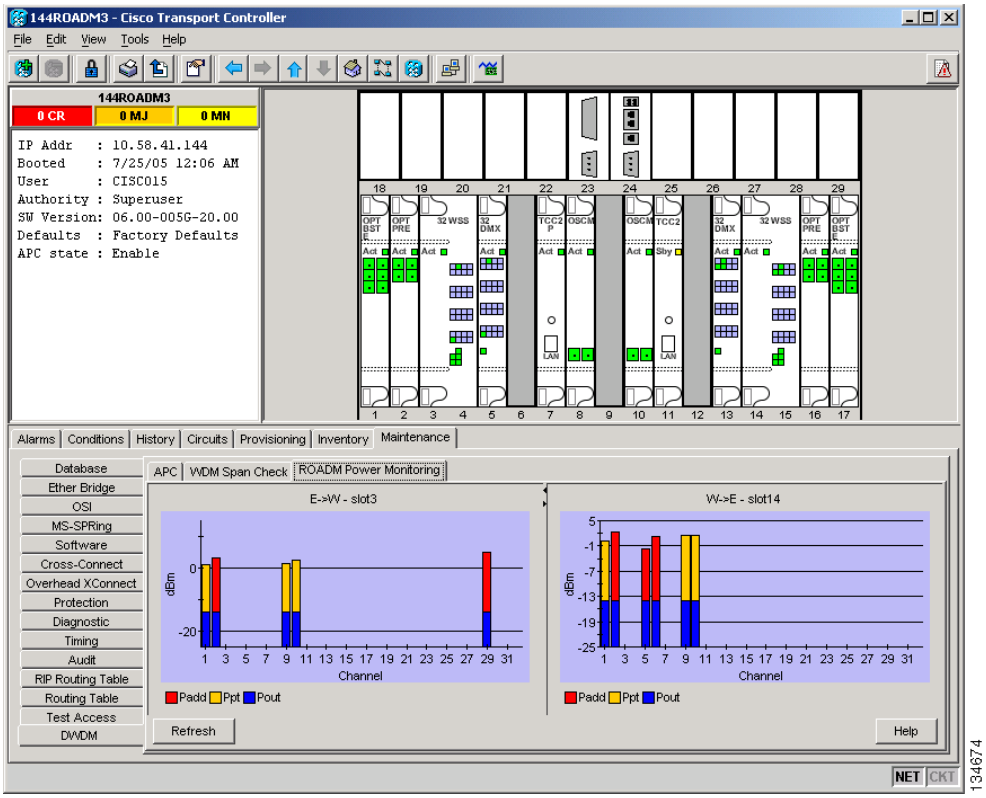
Table 17-21 APC-Managed Parameters (continued)

Card	Port	Parameters
AD-1C-xx.x AD-2C-xx.x	LINE-1-TX	VOA Target Attenuation
AD-4C-xx.x	LINE-1-TX CHAN-i-TX	VOA Target Attenuation
32-DMX	LINE-1-TX	VOA Target Attenuation

17.5 ROADM Power Equalization Monitoring

Reconfigurable OADM (ROADM) nodes allow you to monitor the 32WSS card equalization functions on the Maintenance > DWDM > Power Monitoring subtab (Figure 17-9). The tab shows the input channel power (Padd), the express or pass-through (Ppt) power and the power level at output (Pout).

Figure 17-9 Power Monitoring Subtab



17.6 Span Loss Verification

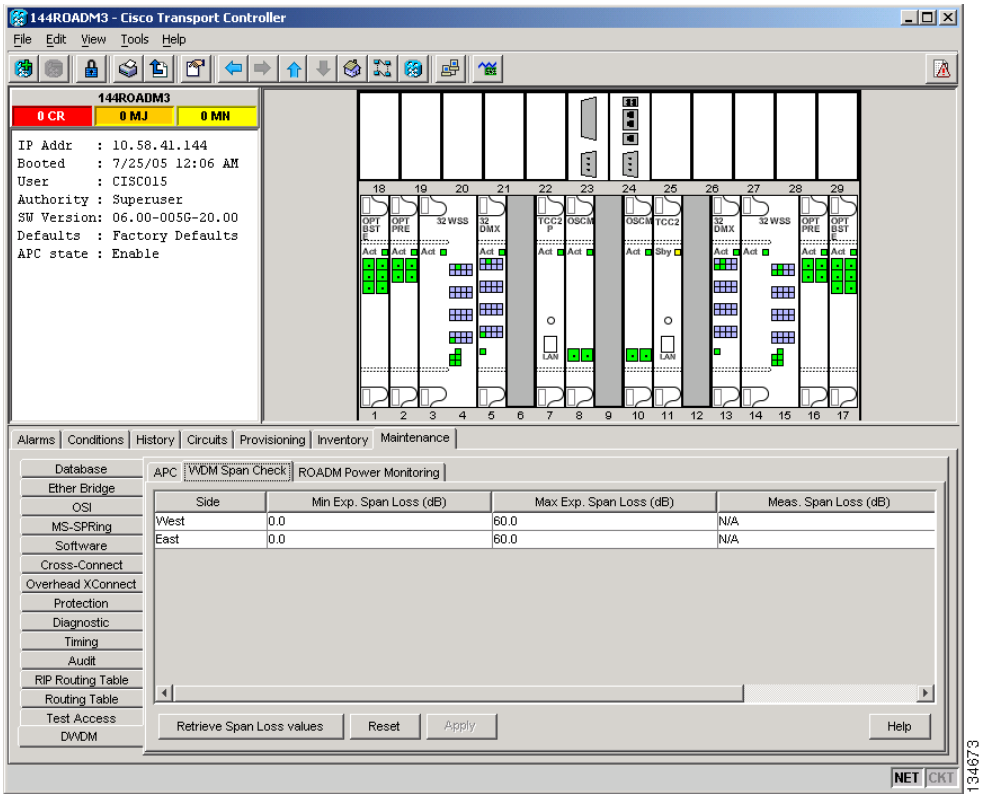
Span loss measurements can be performed from the Maintenance > DWDM > WDM Span Check subtab (Figure 17-10). The CTC span check compares the far-end OSC power with the near-end OSC power. A "Span Loss Out of Range" condition is raised when the measured span loss is higher than the maximum expected span loss. It is also raised when the measured span loss is lower than the minimum expected span loss and the difference between the minimum and maximum span loss values is greater than 1 dB. The minimum and maximum expected span loss values are calculated by Cisco MetroPlanner for the network and imported into CTC. However, you can manually change the minimum and expected span loss values.

CTC span loss measurements provide a quick span loss check and are useful whenever changes to the network occur, for example after you install equipment or repair a broken fiber. CTC span loss measurement resolutions are:

- +/– 1.5 dB for measured span losses between 0 and 25 dB
- +/– 2.5 dB for measured span losses between 25 and 38 dB

For ONS 15454 span loss measurements with higher resolutions, an optical time domain reflectometer (OTDR) must be used.

Figure 17-10 Span Loss Verification



17.7 Network Optical Safety—Automatic Laser Shutdown

Automatic laser shutdown (ALS) is a technique used to automatically shut down the output power of OSC laser transmitters (contained in the OSCM and OSC-CSM cards) and optical amplifiers (contained in OPT-BST cards) in the event of a fiber break. Cards with OSC laser transmitters and optical amplifiers (OPT-BST only) can be provisioned as follows with respect to ALS:

- Disable: ALS is off; the laser and optical amplifiers (OPT-BST only) is not automatically shut down when a traffic outage loss of signal (LOS) occurs
- Auto Restart: ALS is on. The laser and optical amplifiers (OPT-BST only) automatically shuts down when traffic outages (LOS) occur. It automatically restarts when the conditions that caused the outage are resolved.

Note Auto Restart is the default ALS provisioning.

- Manual Restart: ALS is on. The laser and optical amplifiers (OPT-BST only) automatically shuts down when traffic outages (LOS) occur. However, the laser must be manually restarted when conditions that caused the outage are resolved.
- Manual Restart for Test: Manually restarts the laser and optical amplifiers (OPT-BST only) for testing.

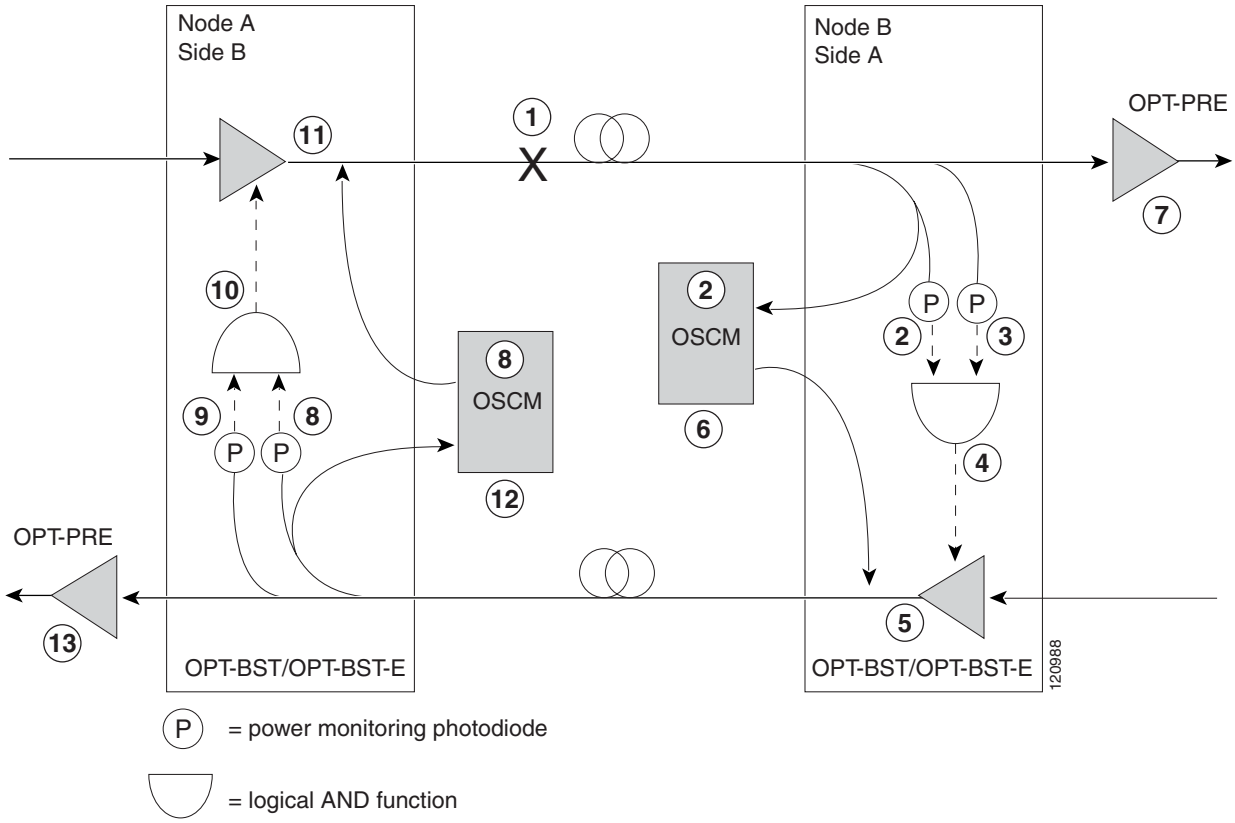
In the following paragraphs, two ALS scenarios are given:

- Nodes using OPT-BST cards (amplified nodes)
- Nodes using OSC-CSM cards (passive nodes)

17.7.1 Scenario 1: Fiber Cut in Nodes Using OPT-BST/OPT-BST-E Cards

Figure 17-11 shows nodes using OPT-BST/OPT-BST-E cards with a fiber cut between them.

Figure 17-11 Nodes Using OPT-BST/OPT-BST-E Cards



Two photodiodes at Node B monitor the received signal strength for the optical payload and optical service channel (OSC) signals. When the fiber is cut, a loss of signal (LOS) is detected at both of the photodiodes. The AND function then indicates an overall LOS condition, which causes the OPT-BST/OPT-BST-E transmitter, OPT-PRE transmitter, and OSCM lasers to shut down. This in turn leads to a LOS for both the optical payload and OSC at Node A, which causes Node A to turn off the OSCM, OPT-PRE transmitter, and OPT-BST/OPT-BST-E transmitter lasers. The sequence of events after a fiber cut is as follows (refer to the numbered circles in Figure 17-11):

1. Fiber is cut.
2. Node B power monitoring photodiode detects a Loss of Incoming Overhead (LOS-O) on the OPT-BST/OPT-BST-E card and the OSCM card detects a LOS (OC3) at the SONET layer. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
3. Node B power monitoring photodiode detects a Loss of Incoming Payload (LOS-P) on the OPT-BST/OPT-BST-E card. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
4. On the OPT-BST/OPT-BST-E card, the simultaneous LOS-O and LOS-P detection triggers a command to shut down the amplifier. CTC reports an LOS alarm (loss of continuity), while LOS-O and LOS-P are demoted. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
5. The OPT-BST/OPT-BST-E card amplifier is shut down within three seconds.
6. The OSCM laser is shut down.
7. The OPT-PRE card automatically shuts down due to a loss of incoming optical power

8. Node A power monitoring photodiode detects a LOS-O on the OPT-BST/OPT-BST-E card and the OSCM card detects a LOS (OC3) at the SONET layer. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
9. Node A power monitoring photodiode detects a LOS-P on the OPT-BST/OPT-BST-E card. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
10. On the OPT-BST, the simultaneous LOS-O and LOS-P detection triggers a command to shut down the amplifier. CTC reports an LOS alarm (loss of continuity), while LOS-O and LOS-P are demoted. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
11. The OPT-BST/OPT-BST-E card amplifier is shut down within three seconds.
12. The OSCM laser is shut down.

Note The shutdown of the OPT-BST/OPT-BST-E and OSCM cards, which launch power into the cut fiber, achieves the aim of the Network Optical Safety feature.

13. The node A OPT-PRE card automatically shuts down due to a loss of incoming optical power.

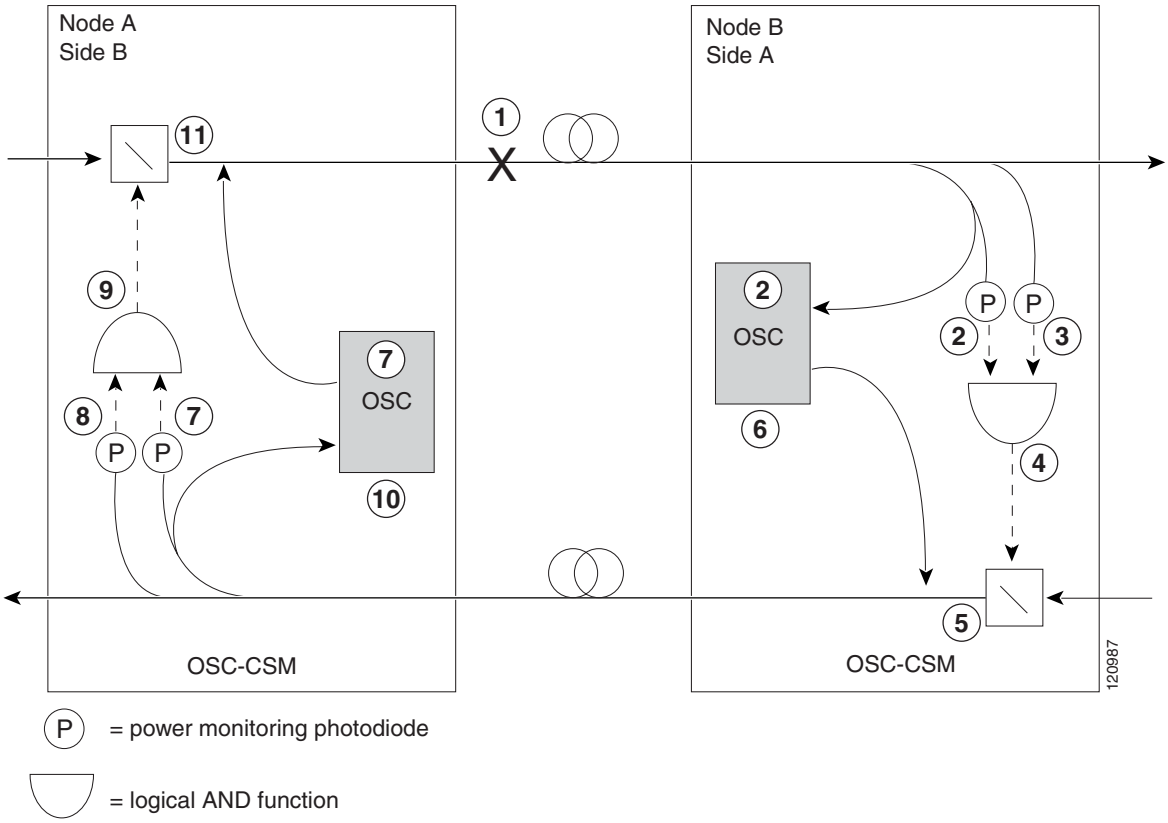
When the fiber is repaired, either an automatic or manual restart at the Node A OPT-BST/OPT-BST-E transmitter or at the Node B OPT-BST/OPT-BST-E transmitter is required. A system that has been shut down is reactivated through the use of a restart pulse. The pulse is used to signal that the optical path has been restored and transmission can begin. For example, when the far end, Node B, receives a pulse, it signals to the Node B OPT-BST/OPT-BST-E transmitter to begin transmitting an optical signal. The OPT-BST/OPT-BST-E receiver at Node A receives that signal and signals the Node A OPT-BST/OPT-BST-E transmitter to resume transmitting.

Note During a laser restart pulse, automatic power reduction (APR) is disabled and the laser power does not exceed Class 1 limits.

17.7.2 Scenario 2: Fiber Cut in Nodes Using OSC-CSM Cards

Figure 17-12 shows nodes using OSC-CSM cards with a fiber cut between them.

Figure 17-12 Nodes Using OSC-CSM Cards



Two photodiodes at the Node B OSC-CSM card monitor the received signal strength for the received optical payload and OSC signals. When the fiber is cut, LOS is detected at both of the photodiodes. The AND function then indicates an overall LOS condition, which causes the Node B OSC laser to shut down and the optical switch to block traffic. This in turn leads to LOS for both the optical payload and OSC signals at Node A, which causes Node A to turn off the OSC laser and the optical switch to block outgoing traffic. The sequence of events after a fiber cut is as follows (refer to the numbered circles in Figure 17-12):

1. Fiber is cut.
2. Node B power monitoring photodiode detects a LOS-O on the OSC-CSM card. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
3. Node B power monitoring photodiode detects a LOS-P on the OSC-CSM card. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
4. On the OSC-CSM, the simultaneous LOS-O and LOS-P detection triggers a change in the position of the optical switch. CTC reports a LOS alarm (loss of continuity), while LOS-O and LOS-P are demoted. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
5. The optical switch blocks outgoing traffic.
6. The OSC laser is shut down.
7. Node A power monitoring photodiode detects a LOS-O on the OSC-CSM card. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

8. Node A power monitoring photodiode detects a LOS-P on the OSC-CSM card. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
9. On the OSC-CSM, the simultaneous LOS-O and LOS-P detection triggers a change in the position of the optical switch. CTC reports a LOS alarm (loss of continuity), while LOS-O and LOS-P are demoted. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.
10. The OSC laser is shut down.
11. The optical switch blocks outgoing traffic.

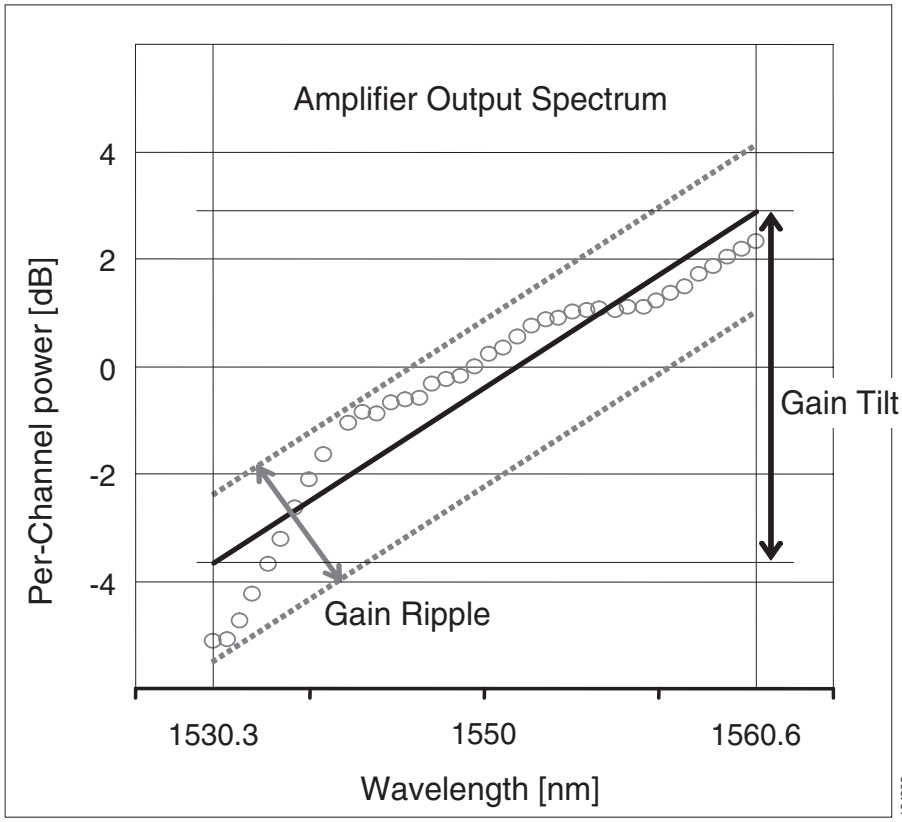
When the fiber is repaired, either an automatic or manual restart at the Node A OSC-CSM OSC or at the Node B OSC-CSM OSC is required. A system that has been shut down is reactivated through the use of a restart pulse. The pulse is used to signal that the optical path has been restored and transmission can begin. For example, when the far-end Node B receives a pulse, it signals to the Node B OSC to begin transmitting its optical signal and for the optical switch to pass incoming traffic. The OSC-CSM at Node A then receives the signal and tells the Node A OSC to resume transmitting and for the optical switch to pass incoming traffic.

17.8 Network-Level Gain—Tilt Management of Optical Amplifiers

The ability to control and adjust per channel optical power equalization is a principal feature of ONS 15454 DWDM Metro-Core network applications. A critical parameter to assure optical spectrum equalization throughout the DWDM system is the gain flatness of EDFA amplifiers.

Two items, gain tilt and gain ripple, are factors in the power equalization of optical amplifier cards such as the OPT-BST/OPT-BST-E or OPT-PRE. Figure 17-13 is a graph of the amplifier output power spectrum and how it is affected by gain tilt and gain ripple.

Figure 17-13 Effect of Gain Ripple and Gain Tilt on Amplifier Output Power



Gain ripple and gain tilt are defined as follows:

- Gain Ripple is random and depends on the spectral shape of the amplifier optical components.
- Gain Tilt is systematic and depends on the gain setpoint (Gstp) of the optical amplifier, which is a mathematical function F(Gstp) that relates to the internal amplifier design.

Gain tilt is the only contribution to the power spectrum disequalization that can be compensated at the card level. A Variable Optical Attenuator (VOA) internal to the amplifier can be used to compensate for gain tilt.

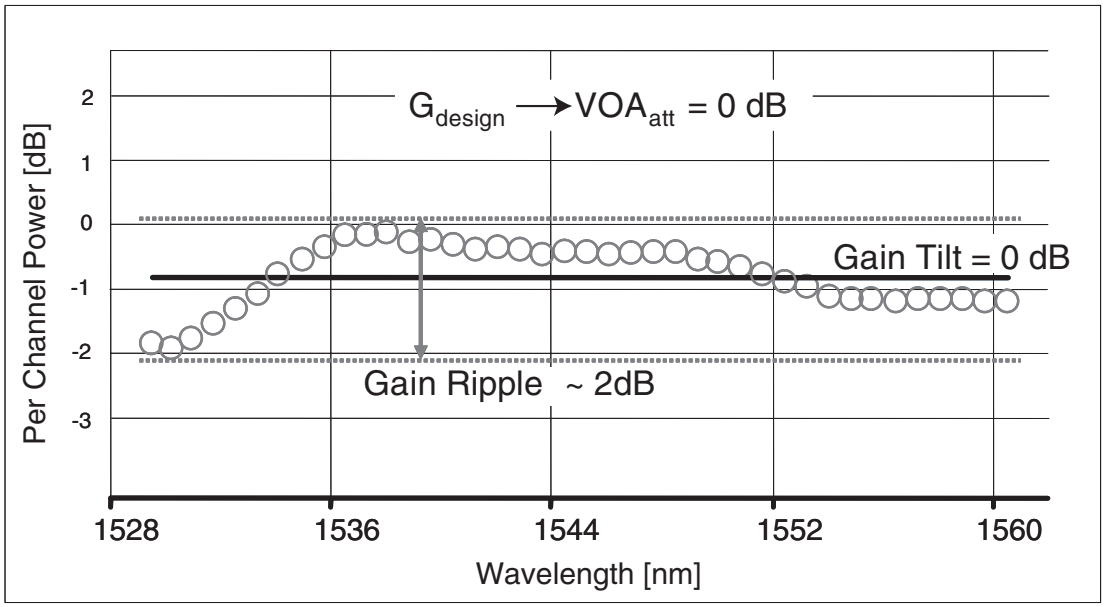
An Optical Spectrum Analyzer (OSA) device is used to acquire the output power spectrum of an amplifier. The OSA shows the peak-to-peak difference between the maximum and minimum power levels, and takes into account the contributions of both gain tilt and gain ripple.

Note Peak-to-peak power acquisition using an OSA cannot be used to "measure" the Gain Tilt, because gain ripple itself is a component of the actual measurement.

17.8.1 Gain Tilt Control at the Card Level

The OPT-BST/OPT-BST-E and OPT-PRE amplifier cards have a "flat" output (gain tilt = 0 dB) for only a specific gain value (Gdesign), based on the internal optical design (see Figure 17-14).

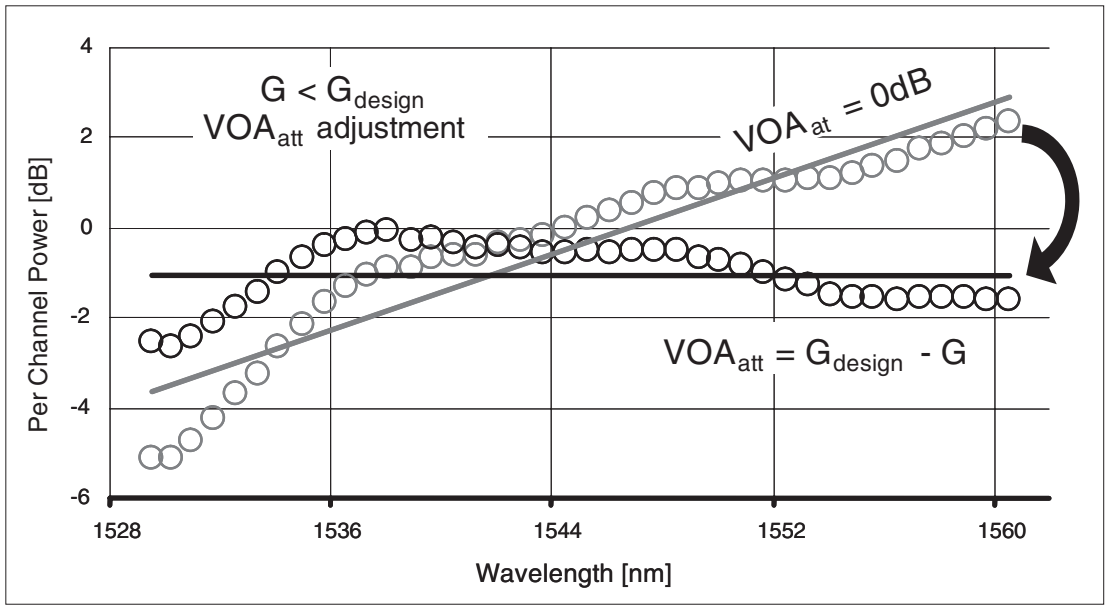
Figure 17-14 Flat Gain (Gain Tilt = 0 dB)



If the "working" gain setpoint of the amplifier is different from Gdesign, the output spectrum begins to suffer a gain tilt variation.

In order to compensate for the absolute value of the increase of the spectrum tilt, the OPT-BST/OPT-BST-E and OPT-PRE cards automatically adjust the attenuation of the VOA to maintain a flat power profile at the output, as shown in Figure 17-15.

Figure 17-15 Effect of VOA Attenuation on Gain Tilt



The VOA attenuator automatic regulation guarantees (within limits) a "zero tilt" condition in the EDFA amplifier for a wide range of possible gain setpoint values.

Table 17-22 shows the "flat output" gain range limits for the OPT-BST/OPT-BST-E and OPT-PRE cards, as well as the maximum (worst case) values of gain tilt and gain ripple expected in the specific gain range.

Table 17-22 Flat Output Gain Range Limits

Amplifier Card Type	Flat Output Gain Range	Gain Tilt (Maximum)	Gain Ripple (Maximum)
OPT-BST/ OPT-BST-E	G < 20 dB	0.5 dB	1.5 dB
OPT-PRE	G < 21 dB	0.5 dB	1.5 dB

If the "operating" gain value is outside of the range shown in Table 17-22, the EDFA amplifier introduces a tilt contribution for which the card itself cannot directly compensate. This condition is managed in different ways, depending the amplifier card type:

- OPT-BST/OPT-BST-E. The OPT-BST/OPT-BST-E amplifier is, by card design, not allowed to work outside the "zero tilt" range. The MetroPlanner tool validates network designs using the OPT-BST/OPT-BST-E amplifier card only when the gain is less than or equal to 20 dB.
- OPT-PRE. The MetroPlanner tool allows network designs even if the operating gain value is equal to or greater than 21 dB. In this case, a system-level tilt compensation strategy is adopted by the DWDM system. A more detailed explanation is given in the following section.

17.8.2 System Level Gain Tilt Control

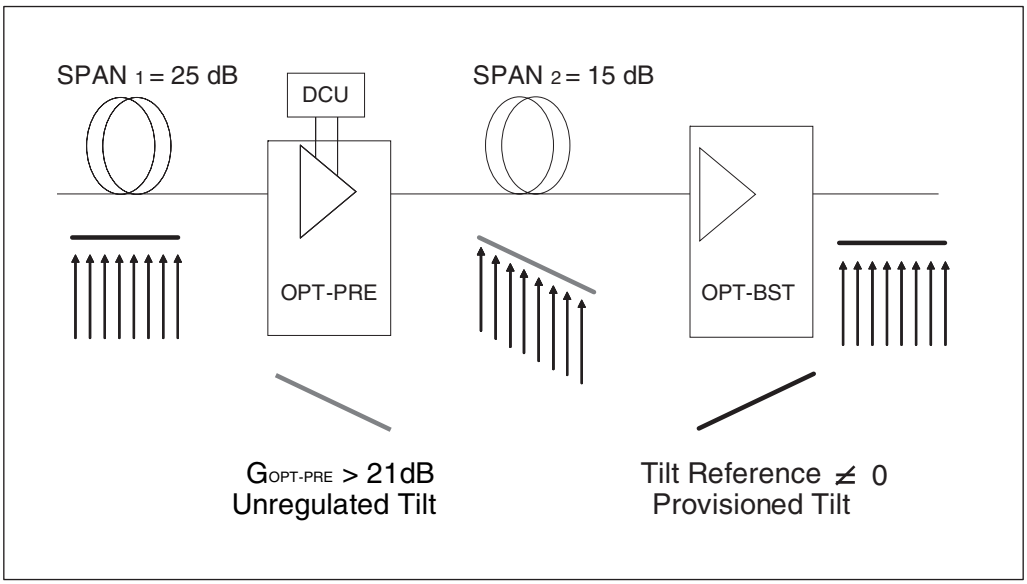
System level gain tilt control for OPT-PRE cards is achievable with two main scenarios:

- Without a reconfigurable optical add-drop multiplexer (ROADM) node
- With a ROADM node

17.8.2.1 System Gain Tilt Compensation Without ROADM Nodes

When an OPT-PRE card along a specific line direction (West to East or East to West) is working outside the "flat output" gain range (G > 21 dB), the unregulated tilt is compensated for in spans not facing ROADM nodes by configuring an equal but opposite tilt on one or more of the amplifiers in the downstream direction. The number of downstream amplifiers involved depends on the amount of tilt compensation needed and the gain setpoint of the amplifiers that are involved. See Figure 17-16.

Figure 17-16 System Tilt Compensation Without a ROADM

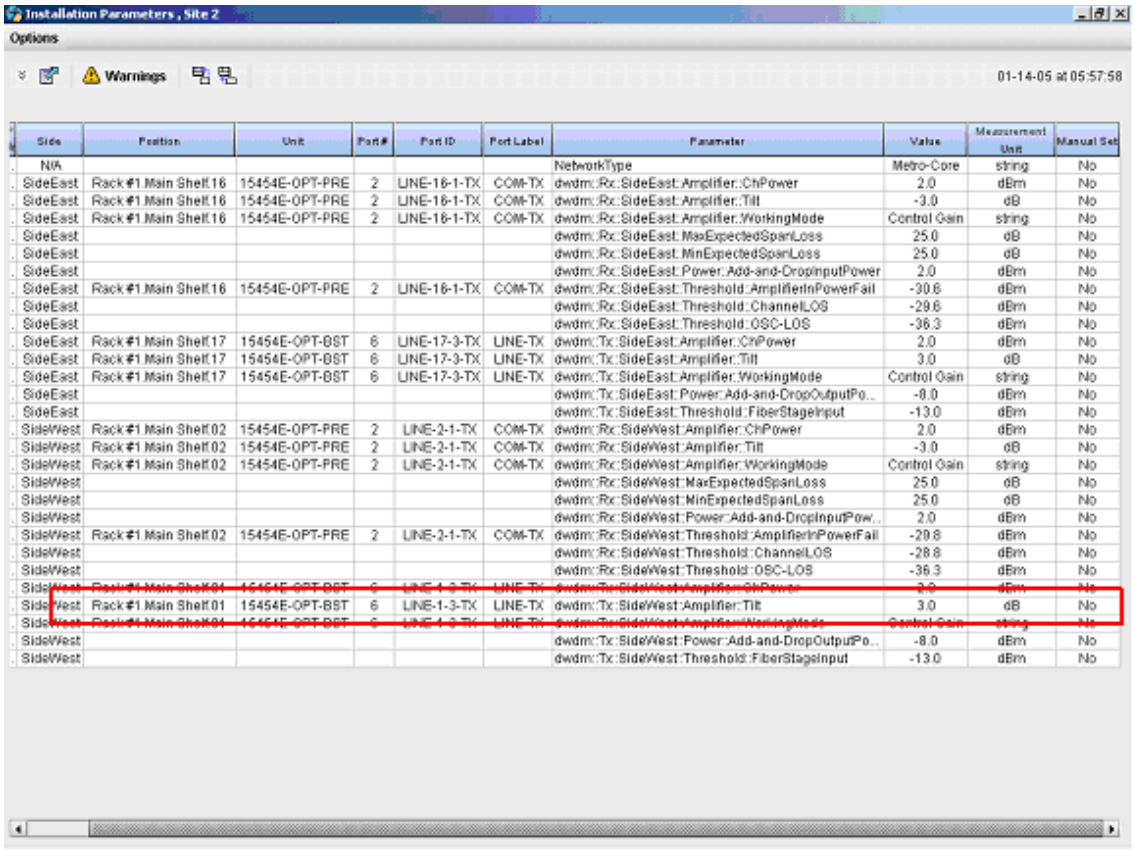


The proper Tilt Reference value is calculated by MetroPlanner and inserted in the Installation Parameter List imported during the Node Turn-Up procedure (see "NTP-G138 Import a Cisco MetroPlanner Configuration File" task on page 3-72). For both OPT-PRE and OPT-BST/OPT-BST-E cards, the provisionable Gain Tilt Reference range is between –3 dB and +3 dB.

During the Automatic Node Setup (ANS) procedure, the Tilt value for the OPT-BST/OPT-BST-E or OPT-PRE card is provisioned by the TCC card (see Figure 17-17). The provisi1

oned Tilt Reference Value is reported in the CTC OPT-PRE or OPT-BST/OPT-BST-E card view (Provisioning > Opt.Ampli.Line > Parameters > Tilt Reference).

Figure 17-17 MetroPlanner Installation Parameters



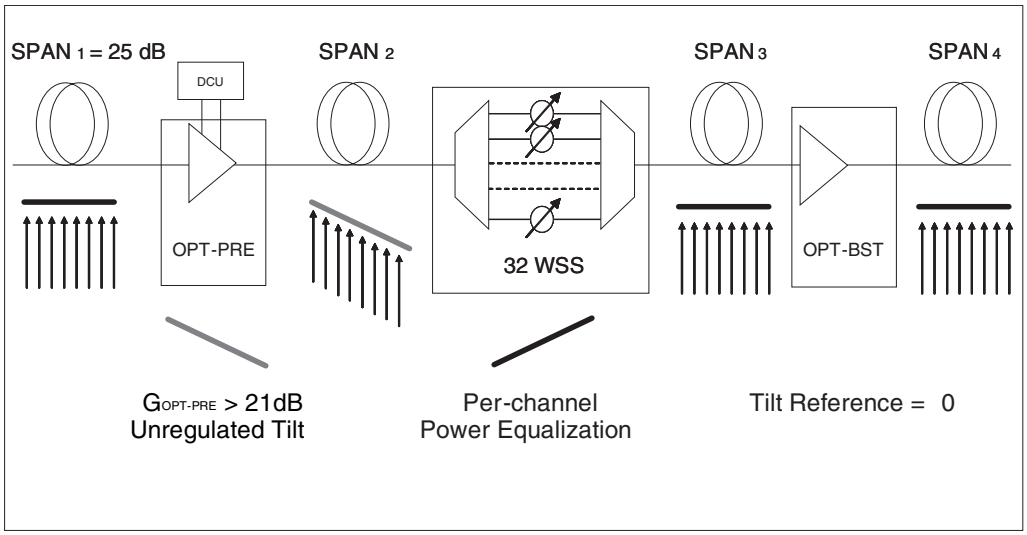
Side	Position	Unit	Port#	Port ID	Port Label	Parameter	Value	Measurement Unit	Manual Set
N/A						NetworkType	Metro-Core	string	No
SideEast	Rack #1 Main Shelf.16	15454E-OPT-PRE	2	LINE-16-1-TX	COM-TX	dwdm::Rx::SideEast::Amplifier::ChPower	2.0	dBm	No
SideEast	Rack #1 Main Shelf.16	15454E-OPT-PRE	2	LINE-16-1-TX	COM-TX	dwdm::Rx::SideEast::Amplifier::Tilt	-3.0	dB	No
SideEast	Rack #1 Main Shelf.16	15454E-OPT-PRE	2	LINE-16-1-TX	COM-TX	dwdm::Rx::SideEast::Amplifier::WorkingMode	Control Gain	string	No
SideEast						dwdm::Rx::SideEast::MaxExpectedSpanLoss	25.0	dB	No
SideEast						dwdm::Rx::SideEast::MinExpectedSpanLoss	25.0	dB	No
SideEast						dwdm::Rx::SideEast::Power::Add-and-DropInputPower	2.0	dBm	No
SideEast	Rack #1 Main Shelf.16	15454E-OPT-PRE	2	LINE-16-1-TX	COM-TX	dwdm::Rx::SideEast::Threshold::AmplifierInPowerFail	-30.6	dBm	No
SideEast						dwdm::Rx::SideEast::Threshold::ChannelLOS	-29.6	dBm	No
SideEast						dwdm::Rx::SideEast::Threshold::OSC-LOS	-36.3	dBm	No
SideEast	Rack #1 Main Shelf.17	15454E-OPT-BST	6	LINE-17-3-TX	LINE-TX	dwdm::Tx::SideEast::Amplifier::ChPower	2.0	dBm	No
SideEast	Rack #1 Main Shelf.17	15454E-OPT-BST	6	LINE-17-3-TX	LINE-TX	dwdm::Tx::SideEast::Amplifier::Tilt	3.0	dB	No
SideEast	Rack #1 Main Shelf.17	15454E-OPT-BST	6	LINE-17-3-TX	LINE-TX	dwdm::Tx::SideEast::Amplifier::WorkingMode	Control Gain	string	No
SideEast						dwdm::Tx::SideEast::Power::Add-and-DropOutputPo..	-8.0	dBm	No
SideEast						dwdm::Tx::SideEast::Threshold::FiberStageInput	-13.0	dBm	No
SideWest	Rack #1 Main Shelf.02	15454E-OPT-PRE	2	LINE-2-1-TX	COM-TX	dwdm::Rx::SideWest::Amplifier::ChPower	2.0	dBm	No
SideWest	Rack #1 Main Shelf.02	15454E-OPT-PRE	2	LINE-2-1-TX	COM-TX	dwdm::Rx::SideWest::Amplifier::Tilt	-3.0	dB	No
SideWest	Rack #1 Main Shelf.02	15454E-OPT-PRE	2	LINE-2-1-TX	COM-TX	dwdm::Rx::SideWest::Amplifier::WorkingMode	Control Gain	string	No
SideWest						dwdm::Rx::SideWest::MaxExpectedSpanLoss	25.0	dB	No
SideWest						dwdm::Rx::SideWest::MinExpectedSpanLoss	25.0	dB	No
SideWest						dwdm::Rx::SideWest::Power::Add-and-DropInputPow..	2.0	dBm	No
SideWest	Rack #1 Main Shelf.02	15454E-OPT-PRE	2	LINE-2-1-TX	COM-TX	dwdm::Rx::SideWest::Threshold::AmplifierInPowerFail	-29.8	dBm	No
SideWest						dwdm::Rx::SideWest::Threshold::ChannelLOS	-28.8	dBm	No
SideWest						dwdm::Rx::SideWest::Threshold::OSC-LOS	-36.3	dBm	No
SideWest	Rack #1 Main Shelf.01	15454E-OPT-BST	6	LINE-1-3-TX	LINE-TX	dwdm::Tx::SideWest::Amplifier::ChPower	2.0	dBm	No
SideWest	Rack #1 Main Shelf.01	15454E-OPT-BST	6	LINE-1-3-TX	LINE-TX	dwdm::Tx::SideWest::Amplifier::Tilt	3.0	dB	No
SideWest	Rack #1 Main Shelf.01	15454E-OPT-BST	6	LINE-1-3-TX	LINE-TX	dwdm::Tx::SideWest::Amplifier::WorkingMode	Control Gain	string	No
SideWest						dwdm::Tx::SideWest::Power::Add-and-DropOutputPo..	-8.0	dBm	No
SideWest						dwdm::Tx::SideWest::Threshold::FiberStageInput	-13.0	dBm	No

17.8.2.2 System Gain Tilt Compensation With ROADM Nodes

When an ROADM Node is present in the network, as shown in Figure 17-18, a per-channel dynamic gain equalization can be performed. Both gain tilt and gain ripple are completely compensated using the following techniques:

- Implementing the per-channel VOAs present inside the 32-WSS, and
- Operating in Power Control Mode with the specific power setpoint designed by MetroPlanner.

Figure 17-18 System Tilt Compensation With a ROADM



CHAPTER 18

CTC Operation Reference

This chapter describes Cisco Transport Controller (CTC), the software interface for the Cisco ONS 15454. For CTC setup and login information, see Chapter 2, "Connect the PC and Log into the GUI."

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Chapter topics include:

- 18.1 CTC Software Delivery Methods, page 18-1
- 18.2 CTC Installation Overview, page 18-3
- 18.3 PC and UNIX Workstation Requirements, page 18-4
- 18.4 ONS 15454 Connections, page 18-6
- 18.5 CTC Window, page 18-7
- 18.6 TCC2/TCC2P Card Reset, page 18-14
- 18.7 TCC2/TCC2P Card Database, page 18-15
- 18.8 Software Revert, page 18-15

18.1 CTC Software Delivery Methods

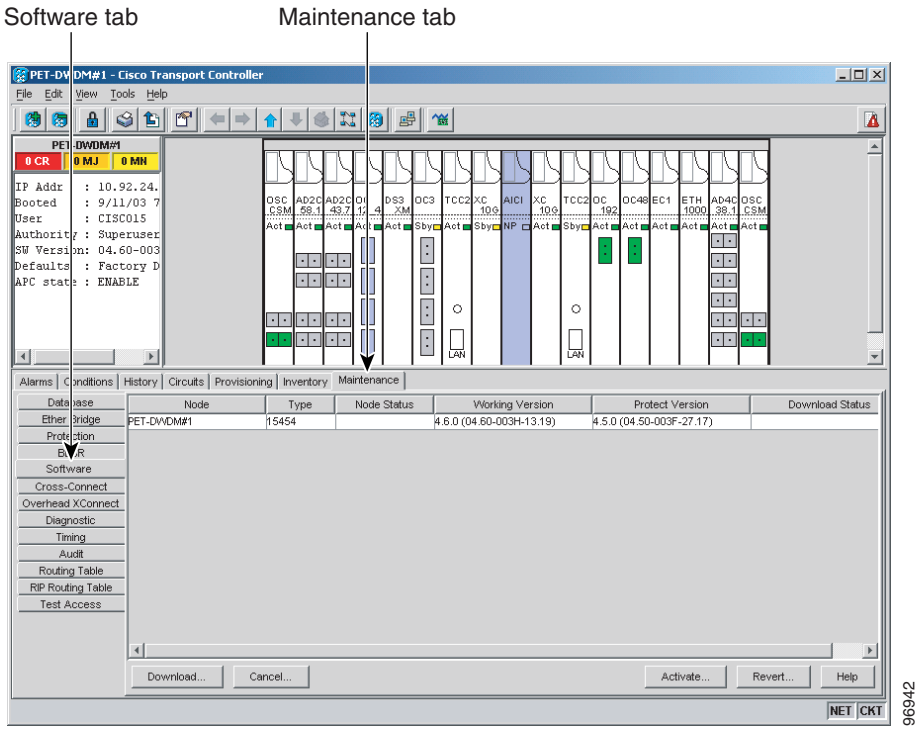
ONS 15454 provisioning and administration is performed using the CTC software. CTC is a Java application that is installed in two locations: it is stored on the TCC2 or TCC2P card and it is downloaded to your workstation the first time you log into the ONS 15454 with a new software release.

18.1.1 CTC Software Installed on the TCC2/TCC2P Card

CTC software is preloaded on the ONS 15454 TCC2/TCC2P cards; therefore, you do not need to install software on the TCC2/TCC2P cards. When a new CTC software version is released, use the release-specific software upgrade document to upgrade the ONS 15454 software on the TCC2/TCC2P card.

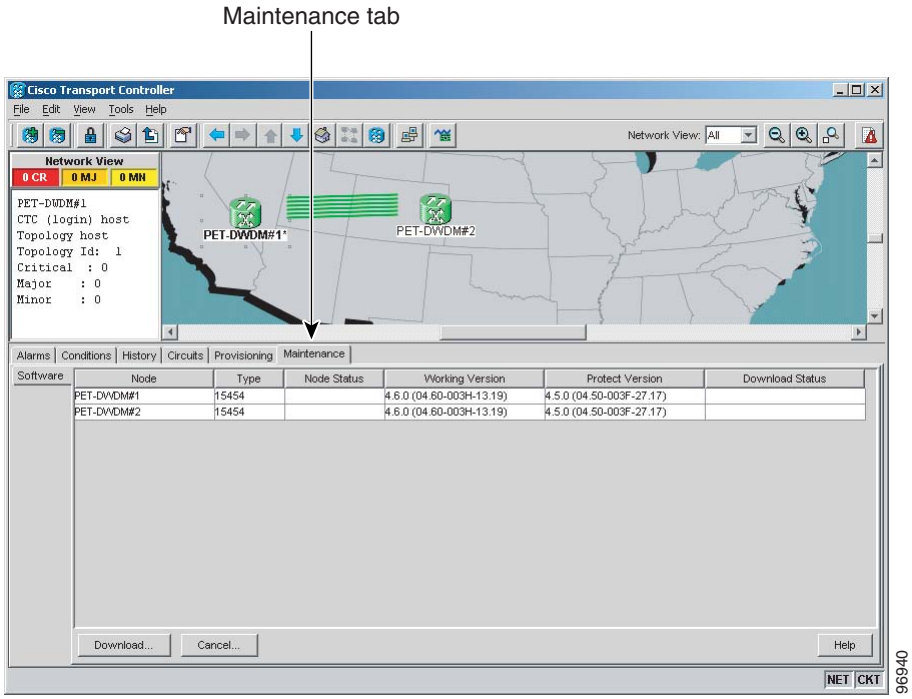
When you upgrade CTC software, the TCC2/TCC2P cards store the new CTC version as the protect CTC version. When you activate the new CTC software, the TCC2/TCC2P cards store the older CTC version as the protect CTC version, and the newer CTC release becomes the working version. You can view the software versions that are installed on an ONS 15454 by selecting the Maintenance > Software tabs in node view (Figure 18-1).

Figure 18-1 CTC Software Versions, Node View



Select the Maintenance > Software tabs in network view to display the software versions installed on all the network nodes (Figure 18-2).

Figure 18-2 CTC Software Versions, Network View



18.1.2 CTC Software Installed on the PC or UNIX Workstation

CTC software is downloaded from the TCC2/TCC2P cards and installed on your computer automatically after you connect to the ONS 15454 with a new software release for the first time. Downloading the CTC software files automatically ensures that your computer is running the same CTC software version as the TCC2/TCC2P cards you are accessing. The CTC files are stored in the temporary directory designated by your computer operating system. You can use the Delete CTC Cache button to remove files stored in the temporary directory. If the files are deleted, they download the next time you connect to an ONS 15454. Downloading the Java archive (JAR) files for CTC takes several minutes depending on the bandwidth of the connection between your workstation and the ONS 15454. For example, JAR files downloaded from a modem or a data communications channel (DCC) network link require more time than JAR files downloaded over a LAN connection.

18.2 CTC Installation Overview

To connect to an ONS 15454 using CTC, you enter the ONS 15454 IP address in the URL field of Netscape Navigator or Microsoft Internet Explorer. After connecting to an ONS 15454, the following occurs automatically:

1. A CTC launcher applet is downloaded from the TCC2/TCC2P card to your computer.
2. The launcher determines whether your computer has a CTC release matching the release on the ONS 15454 TCC2/TCC2P card.

3. If the computer does not have CTC installed, or if the installed release is older than the TCC2/TCC2P card's version, the launcher downloads the CTC program files from the TCC2/TCC2P card.
4. The launcher starts CTC. The CTC session is separate from the web browser session, so the web browser is no longer needed. Always log into nodes having the latest software release. If you log into an ONS 15454 that is connected to ONS 15454s with older versions of CTC, or to Cisco ONS 15327s or Cisco ONS 15600s, CTC files are downloaded automatically to enable you to interact with those nodes. The CTC file download occurs only when necessary, such as during your first login. You cannot interact with nodes on the network that have a software version later than the node that you used to launch CTC.

Each ONS 15454 can handle up to five concurrent CTC sessions. CTC performance can vary, depending upon the volume of activity in each session, network bandwidth, and TCC2/TCC2P card load.

Note You can also use TL1 commands to communicate with the Cisco ONS 15454 through VT100 terminals and VT100 emulation software, or you can telnet to an ONS 15454 using TL1 port 3083. Refer to the *Cisco ONS SONET TL1 Command Guide* or *Cisco ONS 15454 SDH TL1 Command Guide* for a comprehensive list of TL1 commands.

18.3 PC and UNIX Workstation Requirements

To use CTC for the ONS 15454, your computer must have a web browser with the correct Java Runtime Environment (JRE) installed. The correct JRE for each CTC software release is included on the Cisco ONS 15454 software CD and the ONS 15454 documentation CD. If you are running multiple CTC software releases on a network, the JRE installed on the computer must be compatible with the different software releases.

When you change the JRE version on the JRE tab, you must exit and restart CTC for the new JRE version to take effect. Table 18-1 shows JRE compatibility with ONS 15454 software releases.

Table 18-1 JRE Compatibility

ONS Software Release	JRE 1.2.2 Compatible	JRE 1.3 Compatible	JRE 1.4 Compatible
ONS 15454 Release 4.1	No	Yes	No
ONS 15454 Release 4.5	No	Yes	No
ONS 15454 Release 4.6	No	Yes	Yes
ONS 15454 Release 4.7	No	No	Yes
ONS 15454 Release 5.0	No	No	Yes

Table 18-2 lists the requirements for PCs and UNIX workstations. In addition to the JRE, the Java plug-in and modified java.policy file are also included on the ONS 15454 software CD and the ONS 15454 documentation CD.

Table 18-2 Computer Requirements for CTC

Area	Requirements	Notes
Processor	Pentium III 700 MHz, UltraSPARC, or equivalent	700 MHz is the recommended processor speed. You can use computers with a lower processor speed; however, you might experience longer response times and slower performance.
RAM	384 MB RAM recommended, 512 MG RAM optimum	—
Hard drive	20 GB hard drive with 50 MB of space available	—
Operating System	• PC: Windows 98 (1st and 2nd editions), Windows ME, Windows NT 4.0 (with Service Pack 6a), Windows 2000 (with Service Pack 3), or Windows XP Home • Workstation: Solaris versions 8 or 9	—
Java Runtime Environment	JRE 1.4.2	JRE 1.4.2 is installed by the CTC Installation Wizard included on the Cisco ONS 15454 software and documentation CDs. JRE 1.4.2 provides enhancements to CTC performance, especially for large networks with numerous circuits. If CTC must be launched directly from nodes running software earlier than R4.6, uninstall JRE 1.4.2 and reinstall JRE 1.3.1_02, then, to run R5.0, uninstall JRE 1.3.1_02 and reinstall JRE 1.4.2.
Web browser	Netscape 7.x or Internet Explorer 6.x	Netscape 7.x is available at the following site: http://channels.netscape.com/ns/browsers/default.jsp Internet Explorer 6.x is available at the following site: http://www.microsoft.com
Cable	User-supplied CAT-5 straight-through cable with RJ-45 connectors on each end to connect the computer to the ONS 15454 directly or through a LAN	—

18.4 ONS 15454 Connections

You can connect to the ONS 15454 in multiple ways. You can connect your PC directly to the ONS 15454 (local craft connection) using the RJ-45 port on the TCC2/TCC2P card or, for the ANSI shelf, the LAN pins on the backplane (the ETSI shelf provides a LAN connection via the RJ-45 jack on the MIC-T/C/P FMEC). Alternatively, you can connect your PC to a hub or switch that is connected to the ONS 15454, connect to the ONS 15454 through a LAN or modem, or establish TL1 connections from a PC or TL1 terminal. Table 18-3 lists the ONS 15454 connection methods and requirements.

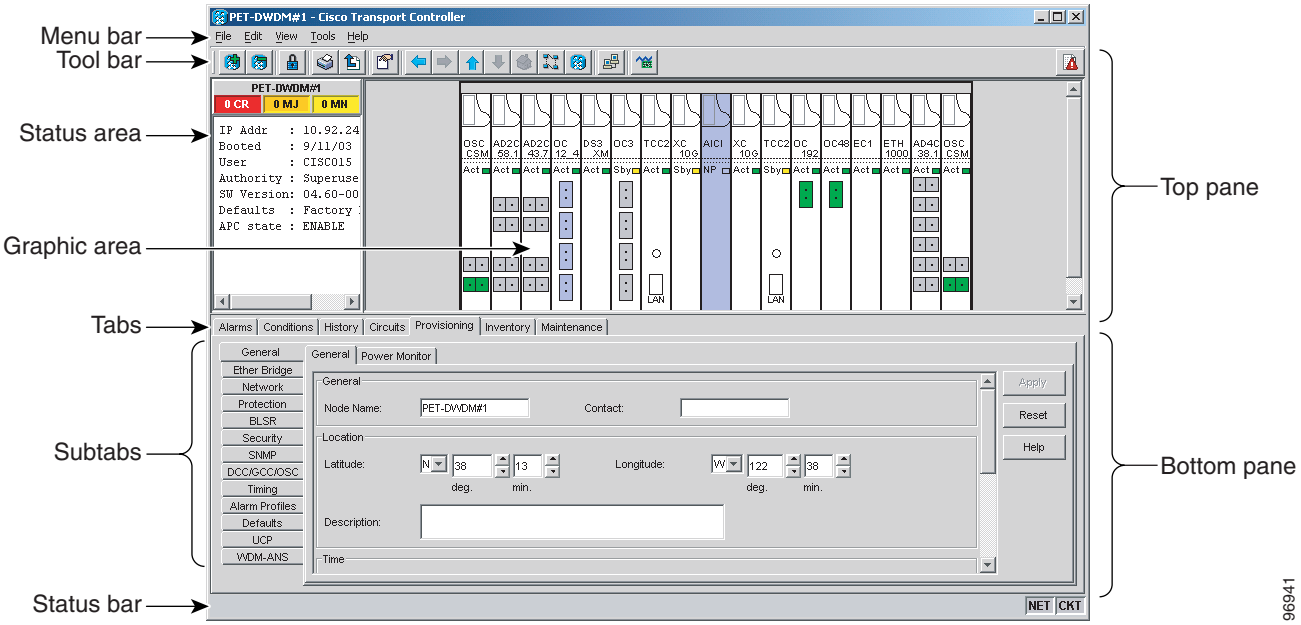
Table 18-3 ONS 15454 Connection Methods

Method	Description	Requirements
Local craft	Refers to onsite network connections between the CTC computer and the ONS 15454 using one of the following: • The RJ-45 (LAN) port on the TCC2/TCC2P card • The LAN pins on the ONS 15454 backplane (ANSI) • The RJ-45 jack on the MIC-T/C/P FMEC (ETSI) • A hub or switch to which the ONS 15454 is connected	If you do not use Dynamic Host Configuration Protocol (DHCP), you must change the computer IP address, subnet mask, and default router, or use automatic host detection.
Corporate LAN	Refers to a connection to the ONS 15454 through a corporate or network operations center (NOC) LAN.	• The ONS 15454 must be provisioned for LAN connectivity, including IP address, subnet mask, and default gateway. • The ONS 15454 must be physically connected to the corporate LAN. • The CTC computer must be connected to the corporate LAN that has connectivity to the ONS 15454.
TL1	Refers to a connection to the ONS 15454 using TL1 rather than CTC. TL1 sessions can be started from CTC, or you can use a TL1 terminal. The physical connection can be a craft connection, corporate LAN, or a TL1 terminal.	Refer to the *Cisco ONS 15454 and Cisco ONS 15327 TL1 Command Guide.*
Remote	Refers to a connection made to the ONS 15454 using a modem.	• A modem must be connected to the ONS 15454. • The modem must be provisioned for the ONS 15454. To run CTC, the modem must be provisioned for Ethernet access.

18.5 CTC Window

The CTC window appears after you log into an ONS 15454 (Figure 18-3). The window includes a menu bar, a toolbar, and a top and bottom pane. The top pane provides status information about the selected objects and a graphic of the current view. The bottom pane provides tabs and subtab to view ONS 15454 information and perform ONS 15454 provisioning and maintenance. From this window, you can display three ONS 15454 views: network, node, and card.

Figure 18-3 Node View (Default Login View)



18.5.1 Node View

Node view, shown in Figure 18-3, is the first view that appears after you log into an ONS 15454. The login node is the first node shown, and it is the "home view" for the session. Node view allows you to manage one ONS 15454 node. The status area shows the node name; IP address; session boot date and time; number of Critical (CR), Major (MJ), and Minor (MN) alarms; name and security level of the current logged-in user; software version; and network element default setup.

18.5.1.1 CTC Card Colors

The graphic area of the CTC window depicts the ONS 15454 shelf assembly. The colors of the cards in the graphic reflect the real-time status of the physical card and slot (Table 18-4).

Table 18-4 Node View Card Colors

Card Color	Status
Gray	Slot is not provisioned; no card is installed.
Violet	Slot is provisioned; no card is installed.

Table 18-4 Node View Card Colors (continued)

Card Color	Status
White	Slot is provisioned; a functioning card is installed.
Yellow	Slot is provisioned; a Minor alarm condition exists.
Orange	Slot is provisioned; a Major alarm condition exists.
Red	Slot is provisioned; a Critical alarm exists.

On the ONS 15454 ETSI, the colors of the Front Mount Electrical Connection (FMEC) cards reflect the real-time status of the physical FMEC cards. Table 18-5 lists the FMEC card colors. The FMEC ports shown in CTC do not change color.

Note You cannot preprovision FMECs.

Table 18-5 Node View FMEC Color

Upper Shelf FMEC Color	Status
White	Functioning card is installed.
Yellow	Minor alarm condition exists.
Orange (Amber)	Major alarm condition exists.
Red	Critical alarm exists.

The wording on a card in node view shows the status of a card (Active, Standby, Loading, or Not Provisioned). Table 18-6 lists the card statuses.

Table 18-6 Node View Card Statuses

Card Status	Description
Sty	Card is in standby mode.
Act	Card is active.
NP	Card is not present.
Ldg	Card is resetting.

Port color in both card and node view indicates the port service state. Table 18-7 lists the port colors and their service states. For more information about port service states, refer to Appendix C, "DWDM Administrative and Service States."

Table 18-7 Node View Card Port Colors and Service States

Port Color	Service State	Description
Cyan (blue)	Out-of-Service and Management, Loopback (OOS-MA,LPBK [ANSI]) Locked-enabled,loopback (ETSI)	Port is in a loopback state. On the card in node view, a line between ports indicates that the port is in terminal or facility loopback (see Figure 18-4 and Figure 18-5). Traffic is carried and alarm reporting is suppressed. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command.
Cyan (blue)	Out-of-Service and Management, Maintenance (OOS-MA,MT [ANSI]) Locked-enabled,maintenance (ETSI)	Port is out-of-service for maintenance. Traffic is carried and loopbacks are allowed. Alarm reporting is suppressed. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command. Use this service state for testing or to suppress alarms temporarily. Change the state to IS-NR/Unlocked-enabled; OOS-MA,DSBLD/Locked-enabled,disabled; or OOS-AU,AINS/Unlocked-disabled,automaticInService when testing is complete.
Gray	Out-of-Service and Management, Disabled (OOS-MA,DSBLD [ANSI]) Locked-enabled,disabled (ETSI)	The port is out-of-service and unable to carry traffic. Loopbacks are not allowed in this service state.
Green	In-Service and Normal (IS-NR [ANSI]) Unlocked-enabled (ETSI)	The port is fully operational and performing as provisioned. The port transmits a signal and displays alarms; loopbacks are not allowed.
Violet	Out-of-Service and Autonomous, Automatic In-Service (OOS-AU,AINS [ANSI]) Unlocked-disabled,automaticInService (ETSI)	The port is out-of-service, but traffic is carried. Alarm reporting is suppressed. The node monitors the ports for an error-free signal. After an error-free signal is detected, the port stays in this service state for the duration of the soak period. After the soak period ends, the port service state changes to IS-NR/Unlocked-enabled. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command. The AINS port will automatically transition to IS-NR/Unlocked-enabled when a signal is received for the length of time provisioned in the soak field.

Figure 18-4 Terminal Loopback Indicator

Figure 18-5 Facility Loopback Indicator

18.5.1.2 Node View Card Shortcuts

If you move your mouse over cards in the graphic, popups display additional information about the card including the card type; the card status (active or standby); the type of alarm, such as Critical, Major, or Minor (if any); the alarm profile used by the card; and for transponder (TXP) or muxponder (MXP) cards, the wavelength of the dense wavelength division multiplexing (DWDM) port. Right-click a card to reveal a shortcut menu, which you can use to open, reset, delete, or change a card. Right-click a slot to preprovision a card (that is, provision a slot before installing the card).

18.5.1.3 Node View Tabs

Table 18-8 lists the tabs and subtabs available in the node view.

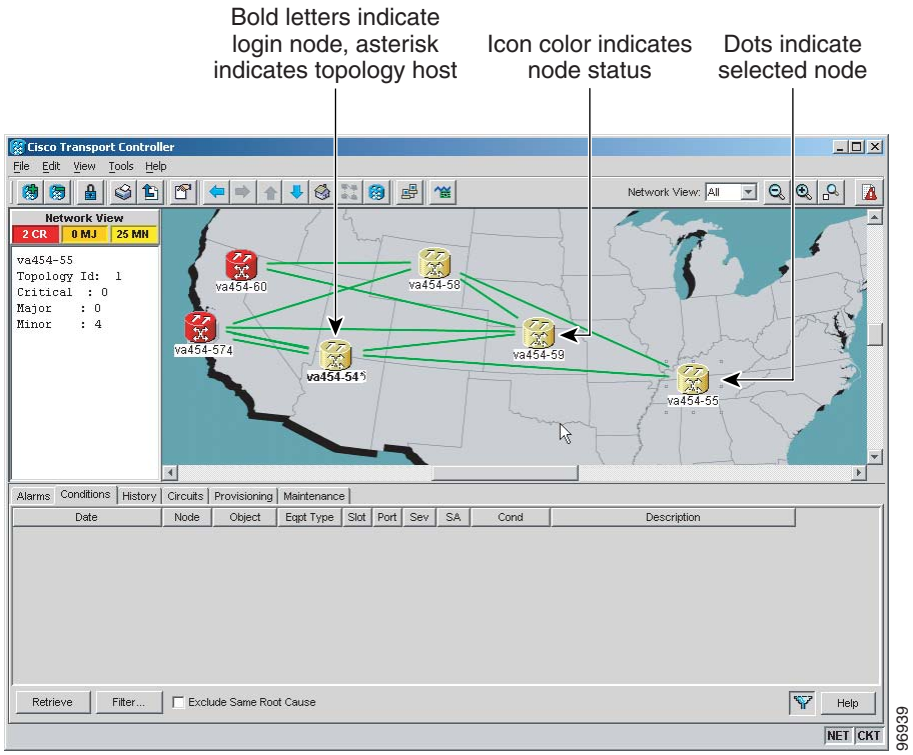
Table 18-8 Node View Tabs and Subtabs

Tab	Description	Subtabs
Alarms	Lists current alarms (CR, MJ, MN) for the node and updates them in real time.	—
Conditions	Displays a list of standing conditions on the node.	—
History	Provides a history of node alarms including date, type, and severity of each alarm. The Session subtab displays alarms and events for the current session. The Node subtab displays alarms and events retrieved from a fixed-size log on the node.	Session, Node
Circuits	Creates, deletes, edits, and maps circuits.	—
Provisioning	Provisions the ONS 15454 node.	General, Ether Bridge, Network, Protection, BLSR, Security, SNMP, Comm Channels, Timing, Alarm Profiles, Defaults, UCP, WDM-ANS
Inventory	Provides inventory information (part number, serial number, Common Language Equipment Identification [CLEI] codes) for cards installed in the node. Allows you to delete and reset cards and change the card service state.	—
Maintenance	Performs maintenance tasks for the node.	Database, Ether Bridge, Protection, BLSR (ANSI), MS-SPRing (ETSI), Software, Cross-Connect, Overhead XConnect, Diagnostic, Timing, Audit, Routing Table, RIP Routing Table, Test Access, DWDM

18.5.2 Network View

Network view allows you to view and manage ONS 15454s that have DCC connections to the node that you logged into and any login node groups you have selected (Figure 18-6).

Figure 18-6 Network in CTC Network View



Note Nodes with DCC connections to the login node do not appear if you checked the Disable Network Discovery check box in the Login dialog box.

The graphic area displays a background image with colored ONS 15454 icons. A Superuser can set up the logical network view feature, which enables each user to see the same network view.

The lines show DCC connections between the nodes (Table 18-9). DCC connections can be green (active) or gray (fail). The lines can also be solid (circuits can be routed through this link) or dashed (circuits cannot be routed through this link). Circuit provisioning uses active/routable links. Selecting a node or span in the graphic area displays information about the node and span in the status area.

Table 18-9 DCC Colors Indicating State in Network View

Color and Line Style	State
Green and solid	Active/Routable
Green and dashed	Active/Nonroutable
Gray and solid	Failed/Routable
Gray and dashed	Failed/Nonroutable

The color of a node in network view, shown in Table 18-10, indicates the node alarm status.

Table 18-10 Node Status Shown in Network View

Color	Alarm Status
Green	No alarms
Yellow	Minor alarms
Orange	Major alarms
Red	Critical alarms
Gray with Unknown#	Node initializing for the first time (CTC displays Unknown# because CTC has not discovered the name of the node yet)

Table 18-11 lists the tabs and subtabs available in network view.

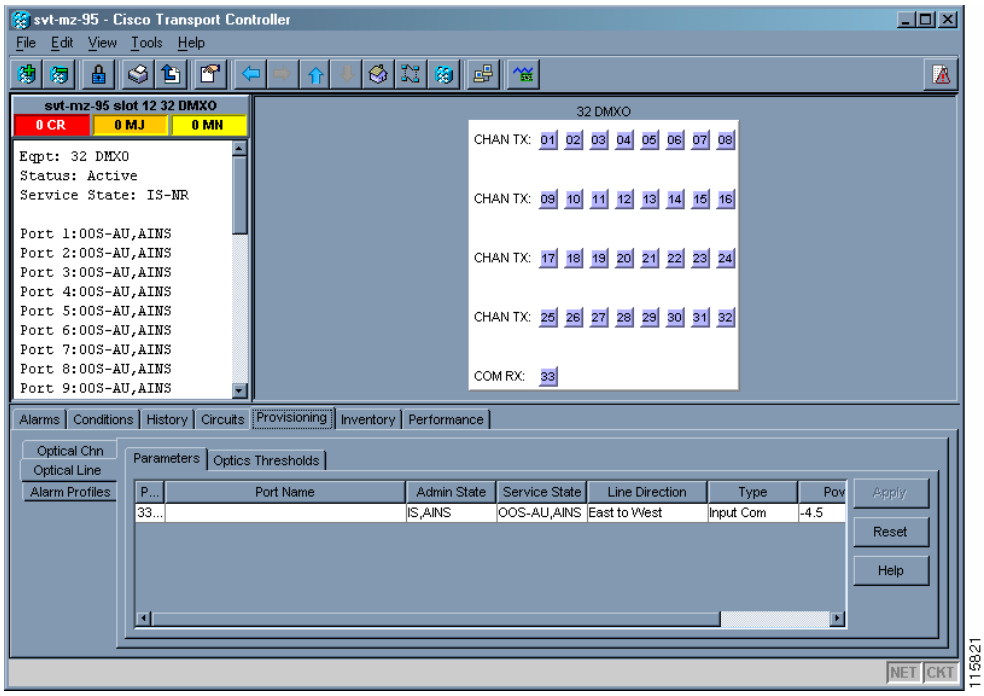
Table 18-11 Network View Tabs and Subtabs

Tab	Description	Subtabs
Alarms	Lists current alarms (CR, MJ, MN) for the network and updates them in real time.	—
Conditions	Displays a list of standing conditions on the network.	—
History	Provides a history of network alarms including date, type, and severity of each alarm.	—
Circuits	Creates, deletes, edits, filters, and searches for network circuits.	—
Provisioning	Provisions security, alarm profiles, bidirectional line switched rings (BLSRs) (ANSI), multiplex section-shared protection rings (MS-SPRing) (ETSI), and overhead circuits.	Security, Alarm Profiles, BLSR (ANSI), MS-SPRing (ETSI), Overhead Circuits, Provisionable Patchcords
Maintenance	Displays the type of equipment and the status of each node in the network; displays working and protect software versions; and allows software to be downloaded.	Software

18.5.3 Card View

The card view provides information about individual ONS 15454 cards. Use this window to perform card-specific maintenance and provisioning (Figure 18-7). A graphic showing the ports on the card is shown in the graphic area. The status area displays the node name, slot, number of alarms, card type, equipment type, card status (active or standby), card service state if the card is present, and port service state (described in Table 18-7 on page 18-9). The information that appears and the actions you can perform depend on the card. For more information about card service states, refer to Appendix C, "DWDM Administrative and Service States."

Figure 18-7 CTC Card View Showing a 32DMX-O Card



Note CTC provides a card view for all ONS 15454 cards except the TCC2/TCC2P card.

Use the card view tabs and subtabs shown in Table 18-12 to provision and manage the ONS 15454. The subtabs, fields, and information shown under each tab depend on the card type selected. The Performance tab is not available for the Alarm Interface Controller (AIC) or Alarm Interface Controller–International (AIC-I) cards.

Table 18-12 Card View Tabs and Subtabs

Tab	Description	Subtabs
Alarms	Lists current alarms (CR, MJ, MN) for the card and updates them in real time.	—
Conditions	Displays a list of standing conditions on the card.	—
History	Provides a history of card alarms including date, object, port, and severity of each alarm.	Session (displays alarms and events for the current session), Card (displays alarms and events retrieved from a fixed-size log on the card)
Circuits	Creates, deletes, edits, and search circuits.	—

Table 18-12 Card View Tabs and Subtabs (continued)

Tab	Description	Subtabs
Provisioning	Provisions an ONS 15454 card.	DS-N and OC-N cards: Line, Line Thresholds (different threshold options are available for DS-N and OC-N cards), Elect Path Thresholds, SONET Thresholds, SONET STS, and Alarm Profiles TXP and MXP cards: Card, Line, Line Thresholds, Optics Thresholds, OTN, and Alarm Profiles DWDM cards (subtabs depend on card type): Optical Line, Optical Chn, Optical Amplifier, Parameters, Optics Thresholds, and Alarm Profiles
Maintenance	Performs maintenance tasks for the card.	Loopback, Info, Protection, J1 Path Trace, AINS Soak (options depend on the card type), Automatic Laser Shutdown
Performance	Performs performance monitoring for the card.	DS-N and OC-N cards: no subtabs TXP and MXP cards: Optics PM, Payload PM, OTN PM DWDM cards (subtabs depend on card type): Optical Line, Optical Chn, Optical Amplifier Line, OC3 Line, Parameters, Optics Thresholds
Inventory	Displays an Inventory screen of the ports (TXP and MXP cards only).	—

18.6 TCC2/TCC2P Card Reset

You can reset the ONS 15454 TCC2/TCC2P card by using CTC (a soft reset) or by physically reseating a TCC2/TCC2P card (a hard reset). A soft reset reboots the TCC2/TCC2P card and reloads the operating system and the application software. Additionally, a hard reset temporarily removes power from the TCC2/TCC2P card and clears all buffer memory.

You can apply a soft reset from CTC to either an active or standby TCC2/TCC2P card without affecting traffic. If you need to perform a hard reset on an active TCC2/TCC2P card, put the TCC2/TCC2P card into standby mode first by performing a soft reset.

Note When a CTC reset is performed on an active TCC2/TCC2P card, the AIC and AIC-I cards go through an initialization process and also reset because the AIC and AIC-I cards are controlled by the active TCC2/TCC2P.

18.7 TCC2/TCC2P Card Database

When dual TCC2/TCC2P cards are installed in the ONS 15454, each TCC2/TCC2P card hosts a separate database; therefore, the protect card database is available if the database on the working TCC2/TCC2P fails. You can also store a backup version of the database on the workstation running CTC. This operation should be part of a regular ONS 15454 maintenance program at approximately weekly intervals, and should also be completed when preparing an ONS 15454 for a pending natural disaster, such as a flood or fire.

Note The following parameters are not backed up and restored: node name, IP address, mask and gateway, and Internet Inter-ORB Protocol (IIOP) port. If you change the node name and then restore a backed up database with a different node name, the circuits map to the new node name. Cisco recommends keeping a record of the old and new node names.

18.8 Software Revert

When you click the Activate button after a software upgrade, the TCC2/TCC2P card copies the current working database and saves it in a reserved location in the TCC2/TCC2P card flash memory. If later during the upgrade you need to revert to the original working software load from the protect software load, the saved database installs automatically. You do not need to restore the database manually or recreate circuits.

The revert feature is useful if the maintenance window in which you were performing an upgrade closes while you are still upgrading CTC software. You can revert to the protect software load without losing traffic. During the next maintenance window, you can complete the upgrade and activate the new software load.

Circuits created or provisioning done after you activate a new software load (upgrade to a higher release) will be lost with a revert. The database configuration at the time of activation is reinstated after a revert. (This does not apply to maintenance reverts, such as R5.0.1 to 5.0.2, because maintenance releases retain the database during activation.)

Caution Cisco does not recommend reverting after changing provisioning on the node. Depending upon the particular provisioning, reverting in this case can be traffic affecting.

To perform a supported (non-service-affecting) revert from a software release you have just activated, the release you revert to must have been working at the time you first activated the new software on that node. Because a supported revert automatically restores the node configuration at the time of the previous activation, any configuration changes made after activation will be lost when you revert the software. Downloading the software release you are upgrading to a second time after you have activated the new load ensures that no actual revert to a previous load can take place (the TCC2/TCC2P will reset, but will not be traffic affecting and will not change your database).

Note To perform a supported software upgrade or revert you must consult the specific upgrade document and release notes for the release you are upgrading to (or reverting from).

CHAPTER 19

Security and Timing Reference

This chapter provides information about Cisco ONS 15454 users and node timing. To provision security and timing, see the "NTP-G23 Create Users and Assign Security" procedure on page 3-5.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Chapter topics include:

- 19.1 Users and Security, page 19-1
- 19.2 Node Timing, page 19-6

19.1 Users and Security

The Cisco Transport Controller (CTC) ID is provided with the ONS 15454 system, but the system does not display the user ID when you sign into CTC. This ID can be used to set up other ONS 15454 users.

You can have up to 500 user IDs on one ONS 15454. Each CTC or TL1 user can be assigned one of the following security levels:

- Retrieve—Users can retrieve and view CTC information but cannot set or modify parameters.
- Maintenance—Users can access only the ONS 15454 maintenance options.
- Provisioning—Users can access provisioning and maintenance options.
- Superusers—Users can perform all of the functions of the other security levels as well as set names, passwords, and security levels for other users.

By default, multiple concurrent user ID sessions are permitted on the node, that is, multiple users can log into a node using the same user ID. However, you can provision the node to allow only a single login per user and prevent concurrent logins for all users.

Note You must add the same user name and password to each node the user accesses.

19.1.1 Security Requirements

Table 19-1 shows the actions that each user privilege level can perform in node view.

Table 19-1 ONS 15454 Security Levels—Node View

CTC Tab	Subtab	[Subtab]:Actions	Retrieve	Maintenance	Provisioning	Superuser
Alarms	—	Synchronize/Filter/Delete Cleared Alarms	X	X	X	X
Conditions	—	Retrieve/Filter	X	X	X	X
History	Session	Filter	X	X	X	X
	Node	Retrieve/Filter	X	X	X	X
Circuits	—	Create/Edit/Delete	—	—	X	X
		Filter/Search	X	X	X	X
Provisioning	General	General: Edit	—	—	Partial[1]	X
		Power Monitor: Edit	—	—	X	X
	EtherBridge	Spanning trees: Edit	—	—	X	X
	Network	General: All	—	—	—	X
		Static Routing: Create/Edit/ Delete	—	—	X	X
		OSPF: Create/Edit/Delete	—	—	X	X
		RIP: Create/Edit/Delete	—	—	X	X
		Proxy: Create/Delete	—	—	—	X
		Firewall: Create/Delete	—	—	—	X
	Protection	Create/Delete/Edit	—	—	X	X
		View	X	X	X	X
	BLSR (ANSI) MS-SPRing (ETSI)	Create/Edit/Delete	—	—	X	X
		Ring Map/Squelch Table/RIP Table	X	X	X	X
	Security	Users: Create/Delete	—	—	—	X
		Users: Change	Same user	Same user	Same user	All users
		Users: Clear Security Intrusion	—	—	—	X
		Active Logins: Logout	—	—	—	X
		Policy: Edit	—	—	—	X
		Access: Edit	—	—	—	X
		Legal Disclaimer: Edit	—	—	—	X
	SNMP	Create/Delete/Edit	—	—	X	X
		Browse trap destinations	X	X	X	X

Table 19-1 ONS 15454 Security Levels—Node View (continued)

CTC Tab	Subtab	[Subtab]:Actions	Retrieve	Maintenance	Provisioning	Superuser
Provisioning	Comm Channels	SDCC: Create/Edit/Delete	—	—	X	X
		LDCC: Create/Edit/Delete	—	—	X	X
		GCC: Create/Edit/Delete	—	—	X	X
		OSC: OSC Terminations: Create/Edit/Delete	—	—	X	X
		OSC: DWDM Ring ID: Create/Edit/Delete	—	X	X	X
		Provisionable Patchcords: Create/Delete	—	—	X	X
	Timing	General: Edit	—	—	X	X
		BITS Facilities: Edit	—	—	X	X
	Alarm Profiles	Alarm Behavior: Edit	—	—	X	X
		Alarm Profiles Editor: Load/Store/Delete[2]	—	—	X	X
		Alarm Profile Editor: New/Compare/Available/Usage	X	X	X	X
	Defaults	Edit/Import	—	—	—	X
		Export	X	X	X	X
	UCP	Node: Edit/Provision	—	—	X	X
		Neighbor: Create/Edit/Delete	—	—	X	X
		IPCC: Create/Edit/Delete	—	—	X	X
		Interface: Create/Edit/Delete	—	—	X	X
		Circuit: Create/Edit/Delete	—	—	X	X
	WDM-ANS	Provisioning: Import	—	—	—	X
		Provisioning: Export	X	X	X	X
		Connections: Create/Edit/Delete/Commit/ Calculate	—	—	X	X
		Port Status: Launch	—	—	X	X
Inventory	—	Delete	—	—	X	X
		Reset	—	X	X	X
Maintenance	Database	Backup	—	X	X	X
		Restore	—	—	—	X
	EtherBridge	Spanning Trees: View	X	X	X	X
		MAC Table: Retrieve	X	X	X	X
		MAC Table: Clear/Clear All	—	X	X	X
		Trunk Utilization: Refresh	X	X	X	X
		Circuits: Refresh	X	X	X	X

Table 19-1 ONS 15454 Security Levels—Node View (continued)

CTC Tab	Subtab	[Subtab]:Actions	Retrieve	Maintenance	Provisioning	Superuser
Maintenance	Protection	Switch/Lock out/Lockon/ Clear/ Unlock	X	X	X	X
	BLSR (ANSI)	West/East Switches	—	—	X	X
	MS-SPRing (ETSI)	Reset	—	X	X	X
	Software	Download	—	X	X	X
		Activate/Revert	—	—	—	X
	Cross-Connect	Cards: Switch/Lock/Unlock	—	X	X	X
		Resource Usage: Delete	—	—	X	X
	Overhead XConnect	View	X	X	X	X
	Diagnostic	Retrieve/Lamp Test	—	X	X	X
	Timing	Source: Edit	—	X	X	X
		Timing Report: View/Refresh	X	X	X	X
	Audit	Retrieve/Archive	—	—	—	X
	Routing Table	Retrieve	X	X	X	X
	RIP Routing Table	Retrieve	X	X	X	X
	Test Access	Read-only	X	X	X	X
	DWDM	APC: Run/Disable/Refresh	—	X	X	X
		WDM Span Check: Retrieve Span Loss values, Reset	X	X	X	X
		Power Monitoring: Refresh	X	X	X	X

1. Provisioner user cannot change node name, contact, or AIS-V insertion on STS-1 signal degrade (SD) parameters.
2. The action buttons in the subtab are active for all users, but the actions can be completely performed only by the users assigned with the required security levels.

Table 19-2 shows the actions that each user privilege level can perform in network view.

Table 19-2 ONS 15454 Security Levels—Network View

CTC Tab	Subtab	[Subtab]: Actions	Retrieve	Maintenance	Provisioning	Superuser
Alarms	—	Synchronize/Filter/Delete cleared alarms	X	X	X	X
Conditions	—	Retrieve/Filter	X	X	X	X
History	—	Filter	X	X	X	X
Circuits	—	Create/Edit/Delete	—	—	X	X
		Filter/Search	X	X	X	X

Table 19-2 ONS 15454 Security Levels—Network View (continued)

CTC Tab	Subtab	[Subtab]: Actions	Retrieve	Maintenance	Provisioning	Superuser
Provisioning	Security	Users: Create/Delete	—	—	—	X
		Users: Change	Same User	Same User	Same User	All Users
		Active logins: Logout	—	—	—	X
		Policy: Change	—	—	—	X
	Alarm Profiles	New/Load/Store/Delete[1]	—	—	X	X
		Compare/Available/Usage	X	X	X	X
	BLSR (ANSI) MS-SPRing (ETSI)	Create/Edit/Delete/Upgrade	—	—	X	X
	Overhead Circuits	Create/Delete/Edit/Merge	—	—	X	X
		Search	X	X	X	X
	Provisionable Patchcords	Create/ Delete	—	—	X	X
Maintenance	Software	Download/Cancel	X	X	X	X

1. The action buttons in the subtab are active for all users, but the actions can be completely performed only by the users assigned with the required security levels.

19.1.2 Security Policies

Users with Superuser security privilege can provision security policies on the ONS 15454. These security policies include idle user timeouts, password changes, password aging, and user lockout parameters. In addition, a Superuser can access the ONS 15454 through the TCC2/TCC2P RJ-45 port, the backplane LAN connection, or both.

19.1.2.1 Idle User Timeout

Each ONS 15454 CTC or TL1 user can be idle during his or her login session for a specified amount of time before the CTC window is locked. The lockouts prevent unauthorized users from making changes. Higher-level users have shorter default idle periods and lower-level users have longer or unlimited default idle periods, as shown in Table 19-3. The user idle period can be modified by a Superuser; refer to the "NTP-G88 Modify Users and Change Security" procedure on page 10-35.

Table 19-3 ONS 15454 Default User Idle Times

Security Level	Idle Time
Superuser	15 minutes
Provisioning	30 minutes
Maintenance	60 minutes
Retrieve	Unlimited

19.1.2.2 User Password, Login, and Access Policies

Superusers can view real-time lists of users who are logged into CTC or TL1 user logins by node. Superusers can also provision the following password, login, and node access policies:

- Password expirations and reuse—Superusers can specify when users must change their passwords and when they can reuse them.
- Login attempts—Superusers can specify the maximum number of times a user is allowed to attempt to login to CTC.
- Locking out and disabling users—Superusers can provision the number of invalid logins that are allowed before locking out users and the length of time before inactive users are disabled. The number of allowed lockout attempts is set to the number of allowed login attempts.
- Node access and user sessions—Superusers can limit the number of CTC sessions one user can have, and they can prohibit access to the ONS 15454 using the LAN or TCC2/TCC2P RJ-45 connections.

  In addition, a Superuser can select secure shell (SSH) instead of Telnet at the CTC Provisioning > Security > Access tabs. SSH is a terminal-remote host Internet protocol that uses encrypted links. It provides authentication and secure communication over unsecure channels. Port 22 is the default port and cannot be changed.

19.1.2.3 Audit Trail

Audit trails prove useful for maintaining security, recovering lost transactions, and enforcing accountability. Accountability refers to tracing user activities; that is, associating a process or action with a specific user.

The ONS 15454 maintains a 640-entry, human-readable audit trail of user or system actions such as login, logout, circuit creation or deletion, and user- or system-generated actions. Login events include authorized Cisco logins using the ONS 15454 command line interface (CLI) or CTC, the ONS 15454 graphical user interface. You can move the log to a local or network drive for later review. The ONS 15454 generates an event to indicate when the log is 80 percent full, and another event to indicate that the oldest log entries are being overwritten.

Table 19-4 contains the columns listed in Audit Trail window.

Table 19-4 Audit Trail Window Columns

Heading	Explanation
Date	Date when the action occurred
Num	Incrementing count of actions
User	User ID that initiated the action
P/F	Pass/Fail (whether or not the action was executed)
Operation	Action that was taken

19.2 Node Timing

SONET timing parameters must be set for each ONS 15454. Each ONS 15454 independently accepts its timing reference from one of three sources:

- The building integrated timing supply (BITS) pins on the ONS 15454 backplane (ANSI) or MIC-C/T/P coaxial connectors (ETSI).

- An OC-N/STM-N card installed in the ONS 15454. The card is connected to a node that receives timing through a BITS source.
- The internal ST3 clock on the TCC2/TCC2P card.

You can set ONS 15454 timing to one of three modes: external, line, or mixed. If timing is coming from the BITS pins, set ONS 15454 timing to external. If the timing comes from an OC-N/STM-N card, set the timing to line. In typical ONS 15454 networks:

- One node is set to external. The external node derives its timing from a BITS source wired to the BITS backplane pins. The BITS source, in turn, derives its timing from a primary reference source (PRS) such as a Stratum 1 clock or global positioning satellite (GPS) signal.
- The other nodes are set to line. The line nodes derive timing from the externally timed node through the OC-N trunk (span) cards. The DWDM node normally derives timing from the line using the OSCM or OSC-CSM card that are inside an OC-3/STM-1 channel.

You can set three timing references for each ONS 15454. The first two references are typically two BITS-level sources, or two line-level sources optically connected to a node with a BITS source. The third reference is usually assigned to the internal clock provided on every ONS 15454 TCC2/TCC2P card. However, if you assign all three references to other timing sources, the internal clock is always available as a backup timing reference. The internal clock is a Stratum 3 (ST3), so if an ONS 15454 node becomes isolated, timing is maintained at the ST3 level.

The CTC Maintenance > Timing > Report tabs show current timing information for an ONS 15454, including the timing mode, clock state and status, switch type, and reference data.

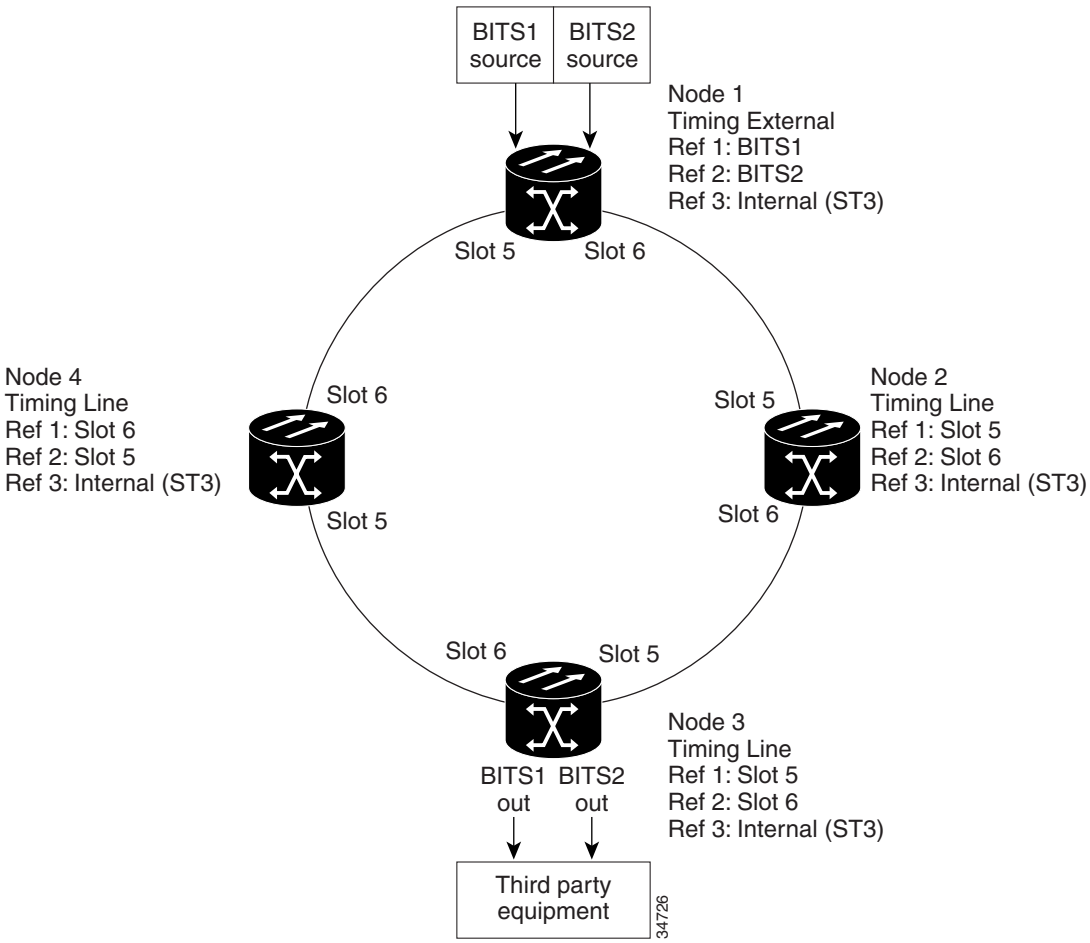
Caution Mixed timing allows you to select both external and line timing sources. However, Cisco does not recommend its use because it can create timing loops. Use this mode with caution.

19.2.1 Network Timing Example

Figure 19-1 shows an ONS 15454 network timing setup example. Node 1 is set to external timing. Two timing references are set to BITS. These are Stratum 1 timing sources wired to the BITS input pins on the Node 1 backplane. The third reference is set to internal clock. The BITS output pins on the backplane of Node 3 are used to provide timing to outside equipment, such as a digital access line access multiplexer.

In the example, Slots 5 and 6 contain the trunk (span) cards. Timing at Nodes 2, 3, and 4 is set to line, and the timing references are set to the trunk cards based on distance from the BITS source. Reference 1 is set to the trunk card closest to the BITS source. At Node 2, Reference 1 is Slot 5 because it is connected to Node 1. At Node 4, Reference 1 is set to Slot 6 because it is connected to Node 1. At Node 3, Reference 1 could be either trunk card because they are equal distance from Node 1.

Figure 19-1 ONS 15454 Timing Example



19.2.2 Synchronization Status Messaging

Synchronization status messaging (SSM) is a SONET protocol that communicates information about the quality of the timing source. SSM messages are carried on the S1 byte of the SONET Line layer. They enable SONET devices to automatically select the highest quality timing reference and to avoid timing loops.

SSM messages are either Generation 1 or Generation 2. Generation 1 is the first and most widely deployed SSM message set. Generation 2 is a newer version. If you enable SSM for the ONS 15454, consult your timing reference documentation to determine which message set to use. Table 19-5 and Table 19-6 on page 19-9 show the Generation 1 and Generation 2 message sets.

Table 19-5 SSM Generation 1 Message Set

Message	Quality	Description
PRS	1	Primary reference source—Stratum 1
STU	2	Synchronization traceability unknown
ST2	3	Stratum 2

Table 19-5 SSM Generation 1 Message Set (continued)

Message	Quality	Description
ST3	4	Stratum 3
SMC	5	SONET minimum clock
ST4	6	Stratum 4
DUS	7	Do not use for timing synchronization
RES	—	Reserved; quality level set by user

Table 19-6 SSM Generation 2 Message Set

Message	Quality	Description
PRS	1	Primary reference source—Stratum 1
STU	2	Synchronization traceability unknown
ST2	3	Stratum 2
TNC	4	Transit node clock
ST3E	5	Stratum 3E
ST3	6	Stratum 3
SMC	7	SONET minimum clock
ST4	8	Stratum 4
DUS	9	Do not use for timing synchronization
RES	—	Reserved; quality level set by user

CHAPTER 20

CTC Connectivity Reference

This chapter provides nine scenarios showing Cisco ONS 15454s in common IP network configurations as well as information about provisionable patchcords, the routing table, external firewalls, and open gateway network element (GNE) networks. The chapter does not provide a comprehensive explanation of IP networking concepts and procedures. For IP setup instructions, see the "DLP-G56 Provision IP Settings" task on page 3-11.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Chapter topics include:

- 20.1 IP Networking Overview, page 20-1
- 20.2 IP Addressing Scenarios, page 20-2
- 20.3 Provisionable Patchcords, page 20-22
- 20.4 Routing Table, page 20-24
- 20.5 External Firewalls, page 20-25
- 20.6 Open GNE, page 20-27

Note To connect ONS 15454s to an IP network, you must work with a LAN administrator or other individual at your site who has IP networking training and experience.

20.1 IP Networking Overview

ONS 15454s can be connected in many different ways within an IP environment:

- They can be connected to LANs through direct connections or a router.
- IP subnetting can create ONS 15454 node groups that allow you to provision non-data communication channel (DCC) connected nodes in a network.
- Different IP functions and protocols can be used to achieve specific network goals. For example, Proxy Address Resolution Protocol (ARP) enables one LAN-connected ONS 15454 to serve as a gateway for ONS 15454s that are not connected to the LAN.
- Static routes can be created to enable connections among multiple Cisco Transport Controller (CTC) sessions with ONS 15454s that reside on the same subnet with multiple CTC sessions.

- ONS 15454s can be connected to Open Shortest Path First (OSPF) networks so ONS 15454 network information is automatically communicated across multiple LANs and WANs.
- The ONS 15454 proxy server can control the visibility and accessibility between CTC computers and ONS 15454 element nodes.

20.2 IP Addressing Scenarios

ONS 15454 IP addressing generally has eight common scenarios or configurations. Use the scenarios as building blocks for more complex network configurations. Table 20-1 provides a general list of items to check when setting up ONS 15454s in IP networks.

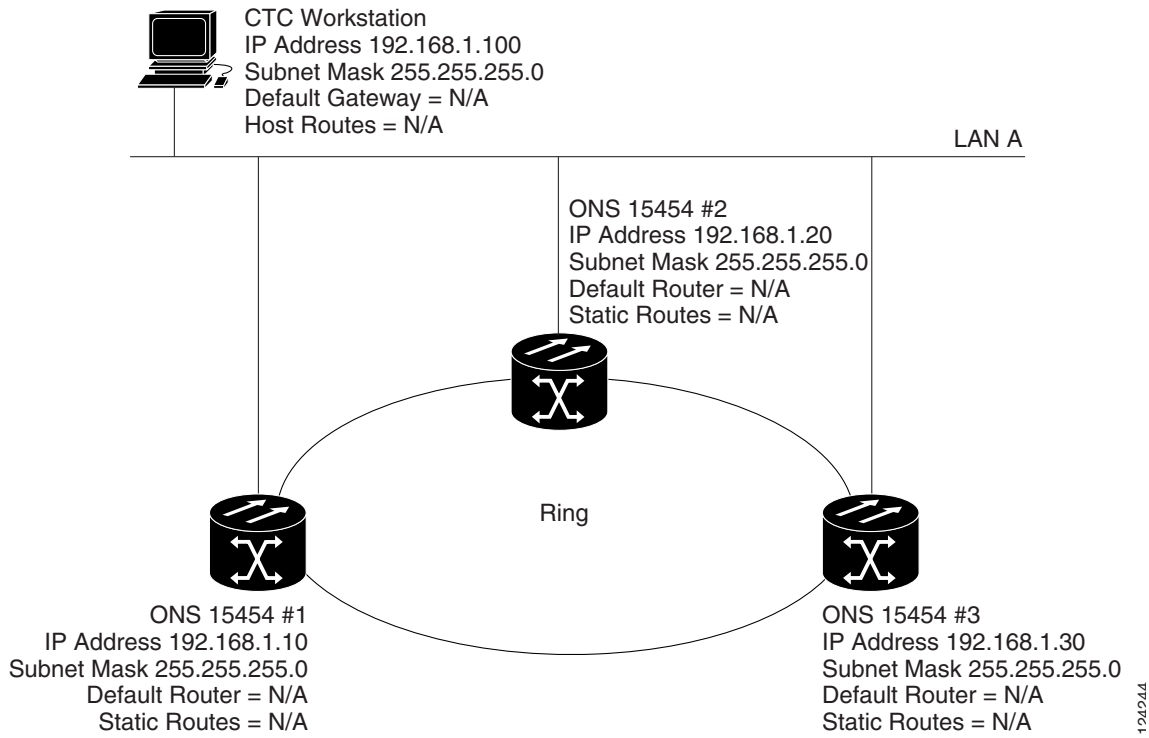
Table 20-1 General ONS 15454 IP Troubleshooting Checklist

Item	What to Check
Link integrity	Verify that link integrity exists between: • CTC computer and network hub/switch • ONS 15454s (backplane [ANSI] or MIC-C/T/P [ETSI] wire-wrap pins or RJ-45 port) and network hub/switch • Router ports and hub/switch ports
ONS 15454 hub/switch ports	If connectivity problems occur, set the hub or switch port that is connected to the ONS 15454 to 10 Mbps half-duplex.
Ping	Ping the node to test connections between computers and ONS 15454s.
IP addresses/subnet masks	Verify that ONS 15454 IP addresses and subnet masks are set up correctly.
Optical connectivity	Verify that ONS 15454 optical trunk ports are in service and that a DCC is enabled on each trunk port.

20.2.1 Scenario 1: CTC and ONS 15454s on Same Subnet

Scenario 1 shows a basic ONS 15454 LAN configuration (Figure 20-1). The ONS 15454s and CTC computer reside on the same subnet. All ONS 15454s connect to LAN A, and all ONS 15454s have DCC connections.

Figure 20-1 Scenario 1: CTC and ONS 15454s on Same Subnet (ANSI and ETSI)

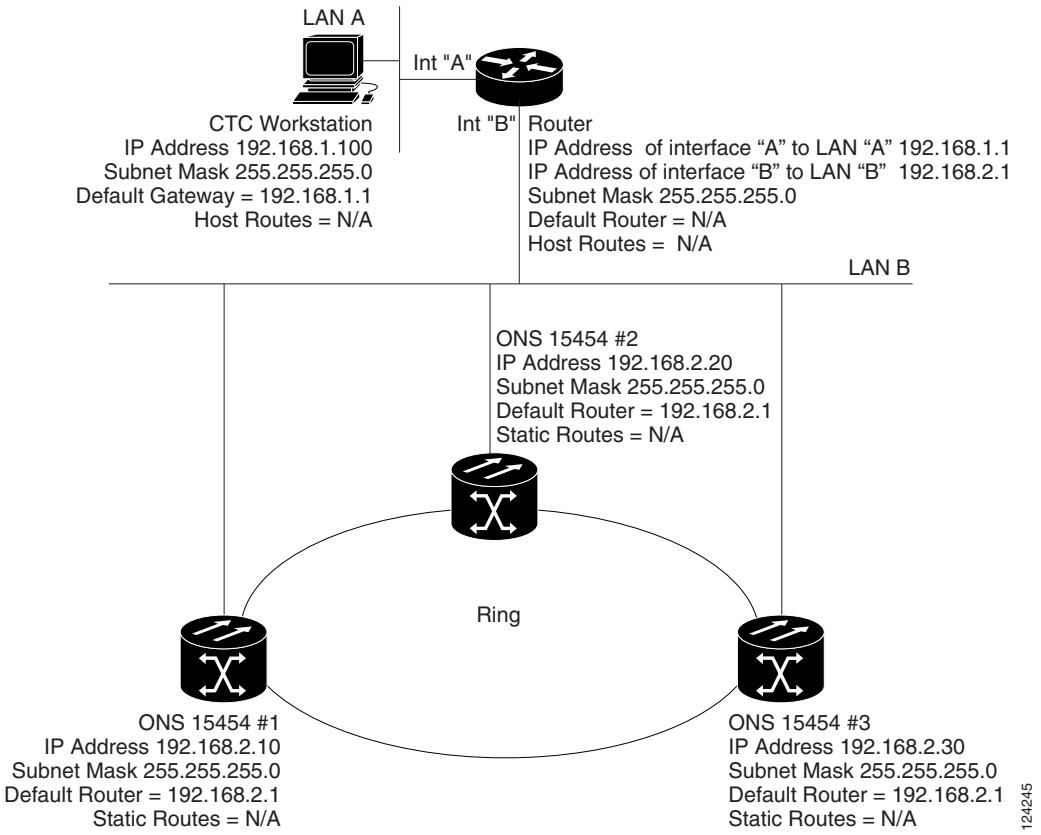


20.2.2 Scenario 2: CTC and ONS 15454s Connected to a Router

In Scenario 2, the CTC computer resides on a subnet (192.168.1.0) and attaches to LAN A (Figure 20-2). The ONS 15454s reside on a different subnet (192.168.2.0) and attach to LAN B. A router connects LAN A to LAN B. The IP address of router interface A is set to LAN A (192.168.1.1), and the IP address of router interface B is set to LAN B (192.168.2.1). The routers each have a subnet mask of 255.255.255.0.

On the CTC computer, the default gateway is set to router interface A. If the LAN uses DHCP (Dynamic Host Configuration Protocol), the default gateway and IP address are assigned automatically. In the Figure 20-2 example, a DHCP server is not available.

Figure 20-2 Scenario 2: CTC and ONS 15454s Connected to Router (ANSI and ETSI)



20.2.3 Scenario 3: Using Proxy ARP to Enable an ONS 15454 Gateway

ARP matches higher-level IP addresses to the physical addresses of the destination host. It uses a lookup table (called ARP cache) to perform the translation. When the address is not found in the ARP cache, a broadcast is sent out on the network with a special format called the ARP request. If one of the machines on the network recognizes its own IP address in the request, it sends an ARP reply back to the requesting host. The reply contains the physical hardware address of the receiving host. The requesting host stores this address in its ARP cache so that all subsequent datagrams (packets) to this destination IP address can be translated to a physical address.

Proxy ARP enables one LAN-connected ONS 15454 to respond to the ARP request for ONS 15454s not connected to the LAN. (ONS 15454 proxy ARP requires no user configuration.) For this to occur, the DCC-connected ONS 15454s must reside on the same subnet as the LAN-connected (gateway) ONS 15454. When a LAN device sends an ARP request to an ONS 15454 that is not connected to the LAN, the gateway ONS 15454 (the one connected to the LAN) returns its MAC address to the LAN

device. The LAN device then sends the datagram for the remote ONS 15454 to the MAC address of the proxy ONS 15454. The proxy ONS 15454 uses its routing table to forward the datagram to the non-LAN ONS 15454.

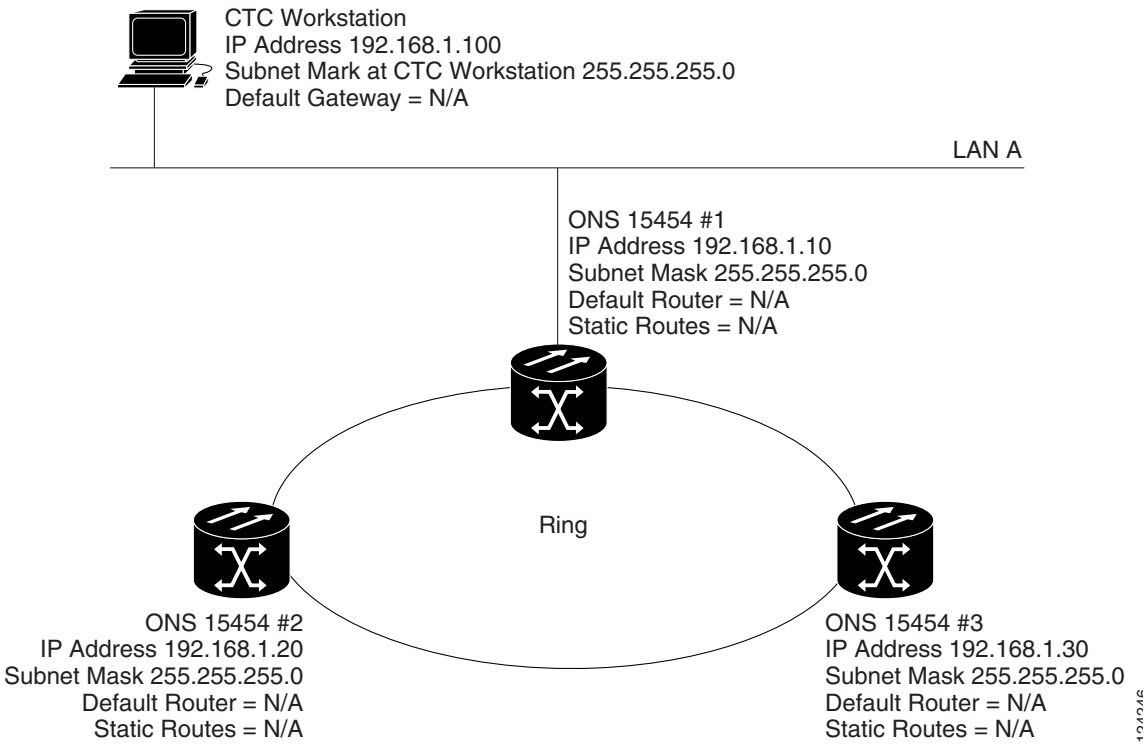
Scenario 3 is similar to Scenario 1, but only one ONS 15454 (Node 1) connects to the LAN (Figure 20-3). Two ONS 15454s (Node 2 and Node 3) connect to ONS 15454 Node 1 through the section DCC. Because all three ONS 15454s are on the same subnet, proxy ARP enables ONS 15454 Node 1 to serve as a gateway for ONS 15345 Node 2 and Node 3.

Note This scenario assumes all CTC connections are to Node 1. If you connect a laptop to either ONS 15454 Node 2 or Node 3, network partitioning occurs; neither the laptop or the CTC computer can see all nodes. If you want laptops to connect directly to end network elements, you must create static routes (see Scenario 5) or enable the ONS 15454 proxy server (see Scenario 7).

Be aware that:

- GNE and ENE 15454 proxy ARP is disabled.
- There is exactly one proxy ARP server on any given Ethernet segment; however, there may be more than one server in an ANSI or ETSI topology.
- The proxy ARP server does not perform the proxy ARP function for any node or host that is on the same Ethernet segment.
- It is important in Figure 20-3 that the CTC workstation be located within the same subnet and on the same Ethernet segment as the proxy ARP server.

Figure 20-3 Scenario 3: Using Proxy ARP (ANSI and ETSI)

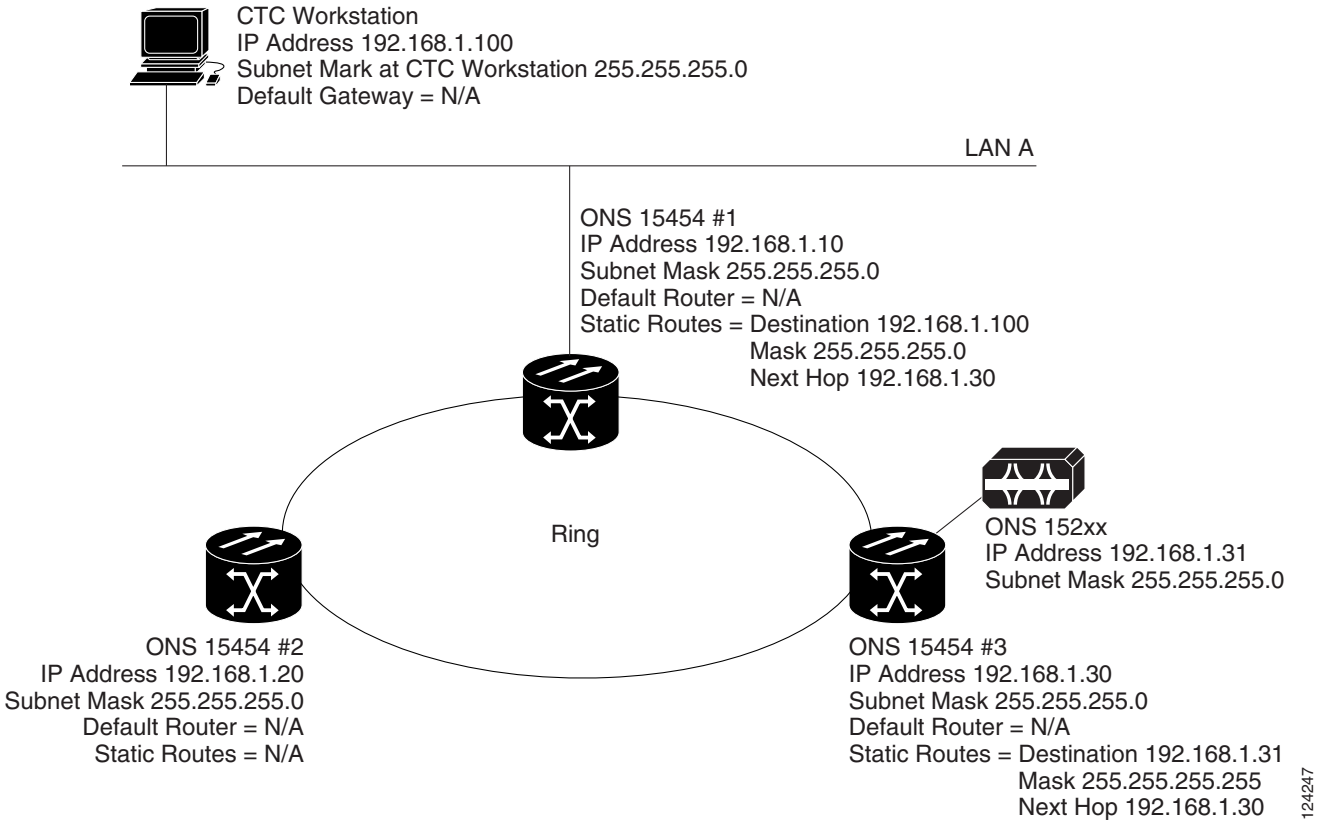


You can also use proxy ARP to communicate with hosts attached to the craft Ethernet ports of DCC-connected nodes (Figure 20-4). The node with an attached host must have a static route to the host. Static routes are propagated to all DCC peers using OSPF. The existing proxy ARP node is the gateway for additional hosts. Each node examines its routing table for routes to hosts that are not connected to the DCC network but are within the subnet. The existing proxy server replies to ARP requests for these additional hosts with the node MAC address. The existence of the host route in the routing table ensures that the IP packets addressed to the additional hosts are routed properly. Other than establishing a static route between a node and an additional host, no provisioning is necessary. The following restrictions apply:

- Only one node acts as the proxy ARP server for any given additional host.
- A node cannot be the proxy ARP server for a host connected to its Ethernet port.

In Figure 20-4, Node 1 announces to Node 2 and 3 that it can reach the CTC host. Similarly, Node 3 announces that it can reach the ONS 152xx. The ONS 152xx is shown as an example; any network element can be set up as an additional host.

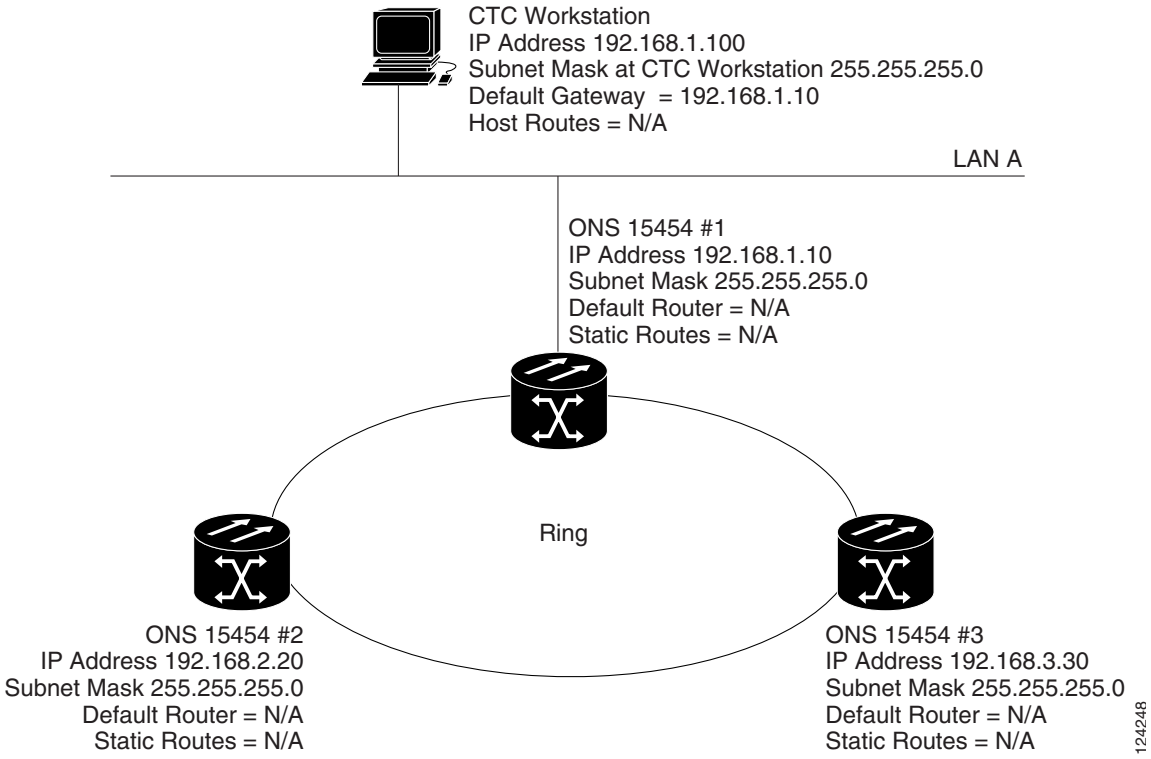
Figure 20-4 Scenario 3: Using Proxy ARP with Static Routing (ANSI and ETSI)



20.2.4 Scenario 4: Default Gateway on CTC Computer

Scenario 4 is similar to Scenario 3, but Nodes 2 and 3 reside on different subnets, 192.168.2.0 and 192.168.3.0, respectively (Figure 20-5). Node 1 and the CTC computer are on subnet 192.168.1.0. Proxy ARP is not used because the network includes different subnets. For the CTC computer to communicate with Nodes 2 and 3, Node 1 is entered as the default gateway on the CTC computer.

Figure 20-5 Scenario 4: Default Gateway on a CTC Computer (ANSI and ETSI)



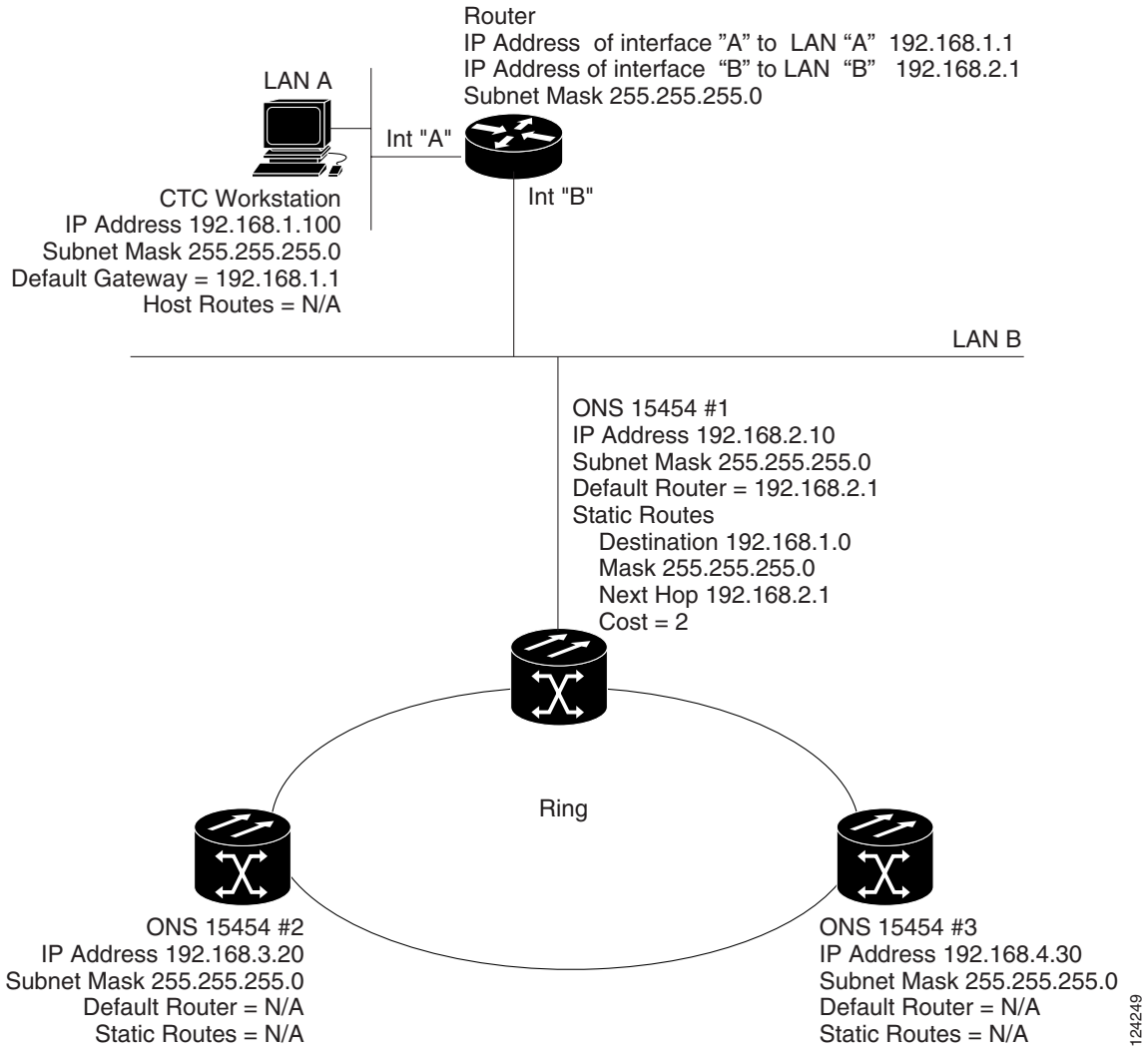
20.2.5 Scenario 5: Using Static Routes to Connect to LANs

Static routes are used for two purposes:

- To connect ONS 15454s to CTC sessions on one subnet connected by a router to ONS 15454s residing on another subnet. (These static routes are not needed if OSPF is enabled. Scenario 6 shows an OSPF example.)
- To enable multiple CTC sessions among ONS 15454s residing on the same subnet.

In Figure 20-6, one CTC residing on subnet 192.168.1.0 connects to a router through interface A (the router is not set up with OSPF). ONS 15454s residing on different subnets are connected through Node 1 to the router through interface B. Because Nodes 2 and 3 are on different subnets, proxy ARP does not enable Node 1 as a gateway. To connect to CTC computers on LAN A, a static route is created on Node 1.

Figure 20-6 Scenario 5: Static Route With One CTC Computer Used as a Destination (ANSI and ETSI)

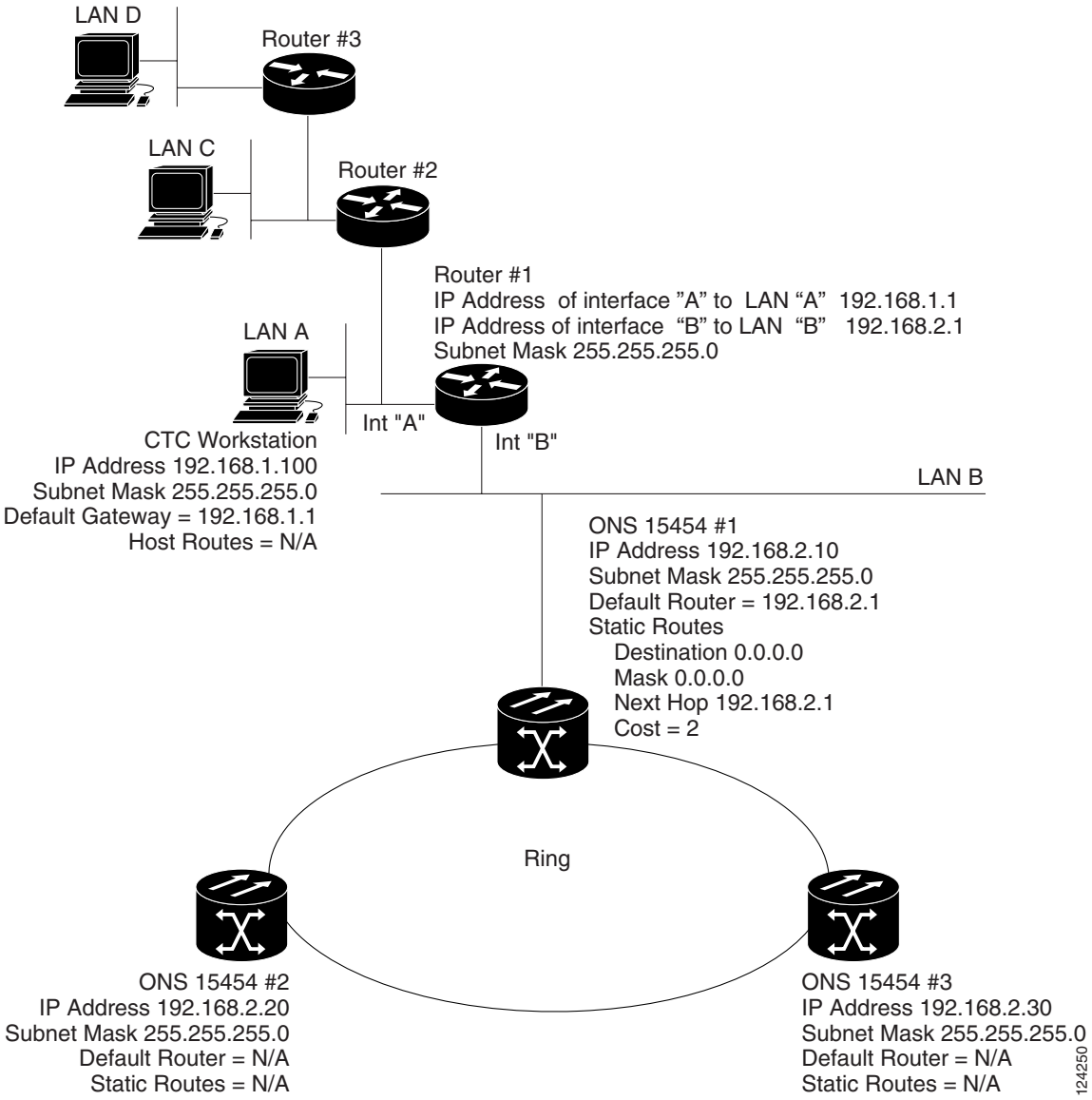


The destination and subnet mask entries control access to the ONS 15454s:

- If a single CTC computer is connected to a router, enter the complete CTC "host route" IP address as the destination with a subnet mask of 255.255.255.255.
- If CTC computers on a subnet are connected to a router, enter the destination subnet (in this example, 192.168.1.0) and a subnet mask of 255.255.255.0.
- If all CTC computers are connected to a router, enter a destination of 0.0.0.0 and a subnet mask of 0.0.0.0. Figure 20-7 shows an example.

The IP address of router interface B is entered as the next hop, and the cost (number of hops from source to destination) is 2.

Figure 20-7 Scenario 5: Static Route With Multiple LAN Destinations (ANSI and ETSI)



20.2.6 Scenario 6: Using OSPF

Open Shortest Path First (OSPF) is a link state Internet routing protocol. Link state protocols use a "hello protocol" to monitor their links with adjacent routers and to test the status of their links to their neighbors. Link state protocols advertise their directly connected networks and their active links. Each link state router captures the link state "advertisements" and puts them together to create a topology of the entire network or area. From this database, the router calculates a routing table by constructing a shortest path tree. Routes are recalculated when topology changes occur.

ONS 15454s use the OSPF protocol in internal ONS 15454 networks for node discovery, circuit routing, and node management. You can enable OSPF on the ONS 15454s so that the ONS 15454 topology is sent to OSPF routers on a LAN. Advertising the ONS 15454 network topology to LAN routers

eliminates the need to manually enter static routes for ONS 15454 subnetworks. Figure 20-8 shows a network enabled for OSPF. Figure 20-9 shows the same network without OSPF. Static routes must be manually added to the router for CTC computers on LAN A to communicate with Nodes 2 and 3 because these nodes reside on different subnets.

OSPF divides networks into smaller regions, called areas. An area is a collection of networked end systems, routers, and transmission facilities organized by traffic patterns. Each OSPF area has a unique ID number, known as the area ID. Every OSPF network has one backbone area called “area 0.” All other OSPF areas must connect to area 0.

When you enable an ONS 15454 OSPF topology for advertising to an OSPF network, you must assign an OSPF area ID in decimal format to the ONS 15454 network. An area ID is a “dotted quad” value that appears similar to an IP address. Coordinate the area ID number assignment with your LAN administrator. All DCC-connected ONS 15454s should be assigned the same OSPF area ID.

Note It is recommended that the number of 15454s in an OSPF area be limited, because this allows faster loading into a CTC an is less likely to incur any problems.

Figure 20-8 Scenario 6: OSPF Enabled (ANSI and ETSI)

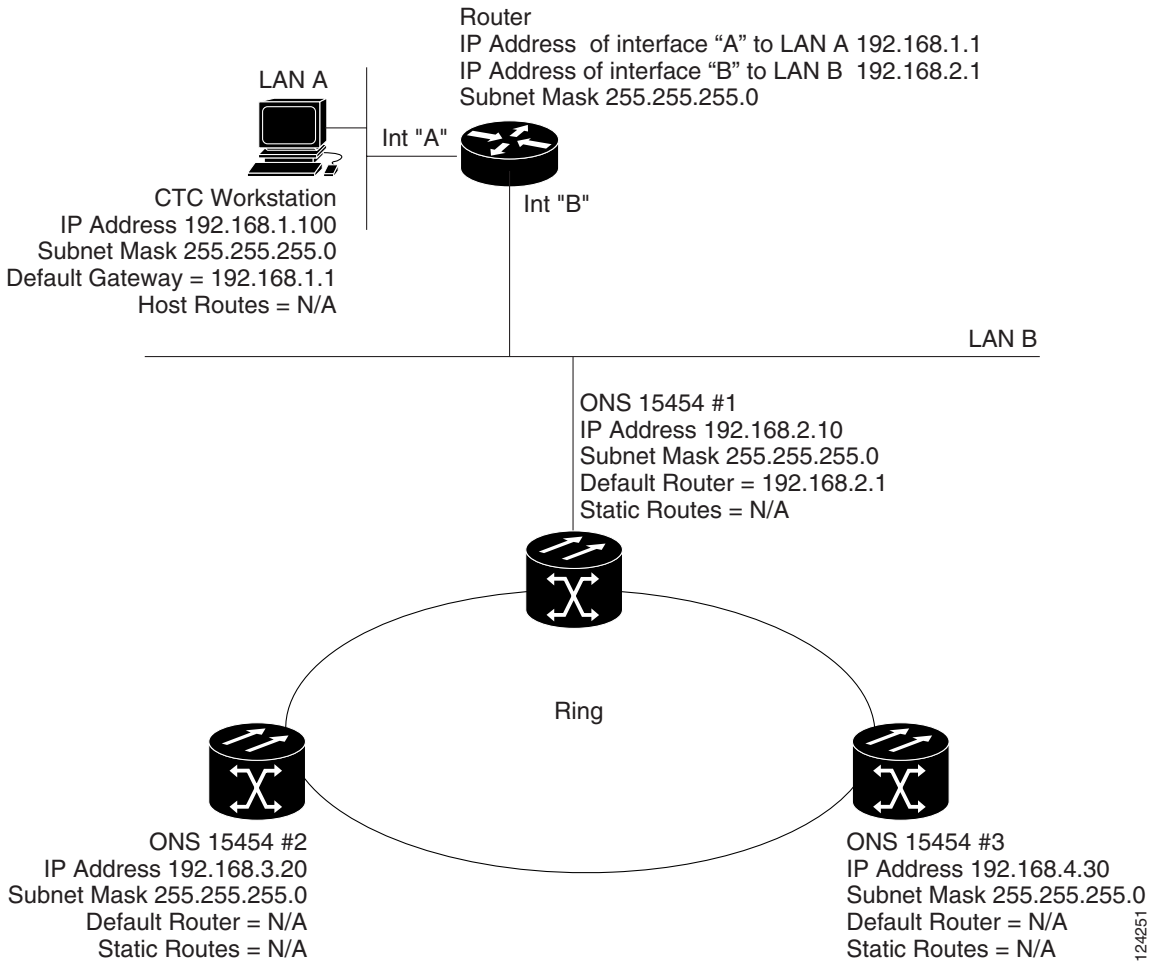
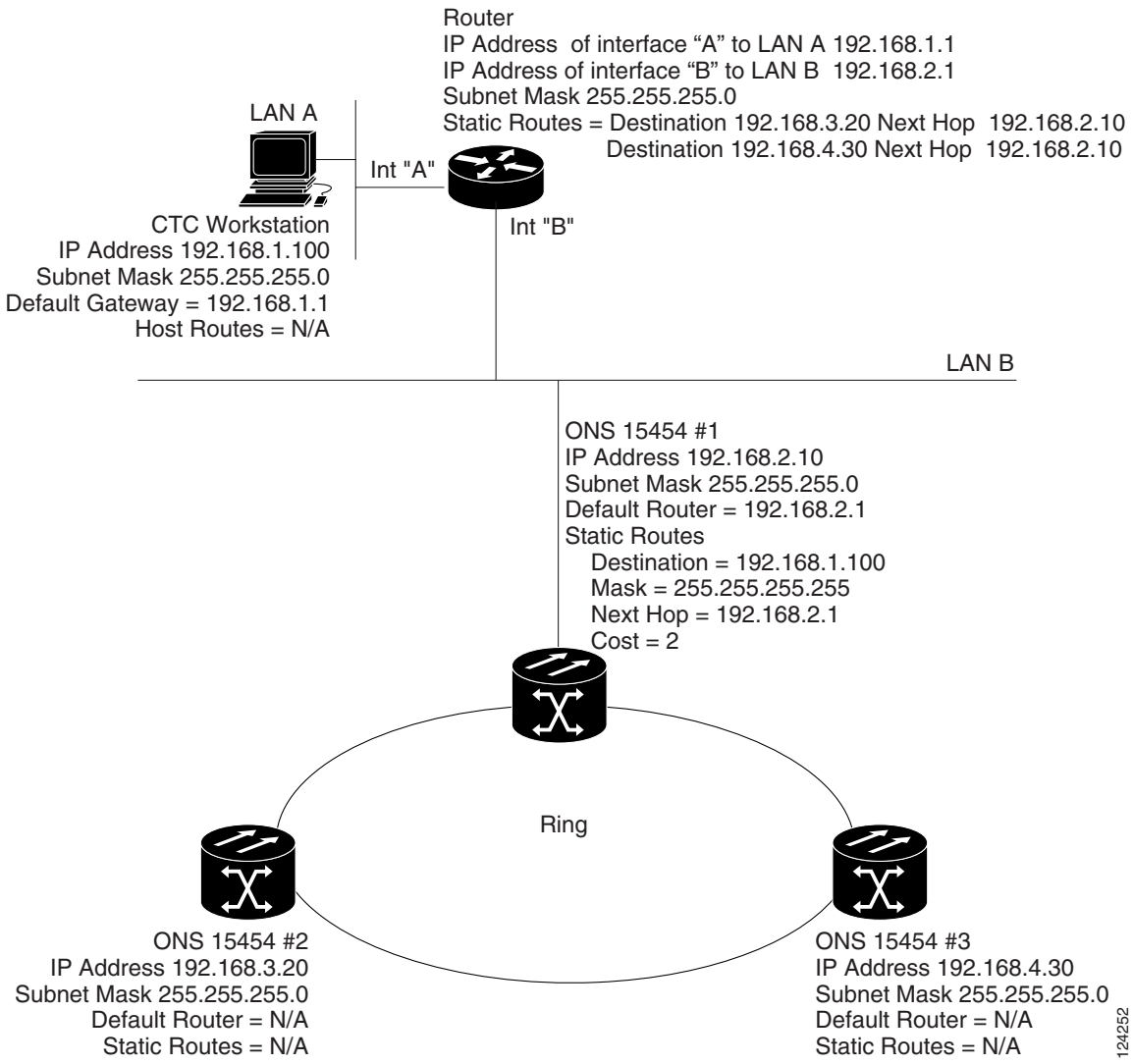


Figure 20-9 Scenario 6: OSPF Not Enabled (ANSI and ETSI)



20.2.7 Scenario 7: Provisioning the ONS 15454 Proxy Server

The ONS 15454 proxy server is a set of functions that allows you to network ONS 15454s in environments where visibility and accessibility between ONS 15454s and CTC computers must be restricted. For example, you can set up a network so that field technicians and network operating center (NOC) personnel can both access the same ONS 15454s while preventing the field technicians from accessing the NOC LAN. To do this, one ONS 15454 is provisioned as a GNE and the other ONS 15454s are provisioned as end network elements (ENEs). The GNE ONS 15454 tunnels connections between CTC computers and ENE ONS 15454s, providing management capability while preventing access for non-ONS 15454 management purposes.

The ONS 15454 gateway setting performs the following tasks:

- Isolates DCC IP traffic from Ethernet (craft port) traffic and accepts packets based on filtering rules. The filtering rules (see Table 20-3 on page 20-17 and Table 20-4 on page 20-18) depend on whether the packet arrives at the ONS 15454 DCC or TCC2/TCC2P Ethernet interface.
- Processes Simple Network Time Protocol (SNTP) and Network Time Protocol (NTP) requests. ONS 15454 ENEs can derive time-of-day from an SNTP/NTP LAN server through the GNE ONS 15454.
- Processes Simple Network Management Protocol version 1 (SNMPv1) traps. The GNE ONS 15454 receives SNMPv1 traps from the ENE ONS 15454s and forwards or relays the traps to SNMPv1 trap destinations or ONS 15454 SNMP relay nodes.

The ONS 15454 proxy server is provisioned using the Enable proxy server on port check box on the Provisioning > Network > General tab (see Figure 20-10 and Figure 20-11). If checked, the ONS 15454 serves as a proxy for connections between CTC clients and ONS 15454s that are DCC-connected to the proxy ONS 15454. The CTC client establishes connections to DCC-connected nodes through the proxy node. The CTC client can connect to nodes that it cannot directly reach from the host on which it runs. If not selected, the node does not proxy for any CTC clients, although any established proxy connections continue until the CTC client exits. In addition, you can set the proxy server as an ENE or a GNE:

- End Network Element (ENE)—If set as an ENE, the ONS 15454 neither installs nor advertises default or static routes that go through its Ethernet port. However, an ENE does install and advertise routes that go through the DCC. CTC computers can communicate with the ONS 15454 using the TCC2/TCC2P craft port, but they cannot communicate directly with any other DCC-connected ONS 15454.

  In addition, firewall is enabled, which means that the node prevents IP traffic from being routed between the DCC and the LAN port. The ONS 15454 can communicate with machines connected to the LAN port or connected through the DCC. However, the DCC-connected machines cannot communicate with the LAN-connected machines, and the LAN-connected machines cannot communicate with the DCC-connected machines. A CTC client using the LAN to connect to the firewall-enabled node can use the proxy capability to manage the DCC-connected nodes that would otherwise be unreachable. A CTC client connected to a DCC-connected node can only manage other DCC-connected nodes and the firewall itself.
- Gateway Network Element (GNE)—If set as a GNE, the CTC computer is visible to other DCC-connected nodes and firewall is enabled.
- Proxy-only—If Proxy-only is selected, firewall is not enabled. CTC can communicate with any other DCC-connected ONS 15454s.

Note If you launch CTC against a node through a Network Address Translation (NAT) or Port Address Translation (PAT) router and that node does not have proxy enabled, your CTC session starts and initially appears to be fine. However CTC never receives alarm updates and disconnects and reconnects every two minutes. If the proxy is accidentally disabled, it is still possible to enable the proxy during a reconnect cycle and recover your ability to manage the node, even through a NAT/PAT firewall.

Figure 20-10 Proxy Server Gateway Settings (ANSI)

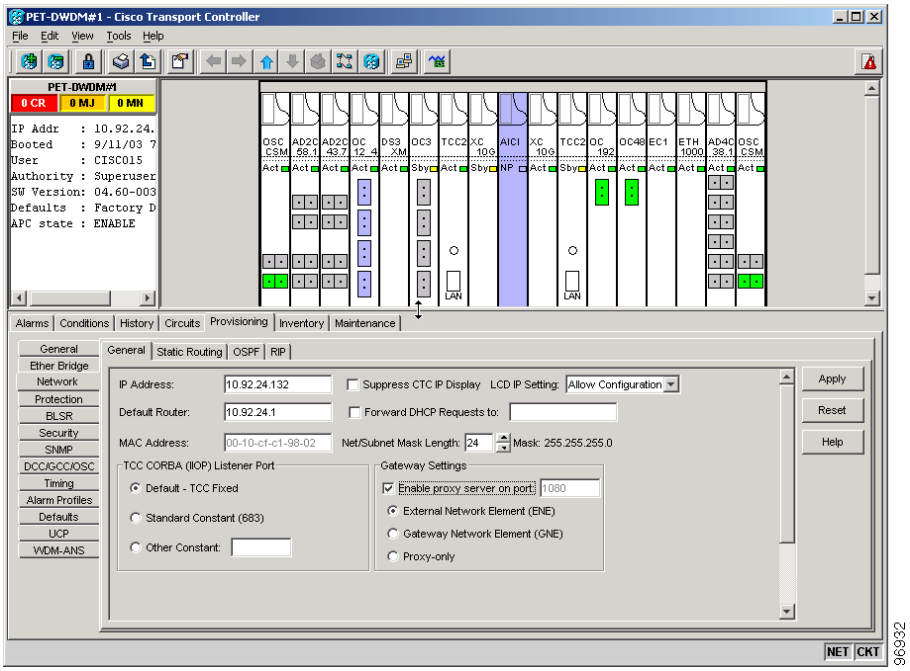


Figure 20-11 Proxy Server Gateway Settings (ETSI)

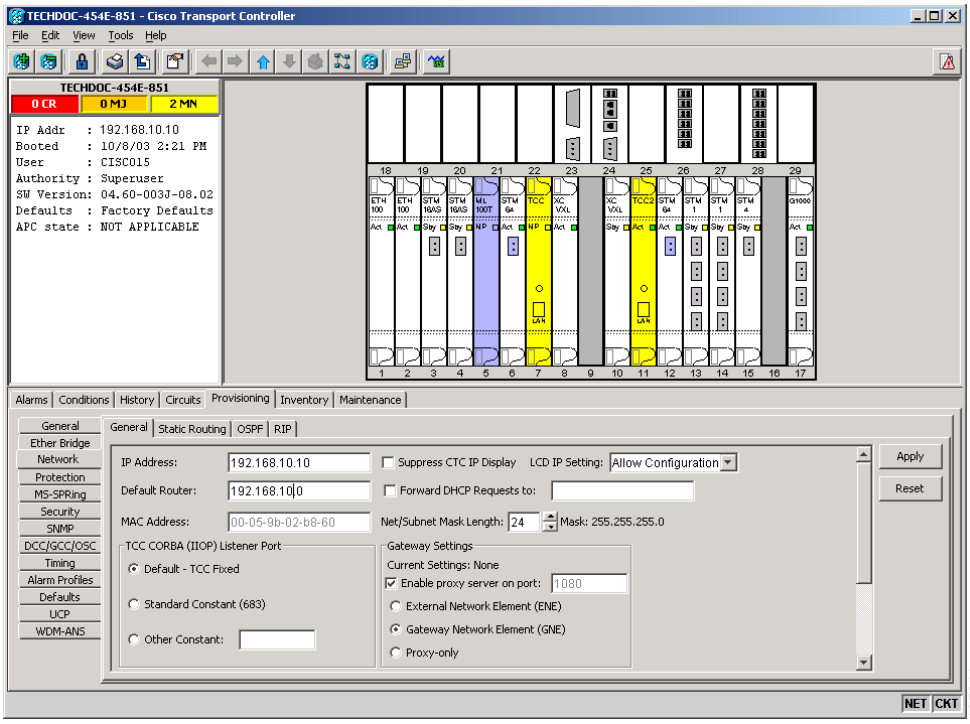


Figure 20-12 shows an ONS 15454 proxy server implementation. A GNE ONS 15454 is connected to a central office LAN and to ENE ONS 15454s. The central office LAN is connected to a NOC LAN, which has CTC computers. The NOC CTC computer and craft technicians must both be able to access the ONS 15454 ENEs. However, the craft technicians must be prevented from accessing or seeing the NOC or central office LANs.

In the example, the ONS 15454 GNE is assigned an IP address within the central office LAN and is physically connected to the LAN through its LAN port. ONS 15454 ENEs are assigned IP addresses that are outside the central office LAN and given private network IP addresses. If the ONS 15454 ENEs are collocated, the craft LAN ports could be connected to a hub. However, the hub should have no other network connections.

Figure 20-12 ONS 15454 Proxy Server with GNE and ENEs on the Same Subnet (ANSI and ETSI)

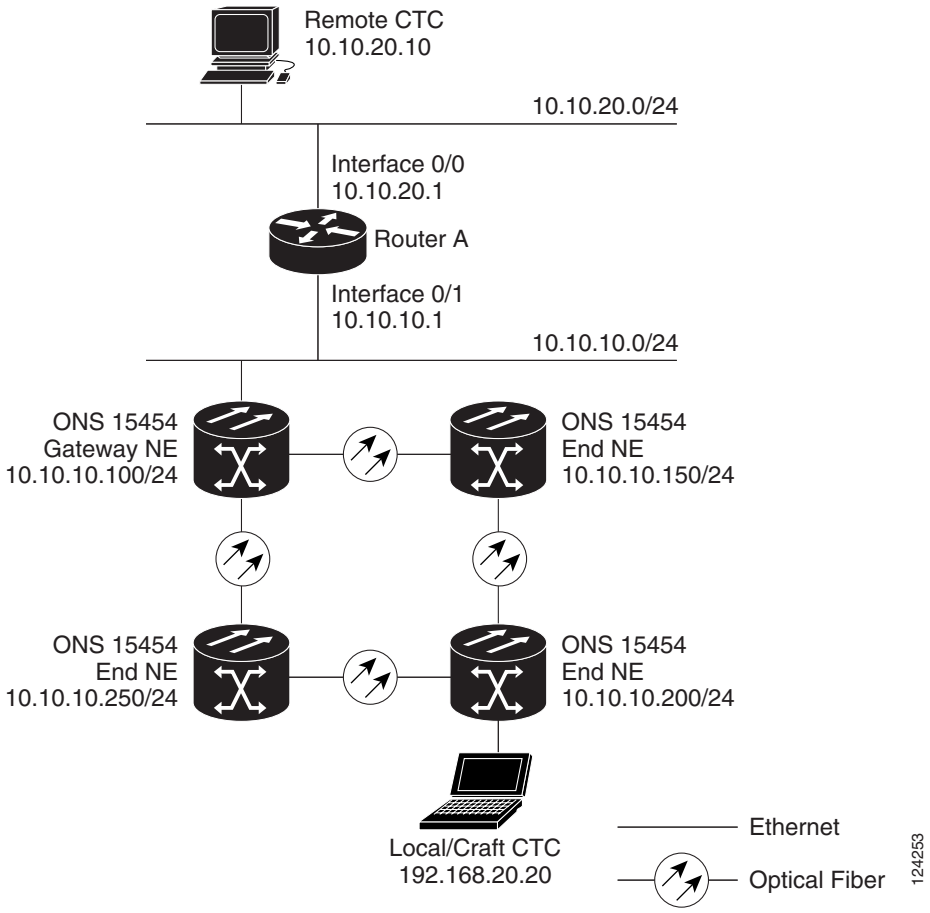


Table 20-2 shows recommended settings for ONS 15454 GNEs and ENEs in the configuration shown in Figure 20-12.

Table 20-2 ONS 15454 Gateway and End NE Settings

Setting	ONS 15454 Gateway NE	ONS 15454 End NE
OSPF	Off	Off

Table 20-2 ONS 15454 Gateway and End NE Settings (continued)

Setting	ONS 15454 Gateway NE	ONS 15454 End NE
SNTP server (if used)	SNTP server IP address	Set to ONS 15454 GNE IP address
SNMP (if used)	SNMPv1 trap destinations	Set SNMPv1 trap destinations to ONS 15454 GNE, port 391

Figure 20-13 shows the same proxy server implementation with ONS 15454 ENEs on different subnets. The ONS 15454 GNEs and ENEs are provisioned with the settings shown in Table 20-2.

Figure 20-13 Scenario 7: ONS 15454 Proxy Server with GNE and ENEs on Different Subnets (ANSI and ETSI)

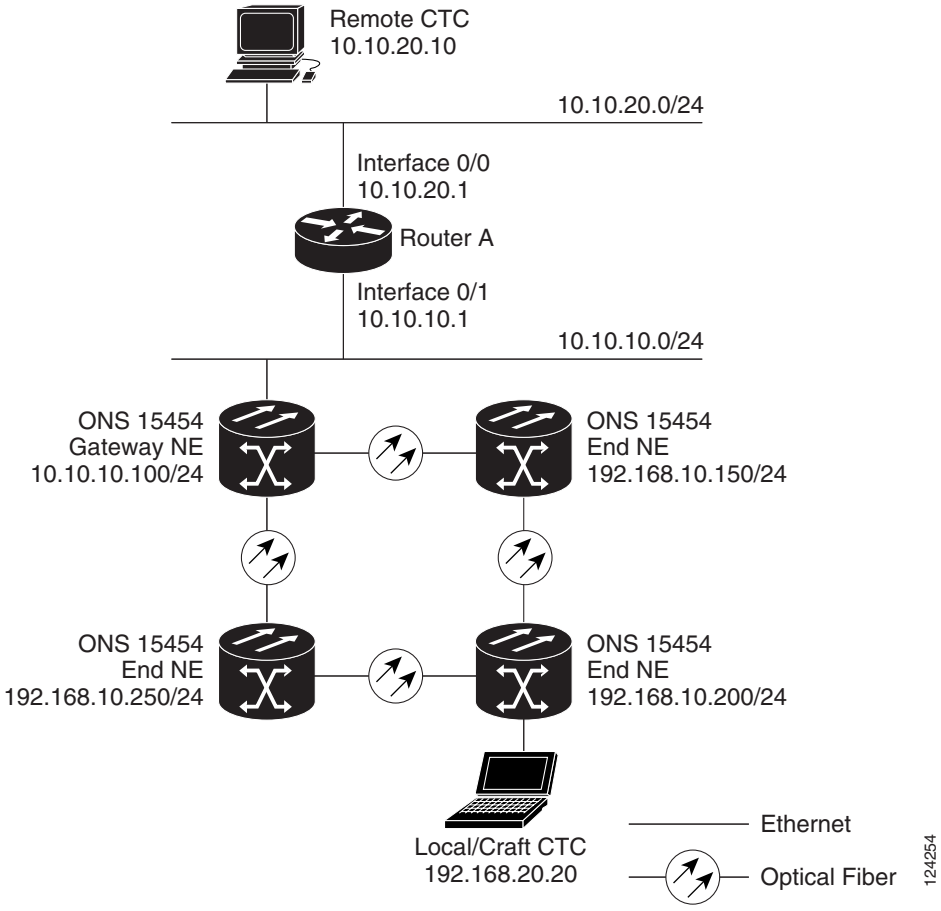


Figure 20-14 shows the implementation with ONS 15454 ENEs in multiple rings.

Figure 20-14 Scenario 7: ONS 15454 Proxy Server With ENEs on Multiple Rings (ANSI and ETSI)

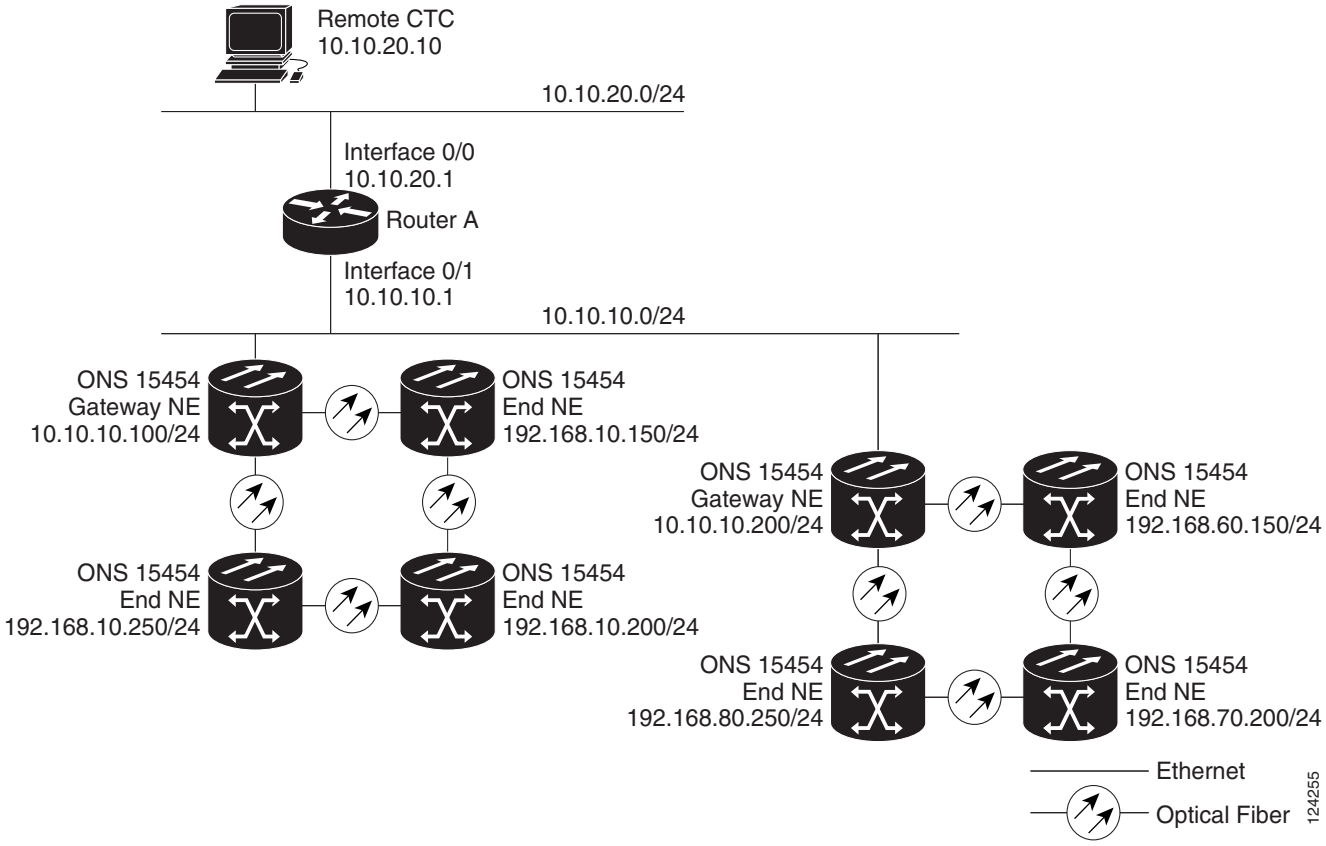


Table 20-3 shows the rules the ONS 15454 follows to filter packets for the firewall when nodes are configured as ENEs and GNEs. If the packet is addressed to the ONS 15454, additional rules, shown in Table 20-4, are applied. Rejected packets are silently discarded.

Table 20-3 Proxy Server Firewall Filtering Rules

Packets Arriving At:	Are Accepted if the Destination IP Address is:
TCC2/TCC2P Ethernet interface	• The ONS 15454 itself • The ONS 15454's subnet broadcast address • Within the 224.0.0.0/8 network (reserved network used for standard multicast messages) • Subnet mask = 255.255.255.255
DCC interface	• The ONS 15454 itself • Any destination connected through another DCC interface • Within the 224.0.0.0/8 network

Table 20-4 Proxy Server Firewall Filtering Rules When Packet Addressed to ONS 15454

Packets Arriving At	Rejects
TCC2/TCC2P Ethernet interface	• UDP (User Datagram Protocol) packets addressed to the SNMP trap relay port (391)
DCC interface	• TCP (Transmission Control Protocol) packets addressed to the proxy server port (1080)

If you implement the proxy server, note that all DCC-connected ONS 15454s on the same Ethernet segment must have the same gateway setting. Mixed values produce unpredictable results, and might leave some nodes unreachable through the shared Ethernet segment.

If nodes become unreachable, correct the setting by performing one of the following:

- Disconnect the craft computer from the unreachable ONS 15454. Connect to the ONS 15454 through another network ONS 15454 that has a DCC connection to the unreachable ONS 15454.
- Disconnect all DCCs to the node by disabling them on neighboring nodes. Connect a CTC computer directly to the ONS 15454 and change its provisioning.

20.2.8 Scenario 8: Dual GNEs on a Subnet

The ONS 15454 provides GNE load balancing, which allows CTC to reach ENEs over multiple GNEs without the ENEs being advertised over OSPF. This feature allows a network to quickly recover from the loss of GNE, even if the GNE is on a different subnet. If a GNE fails, all connections through that GNE fail. CTC disconnects from the failed GNE and from all ENEs for which the GNE was a proxy, and then reconnects through the remaining GNEs. GNE load balancing reduces the dependency on the launch GNE and DCC bandwidth, both of which enhance CTC performance.

Note Dual GNEs do not need special provisioning

Figure 20-15 shows a network with dual GNEs on the same subnet.

Figure 20-15 Scenario 8: Dual GNEs on the Same Subnet (ANSI and ETSI)

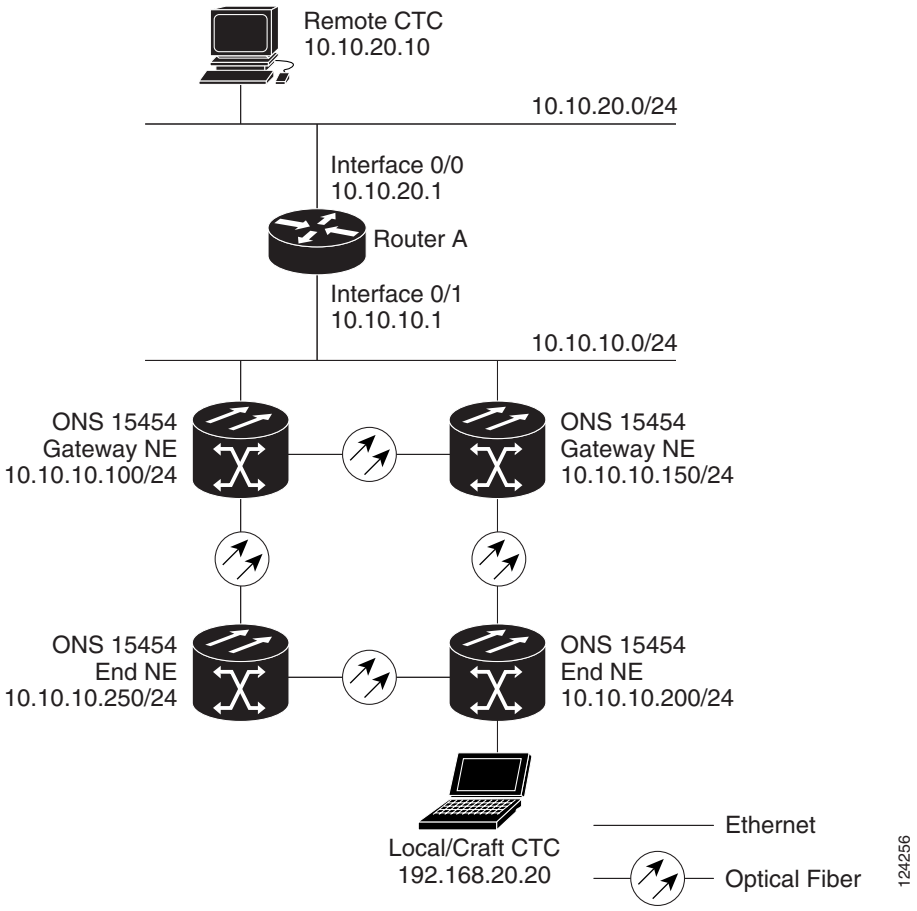
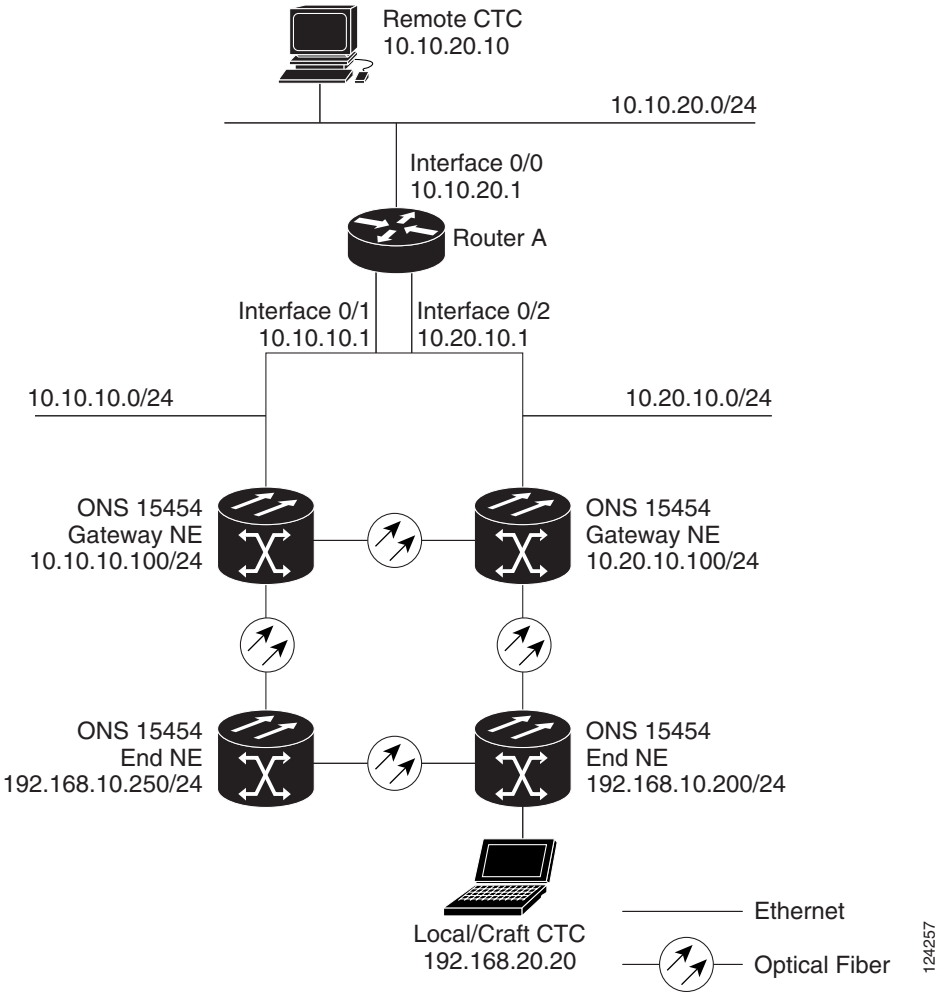


Figure 20-16 shows a network with dual GNEs on different subnets.

Figure 20-16 Scenario 8: Dual GNEs on Different Subnets (ANSI and ETSI)



20.2.9 Scenario 9: IP Addressing with Secure Mode Enabled

TCC2P cards provide a secure mode option allowing you to provision two IP addresses for the ONS 15454. One IP address is provisioned for the ONS 15454 backplane LAN port. The other IP address is provisioned for the TCC2P TCP/IP craft port. The two IP addresses provide an additional layer of separation between the craft access port and the ONS 15454 LAN. If secure mode is enabled, the IP addresses provisioned for the TCC2P TCP/IP ports must follow general IP addressing guidelines. In addition, TCC2P IP addresses must reside on a different subnet from the ONS 15454 backplane port and ONS 15454 default router IP addresses.

The IP address assigned to the backplane LAN port becomes a private address, which is used to connect the ONS 15454 GNE to an OSS (Operations Support System) through a central office LAN or private enterprise network. In secure mode, the backplane's LAN IP address is not displayed on the CTC node view or to a technician directly connected to the node by default. This default can be changed to allow the backplane IP address to be viewed on CTC only by a Superuser.

Figure 20-17 on page 20-21 shows an example of ONS 15454s on the same subnet with secure mode enabled.

Note Secure mode is not available if TCC2 cards are installed, or if only one TCC2P card is installed.

Figure 20-17 Scenario 9: ONS 15454 GNE and ENEs on the Same Subnet with Secure Mode Enabled

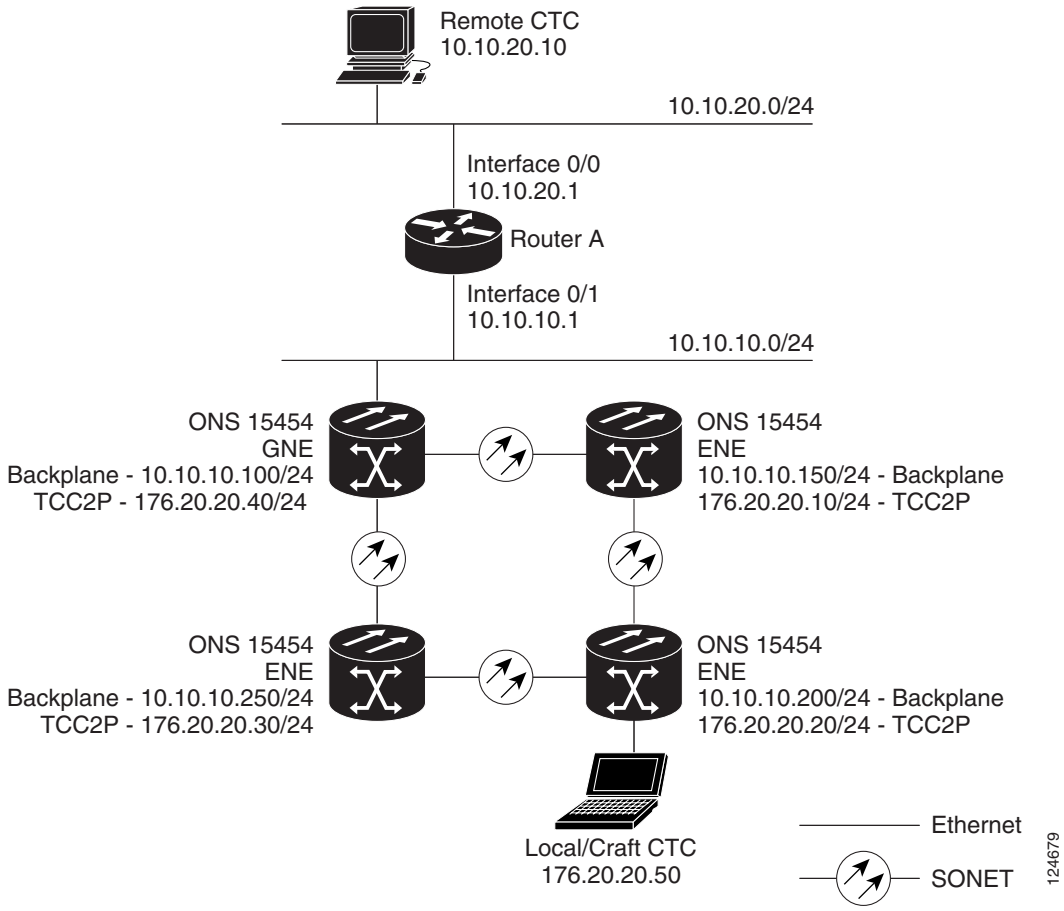
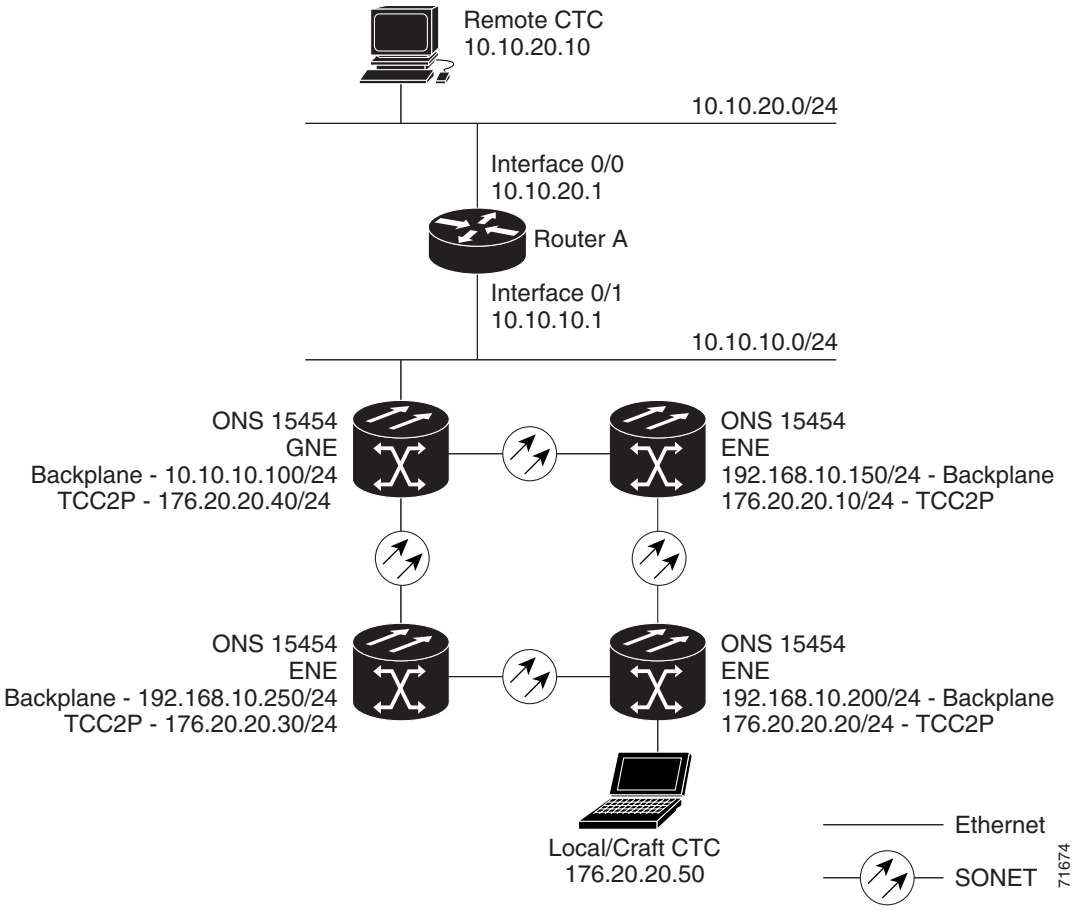


Figure 20-18 shows an example of ONS 15454s connected to a router with secure mode enabled. In each example, TCC2P port addresses are on a different subnet from the node backplane addresses.

Figure 20-18 Scenario 9: ONS 15454 GNE and ENEs on Different Subnets with Secure Mode Enabled



20.3 Provisionable Patchcords

A provisionable patchcord is a user-provisioned link that is advertised by OSPF throughout the network. Provisionable patchcords, also called virtual links, are needed in the following situations:

- An optical port is connected to a transponder or muxponder client port provisioned in transparent mode.
- An optical ITU port is connected to a DWDM optical channel card.
- Two transponder or muxponder trunk ports are connected to a DWDM optical channel card and the generic control channel (GCC) is carried transparently through the ring.
- Transponder or muxponder client and trunk ports are in a regenerator group, the cards are in transparent mode, and DCC/GCC termination is not available.

Provisionable patchcords are required on both ends of a physical link. The provisioning at each end includes a local patchcord ID, slot/port information, remote IP address, and remote patchcord ID. Patchcords appear as dashed lines in CTC network view.

Table 20-5 lists the supported card combinations for client and trunk ports in a provisionable patchcord.

Table 20-5 Cisco ONS 15454 Client/Trunk Card Combinations for Provisionable Patchcords

	Client Cards						
Trunk Cards	**MXP_2.5G_10G/ TXP_MR_10G**	**TXP_MR_2.5G/ TXPP_MR_2.5G**	**MXP_2.5G_10E/ TXP_MR_10E**	**32MUX-O 32DMX-O**	**32WSS/ 32DMX**	**AD-xC-xx.x**	**4MD-xx.x**
MXP_2.5G_10G/ TXP_MR_10G	—	—	—	Yes	Yes	Yes	Yes
TXP_MR_2.5G/ TXPP_MR_2.5G	—	—	—	Yes	Yes	Yes	Yes
MXP_2.5G_10E/ TXP_MR_10E	—	—	—	Yes	Yes	Yes	Yes
MXP_MR_2.5G/ MXPP_MR_2.5G	—	—	—	Yes	Yes	Yes	Yes
OC-192	Yes	—	Yes	—	—	—	—
OC-48	Yes	Yes	Yes	—	—	—	—
OC-192 ITU	—	—	—	Yes	Yes	Yes	Yes
OC-48 ITU	—	—	—	Yes	Yes	Yes	Yes

Note If the OCSM card is installed in Slot 8, provisionable patchcords from OC-N ports to the following cards are not supported on the same node: MXP_2.5G_10G, TXP_MR_10G, TXP_MR_2.5G, TXPP_MR_2.5G, MXP_2.5G_10E, TXP_MR_10E, 32MUX-O, 32DMX-O, 32WSS, or 32DMX.

Table 20-6 lists the supported card combinations for client-to-client ports in a patchcord.

Table 20-6 Cisco ONS 15454 Client/Client Card Combinations for Provisionable Patchcords

Client Cards	**MXP_2.5G_10G/ TXP_MR_10G**	**TXP_MR_2.5G/ TXPP_MR_2.5G**	**MXP_2.5G_10E/ TXP_MR_10E**
MXP_2.5G_10G/TXP_MR_10G	Yes	—	Yes
TXP_MR_2.5G/TXPP_MR_2.5G	—	Yes	—
MXP_2.5G_10E/TXP_MR_10E	Yes	—	Yes

Table 20-7 lists the supported card combinations for trunk-to-trunk ports in a patchcord.

Table 20-7 Cisco ONS 15454 Trunk/Trunk Card Combinations for Provisionable Patchcords

Trunk Cards	**MXP_2.5G_10G/ TXP_MR_10G**	**TXP_MR_2.5G/ TXPP_MR_2.5G**	**MXP_2.5G_10E/ TXP_MR_10E**
MXP_2.5G_10G/TXP_MR_10G	Yes	—	Yes
TXP_MR_2.5G/TXPP_MR_2.5G	—	Yes	—
MXP_2.5G_10E/TXP_MR_10E	Yes	—	Yes

Optical ports have the following requirements when used in a provisionable patchcord:

- An optical port connected to transponder/muxponder port or add/drop multiplexer or multiplexer/demultiplexer port requires section DCC/line DCC (SDCC/LDCC) termination.
- If the optical port is the protection port in a 1+1 group, the working port must have SDCC/LDCC (ANSI) or RS-DCC/MS-DCC (ETSI) termination provisioned.
- If the remote end of a patchcord is Y-cable protected or is an add/drop multiplexer or multiplexer/demultiplexer port, an optical port requires two patchcords.

Transponder and muxponder ports have the following requirements when used in a provisionable patchcord:

- Two patchcords are required when a transponder/muxponder port is connected to an add/drop multiplexer or multiplexer/demultiplexer port. CTC automatically prompts the user to set up the second patchcord.
- If a patchcord is on a client port in a regenerator group, the other end of the patchcord must be on the same node and on a port within the same regenerator group.
- A patchcord is allowed on a client port only if the card is in transparent mode.

DWDM cards support provisionable patchcords only on optical channel ports. Each DWDM optical channel port can have only one provisionable patchcord.

20.4 Routing Table

ONS 15454 routing information is displayed on the Maintenance > Routing Table tabs. The routing table provides the following information:

- Destination—Displays the IP address of the destination network or host.
- Mask—Displays the subnet mask used to reach the destination host or network.
- Gateway—Displays the IP address of the gateway used to reach the destination network or host.
- Usage—Shows the number of times the listed route has been used.
- Interface—Shows the ONS 15454 interface used to access the destination. Values are:
  - motfcc0—The ONS 15454 Ethernet interface, that is, the RJ-45 jack on the TCC2/TCC2P and, for ANSI shelves, the LAN 1 pins on the backplane or, for ETSI shelves, the LAN connection on the MIC-C/T/P.
  - pdcc0—An SDCC interface, that is, an OC-N trunk card identified as the SDCC termination.
  - lo0—A loopback interface.

Table 20-8 shows sample routing entries for an ONS 15454.

Table 20-8 Sample Routing Table Entries

Entry	Destination	Mask	Gateway	Usage	Interface
1	0.0.0.0	0.0.0.0	172.20.214.1	265103	motfcc0
2	172.20.214.0	255.255.255.0	172.20.214.92	0	motfcc0
3	172.20.214.92	255.255.255.255	127.0.0.1	54	lo0
4	172.20.214.93	255.255.255.255	0.0.0.0	16853	pdcc0
5	172.20.214.94	255.255.255.255	172.20.214.93	16853	pdcc0

Entry 1 shows the following:

- Destination (0.0.0.0) is the default route entry. All undefined destination network or host entries on this routing table are mapped to the default route entry.
- Mask (0.0.0.0) is always 0 for the default route.
- Gateway (172.20.214.1) is the default gateway address. All outbound traffic that cannot be found in this routing table or is not on the node's local subnet is sent to this gateway.
- Interface (motfcc0) indicates that the ONS 15454 Ethernet interface is used to reach the gateway.

Entry 2 shows the following:

- Destination (172.20.214.0) is the destination network IP address.
- Mask (255.255.255.0) is a 24-bit mask, meaning all addresses within the 172.20.214.0 subnet can be a destination.
- Gateway (172.20.214.92) is the gateway address. All outbound traffic belonging to this network is sent to this gateway.
- Interface (motfcc0) indicates that the ONS 15454 Ethernet interface is used to reach the gateway.

Entry 3 shows the following:

- Destination (172.20.214.92) is the destination host IP address.
- Mask (255.255.255.255) is a 32 bit mask, meaning only the 172.20.214.92 address is a destination.
- Gateway (127.0.0.1) is a loopback address. The host directs network traffic to itself using this address.
- Interface (lo0) indicates that the local loopback interface is used to reach the gateway.

Entry 4 shows the following:

- Destination (172.20.214.93) is the destination host IP address.
- Mask (255.255.255.255) is a 32 bit mask, meaning only the 172.20.214.93 address is a destination.
- Gateway (0.0.0.0) means the destination host is directly attached to the node.
- Interface (pdcc0) indicates that a DCC interface is used to reach the destination host.

Entry 5 shows a DCC-connected node that is accessible through a node that is not directly connected:

- Destination (172.20.214.94) is the destination host IP address.
- Mask (255.255.255.255) is a 32-bit mask, meaning only the 172.20.214.94 address is a destination.
- Gateway (172.20.214.93) indicates that the destination host is accessed through a node with IP address 172.20.214.93.
- Interface (pdcc0) indicates that a DCC interface is used to reach the gateway.

20.5 External Firewalls

This section provides sample access control lists for external firewalls. Table 20-9 lists the ports that are used by the TCC2/TCC2P.

Table 20-9 Ports Used by the TCC2/TCC2P

Port	Function	Action[1]
0	Never used	D
20	FTP	D
21	FTP control	D
22	SSH	D
23	Telnet	D
80	HTTP	D
111	SUNRPC	NA
161	SNMP traps destinations	D
162	SNMP traps destinations	D
513	rlogin	D
683	CORBA IIOP	OK
1080	Proxy server (socks)	D
2001-2017	I/O card Telnet	D
2018	DCC processor on active TCC2/TCC2P	D
2361	TL1	D
3082	Raw TL1	D
3083	TL1	D
5001	BLSR server port	D
5002	BLSR client port	D
7200	SNMP alarm input port	D
9100	EQM port	D
9401	TCC boot port	D
9999	Flash manager	D
10240-12287	Proxy client	D
57790	Default TCC listener port	OK

1. D = deny, NA = not applicable, OK = do not deny

The following access control list (ACL) example shows a firewall configuration when the proxy server gateway setting is not enabled. In the example, the CTC workstation's address is 192.168.10.10. and the ONS 15454 address is 10.10.10.100. The firewall is attached to the GNE, so inbound is CTC to the GNE and outbound is from the GNE to CTC. The CTC Common Object Request Broker Architecture (CORBA) Standard constant is 683 and the TCC CORBA Default is TCC Fixed (57790).

```
access-list 100 remark *** Inbound ACL, CTC -> NE ***
access-list 100 remark
access-list 100 permit tcp host 192.168.10.10 host 10.10.10.100 eq www
access-list 100 remark *** allows initial contact with ONS 15454 using http (port 80) ***
access-list 100 remark
access-list 100 permit tcp host 192.168.10.10 host 10.10.10.100 eq 57790
access-list 100 remark *** allows CTC communication with ONS 15454 GNE (port 57790) ***
access-list 100 remark
```

```
access-list 100 permit tcp host 192.168.10.10 host 10.10.10.100 established
access-list 100 remark *** allows ACKs back from CTC to ONS 15454 GNE ***

access-list 101 remark *** Outbound ACL, NE -> CTC ***
access-list 101 remark
access-list 101 permit tcp host 10.10.10.100 host 192.168.10.10 eq 683
access-list 101 remark *** allows alarms etc., from the 15454 (random port) to the CTC
workstation (port 683) ***
access-list 100 remark
access-list 101 permit tcp host 10.10.10.100 host 192.168.10.10 established
access-list 101 remark *** allows ACKs from the 15454 GNE to CTC ***
```

The following ACL example shows a firewall configuration when the proxy server gateway setting is enabled. As with the first example, the CTC workstation address is 192.168.10.10 and the ONS 15454 address is 10.10.10.100. The firewall is attached to the GNE, so inbound is CTC to the GNE and outbound is from the GNE to CTC. CTC CORBA Standard constant is 683 and TCC CORBA Default is TCC Fixed (57790).

```
access-list 100 remark *** Inbound ACL, CTC -> NE ***
access-list 100 remark
access-list 100 permit tcp host 192.168.10.10 host 10.10.10.100 eq www
access-list 100 remark *** allows initial contact with the 15454 using http (port 80) ***
access-list 100 remark
access-list 100 permit tcp host 192.168.10.10 host 10.10.10.100 eq 1080
access-list 100 remark *** allows CTC communication with the 15454 GNE (port 1080) ***
access-list 100 remark

access-list 101 remark *** Outbound ACL, NE -> CTC ***
access-list 101 remark
access-list 101 permit tcp host 10.10.10.100 host 192.168.10.10 established
access-list 101 remark *** allows ACKs from the 15454 GNE to CTC ***
```

20.6 Open GNE

The ONS 15454 can communicate with non-ONS nodes that do not support Point-to-Point Protocol (PPP) vendor extensions or OSPF type 10 opaque link-state advertisements (LSA), both of which are necessary for automatic node and link discovery. An open GNE configuration allows a GCC-based network to function as an IP network for non-ONS nodes.

To configure an open GNE network, you can provision GCC terminations to include a far-end, non-ONS node using either the default IP address of 0.0.0.0 or a specified IP address. You provision a far-end, non-ONS node by checking the “Far End is Foreign” check box during GCC creation. The default 0.0.0.0 IP address allows the far-end, non-ONS node to identify itself with any IP address; if you set an IP address other than 0.0.0.0, a link is established only if the far-end node identifies itself with that IP address, providing an extra level of security.

By default, the proxy server only allows connections to discovered ONS peers and the firewall blocks all IP traffic between the GCC network and LAN. You can, however, provision proxy tunnels to allow up to 12 additional destinations for SOCKS version 5 connections to non-ONS nodes. You can also provision firewall tunnels to allow up to 12 additional destinations for direct IP connectivity between the GCC network and LAN. Proxy and firewall tunnels include both a source and destination subnet. The connection must originate within the source subnet and terminate within the destination subnet before either the SOCKS connection or IP packet flow is allowed. A proxy connection is allowed if the CTC client is in a source subnet and the requested destination is in the destination subnet. Firewall tunnels allow IP traffic to route between the node Ethernet and pdcc interfaces. A inbound Ethernet packet is allowed through the firewall if its source address matches a tunnel source and its destination matches a

tunnel destination. An inbound pdcc packet is allowed through the firewall if its source address matches a tunnel destination and its destination address matches a tunnel source. Tunnels only affect TCP and UDP packets.

The availability of proxy and/or firewall tunnels depends on the network access settings of the node:

- If the node is configured with the proxy server enabled in GNE or ENE mode, you must set up a proxy tunnel and/or a firewall tunnel.
- If the node is configured with the proxy server enabled in proxy-only mode, you can set up proxy tunnels. Firewall tunnels are not allowed.
- If the node is configured with the proxy server disabled, neither proxy tunnels or firewall tunnels are allowed.

Figure 20-19 shows an example of a foreign node connected to the GCC network. Proxy and firewall tunnels are useful in this example because the GNE would otherwise block IP access between the PC and the foreign node.

Figure 20-19 Proxy and Firewall Tunnels for Foreign Terminations

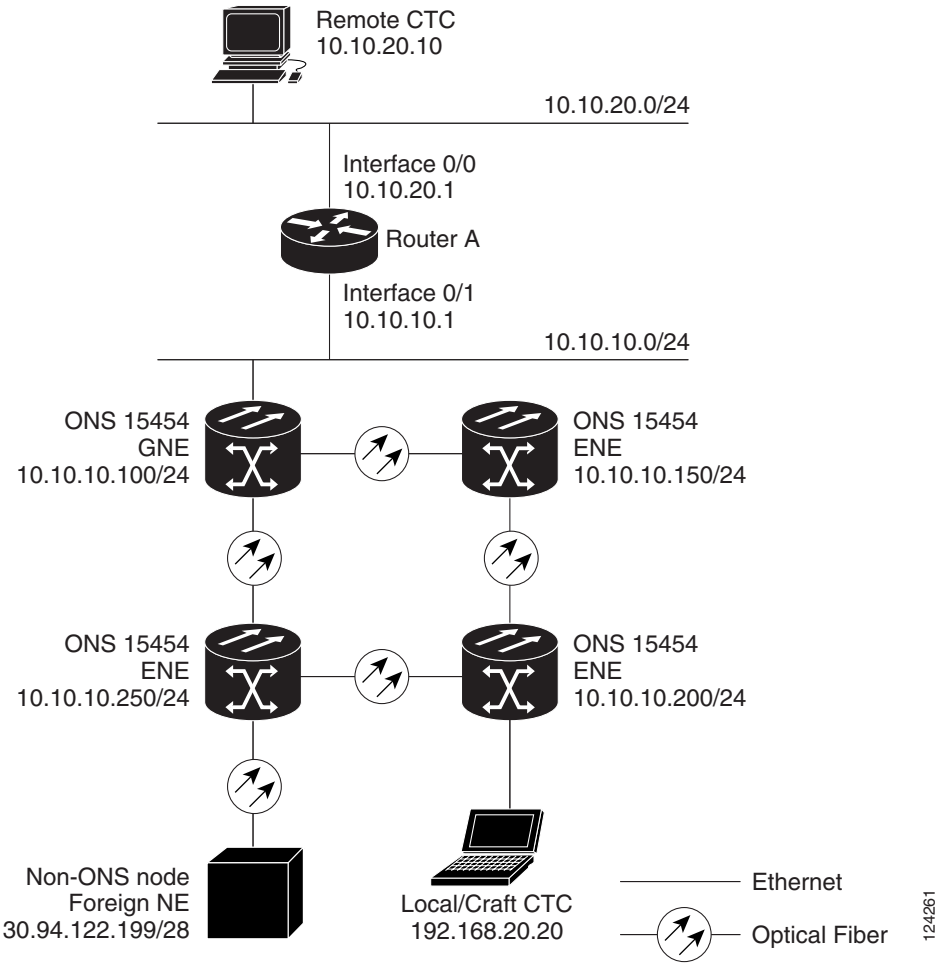
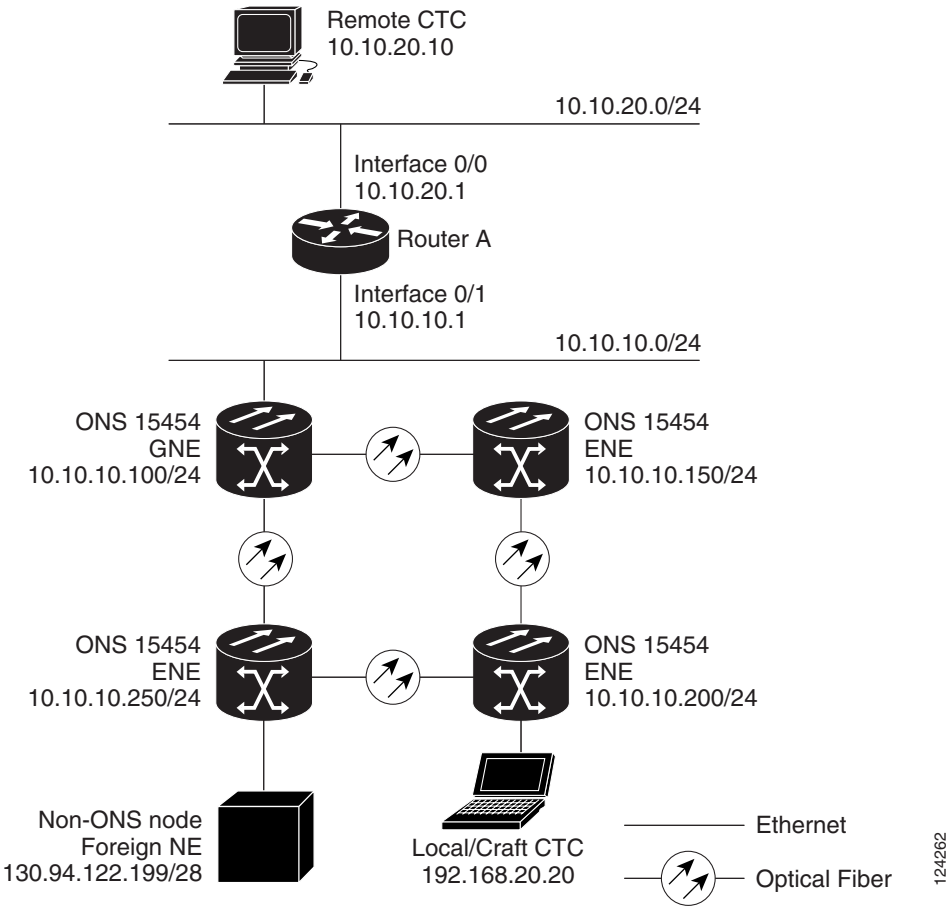


Figure 20-20 shows a remote node connected to an ENE Ethernet port. Proxy and firewall tunnels are useful in this example because the GNE would otherwise block IP access between the PC and foreign node. This configuration also requires a firewall tunnel on the ENE.

Figure 20-20 Foreign Node Connection to an ENE Ethernet Port



CHAPTER 21

Alarm Management Reference

This chapter describes Cisco Transport Controller (CTC) alarm management. To troubleshoot specific alarms, refer to the *Cisco ONS 15454 Troubleshooting Guide* (for ANSI shelves) or the *Cisco ONS 15454 SDH Troubleshooting Guide* (for ETSI shelves).

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Chapter topics include:

- 21.1 Overview, page 21-1
- 21.2 Alarm Counts on the LCD for a Node, Slot, or Port, page 21-2
- 21.3 Alarm Display, page 21-2
- 21.4 Alarm Severities, page 21-7
- 21.5 Alarm Profiles, page 21-7
- 21.6 Alarm Suppression, page 21-11
- 21.7 External Alarms and Controls, page 21-12

21.1 Overview

CTC detects and reports alarms generated by the Cisco ONS 15454 and the larger network. You can use CTC to monitor and manage alarms at the card, node, or network level. Default alarm severities conform to the Telcordia GR-253-CORE standard, but you can set alarm severities in customized alarm profiles or suppress CTC alarm reporting. For a detailed description of the standard Telcordia categories employed by Optical Networking System (ONS) nodes, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide.*

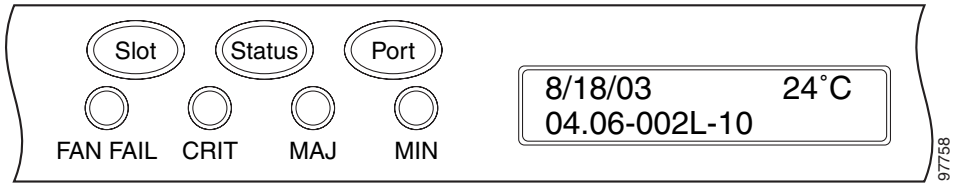
Note ONS 15454 alarms can also be monitored and managed through Transaction Language One (TL1) or a network management system (NMS).

21.2 Alarm Counts on the LCD for a Node, Slot, or Port

You can view node, slot, or port-level alarm counts and summaries using the buttons on the ONS 15454 LCD panel. The Slot and Port buttons toggle between display types; the Slot button toggles between node display and slot display, and the Port button toggles between slot and port views. Pressing the Status button after you choose the display mode changes the display from alarm count to alarm summary.

The ONS 15454 has a one-button update for some commonly viewed alarm counts. If you press the Slot button once and then wait eight seconds, the display automatically changes from a slot alarm count to a slot alarm summary. If you press the Port button to toggle to port-level display, you can use the Port button to toggle to a specific slot and to view each port's port-level alarm count. Figure 21-1 shows the LCD panel layout.

Figure 21-1 Shelf LCD Panel



21.3 Alarm Display

In the card, node, or network CTC view, click the Alarms tab to display the alarms for that card, node, or network. The Alarms window shows alarms in compliance with Telcordia GR-253-CORE. This means that if a network problem causes two alarms, such as loss of frame (LOF) and loss of signal (LOS), CTC only shows the LOS alarm in this window because it supersedes the LOF and replaces it.

The Path Width column in the Alarms and Conditions tabs expands on the alarmed object information contained in the access identifier (AID) string (such as "STS-4-1-3") by giving the number of STSs contained in the alarmed path. For example, the Path Width tells you whether a critical alarm applies to an STS1 or an STS48c. The column reports the width as a 1, 3, 6, 12, 48, etc. as appropriate, understood to be "STS-*N*."

Table 8-1 on page 8-6 lists the column headings and the information recorded in each column and Table 8-2 on page 8-7 provides the color codes for alarm and condition severities.

For a list of circuits with raised alarms, see the "NTP-G66 View Alarm-Affected Circuits" procedure on page 8-14.

21.3.1 Viewing Alarms by Time Zone

By default, alarms and conditions are displayed with the time stamp of the CTC workstation where you are viewing them. However, you can set the node to report alarms (and conditions) using the time zone where the node is located. See the "DLP-G118 Display Alarms and Conditions Using Time Zone" task on page 8-10 for instructions.

21.3.2 Controlling Alarm Display

You can control the display of the alarms shown on the Alarms window. Table 21-1 shows the actions you can perform in the Alarms window.

Table 21-1 Alarm Display

Button/Check Box/Tool	Action
Filter button	Allows you to change the display on the Alarms window to show only alarms that meet a certain severity level, occur in a specified time frame, or reflect specific conditions. For example, you can set the filter so that only critical alarms display in the window. If you enable the Filter feature by clicking the Filter button in one CTC view, such as node view, it is enabled in the others as well (card view and network view).
Synchronize button	Updates the alarm display. Although CTC displays alarms in real time, the Synchronize button allows you to verify the alarm display. This is particularly useful during provisioning or troubleshooting.
Delete Cleared Alarms button	Deletes alarms that have been cleared.
AutoDelete Cleared Alarms check box	If checked, CTC automatically deletes cleared alarms.
Filter tool	Enables or disables alarm filtering in the card, node, or network view. When enabled or disabled, this state applies to other views for that node and for all other nodes in the network. For example, if the Filter tool is enabled in the node (default login) view Alarms window, the network view Alarms window and card view Alarms window also show the tool enabled. All other nodes in the network also show the tool enabled.

21.3.3 Filtering Alarms

The alarm display can be filtered to prevent the display of alarms with certain severities or alarms that occurred between certain dates. You can set the filtering parameters by clicking the Filter button at the bottom-left of the Alarms window. You can turn the filter on or off by clicking the Filter tool at the bottom-right of the window. CTC retains your filter activation setting. For example, if you turn the filter on and then log out, CTC keeps the filter active the next time you log in.

See the "NTP-G69 Enable, Modify, or Disable Alarm Severity Filtering" procedure on page 8-24.

21.3.4 Conditions Tab

The Conditions window displays retrieved fault conditions. A condition is a fault or status detected by ONS 15454 hardware or software. When a condition occurs and continues for a minimum period, CTC raises a condition, which is a flag showing that this particular condition currently exists on the ONS 15454. See the "DLP-G120 View Conditions" task on page 8-11.

The Conditions window shows all conditions that occur, including those that are superseded. For instance, if a network problem causes two alarms, such as LOF and LOS, CTC shows both the LOF and LOS conditions in this window (even though LOS supersedes LOF). Having all conditions visible can

be helpful when troubleshooting the ONS 15454. If you want to retrieve conditions that obey a root-cause hierarchy (that is, LOS supersedes and replaces LOF), you can exclude the same root causes by checking a check box in the window.

Fault conditions include reported alarms and Not Reported or Not Alarmed conditions. Refer to the trouble notifications information in the *Cisco ONS 15454 Troubleshooting Guide* or *Cisco ONS 15454 SDH Troubleshooting Guide* for more information about alarm and condition classifications.

21.3.5 Controlling the Conditions Display

You can control the display of the conditions on the Conditions window. Table 21-2 shows the actions you can perform in the window.

Table 21-2 Conditions Display

Button	Action
Retrieve	Retrieves the current set of all existing fault conditions, as maintained by the alarm manager, from the ONS 15454.
Filter	Allows you to change the Conditions window display to only show the conditions that meet a certain severity level or occur in a specified time frame. For example, you can set the filter so that only critical conditions display on the window. There is a Filter button on the lower-right of the window that allows you to enable or disable the filter feature.
Exclude Same Root Cause	Retrieves conditions that obey a root-cause hierarchy (LOS supersedes and replaces LOF).

21.3.5.1 Retrieving and Displaying Conditions

The current set of all existing conditions maintained by the alarm manager can be seen when you click the Retrieve button. The set of conditions retrieved is relative to the CTC view. For example, if you click the button while displaying the node view, node-specific conditions appear. If you click the button while displaying the network view, all conditions for the network (including ONS 15454 nodes and other connected nodes) appear, and the card view shows only card-specific conditions.

You can also set a node to display conditions using the time zone where the node is located, rather than the time zone of the PC where they are being viewed. See the "DLP-G118 Display Alarms and Conditions Using Time Zone" task on page 8-10 for instructions.

21.3.5.2 Conditions Column Descriptions

Table 21-3 lists the Conditions window column headings and the information recorded in each column.

Table 21-3 Conditions Column Description

Column	Information Recorded
Date	Date and time of the condition.
Object	TL1 AID for the condition object. For an STSmon or VTmon, the object.

Table 21-3 Conditions Column Description (continued)

Column	Information Recorded
Eqpt Type	Card type in this slot.
Slot	Slot where the condition occurred (appears only in network and node view).
Port	Port where the condition occurred. For STSTerm and VTTerm, the port refers to the upstream card it is partnered with.
Path Width	Width of the data path.
Sev[1]	Severity level: CR (Critical), MJ (Major), MN (Minor), NA (Not Alarmed), NR (Not Reported).
SA[1]	Indicates a service-affecting alarm (when checked).
Cond	The error message/alarm name; these names are alphabetically defined in the *Cisco ONS 15454 Troubleshooting Guide or Cisco ONS 15454 SDH Troubleshooting Guide.*
Description	Description of the condition.

1. All alarms, their severities, and service-affecting statuses are also displayed in the Condition tab unless you choose to filter the alarm from the display using the Filter button.

21.3.5.3 Filtering Conditions

The condition display can be filtered to prevent display of conditions (including alarms) with certain severities or that occurred between certain dates. You can set the filtering parameters by clicking the Filter button at the bottom-left of the Conditions window. You can turn the filter on or off by clicking the Filter tool at the bottom-right of the window. CTC retains your filter activation setting. For example, if you turn the filter on and then log out, CTC keeps the filter active the next time your user ID is activated.

21.3.6 Viewing History

The History window displays historic alarm or condition data for the node or for your login session. You can chose to display only alarm history, only events, or both by checking check boxes in the History > Node window. You can view network-level alarm and condition history, such as for circuits, at that level. At the node level, you can see all port (facility), card, STS, and system-level history entries. For example, protection-switching events or performance-monitoring threshold crossings appear here. If you double-click a card, you can view all port, card, and STS alarm or condition history that directly affects the card. See the "DLP-G116 View Alarm or Event History" task on page 8-8.

The ONS 15454 can store up to 640 critical alarm messages, 640 major alarm messages, 640 minor alarm messages, and 640 condition messages. When any of these limits is reached, the ONS 15454 discards the oldest events in that category.

Note In the Preference dialog General tab, the Maximum History Entries value only applies to the Session window.

Different views of CTC display different kinds of history:

- The History > Session window is shown in network view, node view, and card view. It shows alarms and conditions that occurred during the current user CTC session.
- The History > Node window is only shown in node view. It shows the alarms and conditions that occurred on the node since CTC software was operated on the node.
- The History > Card window is only shown in card view. It shows the alarms and conditions that occurred on the card since CTC software was installed on the node.

Tip Double-click an alarm in the History window to display the corresponding view. For example, double-clicking a card alarm takes you to card view. In network view, double-clicking a node alarm takes you to node view.

If you check the History window Alarms check box, you display the node history of alarms. If you check the Events check box, you display the node history of Not Alarmed and transient events (conditions). If you check both check boxes, you retrieve node history for both.

21.3.6.1 History Column Descriptions

Table 21-4 lists the History window column headings and the information recorded in each column.

Table 21-4 History Column Description

Column	Information Recorded
Num	Num (number) is the quantity of alarm messages received, and is incremented automatically as alarms occur to display the current total of received error messages. (The column is hidden by default; to view it, right-click a column and choose Show Column.)
Ref	Ref (reference) is a unique identification number assigned to each alarm to reference a specific alarm message that is displayed. (The column is hidden by default; to view it, right-click a column and choose Show Column.)
Date	Date and time of the condition.
Object	TL1 AID for the condition object. For an STSmon or VTmon, the object.
Slot	Slot where the condition occurred (only displays in network view and node view).
Port	Port where the condition occurred. For STSTerm and VTTerm, the port refers to the upstream card it is partnered with.
Path Width	Width of the data path.
Sev	Severity level: Critical (CR), Major (MJ), Minor (MN), Not Alarmed (NA), Not Reported (NR).
ST	Status: raised (R), cleared (C), or transient (T).
SA	Indicates a service-affecting alarm (when checked).
Cond	Condition name.
Description	Description of the condition.
Eqpt Type	Card type in this slot.

21.3.6.2 Retrieving and Displaying Alarm and Condition History

You can retrieve and view the history of alarms and conditions, including transient conditions (passing notifications of processes as they occur) in the CTC History window. The information in this window is specific to the view where it is shown (that is, network history in the network view, node history in the node view, and card history in the card view).

The node and card history views are each divided into two tabs. In node view, when you click the Retrieve button, you can see the history of alarms, conditions, and transients that have occurred on the node in the History > Node window, and the history of alarms, conditions, and transients that have occurred on the node during your login session in the History > Session window. In the card-view history window, after you retrieve the card history, you can see the history of alarms, conditions, and transients on the card in the History > Card window, or a history of alarms, conditions, and transients that have occurred during your login session in the History > Session window. You can also filter the severities and occurrence period in these history windows.

21.4 Alarm Severities

ONS 15454 alarm severities follow the Telcordia GR-253-CORE standard, so a condition might be Alarmed (at a severity of Critical [CR], Major [MJ], or Minor [MN]), Not Alarmed (NA), or Not Reported (NR). These severities are reported in the CTC software Alarms, Conditions, and History windows at all levels: network, shelf, and card.

ONS equipment provides a standard profile named Default listing all alarms and conditions with severity settings based on Telcordia GR-253-CORE and other standards, but users can create their own profiles with different settings for some or all conditions and apply these wherever desired. (See the "21.5 Alarm Profiles" section on page 21-7.) For example, in a custom alarm profile, the default severity of a carrier loss (CARLOSS) alarm on an Ethernet port could be changed from major to critical. The profile allows setting to Not Reported or Not Alarmed, as well as the three alarmed severities.

Critical and Major severities are only used for service-affecting alarms. If a condition is set as Critical or Major by profile, it will raise as Minor alarm in the following situations:

- In a protection group, if the alarm is on a standby entity (the side not carrying traffic)
- If the alarmed entity has no traffic provisioned on it, no service is lost

Because of this possibility of being raised at two different levels, the alarm profile pane shows Critical as CR / MN and Major as MJ / MN.

21.5 Alarm Profiles

The alarm profiles feature allows you to change default alarm severities by creating unique alarm profiles for individual ONS 15454 ports, cards, or nodes. A created alarm profile can be applied to any node on the network. Alarm profiles can be saved to a file and imported elsewhere in the network, but the profile must be stored locally on a node before it can be applied to the node, its cards, or its cards' ports.

CTC can store up to ten active alarm profiles at any time to apply to the node. Custom profiles can take eight of these active profile positions. Two other profiles, Default profile and Inherited profile, are reserved by the NE, and cannot be edited.The reserved Default profile contains Telcordia GR-253-CORE severities. The reserved Inherited profile allows port alarm severities to be governed by the card-level severities, or card alarm severities to be determined by the node-level severities.

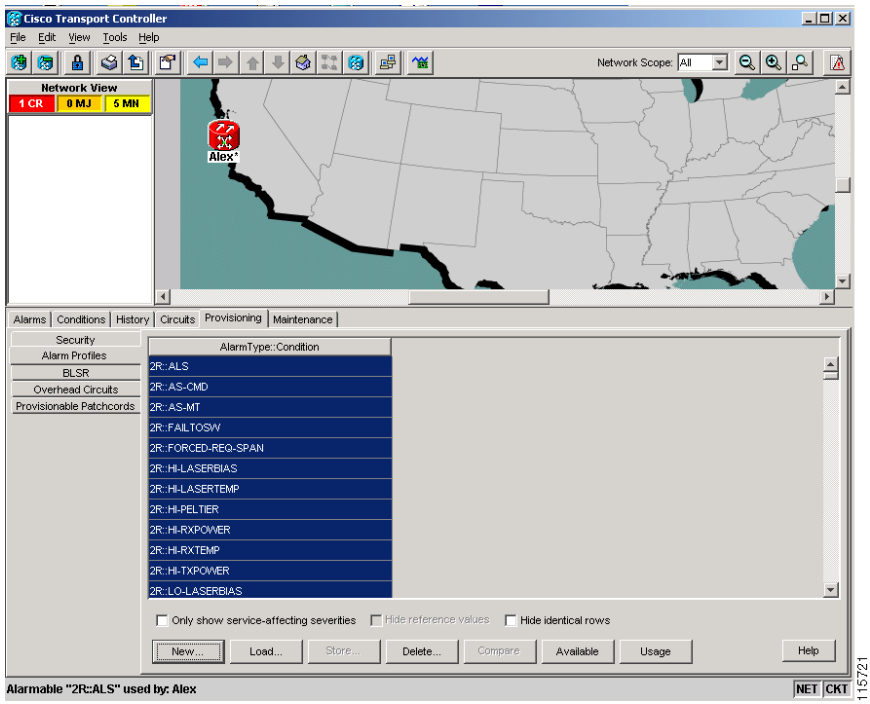
If one or more alarm profiles have been stored as files from elsewhere in the network onto the local PC or server hard drive where CTC resides, you can utilize as many profiles as you can physically store by deleting and replacing them locally in CTC so that only eight are active at any given time.

See the "NTP-G68 Create, Download, and Assign Alarm Severity Profiles" procedure on page 8-16.

21.5.1 Creating and Modifying Alarm Profiles

Alarm profiles are created in the network view using the Provisioning > Alarm Profiles tabs. Figure 21-2 shows the default list of alarm severities. A default alarm severity following Telcordia GR-253-CORE standards is preprovisioned for every alarm. After loading the default profile or another profile on the node, you can clone a profile to create custom profiles. After the new profile is created, the Alarm Profiles window shows the original profile (frequently Default) and the new profile.

Figure 21-2 Network View Alarm Profiles Window



Note The alarm profile list contains a master list of alarms that is used for a mixed node network. Some of these alarms might not be used in all ONS nodes.

Note The Default alarm profile list contains alarm and condition severities that correspond when applicable to default values established in Telcordia GR-253-CORE.

Note All default or user-defined severity settings that are Critical (CR) or Major (MJ) are demoted to Minor (MN) in non-service-affecting situations as defined in Telcordia GR-474.

Tip To see the full list of profiles, including those available for loading or cloning, click the Available button. You must load a profile before you can clone it.

Note Up to 10 profiles, including the two reserved profiles (Inherited and Default) can be stored in CTC.

Wherever it is applied, the Default alarm profile sets severities to standard Telcordia GR-253-CORE settings. In the Inherited profile, alarms inherit, or copy, severity from the next-highest level. For example, a card with an Inherited alarm profile copies the severities used by the node housing the card. If you choose the Inherited profile from the network view, the severities at the lower levels (node and card) are copied from this selection.

You do not have to apply a single severity profile to the node-, card-, and port-level alarms. Different profiles can be applied at different levels. You could use the inherited or default profile on a node and on all cards and ports, but apply a custom profile that downgrades an alarm on one particular card. For example, you might choose to downgrade an OC-N unequipped path alarm (UNEQ-P) from Critical (CR) to Not Alarmed (NA) on an optical card because this alarm raises and then clears every time you create a circuit. UNEQ-P alarms for the card with the custom profile would not display on the Alarms tab (but they would still be recorded on the Conditions and History tabs.)

When you modify severities in an alarm profile:

- All Critical (CR) or Major (MJ) default or user-defined severity settings are demoted to Minor (MN) in Non-Service-Affecting (NSA) situations as defined in Telcordia GR-474.
- Default severities are used for all alarms and conditions until you create a new profile and apply it.

The Load and Store buttons are not available for Retrieve and Maintenance users.

The Delete and Store options will only display nodes to delete profiles from or store profiles to if the user has provisioning permission for those nodes. If the user does not have the proper permissions, CTC greys out the buttons and they are not available to the user.

21.5.2 Alarm Profile Buttons

The Alarm Profiles window displays six buttons at the bottom of the screen. Table 21-5 lists and describes each of the alarm profile buttons and their functions.

Table 21-5 Alarm Profile Buttons

Button	Description
New	Creates a new profile.
Load	Loads a profile to a node or a file.
Store	Saves profiles on a node (or nodes) or in a file.
Delete	Deletes profiles from a node.
Compare	Displays differences between alarm profiles (for example, individual alarms that are not configured equivalently between profiles).
Available	Displays all profiles available on each node.
Usage	Displays all entities (nodes and alarm subjects) present in the network and which profiles contain the alarm. Can be printed.

21.5.3 Alarm Profile Editing

Table 21-6 lists and describes the five profile-editing options available when you right-click an alarm item in the profile column (such as Default).

Table 21-6 Alarm Profile Editing Options

Button	Description
Store	Saves a profile in a node or in a file.
Rename	Changes a profile name.
Clone	Creates a profile that contains the same alarm severity settings as the profile being cloned.
Reset	Restores a profile to its previous state or to the original state (if it has not yet been applied).
Remove	Removes a profile from the table editor.

21.5.4 Alarm Severity Options

To change or assign alarm severity, left-click the alarm severity you want to change in the alarm profile column. Seven severity levels appear for the alarm:

- Not Reported (NR)
- Not Alarmed (NA)
- Minor (MN)
- Major (MJ)
- Critical (CR)
- Use Default
- Inherited

Inherited and Use Default severity levels only appear in alarm profiles. They do not appear when you view alarms, history, or conditions.

21.5.5 Row Display Options

In the network or node view, the Alarm Profiles window (Alarm Profile Editor for Node view) displays three check boxes at the bottom of the window:

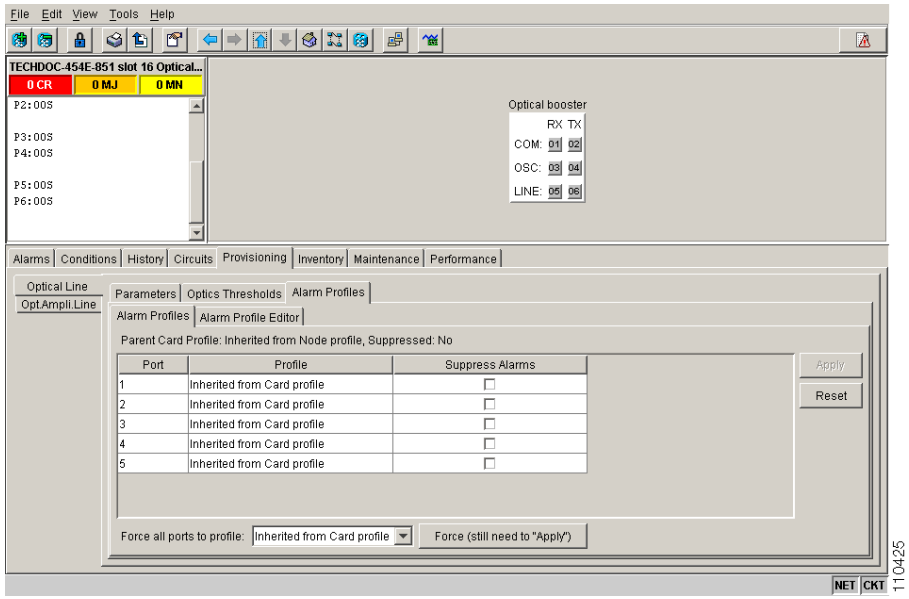
- Only show service-affecting severities—If unchecked, the editor shows severities in the format *sev1*/*sev2* where *sev1* is a service-affecting severity and *sev2* is not service-affecting. If checked, the editor only shows *sev1* alarms.
- Hide reference values—Highlights alarms with nondefault severities by clearing alarm cells with default severities.
- Hide identical rows—Hides rows of alarms that contain the same severity for each profile.

21.5.6 Applying Alarm Profiles

In CTC node view, the Alarm Behavior window displays alarm profiles for the node. In card view, the Alarm Behavior window displays the alarm profiles for the selected card. Alarm profiles form a hierarchy. A node-level alarm profile applies to all cards in the node except cards that have their own profiles. A card-level alarm profile applies to all ports on the card except ports that have their own profiles.

At the node level, you can apply profile changes on a card-by-card basis or set a profile for the entire node. At the card-level view, you can apply profile changes on a port-by-port basis or set alarm profiles for all ports on that card. Figure 21-3 shows alarm profiles for an OPT-BST card.

Figure 21-3 OPT-BST Card Alarm Profiles



21.6 Alarm Suppression

ONS 15454 nodes have an alarm suppression option that clears raised alarm messages for the node, chassis, one or more slots (cards), or one or more ports. After they are cleared, these alarms change appearance from their normal severity color to white and they can be cleared from the display by clicking Synchronize. Alarm suppression itself raises an alarm called AS-CMD that is shown in applicable Alarms windows. Node-level suppression is shown in the node view Alarms window, and card or port-level suppression is shown in all views. The AS-CMD alarm itself is not cleared by the suppress command. Each instance of this alarm indicates its object separately in the Object column.

A suppression command applied at a higher level does not supersede a command applied at a lower level. For example, applying a node-level alarm suppression command makes all raised alarms for the node appear to be cleared, but it does not cancel out card-level or port-level suppression. Each of these conditions can exist independently and must be cleared independently.

Suppression causes the entity alarm to behave like a Not Reported event. This means that the alarms, having been suppressed from view in the Alarms window, are now only shown in the Conditions window. The suppressed alarms are displayed with their usual visual characteristics (service-affecting status and color-coding) in the window. The alarms still appear in the History window.

See the "NTP-G70 Suppress Alarms or Discontinue Alarm Suppression" procedure on page 8-28.

Note Use alarm suppression with caution. If multiple CTC or TL1 sessions are open, suppressing the alarms in one session suppresses the alarms in all other open sessions.

21.7 External Alarms and Controls

External alarm inputs can be provisioned on the Alarm Interface Controller–International (AIC-I) card for external sensors such as an open door and flood sensors, temperature sensors, and other environmental conditions. External control outputs on these two cards allow you to drive external visual or audible devices such as bells and lights. They can control other devices such as generators, heaters, and fans.

Up to 12 external alarm inputs and four external controls are available with the AIC-I card. If you also provision the alarm extension panel (AEP), there are 32 inputs and 16 outputs. The AEP is compatible with the ONS 15454 ANSI shelf only. It is not compatible with the ONS 15454 ETSI shelf.

See the "NTP-G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card" procedure on page 8-31.

21.7.1 External Alarms

You can provision each alarm input separately. Provisionable characteristics of external alarm inputs include:

- Alarm Type—List of alarm types.
- Severity—CR, MJ, MN, NA, and NR.
- Virtual Wire—The virtual wire associated with the alarm.
- Raised When—Open means that the normal condition is no current flowing through the contact, and the alarm is generated when current does flow; closed means that normal condition is to have current flowing through the contact, and the alarm is generated when current stops flowing.
- Description—CTC alarm log description (up to 63 characters).

Note If you provision an external alarm to raise when a contact is open, and you have not attached the alarm cable, the alarm will remain raised until the alarm cable is connected.

Note When you provision an external alarm, the alarm object is ENV-IN-*nn*. The variable *nn* refers to the external alarm's number, regardless of the name you assign.

21.7.2 External Controls

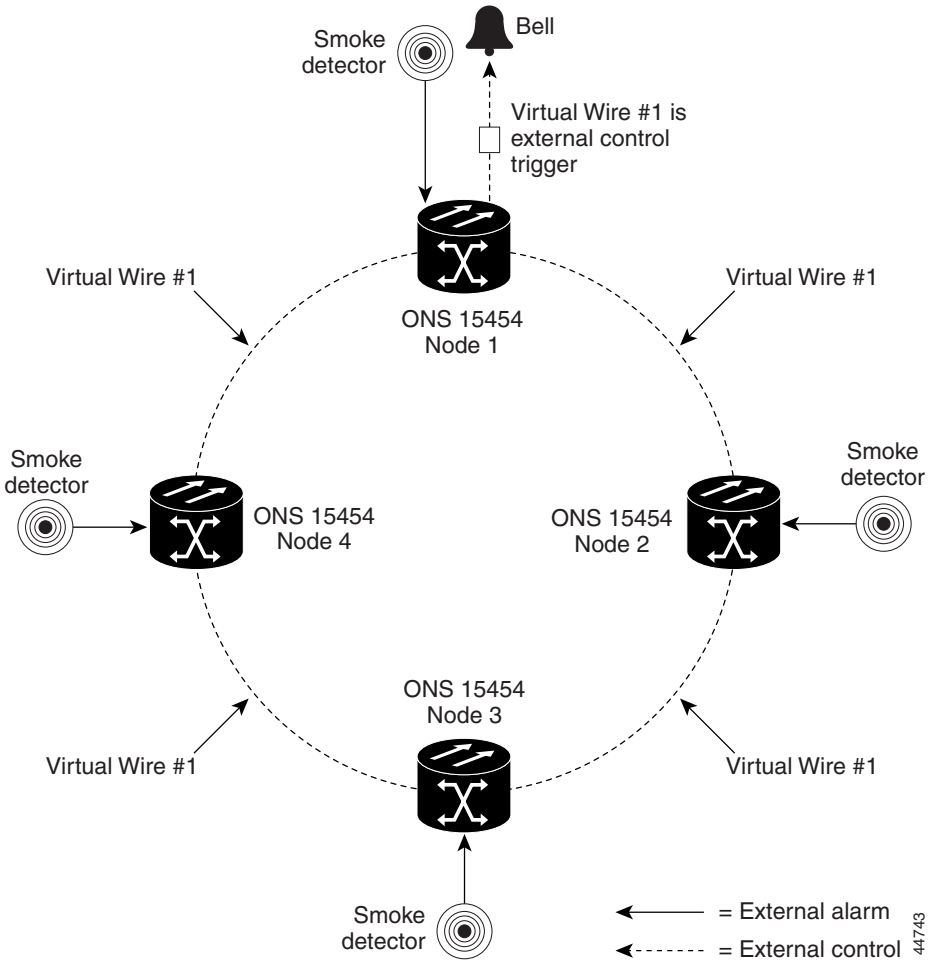
You can provision each alarm output separately. Provisionable characteristics of alarm outputs include:

- Control type.
- Trigger type (alarm or virtual wire).
- Description for CTC display.
- Closure setting (manually or by trigger). If you provision the output closure to be triggered, the following characteristics can be used as triggers:
  - Local NE alarm severity—A chosen alarm severity (for example, major) and any higher-severity alarm (in this case, critical) causes output closure.
  - Remote NE alarm severity—Similar to local NE alarm severity trigger setting, but applies to remote alarms.
  - Virtual wire entities—You can provision an alarm that is input to a virtual wire to trigger an external control output.

21.7.3 Virtual Wires

Provisioning the AIC and AIC-I card provides a "virtual wires" option used to route external alarms and controls from different nodes to one or more alarm collection centers. In Figure 21-4, smoke detectors at Nodes 1, 2, 3, and 4 are assigned to Virtual Wire #1, and Virtual Wire #1 is provisioned as the trigger for an external bell at Node 1.

Figure 21-4 External Alarms and Controls Using a Virtual Wire



When using AIC virtual wires, you can:

- Assign different external devices to the same virtual wire.
- Assign virtual wires as the trigger type for different external controls.

CTC Information and Shortcuts

Note The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This appendix describes the Cisco Transport Controller (CTC) views, menus options, tool options, shortcuts, and table display options. This appendix also describes the shelf inventory data presented in CTC. For more information about CTC, see Chapter 18, "CTC Operation Reference."

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

Display Node, Card, and Network Views

CTC provides three views of the ONS 15454 and the ONS network:

- Node view appears when you first log into an ONS 15454. This view shows a graphic of the ONS 15454 shelf and provides access to tabs and subtabs that you use to manage the node.
- Card view provides access to individual ONS 15454 cards. This view provides a graphic of the card and provides access to tabs and subtabs that you use to manage the card.
- Network view shows all the nodes in a ring. A Superuser can set up this feature so each user will see the same network view, or the user can create a custom view with maps. This view provides access to tabs and subtabs that you use to manage the network.

Table A-1 lists different actions for changing CTC views.

Table A-1 Change CTC Views

To Display	Perform One of the Following
Node view	• Log into a node; node view is the default view. • In network view, double-click a node icon, or right-click the node and choose **Open Node** from the shortcut menu. • In network view, single-click a node icon, then choose **Go To Selected Object View** from the View menu. • From the View menu, choose **Go To Other Node**, then choose the node you want from the shortcut menu. • Use the arrows on the CTC toolbar to navigate up or down views. For example, in network view, click a node, then click the down arrow.
Network view	• In node view, click the up arrow or the Network View tool on the CTC toolbar. • From the View menu, choose **Go To Network View**.
Card view	• In node view, double-click a card or right-click the card and choose **Open Card**. • In node view, single-click a card icon, then choose **Go To Selected Object View** from the View menu. • Use the arrows on the CTC toolbar to navigate up or down views. For example, in node view, click a card, then click the down arrow.

Node Icons on the Network View Map

Table A-2 lists the node icons on the network view map.

Table A-2 Description of Node Icons on Network View Map

Node Name	Icon	Description
SONET SDH Hybrid OADM Hybrid line amplifier Hybrid terminal Passive hybrid terminal Amplified TDM		A SONET, SDH, hybrid, or amplified time-division multiplexing (TDM) node icon is represented as a cylinder with crossed arrows. **Note** Release 4.7 is DWDM only. It does not support SONET, SDH, or hybrid nodes. • A SONET or SDH node can include OC-N cards, electrical cards, cross-connects, and more. • A hybrid optical add/drop multiplexing (OADM) node contains at least one Channel OADM (AD-xC-xx.x) or one Band OADM (AD-xB-xx.x) card and two Advanced Timing, Communications, and Controller (TCC2/TCC2P) cards. TDM cards can be installed in any available slot. • A hybrid line amplifier node contains amplifiers and both TDM and dense wavelength division multiplexing (DWDM) cards. • A hybrid terminal node contains at least one 32-Channel Multiplexer (32MUX-O) card, one Double-Slot 32-Channel Demultiplexer (32DMX-O) card, amplifiers, two TCC2/TCC2P cards, and TDM cards. • A passive hybrid terminal node has the same equipment as the hybrid terminal node, but does not contain amplifiers. • An amplified TDM node is a node that increases the span length between two ONS 15454 nodes that contain TDM cards and optical amplifiers. Amplified TDM nodes contain either Optical Booster (OPT-BST) amplifiers or AD-1C cards.
Hub		A DWDM hub node icon is represented as a three-dimensional cylinder with amplifiers. A hub node contains at least two 32DMX or 32DMX-O cards and two 32MUX-O. No OADM cards are provisioned.
OADM		A DWDM OADM node icon is represented as a three-dimensional cylinder with arrows. An OADM node contains at least one AD-xC-xx.x or one AD-xB-xx.x. No 32MUX-O, 32DMX-O, or 32DMX cards are provisioned.

Table A-2 Description of Node Icons on Network View Map (continued)

Node Name	Icon	Description
ROADM		A reconfigurable OADM (ROADM) node icon is represented as a three-dimensional cylinder with two amplifier symbols that have arrows between them. An ROADM node contains at least one 32-channel Wavelength Selective Switch (32WSS). A single-slot 32DMX or double-slot 32DMX-O can be installed, but is not required. Transponders (TXPs) and muxponders (MXPs) can be installed in Slots 6 and 12. If amplification is not used, TXPs or MXPs can be installed in Slots 1 and 17. If OPT-BSTs are not installed, Optical Service Channel and Combiner/Separator Module (OSC-CSM) cards are installed in Slots 2 and 16 and Slots 8 and 10 are empty.
Terminal (west)		A terminal (west) node is represented as a three-dimensional cylinder with one amplifier on the west side of the icon. • A terminal node contains one 32DMX or 32DMX-O and one 32-MUX-O. No OADM cards are provisioned. • A flexible terminal node contains a series of OADM and amplifier cards.
Terminal (east)		A terminal (east) node is represented as a three-dimensional square with one amplifier on the east side of the icon. • A terminal node contains one 32DMX or 32DMX-O and one 32MUX-O. No OADM cards are provisioned. • A flexible terminal node contains a series of OADM and amplifier cards.
Line OSC regeneration line		Line and OSC regeneration line nodes are represented as a three-dimensional cylinder with one arrow pointing west and another arrow pointing east. • A line node has only Optical Preamplifier (OPT-PRE) or OPT-BST amplifiers provisioned. • An optical service channel (OSC) regeneration line node contains two OSC-CSM cards.
Unknown		An unknown DWDM node icon is represented as a three-dimensional cylinder with one arrow pointing north. An unknown node means that the provisioned cards do not allow the node to fit any of the defined DWDM node categories.

Manage the CTC Window

Different navigational methods are available within the CTC window to access views and perform management actions. You can double-click and right-click objects in the graphic area and move the mouse over nodes, cards, and ports to view popup status information.

CTC Menu and Toolbar Options

The CTC window menu bar and toolbar provide primary CTC functions. Table A-3 shows the actions that are available from the CTC menu and toolbar.

Table A-3 CTC Menu and Toolbar Options

Menu	Menu Option	Toolbar	Description
File	Add Node		Adds a node to the current session. See the "DLP-G49 Add a Node to the Current Session or Login Group" task on page 2-29.
	Delete Selected Node		Deletes a node from the current session.
	Lock CTC		Locks CTC without closing the CTC session. A user name and password are required to open CTC.
	Print		Prints CTC data. See the "DLP-G113 Print CTC Data" task on page 8-2.
	Export		Exports CTC data. See the "DLP-G114 Export CTC Data" task on page 8-4.
	Exit	—	Closes the CTC session.
Edit	Preferences		Displays the Preferences dialog box, which shows the following tabs: • General—Allows you to change event defaults and manage preferences. • Login Node Groups—Allows you to create login node groups. See the "DLP-G48 Create Login Node Groups" task on page 2-28. • Map—Allows you to customize the network view. See the "DLP-G168 Change the Network View Background Color" task on page 10-16 and the "DLP-G170 Apply a Custom Network View Background Map" task on page 10-18. • Circuit—Allows you to change the color of circuit spans. This task is not applicable on DWDM-only nodes. • Firewall—Sets the Internet Inter-ORB Protocol (IIOP) listener ports for access to the ONS 15454 through a firewall. See the "NTP-G27 Set Up the ONS 15454 for Firewall Access" procedure on page 3-21. • JRE—Allows you to select another Java Runtime Environment (JRE) version. See the "DLP-G52 Change the JRE Version" task on page 2-31.

Table A-3 CTC Menu and Toolbar Options (continued)

Menu	Menu Option	Toolbar	Description
View	Go To Previous View		Displays the previous CTC view.
	Go To Next View		Displays the next CTC view. Available only after you navigate to a previous view. Go to Previous View and Go to Next View are similar to forward and backward navigation in a web browser.
	Go To Parent View		References the CTC view hierarchy: network view, node view, and card view. In card view, this command displays the node view; in node view, the command displays network view. Not available in network view.
	Go To Selected Object View		Displays the object selected in the CTC window.
	Go To Home View		Displays the login node in node view.
	Go To Network View		Displays the network view.
	Go To Other Node		Displays a dialog box allowing you to type in the node name or IP address of a a network node that you want to view.
	Show Status Bar	—	Click this item to display or hide the status bar at the bottom of the CTC window.
	Show Tool Bar	—	Click this item to display or hide the CTC toolbar.
—	—		Zooms out the network view area (toolbar only).
—	—		Zooms in the network view area (toolbar only).
—	—		Zooms in a selected network view area (toolbar only).

Table A-3 CTC Menu and Toolbar Options (continued)

Menu	Menu Option	Toolbar	Description
Tools	Circuits	—	Displays the following options: • Repair Circuits—Repairs incomplete circuits following replacement of the ONS 15454 alarm interface panel (AIP). Refer to the *Cisco ONS 15454 SONET and DWDM Troubleshooting Guide* for more information. • Reconfigure Circuits—Allows you to reconfigure circuits. Not applicable to DWDM nodes. • Set Path Selector Attributes—Allows you to edit path protection or subnetwork connection protection (SNCP) circuit path selector attributes. Not applicable on DWDM nodes. • Set Circuit State—Allows you to change a circuit state. Not applicable on DWDM nodes. • Roll Circuit—(ONS 15600 only.) Allows you to reroute live traffic without interrupting service. Refer to the *Cisco ONS 15600 Procedure Guide.* • Delete Rolls —(ONS 15600 only.) Refer to the *Cisco ONS 15600 Procedure Guide.*
	Overhead Circuits	—	Displays the Repair IP Tunnels option, which fixes circuits that are in the PARTIAL status as a result of node IP address changes. See the "DLP-G111 Repair an IP Tunnel" task on page 7-21.
	Topology Upgrade	—	Displays the following options: • Convert UPSR (or SNCP) to BLSR (or MS-SPRing)—Converts a path protection to a bidirectional line switch ring (BLSR). Not applicable to DWDM nodes. • Convert Unprotected to UPSR (or SNCP)—Converts a point-to-point or linear add/drop multiplexer (ADM) to path protection. Not applicable to DWDM nodes.
	Manage VLANs	—	Displays a list of VLANs that have been created and allows you to delete VLANs. Not applicable to DWDM nodes.
	Open TL1 Connection		Displays the TL1 session dialog box so you can create a TL1 session to a specific node. Refer to the *Cisco ONS SONET TL1 Command Guide* and the *Cisco ONS 15454 SDH TL1 Command Guide*.
	Open IOS Connection		Displays the Cisco IOS command line interface dialog box if a Cisco IOS capable card (ML1000-2 or ML100T-12) is installed in the node. Not applicable to DWDM nodes.
Help	Contents and Index	—	Displays the online help window.
	User Manuals	—	Displays the Cisco ONS 15454 documentation.
	About CTC	—	Displays the software version and the nodes in the CTC session.

Table A-3 CTC Menu and Toolbar Options (continued)

Menu	Menu Option	Toolbar	Description
—	Network Scope	—	Displays the selected network scope. The network scope drop-down list has three options: DWDM, TDM, or All. If you choose DWDM, DWDM and hybrid nodes appear on the network view map. If you choose TDM, TDM and hybrid nodes appear on the network view map. If you choose All, every node on the network appears on the network view map. **Note** Release 4.7 is DWDM only. Hybrid configurations are not supported.
—	—		Opens the CTC Alerts dialog box, which shows the status of certain CTC background tasks. When the CTC Alerts toolbar icon contains a red triangle, unread notifications exist. When there are no unread notifications, the CTC Alerts toolbar icon contains a gray triangle (see the icons in the Toolbar column for comparison). Notifications include: • Network disconnection. • Send-PDIP inconsistency—CTC discovers a new node that does not have a SEND-PDIP setting consistent with the login node. • Circuit deletion status—Reports when the circuit deletion process completes if you chose "Notify when complete" as described in the "NTP-G61 Modify and Delete Overhead Circuits" procedure on page 7-20. The CTC Alerts window always reports circuit deletion errors. • Conditions retrieval error. • Software download failure. You can save a notification by clicking the Save button in the CTC Alerts dialog box and navigating to the directory where you want to save the text file. By default, the CTC Alerts dialog box appears automatically. To disable automatic popup, see the "DLP-G53 Configure the CTC Alerts Dialog Box for Automatic Popup" task on page 2-32.

CTC Mouse Options

In addition to the CTC menu bar and toolbar, you can invoke actions by double-clicking CTC window items with your mouse, or by right-clicking an item and selecting actions from shortcut menus. Table A-4 lists the CTC window mouse shortcuts.

Table A-4 CTC Window Mouse Shortcuts

Technique	Description
Double-click	• Node in network view—Displays the node view. • Card in node view—Displays the card view. • Alarm/Event—Displays the object that raised the alarm or event. • Circuits—Displays the Edit Circuit window.
Right-click	• Network view graphic area—Displays a menu that you can use to create a new domain; change the position and zoom level of the graphic image; save the map layout (if you have a Superuser security level); reset the default layout of the network view; set, change, or remove the background image and color; and save or reset the node position. • Node in network view—Displays a menu that you can use to open the node, reset the node icon position to the longitude and latitude set on the Provisioning > General tab, delete the node, fix the node position for automatic layout, provision circuits, provision channels, and update circuits or channels with a new node. • Span in network view—Displays a menu that you can use to view information about the span's source and destination ports, the protection scheme, and the optical or electrical level. • Card in node view—Displays a menu that you can use to open, delete, reset, and change cards. The card that you choose determines the commands that appear. • Card in card view—Displays a menu that you can use to reset the card, or go to the parent view (node view). • Empty slot in node view—Displays a menu with cards that you can choose to preprovision the slot.
Move mouse cursor	• Over node in network view—Displays a summary of node alarms and provides a warning if the node icon has been moved out of the map range. • Over span in network view—Displays circuit (node, slot, port) bandwidth and protection information. For DWDM spans, the optical direction and optical ring ID appear. If the span terminates on the trunk port of a transponder card (TXP or MXP), the associated DWDM wavelength also appears. • Over card in node view—Displays card type, card status, alarm profile status and, depending on the DWDM card type, number of bands or channels. • Over card port in node view—Displays card name, port state, and alarm profile status. • Over card port in card view—Displays port state and alarm profile status. For DWDM cards, the port number is labeled as channel, band, or line depending on the card type along with the port state and alarm profile status.

Node View Shortcuts

Table A-5 shows actions on ONS 15454 cards that you can perform by moving your mouse over the CTC window.

Table A-5 Node View Card-Related Shortcuts

Action	Shortcut
Display card information	In node view, move your mouse over cards in the graphic to display tool tips with the card type, card status (active or standby), the highest level of alarm (if any), and the alarm profile used by the card.
Open, reset, or delete a card	In node view, right-click a card. Choose **Open Card** to display the card in card view, **Delete Card** to delete it, or **Reset Card** to reset the card.
Preprovision a slot	In node view, right-click an empty slot. Choose the card type for which you want to provision the slot from the shortcut menu.
Change a card	In node view, right-click an OC-N card or a DS3 card, and choose **Change Card**. In the Change Card dialog box, choose the card type. Change Card retains all card provisioning, including data communications channel (DCC) terminations, protection, circuits, and ring.

Network View Tasks

Right-click the network view graphic area or a node, span, or domain to display shortcut menus. Table A-6 lists the actions that are available from the network view.

Table A-6 Network Management Tasks in Network View

Action	Task
Open a node	Any of the following: • Double-click a node icon. • Right-click a node icon and choose **Open Node** from the shortcut menu. • Click a node and choose **Go To Selected Object View** from the View menu. • From the View menu, choose **Go To Other Node**. Choose a node from the Select Node dialog box. • Double-click a node alarm or event in the Alarms or History tab.
Move a node icon	Press the **Ctrl** key and the left mouse button simultaneously and drag the node icon to a new location.
Reset node icon position	Right-click a node and choose **Reset Node Position** from the shortcut menu. The node icon moves to the position defined by the longitude and latitude fields on the Provisioning > General tab in node view.
Provision a circuit	Right-click a node. From the shortcut menu, choose **Provision Circuit To** and choose the node where you want to provision the circuit. For circuit creation procedures, see Chapter 7, “Create Channels and Circuits.”

Table A-6 Network Management Tasks in Network View (continued)

Action	Task
Update circuits with new node	Right-click a node and choose **Update Circuits With New Node** from the shortcut menu. Use this command when you add a new node and want to pass circuits through it.
Display a link end point	Right-click a span. From the shortcut menu, choose **Go To {**<*node*> | <*port*> | <*slot*>**}** for the drop port you want to view. CTC displays the card in card view.
Display span properties	Do any of the following: • Move the mouse over a span; the properties appear near the span. • Click a span; the properties appear in the upper left corner of the window. • Right-click a span; the properties appear at the top of the shortcut menu.
Perform a path protection (ANSI) or SNCP (ETSI) protection switch for an entire span	Right-click a network span and click **Circuits**. In the Circuits on Span dialog box, switch options appear in the path protection (or SNCP) Span Switching field.
Display DWDM span properties	Right-click a DWDM network span and choose **Circuits** from the shortcut menu. The optical channel network connection (OCHNC), optical direction, and circuit appear.
Upgrade a span	Right-click a span and choose **Upgrade Span** from the shortcut menu. Not applicable to DWDM nodes.

Table Display Options

Right-clicking a table column displays a menu. Table A-7 shows table display options, which include rearranging or hiding CTC table columns and sorting table columns by primary or secondary keys.

Table A-7 Table Display Options

Task	Click	Right-Click Shortcut Menu
Resize column	Click while dragging the column separator to the right or left.	—
Rearrange column order	Click while dragging the column header to the right or left.	—
Reset column order	—	Choose **Reset Columns Order/Visibility**.
Hide column	—	Choose **Hide Column**.
Show column	—	Choose **Show Column >** *column_name*.
Display all hidden columns	—	Choose **Reset Columns Order/Visibility**.
Sort table (primary)	Click a column header; each click changes sort order (ascending or descending).	Choose **Sort Column**.

Table A-7 Table Display Options (continued)

Task	Click	Right-Click Shortcut Menu
Sort table (secondary sorting keys)	Press the **Shift** key and simultaneously click the column header.	Choose **Sort Column (incremental)**.
Reset sorting	—	Choose **Reset Sorting**.
View table row count	—	View the number after "Row count=" (it is the last item on the shortcut menu).

Equipment Inventory

In node view, the Inventory tab displays information about the ONS 15454 equipment, including:

- Delete button—After highlighting a card with your mouse, use this button to delete the card from node view.
- Reset button—After highlighting a card with your mouse, use this button to reset the card.
- Location—Identifies where the equipment is installed, either chassis or slot number.
- Eqpt Type—Displays the type of equipment but not the specific card name, for example, OC-12 or DS-1.
- Actual Eqpt Type—Displays the specific card name, for example, OC12 IR/STM4 SH 1310.
- Admin State—Changes the card service state unless network conditions prevent the change. For more information about card administrative states, see Appendix C, "DWDM Administrative and Service States."
  - IS (ANSI) or Unlocked (ETSI)—Places the card in the *In-Service and Normal* (IS-NR [ANSI]) or Unlocked-enabled (ETSI) service state.
  - OOS,MA (ANSI) or Locked,maintenance (ETSI)—Places the card in the *Out-of-Service and Autonomous, Maintenance* (OOS-AU,MT [ANSI]) or Unlocked-disabled,maintenance (ETSI) service state.
- Service State—Displays the current card service state, which is an autonomously generated state that gives the overall condition of the card. Service states appear in the format: Primary State-Primary State Qualifier, Secondary State. For more information about card service states, see Appendix C, "DWDM Administrative and Service States."
- HW Part #—Displays the hardware part number; this number is printed on the top of the card or equipment piece.
- HW Rev—Displays the hardware revision number.
- Serial #—Displays the equipment serial number; this number is unique to each card.
- CLEI Code—Displays the Common Language Equipment Identifier code.
- Firmware Rev—Displays the revision number of the software used by the application-specific integrated circuit (ASIC) chip installed on the ONS 15454 card.
- Product ID—Displays the manufacturing product identifier for a hardware component, such as a fan tray, chassis, or card. The Product ID column displays "N/A" for equipment existing before Software Release 4.6.
- Version ID—Displays the manufacturing version identifier for a fan tray, chassis, or card. The Version ID column displays "N/A" for equipment existing before Software Release 4.6.

Hardware Specifications

This appendix contains hardware and software specifications for the ONS 15454 ANSI and ETSI shelf assemblies and cards.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

B.1 Shelf Specifications

This section provides specifications for shelf bandwidth; a list of topologies; Cisco Transport Controller (CTC) specifications; the LAN, TL1, modem, and alarm specifications; timing, power, and environmental specifications; and shelf dimensions.

B.1.1 Bandwidth

The ONS 15454 has the following bandwidth specifications:

- Total bandwidth: 240 Gbps
- Data plane bandwidth: 160 Gbps
- SONET/SDH plane bandwidth: 80 Gbps

B.1.2 Configurations

The ONS 15454 can be configured for the following dense wavelength division multiplexing (DWDM) topologies:

- Hubbed rings
- Multihubbed rings
- Point-to-point
- Linear
- Linear with optical add/drop multiplexing (OADM)

B.1.3 Cisco Transport Controller

CTC, the ONS 15454 craft interface software, has the following specifications:

- 10BaseT
- Advanced Timing, Communications, and Control (TCC2/TCC2P) card access: RJ-45 connector
- Backplane access: LAN pin field (ANSI only)
- Front Mount Electrical Connection (FMEC) access: LAN connector on MIC-C/T/P faceplate (ETSI only)

B.1.4 External LAN Interface

The ONS 15454 external LAN interface has the following specifications:

- 10BaseT Ethernet
- Backplane access: LAN pin field (ANSI only)
- FMEC access: LAN connector on MIC-C/T/P faceplate (ETSI only)

B.1.5 TL1 Craft Interface

The ONS 15454 TL1 craft interface has the following specifications:

- Speed: 9600 bps
- TCC2/TCC2P access: EIA/TIA-232 DB-9 type connector
- Backplane access: CRAFT pin field (ANSI only)

B.1.6 Modem Interface

The ONS 15454 modem interface has the following specifications:

- Hardware flow control
- TCC2/TCC2P: EIA/TIA-232 DB-9 type connector

B.1.7 Alarm Interface

The ONS 15454 alarm interface has the following specifications:

- ETSI
  - Visual: Critical, Major, Minor, Remote
  - Audible: Critical, Major, Minor, Remote
  - FMEC access: 62-Pin DB connector on MIC-A/P faceplate
  - Alarm inputs: Common 32-VDC output for all alarm-inputs, closed contact limited to 2 mA
  - Control outputs: Open contact maximum 60 VDC, closed contact maximum 100 mA
- ANSI

  - Visual: Critical, Major, Minor, Remote
  - Audible: Critical, Major, Minor, Remote
  - Backplane access: Alarm pin fields
  - Alarm contacts: 0.045 mm, –48 V, 50 mA

B.1.8 EIA Interface (ANSI only)

The ONS 15454 electrical interface assembly (EIA) interface has the following specifications:

- SMB: AMP #415504-3 75-ohm, 4-leg connectors
- BNC: Trompeter #UCBJ224 75-ohm 4 leg connector (King or ITT are also compatible)
- AMP Champ: AMP#552246-1 with #552562-2 bail locks

B.1.9 BITS Interface (ANSI only)

The ONS 15454 building integrated timing supply (BITS) interface has the following specifications:

- 2 DS-1 BITS inputs
- 2 derived DS-1 outputs
- Backplane access: BITS pin field

B.1.10 System Timing

The ONS 15454 ANSI has the following system timing specifications:

- Stratum 3 per Telcordia GR-253-CORE
- Free running accuracy: +/– 4.6 ppm
- Holdover stability: 3.7 x 10^{-7} per day, including temperature (< 255 slips in first 24 hours)
- Reference: External BITS, line, internal

The ONS 15454 ETSI has the following system timing specifications:

- Stratum 3E, per ITU-T G.813
- Free running accuracy: +/– 4.6 ppm
- Holdover stability: 3.7 exp –7 per day, including temperature (< 255 slips in first 24 hours)
- Reference: External BITS, line, internal

B.1.11 System Power

The ONS 15454 ANSI has the following power specifications:

- Input power: –48 VDC
- Power consumption: 55 W (fan tray only); 650 W (maximum draw with cards)
- Power requirements: –40.5 to –57 VDC
- Power terminals: #6 Lug

- ANSI shelf: 100-A fuse panel (minimum 30 A fuse per shelf)
  HD shelf: 100-A fuse panel (minimum 35 A fuse per shelf)

The ONS 15454 ETSI has the following power specifications:

- Input voltage: –48 VDC
- Power consumption: Configuration dependent, 53 W for fan tray; 650 W (maximum draw with cards)
- Power requirements:
  - Nominal: –48 VDC
  - Tolerance limits: –40.5 to –57.0 VDC
- Power terminals: 3WK3 Combo-D power cable connector (MIC-A/P and MIC-C/T/P faceplates)
- Fusing: 100 A fuse panel; minimum 30 A fuse per shelf

B.1.12 System Environmental Specifications

The ONS 15454 ANSI has the following environmental specifications:

- Operating temperature: 32 to +131 degrees Farenheit (0 to +55 degrees Celsius); -40 to +139 degrees Farenheit (–40 to +65 degrees Celsius) with industrial temperature rated cards
- Operating humidity: 5 to 95 percent, noncondensing

The ONS 15454 ETSI has the following environmental specifications:

- Operating temperature: 32 to 104 degrees Fahrenheit (0 to +40 degrees Celsius)
- Operating humidity: 5 to 95 percent, noncondensing

B.1.13 Dimensions

The ONS 15454 ANSI shelf assembly has the following dimensions:

- Height: 18.5 in. (40.7 cm)
- Width: 19 or 23 in. (41.8 or 50.6 cm) with mounting ears attached
- Depth: 12 in. (26.4 cm) (5 in. or 12.7 cm projection from rack)
- Weight: 55 lb (24.947 kg) empty

The ONS 15454 ETSI shelf assembly has the following dimensions:

- Height: 616.5 mm (24.27 in.)
- Width: 535 mm (17 in.) without mounting ears attached
- Depth: 280 mm (11.02 in.)
- Weight: 26 kg empty (57.3 lb)

B.2 General Card Specifications

This section provides power specifications and temperature ranges for all ONS 15454 cards.

B.2.1 Power

Table B-1 provides power consumption information for the ONS 15454 cards.

Table B-1 Individual Card Power Requirements

Card Type	Card Name	Watts	Amperes at –48 V	BTU/Hr.
Common Control Cards	TCC2/TCC2P	19.20	0.4	66.8
	AIC-I	4.8	0.1	15.3
	AEP	3	(from +5 VDC from AIC-I)	10.2
	MIC-A/P	0.13	via TCC2/TCC2P	—
	MIC-C/T/P	0.38	via TCC2/TCC2P	—
DWDM Cards	OSCM	Nominal 23 Maximum 26	Nominal 0.48 Maximum 0.54	Nominal 78.48 Maximum 88.71
	OSC-CSM	Nominal 24 Maximum 27	Nominal 0.5 Maximum 0.56	Nominal 81.89 Maximum 92.12
	OPT-PRE	Minimum 25 Nominal 30 Maximum39	Minimum 0.52 Nominal 0.5 Maximum 0.81	Minimum 85.3 Nominal 102.36 Maximum 88.71
	OPT-BST	Nominal 30 Maximum 39	Nominal 0.63 Maximum 0.81	Nominal 102.36 Maximum 88.71
	OPT-BST-E	Nominal 30 Maximum 39	Nominal 0.63 Maximum 0.81	Nominal 102.36 Maximum 88.71
	32MUX-O	Nominal 16 Maximum 25	Nominal 0.33 Maximum 0.52	Nominal 54.59 Maximum 85.3
	32DMX-O	Nominal 16 Maximum 25	Nominal 0.33 Maximum 0.52	Nominal 54.59 Maximum 85.3
	32DMX	Nominal 15 Maximum 25	Nominal 0.31 Maximum 0.52	Nominal 51.21 Maximum 85
	4MD-xx.x	Nominal 17 Maximum 25	Nominal 0.35 Maximum 0.52	Nominal 58.0 Maximum 85.3
	AD-1C-xx.x	Nominal 17 Maximum 25	Nominal 0.35 Maximum 0.52	Nominal 58.0 Maximum 85.3
	AD-2C-xx.x	Nominal 17 Maximum 25	Nominal 0.35 Maximum 0.52	Nominal 58.0 Maximum 85.3
	AD-4C-xx.x	Nominal 17 Maximum 25	Nominal 0.35 Maximum 0.52	Nominal 58.0 Maximum 85.3

Table B-1 Individual Card Power Requirements (continued)

Card Type	Card Name	Watts	Amperes at –48 V	BTU/Hr.
DWDM Cards	AD-1B-xx.x	Nominal 17 Maximum 25	Nominal 0.35 Maximum 0.52	Nominal 58.0 Maximum 85.3
	AD-4B-xx.x	Nominal 17 Maximum 25	Nominal 0.35 Maximum 0.52	Nominal 58.0 Maximum 85.3
	32WSS	Nominal 50 Maximum 65	Nominal 1.04 Maximum 1.35	Nominal 170 Maximum 221
Transponder and Muxponder Cards	TXP_MR_10G	35.00[1]	0.73	119.5
	TXP_MR_10E	Nominal 40 Maximum 50	Nominal 1.11 Maximum 1.04	Nominal 136.6 Maximum 170.7
	TXP_MR_2.5G	35.00[1]	0.73	119.5
	TXPP_MR_2.5G	50[1]	1.04	170.5
	MXP_2.5G_10G	50[1]	1.04	170.7
	MXP_2.5G_10E	Nominal 40 Maximum 50	Nominal 1.11 Maximum 1.04	Nominal 136.6 Maximum 170.7
	MXP_MR_2.5G	Nominal 50 Maximum 60	Nominal 1.04 Maximum 1.25	Nominal 170.7 Maximum 204
	MXPP_MR_2.5G	Nominal 50 Maximum 60	Nominal 1.04 Maximum 1.25	Nominal 170.7 Maximum 204

1. Calculated power; measured power was not available at the time of publication.

B.2.2 Temperature

Table B-2 provides temperature ranges and product names for ONS 15454 cards.

Note The I-Temp symbol is displayed on the faceplate of an I-Temp compliant card. A card without this symbol is C-Temp compliant.

Table B-2 Card Temperature Ranges and Product Names

Card Type	Card Name	C-Temp Product Name (32 to 131 degrees Fahrenheit, 0 to +55 degrees Celsius)	I-Temp Product Name (–40 to 149 degrees Fahrenheit, –40 to +65 degrees Celsius)
Common Control Cards	TCC2/TCC2P	—	15454-TCC2/TCC2P
	AIC-I	—	15454-AIC-I
	AEP	—	15454-AEP
	MIC-A/P	15454-MIC-A/P	—
	MIC-C/T/P	15454 MIC-C/T/P	—

Table B-2 Card Temperature Ranges and Product Names (continued)

Card Type	Card Name	C-Temp Product Name (32 to 131 degrees Fahrenheit, 0 to +55 degrees Celsius)	I-Temp Product Name (–40 to 149 degrees Fahrenheit, –40 to +65 degrees Celsius)
DWDM Cards	OSCM	15454-OSCM	—
	OSC-CSM	15454-OSC-CSM	—
	OPT-PRE	15454-OPT-PRE	—
	OPT-BST	15454-OPT-BST	—
	OPT-BST-E	15454-OPT-BST-E	—
	32MUX-O	15454-32 MUX-O	—
	32DMX-O	15454-32 DMX-O	—
	32DMX	15454-32-DMX	—
	4MD-xx.x	15454-4MD-xx.x	—
	AD-1B-xx.x	15454-AD-1B-xx.x	—
	AD-4B-xx.x	15454-AD-4B-xx.x	—
	AD-1C-xx.x	15454-AD-1C-xx.x	—
	AD-2C-xx.x	15454-AD-2C-xx.x	—
	AD-4C-xx.x	15454-AD-4C-xx.x	—
	32WSS	15454-WSS	—
Transponder and Muxponder Cards	TXP_MR_10G	15454-TXPMR10G	—
	TXP_MR_10E	15454-10EMRTXP	—
	TXP_MR_2.5G	15454-2.5GMRTXP	—
	TXPP_MR_2.5G	15454-2.5GMRTXP-P	—
	MXP_2.5G_10G	15454-MXP2.5G10G	—
	MXP_2.5G_10E	15454-4x2.5G10EMXP	—
	MXP_MR_2.5G	15454-Datamux2.5GDM	—
	MXPP_MR_2.5G	15454-Datamux2.5GDMP	—

B.3 Common Control Card Specifications

This section provides specifications for the TCC2, TCC2P, AIC, and AIC-I cards, the alarm expansion panel (AEP), and the MIC-A/P and MIC-C/T/P FMECs.

For compliance information, refer to the *Cisco Optical Transport Products Safety and Compliance Information* document.

B.3.1 TCC2 Card Specifications

The TCC2 card has the following specifications:

- CTC software

  - Interface: EIA/TIA-232 (local craft access, on TCC2 faceplate)
  - Interface: 10BaseT LAN (on TCC2 faceplate)
  - Interface: 10BaseT LAN (through the backplane)
- Synchronization
  - Stratum 3, per Telcordia GR-253-CORE
  - Free running access: Accuracy +/– 4.6 ppm
  - Holdover stability: 3.7 x 10^{-7} per day including temperature (< 255 slips in first 24 hours)
  - Reference: External BITS, line, internal
- Supply voltage monitoring
  - Both supply voltage inputs are monitored.
  - Normal operation: –40.5 to –56.7 V
  - Undervoltage: Major alarm
  - Overvoltage: Major alarm
- Environmental
  - Operating temperature: –40 to +149 degrees Fahrenheit (–40 to +65 degrees Celsius)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 26.00 W, 0.54 A at –48 V, 88.8 BTU/hr
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.716 in. (18.2 mm)
  - Depth: 9.000 in. (228.6 mm)
  - Depth with backplane connector: 235 mm (9.250 in.)
  - Weight not including clam shell: 0.7 kg (1.5 lb)

B.3.2 TCC2P Card Specifications

The TCC2P card has the following specifications:

- CTC software
  - Interface: EIA/TIA-232 (local craft access, on TCC2P faceplate)
  - Interface: 10BaseT LAN (on TCC2P faceplate)
  - Interface: 10BaseT LAN (through the backplane)
- Synchronization
  - Stratum 3, per Telcordia GR-253-CORE
  - Free running access: Accuracy +/– 4.6 ppm
  - Holdover stability: 3.7 * 10 exp – 7 per day including temperature (< 255 slips in first 24 hours)
  - Reference: External BITS, line, internal
- Supply voltage monitoring
  - Both supply voltage inputs are monitored.

  - Normal operation: –40.5 to –56.7 V (in –48 VDC systems)
  - Undervoltage: Major alarm
  - Overvoltage: Major alarm
- Environmental
  - Operating temperature: –40 to +149 degrees Fahrenheit (–40 to +65 degrees Celsius)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 26.00 W, 0.54 A at –48 V, 88.8 BTU/hr
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.716 in. (18.2 mm)
  - Depth: 9.000 in. (228.6 mm)
  - Depth with backplane connector: 9.250 in. (235 mm)
  - Weight not including clam shell: 1.5 lb (0.7 kg)

B.3.3 AIC-I Card Specifications

The AIC-I card has the following specifications:

- Alarm inputs
  - Number of inputs: 12 without AEP, 32 with AEP
  - Opto-coupler isolated
  - Label customer provisionable
  - Severity customer provisionable
  - Common 32 V output for all alarm inputs
  - Each input limited to 2 mA
  - Termination: Wire-wrap on backplane without AEP, on AEP connectors with AEP
- Alarm outputs
  - Number of outputs: 4 (user configurable as inputs) without AEP, 16 with AEP
  - Switched by opto MOS (metal oxide semiconductor)
  - Triggered by definable alarm condition
  - Maximum allowed open circuit voltage: 60 VDC
  - Maximum allowed closed circuit current: 100 mA
  - Termination: Wire-wrap on backplane without AEP, on AEP connectors with AEP
- Express orderwire/local orderwire (EOW/LOW)
  - ITU-T G.711, ITU-T G.712, Telcordia GR-253-CORE
  - A-law, mu-law

Note Due to the nature of mixed coding, in a mixed-mode (A-law/mu-law) configuration, the orderwire is not ITU-T G.712 compliant.

  - Orderwire party line
  - Dual tone, multifrequency (DTMF) signaling
- User data channel (UDC)
  - Bit rate: 64 kbps, codirectional
  - ITU-T G.703
  - Input/output impedance: 120 ohm
  - Termination: RJ-11 connectors
- Data communications channel (DCC)
  - Bit rate: 576 kbps
  - EIA/TIA-485/V11
  - Input/output impedance: 120 ohm
  - Termination: RJ-45 connectors
- ACC connection for additional alarm interfaces
  - Connection to AEP
- Power monitoring alarming states:
  - Power failure (0 to –38 VDC)
  - Undervoltage (–38 to –40.5 VDC)
  - Overvoltage (beyond –56.7 VDC)
- Environmental
  - Operating temperature: –40 to 149 degrees Fahrenheit (–40 to +65 degrees Celsius)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption (including AEP, if used): 8.00 W, 0.17 A, 27.3 BTU/hr
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.716 in. (18.2 mm)
  - Depth: 9.000 in. (228.6 mm)
  - Weight: 1.8 lb (0.82 kg)

B.3.4 AEP Specifications (ANSI only)

The AEP has the following specifications:

- Alarm inputs
  - Number of inputs: 32
  - Optocoupler isolated
  - Label customer provisionable
  - Severity customer provisionable
  - Common 32 V output for all alarm inputs
  - Each input limited to 2 mA

  - Termination: 50-pin AMP champ connector
- Alarm outputs
  - Number of outputs: 16
  - Switched by opto MOS
  - Triggered by definable alarm condition
  - Maximum allowed open circuit voltage: 60 VDC
  - Maximum allowed closed circuit current: 100 mA
  - Termination: 50-pin AMP champ connector
- Environmental
  - Overvoltage protection: as in ITU-T G.703 Annex B
  - Operating temperature: –40 to +65 degrees Celsius (–40 to +149 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 3.00 W max., from +5 VDC from AIC-I, 10.2 BTU/hr max.
- Dimensions of AEP board
  - Height: 20 mm (0.79 in.)
  - Width: 330 mm (13.0 in.)
  - Depth: 89 mm (3.5 in.)
  - Weight: 0.18 kg (0.4 lb)

B.3.5 MIC-A/P FMEC Specifications (ETSI only)

The MIC-A/P FMEC card has the following specifications:

- Power supply input BATTERY B
  - System supply voltage: Nominal –48 VDC
    Tolerance limits: –40.5 to –57.0 VDC
  - Connector: 3WK3 Combo-D power cable connector
- Alarm outputs
  - Voltage (open contact): Maximum 60 VDC
  - Current (closed contact): Maximum 250 mA
  - Connector: 62-pin DB connector (common for inputs/outputs)
- Alarm inputs
  - Voltage (open contact): Maximum 60 VDC
  - Current (closed contact): Maximum 2 mA
  - Connector: 62-pin DB connector (common for inputs/outputs)
- Environmental
  - Operating temperature: –5 to +45 degrees Celsius (+23 to +113 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 0.13 W (provided by +5 V from the TCC2/TCC2P card), 0.44 BTU/hr

- Dimensions
  - Height: 182 mm (7.165 in.)
  - Width: 32 mm (1.25 in.)
  - Depth: 92 mm (3.62 in.)
  - Depth with backplane connector: 98 mm (3.87 in.)
  - Weight not including clam shell: 0.2 kg (0.5 lb)

B.3.6 MIC-C/T/P FMEC Specifications (ETSI only)

The MIC-C/T/P FMEC card has the following specifications:

- Power supply input BATTERY A
  - System supply voltage: Nominal –48 VDC
    Tolerance limits: –40.5 to –57.0 VDC
  - Connector: 3WK3 Combo-D power cable connector
- Timing connector
  - Frequency: 2.048 MHz +/–10 ppm
  - Signal level: 0.75 to 1.5 V
  - Impedance: 75 ohms +/–5 percent (switchable by jumper to high impedance > 3 kohms)

    Note 120 ohms balanced impedance is possible with external matching cable.

  - Cable attenuation: Up to 6 dB at 2 MHz
  - Connectors: 1.0/2.3 miniature coax connector
- System management serial port:
  - System management serial port craft interface
  - Modem port (for future use)
  - Connectors: 8-pin RJ-45
- System management LAN port connectors:
  - Signal: IEEE 802.3 10BaseT
  - Connectors: 8-pin RJ-45
- Environmental
  - Operating temperature: –5 to +45 degrees Celsius (+23 to +113 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 0.38 W (provided by +5 V from the TCC2/TCC2P card), 1.37 BTU/hr
- Dimensions
  - Height: 182 mm (7.165 in.)
  - Width: 32 mm (1.25 in.)
  - Depth: 92 mm (3.62 in.)
  - Depth with backplane connector: 98 mm (3.87 in.)

- Weight not including clam shell: 0.2 kg (0.5 lb)

B.4 DWDM Card Specifications

This section provides specifications for the OSCM, OSC-CSM, OPT-PRE amplifier, OPT-BST amplifier, OPT-BST-E amplifier, 32MUX-O, 32DMX-O, 32DMX, 4MD-xx.x, AD-IC-xx.x, AD-2C-xx.x, AD-4C-xx.x, AD-1B-xx.x, AD-4B-xx.x, and 32WSS cards.

For compliance information, refer to the *Cisco Optical Transport Products Safety and Compliance Information* document.

B.4.1 OSCM Card Specifications

The OSCM card has the following specifications:

- Line
  - Bit rate: 155 Mbps
  - Code: Scrambled non-return to zero (NRZ)
  - Loopback modes: None
  - Connector: Duplex LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.957
- Transmitter optical service channel (OSC) signal
  - Maximum transmitter output power: –1 dBm
  - Minimum transmitter output power: –5 dBm
  - Nominal wavelength: 1510-nm +/–10 nm
  - Variable optical attenuator (VOA) necessary in the transmit path to adjust the in-fiber optical power level
- Receiver OSC signal
  - Maximum receiver level: –8 dBm at 10^{-10} bit error rate (BER)
  - Minimum receiver level: –40 dBm at 10^{-10} BER
  - Span budget: 40-dB span budget (about 150 km assuming fiber path loss equals 0.25 dB/km)
  - Jitter tolerance: Telcordia GR-253/G.823 compliant
- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
- Dimensions
  - Height: 12.65 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.00 in. (228.6 mm)

B.4.2 OSC-CSM Card Specifications

The OSC-CSM card has the following specifications:

- Line
  - Bit rate: 155 Mbps
  - Code: Scrambled NRZ
  - Loopback modes: None
  - Connector: Duplex LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.957
- Transmitter OSC signal
  - Maximum transmitter output power: –2 dBm
  - Minimum transmitter output power: –24 dBm
  - Nominal wavelength: 1510-nm +/–10 nm
  - VOA is necessary in the transmit path to adjust the in-fiber optical power level
- Receiver OSC signal
  - Maximum receiver level: –8 dBm at 10^{-10} BER
  - Minimum receiver level: –40 dBm at 10^{-10} BER
  - Span loss budget: 35-dB span budget (approximately 140 km assuming that the fiber path loss is equal to 0.25 dB/km)
  - Jitter tolerance: Telcordia GR-253/G.823 compliant
- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
- Dimensions
  - Height: 12.65 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.00 in. (228.6 mm)

B.4.3 OPT-PRE Amplifier Card Specifications

The OPT-PRE amplifier card has the following specifications:

- Optical characteristics:
  - Total operating wavelength range: 1530 to 1561.3 nm
  - Gain ripple (peak to valley): 1.5 dB
  - Mid-access loss (MAL) range (for dispersion compensation unit [DCU]): 3 to 9 dB
  - Gain range: 5 to 38.5 dBm in constant power mode, 5 to 28 dBm in constant gain mode
  - Minimum gain (standard range): 5.0 dBm

Maximum gain (standard range with programmable gain tilt): 21 dBm

Maximum gain (extended range with uncontrolled gain tilt): 38.5 dBm

  - Gain and power regulation over/undershoot: 0.5 dB
  - Limited maximum output power: 17.5 dBm
  - Maximum output power (with full channel load): 17 dB
  - Minimum output power (with one channel): –1 dBm
  - Input power (Pin) range at full channel load: –21.5 to 12 dBm
  - Input power (Pin) range at single channel load: –39.5 to –6 dBm
  - Noise figure at G^3 21 dB = 6.5 dB
  - OSC filter drop (channels) insertion loss maximum: 1 dB
  - OSC filter drop (OSC) insertion loss maximum: 1.8 dB
  - OSC filter add (OSC) insertion loss maximum: 1.3 dB
  - Optical connectors: LC-UPC/2
- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 85 percent, noncondensing
- Dimensions
  - Height: 12.65 in. (332 mm)
  - Width: 0.92 in. (24 mm)
  - Depth: 9.00 in. (240 mm)

B.4.4 OPT-BST Amplifier Card Specifications

The OPT-BST amplifier card has the following specifications:

- Optical characteristics:
  - Total operating wavelength range: 1530 to 1561.3 nm
  - Gain ripple (peak to valley): 1.5 dB
  - Gain range: 5 to 20 dBm with programmable gain tilt
  - Gain and power regulation over/undershoot: 0.5 dB
  - Limited maximum output power: 17.5 dBm
  - Maximum output power (with full channel load): 17 dB
  - Minimum output power (with one channel): –1 dBm
  - Input power (Pin) range at full channel load: –3 to 12 dBm
  - Input power (Pin) range at single channel load: –21 to –6 dBm
  - Noise figure at G^3 20 dB = 6 dB
  - OSC filter drop (channels) insertion loss maximum: 1 dB
  - OSC filter drop (OSC) insertion loss maximum: 1.8 dB

  - OSC filter add (OSC) insertion loss maximum: 1.3 dB
  - Optical connectors: LC-UPC/2
- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 85 percent, noncondensing
- Dimensions
  - Height: 12.65 in. (332 mm)
  - Width: 0.92 in. (24 mm)
  - Depth: 9.00 in. (240 mm)

B.4.5 OPT-BST-E Amplifier Card Specifications

The OPT-BST-E amplifier card has the following specifications:

- Optical characteristics:
  - Total operating wavelength range: 1530 to 1561.3 nm
  - Gain ripple (peak to valley): 1.8 dB
  - Gain range: 8 to 23 dB with programmable gain tilt
  - Extended gain range: 23 to 26 dB with gain tilt uncontrolled
  - Gain and power regulation over/undershoot: 0.5 dB
  - Limited maximum output power: 20.5 dBm
  - Maximum output power (with full channel load): 20 dB
  - Minimum output power (with one channel): –1 dBm
  - Input power (Pin) range at full channel load: –6 to 12 dBm
  - Input power (Pin) range at single channel load: –26 to –8 dBm
  - Noise figure at G^3 23 dB = 6 dB
  - OSC filter drop (channels) insertion loss maximum: 1 dB
  - OSC filter drop (OSC) insertion loss maximum: 1.8 dB
  - OSC filter add (OSC) insertion loss maximum: 1.3 dB
  - Optical connectors: LC-UPC/2
- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 85 percent, noncondensing
- Dimensions
  - Height: 12.65 in. (332 mm)
  - Width: 0.92 in. (24 mm)
  - Depth: 9.00 in. (240 mm)

B.4.6 32MUX-O Card Specifications

The 32 MUX-O card optical specifications are listed in Table B-3.

Note For power specifications, refer to the "15.1.7 Multiplexer, Demultiplexer, and OADM Card Interface Classes" section on page 15-6.

Table B-3 32MUX-O Optical Specifications

Parameter	Note	Condition	Min	Max	Unit
Tx filter shape (–1 dB bandwidth)	All standard operating procedures (SOP) and within whole operating temperature range	In 1/32—Out beginning of life (BOL)	+/–180	+/–300	pm
		In 1/32—Out end of life (EOL)	+/–160	+/–300	pm
Insertion loss	All SOP and within whole operating temperature range	In 1/32—Out BOL	4	8.0	dB
		In 1/32—Out EOL	4	8.5	dB
VOA dynamic range	—	—	25	—	dB
Optical monitor tap-splitting ratio on monitor port	Optical monitor port with respect to output port in multiplexer only	—	19	21	dB
Maximum optical input power	—	—	300	—	mW

The 32MUX-O card has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent relative humidity (RH)
- Dimensions
  - Height: 12.65 in. (321.3 mm)
  - Width: 1.84 in. (46.8 mm)
  - Depth: 9.00 in. (228.6 mm)

B.4.7 32DMX-O Card Specifications

The 32DMX-O card optical specifications are listed in Table B-4.

Note For power specifications, see the "15.1.7 Multiplexer, Demultiplexer, and OADM Card Interface Classes" section on page 15-6.

Table B-4 32DMX-O Optical Specifications

Parameter	Note	Condition	Min	Max	Unit
Rx filter shape (–1 dB bandwidth)	All SOP and within whole operating temperature range	In 1/32—Out BOL	+/–180	+/–300	pm
		In 1/32—Out EOL	+/–160	+/–300	pm
Insertion loss	All SOP and within whole operating temperature range	In 1/32—Out BOL	4	8.0	dB
		In 1/32—Out EOL	4	8.5	dB
VOA dynamic range	—	—	25	—	dB
Maximum optical input power	—	—	300	—	mW

The 32DMX-O card has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent RH
- Dimensions
  - Height: 12.65 in. (321.3 mm)
  - Width: 1.84 in. (46.8 mm)
  - Depth: 9.00 in. (228.6 mm)

B.4.8 32DMX Card Specifications

The 32DMX card optical specifications are listed in Table B-5.

Note For power specifications, see the "15.1.7 Multiplexer, Demultiplexer, and OADM Card Interface Classes" section on page 15-6.

Table B-5 32DMX Optical Specifications

Parameter	Note	Condition	Min	Typical	Max	Units
–1 dB bandwidth	All SOP and within whole operating temperature range, connectors included, and for maximum VOA operating attenuation.	COM RX => TX 1, 32 (OUT)	+/–110	—	—	pm
–3 dB bandwidth			+/–200	—	—	pm
Insertion loss	All SOP, and within whole operating temperature range, connectors included.	COM RX => TX 1, 32	—	—	5.5	dB

Table B-5 32DMX Optical Specifications (continued)

Parameter	Note	Condition	Min	Typical	Max	Units
VOA dynamic range	—	COM RX => TX 1, 32	25	—	—	dB
Maximum optical input power	—	—	300	—	—	mW

The 32DMX channel plan is shown in Table B-6. All 32DMX client interfaces must comply with this plan.

Table B-6 32DMX Channel Plan

Channel Number	Band	Channel ID	Frequency (GHz)	Wavelength (nm)
1	1	30.3	195.9	1530.33
2		31.2	195.8	1531.12
3		31.9	195.7	1531.90
4		32.6	195.6	1532.68
5	2	34.2	195.4	1534.25
6		35.0	195.3	1535.04
7		35.8	195.2	1535.82
8		36.6	195.1	1536.61
9	3	38.1	194.9	1538.19
10		38.9	194.8	1538.98
11		39.7	194.7	1539.77
12		40.5	194.6	1540.56
13	4	42.1	194.4	1542.14
14		42.9	194.3	1542.94
15		43.7	194.2	1543.73
16		44.5	194.1	1544.53
17	5	46.1	193.9	1546.12
18		46.9	193.8	1546.92
19		47.7	193.7	1547.72
20		48.5	193.6	1548.51
21	6	50.1	193.4	1550.12
22		50.9	193.3	1550.92
23		51.7	193.2	1551.72
24		52.5	193.1	1552.52

Table B-6 32DMX Channel Plan (continued)

Channel Number	Band	Channel ID	Frequency (GHz)	Wavelength (nm)
25	7	54.1	192.9	1554.13
26		54.9	192.8	1554.94
27		55.7	192.7	1555.75
28		56.5	192.6	1556.55
29	8	58.1	192.4	1558.17
30		58.9	192.3	1558.98
31		59.7	192.2	1559.79
32		60.6	192.1	1560.61

The 32DMX card has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent RH
- Dimensions
  - Height: 12.65 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.00 in. (228.6 mm)

B.4.9 4MD-xx.x Card Specifications

The 4MD-xx.x card optical specifications are listed in Table B-7.

Note For power specifications, see the "15.1.7 Multiplexer, Demultiplexer, and OADM Card Interface Classes" section on page 15-6.

Table B-7 4MD-xx.x Optical Specifications

Parameter	Note	Condition	Min	Max	Unit
Trx filter shape (–0.5 dB bandwidth $TrxBW_2$)	All SOP and within whole operating temperature range	COM Rx—xx.xx Tx COM Rx—yy.yy Tx COM Rx—zz.zz Tx COM Rx—kk.kk Tx xx.xx Rx—COM Tx yy.yy Rx—COM Tx zz.zz Rx—COM Tx kk.kk Rx—COM Tx	+/–180	—	pm
Insertion loss demultiplexer section	All SOP and within whole operating temperature range	COM Rx—xx.xx Tx	—	1.9	dB
		COM Rx—yy.yy Tx	—	2.4	dB
		COM Rx—zz.zz Tx	—	2.8	dB
		COM Rx—kk.kk Tx	—	3.3	dB
Insertion loss multiplexer section	All SOP and within whole operating temperature range (two connectors included)	xx.xx Rx—COM Tx	—	3.6	dB
		yy.yy Rx—COM Tx	—	3.2	dB
		zz.zz Rx—COM Tx	—	3.0	dB
		kk.kk Rx—COM Tx	—	2.6	dB
VOA dynamic range	—	—	25	—	dB
Maximum optical input power	—	—	300	—	mW

The 4MD-xx.x card has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent RH
- Dimensions
  - Height: 12.65 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.00 in. (228.6 mm)

B.4.10 AD-1C-xx.x Card Specifications

Table B-8 lists the AD-1C-xx.x optical specifications.

Table B-8 AD-1C-xx.x Card Optical Specifications

Parameter	Note	Condition	Min	Max	Unit
Trx filter shape (–0.5 dB bandwidth) $TrxBW_2$	All SOP and within whole operating temperature range	COM Rx—xx.xx Tx xx.xx Rx—COM Tx	+/–180	—	pm
Rfx filter shape (–0.5 dB bandwidth) $RfxBW_2$	All SOP and within whole operating temperature range	COM Rx—Exp Tx Exp Rx—COM Tx	+/–180	—	pm
Insertion loss (drop section)	All SOP and within whole operating temperature range (two connectors included)	COM Rx—xx.xx Tx	—	2.0	dB
Insertion loss (express section)	VOA at minimum attenuation; all SOP and within whole operating temperature range (two connectors included)	COM Rx—Exp Tx Exp Rx—COM Tx	—	2.4 or 1.2	dB
Insertion loss (add section)	VOA at minimum attenuation; all SOP and within whole operating temperature range (two connectors included)	xx.xx Rx—COM Tx	—	2.6	dB
VOA dynamic range	—	—	30	—	dB
Maximum optical input power	—	—	300	—	mW

AD-1C-xx.x optical input and output power varies with amplifier output levels and the class of transponder interfaces used. See Table 15-3 on page 15-6 through Table 15-5 on page 15-8 for this information.

The AD-1C-xx.x card has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: Telcordia GR-63 5.1.1.3 compliant; 5 to 95 percent RH
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.0 in. (228.6 mm)

B.4.11 AD-2C-xx.x Card Specifications

Table B-9 lists the AD-2C-xx.x optical specifications.

Table B-9 AD-2C-xx.x Card Optical Specifications

Parameter	Note	Condition	Min	Max	Unit
Trx filter shape (–0.5 dB bandwidth) $TrxBW_2$	All SOP and within whole operating temperature range	COM Rx—xx.xx Tx COM Rx—yy.yy Tx	+/–180	—	pm
		xx.xx Rx—COM Tx yy.yy Rx—COM Tx	+/–180	—	
Rfx filter shape (–0.5 dB bandwidth) $RfxBW_2$	All SOP and within whole operating temperature range	COM Rx—Exp Tx Exp Rx—COM Tx	+/–180	—	pm
Insertion loss (drop section)	All SOP and within whole operating temperature range (two connectors included)	COM Rx—xx.xx Tx	—	2.0	dB
		COM Rx—yy.yy Tx	—	2.4	dB
Insertion loss (express section)	VOA at minimum attenuation; all SOP and within whole operating temperature range (two connectors included)	COM Rx—Exp Tx	—	2.7	dB
		Exp Rx—COM Tx	—	1.6	dB
Insertion loss (add section)	VOA at minimum attenuation; all SOP and within whole operating temperature range (two connectors included)	xx.xx Rx—COM Tx	—	3.1	dB
		yy.yy Rx—COM Tx	—	2.7	dB
VOA dynamic range	—	—	30	—	dB
Maximum optical input power	—	—	300	—	mW

AD-2C-xx.x optical input and output power varies with amplifier output levels and the class of transponder interfaces used. See Table 15-3 on page 15-6 through Table 15-5 on page 15-8 for this information.

The AD-2C-xx.x has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: Telcordia GR-63 5.1.1.3 compliant; 5 to 95 percent RH
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.0 in. (228.6 mm)

B.4.12 AD-4C-xx.x Card Specifications

Table B-10 lists the AD-4C-xx.x optical specifications.

Table B-10 AD-4C-xx.x Optical Specifications

Parameter	Note	Condition	Min	Max	Unit
Channel grid	See Table B-11. The channel plan for the AD-4C-xx.x card is identical to the channel plan for the AD-1B-xx.x card.	—	—	—	—
Trx filter shape (–0.5 dB bandwidth) $TrxBW_2$	All SOP and within whole operating temperature range	COM Rx—xx.xx Tx COM Rx—yy.yy Tx COM Rx—zz.zz Tx COM Rx—kk.kk Tx xx.xx Rx—COM Tx yy.yy Rx—COM Tx	+/–180	—	pm
Rfx filter shape (–1 dB bandwidth) $RfxBW_2$	All SOP and within whole operating temperature range	COM Rx—Exp Tx Exp Rx—COM Tx	—	—	pm
Insertion loss (drop section)	All SOP and within whole operating temperature range (two connectors included)	COM Rx—xx.xx Tx	—	5.5	dB
		COM Rx—yy.yy Tx	—	5.0	dB
		COM Rx—zz.zz Tx	—	4.5	dB
		COM Rx—kk.kk Tx	—	4.1	dB
Insertion loss (express section)	VOA at minimum attenuation; all SOP and within whole operating temperature range (two connectors included)	COM Rx—Exp Tx	—	2.7	dB
		Exp Rx—COM Tx	—	1.2	dB
Insertion loss (add section)	VOA at minimum attenuation; all SOP and within whole operating temperature range (two connectors included)	xx.xx Rx—COM Tx	—	3.9	dB
		yy.yy Rx—COM Tx	—	4.3	dB
		zz.zz Rx—COM Tx	—	4.5	dB
		kk.kk Rx—COM Tx	—	4.9	dB
VOA dynamic range	—	—	30	—	dB
Maximum optical input power	—	—	300	—	mW

AD-4C-xx.x optical input and output power varies with amplifier output levels and the class of transponder interfaces used. See Table 15-3 on page 15-6 through Table 15-5 on page 15-8 for this information.

The AD-4C-xx.x has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: Telcordia GR-63 5.1.1.3 compliant; 5 to 95 percent RH
- Dimensions
  - Height: 12.650 in. (321.3 mm)

- Width: 0.92 in. (23.4 mm)
- Depth: 9.0 in. (228.6 mm)

B.4.13 AD-1B-xx.x Card Specifications

Table B-11 lists the unit names, band IDs, channel IDs, frequencies, and wavelengths assigned to the eight versions of the AD-1B-xx.x card.

Table B-11 AD-1B-xx.x Channel Allocation Plan by Band

Unit Name	Band ID	Channel ID	Frequency (GHz)	Wavelength (nm)
AD-1B-30.3	B30.3	30.3	195.9	1530.33
		30.7	195.85	1530.72
		31.1	195.8	1531.12
		31.5	195.75	1531.51
		31.9	195.7	1531.90
		32.2	195.65	1532.29
		32.6	195.6	1532.68
		33.3	195.55	1533.07
AD-1B-34.2	B34.2	34.2	195.4	1534.25
		34.6	195.35	1534.64
		35.0	195.3	1535.04
		35.4	195.25	1535.43
		35.8	195.2	1535.82
		36.2	195.15	1536.22
		36.6	195.1	1536.61
		37.0	195.05	1537.00
AD-1B-38.1	B38.1	38.1	194.9	1538.19
		38.5	194.85	1538.58
		38.9	194.8	1538.98
		39.3	194.75	1539.37
		39.7	194.7	1539.77
		40.1	194.65	1540.16
		40.5	194.6	1540.56
		40.9	194.55	1540.95

Table B-11 AD-1B-xx.x Channel Allocation Plan by Band (continued)

Unit Name	Band ID	Channel ID	Frequency (GHz)	Wavelength (nm)
AD-1B-42.2	B42.1	42.1	194.4	1542.14
		42.5	194.35	1542.54
		42.9	194.3	1542.94
		43.3	194.25	1543.33
		43.7	194.2	1543.73
		44.1	194.15	1544.13
		44.5	194.1	1544.53
		44.9	194.05	1544.92
AD-1B-46.1	B46.1	46.1	193.9	1546.12
		46.5	193.85	1546.52
		46.9	193.8	1546.92
		47.3	193.75	1547.32
		47.7	193.7	1547.72
		48.1	193.65	1548.11
		48.5	193.6	1548.51
		48.9	193.55	1548.91
AD-1B-50.1	B50.1	50.1	193.4	1550.12
		50.5	193.35	1550.52
		50.9	193.3	1550.92
		51.3	193.25	1551.32
		51.7	193.2	1551.72
		52.1	193.15	1552.12
		52.5	193.1	1552.52
		52.9	193.05	1552.93
AD-1B-54.1	B54.1	54.1	192.9	1554.13
		54.5	192.85	1554.54
		54.9	192.8	1554.94
		55.3	192.75	1555.34
		55.7	192.7	1555.75
		56.1	192.65	1556.15
		56.5	192.6	1556.96
		56.9	192.55	1556.96

Table B-11 AD-1B-xx.x Channel Allocation Plan by Band (continued)

Unit Name	Band ID	Channel ID	Frequency (GHz)	Wavelength (nm)
AD-1B-58.1	B58.1	58.1	192.4	1558.17
		58.5	192.35	1558.58
		58.9	192.3	1558.98
		59.3	192.25	1559.39
		59.7	192.2	1559.79
		60.2	192.15	1560.20
		60.6	192.1	1560.61
		61.0	192.05	1561.01

Table B-12 lists AD-1B-xx.x optical specifications.

Table B-12 AD-1B-xx.x Optical Specifications

Parameter	Note	Condition	Min	Max	Unit
–1 dB bandwidth	All SOP and within whole operating environmental range	COM Rx—Band Tx Band Rx—COM Tx	3.6	—	nm
–1 dB bandwidth	All SOP and within whole operating temperature range	COM Rx—Exp Tx Exp Rx—COM Tx	Refer to Table B-13.		nm
Insertion loss (drop section)	All SOP and within whole operating environmental range; two connectors included, VOA set at minimum attenuation	COM Rx—Band Tx	—	3.0	dB
Insertion loss (express section)	All SOP and within whole operating environmental range; two connectors included	Exp Rx—COM Tx	—	1.6	dB
	All SOP and within whole operating environmental range; two connectors included, VOA set at its minimum attenuation	COM Rx—Exp Tx	—	2.2	dB
Insertion loss (add section)	All SOP and within whole operating environmental range; two connectors included	Band Rx—COM Tx	—	2.2	dB
VOA dynamic range	—	—	30	—	dB
Maximum optical input power	—	—	300	—	mW

Table B-13 lists the range of wavelengths for the receive (express) band.

Table B-13 AD-1B-xx.x Transmit and Receive Dropped Band Wavelength Ranges

	Rx (Express) Band	
Tx (Dropped) Band	**Left Side (nm)**	**Right Side (nm)**
B30.3	—	Wavelengths 1533.825 or higher
B34.2	Wavelengths 1533.395 or lower	Wavelengths 1537.765 or higher
B38.1	Wavelengths 1537.325 or lower	Wavelengths 1541.715 or higher
42.1	Wavelengths 1541.275 or lower	Wavelengths 1545.695 or higher
46.1	Wavelengths 1545.245 or lower	Wavelengths 1549.695 or higher
50.1	Wavelengths 1549.235 or lower	Wavelengths 1553.705 or higher
54.1	Wavelengths 1553.255 or lower	Wavelengths 1557.745 or higher
58.1	Wavelengths 1557.285 or lower	—

AD-1B-xx.x optical input and output power varies with amplifier output levels and the class of transponder interfaces used. See Table 15-3 on page 15-6 through Table 15-5 on page 15-8 for this information.

The AD-1B-xx.x card has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: Telcordia GR-63 5.1.1.3 compliant; 5 to 95 percent RH
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.0 in. (228.6 mm)

B.4.14 AD-4B-xx.x Card Specifications

Table B-14 lists the unit names, band IDs, channel IDs, frequencies, and wavelengths assigned to the two versions of the card.

Table B-14 AD-4B-xx.x Channel Allocation Plan by Band

Unit Name	Band ID	Channel ID	Frequency (GHz)	Wavelength (nm)
AD-4B-30.3	B30.3	30.3	195.9	1530.33
		30.7	195.85	1530.72
		31.1	195.8	1531.12
		31.5	195.75	1531.51
		31.9	195.7	1531.90
		32.2	195.65	1532.29
		32.6	195.6	1532.68
		33.3	195.55	1533.07
	B34.2	34.2	195.4	1534.25
		34.6	195.35	1534.64
		35.0	195.3	1535.04
		35.4	195.25	1535.43
		35.8	195.2	1535.82
		36.2	195.15	1536.22
		36.6	195.1	1536.61
		37.0	195.05	1537.00
	B38.1	38.1	194.9	1538.19
		38.5	194.85	1538.58
		38.9	194.8	1538.98
		39.3	194.75	1539.37
		39.7	194.7	1539.77
		40.1	194.65	1540.16
		40.5	194.6	1540.56
		40.9	194.55	1540.95
	B42.1	42.1	194.4	1542.14
		42.5	194.35	1542.54
		42.9	194.3	1542.94
		43.3	194.25	1543.33
		43.7	194.2	1543.73
		44.1	194.15	1544.13
		44.5	194.1	1544.53
		44.9	194.05	1544.92

Table B-14 AD-4B-xx.x Channel Allocation Plan by Band (continued)

Unit Name	Band ID	Channel ID	Frequency (GHz)	Wavelength (nm)
AD-4B-46.1	B46.1	46.1	193.9	1546.12
		46.5	193.85	1546.52
		46.9	193.8	1546.92
		47.3	193.75	1547.32
		47.7	193.7	1547.72
		48.1	193.65	1548.11
		48.5	193.6	1548.51
		48.9	193.55	1548.91
	B50.1	50.1	193.4	1550.12
		50.5	193.35	1550.52
		50.9	193.3	1550.92
		51.3	193.25	1551.32
		51.7	193.2	1551.72
		52.1	193.15	1552.12
		52.5	193.1	1552.52
		52.9	193.05	1552.93
	B54.1	54.1	192.9	1554.13
		54.5	192.85	1554.54
		54.9	192.8	1554.94
		55.3	192.75	1555.34
		55.7	192.7	1555.75
		56.1	192.65	1556.15
		56.5	192.6	1556.96
		56.9	192.55	1556.96
	B58.1	58.1	192.4	1558.17
		58.5	192.35	1558.58
		58.9	192.3	1558.98
		59.3	192.25	1559.39
		59.7	192.2	1559.79
		60.2	192.15	1560.20
		60.6	192.1	1560.61
		61.0	192.05	1561.01

Table B-15 lists AD-4B-xx.x optical specifications.

Table B-15 AD-4B-xx.x Optical Specifications

Parameter	Note	Condition	Min	Max	Unit
–1 dB bandwidth	All SOP and within whole operating environmental range	COM Rx—Band Tx Band Rx—COM Tx	3.6	—	nm
–1 dB bandwidth	All SOP and within whole operating temperature range	COM Rx—Exp Tx Exp Rx—COM Tx	Refer to Table B-16.		nm
Insertion loss (drop section)	All SOP and within whole operating environmental range; two connectors included, VOA set at minimum attenuation	COM Rx—Band Tx 30.3/46.1	—	2.9	dB
		COM Rx—Band Tx 34.2/50.1	—	3.3	dB
		COM Rx—Band Tx 38.1/54.1	—	3.8	dB
		COM Rx—Band Tx 42.1/58.1	—	4.5	dB
Insertion loss (express section)	All SOP and within whole operating environmental range; two connectors included	Exp Rx—COM Tx	—	4.9	dB
	All SOP and within whole operating environmental range; two connectors included, VOA set at its minimum attenuation	COM Rx—Exp Tx	—	3	dB
Insertion loss (add section)	All SOP and within whole operating environmental range; two connectors included	Band Rx 30.3/46.1—COM Tx	—	3.5	dB
		Band Rx 34.2/50.1—COM Tx	—	2.8	dB
		Band Rx 38.1/54.1—COM Tx	—	2.3	dB
		Band Rx 42.1/58.1—COM Tx	—	1.8	dB
VOA dynamic range	—	—	30	—	dB
Maximum optical input power	—	—	300	—	mW

Table B-16 lists the range of wavelengths for the receive (express) band.

Table B-16 AD-4B-xx.x Transmit and Receive Dropped Band Wavelength Ranges

	Rx (Express) Band	
Tx (Dropped) Band	Left Side (nm)	Right Side (nm)
B30.3	—	Wavelengths 1533.825 or higher
B34.2	Wavelengths 1533.395 or lower	Wavelengths 1537.765 or higher
B38.1	Wavelengths 1537.325 or lower	Wavelengths 1541.715 or higher
B42.1	Wavelengths 1541.275 or lower	Wavelengths 1545.695 or higher

Table B-16 AD-4B-xx.x Transmit and Receive Dropped Band Wavelength Ranges (continued)

	Rx (Express) Band	
Tx (Dropped) Band	**Left Side (nm)**	**Right Side (nm)**
B46.1	Wavelengths 1545.245 or lower	Wavelengths 1549.695 or higher
B50.1	Wavelengths 1549.235 or lower	Wavelengths 1553.705 or higher
B54.1	Wavelengths 1553.255 or lower	Wavelengths 1557.745 or higher
B58.1	Wavelengths 1557.285 or lower	—

AD-4B-xx.x optical input and output power varies with amplifier output levels and the class of transponder interfaces used. See Table 15-3 on page 15-6 through Table 15-5 on page 15-8 for this information.

The AD-4B-xx.x has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: Telcordia GR-63 5.1.1.3 compliant; 5 to 95 percent RH
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.0 in. (228.6 mm)

B.4.15 32WSS Card Specifications

The 32WSS card optical specifications are listed in Table B-17.

Note For power specifications, see the "15.1.7 Multiplexer, Demultiplexer, and OADM Card Interface Classes" section on page 15-6.

Table B-17 32WSS Optical Specifications

Parameter	Note	Condition	Min	Typical	Max	Units
–0.25 dB bandwidth	All SOP and within whole operating temperature range, connectors included, and for maximum VOA operating attenuation.	EXP RX => COM TX	+/–/95	—	—	pm
–0.5 dB bandwidth			+/–115	—	—	pm
–1.0 dB bandwidth			+/–135	—	—	pm
–0.25 dB bandwidth		Add 1, 32 => COM TX	+/–115	—	—	pm
–0.5 dB bandwidth			+/–135	—	—	pm
–1.0 dB bandwidth			+/–160	—	—	pm

Table B-17 32WSS Optical Specifications (continued)

Parameter	Note	Condition	Min	Typical	Max	Units
Insertion loss	All SOP, any optical switch state, and within whole operating temperature range, connectors included.	EXP RX => COM TX	—	—	11.3	dB
	—	COM RX => EXP TX	—	—	1.5	dB
	—	Add 1, 32 => COM TX	—	—	7.6	dB
	—	COM RX => DROP TX	6	—	8.5	dB
VOA dynamic range	—	EXP RX => COM TX	20	—	—	dB
	—	Add 1, 32 => COM TX	25	—	—	dB
Maximum optical input power	—	—	300	—	—	mW

The 32WSS channel plan is shown in Table B-18. All 32WSS client interfaces must comply with this plan.

Table B-18 32WSS Channel Plan

Channel Number	Band	Channel ID	Frequency (GHz)	Wavelength (nm)
1	1	30.3	195.9	1530.33
2		31.2	195.8	1531.12
3		31.9	195.7	1531.90
4		32.6	195.6	1532.68
5	2	34.2	195.4	1534.25
6		35.0	195.3	1535.04
7		35.8	195.2	1535.82
8		36.6	195.1	1536.61
9	3	38.1	194.9	1538.19
10		38.9	194.8	1538.98
11		39.7	194.7	1539.77
12		40.5	194.6	1540.56

Table B-18 32WSS Channel Plan (continued)

Channel Number	Band	Channel ID	Frequency (GHz)	Wavelength (nm)
13	4	42.1	194.4	1542.14
14		42.9	194.3	1542.94
15		43.7	194.2	1543.73
16		44.5	194.1	1544.53
17	5	46.1	193.9	1546.12
18		46.9	193.8	1546.92
19		47.7	193.7	1547.72
20		48.5	193.6	1548.51
21	6	50.1	193.4	1550.12
22		50.9	193.3	1550.92
23		51.7	193.2	1551.72
24		52.5	193.1	1552.52
25	7	54.1	192.9	1554.13
26		54.9	192.8	1554.94
27		55.7	192.7	1555.75
28		56.5	192.6	1556.55
29	8	58.1	192.4	1558.17
30		58.9	192.3	1558.98
31		59.7	192.2	1559.79
32		60.6	192.1	1560.61

The 32WSS card has the following additional specifications:

- Environmental
  - Operating temperature:

    C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent RH
- Dimensions
  - Height: 12.65 in. (321.3 mm)
  - Width: 1.84 in. (46.8 mm)
  - Depth: 9.00 in. (228.6 mm)

B.5 Transponder and Muxponder Card Specifications

This section provides specifications for the TXP_MR_10G, MXP_2.5G_10G, TXP_MR_2.5G, TXPP_MR_2.5G, MXP_MR_2.5G, MXPP_MR_2.5G, MXP_2.5G_10E, and TXP_MR_2.5G cards.

For compliance information, refer to the *Cisco Optical Transport Products Safety and Compliance Information* document.

B.5.1 TXP_MR_10G Card Specifications

The TXP_MR_10G card has the following specifications:

- Line (trunk side)
  - Bit rate:

    9.95328 Gbps for OC-192/STM-64

    10.70923 Gbps with ITU-T G.709 Digital Wrapper/forward error correction (FEC)

    10.3125 Gbps for 10 Gigabit Ethernet (GE)

    11.095 Gbps with ITU-T G.709 Digital Wrapper/FEC over 10 GE
  - Code: Scrambled NRZ
  - Fiber: 1550-nm single-mode
  - Maximum chromatic dispersion allowance: 1000 ps/nm
  - Loopback modes: Terminal and facility

Caution You must use a 15-dB fiber attenuator (10 to 20 dB) when working with the TXP_MR_10G card in a loopback on the trunk port. Do not use direct fiber loopbacks with the TXP_MR_10G card. Using direct fiber loopbacks causes irreparable damage to the TXP_MR_10G card.

  - Connectors: LC
  - Compliance Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.691
- Transmitter (trunk side)
  - Maximum transmitter output power: +3.5 dBm
  - Minimum transmitter output power: +2.5 dBm
  - Transmitter: Lithium Niobate (LN) external modulator transmitter
  - Wavelength stability (drift): +/– 25 picometers (pm)

Note An optical device on the card keeps the laser wavelength locked as closely as possible to the ITU nominal value. The allowed drift is +/– 25 pm.

- Currently available wavelengths and versions of TXP_MR_10G (16 card versions, each covering two wavelengths):
  - 1530.33 to 1531.12 nm (two wavelengths)
  - 1531.90 to 1532.68 nm (two wavelengths)
  - 1534.25 to 1535.04 nm (two wavelengths)
  - 1535.82 to 1536.61 nm (two wavelengths)
  - 1538.19 to 1538.98 nm (two wavelengths)
  - 1539.77 to 1540.56 nm (two wavelengths)

  - 1542.14 to 1542.94 nm (two wavelengths)
  - 1543.73 to 1544.53 nm (two wavelengths)
  - 1546.12 to 1546.92 nm (two wavelengths)
  - 1547.72 to 1548.51 nm (two wavelengths)
  - 1550.12 to 1550.92 nm (two wavelengths)
  - 1551.72 to 1552.52 nm (two wavelengths)
  - 1554.13 to 1554.94 nm (two wavelengths)
  - 1555.75 to 1556.55 nm (two wavelengths)
  - 1558.17 to 1558.98 nm (two wavelengths)
  - 1559.79 to 1560.61 nm (two wavelengths)
- Receiver (trunk side):
  - Receiver input power (no FEC, unamplified, 23 dB optical signal-to-noise ratio [OSNR], BER 1 * 10 exp – 12): –8 to –21 dBm
  - Receiver input power (no FEC, unamplified, 23 dB OSNR, at +/– 1000 ps/nm BER 1 * 10 exp – 12): –8 to –19 dBm
  - Receiver input power (no FEC, amplified, 19 dB OSNR, BER 1 * 10 exp – 12): –8 to –20 dBm
  - Receiver input power (no FEC, amplified, 19 dB OSNR, at +/– 1000 ps/nm BER 1 * 10 exp – 12):–8 to –18 dBm
  - Receiver input power (FEC, unamplified, 23 dB OSNR, BER 8 * 10 exp – 5): –8 to –24 dBm
  - Receiver input power (FEC, unamplified, 23 dB OSNR, at +/– 1000 ps/nm, BER 8 * 10 exp – 5): –8 to –22 dBm
  - Receiver input power (FEC, amplified, 9 dB OSNR, BER 8 * 10 exp – 5): –8 to –18 dBm
  - Receiver input power (FEC, unamplified, 11 dB OSNR, at +/– 800 ps/nm, BER 8 * 10 exp – 5): –8 to –18 dBm
- Line (client side)
  - Bit rate: 9.95328 Gbps or 10.3125 Gbps
  - Code: Scrambled NRZ
  - Fiber: 1550-nm single-mode
  - Maximum chromatic dispersion allowance: Compliant with SR-1 specification for OC-192. In the case of 10 GE, the allowance is up to 10 km of single-mode fiber (SMF) dispersion.
  - Loopback modes: Terminal and facility
  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.697, 10GEBase-LR
- Transmitter (client side)
  - Maximum transmitter output power: –1 dBm
  - Minimum transmitter output power: –6 dBm
  - Center wavelength: 1290 to 1330 nm
  - Nominal wavelength: 1310 nm
  - Transmitter: Distributed feedback (DFB) laser

- Receiver (client side)
  - Maximum receiver level: –1 dBm at BER 1 * 10 exp – 12
  - Minimum receiver level: –14 dBm at BER 1 * 10 exp – 12
  - Receiver: avalanche photodiode (APD)
  - Link loss budget: 8 dB minimum, at BER = 1 * 10 exp – 12
  - Receiver input wavelength range: 1290 to 1605 nm
- Environmental
  - Operating temperature: –5 to +55 degrees Celsius (+23 to +113 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 35.00 W, 0.73 A at –48 V, 119.5 BTU/hr
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.716 in. (18.2 mm)
  - Depth: 9.000 in. (228.6 mm)
  - Depth with backplane connector: 9.250 in. (235 mm)
  - Weight not including clam shell: 3.1 lb (1.3 kg)

B.5.2 MXP_2.5G_10G Card Specifications

The MXP_2.5G_10G card has the following specifications:

- Line (trunk side)
  - Bit rate:

    9.95328 Gbps for OC-192/STM-64

    10.70923 Gbps with ITU-T G.709 Digital Wrapper/FEC
  - Code: Scrambled NRZ
  - Fiber: 1550-nm single-mode
  - Maximum chromatic dispersion allowance: 1000 ps/nm
  - Loopback modes: Terminal and facility

Caution You must use a 20-dB fiber attenuator (15 to 25 dB) when working with the MXP_2.5G_10G card in a loopback on the trunk port. Do not use direct fiber loopbacks with the MXP_2.5G_10G card. Using direct fiber loopbacks causes irreparable damage to the MXP_2.5G_10G card.

  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.691
- Transmitter (trunk side)
  - Maximum transmitter output power: +3.5 dBm
  - Minimum transmitter output power: +2.5 dBm

  - Transmitter: LN external modulator transmitter
  - Wavelength stability (drift): +/– 25 picometers (pm)

Note An optical device on the card keeps the laser wavelength locked as closely as possible to the ITU nominal value. The allowed drift is +/– 25 pm.

- Currently available wavelengths and versions of MXP_2.5G_10G (16 card versions, each covering two wavelengths):
  - 1530.33 to 1531.12 nm (two wavelengths)
  - 1531.90 to 1532.68 nm (two wavelengths)
  - 1534.25 to 1535.04 nm (two wavelengths)
  - 1535.82 to 1536.61 nm (two wavelengths)
  - 1538.19 to 1538.98 nm (two wavelengths)
  - 1539.77 to 1540.56 nm (two wavelengths)
  - 1542.14 to 1542.94 nm (two wavelengths)
  - 1543.73 to 1544.53 nm (two wavelengths)
  - 1546.12 to 1546.92 nm (two wavelengths)
  - 1547.72 to 1548.51 nm (two wavelengths)
  - 1550.12 to 1550.92 nm (two wavelengths)
  - 1551.72 to 1552.52 nm (two wavelengths)
  - 1554.13 to 1554.94 nm (two wavelengths)
  - 1555.75 to 1556.55 nm (two wavelengths)
  - 1558.17 to 1558.98 nm (two wavelengths)
  - 1559.79 to 1560.61 nm (two wavelengths)
- Receiver (trunk side)
  - Receiver input power (no FEC, unamplified, 23 dB OSNR, BER 1 * 10 exp – 12): –8 to –21 dBm
  - Receiver input power (no FEC, unamplified, 23 dB OSNR, at +/– 1000 ps/nm BER 1 * 10 exp – 12): –8 to –19 dBm
  - Receiver input power (no FEC, amplified, 19 dB OSNR, BER 1 * 10 exp – 12): –8 to –20 dBm
  - Receiver input power (no FEC, amplified, 19 dB OSNR, at +/– 1000 ps/nm BER 1 * 10 exp – 12):–8 to –18 dBm
  - Receiver input power (FEC, unamplified, 23 dB OSNR, BER 8 * 10 exp – 5): –8 to –24 dBm
  - Receiver input power (FEC, unamplified, 23 dB OSNR, at +/– 1000 ps/nm, BER 8 * 10 exp – 5): –8 to –22 dBm
  - Receiver input power (FEC, amplified, 9 dB OSNR, BER 8 * 10 exp – 5): –8 to –18 dBm
  - Receiver input power (FEC, unamplified, 11 dB OSNR, at +/– 800 ps/nm, BER 8 * 10 exp – 5): –8 to –18 dBm
- Line (client side)
  - Bit rate: 2.48832 Gbps
  - Code: Scrambled NRZ

  - Fiber: 1550-nm single-mode
  - Maximum chromatic dispersion allowance: Compliant with SR-1 specification for OC-192. In the case of 10 GE, allowance is up to 10 km of SMF fiber of dispersion.
  - Loopback modes: Terminal and facility
  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.957
- Transmitter (client side): Depends on the Small Form-factor Pluggable (SFP) that is used.
- Receiver (client side): Depends on the SFP that is used.
- Environmental
  - Operating temperature: –5 to +55 degrees Celsius (+23 to +113 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 50.00 W, 1.04 A at –48 V, 170.7 BTU/hr
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.716 in. (18.2 mm)
  - Depth: 9.000 in. (228.6 mm)
  - Depth with backplane connector: 9.250 in. (235 mm)
  - Weight not including clam shell: 3.1 lb (1.3 kg)

B.5.3 TXP_MR_2.5G and TXPP_MR_2.5G Card Specifications

The TXP_MR_2.5G and TXPP_MR_2.5G cards have the following specifications:

- Line (trunk side)
  - Bit rate:

    2.488 Gbps for OC-48/STM-16

    2.66 Gbps with ITU-T G.709 Digital Wrapper/FEC
  - Code: Scrambled NRZ
  - Fiber: 1550-nm single-mode
  - Maximum chromatic dispersion allowance: 5400 ps/nm
  - Loopback modes: Terminal and facility

Caution You must use a 20-dB fiber attenuator (15 to 25 dB) when working with the TXP_MR_2.5G and TXPP_MR_2.5G cards in a loopback on the trunk port. Do not use direct fiber loopbacks with the TXP_MR_2.5G and TXPP_MR_2.5G cards. Using direct fiber loopbacks causes irreparable damage to the TXP_MR_2.5G and TXPP_MR_2.5G cards.

  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.957
- Transmitter (trunk side)

- Maximum transmitter output power: +1 dBm
- Minimum transmitter output power: –4.5 dBm
- Transmitter: Direct modulated laser
- Wavelength stability (drift): +/– 25 picometers (pm)

Note An optical device on the card keeps the laser wavelength locked as closely as possible to the ITU nominal value. The allowed drift is +/– 25 pm.

- Currently available wavelengths of TXP_MR_2.5G and TXPP_MR_2.5G (eight card versions):

  ITU grid blue band: 1530.334 to 1544.526 nm (four card versions covering four wavelengths each)

  ITU grid red band: 1546.119 to 1560.606 nm (four card versions covering four wavelengths each)
- Receiver (trunk side)

Table B-19 TXP_MR_2.5G/TXPP_MR_2.5G Receiver Trunk Side Specifications

OSNR[1]	FEC Type	Pre-FEC BER	Post-FEC BER	Input Power Sensitivity	Chromatic Dispersion Tolerance
15 dB	Off - 2R	<10 exp – 12	N/A	– 9 to – 24 dBm	—
15 dB	Off - 2R	<10 exp – 12	N/A	– 9 to – 21 dBm	+/– 3300ps/nm
14 dB	Off - 3R	<10 exp – 12	N/A	– 9 to – 30 dBm	—
15 dB	Off - 3R	<10 exp – 12	N/A	– 9 to – 30 dBm	+/– 1800ps/nm
16 dB	Off - 3R	<10 exp – 12	N/A	– 9 to – 30 dBm	+/– 5400ps/nm
5 dB	Standard- 3R	<10 exp – 5	<10 exp – 15	– 9 to – 25 dBm	—
5 dB	Standard- 3R	<10 exp – 5	<10 exp – 15	– 9 to – 24 dBm	+/– 1800ps/nm
5 dB	Standard- 3R	<10 exp – 5	<10 exp – 15	– 9 to – 23 dBm	+/– 5400ps/nm
14 dB	Standard- 3R	<10 exp – 5	<10 exp – 15	– 9 to – 31 dBm	—

1. Optical Signal-to-Noise ratio (OSNR) defined with 0.5 nm Resolution Bandwidth (RBW)

  - Receiver: APD
  - Link loss budget: 24 dB minimum, with no dispersion or 22 dB optical path loss at BER = 1 * 10 exp – 12 including dispersion
  - Receiver input wavelength range: 1290 to 1605 nm
- Line (client side)
  - Bit rate: 8 Mbps to 2.488 Gbps
  - Code: Scrambled NRZ
  - Fiber: 1310-nm single-mode
  - Maximum chromatic dispersion allowance: 1600 ps/nm
  - Loopback modes: Terminal and facility
  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.957
- Transmitter (client side)

  - Maximum transmitter output power: –1 dBm
  - Minimum transmitter output power: –6 dBm
  - Center wavelength: 1290 to 1330 nm
  - Nominal wavelength: 1310 nm
  - Transmitter: DFB laser
- Receiver (client side)
  - Maximum receiver level: –1 dBm at BER 1 * 10 exp – 12
  - Minimum receiver level: –14 dBm at BER 1 * 10 exp – 12
  - Receiver: APD
  - Link loss budget: 8 dB minimum, at BER = 1 * 10 exp – 12
  - Receiver input wavelength range: 1290 to 1605 nm
- Environmental
  - Operating temperature: –5 to +45 degrees Celsius (+23 to +113 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 35.00 W, 0.73 A at –48 V, 119.5 BTU/hr
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.716 in. (18.2 mm)
  - Depth: 9.000 in. (228.6 mm)
  - Depth with backplane connector: 9.250 in. (235 mm)
  - Weight not including clam shell: 3.1 lb (1.3 kg)

B.5.4 MXP_MR_2.5G and MXPP_MR_2.5G Card Specifications

The MXP_MR_2.5G and MXPP_MR_2.5G cards have the following specifications:

- Payload configuration
  - FC1G—Fiber Channel 1.06 Gbps
  - FC2G—Fiber Channel 2.125 Gbps
  - FICON1G—Fiber CON 1.06 Gbps (IBM signal)
  - FICON2G—Fiber CON 2.125 Gbps (IBM signal)
  - ONE_GE—One Gigabit Ethernet 1.125 Gbps
  - Mixed configurations up to maximum line rate (for example, if you have a port configured for 2G FC, you cannot use another port at the same time)
- Client ports: 8x SFP
- Performance monitoring (PM) for all interfaces
- Buffer-to-buffer credit management for distance extension
- Line (trunk side)
  - Bit rate: 2.488 Gbps for OC-48/STM-16

  - Code: Scrambled NRZ
  - Fiber: 1550-nm single-mode
  - Maximum chromatic dispersion allowance: 6000 ps/nm
  - Loopback modes: Terminal and facility

Caution You must use a 20-dB fiber attenuator (15 to 25 dB) when working with the MXP_MR_2.5G and MXPP_MR_2.5G cards in a loopback on the trunk port. Do not use direct fiber loopbacks with the MXP_MR_2.5G and MXPP_MR_2.5G cards. Using direct fiber loopbacks causes irreparable damage to the MXP_MR_2.5G and MXPP_MR_2.5G cards.

  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, Telcordia GR-2918-CORE, Issue 2, ITU-T G.957, and ITU-T 100-GHz grid standard G.692

- Transmitter (trunk side)
  - Transmit power: +3 +/– 1 dBm with MXP_MR_2.5G card, and +/– 1 dBm with MXPP_MR_2.5G card
  - 50-GHz DWDM migration ready (the wavelength deviation is less than +/– 0.040 nm through wavelocker deployment)
  - Four-channel wavelength tunability at 100-GHz spacing
  - Transmitter maximum return reflectance: –27 dB
  - Chromatic dispersion allowance: 5400 ps/nm, giving an optical power penalty < 2.0 dB
  - Minimum side mode suppression ratio: 30 dB
  - Transmitter is a direct modulated laser
  - Wavelength stability (drift): +/– 25 picometers (pm)

Note An optical device on the card keeps the laser wavelength locked as closely as possible to the ITU nominal value. The allowed drift is +/– 25 pm.

- Currently available wavelengths of the TXP_MR_2.5G and TXPP_MR_2.5G cards (eight card versions):

  ITU grid blue band: 1530.334 to 1544.526 nm (four card versions, four wavelengths each)

  ITU grid red band: 1546.119 to 1560.606 nm (four card versions, four wavelengths each)

- Receiver (trunk side)

Table B-20 MXP_MR_2.5G/MXPP_MR_2.5G Receiver Trunk Side Specifications

OSNR[1]	FEC Type	Pre-FEC BER	Post-FEC BER	Input Power Sensitivity	Chromatic Dispersion Tolerance
10 dB	N/A	<10 exp – 12	N/A	– 9 to – 23 dBm	—
10 dB	N/A	<10 exp – 12	N/A	– 9 to – 22 dBm	+/– 1800 ps/nm
10 dB	N/A	<10 exp – 12	N/A	– 9 to – 21 dBm	+/– 5400 ps/nm
11 dB	N/A	<10 exp – 12	N/A	– 9 to – 23 dBm	+/– 1800 ps/nm
12 dB	N/A	<10 exp – 12	N/A	– 9 to – 23 dBm	+/– 5400 ps/nm

Table B-20 MXP_MR_2.5G/MXPP_MR_2.5G Receiver Trunk Side Specifications (continued)

OSNR[1]	FEC Type	Pre-FEC BER	Post-FEC BER	Input Power Sensitivity	Chromatic Dispersion Tolerance
14 dB	N/A	<10 exp – 12	N/A	– 9 to – 30 dBm	—
14 dB	N/A	<10 exp – 12	N/A	– 9 to – 29 dBm	+/– 1800 ps/nm
14 dB	N/A	<10 exp – 12	N/A	– 9 to – 28 dBm	+/– 5400 ps/nm
15 dB	N/A	<10 exp – 12	N/A	– 9 to – 30dBm	+/– 1800 ps/nm
16 dB	N/A	<10 exp – 12	N/A	– 9 to – 30dBm	+/– 5400 ps/nm

1. Optical Signal-to-Noise ratio (OSNR) defined with 0.5 nm Resolution Bandwidth (RBW)

  - Receiver sensitivity –28 dBm, BER 1 * 10 exp – 12
  - Receiver overload is equal to or exceeds –8 dBm
  - Receiver maximum reflectance of –27 dB
- Line (client side)
  - Bit rate: 1.06 Gbps to 2.125 Gbps per client
  - Code: Scrambled NRZ
  - Fiber: 1310-nm single-mode or 850-nm multimode
  - Maximum chromatic dispersion allowance: 1600 ps/nm
  - Loopback modes: Terminal and facility
  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.957
- Transmitter (client side)
  - Maximum transmitter output power: –1 dBm
  - Minimum transmitter output power: –6 dBm
  - Center wavelength: 1290 to 1330 nm
  - Nominal wavelength: 1310 nm
  - Transmitter: DFB laser
- Receiver (client side)
  - Maximum receiver level: –1 dBm at BER 1 * 10 exp – 12
  - Minimum receiver level: –14 dBm at BER 1 * 10 exp – 12
  - Receiver: APD
  - Link loss budget: 8 dB minimum, at BER = 1 * 10 exp – 12
  - Receiver input wavelength range: 1290 to 1605 nm
- Environmental
  - Operating temperature: –5 to +40 degrees Celsius (+23 to +104 degrees Fahrenheit)
  - Operating humidity: 5 to 85 percent, noncondensing
  - Power consumption (maximum): 60 W, 1.25 A at –48 V, 204 BTU/hr
- Dimensions

- Height: 12.650 in. (321.3 mm)
- Width: 0.716 in. (18.2 mm)
- Depth: 9.000 in. (228.6 mm)
- Depth with backplane connector: 9.250 in. (235 mm)
- Weight not including clam shell: 2.25 lb (1.02 kg)

B.5.5 MXP_2.5G_10E Card Specifications

The MXP_2.5G_10E card has the following specifications:

- Line (trunk side)
  - Bit rate: 10.70923 Gbps (in ITU-T G.709 Digital Wrapper/FEC mode)
  - Code: Scrambled NRZ
  - Fiber: 1550-nm single-mode
  - Maximum chromatic dispersion allowance: +/– 1200 ps/nm (specified penalty)
  - Loopback modes: Terminal and facility

Caution You must use a 20-dB fiber attenuator (15 to 25 dB) when working with the MXP_2.5G_10E card in a loopback on the trunk port. Do not use direct fiber loopbacks with the MXP_2.5G_10E card. Using direct fiber loopbacks causes irreparable damage to the MXP_2.5G_10E card.

  - Connectors: LC
  - Compliance: ITU-T G.707, ITU-T G.709, ITU-T G.957, and Telcordia GR-253-CORE
- Transmitter (trunk side)
  - Maximum transmitter output power: +6 dBm
  - Minimum transmitter output power: +3 dBm
  - Transmitter: LN external modulator transmitter
  - Wavelength stability (drift): +/– 25 picometers (pm)

Note An optical device on the card keeps the laser wavelength locked as closely as possible to the ITU nominal value. The allowed drift is +/– 25 pm.

- Currently available wavelengths and versions of MXP_2.5G_10E (eight card versions):

  ITU grid blue band:
  - 1530.33 to 1533.07 nm (four channels)
  - 1534.25 to 1537.00 nm (four channels)
  - 1538.19 to 1540.95 nm (four channels)
  - 1542.14 to 1544.92 nm (four channels)

  ITU grid red band:
  - 1546.12 to 1548.92 nm (four channels)
  - 1550.12 to 1552.93 nm (four channels)

  - 1554.13 to 1556.96 nm (four channels)
  - 1558.17 to 1561.01 nm (four channels)
- Receiver (trunk side)

Table B-21 MXP_2.5G_10E Receiver Trunk Side Specifications

OSNR[1]	FEC Type	Pre-FEC BER	Post-FEC BER	Input Power Sensitivity	Chromatic Dispersion Tolerance
23 dB	Off	<10 exp – 12	N/A	– 8 to – 20 dBm	+/– 1200 ps/nm
19 dB	Off	<10 exp – 12	N/A	– 8 to – 20 dBm	+/– 1000 ps/nm
19 dB	Off	<10 exp – 12	N/A	– 8 to – 22 dBm	—
10 dB	Standard	<10 exp – 5	<10 exp – 15	– 8 to – 18 dBm	+/– 800 ps/nm
8 dB	Standard	<10 exp – 5	<10 exp – 15	– 8 to – 18 dBm	—
8 dB	Enhanced	<7 x 10 exp – 4	<10 exp – 15	– 8 to – 18 dBm	+/– 800 ps/nm
7 dB	Enhanced	<7 x 10 exp – 4	<10 exp – 15	– 8 to – 18 dBm	—

1. Optical Signal-to-Noise ratio (OSNR) defined with 0.5 nm Resolution Bandwidth (RBW)

  - Receiver: APD
  - Link loss budget: 24 dB minimum, with no dispersion or 22 dB optical path loss at BER = 1 * 10 exp – 12 including dispersion
  - Receiver input wavelength range: 1290 to 1605 nm
- Line (client side)
  - Bit rate: 2.5 Gbps per port (OC-48/STM-16)
  - Code: Scrambled NRZ
  - Fiber: 1310-nm single-mode
  - Maximum chromatic dispersion allowance: 12 ps/nm (SR SFP version)
  - Loopback modes: Terminal and facility
  - Connectors: LC (optical)
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.957
- Transmitter (client side): Depends on the SFP that is used.
- Receiver (client side): Depends on the SFP that is used.
- Environmental
  - Operating temperature: –5 to +55 degrees Celsius (+23 to +113 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 50.00 W (maximum), 1.11 A at –48 V, 136.6 BTU/hr
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.716 in. (18.2 mm)
  - Depth: 9.000 in. (228.6 mm)
  - Depth with backplane connector: 9.250 in. (235 mm)

- Weight not including clam shell: 3.1 lb (1.3 kg)

B.5.6 TXP_MR_10E Card Specifications

The TXP_MR_10E card has the following specifications:

- Line (trunk side)
  - Bit rate: OC-192/STM-64 (9.95328 Gbps), OTU2 (10.70923 Gbps), 10GE (10.3125 Gbps), 10GE into OTU2 (non-standard 11.0957 Gbps), 10G FC (10.51875 Gbps), or 10G FC into OTU2 (non-standard 11.31764 Gbps)
  - Code: Scrambled NRZ
  - Fiber: 1550-nm single-mode
  - Maximum chromatic dispersion allowance: +/– 1200 ps/nm (specified penalty)
  - Loopback modes: Terminal and facility

Caution You must use a 15-dB fiber attenuator (10 to 20 dB) when working with the TXP_MR_10E card in a loopback on the trunk port. Do not use direct fiber loopbacks with the TXP_MR_10E card. Using direct fiber loopbacks causes irreparable damage to the TXP_MR_10E card.

  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.957, and ITU-T G.709
- Transmitter (trunk side)
  - Maximum transmitter output power: +6 dBm
  - Minimum transmitter output power: +3 dBm for C-band and +2 dBm for L-band
  - Transmitter: LN external modulator transmitter
  - Wavelength stability (drift): +/– 25 picometers (pm)

Note An optical device on the card keeps the laser wavelength locked as closely as possible to the ITU nominal value. The allowed drift is +/– 25 pm.

- Currently available wavelengths and versions of TXP_MR_10E:

  C-band frequency plan (eight card versions, each with four tunable channels on the ITU 100-GHz grid):
  - 1530.33 to 1533.07 nm (four channels)
  - 1534.25 to 1537.00 nm (four channels)
  - 1538.19 to 1540.95 nm (four channels)
  - 1542.14 to 1544.92 nm (four channels)
  - 1546.12 to 1548.92 nm (four channels)
  - 1550.12 to 1552.93 nm (four channels)
  - 1554.13 to 1556.96 nm (four channels)
  - 1558.17 to 1561.01 nm (four channels)

L-band frequency plan (five card versions, each with eight tunable channels on the ITU 50-GHz grid):

- 1577.44 to 1580.35 nm (eight channels)
- 1580.77 to 1583.69 nm (eight channels)
- 1584.11 to 1587.04 nm (eight channels)
- 1587.46 to 1590.41 nm (eight channels)
- 1590.83 to 1593.79 nm (eight channels)

- Receiver (trunk side)

Table B-22 TXP_MR_10E Receiver Trunk Side Specifications

OSNR[1]	FEC Type	Pre-FEC BER	Post-FEC BER	Input Power Sensitivity[2]	Chromatic Dispersion Tolerance
23 dB	Off	<10 exp – 12	N/A	– 8 to – 20 dBm	+/– 1200 ps/nm
19 dB	Off	<10 exp – 12	N/A	– 8 to – 20 dBm	+ – 1000 ps/nm
19 dB	Off	<10 exp – 12	N/A	– 8 to – 22 dBm	—
10 dB	Standard	<10 exp – 5	<10 exp – 15	– 8 to – 18 dBm	+/– 800 ps/nm
8 dB	Standard	<10 exp – 5	<10 exp – 15	– 8 to – 18 dBm	—
8 dB	Enhanced	<7 x 10 exp – 4	<10 exp – 15	– 8 to – 18 dBm	+/– 800 ps/nm
7 dB	Enhanced	<7 x 10 exp – 4	<10 exp – 15	– 8 to – 18 dBm	—

1. Optical Signal-to-Noise ratio (OSNR) defined with 0.5 nm Resolution Bandwidth (RBW)
2. Receiver filter bandwidth greater than or equal to 180 pm (at - 3 dBm)

  - Receiver: APD
  - Link loss budget: 24 dB minimum, with no dispersion or 22 dB optical path loss at BER = 1 * 10 exp – 12 including dispersion
  - Receiver input wavelength range: 1290 to 1605 nm
- Line (client side):
  - 10-Gigabit Small Form-factor Pluggable (XFP)-based SR
  - Bit rate: 10GE (10.3125 Gbps), 10G FC (10.51875 Gbps), or STM-64/OC-192
  - Code: Scrambled NRZ
  - Fiber: 1310-nm single-mode
  - Maximum chromatic dispersion allowance: 6.6 ps/nm
  - Loopback modes: Terminal and facility
  - Connectors: LC
  - Compliance: Telcordia GR-253-CORE, ITU-T G.707, ITU-T G.957, ITU-T G.691
- Transmitter (client side)
  - Maximum transmitter output power: –1 dBm
  - Minimum transmitter output power: –6 dBm
  - Center wavelength: 1290 to 1330 nm
  - Nominal wavelength: 1310 nm

  - Transmitter: DFB laser
- Receiver (client side)
  - Maximum receiver level: –1 dBm at BER 1 * 10 exp – 12
  - Minimum receiver level: –14 dBm at BER 1 * 10 exp – 12
  - Receiver: APD
  - Link loss budget: 8 dB minimum, at BER = 1 * 10 exp – 12
  - Receiver input wavelength range: 1290 to 1605 nm
- Environmental
  - Operating temperature: –5 to +55 degrees Celsius (+23 to +113 degrees Fahrenheit)
  - Operating humidity: 5 to 95 percent, noncondensing
  - Power consumption: 50.00 W (maximum), 1.11 A at –48 V, 136.6 BTU/hr
- Dimensions
  - Height: 12.650 in. (321.3 mm)
  - Width: 0.716 in. (18.2 mm)
  - Depth: 9.000 in. (228.6 mm)
  - Depth with backplane connector: 9.250 in. (235 mm)
  - Weight not including clam shell: 3.1 lb (1.3 kg)

B.6 SFP Specifications

Table B-23 lists the specifications for available SFPs.

Table B-23 SFP Specifications

SFP Product ID	Interface	Transmitter Output Power Min/Max (dBm)	Receiver Input Power Min/Max (dBm)
15454-SFP3-1-IR=	OC-3	–15 to –8	–23 to –8
15454E-SFP-L.1.1=	STM-1	–15 to –8	–34 to –10
15454-SFP12-4-IR=	OC-12, D1 Video	–15 to –8	–28 to –7
15454E-SFP-L.4.1=	STM-4, D1 Video	–15 to –8	–28 to –8
15454-SFP-OC48-IR=	OC-48, DV6000 (C-Cor)	–5 to +0	–18 to +0
ONS-SE-2G-S1=	OC-48, STM-16	–10 to –3	–18 to –3
15454E-SFP-L.16.1=	STM-16, DV6000 (C-Cor)	–5 to +0	–18 to 0
15454-SFP-200/ 15454E-SFP-200	ESCON[1]	–20.5 to –15	–29 to –4
15454-SFP-GEFC-SX=/ 15454E-SFP-GEFC-S=	Fibre Channel (1 and 2 Gbps), FICON[2], GE	–10 to –3.5	–17 to 0 (1FC and 1GE) –15 to 0 (2FC)

Table B-23 SFP Specifications (continued)

SFP Product ID	Interface	Transmitter Output Power Min/Max (dBm)	Receiver Input Power Min/Max (dBm)
15454-SFP-GE+-LX=/ 15454E-SFP-GE+-LX=	Fibre Channel (1 and 2 Gbps), FICON, GE, HDTV[3]	–9.5 to –3.0	–20 to –3 (1FC, 1GE, and 2FC)
ONS-SE-2G-L2	OC-48, STM-16	–2 to 3	–28 to –9
ONS-SE-GE-ZX	Fibre Channel (1 and 2 Gbps), FICON, GE	0 to 5	–25 to 0

1. ESCON = Enterprise System Connection
2. FICON = fiber connectivity
3. HDTV = high-definition television

SFP Port Cabling Specifications

Table B-24 provides cabling specifications for the single-mode fiber (SMF) SFPs and Table B-25 provides cabling specifications for multimode fiber (MMF) SFPs that you install into Ethernet cards. The ports of the listed SFPs have LC-type connectors.

Table B-24 Single-Mode Fiber SFP Port Cabling Specifications

SFP Product ID	Wavelength[1]	Fiber Type	Cable Distance
15454-SFP3-1-IR= Intermediate Reach	1310 nm	9 micron SMF	15 km (9.3 miles)
15454E-SFP-L.1.1= Short Haul	1310 nm	9 micron SMF	15 km (9.3 miles)
15454-SFP12-4-IR= Intermediate Reach	1310 nm	9 micron SMF	15 km (9.3 miles)
15454E-SFP-L.4.1= Short Haul	1310 nm	9 micron SMF	15 km (9.3 miles)
15454-SFP-OC48-IR= Intermediate Reach	1310 nm	9 micron SMF	15 km (9.3 miles)
ONS-SE-2G-S1= Short Reach	1310 nm	9 micron SMF	2 km (1.2 miles)
15454E-SFP-L.16.1= Short Haul	1310 nm	9 micron SMF	15 km (9.3 miles)
15454-SFP-GE+-LX=/ 15454E-SFP-GE+-LX= Long Reach	1310 nm	9 micron SMF	10 km (6.2 miles) for FC 1G, FC 2G, and GE 5 km (3.1 miles) for HDTV

1. Typical loss on a 1310 nm wavelength is 0.6 dB/km.

Table B-25 Multimode Fiber SFP Port Cabling Specifications

SFP Product ID	Wavelength	Fiber Type	Cable Distance
15454-SFP-200/ 15454E-SFP-200 Long Reach	1310 nm	62.5 micron MMF	2 km (1.2 miles)
15454-SFP-GEFC-SX/ 15454E-SFP-GEFC-S Short Reach	850 nm	62.5 micron MMF	300 m (984 ft) for FC 1 Gbps and 1.2 Gbps GE 150 m (492 ft) for FC 2 Gbps
		50.0 micron MMF	550 m (1804 ft) for FC 1 Gbps and 1.2 Gbps GE 300 m (984 ft) for FC 2 Gbps

B.7 XFP Specifications

Table B-26 lists the specifications for available XFPs.

Table B-26 XFP Specifications

XFP Product ID	Interface	Transmitter Output Power Min/Max (dBm)	Receiver Input Power Min/Max (dBm)
ONS-XC-10G-S1	10 Gigabit Ethernet, OC-192, STM-64, 10Gbps Fibre Channel	-1 to -11	0.5

B.7.1 XFP Port Cabling Specifications

Table B-27 provides cabling specifications for the SMF XFPs. The ports of the listed XFPs have LC-type connectors.

Table B-27 Single-Mode Fiber XFP Port Cabling Specifications

XFP Product ID	Wavelength[1]	Fiber Type	Cable Distance
ONS-XC-10G-S1	1310 nm	SMF	10 km (6.2 miles)

1. Typical loss on a 1310 nm wavelength is 0.6 dB/km.

DWDM Administrative and Service States

This appendix describes the administrative and service states for Cisco ONS 15454 dense wavelength division multiplexing (DWDM) cards, optical payload ports, out-of-band optical supervision channel (OSC) ports, optical channel network connections (OCHNC), and transponder/muxponder cards and ports. Software Release 5.0 states are based on the generic state model defined in Telcordia GR-1093-Core, Issue 2 and ITU-T X.731.

C.1 Service States

Service states include a Primary State (PST), a Primary State Qualifier (PSTQ), and one or more Secondary States (SST). Table C-1 lists the ANSI and ETSI service state PSTs and PSTQs supported by the ONS 15454.

Table C-1 ONS 15454 Service State Primary States and Primary State Qualifiers

ANSI Primary State, Primary State Qualifier	ETSI Primary State, Primary State Qualifier	Definition
IS-NR (In-Service and Normal)	Unlocked-enabled	The entity is fully operational and will perform as provisioned.
OOS-AU (Out-of-Service and Autonomous)	Unlocked-disabled	The entity is not operational because of an autonomous event.
OOS-AUMA (Out-of-Service and Autonomous Management)	Locked-disabled	The entity is not operational because of an autonomous event and has also been manually removed from service.
OOS-MA (Out-of-Service and Management)	Locked-enabled	The entity has been manually removed from service.

Table C-2 defines the ANSI and ETSI SSTs supported by the ONS 15454.

Table C-2 ONS 15454 Secondary States

ANSI Secondary State	ETSI Secondary State	Definition
AINS	automaticInService	The entity is delayed before transitioning to the IS-NR (ANSI)/Unlocked-enabled (ETSI) service state. The transition to IS-NR/Unlocked-enabled depends on correction of conditions. Alarm reporting is suppressed, but traffic is carried. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command.
DSBLD	disabled	The entity was manually removed from service and does not provide its provisioned functions. All services are disrupted; unable to carry traffic.
MEA	mismatchOfEquipment	An improper card is installed. For example, an installed card is not compatible with the card pre-provisioning or the slot. This SST applies only to cards.
MT	maintenance	The entity has been manually removed from service for a maintenance activity but still performs its provisioned functions. Alarm reporting is suppressed, but traffic is carried. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command.
SWDL	softwareDownload	The card is involved in a software and database download. This SST applies only to cards.
UAS	unassigned	The card is not provisioned in the database. This SST applies only to cards.
UEQ (Unequipped)	notInstalled	The card is not physically present (that is, an empty slot). This SST applies only to cards.

C.2 Administrative States

Administrative states are used to manage service states. Administrative states consist of a PST and an SST. Table C-3 lists the ANSI and ETSI administrative states supported by the ONS 15454. See Table C-2 for SST definitions.

Note A change in the administrative state of an entity does not change the service state of supporting or supported entities.

Table C-3 ONS 15454 Administrative States

ANSI Administrative State (PST,SST)	ETSI Administrative State (PST,SST)	Definition
IS	Unlocked	Puts the entity in-service.
IS,AINS	Unlocked,automaticInService	Puts the entity in automatic in-service.
OOS,DSBLD	Locked,disabled	Removes the entity from service and disables it.
OOS,MT	Locked,maintenance	Removes the entity from service for maintenance.

C.3 Service State Transitions

This section describes the transition from one service state to the next state for DWDM cards, optical payload ports, OSC ports, OCHNCs, and transponder/muxponder cards and ports. A service state transition is based on the action performed on the entity and any autonomous activity.

C.3.1 DWDM Card Service State Transitions

Table C-4 lists ANSI and ETSI service state transitions for AD-1B-xx.x, AD-4B-xx.x, AD-1C-xx.x, AD-2C-xx.x, AD-4C-xx.x, OSC-CSM, OSCM, OPT-BST, OPT-PRE, 4MD-xx.x, 32WSS, 32MUX-O, and 32DMX-O cards.

Table C-4 ONS 15454 Optical Unit Service State Transitions

Current Service State	Action	Next Service State
IS-NR (ANSI) Unlocked-enabled (ETSI)	Delete the card.	OOS-AUMA,UAS (ANSI) Locked-disabled,unassigned (ETSI)
	Pull the card.	OOS-AU,UEQ (ANSI) Unlocked-disabled,notInstalled (ETSI)
	Reset the card.	OOS-AU,SWDL (ANSI) Unlocked-disabled,softwareDownload (ETSI)
OOS-AU,AINS & MEA (ANSI) Unlocked-disabled,automaticInService & mismatchOfEquipment (ETSI)	Pull the card.	OOS-AU,AINS & UEQ (ANSI) Unlocked-disabled,automaticInService & notInstalled (ETSI)
	Delete the card.	If the card is valid: • OOS-AUMA,UAS (ANSI) • Locked-disabled,unassigned (ETSI) If the card is invalid: • OOS-AUMA,MEA & UAS (ANSI) • Locked-disabled,mismatchOfEquipment & unassigned (ETSI)
OOS-AU,AINS & SWDL (ANSI) Unlocked-disabled,automaticInService & softwareDownload (ETSI)	Restart completed.	IS-NR (ANSI) Unlocked-enabled (ETSI)
		OOS-AU,AINS & MEA (ANSI) Unlocked-disabled,automaticInService & mismatchOfEquipment (ETSI)
	Pull the card.	OOS-AU,AINS & UEQ (ANSI) Unlocked-disabled,automaticInService & notInstalled (ETSI)

Table C-4 ONS 15454 Optical Unit Service State Transitions (continued)

Current Service State	Action	Next Service State
OOS-AU,AINS & UEQ (ANSI) Unlocked-disabled,automaticInService & notInstalled (ETSI)	Insert a valid card.	OOS-AU,AINS & SWDL (ANSI) Unlocked-disabled,automaticInService & softwareDownload (ETSI)
	Insert an invalid card.	OOS-AU,AINS & MEA (ANSI) Unlocked-disabled,automaticInService & mismatchOfEquipment (ETSI)
	Delete the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)
OOS-AU,MEA (ANSI) Unlocked-disabled,mismatchOfEquipment (ETSI)	Pull the card.	OOS-AU,UEQ (ANSI) Unlocked-disabled,notInstalled (ETSI)
	Delete the card.	If the card is valid: • OOS-AUMA,UAS (ANSI) • Locked-disabled,unassigned (ETSI) If the card is invalid: • OOS-AUMA,MEA & UAS (ANSI) • Locked-disabled,mismatchOfEquipment & unassigned (ETSI)
OOS-AU,SWDL (ANSI) Unlocked-disabled,softwareDownload (ETSI)	Restart completed.	IS-NR (ANSI) Unlocked-enabled (ETSI)
		OOS-AU,MEA (ANSI) Unlocked-disabled,mismatchOfEquipment (ETSI)
	Pull the card.	OOS-AU,UEQ (ANSI) Unlocked-disabled,notInstalled (ETSI)
OOS-AU,UEQ (ANSI) Unlocked-disabled,notInstalled (ETSI)	Insert a valid card.	OOS-AU,SWDL (ANSI) Unlocked-disabled,softwareDownload (ETSI)
	Insert an invalid card.	OOS-AU,MEA (ANSI) Unlocked-disabled,mismatchOfEquipment (ETSI)
	Delete the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)
OOS-AUMA,MEA & UAS (ANSI) Locked-disabled,mismatchOfEquipment & unassigned (ETSI)	Pull the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)
	Provision the card.	OOS-AU,MEA (ANSI) Unlocked-disabled,mismatchOfEquipment (ETSI)

Table C-4 ONS 15454 Optical Unit Service State Transitions (continued)

Current Service State	Action	Next Service State
OOS-AUMA,MT & SWDL (ANSI) Locked-disabled,maintenance & softwareDownload (ETSI)	Restart completed.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
		OOS-AUMA,MEA & MT (ANSI) Locked-disabled,mismatchOfEquipment & maintenance (ETSI)
	Pull the card.	OOS-AUMA,MT & UEQ (ANSI) Locked-disabled,maintenance & notInstalled (ETSI)
OOS-AUMA,UAS (ANSI) Locked-disabled,unassigned (ETSI)	Pull the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)
	Provision an invalid card.	OOS-AU,MEA (ANSI) Unlocked-disabled,mismatchOfEquipment (ETSI)
	Provision a valid card.	OOS-AU,SWDL (ANSI) Unlocked-disabled,softwareDownload (ETSI)
OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)	Insert a valid card.	OOS-AU,SWDL (ANSI) Unlocked-disabled,softwareDownload (ETSI)
	Insert an invalid card.	OOS-AUMA,MEA & UAS (ANSI) Locked-disabled,mismatchOfEquipment & unassigned (ETSI)
	Pre-provision a card.	OOS-AU,AINS & UEQ (ANSI) Unlocked-disabled,automaticInService & notInstalled (ETSI)

C.3.2 Optical Payload Port Service State Transitions

Table C-5 lists the ANSI and ETSI optical payload port service state transitions.

Table C-5 ONS 15454 Optical Payload Port Service State Transitions

Current Service State	Action	Next Service State
IS-NR (ANSI) Unlocked-enabled (ETSI)	Put the port in the OOS,DSBLD administrative state.	OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)
	The OCHNC end-to-end path no longer exists.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)

Table C-5 ONS 15454 Optical Payload Port Service State Transitions (continued)

Current Service State	Action	Next Service State
OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)	All required OCHNC connections exist.	IS-NR (ANSI) Unlocked-enabled (ETSI)
	Put the port in the OOS,MT administrative state.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
	Put the port in the OOS,DSBLD.	OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)
OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)	Put the port in the IS,AINS administrative state.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)
	Put the port in the OOS,MT.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)	Put the port in the IS,AINS administrative state.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)
	Put the port in the OOS,DSBLD administrative state.	OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)

C.3.3 OSC Port Service State Transitions

Table C-6 lists the ANSI and ETSI OSC port service state transitions.

Table C-6 ONS 15454 OSC Port Service State Transitions

Current Service State	Action	Next Service State
IS-NR (ANSI) Unlocked-enabled (ETSI)	Delete the OSC.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)
OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)	Create the OSC.	IS-NR (ANSI) Unlocked-enabled (ETSI)
	Put the port in the OOS,MT administrative state.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)	Put the port in the IS,AINS administrative state.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)

C.3.4 OCHNC Service State Transitions

Table C-7 lists the ANSI and ETSI OCHNC service state transitions.

Table C-7 ONS 15454 OCHNC Service State Transitions

Current Service State	Action	Next Service State
IS-NR (ANSI) Unlocked-enabled (ETSI)	Put the connection in the OOS,MT administrative state.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
	Put the connection in the IS,AINS administrative state.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)
OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)	Put the connection in the IS administrative state.	IS-NR (ANSI) Unlocked-enabled (ETSI)
OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)	Put the connection in the IS,AINS administrative state.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)

C.3.5 Transponder/Muxponder Card Service State Transitions

Table C-8 lists ANSI and ETSI transponder and muxponder card service state transitions.

Table C-8 ONS 15454 Transponder/Muxponder Card Service State Transitions

Current Service State	Action	Next Service State
IS-NR (ANSI) Unlocked-enabled (ETSI)	Change the administrative state to OOS,MT.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
	Delete the card.	OOS-AUMA,UAS (ANSI) Locked-disabled,unassigned (ETSI)
	Pull the card.	OOS-AU,UEQ (ANSI) Unlocked-disabled,notInstalled (ETSI)
	Reset the card.	OOS-AU,SWDL (ANSI) Unlocked-disabled,softwareDownload (ETSI)

Table C-8 ONS 15454 Transponder/Muxponder Card Service State Transitions (continued)

Current Service State	Action	Next Service State
OOS-AU,AINS & MEA (ANSI) Unlocked-disabled,automaticInService & mismatchOfEquipment (ETSI)	Change the administrative state to OOS,MT.	OOS-AUMA,MEA & MT (ANSI) Locked-disabled,mismatchOfEquipment & maintenance (ETSI)
	Pull the card.	OOS-AU,AINS & UEQ (ANSI) Unlocked-disabled,automaticInService & notInstalled (ETSI)
	Delete the card.	If the card is valid: • OOS-AUMA,UAS (ANSI) • Locked-disabled,unassigned (ETSI) If the card is invalid: • OOS-AUMA,MEA & UAS (ANSI) • Locked-disabled,mismatchOfEquipment & unassigned (ETSI)
OOS-AU,AINS & SWDL (ANSI) Unlocked-disabled,automaticInService & softwareDownload (ETSI)	Restart completed.	IS-NR (ANSI) Unlocked-enabled (ETSI)
	Pull the card.	OOS-AU,AINS & UEQ (ANSI) Unlocked-disabled,automaticInService & notInstalled (ETSI)
OOS-AU,AINS & UEQ (ANSI) Unlocked-disabled,automaticInService & notInstalled (ETSI)	Insert a valid card.	OOS-AU,AINS & SWDL (ANSI) Unlocked-disabled,automaticInService & softwareDownload (ETSI)
	Insert an invalid card.	OOS-AU,AINS & MEA (ANSI) Unlocked-disabled,automaticInService & mismatchOfEquipment (ETSI)
	Delete the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)
	Change the administrative state to OOS,MT.	OOS-AUMA,MT & UEQ (ANSI) Locked-disabled,maintenance & notInstalled (ETSI)

Table C-8 ONS 15454 Transponder/Muxponder Card Service State Transitions (continued)

Current Service State	Action	Next Service State
OOS-AU,MEA (ANSI)	Pull the card.	OOS-AU,UEQ (ANSI) Unlocked-disabled,notInstalled (ETSI)
	Delete the card.	If the card is valid: • OOS-AUMA,UAS (ANSI) • Locked-disabled,unassigned (ETSI) If the card is invalid: • OOS-AUMA,MEA & UAS (ANSI) • Locked-disabled,mismatchOfEquipment & unassigned (ETSI)
	Change the administrative state to OOS,MT.	OOS-AUMA,MT & UEQ (ANSI) Locked-disabled,maintenance & notInstalled (ETSI)
OOS-AU,SWDL (ANSI) Locked-disabled,softwareDownload (ETSI)	Restart completed.	IS-NR (ANSI) Unlocked-enabled (ETSI)
	Pull the card.	OOS-AU,UEQ (ANSI) Locked-disabled,notInstalled (ETSI)
OOS-AU,UEQ (ANSI) Locked-disabled,notInstalled (ETSI)	Insert a valid card.	OOS-AU,SWDL (ANSI) Locked-disabled,softwareDownload (ETSI)
	Insert an invalid card.	OOS-AU,MEA (ANSI) Locked-disabled,mismatchOfEquipment (ETSI)
	Delete the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)
	Change the administrative state to OOS,MT.	OOS-AUMA,MT & UEQ (ANSI) Locked-disabled,maintenance & notInstalled (ETSI)

Table C-8 ONS 15454 Transponder/Muxponder Card Service State Transitions (continued)

Current Service State	Action	Next Service State
OOS-AUMA,MEA & MT (ANSI) Locked-disabled,mismatchOfEquipment & maintenance (ETSI)	Change the administrative state to IS.	OOS-AU,MEA (ANSI) Locked-disabled,mismatchOfEquipment (ETSI)
	Pull the card.	OOS-AUMA,MT & UEQ (ANSI) Locked-disabled,maintenance & notInstalled (ETSI)
	Delete the card.	If the card is valid: • OOS-AUMA,UAS (ANSI) • Locked-disabled,unassigned (ETSI) If the card is invalid: • OOS-AUMA,MEA & UAS (ANSI) • Locked-disabled,mismatchOfEquipment & unassigned (ETSI)
OOS-AUMA,MEA & UAS (ANSI) Locked-disabled,mismatchOfEquipment & unassigned (ETSI)	Pull the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)
	Provision the card.	OOS-AU,MEA (ANSI) Locked-disabled,mismatchOfEquipment (ETSI)
OOS-AUMA,MT & SWDL (ANSI) Locked-disabled,maintenance & softwareDownload (ETSI)	Restart completed.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
	Pull the card.	OOS-AUMA,MT & UEQ (ANSI) Locked-disabled,maintenance & notInstalled (ETSI)
OOS-AUMA,MT & UEQ (ANSI) Locked-disabled,maintenance & notInstalled (ETSI)	Change the administrative state to IS.	OOS-AU,UEQ (ANSI) Locked-disabled,notInstalled (ETSI)
	Insert a valid card.	OOS-AUMA,MT & SWDL (ANSI) Locked-disabled,maintenance & softwareDownload (ETSI)
	Insert an invalid card.	OOS-AUMA,MEA & MT (ANSI) Locked-disabled,mismatchOfEquipment & maintenance (ETSI)
	Delete the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)

Table C-8 ONS 15454 Transponder/Muxponder Card Service State Transitions (continued)

Current Service State	Action	Next Service State
OOS-AUMA,UAS (ANSI) Locked-disabled,unassigned (ETSI)	Pull the card.	OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)
	Provision an invalid card.	OOS-AU,MEA (ANSI) Locked-disabled,mismatchOfEquipment (ETSI)
	Provision a valid card.	OOS-AU,SWDL (ANSI) Locked-disabled,softwareDownload (ETSI)
OOS-AUMA,UAS & UEQ (ANSI) Locked-disabled,unassigned & notInstalled (ETSI)	Insert a valid card.	OOS-AU,SWDL (ANSI) Locked-disabled,softwareDownload (ETSI)
	Insert an invalid card.	OOS-AUMA,MEA & UAS (ANSI) Locked-disabled,mismatchOfEquipment & unassigned (ETSI)
	Pre-provision a card.	OOS-AU,AINS & UEQ (ANSI) Unlocked-disabled,automaticInService & notInstalled (ETSI)
OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)	Change the administrative state to IS.	IS-NR (ANSI) Unlocked-enabled (ETSI)
	Delete the card.	OOS-AUMA,UAS (ANSI) Locked-disabled,unassigned (ETSI)
	Pull the card.	OOS-AUMA,MT & UEQ (ANSI) Locked-disabled,maintenance & notInstalled (ETSI)
	Reset the card.	OOS-AUMA,MT & SWDL (ANSI) Locked-disabled,maintenance & softwareDownload (ETSI)

C.3.6 Transponder/Muxponder Port Service State Transitions

Table C-9 lists the ANSI and ETSI transponder and muxponder port service state transitions.

Table C-9 ONS 15454 Transponder/Muxponder Port Service State Transitions

Current Service State	Action	Next Service State
IS-NR (ANSI) Unlocked-enabled (ETSI)	Put the port in the OOS,MT administrative state.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
	Put the port in the OOS,DSBLD administrative state.	OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)
	Put the port in the IS,AINS administrative state.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)
OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)	Put the port in the IS administrative state.	IS-NR[1] (ANSI) Unlocked-enabled (ETSI)
	Put the port in the OOS,MT administrative state.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
	Put the port in the OOS,DSBLD.	OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)
OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)	Put the port in the IS administrative state.	IS-NR[1] (ANSI) Unlocked-enabled (ETSI)
	Put the port in the IS,AINS administrative state.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)
	Put the port in the OOS,MT.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)
OOS-MA,LPBK & MT (ANSI) Locked-enabled,loopback & maintenance (ETSI)	Release the loopback.	OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)

Table C-9 ONS 15454 Transponder/Muxponder Port Service State Transitions (continued)

Current Service State	Action	Next Service State
OOS-MA,MT (ANSI) Locked-enabled,maintenance (ETSI)	Put the port in the IS administrative state.	IS-NR[1] Unlocked-enabled (ETSI)
	Put the port in the IS,AINS administrative state.	OOS-AU,AINS (ANSI) Unlocked-disabled,automaticInService (ETSI)
	Put the port in the OOS,DSBLD.	OOS-MA,DSBLD (ANSI) Locked-enabled,disabled (ETSI)
	Put the port in loopback.	OOS-MA,LPBK & MT[2] [3] (ANSI) Locked-enabled,loopback & maintenance (ETSI)

1. The transponder and muxponder cards have both client and trunk ports. To bring up service, it is not necessary that both the client side and trunk side have to be in the IS-NR (ANSI)/Unlocked-enabled (ETSI) service state.
2. In a client-side facility loopback, the client port is in the OOS-MA,LPBK & MT (ANSI)/Locked-enabled,loopback and maintenance (ETSI) service state and the remaining client and trunk ports can be in any other service state. In a client-side terminal loopback on transponder cards, the client port is in the OOS-MA,LPBK & MT service state and the trunk ports are in IS-NR (ANSI)/Unlocked-enabled (ETSI). For client-side terminal loopbacks on muxponder cards, the client port is in the OOS-MA,LPBK & MT service state and remaining client and trunk ports can be in any service state.
3. In a trunk-side facility loopback, the trunk port is in the OOS-MA,LPBK & MT (ANSI)/Locked-enabled,loopback and maintenance (ETSI) service state and the remaining client and trunk ports can be in any other service state. In a trunk-side terminal loopback, the trunk port is in the OOS-MA,LPBK & MT (ANSI)/Locked-enabled,loopback and maintenance (ETSI) service state and the client ports are in IS-NR (ANSI)/Unlocked-enabled (ETSI) for complete loopback functionality. This type of loopback affects all client ports because it is performed on the aggregate signal.

Network Element Defaults

Note The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This appendix describes the factory-configured (default) network element (NE) settings for the Cisco ONS 15454. It includes descriptions of card default settings and node default settings. To import, export, or edit the settings, refer to Chapter 12, "Maintain the Node." Cards supported by this platform that are not listed in this appendix are not supported by factory-configured NE default settings.

To change card settings individually (that is, without changing the defaults), refer to Chapter 11, "Change DWDM Card Settings." To change node settings, refer to Chapter 10, "Manage the Node."

Note Unless otherwise specified, in this appendix "ONS 15454" refers to both ANSI (ONS 15454 SONET) and ETSI (ONS 15454 SDH) shelf assemblies.

D.1 Network Element Defaults Description

The NE defaults are pre-installed on each Cisco ONS 15454 TCC2/TCC2P card. They also ship as a file called 15454-defaults.txt (ANSI shelves) or 15454SDH-defaults.txt (ETSI shelves) on the CTC software CD in the event you want to import the defaults onto existing TCC2/TCC2P cards. The NE defaults include card-level, CTC, and node-level defaults.

Changes made manually using Change Card Settings procedures in Chapter 11, "Change DWDM Card Settings" override default settings. If you use the Defaults Editor or import a new defaults file, the default changes do not change the settings for cards that are currently installed or slots that are pre-provisioned for cards.

Changes made manually to most node-level default settings (either when you initially turn up a node or change node settings later) override the current settings, whether default or provisioned. If you change the default settings, using either the Defaults Editor or by importing a new defaults file, the new defaults take effect immediately for all settings except those relating to protection (1+1 bidirectional switching, 1+1 reversion time, 1+1 revertive, BLSR/MS-SPRing reversion time, BLSR/MS-SPRing ring revertive, BLSR/MS-SPRing span reversion time, BLSR/MS-SPRingnp span revertive).

Note Changing the IIOP listener port in the NE defaults requires a reboot of the node in order for the default change to occur. Use caution when changing this default setting.

D.2 ANSI Platform Defaults

The following sections give the NE defaults for the 15454 ANSI platform. To see defaults for the 15454 ETSI platform, refer to the "D.3 ETSI Platform Defaults" section on page D-43.

D.2.1 ANSI Card Default Settings

The tables in this section list the default settings for each DWDM, TXP, and MXP card. For all other cards, including electrical, optical, Ethernet, and fibre channel, refer to the *Cisco ONS 15454 Reference Manual*.

Cisco provides settings that are pre-provisioned for the Cisco ONS 15454 cards, including:

- Soak Time (all cards) is the length of time that elapses between an AINS port receiving a valid signal and when it automatically changes to in-service status.
- Port State (all cards) sets the port to one of the four available states (IS, OOS, OOS_MT, or OOS_AINS), depending on whether you need ports in or out of service.
- SF BER Level (TXP and MXP cards) defines the signal fail bit error rate.
- SD BER Level (TXP and MXP cards) defines the signal degrade bit error rate.
- Enable Sync Messages (MXP cards) enables synchronization status messages (S1 byte), which allow the node to choose the best timing source.
- Send Do Not Use (TXP and MXP cards) sends a DUS message on the S1 byte when enabled.
- Payload Type (TXP and MXP cards) defines the type of client signal.
- Termination Mode (TXP and MXP cards) defines the type of termination (line, section, or transparent).
- ALS Mode (TXP and MXP cards) sets the automatic laser shutdown feature to one of four available states (disabled, auto restart, manual restart, manual restart for test).
- ALS Recovery Interval (TXP and MXP cards) sets the automatic laser shutdown recovery time interval.
- ALS Recovery Pulse Width (TXP and MXP cards) set the automatic laser shutdown recovery pulse signal width.
- FEC (TXP and MXP cards) enables or disables the FEC monitoring on the optical transport network.
- G.709 OTN (TXP and MXP cards) enables or disables the G.709 monitoring on the optical transport network.
- FEC Thresholds (TXP and MXP cards) set the performance monitoring parameters for gathering FEC performance data and detecting problems early.
- Optical Thresholds (TXP and MXP cards) set the performance monitoring parameters for gathering physical optics performance data and detecting problems early.
- OTN Thresholds (TXP and MXP cards) set the performance monitoring parameters for gathering OTN trunk-side performance data and detecting problems early.

- PM Threshold Settings (all cards) set the performance monitoring parameters for gathering performance data and detecting problems early.

Note For more information about the performance monitoring parameters, refer to Chapter 9, "Monitor Performance."

D.2.1.1 MXP-2.5G-10E Card Default Settings

Table D-1 lists the MXP-2.5G-10E card default settings.

Table D-1 MXP-2.5G-10E Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.config.client.AINSSoakTime	08:00 (hours:mins)		
MXP-2_5G-10E.config.client.AisSquelchMode	Squelch		
MXP-2_5G-10E.config.client.AlsMode	Disabled		
MXP-2_5G-10E.config.client.AlsRecoveryPulseDuration	2		
MXP-2_5G-10E.config.client.AlsRecoveryPulseInterval	100	100	2000
MXP-2_5G-10E.config.client.SDBER	1e-007		
MXP-2_5G-10E.config.client.SFBER	0.0001		
MXP-2_5G-10E.config.client.SendDoNotUse	FALSE		
MXP-2_5G-10E.config.client.SyncMsgIn	TRUE		
MXP-2_5G-10E.config.client.TerminationMode	Transparent		
MXP-2_5G-10E.config.client.ppmPortAssignment	OC48_PORT		
MXP-2_5G-10E.config.client.ppmSlotAssignment	UNASSIGNED		
MXP-2_5G-10E.config.trunk.AINSSoakTime	0.33333333333		
MXP-2_5G-10E.config.trunk.AlsMode	Disabled		
MXP-2_5G-10E.config.trunk.AlsRecoveryPulseDuration	100		
MXP-2_5G-10E.config.trunk.AlsRecoveryPulseInterval	300	200	2000
MXP-2_5G-10E.opticalthresholds.client.alarm.HighLaserBias	90		
MXP-2_5G-10E.opticalthresholds.client.alarm.HighRxPower	3		
MXP-2_5G-10E.opticalthresholds.client.alarm.HighTxPower	3		
MXP-2_5G-10E.opticalthresholds.client.alarm.LowRxPower	-21		
MXP-2_5G-10E.opticalthresholds.client.alarm.LowTxPower	-8		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.HighLaserBias	81		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.HighRxPower	2		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.HighTxPower	2		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.LowRxPower	-20		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.LowTxPower	-7		

Table D-1 MXP-2.5G-10E Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.HighRxPower	2.5		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.HighTxPower	2.5		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.HighLaserBias	98		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.HighRxPower	-7		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.HighTxPower	8		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.LowRxPower	-25		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.LowTxPower	1		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.HighTxPower	7		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.LowTxPower	2		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.HighTxPower	7		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.LowTxPower	2		
MXP-2_5G-10E.otn.fecthresholds.enhanced.15min.BitErrorsCorrected	903330	0	9033621811200
MXP-2_5G-10E.otn.fecthresholds.enhanced.15min.UncorrectableWords	5	0	4724697600
MXP-2_5G-10E.otn.fecthresholds.enhanced.1day.BitErrorsCorrected	86719680	0	867227693875200
MXP-2_5G-10E.otn.fecthresholds.enhanced.1day.UncorrectableWords	480	0	453570969600
MXP-2_5G-10E.otn.fecthresholds.standard.15min.BitErrorsCorrected	903330	0	9033621811200
MXP-2_5G-10E.otn.fecthresholds.standard.15min.UncorrectableWords	5	0	4724697600
MXP-2_5G-10E.otn.fecthresholds.standard.1day.BitErrorsCorrected	86719680	0	867227693875200
MXP-2_5G-10E.otn.fecthresholds.standard.1day.UncorrectableWords	480	0	453570969600
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.BBE	85040	0	8850600
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.ES	87	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.FC	10	0	72
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.SES	1	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.BBE	850400	0	849657600

Table D-1 MXP-2.5G-10E Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.BBE	85040	0	8850600
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.BBE	850400	0	849657600
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.ES	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.FC	10	0	72
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.SES	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
MXP-2_5G-10E.otn.otnLines.AsynchSynchMapping	ODU Multiplex		
MXP-2_5G-10E.otn.otnLines.FEC	Standard		

Table D-1 MXP-2.5G-10E Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.otn.otnLines.G709OTN	TRUE		
MXP-2_5G-10E.otn.otnLines.SDBER	1e-007		
MXP-2_5G-10E.pmthresholds.client.line.farend.15min.CV	21260	0	2212200
MXP-2_5G-10E.pmthresholds.client.line.farend.15min.ES	87	0	900
MXP-2_5G-10E.pmthresholds.client.line.farend.15min.FC	10	0	72
MXP-2_5G-10E.pmthresholds.client.line.farend.15min.SES	1	0	900
MXP-2_5G-10E.pmthresholds.client.line.farend.15min.UAS	3	0	900
MXP-2_5G-10E.pmthresholds.client.line.farend.1day.CV	212600	0	212371200
MXP-2_5G-10E.pmthresholds.client.line.farend.1day.ES	864	0	86400
MXP-2_5G-10E.pmthresholds.client.line.farend.1day.FC	40	0	6912
MXP-2_5G-10E.pmthresholds.client.line.farend.1day.SES	4	0	86400
MXP-2_5G-10E.pmthresholds.client.line.farend.1day.UAS	10	0	86400
MXP-2_5G-10E.pmthresholds.client.line.nearend.15min.CV	21260	0	2212200
MXP-2_5G-10E.pmthresholds.client.line.nearend.15min.ES	87	0	900
MXP-2_5G-10E.pmthresholds.client.line.nearend.15min.FC	10	0	72
MXP-2_5G-10E.pmthresholds.client.line.nearend.15min.SES	1	0	900
MXP-2_5G-10E.pmthresholds.client.line.nearend.15min.UAS	3	0	900
MXP-2_5G-10E.pmthresholds.client.line.nearend.1day.CV	212600	0	212371200
MXP-2_5G-10E.pmthresholds.client.line.nearend.1day.ES	864	0	86400
MXP-2_5G-10E.pmthresholds.client.line.nearend.1day.FC	40	0	6912
MXP-2_5G-10E.pmthresholds.client.line.nearend.1day.SES	4	0	86400
MXP-2_5G-10E.pmthresholds.client.line.nearend.1day.UAS	10	0	86400
MXP-2_5G-10E.pmthresholds.client.section.nearend.15min.CV	10000	0	2151900
MXP-2_5G-10E.pmthresholds.client.section.nearend.15min.ES	500	0	900
MXP-2_5G-10E.pmthresholds.client.section.nearend.15min.SEFS	500	0	900
MXP-2_5G-10E.pmthresholds.client.section.nearend.15min.SES	500	0	900
MXP-2_5G-10E.pmthresholds.client.section.nearend.1day.CV	100000	0	206582400
MXP-2_5G-10E.pmthresholds.client.section.nearend.1day.ES	5000	0	86400
MXP-2_5G-10E.pmthresholds.client.section.nearend.1day.SEFS	5000	0	86400
MXP-2_5G-10E.pmthresholds.client.section.nearend.1day.SES	5000	0	86400

D.2.1.2 MXP-2.5G-10G Card Default Settings

Table D-2 lists the MXP-2.5G-10G card default settings.

Table D-2 MXP-2.5G-10G Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.config.client.AINSSoakTime	0.33333333333		
MXP-2_5G-10G.config.client.AlsMode	Disabled		
MXP-2_5G-10G.config.client.AlsRecoveryPulseDuration	4		
MXP-2_5G-10G.config.client.AlsRecoveryPulseInterval	100	60	300
MXP-2_5G-10G.config.client.SDBER	1e-007		
MXP-2_5G-10G.config.client.SFBER	0.0001		
MXP-2_5G-10G.config.client.SendDoNotUse	FALSE		
MXP-2_5G-10G.config.client.SyncMsgIn	TRUE		
MXP-2_5G-10G.config.client.TerminationMode	Transparent		
MXP-2_5G-10G.config.client.ppmPortAssignment	OC48_PORT		
MXP-2_5G-10G.config.client.ppmSlotAssignment	UNASSIGNED		
MXP-2_5G-10G.config.trunk.AINSSoakTime	0.33333333333		
MXP-2_5G-10G.config.trunk.AlsMode	Disabled		
MXP-2_5G-10G.config.trunk.AlsRecoveryPulseDuration	4		
MXP-2_5G-10G.config.trunk.AlsRecoveryPulseInterval	100	60	300
MXP-2_5G-10G.opticalthresholds.client.alarm.HighLaserBias	90		
MXP-2_5G-10G.opticalthresholds.client.alarm.HighRxPower	3		
MXP-2_5G-10G.opticalthresholds.client.alarm.HighTxPower	3		
MXP-2_5G-10G.opticalthresholds.client.alarm.LowRxPower	-21		
MXP-2_5G-10G.opticalthresholds.client.alarm.LowTxPower	-8		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.HighLaserBias	81		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.HighRxPower	2		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.HighTxPower	2		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.LowRxPower	-20		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.LowTxPower	-7		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.HighLaserBias	90		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.HighRxPower	-7		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.HighTxPower	4		

Table D-2 MXP-2.5G-10G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.opticalthresholds.trunk.alarm.LowRxPower	-25		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.LowTxPower	2		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.HighLaserBias	81		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.HighTxPower	3.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.LowTxPower	2.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.HighLaserBias	85.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.HighTxPower	3.7		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.LowTxPower	2.3		
MXP-2_5G-10G.otn.fecthresholds.standard.15min.BitErrorsCorrected	903330	0	9033621811200
MXP-2_5G-10G.otn.fecthresholds.standard.15min.UncorrectableWords	5	0	4724697600
MXP-2_5G-10G.otn.fecthresholds.standard.1day.BitErrorsCorrected	86719680	0	867227693875200
MXP-2_5G-10G.otn.fecthresholds.standard.1day.UncorrectableWords	480	0	453570969600
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.BBE	85040	0	8850600
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.ES	87	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.FC	10	0	72
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.SES	1	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.BBE	850400	0	849657600
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.BBE	85040	0	8850600
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.BBE	850400	0	849657600
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400

Table D-2 MXP-2.5G-10G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.ES	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.FC	10	0	72
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.SES	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
MXP-2_5G-10G.otn.otnLines.FEC	Standard		
MXP-2_5G-10G.otn.otnLines.G709OTN	TRUE		
MXP-2_5G-10G.otn.otnLines.SDBER	1e-007		
MXP-2_5G-10G.pmthresholds.client.line.farend.15min.CV	21260	0	2212200
MXP-2_5G-10G.pmthresholds.client.line.farend.15min.ES	87	0	900
MXP-2_5G-10G.pmthresholds.client.line.farend.15min.FC	10	0	72
MXP-2_5G-10G.pmthresholds.client.line.farend.15min.SES	1	0	900
MXP-2_5G-10G.pmthresholds.client.line.farend.15min.UAS	3	0	900
MXP-2_5G-10G.pmthresholds.client.line.farend.1day.CV	212600	0	212371200
MXP-2_5G-10G.pmthresholds.client.line.farend.1day.ES	864	0	86400
MXP-2_5G-10G.pmthresholds.client.line.farend.1day.FC	40	0	6912
MXP-2_5G-10G.pmthresholds.client.line.farend.1day.SES	4	0	86400
MXP-2_5G-10G.pmthresholds.client.line.farend.1day.UAS	10	0	86400
MXP-2_5G-10G.pmthresholds.client.line.nearend.15min.CV	21260	0	2212200
MXP-2_5G-10G.pmthresholds.client.line.nearend.15min.ES	87	0	900

Table D-2 MXP-2.5G-10G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.pmthresholds.client.line.nearend.15min.FC	10	0	72
MXP-2_5G-10G.pmthresholds.client.line.nearend.15min.SES	1	0	900
MXP-2_5G-10G.pmthresholds.client.line.nearend.15min.UAS	3	0	900
MXP-2_5G-10G.pmthresholds.client.line.nearend.1day.CV	212600	0	212371200
MXP-2_5G-10G.pmthresholds.client.line.nearend.1day.ES	864	0	86400
MXP-2_5G-10G.pmthresholds.client.line.nearend.1day.FC	40	0	6912
MXP-2_5G-10G.pmthresholds.client.line.nearend.1day.SES	4	0	86400
MXP-2_5G-10G.pmthresholds.client.line.nearend.1day.UAS	10	0	86400
MXP-2_5G-10G.pmthresholds.client.section.nearend.15min.CV	10000	0	2151900
MXP-2_5G-10G.pmthresholds.client.section.nearend.15min.ES	500	0	900
MXP-2_5G-10G.pmthresholds.client.section.nearend.15min.SEFS	500	0	900
MXP-2_5G-10G.pmthresholds.client.section.nearend.15min.SES	500	0	900
MXP-2_5G-10G.pmthresholds.client.section.nearend.1day.CV	100000	0	206582400
MXP-2_5G-10G.pmthresholds.client.section.nearend.1day.ES	5000	0	86400
MXP-2_5G-10G.pmthresholds.client.section.nearend.1day.SEFS	5000	0	86400
MXP-2_5G-10G.pmthresholds.client.section.nearend.1day.SES	5000	0	86400
MXP-2_5G-10G.pmthresholds.trunk.line.farend.15min.CV	85040	0	8850600
MXP-2_5G-10G.pmthresholds.trunk.line.farend.15min.ES	87	0	900
MXP-2_5G-10G.pmthresholds.trunk.line.farend.15min.FC	10	0	72
MXP-2_5G-10G.pmthresholds.trunk.line.farend.15min.SES	1	0	900
MXP-2_5G-10G.pmthresholds.trunk.line.farend.15min.UAS	3	0	900
MXP-2_5G-10G.pmthresholds.trunk.line.farend.1day.CV	850400	0	849657600
MXP-2_5G-10G.pmthresholds.trunk.line.farend.1day.ES	864	0	86400
MXP-2_5G-10G.pmthresholds.trunk.line.farend.1day.FC	40	0	6912
MXP-2_5G-10G.pmthresholds.trunk.line.farend.1day.SES	4	0	86400
MXP-2_5G-10G.pmthresholds.trunk.line.farend.1day.UAS	10	0	86400
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.15min.CV	85040	0	8850600
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.15min.ES	87	0	900
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.15min.FC	10	0	72
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.15min.SES	1	0	900
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.15min.UAS	3	0	900
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.1day.CV	850400	0	849657600
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.1day.ES	864	0	86400
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.1day.FC	40	0	6912
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.1day.SES	4	0	86400
MXP-2_5G-10G.pmthresholds.trunk.line.nearend.1day.UAS	10	0	86400

Table D-2 MXP-2.5G-10G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.pmthresholds.trunk.section.nearend.15min.CV	10000	0	7967700
MXP-2_5G-10G.pmthresholds.trunk.section.nearend.15min.ES	500	0	900
MXP-2_5G-10G.pmthresholds.trunk.section.nearend.15min.SEFS	500	0	900
MXP-2_5G-10G.pmthresholds.trunk.section.nearend.15min.SES	500	0	900
MXP-2_5G-10G.pmthresholds.trunk.section.nearend.1day.CV	100000	0	764899200
MXP-2_5G-10G.pmthresholds.trunk.section.nearend.1day.ES	5000	0	86400
MXP-2_5G-10G.pmthresholds.trunk.section.nearend.1day.SEFS	5000	0	86400
MXP-2_5G-10G.pmthresholds.trunk.section.nearend.1day.SES	5000	0	86400

D.2.1.3 MXP-MR-2.5G Card Default Settings

Table D-3 lists the MXP-MR-2.5G card default settings.

Table D-3 MXP-MR-2.5G Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
MXP-MR-2_5G.config.client.AlsMode	Disabled		
MXP-MR-2_5G.config.client.AlsRecoveryPulseDuration	4		
MXP-MR-2_5G.config.client.AlsRecoveryPulseInterval	100	60	300
MXP-MR-2_5G.config.client.ppmPortAssignment	UNASSIGNED		
MXP-MR-2_5G.config.client.ppmSlotAssignment	UNASSIGNED		
MXP-MR-2_5G.config.fc.distanceExtension.AutoDetect	TRUE		
MXP-MR-2_5G.config.fc.distanceExtension.AutoadjustGFPBufferThreshold	TRUE		
MXP-MR-2_5G.config.fc.distanceExtension.Enabled	TRUE		
MXP-MR-2_5G.config.fc.distanceExtension.NumCredits	32	2	256
MXP-MR-2_5G.config.fc.distanceExtension.NumGFPBuffers	16		
MXP-MR-2_5G.config.fc.enhancedFibreChannelFicon.MaxFrameSize	2148		
MXP-MR-2_5G.config.trunk.AINSSoakTime	0.33333333333		
MXP-MR-2_5G.config.trunk.AlsMode	Disabled		
MXP-MR-2_5G.config.trunk.AlsRecoveryPulseDuration	4		
MXP-MR-2_5G.config.trunk.AlsRecoveryPulseInterval	100	60	300
MXP-MR-2_5G.config.trunk.SDBER	1e-007		
MXP-MR-2_5G.config.trunk.SFBER	0.0001		
MXP-MR-2_5G.config.trunk.SendDoNotUse	FALSE		
MXP-MR-2_5G.config.trunk.SyncMsgIn	TRUE		
MXP-MR-2_5G.opticalthresholds.client.alarm.HighLaserBias	90		
MXP-MR-2_5G.opticalthresholds.client.alarm.HighRxPower	3		

Table D-3 MXP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-MR-2_5G.opticalthresholds.client.alarm.HighTxPower	3		
MXP-MR-2_5G.opticalthresholds.client.alarm.LowRxPower	-21		
MXP-MR-2_5G.opticalthresholds.client.alarm.LowTxPower	-8		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.HighLaserBias	81		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.HighRxPower	2		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.HighTxPower	2		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.LowRxPower	-20		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.LowTxPower	-7		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.HighLaserBias	98		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.HighRxPower	-7		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.HighTxPower	30		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.LowRxPower	-25		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.LowTxPower	-40		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighTxPower	30		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowTxPower	-40		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighTxPower	30		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowTxPower	-40		
MXP-MR-2_5G.pmthresholds.trunk.line.farend.15min.CV	21260	0	2212200
MXP-MR-2_5G.pmthresholds.trunk.line.farend.15min.ES	87	0	900
MXP-MR-2_5G.pmthresholds.trunk.line.farend.15min.FC	10	0	72
MXP-MR-2_5G.pmthresholds.trunk.line.farend.15min.SES	1	0	900
MXP-MR-2_5G.pmthresholds.trunk.line.farend.15min.UAS	3	0	900
MXP-MR-2_5G.pmthresholds.trunk.line.farend.1day.CV	212600	0	212371200
MXP-MR-2_5G.pmthresholds.trunk.line.farend.1day.ES	864	0	86400

Table D-3 MXP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-MR-2_5G.pmthresholds.trunk.line.farend.1day.FC	40	0	6912
MXP-MR-2_5G.pmthresholds.trunk.line.farend.1day.SES	4	0	86400
MXP-MR-2_5G.pmthresholds.trunk.line.farend.1day.UAS	10	0	86400
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.CV	21260	0	2212200
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.ES	87	0	900
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.FC	10	0	72
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.SES	1	0	900
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.UAS	3	0	900
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.CV	212600	0	212371200
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.ES	864	0	86400
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.FC	40	0	6912
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.SES	4	0	86400
MXP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.UAS	10	0	86400
MXP-MR-2_5G.pmthresholds.trunk.section.nearend.15min.CV	10000	0	2151900
MXP-MR-2_5G.pmthresholds.trunk.section.nearend.15min.ES	500	0	900
MXP-MR-2_5G.pmthresholds.trunk.section.nearend.15min.SEFS	500	0	900
MXP-MR-2_5G.pmthresholds.trunk.section.nearend.15min.SES	500	0	900
MXP-MR-2_5G.pmthresholds.trunk.section.nearend.1day.CV	100000	0	206582400
MXP-MR-2_5G.pmthresholds.trunk.section.nearend.1day.ES	5000	0	86400
MXP-MR-2_5G.pmthresholds.trunk.section.nearend.1day.SEFS	5000	0	86400
MXP-MR-2_5G.pmthresholds.trunk.section.nearend.1day.SES	5000	0	86400

D.2.1.4 MXPP-MR-2.5G Card Default Settings

Table D-4 lists the MXPP-MR-2.5G card default settings.

Table D-4 MXPP-MR-2.5G Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
MXPP-MR-2_5G.config.client.AlsMode	Disabled		
MXPP-MR-2_5G.config.client.AlsRecoveryPulseDuration	4		
MXPP-MR-2_5G.config.client.AlsRecoveryPulseInterval	100	60	300
MXPP-MR-2_5G.config.client.ppmPortAssignment	UNASSIGNED		
MXPP-MR-2_5G.config.client.ppmSlotAssignment	UNASSIGNED		
MXPP-MR-2_5G.config.fc.distanceExtension.AutoDetect	TRUE		
MXPP-MR-2_5G.config.fc.distanceExtension.AutoadjustGFPBufferThreshold	TRUE		
MXPP-MR-2_5G.config.fc.distanceExtension.Enabled	TRUE		

Table D-4 MXPP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXPP-MR-2_5G.config.fc.distanceExtension.NumCredits	32	2	256
MXPP-MR-2_5G.config.fc.distanceExtension.NumGFPBuffers	16		
MXPP-MR-2_5G.config.fc.enhancedFibreChannelFicon.MaxFrameSize	2148		
MXPP-MR-2_5G.config.trunk.AINSSoakTime	0.33333333333		
MXPP-MR-2_5G.config.trunk.AlsMode	Disabled		
MXPP-MR-2_5G.config.trunk.AlsRecoveryPulseDuration	4		
MXPP-MR-2_5G.config.trunk.AlsRecoveryPulseInterval	100	60	300
MXPP-MR-2_5G.config.trunk.SDBER	1e-007		
MXPP-MR-2_5G.config.trunk.SFBER	0.0001		
MXPP-MR-2_5G.opticalthresholds.client.alarm.HighLaserBias	90		
MXPP-MR-2_5G.opticalthresholds.client.alarm.HighRxPower	3		
MXPP-MR-2_5G.opticalthresholds.client.alarm.HighTxPower	3		
MXPP-MR-2_5G.opticalthresholds.client.alarm.LowRxPower	-21		
MXPP-MR-2_5G.opticalthresholds.client.alarm.LowTxPower	-8		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighLaserBias	81		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighRxPower	2		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighTxPower	2		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.LowRxPower	-20		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.LowTxPower	-7		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighLaserBias	98		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighRxPower	-7		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighTxPower	30		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.LowRxPower	-25		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.LowTxPower	-40		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighTxPower	30		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowTxPower	-40		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		

Table D-4 MXPP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighTxPower	30		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowTxPower	-40		
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.15min.CV	21260	0	2212200
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.15min.ES	87	0	900
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.15min.FC	10	0	72
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.15min.SES	1	0	900
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.15min.UAS	3	0	900
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.1day.CV	212600	0	212371200
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.1day.ES	864	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.1day.FC	40	0	6912
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.1day.SES	4	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.line.farend.1day.UAS	10	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.CV	21260	0	2212200
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.ES	87	0	900
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.FC	10	0	72
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.SES	1	0	900
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.15min.UAS	3	0	900
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.CV	212600	0	212371200
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.ES	864	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.FC	40	0	6912
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.SES	4	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.line.nearend.1day.UAS	10	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.section.nearend.15min.CV	10000	0	2151900
MXPP-MR-2_5G.pmthresholds.trunk.section.nearend.15min.ES	500	0	900
MXPP-MR-2_5G.pmthresholds.trunk.section.nearend.15min.SEFS	500	0	900
MXPP-MR-2_5G.pmthresholds.trunk.section.nearend.15min.SES	500	0	900
MXPP-MR-2_5G.pmthresholds.trunk.section.nearend.1day.CV	100000	0	206582400
MXPP-MR-2_5G.pmthresholds.trunk.section.nearend.1day.ES	5000	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.section.nearend.1day.SEFS	5000	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.section.nearend.1day.SES	5000	0	86400

D.2.1.5 TXP-MR-10E Card Default Settings

Table D-5 lists the TXP-MR-10E card default settings.

Table D-5 TXP-MR-10E Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.config.client.AINSSoakTime	0.33333333333		
TXP-MR-10E.config.client.AisSquelchMode	Squelch		
TXP-MR-10E.config.client.AlsMode	Disabled		
TXP-MR-10E.config.client.AlsRecoveryPulseDuration	2		
TXP-MR-10E.config.client.AlsRecoveryPulseInterval	100	100	2000
TXP-MR-10E.config.client.SDBER	1e-007		
TXP-MR-10E.config.client.SFBER	0.0001		
TXP-MR-10E.config.client.SendDoNotUse	FALSE		
TXP-MR-10E.config.client.SyncMsgIn	TRUE		
TXP-MR-10E.config.client.TerminationMode	Transparent		
TXP-MR-10E.config.client.ppmPortAssignment	UNASSIGNED		
TXP-MR-10E.config.client.ppmSlotAssignment	UNASSIGNED		
TXP-MR-10E.config.trunk.AINSSoakTime	0.33333333333		
TXP-MR-10E.config.trunk.AlsMode	Disabled		
TXP-MR-10E.config.trunk.AlsRecoveryPulseDuration	100		
TXP-MR-10E.config.trunk.AlsRecoveryPulseInterval	300	200	2000
TXP-MR-10E.config.trunk.SDBER	1e-007		
TXP-MR-10E.config.trunk.SFBER	0.0001		
TXP-MR-10E.opticalthresholds.client.alarm.HighLaserBias	90		
TXP-MR-10E.opticalthresholds.client.alarm.HighRxPower	2		
TXP-MR-10E.opticalthresholds.client.alarm.HighTxPower	2		
TXP-MR-10E.opticalthresholds.client.alarm.LowRxPower	-17		
TXP-MR-10E.opticalthresholds.client.alarm.LowTxPower	-9		
TXP-MR-10E.opticalthresholds.client.warning.15min.HighLaserBias	81		
TXP-MR-10E.opticalthresholds.client.warning.15min.HighRxPower	1		
TXP-MR-10E.opticalthresholds.client.warning.15min.HighTxPower	1		
TXP-MR-10E.opticalthresholds.client.warning.15min.LowRxPower	-16		
TXP-MR-10E.opticalthresholds.client.warning.15min.LowTxPower	-8		
TXP-MR-10E.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
TXP-MR-10E.opticalthresholds.client.warning.1day.HighRxPower	1.5		
TXP-MR-10E.opticalthresholds.client.warning.1day.HighTxPower	1.5		
TXP-MR-10E.opticalthresholds.client.warning.1day.LowRxPower	-16.5		
TXP-MR-10E.opticalthresholds.client.warning.1day.LowTxPower	-8.5		
TXP-MR-10E.opticalthresholds.trunk.alarm.HighLaserBias	98		
TXP-MR-10E.opticalthresholds.trunk.alarm.HighRxPower	-7		
TXP-MR-10E.opticalthresholds.trunk.alarm.HighTxPower	8		

Table D-5 TXP-MR-10E Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.opticalthresholds.trunk.alarm.LowRxPower	-25		
TXP-MR-10E.opticalthresholds.trunk.alarm.LowTxPower	1		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.HighTxPower	7		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.LowTxPower	2		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.HighTxPower	7		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.LowTxPower	2		
TXP-MR-10E.otn.fecthresholds.enhanced.15min.BitErrorsCorrected	903330	0	9033621811200
TXP-MR-10E.otn.fecthresholds.enhanced.15min.UncorrectableWords	5	0	4724697600
TXP-MR-10E.otn.fecthresholds.enhanced.1day.BitErrorsCorrected	86719680	0	867227693875200
TXP-MR-10E.otn.fecthresholds.enhanced.1day.UncorrectableWords	480	0	453570969600
TXP-MR-10E.otn.fecthresholds.standard.15min.BitErrorsCorrected	903330	0	9033621811200
TXP-MR-10E.otn.fecthresholds.standard.15min.UncorrectableWords	5	0	4724697600
TXP-MR-10E.otn.fecthresholds.standard.1day.BitErrorsCorrected	86719680	0	867227693875200
TXP-MR-10E.otn.fecthresholds.standard.1day.UncorrectableWords	480	0	453570969600
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.BBE	85040	0	8850600
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.ES	87	0	900
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.FC	10	0	72
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.SES	1	0	900
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.BBE	850400	0	849657600
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.BBE	85040	0	8850600
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.SES	1	0	900

Table D-5 TXP-MR-10E Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.BBE	850400	0	849657600
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.ES	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.FC	10	0	72
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.SES	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
TXP-MR-10E.otn.otnLines.AsynchSynchMapping	Synch Mapping		
TXP-MR-10E.otn.otnLines.FEC	Standard		
TXP-MR-10E.otn.otnLines.G709OTN	TRUE		
TXP-MR-10E.otn.otnLines.SDBER	1e-007		
TXP-MR-10E.pmthresholds.client.line.farend.15min.CV	85040	0	8850600
TXP-MR-10E.pmthresholds.client.line.farend.15min.ES	87	0	900
TXP-MR-10E.pmthresholds.client.line.farend.15min.FC	10	0	72
TXP-MR-10E.pmthresholds.client.line.farend.15min.SES	1	0	900
TXP-MR-10E.pmthresholds.client.line.farend.15min.UAS	3	0	900
TXP-MR-10E.pmthresholds.client.line.farend.1day.CV	850400	0	849657600

Table D-5 TXP-MR-10E Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.pmthresholds.client.line.farend.1day.ES	864	0	86400
TXP-MR-10E.pmthresholds.client.line.farend.1day.FC	40	0	6912
TXP-MR-10E.pmthresholds.client.line.farend.1day.SES	4	0	86400
TXP-MR-10E.pmthresholds.client.line.farend.1day.UAS	10	0	86400
TXP-MR-10E.pmthresholds.client.line.nearend.15min.CV	85040	0	8850600
TXP-MR-10E.pmthresholds.client.line.nearend.15min.ES	87	0	900
TXP-MR-10E.pmthresholds.client.line.nearend.15min.FC	10	0	72
TXP-MR-10E.pmthresholds.client.line.nearend.15min.SES	1	0	900
TXP-MR-10E.pmthresholds.client.line.nearend.15min.UAS	3	0	900
TXP-MR-10E.pmthresholds.client.line.nearend.1day.CV	850400	0	849657600
TXP-MR-10E.pmthresholds.client.line.nearend.1day.ES	864	0	86400
TXP-MR-10E.pmthresholds.client.line.nearend.1day.FC	40	0	6912
TXP-MR-10E.pmthresholds.client.line.nearend.1day.SES	4	0	86400
TXP-MR-10E.pmthresholds.client.line.nearend.1day.UAS	10	0	86400
TXP-MR-10E.pmthresholds.client.section.nearend.15min.CV	10000	0	7967700
TXP-MR-10E.pmthresholds.client.section.nearend.15min.ES	500	0	900
TXP-MR-10E.pmthresholds.client.section.nearend.15min.SEFS	500	0	900
TXP-MR-10E.pmthresholds.client.section.nearend.15min.SES	500	0	900
TXP-MR-10E.pmthresholds.client.section.nearend.1day.CV	100000	0	764899200
TXP-MR-10E.pmthresholds.client.section.nearend.1day.ES	5000	0	86400
TXP-MR-10E.pmthresholds.client.section.nearend.1day.SEFS	5000	0	86400
TXP-MR-10E.pmthresholds.client.section.nearend.1day.SES	5000	0	86400
TXP-MR-10E.pmthresholds.trunk.line.farend.15min.CV	85040	0	8850600
TXP-MR-10E.pmthresholds.trunk.line.farend.15min.ES	87	0	900
TXP-MR-10E.pmthresholds.trunk.line.farend.15min.FC	10	0	72
TXP-MR-10E.pmthresholds.trunk.line.farend.15min.SES	1	0	900
TXP-MR-10E.pmthresholds.trunk.line.farend.15min.UAS	3	0	900
TXP-MR-10E.pmthresholds.trunk.line.farend.1day.CV	850400	0	849657600
TXP-MR-10E.pmthresholds.trunk.line.farend.1day.ES	864	0	86400
TXP-MR-10E.pmthresholds.trunk.line.farend.1day.FC	40	0	6912
TXP-MR-10E.pmthresholds.trunk.line.farend.1day.SES	4	0	86400
TXP-MR-10E.pmthresholds.trunk.line.farend.1day.UAS	10	0	86400
TXP-MR-10E.pmthresholds.trunk.line.nearend.15min.CV	85040	0	8850600
TXP-MR-10E.pmthresholds.trunk.line.nearend.15min.ES	87	0	900
TXP-MR-10E.pmthresholds.trunk.line.nearend.15min.FC	10	0	72
TXP-MR-10E.pmthresholds.trunk.line.nearend.15min.SES	1	0	900

Table D-5 TXP-MR-10E Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.pmthresholds.trunk.line.nearend.15min.UAS	3	0	900
TXP-MR-10E.pmthresholds.trunk.line.nearend.1day.CV	850400	0	849657600
TXP-MR-10E.pmthresholds.trunk.line.nearend.1day.ES	864	0	86400
TXP-MR-10E.pmthresholds.trunk.line.nearend.1day.FC	40	0	6912
TXP-MR-10E.pmthresholds.trunk.line.nearend.1day.SES	4	0	86400
TXP-MR-10E.pmthresholds.trunk.line.nearend.1day.UAS	10	0	86400
TXP-MR-10E.pmthresholds.trunk.section.nearend.15min.CV	10000	0	7967700
TXP-MR-10E.pmthresholds.trunk.section.nearend.15min.ES	500	0	900
TXP-MR-10E.pmthresholds.trunk.section.nearend.15min.SEFS	500	0	900
TXP-MR-10E.pmthresholds.trunk.section.nearend.15min.SES	500	0	900
TXP-MR-10E.pmthresholds.trunk.section.nearend.1day.CV	100000	0	764899200
TXP-MR-10E.pmthresholds.trunk.section.nearend.1day.ES	5000	0	86400
TXP-MR-10E.pmthresholds.trunk.section.nearend.1day.SEFS	5000	0	86400
TXP-MR-10E.pmthresholds.trunk.section.nearend.1day.SES	5000	0	86400

D.2.1.6 TXP_MR_10G Card Default Settings

Table D-6 lists the TXP_MR_10G card default settings.

Table D-6 TXP_MR_10G Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.config.client.AINSSoakTime	0.33333333333		
TXP-MR-10G.config.client.AlsMode	Disabled		
TXP-MR-10G.config.client.AlsRecoveryPulseDuration	4		
TXP-MR-10G.config.client.AlsRecoveryPulseInterval	100	60	300
TXP-MR-10G.config.client.SDBER	1e-007		
TXP-MR-10G.config.client.SFBER	0.0001		
TXP-MR-10G.config.client.TerminationMode	Transparent		
TXP-MR-10G.config.client.mrPortAssignment	UNASSIGNED		
TXP-MR-10G.config.trunk.AINSSoakTime	0.33333333333		
TXP-MR-10G.config.trunk.AlsMode	Disabled		
TXP-MR-10G.config.trunk.AlsRecoveryPulseDuration	4		
TXP-MR-10G.config.trunk.AlsRecoveryPulseInterval	100	60	300
TXP-MR-10G.config.trunk.SDBER	1e-007		
TXP-MR-10G.config.trunk.SFBER	0.0001		
TXP-MR-10G.opticalthresholds.client.alarm.HighLaserBias	90		
TXP-MR-10G.opticalthresholds.client.alarm.HighRxPower	2		

Table D-6 TXP_MR_10G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.opticalthresholds.client.alarm.HighTxPower	2		
TXP-MR-10G.opticalthresholds.client.alarm.LowRxPower	-17		
TXP-MR-10G.opticalthresholds.client.alarm.LowTxPower	-9		
TXP-MR-10G.opticalthresholds.client.warning.15min.HighLaserBias	81		
TXP-MR-10G.opticalthresholds.client.warning.15min.HighRxPower	1		
TXP-MR-10G.opticalthresholds.client.warning.15min.HighTxPower	1		
TXP-MR-10G.opticalthresholds.client.warning.15min.LowRxPower	-16		
TXP-MR-10G.opticalthresholds.client.warning.15min.LowTxPower	-8		
TXP-MR-10G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
TXP-MR-10G.opticalthresholds.client.warning.1day.HighRxPower	1.5		
TXP-MR-10G.opticalthresholds.client.warning.1day.HighTxPower	1.5		
TXP-MR-10G.opticalthresholds.client.warning.1day.LowRxPower	-16.5		
TXP-MR-10G.opticalthresholds.client.warning.1day.LowTxPower	-8.5		
TXP-MR-10G.opticalthresholds.trunk.alarm.HighLaserBias	90		
TXP-MR-10G.opticalthresholds.trunk.alarm.HighRxPower	-7		
TXP-MR-10G.opticalthresholds.trunk.alarm.HighTxPower	4		
TXP-MR-10G.opticalthresholds.trunk.alarm.LowRxPower	-25		
TXP-MR-10G.opticalthresholds.trunk.alarm.LowTxPower	2		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.HighLaserBias	81		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.HighTxPower	3.5		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.LowTxPower	2.5		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.HighLaserBias	85.5		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.HighTxPower	3.7		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.LowTxPower	2.3		
TXP-MR-10G.otn.fecthresholds.standard.15min.BitErrorsCorrected	903330	0	9033621811200
TXP-MR-10G.otn.fecthresholds.standard.15min.UncorrectableWords	5	0	4724697600
TXP-MR-10G.otn.fecthresholds.standard.1day.BitErrorsCorrected	86719680	0	867227693875200
TXP-MR-10G.otn.fecthresholds.standard.1day.UncorrectableWords	480	0	453570969600
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.BBE	85040	0	8850600
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.ES	87	0	900
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.FC	10	0	72

Table D-6 TXP_MR_10G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.SES	1	0	900
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.BBE	850400	0	849657600
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.BBE	85040	0	8850600
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.BBE	850400	0	849657600
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.ES	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.FC	10	0	72
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.SES	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400

Table D-6 TXP_MR_10G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
TXP-MR-10G.otn.otnLines.FEC	Enable		
TXP-MR-10G.otn.otnLines.G709OTN	TRUE		
TXP-MR-10G.otn.otnLines.SDBER	1e-007		
TXP-MR-10G.pmthresholds.client.line.farend.15min.CV	85040	0	8850600
TXP-MR-10G.pmthresholds.client.line.farend.15min.ES	87	0	900
TXP-MR-10G.pmthresholds.client.line.farend.15min.FC	10	0	72
TXP-MR-10G.pmthresholds.client.line.farend.15min.SES	1	0	900
TXP-MR-10G.pmthresholds.client.line.farend.15min.UAS	3	0	900
TXP-MR-10G.pmthresholds.client.line.farend.1day.CV	850400	0	849657600
TXP-MR-10G.pmthresholds.client.line.farend.1day.ES	864	0	86400
TXP-MR-10G.pmthresholds.client.line.farend.1day.FC	40	0	6912
TXP-MR-10G.pmthresholds.client.line.farend.1day.SES	4	0	86400
TXP-MR-10G.pmthresholds.client.line.farend.1day.UAS	10	0	86400
TXP-MR-10G.pmthresholds.client.line.nearend.15min.CV	85040	0	8850600
TXP-MR-10G.pmthresholds.client.line.nearend.15min.ES	87	0	900
TXP-MR-10G.pmthresholds.client.line.nearend.15min.FC	10	0	72
TXP-MR-10G.pmthresholds.client.line.nearend.15min.SES	1	0	900
TXP-MR-10G.pmthresholds.client.line.nearend.15min.UAS	3	0	900
TXP-MR-10G.pmthresholds.client.line.nearend.1day.CV	850400	0	849657600
TXP-MR-10G.pmthresholds.client.line.nearend.1day.ES	864	0	86400
TXP-MR-10G.pmthresholds.client.line.nearend.1day.FC	40	0	6912
TXP-MR-10G.pmthresholds.client.line.nearend.1day.SES	4	0	86400
TXP-MR-10G.pmthresholds.client.line.nearend.1day.UAS	10	0	86400
TXP-MR-10G.pmthresholds.client.section.nearend.15min.CV	10000	0	7967700
TXP-MR-10G.pmthresholds.client.section.nearend.15min.ES	500	0	900
TXP-MR-10G.pmthresholds.client.section.nearend.15min.SEFS	500	0	900
TXP-MR-10G.pmthresholds.client.section.nearend.15min.SES	500	0	900
TXP-MR-10G.pmthresholds.client.section.nearend.1day.CV	100000	0	764899200
TXP-MR-10G.pmthresholds.client.section.nearend.1day.ES	5000	0	86400
TXP-MR-10G.pmthresholds.client.section.nearend.1day.SEFS	5000	0	86400
TXP-MR-10G.pmthresholds.client.section.nearend.1day.SES	5000	0	86400
TXP-MR-10G.pmthresholds.trunk.line.farend.15min.CV	85040	0	8850600
TXP-MR-10G.pmthresholds.trunk.line.farend.15min.ES	87	0	900
TXP-MR-10G.pmthresholds.trunk.line.farend.15min.FC	10	0	72
TXP-MR-10G.pmthresholds.trunk.line.farend.15min.SES	1	0	900

Table D-6 TXP_MR_10G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.pmthresholds.trunk.line.farend.15min.UAS	3	0	900
TXP-MR-10G.pmthresholds.trunk.line.farend.1day.CV	850400	0	849657600
TXP-MR-10G.pmthresholds.trunk.line.farend.1day.ES	864	0	86400
TXP-MR-10G.pmthresholds.trunk.line.farend.1day.FC	40	0	6912
TXP-MR-10G.pmthresholds.trunk.line.farend.1day.SES	4	0	86400
TXP-MR-10G.pmthresholds.trunk.line.farend.1day.UAS	10	0	86400
TXP-MR-10G.pmthresholds.trunk.line.nearend.15min.CV	85040	0	8850600
TXP-MR-10G.pmthresholds.trunk.line.nearend.15min.ES	87	0	900
TXP-MR-10G.pmthresholds.trunk.line.nearend.15min.FC	10	0	72
TXP-MR-10G.pmthresholds.trunk.line.nearend.15min.SES	1	0	900
TXP-MR-10G.pmthresholds.trunk.line.nearend.15min.UAS	3	0	900
TXP-MR-10G.pmthresholds.trunk.line.nearend.1day.CV	850400	0	849657600
TXP-MR-10G.pmthresholds.trunk.line.nearend.1day.ES	864	0	86400
TXP-MR-10G.pmthresholds.trunk.line.nearend.1day.FC	40	0	6912
TXP-MR-10G.pmthresholds.trunk.line.nearend.1day.SES	4	0	86400
TXP-MR-10G.pmthresholds.trunk.line.nearend.1day.UAS	10	0	86400
TXP-MR-10G.pmthresholds.trunk.section.nearend.15min.CV	10000	0	7967700
TXP-MR-10G.pmthresholds.trunk.section.nearend.15min.ES	500	0	900
TXP-MR-10G.pmthresholds.trunk.section.nearend.15min.SEFS	500	0	900
TXP-MR-10G.pmthresholds.trunk.section.nearend.15min.SES	500	0	900
TXP-MR-10G.pmthresholds.trunk.section.nearend.1day.CV	100000	0	764899200
TXP-MR-10G.pmthresholds.trunk.section.nearend.1day.ES	5000	0	86400
TXP-MR-10G.pmthresholds.trunk.section.nearend.1day.SEFS	5000	0	86400
TXP-MR-10G.pmthresholds.trunk.section.nearend.1day.SES	5000	0	86400

D.2.1.7 TXP-MR-2.5G Card Default Settings

Table D-7 lists the TXP-MR-2.5G card default settings.

Table D-7 TXP-MR-2.5G Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.config.client.AINSSoakTime	0.33333333333		
TXP-MR-2_5G.config.client.AlsMode	Disabled		
TXP-MR-2_5G.config.client.AlsRecoveryPulseDuration	40		
TXP-MR-2_5G.config.client.AlsRecoveryPulseInterval	100	60	300
TXP-MR-2_5G.config.client.SDBER	1e-007		

Table D-7 TXP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.config.client.SFBER	0.0001		
TXP-MR-2_5G.config.client.TerminationMode	Transparent		
TXP-MR-2_5G.config.client.ppmPortAssignment	UNASSIGNED		
TXP-MR-2_5G.config.client.ppmSlotAssignment	UNASSIGNED		
TXP-MR-2_5G.config.trunk.AINSSoakTime	0.33333333333		
TXP-MR-2_5G.config.trunk.AlsMode	Disabled		
TXP-MR-2_5G.config.trunk.AlsRecoveryPulseDuration	40		
TXP-MR-2_5G.config.trunk.AlsRecoveryPulseInterval	100	60	300
TXP-MR-2_5G.config.trunk.SDBER	1e-007		
TXP-MR-2_5G.config.trunk.SFBER	0.0001		
TXP-MR-2_5G.opticalthresholds.client.alarm.HighLaserBias	90		
TXP-MR-2_5G.opticalthresholds.client.alarm.HighRxPower	3		
TXP-MR-2_5G.opticalthresholds.client.alarm.HighTxPower	3		
TXP-MR-2_5G.opticalthresholds.client.alarm.LowRxPower	-21		
TXP-MR-2_5G.opticalthresholds.client.alarm.LowTxPower	-15		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.HighLaserBias	81		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.HighRxPower	2		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.HighTxPower	2		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.LowRxPower	-20		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.LowTxPower	-7		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
TXP-MR-2_5G.opticalthresholds.trunk.alarm.HighLaserBias	98		
TXP-MR-2_5G.opticalthresholds.trunk.alarm.HighRxPower	-7		
TXP-MR-2_5G.opticalthresholds.trunk.alarm.LowRxPower	-25		
TXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
TXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
TXP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
TXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
TXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
TXP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		

Table D-7 TXP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.otn.fecthresholds.1gethernet.15min.BitErrorsCorrected	112500	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.1gethernet.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.1gethernet.1day.BitErrorsCorrected	10800000	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.1gethernet.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.1gfiberchannel.15min.BitErrorsCorrected	90000	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.1gfiberchannel.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.1gfiberchannel.1day.BitErrorsCorrected	8640000	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.1gfiberchannel.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.1gficon.15min.BitErrorsCorrected	90000	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.1gficon.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.1gficon.1day.BitErrorsCorrected	8640000	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.1gficon.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.2gfiberchannel.15min.BitErrorsCorrected	180900	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.2gfiberchannel.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.2gfiberchannel.1day.BitErrorsCorrected	17366400	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.2gfiberchannel.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.2gficon.15min.BitErrorsCorrected	180900	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.2gficon.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.2gficon.1day.BitErrorsCorrected	17366400	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.2gficon.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.oc12.15min.BitErrorsCorrected	56457	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.oc12.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.oc12.1day.BitErrorsCorrected	5419872	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.oc12.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.oc3.15min.BitErrorsCorrected	15012	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.oc3.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.oc3.1day.BitErrorsCorrected	1441152	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.oc3.1day.UncorrectableWords	96	0	453570969600

Table D-7 TXP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.otn.fecthresholds.oc48.15min.BitErrorsCorrected	225837	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.oc48.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.oc48.1day.BitErrorsCorrected	21680352	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.oc48.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.BBE	21260	0	8850600
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.ES	87	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.FC	10	0	72
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.SES	1	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.BBE	212600	0	849657600
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.BBE	21260	0	8850600
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.BBE	212600	0	849657600
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.ES	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.FC	10	0	72
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.SES	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600

Table D-7 TXP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
TXP-MR-2_5G.otn.otnLines.FEC	Enable		
TXP-MR-2_5G.otn.otnLines.G709OTN	TRUE		
TXP-MR-2_5G.otn.otnLines.SDBER	1e-007		
TXP-MR-2_5G.pmthresholds.oc12.line.farend.15min.CV	5315	0	552600
TXP-MR-2_5G.pmthresholds.oc12.line.farend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.oc12.line.farend.15min.FC	10	0	72
TXP-MR-2_5G.pmthresholds.oc12.line.farend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.oc12.line.farend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.oc12.line.farend.1day.CV	53150	0	53049600
TXP-MR-2_5G.pmthresholds.oc12.line.farend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.oc12.line.farend.1day.FC	40	0	72
TXP-MR-2_5G.pmthresholds.oc12.line.farend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.oc12.line.farend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.CV	5315	0	552600
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.FC	10	0	72
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.CV	53150	0	53049600
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.FC	40	0	6912
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.oc12.section.nearend.15min.CV	10000	0	553500
TXP-MR-2_5G.pmthresholds.oc12.section.nearend.15min.ES	500	0	900
TXP-MR-2_5G.pmthresholds.oc12.section.nearend.15min.SEFS	500	0	900
TXP-MR-2_5G.pmthresholds.oc12.section.nearend.15min.SES	500	0	900

Table D-7 TXP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.pmthresholds.oc12.section.nearend.1day.CV	100000	0	53136000
TXP-MR-2_5G.pmthresholds.oc12.section.nearend.1day.ES	5000	0	86400
TXP-MR-2_5G.pmthresholds.oc12.section.nearend.1day.SEFS	5000	0	86400
TXP-MR-2_5G.pmthresholds.oc12.section.nearend.1day.SES	5000	0	86400
TXP-MR-2_5G.pmthresholds.oc3.line.farend.15min.CV	1312	0	137700
TXP-MR-2_5G.pmthresholds.oc3.line.farend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.oc3.line.farend.15min.FC	10	0	72
TXP-MR-2_5G.pmthresholds.oc3.line.farend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.oc3.line.farend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.oc3.line.farend.1day.CV	13120	0	13219200
TXP-MR-2_5G.pmthresholds.oc3.line.farend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.oc3.line.farend.1day.FC	40	0	6912
TXP-MR-2_5G.pmthresholds.oc3.line.farend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.oc3.line.farend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.CV	1312	0	137700
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.FC	10	0	72
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.CV	13120	0	13219200
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.FC	40	0	6912
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.oc3.section.nearend.15min.CV	10000	0	138600
TXP-MR-2_5G.pmthresholds.oc3.section.nearend.15min.ES	500	0	900
TXP-MR-2_5G.pmthresholds.oc3.section.nearend.15min.SEFS	500	0	900
TXP-MR-2_5G.pmthresholds.oc3.section.nearend.15min.SES	500	0	900
TXP-MR-2_5G.pmthresholds.oc3.section.nearend.1day.CV	100000	0	13305600
TXP-MR-2_5G.pmthresholds.oc3.section.nearend.1day.ES	5000	0	86400
TXP-MR-2_5G.pmthresholds.oc3.section.nearend.1day.SEFS	5000	0	86400
TXP-MR-2_5G.pmthresholds.oc3.section.nearend.1day.SES	5000	0	86400
TXP-MR-2_5G.pmthresholds.oc48.line.farend.15min.CV	21260	0	2212200
TXP-MR-2_5G.pmthresholds.oc48.line.farend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.oc48.line.farend.15min.FC	10	0	72
TXP-MR-2_5G.pmthresholds.oc48.line.farend.15min.SES	1	0	900

Table D-7 TXP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.pmthresholds.oc48.line.farend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.oc48.line.farend.1day.CV	212600	0	212371200
TXP-MR-2_5G.pmthresholds.oc48.line.farend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.oc48.line.farend.1day.FC	40	0	6912
TXP-MR-2_5G.pmthresholds.oc48.line.farend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.oc48.line.farend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.CV	21260	0	2212200
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.FC	10	0	72
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.CV	212600	0	212371200
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.FC	40	0	6912
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.oc48.section.nearend.15min.CV	10000	0	2151900
TXP-MR-2_5G.pmthresholds.oc48.section.nearend.15min.ES	500	0	900
TXP-MR-2_5G.pmthresholds.oc48.section.nearend.15min.SEFS	500	0	900
TXP-MR-2_5G.pmthresholds.oc48.section.nearend.15min.SES	500	0	900
TXP-MR-2_5G.pmthresholds.oc48.section.nearend.1day.CV	100000	0	206582400
TXP-MR-2_5G.pmthresholds.oc48.section.nearend.1day.ES	5000	0	86400
TXP-MR-2_5G.pmthresholds.oc48.section.nearend.1day.SEFS	5000	0	86400
TXP-MR-2_5G.pmthresholds.oc48.section.nearend.1day.SES	5000	0	86400

D.2.1.8 TXPP-MR-2.5G Card Default Settings

Table D-8 lists the TTXPP-MR-2.5G card default settings.

Table D-8 TXPP-MR-2.5G Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.config.client.AINSSoakTime	0.33333333333		
TXPP-MR-2_5G.config.client.AlsMode	Disabled		
TXPP-MR-2_5G.config.client.AlsRecoveryPulseDuration	40		
TXPP-MR-2_5G.config.client.AlsRecoveryPulseInterval	100	60	300
TXPP-MR-2_5G.config.client.SDBER	1e-007		
TXPP-MR-2_5G.config.client.SFBER	0.0001		

Table D-8 TXPP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.config.client.TerminationMode	Transparent		
TXPP-MR-2_5G.config.client.ppmPortAssignment	UNASSIGNED		
TXPP-MR-2_5G.config.client.ppmSlotAssignment	UNASSIGNED		
TXPP-MR-2_5G.config.trunk.AINSSoakTime	0.33333333333		
TXPP-MR-2_5G.config.trunk.AlsMode	Disabled		
TXPP-MR-2_5G.config.trunk.AlsRecoveryPulseDuration	40		
TXPP-MR-2_5G.config.trunk.AlsRecoveryPulseInterval	100	60	300
TXPP-MR-2_5G.config.trunk.SDBER	1e-007		
TXPP-MR-2_5G.config.trunk.SFBER	0.0001		
TXPP-MR-2_5G.opticalthresholds.client.alarm.HighLaserBias	90		
TXPP-MR-2_5G.opticalthresholds.client.alarm.HighRxPower	3		
TXPP-MR-2_5G.opticalthresholds.client.alarm.HighTxPower	3		
TXPP-MR-2_5G.opticalthresholds.client.alarm.LowRxPower	-21		
TXPP-MR-2_5G.opticalthresholds.client.alarm.LowTxPower	-15		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighLaserBias	81		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighRxPower	2		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighTxPower	2		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.LowRxPower	-20		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.LowTxPower	-7		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
TXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighLaserBias	98		
TXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighRxPower	-7		
TXPP-MR-2_5G.opticalthresholds.trunk.alarm.LowRxPower	-25		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
TXPP-MR-2_5G.otn.fecthresholds.1gethernet.15min.BitErrorsCorrected	112500	0	9033621811200

Table D-8 TXPP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.otn.fecthresholds.1gethernet.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.1gethernet.1day.BitErrorsCorrected	10800000	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.1gethernet.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.1gfiberchannel.15min.BitErrorsCorrected	90000	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.1gfiberchannel.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.1gfiberchannel.1day.BitErrorsCorrected	8640000	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.1gfiberchannel.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.1gficon.15min.BitErrorsCorrected	90000	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.1gficon.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.1gficon.1day.BitErrorsCorrected	8640000	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.1gficon.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.2gfiberchannel.15min.BitErrorsCorrected	180900	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.2gfiberchannel.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.2gfiberchannel.1day.BitErrorsCorrected	17366400	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.2gfiberchannel.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.2gficon.15min.BitErrorsCorrected	180900	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.2gficon.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.2gficon.1day.BitErrorsCorrected	17366400	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.2gficon.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.oc12.15min.BitErrorsCorrected	56457	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.oc12.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.oc12.1day.BitErrorsCorrected	5419872	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.oc12.1day.UncorrectableWords	96	0	453570969600

Table D-8 TXPP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.otn.fecthresholds.oc3.15min.BitErrorsCorrected	15012	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.oc3.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.oc3.1day.BitErrorsCorrected	1441152	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.oc3.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.oc48.15min.BitErrorsCorrected	225837	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.oc48.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.oc48.1day.BitErrorsCorrected	21680352	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.oc48.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.BBE	21260	0	8850600
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.ES	87	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.FC	10	0	72
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.SES	1	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.BBE	212600	0	849657600
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.BBE	21260	0	8850600
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.BBE	212600	0	849657600
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.ES	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.FC	10	0	72
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.SES	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.UAS	500	0	900

Table D-8 TXPP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
TXPP-MR-2_5G.otn.otnLines.FEC	Enable		
TXPP-MR-2_5G.otn.otnLines.G709OTN	TRUE		
TXPP-MR-2_5G.otn.otnLines.SDBER	1e-007		
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.15min.CV	5315	0	552600
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.15min.FC	10	0	72
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.1day.CV	53150	0	53049600
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.1day.FC	40	0	72
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.oc12.line.farend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.CV	5315	0	552600
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.FC	10	0	72
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.CV	53150	0	53049600
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.FC	40	0	6912

Table D-8 TXPP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.oc12.line.nearend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.oc12.section.nearend.15min.CV	10000	0	553500
TXPP-MR-2_5G.pmthresholds.oc12.section.nearend.15min.ES	500	0	900
TXPP-MR-2_5G.pmthresholds.oc12.section.nearend.15min.SEFS	500	0	900
TXPP-MR-2_5G.pmthresholds.oc12.section.nearend.15min.SES	500	0	900
TXPP-MR-2_5G.pmthresholds.oc12.section.nearend.1day.CV	100000	0	53136000
TXPP-MR-2_5G.pmthresholds.oc12.section.nearend.1day.ES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.oc12.section.nearend.1day.SEFS	5000	0	86400
TXPP-MR-2_5G.pmthresholds.oc12.section.nearend.1day.SES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.15min.CV	1312	0	137700
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.15min.FC	10	0	72
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.1day.CV	13120	0	13219200
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.1day.FC	40	0	6912
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.oc3.line.farend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.CV	1312	0	137700
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.FC	10	0	72
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.CV	13120	0	13219200
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.FC	40	0	6912
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.oc3.line.nearend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.oc3.section.nearend.15min.CV	10000	0	138600
TXPP-MR-2_5G.pmthresholds.oc3.section.nearend.15min.ES	500	0	900
TXPP-MR-2_5G.pmthresholds.oc3.section.nearend.15min.SEFS	500	0	900
TXPP-MR-2_5G.pmthresholds.oc3.section.nearend.15min.SES	500	0	900
TXPP-MR-2_5G.pmthresholds.oc3.section.nearend.1day.CV	100000	0	13305600
TXPP-MR-2_5G.pmthresholds.oc3.section.nearend.1day.ES	5000	0	86400

Table D-8 TXPP-MR-2.5G Card Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.pmthresholds.oc3.section.nearend.1day.SEFS	5000	0	86400
TXPP-MR-2_5G.pmthresholds.oc3.section.nearend.1day.SES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.15min.CV	21260	0	2212200
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.15min.FC	10	0	72
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.1day.CV	212600	0	212371200
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.1day.FC	40	0	6912
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.line.farend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.CV	21260	0	2212200
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.FC	10	0	72
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.CV	212600	0	212371200
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.FC	40	0	6912
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.line.nearend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.section.nearend.15min.CV	10000	0	2151900
TXPP-MR-2_5G.pmthresholds.oc48.section.nearend.15min.ES	500	0	900
TXPP-MR-2_5G.pmthresholds.oc48.section.nearend.15min.SEFS	500	0	900
TXPP-MR-2_5G.pmthresholds.oc48.section.nearend.15min.SES	500	0	900
TXPP-MR-2_5G.pmthresholds.oc48.section.nearend.1day.CV	100000	0	206582400
TXPP-MR-2_5G.pmthresholds.oc48.section.nearend.1day.ES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.section.nearend.1day.SEFS	5000	0	86400
TXPP-MR-2_5G.pmthresholds.oc48.section.nearend.1day.SES	5000	0	86400

D.2.1.9 OSCM Card Default Settings

Table D-9 lists the OSCM card default settings.

Table D-9 OSCM Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
OSCM.pmthresholds.line.farend.15min.CV	1312	0	137700
OSCM.pmthresholds.line.farend.15min.ES	87	0	900
OSCM.pmthresholds.line.farend.15min.FC	10	0	72
OSCM.pmthresholds.line.farend.15min.SES	1	0	900
OSCM.pmthresholds.line.farend.15min.UAS	3	0	900
OSCM.pmthresholds.line.farend.1day.CV	13120	0	13219200
OSCM.pmthresholds.line.farend.1day.ES	864	0	86400
OSCM.pmthresholds.line.farend.1day.FC	40	0	6912
OSCM.pmthresholds.line.farend.1day.SES	4	0	86400
OSCM.pmthresholds.line.farend.1day.UAS	10	0	86400
OSCM.pmthresholds.line.nearend.15min.CV	1312	0	137700
OSCM.pmthresholds.line.nearend.15min.ES	87	0	900
OSCM.pmthresholds.line.nearend.15min.FC	10	0	72
OSCM.pmthresholds.line.nearend.15min.SES	1	0	900
OSCM.pmthresholds.line.nearend.15min.UAS	3	0	900
OSCM.pmthresholds.line.nearend.1day.CV	13120	0	13219200
OSCM.pmthresholds.line.nearend.1day.ES	864	0	86400
OSCM.pmthresholds.line.nearend.1day.FC	40	0	6912
OSCM.pmthresholds.line.nearend.1day.SES	4	0	86400
OSCM.pmthresholds.line.nearend.1day.UAS	10	0	86400
OSCM.pmthresholds.section.nearend.15min.CV	10000	0	138600
OSCM.pmthresholds.section.nearend.15min.ES	500	0	900
OSCM.pmthresholds.section.nearend.15min.SEFS	500	0	900
OSCM.pmthresholds.section.nearend.15min.SES	500	0	900
OSCM.pmthresholds.section.nearend.1day.CV	100000	0	13305600
OSCM.pmthresholds.section.nearend.1day.ES	5000	0	86400
OSCM.pmthresholds.section.nearend.1day.SEFS	5000	0	86400
OSCM.pmthresholds.section.nearend.1day.SES	5000	0	86400

D.2.1.10 OSC-CSM Card Default Settings

Table D-10 lists the OSC-CSM card default settings

Table D-10 OSC-CSM Card Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
OSC_CSM.pmthresholds.line.farend.15min.CV	1312	0	137700
OSC_CSM.pmthresholds.line.farend.15min.ES	87	0	900
OSC_CSM.pmthresholds.line.farend.15min.FC	10	0	72
OSC_CSM.pmthresholds.line.farend.15min.SES	1	0	900
OSC_CSM.pmthresholds.line.farend.15min.UAS	3	0	900
OSC_CSM.pmthresholds.line.farend.1day.CV	13120	0	13219200
OSC_CSM.pmthresholds.line.farend.1day.ES	864	0	86400
OSC_CSM.pmthresholds.line.farend.1day.FC	40	0	6912
OSC_CSM.pmthresholds.line.farend.1day.SES	4	0	86400
OSC_CSM.pmthresholds.line.farend.1day.UAS	10	0	86400
OSC_CSM.pmthresholds.line.nearend.15min.CV	1312	0	137700
OSC_CSM.pmthresholds.line.nearend.15min.ES	87	0	900
OSC_CSM.pmthresholds.line.nearend.15min.FC	10	0	72
OSC_CSM.pmthresholds.line.nearend.15min.SES	1	0	900
OSC_CSM.pmthresholds.line.nearend.15min.UAS	3	0	900
OSC_CSM.pmthresholds.line.nearend.1day.CV	13120	0	13219200
OSC_CSM.pmthresholds.line.nearend.1day.ES	864	0	86400
OSC_CSM.pmthresholds.line.nearend.1day.FC	40	0	6912
OSC_CSM.pmthresholds.line.nearend.1day.SES	4	0	86400
OSC_CSM.pmthresholds.line.nearend.1day.UAS	10	0	86400
OSC_CSM.pmthresholds.section.nearend.15min.CV	10000	0	138600
OSC_CSM.pmthresholds.section.nearend.15min.ES	500	0	900
OSC_CSM.pmthresholds.section.nearend.15min.SEFS	500	0	900
OSC_CSM.pmthresholds.section.nearend.15min.SES	500	0	900
OSC_CSM.pmthresholds.section.nearend.1day.CV	100000	0	13305600
OSC_CSM.pmthresholds.section.nearend.1day.ES	5000	0	86400
OSC_CSM.pmthresholds.section.nearend.1day.SEFS	5000	0	86400
OSC_CSM.pmthresholds.section.nearend.1day.SES	5000	0	86400

D.2.2 ANSI Node Default Settings

Table D-11 lists the node-level default settings for the Cisco ONS 15454. Cisco provides the following types of settings preprovisioned for each Cisco ONS 15454 node:

- Create TL1-Like instructs the node to create only cross-connects, allowing the resulting circuits to be in an upgradable state.
- Insert AIS-V on SDP instructs the node to insert AIS-V in each VT whenever the carrying STS crosses the signal degrade path BER threshold.

- SDP BER defines the node signal degrade path bit error rate.
- Path protection settings determine whether path protection circuits have switching on PDIP enabled, have SD BER and SF BER monitoring enabled, are revertive, and what the reversion time is.
- Craft Access Only allows CTC connectivity to the node only through the craft access port.
- CTC IP Display Suppression prevents display of node IP addresses in CTC.
- Defaults Description lists the current defaults file on the node.
- Enable Firewall enables or disables the use of a firewall for accessing the node.
- Enable Proxy enables or disables the use of a proxy server with the node.
- IIOP Listener Port sets the IIOP listener port number.
- LCD IP Setting sets the node LCD screen to display the node IP address and use the buttons on the LCD panel, only display the IP address, or suppress display of the IP address.
- Login Warning Message warns users at the login screen about the possible legal or contractual ramifications of accessing equipment, systems, or networks without authorization.
- NTP SNTP Server sets the IP address of the NTP SNTP server to be used with the node.
- Time Zone sets the time zone where the node is located.
- Use DST enables or disables the use of Daylight Savings Time.
- Use NTP SNTP Server enables or disables the use of the specified NTP SNTP server with the node.
- 1+1 protection settings determine whether or not 1+1 protected circuits have bidirectional switching, are revertive, and what the reversion time is.
- BLSR Protection Settings determine whether BLSR-protected circuits are revertive and what the reversion time is at both the ring and span levels.
- Y Cable Protection Settings determine whether Y-Cable protected circuits have bidirectional switching, are revertive, and what the reversion time is.
- Security Policy settings determine the failed logins before lockout, idle user timeout for each user level, lockout duration, manual unlock user level enabled, password reuse timeout and threshold, and single session per user for the node security.
- BITS Timing settings determine the AIS threshold, coding, and framing for BITS1 and BITS2 timing.
- General Timing settings determine the mode (internal or external), quality of RES, revertive, reversion time, and SSM message set for node timing.

Table D-11 Node Default Settings (ANSI)

Default Name	Default Value	Minimum	Maximum
NODE.circuits.SendPDIP	TRUE		
NODE.circuits.State	IS,AINS		
NODE.circuits.upsr.ReversionTime	5		
NODE.circuits.upsr.Revertive	FALSE		
NODE.circuits.upsr.STS_SDBER	1e-006		
NODE.circuits.upsr.STS_SFBER	0.0001		
NODE.circuits.upsr.SwitchOnPDIP	FALSE		
NODE.circuits.upsr.VT_SDBER	1e-005		

Table D-11 Node Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
NODE.circuits.upsr.VT_SFBER	0.001		
NODE.general.DefaultsDescription	Factory Defaults		
NODE.general.IIOPListenerPort	57790	0	65535
NODE.general.InsertAISVOnSDP	FALSE		
NODE.general.NtpSntpServer	0.0.0.0		
NODE.general.SDPBER	1e-006		
NODE.general.TimeZone	(GMT-08:00) Pacific Time (US & Canada), Tijuana		
NODE.general.UseDST	TRUE		
NODE.network.general.AlarmMissingBackplaneLAN	FALSE		
NODE.network.general.CtcIpDisplaySuppression	FALSE		
NODE.network.general.GatewaySettings	None		
NODE.network.general.LcdIpSetting	Allow Configuration		
NODE.powerMonitor.EHIBATVG	-56.5		
NODE.powerMonitor.ELWBATVG	-40.5		
NODE.powerMonitor.HIBATVG	-54		
NODE.powerMonitor.LWBATVG	-44		
NODE.protection.1+1.BidirectionalSwitching	FALSE		
NODE.protection.1+1.DetectionGuardTimer	1		
NODE.protection.1+1.RecoveryGuardTimer	1		
NODE.protection.1+1.ReversionTime	5		
NODE.protection.1+1.Revertive	FALSE		
NODE.protection.1+1.VerifyGuardTimer	0.5		
NODE.protection.blsr.RingReversionTime	5		
NODE.protection.blsr.RingRevertive	TRUE		
NODE.protection.blsr.SpanReversionTime	5		
NODE.protection.blsr.SpanRevertive	TRUE		
NODE.protection.splitter.ReversionTime	5		
NODE.protection.splitter.Revertive	FALSE		
NODE.protection.ycable.ReversionTime	5		
NODE.protection.ycable.Revertive	FALSE		
NODE.security.access.LANAccess	Front & Backplane		
NODE.security.access.RestoreTimeout	5		
NODE.security.dataComm.CtcBackplaneIpDisplaySuppression	FALSE		
NODE.security.dataComm.DefaultTCCEthernetIP	10.10.0.1		
NODE.security.dataComm.DefaultTCCEthernetIPNetmask	24		

Table D-11 Node Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
NODE.security.dataComm.LcdBackplaneIpSetting	Suppress Display		
NODE.security.dataComm.SecureModeLocked	FALSE		
NODE.security.dataComm.SecureModeOn	FALSE		
NODE.security.idleUserTimeout.Maintenance	0.041666666667		
NODE.security.idleUserTimeout.Provisioning	0.020833333333		
NODE.security.idleUserTimeout.Retrieve	0		
NODE.security.idleUserTimeout.Superuser	0.010416666667		
NODE.security.legalDisclaimer.LoginWarningMessage	WARNING This system is restricted to authorized users for business purposes. Unauthorized<p>access is a violation of the law. This service may be monitored for administrative<p>and security reasons. By proceeding, you consent to this monitoring.		
NODE.security.other.DisableInactiveUser	FALSE		
NODE.security.other.InactiveDuration	45	20	90
NODE.security.other.PMClearingPrivilege	Provisioning		
NODE.security.other.SingleSessionPerUser	FALSE		
NODE.security.passwordAging.EnforcePasswordAging	FALSE		
NODE.security.passwordAging.maintenance.AgingPeriod	45	20	90
NODE.security.passwordAging.maintenance.WarningPeriod	5	2	20
NODE.security.passwordAging.provisioning.AgingPeriod	45	20	90
NODE.security.passwordAging.provisioning.WarningPeriod	5	2	20
NODE.security.passwordAging.retrieve.AgingPeriod	45	20	90
NODE.security.passwordAging.retrieve.WarningPeriod	5	2	20
NODE.security.passwordAging.superuser.AgingPeriod	45	20	90
NODE.security.passwordAging.superuser.WarningPeriod	5	2	20
NODE.security.passwordChange.CannotChangeNewPassword	FALSE		
NODE.security.passwordChange.CannotChangeNewPasswordForNDays	20	20	95
NODE.security.passwordChange.PreventReusingLastNPasswords	1	1	10
NODE.security.passwordChange.RequirePasswordChangeOnFirstLoginToNewAccount	FALSE		
NODE.security.shellAccess.EnableShellPassword	FALSE		
NODE.security.shellAccess.SSH	FALSE		

Table D-11 Node Default Settings (ANSI) (continued)

Default Name	Default Value	Minimum	Maximum
NODE.security.shellAccess.TelnetPort	23	23	9999
NODE.security.userLockout.FailedLoginsBeforeLockout	5	0	10
NODE.security.userLockout.LockoutDuration	0.020833333333		
NODE.security.userLockout.ManualUnlockBySuperuser	FALSE		
NODE.timing.bits-1.AISThreshold	SMC		
NODE.timing.bits-1.AdminSSMIn	STU		
NODE.timing.bits-1.Coding	B8ZS		
NODE.timing.bits-1.CodingOut	B8ZS		
NODE.timing.bits-1.FacilityType	DS1		
NODE.timing.bits-1.FacilityTypeOut	DS1		
NODE.timing.bits-1.Framing	ESF		
NODE.timing.bits-1.FramingOut	ESF		
NODE.timing.bits-1.LBO	0-133		
NODE.timing.bits-1.State	IS		
NODE.timing.bits-1.StateOut	IS		
NODE.timing.bits-2.AISThreshold	SMC		
NODE.timing.bits-2.AdminSSMIn	STU		
NODE.timing.bits-2.Coding	B8ZS		
NODE.timing.bits-2.CodingOut	B8ZS		
NODE.timing.bits-2.FacilityType	DS1		
NODE.timing.bits-2.FacilityTypeOut	DS1		
NODE.timing.bits-2.Framing	ESF		
NODE.timing.bits-2.FramingOut	ESF		
NODE.timing.bits-2.LBO	0-133		
NODE.timing.bits-2.State	IS		
NODE.timing.bits-2.StateOut	IS		
NODE.timing.general.Mode	External		
NODE.timing.general.QualityOfRES	RES=DUS		
NODE.timing.general.ReversionTime	5		
NODE.timing.general.Revertive	FALSE		
NODE.timing.general.SSMMessageSet	Generation 1		

D.2.3 ANSI CTC Default Settings

Table D-12 lists the CTC-level default settings for the Cisco ONS 15454. Cisco provides the following types of settings preprovisioned for CTC.

- Create circuits with the Auto route check box selected by default.

- Create TL1-like circuits—instructs the node to create only cross-connects, allowing the resulting circuits to be in an upgradable state.
- Choose a default network map (which country).

Table D-12 CTC Default Settings (ANSI)

Default Name	Default Value
CTC.circuits.AutoRoute	TRUE
CTC.circuits.CreateLikeTL1	FALSE
CTC.network.Map	United States

D.3 ETSI Platform Defaults

The following sections give the NE defaults for the 15454 ETSI platform. To see defaults for the 15454 ANSI platform, refer to the "D.2 ANSI Platform Defaults" section on page D-2.

D.3.1 ETSI Card Default Settings

The tables in this section list the default settings for each DWDM, TXP, and MXP card. For all other cards, including optical, electrical, Ethernet, and fibre channel, refer to the *Cisco ONS 15454 SDH Reference Manual*.

Cisco provides settings that are pre-provisioned for the Cisco ONS 15454 cards, including:

- Soak Time (all cards) is the length of time that elapses between an AINS port receiving a valid signal and when it automatically changes to in-service status.
- Port State (all cards) sets the port to one of the four available states (IS, OOS, OOS_MT, or OOS_AINS), depending on whether you need ports in or out of service.
- SF BER Level (TXP and MXP cards) defines the signal fail bit error rate.
- SD BER Level (TXP and MXP cards) defines the signal degrade bit error rate.
- Enable Sync Messages (MXP cards) enables synchronization status messages (S1 byte), which allow the node to choose the best timing source.
- Send Do Not Use (TXP and MXP cards) sends a DUS message on the S1 byte when enabled.
- Payload Type (TXP and MXP cards) defines the type of client signal.
- Termination Mode (TXP and MXP cards) defines the type of termination (line, section, or transparent).
- ALS Mode (TXP and MXP cards) sets the automatic laser shutdown feature to one of four available states (disabled, auto restart, manual restart, manual restart for test).
- ALS Recovery Interval (TXP and MXP cards) sets the automatic laser shutdown recovery time interval.
- ALS Recovery Pulse Width (TXP and MXP cards) set the automatic laser shutdown recovery pulse signal width.
- FEC (TXP and MXP cards) enables or disables the FEC monitoring on the optical transport network.
- G.709 OTN (TXP and MXP cards) enables or disables the G.709 monitoring on the optical transport network.

- FEC Thresholds (TXP and MXP cards) set the performance monitoring parameters for gathering FEC performance data and detecting problems early.
- Optical Thresholds (TXP and MXP cards) set the performance monitoring parameters for gathering physical optics performance data and detecting problems early.
- OTN Thresholds (TXP and MXP cards) set the performance monitoring parameters for gathering OTN trunk-side performance data and detecting problems early.
- PM Threshold Settings (all cards) set the performance monitoring parameters for gathering performance data and detecting problems early.

Note For more information about the performance monitoring parameters, refer to the Chapter 9, "Monitor Performance."

D.3.1.1 MXP_2.5G_10G Card Default Settings

Table D-13 lists the MXP_2.5G_10G card default settings.

Table D-13 MXP_2.5G_10G Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.config.client.AINSSoakTime	0.33333333333		
MXP-2_5G-10G.config.client.AlsMode	Disabled		
MXP-2_5G-10G.config.client.AlsRecoveryPulseDuration	4		
MXP-2_5G-10G.config.client.AlsRecoveryPulseInterval	100	60	300
MXP-2_5G-10G.config.client.ppmPortAssignment	STM16_PORT		
MXP-2_5G-10G.config.client.ppmSlotAssignment	UNASSIGNED		
MXP-2_5G-10G.config.client.SDBER	1e-007		
MXP-2_5G-10G.config.client.SendDoNotUse	FALSE		
MXP-2_5G-10G.config.client.SFBER	0.0001		
MXP-2_5G-10G.config.client.SyncMsgIn	TRUE		
MXP-2_5G-10G.config.client.TerminationMode	Transparent		
MXP-2_5G-10G.config.trunk.AINSSoakTime	0.33333333333		
MXP-2_5G-10G.config.trunk.AlsMode	Disabled		
MXP-2_5G-10G.config.trunk.AlsRecoveryPulseDuration	4		
MXP-2_5G-10G.config.trunk.AlsRecoveryPulseInterval	100	60	300
MXP-2_5G-10G.opticalthresholds.client.alarm.HighLaserBias	90		
MXP-2_5G-10G.opticalthresholds.client.alarm.HighRxPower	3		
MXP-2_5G-10G.opticalthresholds.client.alarm.HighTxPower	3		
MXP-2_5G-10G.opticalthresholds.client.alarm.LowRxPower	-21		
MXP-2_5G-10G.opticalthresholds.client.alarm.LowTxPower	-8		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.HighLaserBias	81		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.HighRxPower	2		

Table D-13 MXP_2.5G_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.opticalthresholds.client.warning.15min.HighTxPower	2		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.LowRxPower	-20		
MXP-2_5G-10G.opticalthresholds.client.warning.15min.LowTxPower	-7		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
MXP-2_5G-10G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.HighLaserBias	90		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.HighRxPower	-7		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.HighTxPower	4		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.LowRxPower	-25		
MXP-2_5G-10G.opticalthresholds.trunk.alarm.LowTxPower	2		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.HighLaserBias	81		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.HighTxPower	3.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.15min.LowTxPower	2.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.HighLaserBias	85.5		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.HighTxPower	3.7		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
MXP-2_5G-10G.opticalthresholds.trunk.warning.1day.LowTxPower	2.3		
MXP-2_5G-10G.otn.fecthresholds.standard.15min.BitErrorsCorrected	903330	0	9033621811200
MXP-2_5G-10G.otn.fecthresholds.standard.15min.UncorrectableWords	5	0	4724697600
MXP-2_5G-10G.otn.fecthresholds.standard.1day.BitErrorsCorrected	86719680	0	867227693875200
MXP-2_5G-10G.otn.fecthresholds.standard.1day.UncorrectableWords	480	0	453570969600
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.BBE	85040	0	8850600
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.ES	87	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.FC	10	0	72
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.SES	1	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.BBE	850400	0	849657600
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.SES	4	0	86400

Table D-13 MXP_2.5G_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.BBE	85040	0	8850600
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.BBE	850400	0	849657600
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
MXP-2_5G-10G.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.ES	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.FC	10	0	72
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.SES	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
MXP-2_5G-10G.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
MXP-2_5G-10G.otn.otnLines.FEC	Standard		
MXP-2_5G-10G.otn.otnLines.G709OTN	TRUE		
MXP-2_5G-10G.otn.otnLines.SDBER	1e-007		
MXP-2_5G-10G.pmthresholds.client.ms.farend.15min.BBE	21260	0	2212200
MXP-2_5G-10G.pmthresholds.client.ms.farend.15min.EB	21260	0	2212200

Table D-13 MXP_2.5G_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.pmthresholds.client.ms.farend.15min.ES	87	0	900
MXP-2_5G-10G.pmthresholds.client.ms.farend.15min.SES	1	0	900
MXP-2_5G-10G.pmthresholds.client.ms.farend.15min.UAS	3	0	900
MXP-2_5G-10G.pmthresholds.client.ms.farend.1day.BBE	212600	0	212371200
MXP-2_5G-10G.pmthresholds.client.ms.farend.1day.EB	212600	0	212371200
MXP-2_5G-10G.pmthresholds.client.ms.farend.1day.ES	864	0	86400
MXP-2_5G-10G.pmthresholds.client.ms.farend.1day.SES	4	0	86400
MXP-2_5G-10G.pmthresholds.client.ms.farend.1day.UAS	10	0	86400
MXP-2_5G-10G.pmthresholds.client.ms.nearend.15min.BBE	21260	0	2212200
MXP-2_5G-10G.pmthresholds.client.ms.nearend.15min.EB	21260	0	2212200
MXP-2_5G-10G.pmthresholds.client.ms.nearend.15min.ES	87	0	900
MXP-2_5G-10G.pmthresholds.client.ms.nearend.15min.SES	1	0	900
MXP-2_5G-10G.pmthresholds.client.ms.nearend.15min.UAS	3	0	900
MXP-2_5G-10G.pmthresholds.client.ms.nearend.1day.BBE	212600	0	212371200
MXP-2_5G-10G.pmthresholds.client.ms.nearend.1day.EB	212600	0	212371200
MXP-2_5G-10G.pmthresholds.client.ms.nearend.1day.ES	864	0	86400
MXP-2_5G-10G.pmthresholds.client.ms.nearend.1day.SES	4	0	86400
MXP-2_5G-10G.pmthresholds.client.ms.nearend.1day.UAS	10	0	86400
MXP-2_5G-10G.pmthresholds.client.rs.nearend.15min.BBE	10000	0	2212200
MXP-2_5G-10G.pmthresholds.client.rs.nearend.15min.EB	10000	0	2151900
MXP-2_5G-10G.pmthresholds.client.rs.nearend.15min.ES	500	0	900
MXP-2_5G-10G.pmthresholds.client.rs.nearend.15min.SES	500	0	900
MXP-2_5G-10G.pmthresholds.client.rs.nearend.15min.UAS	500	0	900
MXP-2_5G-10G.pmthresholds.client.rs.nearend.1day.BBE	100000	0	212371200
MXP-2_5G-10G.pmthresholds.client.rs.nearend.1day.EB	100000	0	206582400
MXP-2_5G-10G.pmthresholds.client.rs.nearend.1day.ES	5000	0	86400
MXP-2_5G-10G.pmthresholds.client.rs.nearend.1day.SES	5000	0	86400
MXP-2_5G-10G.pmthresholds.client.rs.nearend.1day.UAS	5000	0	86400
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.15min.BBE	85040	0	8850600
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.15min.EB	85040	0	8850600
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.15min.ES	87	0	900
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.15min.SES	1	0	900
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.15min.UAS	3	0	900
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.1day.BBE	850400	0	849657600
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.1day.EB	850400	0	849657600
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.1day.ES	864	0	86400

Table D-13 MXP_2.5G_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.1day.SES	4	0	86400
MXP-2_5G-10G.pmthresholds.trunk.ms.farend.1day.UAS	10	0	86400
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.15min.BBE	85040	0	8850600
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.15min.EB	85040	0	8850600
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.15min.ES	87	0	900
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.15min.SES	1	0	900
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.15min.UAS	3	0	900
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.1day.BBE	850400	0	849657600
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.1day.EB	850400	0	849657600
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.1day.ES	864	0	86400
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.1day.SES	4	0	86400
MXP-2_5G-10G.pmthresholds.trunk.ms.nearend.1day.UAS	10	0	86400
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.15min.BBE	10000	0	8850600
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.15min.EB	10000	0	7967700
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.15min.ES	500	0	900
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.15min.SES	500	0	900
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.15min.UAS	500	0	900
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.1day.BBE	100000	0	849657600
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.1day.EB	100000	0	764899200
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.1day.ES	5000	0	86400
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.1day.SES	5000	0	86400
MXP-2_5G-10G.pmthresholds.trunk.rs.nearend.1day.UAS	5000	0	86400

D.3.1.2 MXP_2.5G_10E Card Default Settings

Table D-14 lists the MXP_2.5G_10E card default settings.

Table D-14 MXP_2.5G_10E Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.config.client.AINSSoakTime	0.33333333333		
MXP-2_5G-10E.config.client.AisSquelchMode	Squelch		
MXP-2_5G-10E.config.client.AlsMode	Disabled		
MXP-2_5G-10E.config.client.AlsRecoveryPulseDuration	2		
MXP-2_5G-10E.config.client.AlsRecoveryPulseInterval	100	100	2000
MXP-2_5G-10E.config.client.ppmPortAssignment	STM16_PORT		
MXP-2_5G-10E.config.client.ppmSlotAssignment	UNASSIGNED		
MXP-2_5G-10E.config.client.SDBER	1e-007		

Table D-14 MXP_2.5G_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.config.client.SendDoNotUse	FALSE		
MXP-2_5G-10E.config.client.SFBER	0.0001		
MXP-2_5G-10E.config.client.SyncMsgIn	TRUE		
MXP-2_5G-10E.config.client.TerminationMode	Transparent		
MXP-2_5G-10E.config.trunk.AINSSoakTime	0.33333333333		
MXP-2_5G-10E.config.trunk.AlsMode	Disabled		
MXP-2_5G-10E.config.trunk.AlsRecoveryPulseDuration	100		
MXP-2_5G-10E.config.trunk.AlsRecoveryPulseInterval	300	200	2000
MXP-2_5G-10E.opticalthresholds.client.alarm.HighLaserBias	90		
MXP-2_5G-10E.opticalthresholds.client.alarm.HighRxPower	3		
MXP-2_5G-10E.opticalthresholds.client.alarm.HighTxPower	3		
MXP-2_5G-10E.opticalthresholds.client.alarm.LowRxPower	-21		
MXP-2_5G-10E.opticalthresholds.client.alarm.LowTxPower	-8		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.HighLaserBias	81		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.HighRxPower	2		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.HighTxPower	2		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.LowRxPower	-20		
MXP-2_5G-10E.opticalthresholds.client.warning.15min.LowTxPower	-7		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.HighRxPower	2.5		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.HighTxPower	2.5		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
MXP-2_5G-10E.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.HighLaserBias	98		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.HighRxPower	-7		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.HighTxPower	8		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.LowRxPower	-25		
MXP-2_5G-10E.opticalthresholds.trunk.alarm.LowTxPower	1		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.HighTxPower	7		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
MXP-2_5G-10E.opticalthresholds.trunk.warning.15min.LowTxPower	2		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.HighTxPower	7		

Table D-14 MXP_2.5G_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
MXP-2_5G-10E.opticalthresholds.trunk.warning.1day.LowTxPower	2		
MXP-2_5G-10E.otn.fecthresholds.enhanced.15min.BitErrorsCorrected	903330	0	9033621811200
MXP-2_5G-10E.otn.fecthresholds.enhanced.15min.UncorrectableWords	5	0	4724697600
MXP-2_5G-10E.otn.fecthresholds.enhanced.1day.BitErrorsCorrected	86719680	0	867227693875200
MXP-2_5G-10E.otn.fecthresholds.enhanced.1day.UncorrectableWords	480	0	4535709696 00
MXP-2_5G-10E.otn.fecthresholds.standard.15min.BitErrorsCorrected	903330	0	9033621811200
MXP-2_5G-10E.otn.fecthresholds.standard.15min.UncorrectableWords	5	0	4724697600
MXP-2_5G-10E.otn.fecthresholds.standard.1day.BitErrorsCorrected	86719680	0	867227693875200
MXP-2_5G-10E.otn.fecthresholds.standard.1day.UncorrectableWords	480	0	4535709696 00
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.BBE	85040	0	8850600
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.ES	87	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.FC	10	0	72
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.SES	1	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.BBE	850400	0	849657600
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.BBE	85040	0	8850600
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.BBE	850400	0	849657600
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
MXP-2_5G-10E.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.ES	500	0	900

Table D-14 MXP_2.5G_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.FC	10	0	72
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.SES	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
MXP-2_5G-10E.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
MXP-2_5G-10E.otn.otnLines.AsynchSynchMapping	ODU Multiplex		
MXP-2_5G-10E.otn.otnLines.FEC	Standard		
MXP-2_5G-10E.otn.otnLines.G709OTN	TRUE		
MXP-2_5G-10E.otn.otnLines.SDBER	1e-007		
MXP-2_5G-10E.pmthresholds.client.ms.farend.15min.BBE	21260	0	2212200
MXP-2_5G-10E.pmthresholds.client.ms.farend.15min.EB	21260	0	2212200
MXP-2_5G-10E.pmthresholds.client.ms.farend.15min.ES	87	0	900
MXP-2_5G-10E.pmthresholds.client.ms.farend.15min.SES	1	0	900
MXP-2_5G-10E.pmthresholds.client.ms.farend.15min.UAS	3	0	900
MXP-2_5G-10E.pmthresholds.client.ms.farend.1day.BBE	212600	0	212371200
MXP-2_5G-10E.pmthresholds.client.ms.farend.1day.EB	212600	0	212371200
MXP-2_5G-10E.pmthresholds.client.ms.farend.1day.ES	864	0	86400
MXP-2_5G-10E.pmthresholds.client.ms.farend.1day.SES	4	0	86400
MXP-2_5G-10E.pmthresholds.client.ms.farend.1day.UAS	10	0	86400
MXP-2_5G-10E.pmthresholds.client.ms.nearend.15min.BBE	21260	0	2212200
MXP-2_5G-10E.pmthresholds.client.ms.nearend.15min.EB	21260	0	2212200
MXP-2_5G-10E.pmthresholds.client.ms.nearend.15min.ES	87	0	900
MXP-2_5G-10E.pmthresholds.client.ms.nearend.15min.SES	1	0	900

Table D-14 MXP_2.5G_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-2_5G-10E.pmthresholds.client.ms.nearend.15min.UAS	3	0	900
MXP-2_5G-10E.pmthresholds.client.ms.nearend.1day.BBE	212600	0	212371200
MXP-2_5G-10E.pmthresholds.client.ms.nearend.1day.EB	212600	0	212371200
MXP-2_5G-10E.pmthresholds.client.ms.nearend.1day.ES	864	0	86400
MXP-2_5G-10E.pmthresholds.client.ms.nearend.1day.SES	4	0	86400
MXP-2_5G-10E.pmthresholds.client.ms.nearend.1day.UAS	10	0	86400
MXP-2_5G-10E.pmthresholds.client.rs.nearend.15min.BBE	10000	0	2212200
MXP-2_5G-10E.pmthresholds.client.rs.nearend.15min.EB	10000	0	2151900
MXP-2_5G-10E.pmthresholds.client.rs.nearend.15min.ES	500	0	900
MXP-2_5G-10E.pmthresholds.client.rs.nearend.15min.SES	500	0	900
MXP-2_5G-10E.pmthresholds.client.rs.nearend.15min.UAS	500	0	900
MXP-2_5G-10E.pmthresholds.client.rs.nearend.1day.BBE	100000	0	212371200
MXP-2_5G-10E.pmthresholds.client.rs.nearend.1day.EB	100000	0	206582400
MXP-2_5G-10E.pmthresholds.client.rs.nearend.1day.ES	5000	0	86400
MXP-2_5G-10E.pmthresholds.client.rs.nearend.1day.SES	5000	0	86400
MXP-2_5G-10E.pmthresholds.client.rs.nearend.1day.UAS	5000	0	86400

D.3.1.3 MXP_MR_2.5G Card Default Settings

Table D-15 lists the MXP_MR_2.5G card default settings.

Table D-15 MXP_MR_2.5G Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
MXP-MR-2_5G.config.client.AlsMode	Disabled		
MXP-MR-2_5G.config.client.AlsRecoveryPulseDuration	4		
MXP-MR-2_5G.config.client.AlsRecoveryPulseInterval	100	60	300
MXP-MR-2_5G.config.client.ppmPortAssignment	UNASSIGNED		
MXP-MR-2_5G.config.client.ppmSlotAssignment	UNASSIGNED		
MXP-MR-2_5G.config.fc.distanceExtension.AutoadjustGFPBufferThreshold	TRUE		
MXP-MR-2_5G.config.fc.distanceExtension.AutoDetect	TRUE		
MXP-MR-2_5G.config.fc.distanceExtension.Enabled	TRUE		
MXP-MR-2_5G.config.fc.distanceExtension.NumCredits	32	2	256
MXP-MR-2_5G.config.fc.distanceExtension.NumGFPBuffers	16		
MXP-MR-2_5G.config.fc.enhancedFibreChannelFicon.MaxFrameSize	2148		
MXP-MR-2_5G.config.trunk.AINSSoakTime	0.33333333333		
MXP-MR-2_5G.config.trunk.AlsMode	Disabled		

Table D-15 MXP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-MR-2_5G.config.trunk.AlsRecoveryPulseDuration	4		
MXP-MR-2_5G.config.trunk.AlsRecoveryPulseInterval	100	60	300
MXP-MR-2_5G.config.trunk.SDBER	1e-007		
MXP-MR-2_5G.config.trunk.SendDoNotUse	FALSE		
MXP-MR-2_5G.config.trunk.SFBER	0.0001		
MXP-MR-2_5G.config.trunk.SyncMsgIn	TRUE		
MXP-MR-2_5G.opticalthresholds.client.alarm.HighLaserBias	90		
MXP-MR-2_5G.opticalthresholds.client.alarm.HighRxPower	3		
MXP-MR-2_5G.opticalthresholds.client.alarm.HighTxPower	3		
MXP-MR-2_5G.opticalthresholds.client.alarm.LowRxPower	-21		
MXP-MR-2_5G.opticalthresholds.client.alarm.LowTxPower	-8		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.HighLaserBias	81		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.HighRxPower	2		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.HighTxPower	2		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.LowRxPower	-20		
MXP-MR-2_5G.opticalthresholds.client.warning.15min.LowTxPower	-7		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
MXP-MR-2_5G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.HighLaserBias	98		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.HighRxPower	-7		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.HighTxPower	30		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.LowRxPower	-25		
MXP-MR-2_5G.opticalthresholds.trunk.alarm.LowTxPower	-40		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighTxPower	30		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
MXP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowTxPower	-40		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighTxPower	30		
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		

Table D-15 MXP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowTxPower	-40		
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.BBE	21260	0	2212200
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.EB	21260	0	2212200
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.ES	87	0	900
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.SES	1	0	900
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.UAS	3	0	900
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.BBE	212600	0	2212200
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.EB	212600	0	212371200
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.ES	864	0	86400
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.SES	4	0	86400
MXP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.UAS	10	0	86400
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.BBE	21260	0	2212200
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.EB	21260	0	2212200
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.ES	87	0	900
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.SES	1	0	900
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.UAS	3	0	900
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.BBE	212600	0	2212200
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.EB	212600	0	212371200
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.ES	864	0	86400
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.SES	4	0	86400
MXP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.UAS	10	0	86400
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.BBE	10000	0	2151900
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.EB	10000	0	2151900
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.ES	500	0	900
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.SES	500	0	900
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.UAS	500	0	900
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.BBE	100000	0	206582400
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.EB	100000	0	206582400
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.ES	5000	0	86400
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.SES	5000	0	86400
MXP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.UAS	5000	0	86400

D.3.1.4 MXPP_MR_2.5G Card Default Settings

Table D-16 lists the MXPP_MR_2.5G card default settings.

Table D-16 MXPP_MR_2.5G Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
MXPP-MR-2_5G.config.client.AlsMode	Disabled		
MXPP-MR-2_5G.config.client.AlsRecoveryPulseDuration	4		
MXPP-MR-2_5G.config.client.AlsRecoveryPulseInterval	100	60	300
MXPP-MR-2_5G.config.client.ppmPortAssignment	UNASSIGNED		
MXPP-MR-2_5G.config.client.ppmSlotAssignment	UNASSIGNED		
MXPP-MR-2_5G.config.fc.distanceExtension.AutoadjustGFPBufferThreshold	TRUE		
MXPP-MR-2_5G.config.fc.distanceExtension.AutoDetect	TRUE		
MXPP-MR-2_5G.config.fc.distanceExtension.Enabled	TRUE		
MXPP-MR-2_5G.config.fc.distanceExtension.NumCredits	32	2	256
MXPP-MR-2_5G.config.fc.distanceExtension.NumGFPBuffers	16		
MXPP-MR-2_5G.config.fc.enhancedFibreChannelFicon.MaxFrameSize	2148		
MXPP-MR-2_5G.config.trunk.AINSSoakTime	0.33333333333		
MXPP-MR-2_5G.config.trunk.AlsMode	Disabled		
MXPP-MR-2_5G.config.trunk.AlsRecoveryPulseDuration	4		
MXPP-MR-2_5G.config.trunk.AlsRecoveryPulseInterval	100	60	300
MXPP-MR-2_5G.config.trunk.SDBER	1e-007		
MXPP-MR-2_5G.config.trunk.SFBER	0.0001		
MXPP-MR-2_5G.opticalthresholds.client.alarm.HighLaserBias	90		
MXPP-MR-2_5G.opticalthresholds.client.alarm.HighRxPower	3		
MXPP-MR-2_5G.opticalthresholds.client.alarm.HighTxPower	3		
MXPP-MR-2_5G.opticalthresholds.client.alarm.LowRxPower	-21		
MXPP-MR-2_5G.opticalthresholds.client.alarm.LowTxPower	-8		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighLaserBias	81		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighRxPower	2		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighTxPower	2		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.LowRxPower	-20		
MXPP-MR-2_5G.opticalthresholds.client.warning.15min.LowTxPower	-7		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighRxPower	2.5		

Table D-16 MXPP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighTx Power	2.5		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.LowRx Power	-20.5		
MXPP-MR-2_5G.opticalthresholds.client.warning.1day.LowTx Power	-7.5		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighLaserBias	98		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighRxPower	-7		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighTxPower	30		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.LowRxPower	-25		
MXPP-MR-2_5G.opticalthresholds.trunk.alarm.LowTxPower	-40		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighL aserBias	95		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighR xPower	-7.5		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighT xPower	30		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowR xPower	-24.5		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowT xPower	-40		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighLas erBias	96		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighRx Power	-7.3		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighTx Power	30		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowRxP ower	-24.7		
MXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowTxP ower	-40		
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.BBE	21260	0	2212200
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.EB	21260	0	2212200
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.ES	87	0	900
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.SES	1	0	900
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.15min.UAS	3	0	900
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.BBE	212600	0	2212200
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.EB	212600	0	212371200
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.ES	864	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.SES	4	0	86400

Table D-16 MXPP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
MXPP-MR-2_5G.pmthresholds.trunk.ms.farend.1day.UAS	10	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.BBE	21260	0	2212200
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.EB	21260	0	2212200
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.ES	87	0	900
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.SES	1	0	900
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.15min.UAS	3	0	900
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.BBE	212600	0	2212200
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.EB	212600	0	212371200
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.ES	864	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.SES	4	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.ms.nearend.1day.UAS	10	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.BBE	10000	0	2151900
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.EB	10000	0	2151900
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.ES	500	0	900
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.SES	500	0	900
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.15min.UAS	500	0	900
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.BBE	100000	0	206582400
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.EB	100000	0	206582400
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.ES	5000	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.SES	5000	0	86400
MXPP-MR-2_5G.pmthresholds.trunk.rs.nearend.1day.UAS	5000	0	86400

D.3.1.5 TXP_MR_10E Card Default Settings

Table D-17 lists the TXP_MR_10E card default settings.

Table D-17 TXP_MR_10E Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.config.client.AINSSoakTime	0.33333333333		
TXP-MR-10E.config.client.AisSquelchMode	Squelch		
TXP-MR-10E.config.client.AlsMode	Disabled		
TXP-MR-10E.config.client.AlsRecoveryPulseDuration	2		
TXP-MR-10E.config.client.AlsRecoveryPulseInterval	100	100	2000
TXP-MR-10E.config.client.ppmPortAssignment	UNASSIGNED		
TXP-MR-10E.config.client.ppmSlotAssignment	UNASSIGNED		

Table D-17 TXP_MR_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.config.client.SDBER	1e-007		
TXP-MR-10E.config.client.SendDoNotUse	FALSE		
TXP-MR-10E.config.client.SFBER	0.0001		
TXP-MR-10E.config.client.SyncMsgIn	TRUE		
TXP-MR-10E.config.client.TerminationMode	Transparent		
TXP-MR-10E.config.trunk.AINSSoakTime	0.33333333333		
TXP-MR-10E.config.trunk.AlsMode	Disabled		
TXP-MR-10E.config.trunk.AlsRecoveryPulseDuration	100		
TXP-MR-10E.config.trunk.AlsRecoveryPulseInterval	300	200	2000
TXP-MR-10E.config.trunk.SDBER	1e-007		
TXP-MR-10E.config.trunk.SFBER	0.0001		
TXP-MR-10E.opticalthresholds.client.alarm.HighLaserBias	90		
TXP-MR-10E.opticalthresholds.client.alarm.HighRxPower	2		
TXP-MR-10E.opticalthresholds.client.alarm.HighTxPower	2		
TXP-MR-10E.opticalthresholds.client.alarm.LowRxPower	-17		
TXP-MR-10E.opticalthresholds.client.alarm.LowTxPower	-9		
TXP-MR-10E.opticalthresholds.client.warning.15min.HighLaserBias	81		
TXP-MR-10E.opticalthresholds.client.warning.15min.HighRxPower	1		
TXP-MR-10E.opticalthresholds.client.warning.15min.HighTxPower	1		
TXP-MR-10E.opticalthresholds.client.warning.15min.LowRxPower	-16		
TXP-MR-10E.opticalthresholds.client.warning.15min.LowTxPower	-8		
TXP-MR-10E.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
TXP-MR-10E.opticalthresholds.client.warning.1day.HighRxPower	1.5		
TXP-MR-10E.opticalthresholds.client.warning.1day.HighTxPower	1.5		
TXP-MR-10E.opticalthresholds.client.warning.1day.LowRxPower	-16.5		
TXP-MR-10E.opticalthresholds.client.warning.1day.LowTxPower	-8.5		
TXP-MR-10E.opticalthresholds.trunk.alarm.HighLaserBias	98		
TXP-MR-10E.opticalthresholds.trunk.alarm.HighRxPower	-7		
TXP-MR-10E.opticalthresholds.trunk.alarm.HighTxPower	8		
TXP-MR-10E.opticalthresholds.trunk.alarm.LowRxPower	-25		
TXP-MR-10E.opticalthresholds.trunk.alarm.LowTxPower	1		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.HighTxPower	7		
TXP-MR-10E.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		

Table D-17 TXP_MR_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.opticalthresholds.trunk.warning.15min.LowTxPower	2		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.HighTxPower	7		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
TXP-MR-10E.opticalthresholds.trunk.warning.1day.LowTxPower	2		
TXP-MR-10E.otn.fecthresholds.enhanced.15min.BitErrorsCorrected	903330	0	9033621811200
TXP-MR-10E.otn.fecthresholds.enhanced.15min.UncorrectableWords	5	0	4724697600
TXP-MR-10E.otn.fecthresholds.enhanced.1day.BitErrorsCorrected	86719680	0	867227693875200
TXP-MR-10E.otn.fecthresholds.enhanced.1day.UncorrectableWords	480	0	453570969600
TXP-MR-10E.otn.fecthresholds.standard.15min.BitErrorsCorrected	903330	0	9033621811200
TXP-MR-10E.otn.fecthresholds.standard.15min.UncorrectableWords	5	0	4724697600
TXP-MR-10E.otn.fecthresholds.standard.1day.BitErrorsCorrected	86719680	0	867227693875200
TXP-MR-10E.otn.fecthresholds.standard.1day.UncorrectableWords	480	0	453570969600
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.BBE	85040	0	8850600
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.ES	87	0	900
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.FC	10	0	72
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.SES	1	0	900
TXP-MR-10E.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.BBE	850400	0	849657600
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
TXP-MR-10E.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.BBE	85040	0	8850600
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
TXP-MR-10E.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.BBE	850400	0	849657600
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400

Table D-17 TXP_MR_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.ES	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.FC	10	0	72
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.SES	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
TXP-MR-10E.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
TXP-MR-10E.otn.otnLines.AsynchSynchMapping	Synch Mapping		
TXP-MR-10E.otn.otnLines.FEC	Standard		
TXP-MR-10E.otn.otnLines.G709OTN	TRUE		
TXP-MR-10E.otn.otnLines.SDBER	1e-007		
TXP-MR-10E.pmthresholds.client.ms.farend.15min.BBE	85040	0	8850600
TXP-MR-10E.pmthresholds.client.ms.farend.15min.EB	85040	0	8850600
TXP-MR-10E.pmthresholds.client.ms.farend.15min.ES	87	0	900
TXP-MR-10E.pmthresholds.client.ms.farend.15min.SES	1	0	900
TXP-MR-10E.pmthresholds.client.ms.farend.15min.UAS	3	0	900
TXP-MR-10E.pmthresholds.client.ms.farend.1day.BBE	850400	0	849657600
TXP-MR-10E.pmthresholds.client.ms.farend.1day.EB	850400	0	849657600
TXP-MR-10E.pmthresholds.client.ms.farend.1day.ES	864	0	86400
TXP-MR-10E.pmthresholds.client.ms.farend.1day.SES	4	0	86400
TXP-MR-10E.pmthresholds.client.ms.farend.1day.UAS	10	0	86400

Table D-17 TXP_MR_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.pmthresholds.client.ms.nearend.15min.BBE	85040	0	8850600
TXP-MR-10E.pmthresholds.client.ms.nearend.15min.EB	85040	0	8850600
TXP-MR-10E.pmthresholds.client.ms.nearend.15min.ES	87	0	900
TXP-MR-10E.pmthresholds.client.ms.nearend.15min.SES	1	0	900
TXP-MR-10E.pmthresholds.client.ms.nearend.15min.UAS	3	0	900
TXP-MR-10E.pmthresholds.client.ms.nearend.1day.BBE	850400	0	849657600
TXP-MR-10E.pmthresholds.client.ms.nearend.1day.EB	850400	0	849657600
TXP-MR-10E.pmthresholds.client.ms.nearend.1day.ES	864	0	86400
TXP-MR-10E.pmthresholds.client.ms.nearend.1day.SES	4	0	86400
TXP-MR-10E.pmthresholds.client.ms.nearend.1day.UAS	10	0	86400
TXP-MR-10E.pmthresholds.client.rs.nearend.15min.BBE	10000	0	8850600
TXP-MR-10E.pmthresholds.client.rs.nearend.15min.EB	10000	0	7967700
TXP-MR-10E.pmthresholds.client.rs.nearend.15min.ES	500	0	900
TXP-MR-10E.pmthresholds.client.rs.nearend.15min.SES	500	0	900
TXP-MR-10E.pmthresholds.client.rs.nearend.15min.UAS	500	0	900
TXP-MR-10E.pmthresholds.client.rs.nearend.1day.BBE	100000	0	849657600
TXP-MR-10E.pmthresholds.client.rs.nearend.1day.EB	100000	0	764899200
TXP-MR-10E.pmthresholds.client.rs.nearend.1day.ES	5000	0	86400
TXP-MR-10E.pmthresholds.client.rs.nearend.1day.SES	5000	0	86400
TXP-MR-10E.pmthresholds.client.rs.nearend.1day.UAS	5000	0	86400
TXP-MR-10E.pmthresholds.trunk.ms.farend.15min.BBE	85040	0	8850600
TXP-MR-10E.pmthresholds.trunk.ms.farend.15min.EB	85040	0	8850600
TXP-MR-10E.pmthresholds.trunk.ms.farend.15min.ES	87	0	900
TXP-MR-10E.pmthresholds.trunk.ms.farend.15min.SES	1	0	900
TXP-MR-10E.pmthresholds.trunk.ms.farend.15min.UAS	3	0	900
TXP-MR-10E.pmthresholds.trunk.ms.farend.1day.BBE	850400	0	849657600
TXP-MR-10E.pmthresholds.trunk.ms.farend.1day.EB	850400	0	849657600
TXP-MR-10E.pmthresholds.trunk.ms.farend.1day.ES	864	0	86400
TXP-MR-10E.pmthresholds.trunk.ms.farend.1day.SES	4	0	86400
TXP-MR-10E.pmthresholds.trunk.ms.farend.1day.UAS	10	0	86400
TXP-MR-10E.pmthresholds.trunk.ms.nearend.15min.BBE	85040	0	8850600
TXP-MR-10E.pmthresholds.trunk.ms.nearend.15min.EB	85040	0	8850600
TXP-MR-10E.pmthresholds.trunk.ms.nearend.15min.ES	87	0	900
TXP-MR-10E.pmthresholds.trunk.ms.nearend.15min.SES	1	0	900
TXP-MR-10E.pmthresholds.trunk.ms.nearend.15min.UAS	3	0	900
TXP-MR-10E.pmthresholds.trunk.ms.nearend.1day.BBE	850400	0	849657600

Table D-17 TXP_MR_10E Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10E.pmthresholds.trunk.ms.nearend.1day.EB	850400	0	849657600
TXP-MR-10E.pmthresholds.trunk.ms.nearend.1day.ES	864	0	86400
TXP-MR-10E.pmthresholds.trunk.ms.nearend.1day.SES	4	0	86400
TXP-MR-10E.pmthresholds.trunk.ms.nearend.1day.UAS	10	0	86400
TXP-MR-10E.pmthresholds.trunk.rs.nearend.15min.BBE	10000	0	8850600
TXP-MR-10E.pmthresholds.trunk.rs.nearend.15min.EB	10000	0	7967700
TXP-MR-10E.pmthresholds.trunk.rs.nearend.15min.ES	500	0	900
TXP-MR-10E.pmthresholds.trunk.rs.nearend.15min.SES	500	0	900
TXP-MR-10E.pmthresholds.trunk.rs.nearend.15min.UAS	500	0	900
TXP-MR-10E.pmthresholds.trunk.rs.nearend.1day.BBE	100000	0	849657600
TXP-MR-10E.pmthresholds.trunk.rs.nearend.1day.EB	100000	0	764899200
TXP-MR-10E.pmthresholds.trunk.rs.nearend.1day.ES	5000	0	86400
TXP-MR-10E.pmthresholds.trunk.rs.nearend.1day.SES	5000	0	86400
TXP-MR-10E.pmthresholds.trunk.rs.nearend.1day.UAS	5000	0	86400

D.3.1.6 TXP_MR_10G Card Default Settings

Table D-18 lists the TXP_MR_10G card default settings.

Table D-18 TXP_MR_10G Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.config.client.AINSSoakTime	0.33333333333		
TXP-MR-10G.config.client.AlsMode	Disabled		
TXP-MR-10G.config.client.AlsRecoveryPulseDuration	4		
TXP-MR-10G.config.client.AlsRecoveryPulseInterval	100	100	300
TXP-MR-10G.config.client.mrPortAssignment	UNASSIGNED		
TXP-MR-10G.config.client.SDBER	1e-007		
TXP-MR-10G.config.client.SFBER	0.0001		
TXP-MR-10G.config.client.TerminationMode	Transparent		
TXP-MR-10G.config.trunk.AINSSoakTime	0.33333333333		
TXP-MR-10G.config.trunk.AlsMode	Disabled		
TXP-MR-10G.config.trunk.AlsRecoveryPulseDuration	4		
TXP-MR-10G.config.trunk.AlsRecoveryPulseInterval	100	60	300
TXP-MR-10G.config.trunk.SDBER	1e-007		
TXP-MR-10G.config.trunk.SFBER	0.0001		
TXP-MR-10G.opticalthresholds.client.alarm.HighLaserBias	90		
TXP-MR-10G.opticalthresholds.client.alarm.HighRxPower	2		

Table D-18 TXP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.opticalthresholds.client.alarm.HighTxPower	2		
TXP-MR-10G.opticalthresholds.client.alarm.LowRxPower	-17		
TXP-MR-10G.opticalthresholds.client.alarm.LowTxPower	-9		
TXP-MR-10G.opticalthresholds.client.warning.15min.HighLaserBias	81		
TXP-MR-10G.opticalthresholds.client.warning.15min.HighRxPower	1		
TXP-MR-10G.opticalthresholds.client.warning.15min.HighTxPower	1		
TXP-MR-10G.opticalthresholds.client.warning.15min.LowRxPower	-16		
TXP-MR-10G.opticalthresholds.client.warning.15min.LowTxPower	-8		
TXP-MR-10G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
TXP-MR-10G.opticalthresholds.client.warning.1day.HighRxPower	1.5		
TXP-MR-10G.opticalthresholds.client.warning.1day.HighTxPower	1.5		
TXP-MR-10G.opticalthresholds.client.warning.1day.LowRxPower	-16.5		
TXP-MR-10G.opticalthresholds.client.warning.1day.LowTxPower	-8.5		
TXP-MR-10G.opticalthresholds.trunk.alarm.HighLaserBias	90		
TXP-MR-10G.opticalthresholds.trunk.alarm.HighRxPower	-7		
TXP-MR-10G.opticalthresholds.trunk.alarm.HighTxPower	4		
TXP-MR-10G.opticalthresholds.trunk.alarm.LowRxPower	-25		
TXP-MR-10G.opticalthresholds.trunk.alarm.LowTxPower	2		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.HighLaserBias	81		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.HighTxPower	3.5		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
TXP-MR-10G.opticalthresholds.trunk.warning.15min.LowTxPower	2.5		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.HighLaserBias	85.5		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.HighTxPower	3.7		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
TXP-MR-10G.opticalthresholds.trunk.warning.1day.LowTxPower	2.3		
TXP-MR-10G.otn.fecthresholds.standard.15min.BitErrorsCorrected	903330	0	9033621811200
TXP-MR-10G.otn.fecthresholds.standard.15min.UncorrectableWords	5	0	4724697600
TXP-MR-10G.otn.fecthresholds.standard.1day.BitErrorsCorrected	86719680	0	867227693875200
TXP-MR-10G.otn.fecthresholds.standard.1day.UncorrectableWords	480	0	453570969600
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.BBE	85040	0	8850600
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.ES	87	0	900

Table D-18 TXP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.FC	10	0	72
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.SES	1	0	900
TXP-MR-10G.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.BBE	850400	0	849657600
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
TXP-MR-10G.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.BBE	85040	0	8850600
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
TXP-MR-10G.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.BBE	850400	0	849657600
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
TXP-MR-10G.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.ES	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.FC	10	0	72
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.SES	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912

Table D-18 TXP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
TXP-MR-10G.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
TXP-MR-10G.otn.otnLines.FEC	Enable		
TXP-MR-10G.otn.otnLines.G709OTN	TRUE		
TXP-MR-10G.otn.otnLines.SDBER	1e-007		
TXP-MR-10G.pmthresholds.client.ms.farend.15min.BBE	85040	0	8850600
TXP-MR-10G.pmthresholds.client.ms.farend.15min.EB	85040	0	8850600
TXP-MR-10G.pmthresholds.client.ms.farend.15min.ES	87	0	900
TXP-MR-10G.pmthresholds.client.ms.farend.15min.SES	1	0	900
TXP-MR-10G.pmthresholds.client.ms.farend.15min.UAS	3	0	900
TXP-MR-10G.pmthresholds.client.ms.farend.1day.BBE	850400	0	849657600
TXP-MR-10G.pmthresholds.client.ms.farend.1day.EB	850400	0	849657600
TXP-MR-10G.pmthresholds.client.ms.farend.1day.ES	864	0	86400
TXP-MR-10G.pmthresholds.client.ms.farend.1day.SES	4	0	86400
TXP-MR-10G.pmthresholds.client.ms.farend.1day.UAS	10	0	86400
TXP-MR-10G.pmthresholds.client.ms.nearend.15min.BBE	85040	0	8850600
TXP-MR-10G.pmthresholds.client.ms.nearend.15min.EB	85040	0	8850600
TXP-MR-10G.pmthresholds.client.ms.nearend.15min.ES	87	0	900
TXP-MR-10G.pmthresholds.client.ms.nearend.15min.SES	1	0	900
TXP-MR-10G.pmthresholds.client.ms.nearend.15min.UAS	3	0	900
TXP-MR-10G.pmthresholds.client.ms.nearend.1day.BBE	850400	0	849657600
TXP-MR-10G.pmthresholds.client.ms.nearend.1day.EB	850400	0	849657600
TXP-MR-10G.pmthresholds.client.ms.nearend.1day.ES	864	0	86400
TXP-MR-10G.pmthresholds.client.ms.nearend.1day.SES	4	0	86400
TXP-MR-10G.pmthresholds.client.ms.nearend.1day.UAS	10	0	86400
TXP-MR-10G.pmthresholds.client.rs.nearend.15min.BBE	10000	0	8850600
TXP-MR-10G.pmthresholds.client.rs.nearend.15min.EB	10000	0	7967700
TXP-MR-10G.pmthresholds.client.rs.nearend.15min.ES	500	0	900
TXP-MR-10G.pmthresholds.client.rs.nearend.15min.SES	500	0	900
TXP-MR-10G.pmthresholds.client.rs.nearend.15min.UAS	500	0	900
TXP-MR-10G.pmthresholds.client.rs.nearend.1day.BBE	100000	0	849657600
TXP-MR-10G.pmthresholds.client.rs.nearend.1day.EB	100000	0	764899200
TXP-MR-10G.pmthresholds.client.rs.nearend.1day.ES	5000	0	86400
TXP-MR-10G.pmthresholds.client.rs.nearend.1day.SES	5000	0	86400
TXP-MR-10G.pmthresholds.client.rs.nearend.1day.UAS	5000	0	86400
TXP-MR-10G.pmthresholds.trunk.ms.farend.15min.BBE	85040	0	8850600

Table D-18 TXP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-10G.pmthresholds.trunk.ms.farend.15min.EB	85040	0	8850600
TXP-MR-10G.pmthresholds.trunk.ms.farend.15min.ES	87	0	900
TXP-MR-10G.pmthresholds.trunk.ms.farend.15min.SES	1	0	900
TXP-MR-10G.pmthresholds.trunk.ms.farend.15min.UAS	3	0	900
TXP-MR-10G.pmthresholds.trunk.ms.farend.1day.BBE	850400	0	849657600
TXP-MR-10G.pmthresholds.trunk.ms.farend.1day.EB	850400	0	849657600
TXP-MR-10G.pmthresholds.trunk.ms.farend.1day.ES	864	0	86400
TXP-MR-10G.pmthresholds.trunk.ms.farend.1day.SES	4	0	86400
TXP-MR-10G.pmthresholds.trunk.ms.farend.1day.UAS	10	0	86400
TXP-MR-10G.pmthresholds.trunk.ms.nearend.15min.BBE	85040	0	8850600
TXP-MR-10G.pmthresholds.trunk.ms.nearend.15min.EB	85040	0	8850600
TXP-MR-10G.pmthresholds.trunk.ms.nearend.15min.ES	87	0	900
TXP-MR-10G.pmthresholds.trunk.ms.nearend.15min.SES	1	0	900
TXP-MR-10G.pmthresholds.trunk.ms.nearend.15min.UAS	3	0	900
TXP-MR-10G.pmthresholds.trunk.ms.nearend.1day.BBE	850400	0	849657600
TXP-MR-10G.pmthresholds.trunk.ms.nearend.1day.EB	850400	0	849657600
TXP-MR-10G.pmthresholds.trunk.ms.nearend.1day.ES	864	0	86400
TXP-MR-10G.pmthresholds.trunk.ms.nearend.1day.SES	4	0	86400
TXP-MR-10G.pmthresholds.trunk.ms.nearend.1day.UAS	10	0	86400
TXP-MR-10G.pmthresholds.trunk.rs.nearend.15min.BBE	10000	0	8850600
TXP-MR-10G.pmthresholds.trunk.rs.nearend.15min.EB	10000	0	7967700
TXP-MR-10G.pmthresholds.trunk.rs.nearend.15min.ES	500	0	900
TXP-MR-10G.pmthresholds.trunk.rs.nearend.15min.SES	500	0	900
TXP-MR-10G.pmthresholds.trunk.rs.nearend.15min.UAS	500	0	900
TXP-MR-10G.pmthresholds.trunk.rs.nearend.1day.BBE	100000	0	849657600
TXP-MR-10G.pmthresholds.trunk.rs.nearend.1day.EB	100000	0	764899200
TXP-MR-10G.pmthresholds.trunk.rs.nearend.1day.ES	5000	0	86400
TXP-MR-10G.pmthresholds.trunk.rs.nearend.1day.SES	5000	0	86400
TXP-MR-10G.pmthresholds.trunk.rs.nearend.1day.UAS	5000	0	86400

D.3.1.7 TXP_MR_2.5G Card Default Settings

Table D-19 lists the TXP_MR_2.5G card default settings.

Table D-19 TXP_MR_2.5G Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.config.client.AINSSoakTime	0.33333333333		
TXP-MR-2_5G.config.client.AlsMode	Disabled		
TXP-MR-2_5G.config.client.AlsRecoveryPulseDuration	40		
TXP-MR-2_5G.config.client.AlsRecoveryPulseInterval	100	60	300
TXP-MR-2_5G.config.client.ppmPortAssignment	UNASSIGNED		
TXP-MR-2_5G.config.client.ppmSlotAssignment	UNASSIGNED		
TXP-MR-2_5G.config.client.SDBER	1e-007		
TXP-MR-2_5G.config.client.SFBER	0.0001		
TXP-MR-2_5G.config.client.TerminationMode	Transparent		
TXP-MR-2_5G.config.trunk.AINSSoakTime	0.33333333333		
TXP-MR-2_5G.config.trunk.AlsMode	Disabled		
TXP-MR-2_5G.config.trunk.AlsRecoveryPulseDuration	40		
TXP-MR-2_5G.config.trunk.AlsRecoveryPulseInterval	100	60	300
TXP-MR-2_5G.config.trunk.SDBER	1e-007		
TXP-MR-2_5G.config.trunk.SFBER	0.0001		
TXP-MR-2_5G.opticalthresholds.client.alarm.HighLaserBias	90		
TXP-MR-2_5G.opticalthresholds.client.alarm.HighRxPower	3		
TXP-MR-2_5G.opticalthresholds.client.alarm.HighTxPower	3		
TXP-MR-2_5G.opticalthresholds.client.alarm.LowRxPower	-21		
TXP-MR-2_5G.opticalthresholds.client.alarm.LowTxPower	-15		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.HighLaserBias	81		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.HighRxPower	2		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.HighTxPower	2		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.LowRxPower	-20		
TXP-MR-2_5G.opticalthresholds.client.warning.15min.LowTxPower	-7		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
TXP-MR-2_5G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
TXP-MR-2_5G.opticalthresholds.trunk.alarm.HighLaserBias	98		
TXP-MR-2_5G.opticalthresholds.trunk.alarm.HighRxPower	-7		
TXP-MR-2_5G.opticalthresholds.trunk.alarm.LowRxPower	-25		

Table D-19 TXP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
TXP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
TXP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
TXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
TXP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
TXP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
TXP-MR-2_5G.otn.fecthresholds.1gethernet.15min.BitErrorsCorrected	112500	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.1gethernet.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.1gethernet.1day.BitErrorsCorrected	10800000	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.1gethernet.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.1gfiberchannel.15min.BitErrorsCorrected	90000	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.1gfiberchannel.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.1gfiberchannel.1day.BitErrorsCorrected	8640000	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.1gfiberchannel.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.1gficon.15min.BitErrorsCorrected	90000	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.1gficon.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.1gficon.1day.BitErrorsCorrected	8640000	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.1gficon.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.2gfiberchannel.15min.BitErrorsCorrected	180900	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.2gfiberchannel.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.2gfiberchannel.1day.BitErrorsCorrected	17366400	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.2gfiberchannel.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.2gficon.15min.BitErrorsCorrected	180900	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.2gficon.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.2gficon.1day.BitErrorsCorrected	17366400	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.2gficon.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.stm1.15min.BitErrorsCorrected	15012	0	9033621811200

Table D-19 TXP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.otn.fecthresholds.stm1.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.stm1.1day.BitErrorsCorrected	1441152	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.stm1.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.stm16.15min.BitErrorsCorrected	225837	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.stm16.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.stm16.1day.BitErrorsCorrected	21680352	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.stm16.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.fecthresholds.stm4.15min.BitErrorsCorrected	56457	0	9033621811200
TXP-MR-2_5G.otn.fecthresholds.stm4.15min.UncorrectableWords	1	0	4724697600
TXP-MR-2_5G.otn.fecthresholds.stm4.1day.BitErrorsCorrected	5419872	0	867227693875200
TXP-MR-2_5G.otn.fecthresholds.stm4.1day.UncorrectableWords	96	0	453570969600
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.BBE	21260	0	8850600
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.ES	87	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.FC	10	0	72
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.SES	1	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.BBE	212600	0	849657600
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.FC	40	0	6912
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.BBE	21260	0	8850600
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.BBE	212600	0	849657600
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
TXP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.ES	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.FC	10	0	72

Table D-19 TXP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.SES	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
TXP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
TXP-MR-2_5G.otn.otnLines.FEC	Enable		
TXP-MR-2_5G.otn.otnLines.G709OTN	TRUE		
TXP-MR-2_5G.otn.otnLines.SDBER	1e-007		
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.BBE	1312	0	137700
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.EB	1312	0	137700
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.BBE	13120	0	13219200
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.EB	13120	0	13219200
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.BBE	1312	0	137700
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.EB	1312	0	137700
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.BBE	13120	0	13219200

Table D-19 TXP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.EB	13120	0	13219200
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.BBE	10000	0	138600
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.EB	10000	0	138600
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.ES	500	0	900
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.SES	500	0	900
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.UAS	500	0	900
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.BBE	10000	0	13305600
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.EB	100000	0	13305600
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.ES	5000	0	86400
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.SES	5000	0	86400
TXP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.UAS	5000	0	86400
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.BBE	21260	0	2212200
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.EB	21260	0	2212200
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.BBE	212600	0	212371200
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.EB	212600	0	212371200
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.ES	864	0	900
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.BBE	21260	0	2212200
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.EB	21260	0	2212200
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.BBE	212600	0	212371200
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.EB	212600	0	212371200
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.BBE	10000	0	2151900
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.EB	10000	0	2151900

Table D-19 TXP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.ES	500	0	900
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.SES	500	0	900
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.UAS	500	0	900
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.BBE	10000	0	206582400
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.EB	100000	0	206582400
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.ES	5000	0	86400
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.SES	5000	0	86400
TXP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.UAS	5000	0	86400
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.BBE	5315	0	552600
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.EB	5315	0	552600
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.BBE	53150	0	53049600
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.EB	53150	0	53049600
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.BBE	5315	0	552600
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.EB	5315	0	552600
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.ES	87	0	900
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.SES	1	0	900
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.UAS	3	0	900
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.BBE	53150	0	53049600
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.EB	53150	0	53049600
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.ES	864	0	86400
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.SES	4	0	86400
TXP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.UAS	10	0	86400
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.BBE	10000	0	553500
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.EB	10000	0	553500
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.ES	500	0	900
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.SES	500	0	900
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.UAS	500	0	900
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.BBE	10000	0	53136000
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.EB	100000	0	53136000
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.ES	5000	0	86400

Table D-19 TXP_MR_2.5G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.SES	5000	0	86400
TXP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.UAS	5000	0	86400

D.3.1.8 TXPP_MR_10G Card Default Settings

Table D-20 lists the TXPP_MR_10G card default settings.

Table D-20 TXPP_MR_10G Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.config.client.AINSSoakTime	0.3333333333		
TXPP-MR-2_5G.config.client.AlsMode	Disabled		
TXPP-MR-2_5G.config.client.AlsRecoveryPulseDuration	40		
TXPP-MR-2_5G.config.client.AlsRecoveryPulseInterval	100	60	300
TXPP-MR-2_5G.config.client.ppmPortAssignment	UNASSIGNED		
TXPP-MR-2_5G.config.client.ppmSlotAssignment	UNASSIGNED		
TXPP-MR-2_5G.config.client.SDBER	1e-007		
TXPP-MR-2_5G.config.client.SFBER	0.0001		
TXPP-MR-2_5G.config.client.TerminationMode	Transparent		
TXPP-MR-2_5G.config.trunk.AINSSoakTime	0.3333333333		
TXPP-MR-2_5G.config.trunk.AlsMode	Disabled		
TXPP-MR-2_5G.config.trunk.AlsRecoveryPulseDuration	40		
TXPP-MR-2_5G.config.trunk.AlsRecoveryPulseInterval	100	60	300
TXPP-MR-2_5G.config.trunk.SDBER	1e-007		
TXPP-MR-2_5G.config.trunk.SFBER	0.0001		
TXPP-MR-2_5G.opticalthresholds.client.alarm.HighLaserBias	90		
TXPP-MR-2_5G.opticalthresholds.client.alarm.HighRxPower	3		
TXPP-MR-2_5G.opticalthresholds.client.alarm.HighTxPower	3		
TXPP-MR-2_5G.opticalthresholds.client.alarm.LowRxPower	-21		
TXPP-MR-2_5G.opticalthresholds.client.alarm.LowTxPower	-15		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighLaserBias	81		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighRxPower	2		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.HighTxPower	2		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.LowRxPower	-20		
TXPP-MR-2_5G.opticalthresholds.client.warning.15min.LowTxPower	-7		

Table D-20 TXPP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighLaserBias	85.5		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighRxPower	2.5		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.HighTxPower	2.5		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.LowRxPower	-20.5		
TXPP-MR-2_5G.opticalthresholds.client.warning.1day.LowTxPower	-7.5		
TXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighLaserBias	98		
TXPP-MR-2_5G.opticalthresholds.trunk.alarm.HighRxPower	-7		
TXPP-MR-2_5G.opticalthresholds.trunk.alarm.LowRxPower	-25		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighLaserBias	95		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.HighRxPower	-7.5		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.15min.LowRxPower	-24.5		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighLaserBias	96		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.HighRxPower	-7.3		
TXPP-MR-2_5G.opticalthresholds.trunk.warning.1day.LowRxPower	-24.7		
TXPP-MR-2_5G.otn.fecthresholds.1gethernet.15min.BitErrorsCorrected	112500	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.1gethernet.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.1gethernet.1day.BitErrorsCorrected	10800000	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.1gethernet.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.1gfiberchannel.15min.BitErrorsCorrected	90000	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.1gfiberchannel.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.1gfiberchannel.1day.BitErrorsCorrected	8640000	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.1gfiberchannel.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.1gficon.15min.BitErrorsCorrected	90000	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.1gficon.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.1gficon.1day.BitErrorsCorrected	8640000	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.1gficon.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.2gfiberchannel.15min.BitErrorsCorrected	180900	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.2gfiberchannel.15min.UncorrectableWords	1	0	4724697600

Table D-20 TXPP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.otn.fecthresholds.2gfiberchannel.1day.BitErrorsCorrected	17366400	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.2gfiberchannel.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.2gficon.15min.BitErrorsCorrected	180900	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.2gficon.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.2gficon.1day.BitErrorsCorrected	17366400	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.2gficon.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.stm1.15min.BitErrorsCorrected	15012	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.stm1.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.stm1.1day.BitErrorsCorrected	1441152	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.stm1.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.stm16.15min.BitErrorsCorrected	225837	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.stm16.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.stm16.1day.BitErrorsCorrected	21680352	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.stm16.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.fecthresholds.stm4.15min.BitErrorsCorrected	56457	0	9033621811200
TXPP-MR-2_5G.otn.fecthresholds.stm4.15min.UncorrectableWords	1	0	4724697600
TXPP-MR-2_5G.otn.fecthresholds.stm4.1day.BitErrorsCorrected	5419872	0	867227693875200
TXPP-MR-2_5G.otn.fecthresholds.stm4.1day.UncorrectableWords	96	0	453570969600
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.BBE	21260	0	8850600
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.ES	87	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.FC	10	0	72
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.SES	1	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.15min.UAS	3	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.BBE	212600	0	849657600
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.ES	864	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.FC	40	0	6912

Table D-20 TXPP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.SES	4	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.farend.1day.UAS	10	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.BBE	21260	0	8850600
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.ES	87	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.FC	10	0	72
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.SES	1	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.15min.UAS	3	0	900
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.BBE	212600	0	849657600
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.ES	864	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.FC	40	0	6912
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.SES	4	0	86400
TXPP-MR-2_5G.otn.g709thresholds.pm.nearend.1day.UAS	10	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.BBE	10000	0	8850600
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.ES	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.FC	10	0	72
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.SES	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.15min.UAS	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.BBE	100000	0	849657600
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.ES	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.FC	40	0	6912
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.SES	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.farend.1day.UAS	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.BBE	10000	0	8850600
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.ES	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.FC	10	0	72
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.SES	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.15min.UAS	500	0	900
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.BBE	100000	0	849657600
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.ES	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.FC	40	0	6912
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.SES	5000	0	86400
TXPP-MR-2_5G.otn.g709thresholds.sm.nearend.1day.UAS	5000	0	86400
TXPP-MR-2_5G.otn.otnLines.FEC	Enable		
TXPP-MR-2_5G.otn.otnLines.G709OTN	TRUE		
TXPP-MR-2_5G.otn.otnLines.SDBER	1e-007		
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.BBE	1312	0	137700

Table D-20 TXPP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.EB	1312	0	137700
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.BBE	13120	0	13219200
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.EB	13120	0	13219200
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.stm1.ms.farend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.BBE	1312	0	137700
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.EB	1312	0	137700
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.BBE	13120	0	13219200
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.EB	13120	0	13219200
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.stm1.ms.nearend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.BBE	10000	0	138600
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.EB	10000	0	138600
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.ES	500	0	900
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.SES	500	0	900
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.15min.UAS	500	0	900
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.BBE	10000	0	13305600
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.EB	100000	0	13305600
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.ES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.SES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.stm1.rs.nearend.1day.UAS	5000	0	86400
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.BBE	21260	0	2212200
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.EB	21260	0	2212200
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.BBE	212600	0	212371200
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.EB	212600	0	212371200

Table D-20 TXPP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.ES	864	0	900
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.stm16.ms.farend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.BBE	21260	0	2212200
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.EB	21260	0	2212200
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.BBE	212600	0	212371200
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.EB	212600	0	212371200
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.stm16.ms.nearend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.BBE	10000	0	2151900
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.EB	10000	0	2151900
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.ES	500	0	900
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.SES	500	0	900
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.15min.UAS	500	0	900
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.BBE	10000	0	206582400
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.EB	100000	0	206582400
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.ES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.SES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.stm16.rs.nearend.1day.UAS	5000	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.BBE	5315	0	552600
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.EB	5315	0	552600
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.ES	87	0	900
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.BBE	53150	0	53049600
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.EB	53150	0	53049600
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.ms.farend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.BBE	5315	0	552600
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.EB	5315	0	552600
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.ES	87	0	900

Table D-20 TXPP_MR_10G Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.SES	1	0	900
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.15min.UAS	3	0	900
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.BBE	53150	0	53049600
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.EB	53150	0	53049600
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.ES	864	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.SES	4	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.ms.nearend.1day.UAS	10	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.BBE	10000	0	553500
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.EB	10000	0	553500
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.ES	500	0	900
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.SES	500	0	900
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.15min.UAS	500	0	900
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.BBE	10000	0	53136000
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.EB	100000	0	53136000
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.ES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.SES	5000	0	86400
TXPP-MR-2_5G.pmthresholds.stm4.rs.nearend.1day.UAS	5000	0	86400

D.3.1.9 OSCM Card Default Settings

Table D-21 lists the OSCM card default settings.

Table D-21 OSCM Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
OSCM.pmthresholds.ms.farend.15min.BBE	1312	0	137700
OSCM.pmthresholds.ms.farend.15min.EB	1312	0	137700
OSCM.pmthresholds.ms.farend.15min.ES	87	0	900
OSCM.pmthresholds.ms.farend.15min.SES	1	0	900
OSCM.pmthresholds.ms.farend.15min.UAS	3	0	900
OSCM.pmthresholds.ms.farend.1day.BBE	13120	0	13219200
OSCM.pmthresholds.ms.farend.1day.EB	13120	0	13219200
OSCM.pmthresholds.ms.farend.1day.ES	864	0	86400
OSCM.pmthresholds.ms.farend.1day.SES	4	0	86400
OSCM.pmthresholds.ms.farend.1day.UAS	10	0	86400
OSCM.pmthresholds.ms.nearend.15min.BBE	1312	0	137700
OSCM.pmthresholds.ms.nearend.15min.EB	1312	0	137700
OSCM.pmthresholds.ms.nearend.15min.ES	87	0	900

Table D-21 OSCM Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
OSCM.pmthresholds.ms.nearend.15min.SES	1	0	900
OSCM.pmthresholds.ms.nearend.15min.UAS	3	0	900
OSCM.pmthresholds.ms.nearend.1day.BBE	13120	0	13219200
OSCM.pmthresholds.ms.nearend.1day.EB	13120	0	13219200
OSCM.pmthresholds.ms.nearend.1day.ES	864	0	86400
OSCM.pmthresholds.ms.nearend.1day.SES	4	0	86400
OSCM.pmthresholds.ms.nearend.1day.UAS	10	0	86400
OSCM.pmthresholds.rs.nearend.15min.BBE	10000	0	138600
OSCM.pmthresholds.rs.nearend.15min.EB	10000	0	138600
OSCM.pmthresholds.rs.nearend.15min.ES	500	0	900
OSCM.pmthresholds.rs.nearend.15min.SES	500	0	900
OSCM.pmthresholds.rs.nearend.1day.BBE	100000	0	13305600
OSCM.pmthresholds.rs.nearend.1day.EB	100000	0	13305600
OSCM.pmthresholds.rs.nearend.1day.ES	5000	0	86400
OSCM.pmthresholds.rs.nearend.1day.SES	5000	0	86400

D.3.1.10 OSC-CSM Card Default Settings

Table D-22 lists the OSC-CSM card default settings.

Table D-22 OSC-CSM Card Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
OSC_CSM.pmthresholds.ms.farend.15min.BBE	1312	0	137700
OSC_CSM.pmthresholds.ms.farend.15min.EB	1312	0	137700
OSC_CSM.pmthresholds.ms.farend.15min.ES	87	0	900
OSC_CSM.pmthresholds.ms.farend.15min.SES	1	0	900
OSC_CSM.pmthresholds.ms.farend.15min.UAS	3	0	900
OSC_CSM.pmthresholds.ms.farend.1day.BBE	13120	0	13219200
OSC_CSM.pmthresholds.ms.farend.1day.EB	13120	0	13219200
OSC_CSM.pmthresholds.ms.farend.1day.ES	864	0	86400
OSC_CSM.pmthresholds.ms.farend.1day.SES	4	0	86400
OSC_CSM.pmthresholds.ms.farend.1day.UAS	10	0	86400
OSC_CSM.pmthresholds.ms.nearend.15min.BBE	1312	0	137700
OSC_CSM.pmthresholds.ms.nearend.15min.EB	1312	0	137700
OSC_CSM.pmthresholds.ms.nearend.15min.ES	87	0	900
OSC_CSM.pmthresholds.ms.nearend.15min.SES	1	0	900
OSC_CSM.pmthresholds.ms.nearend.15min.UAS	3	0	900

Table D-22 OSC-CSM Card Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
OSC_CSM.pmthresholds.ms.nearend.1day.BBE	13120	0	13219200
OSC_CSM.pmthresholds.ms.nearend.1day.EB	13120	0	13219200
OSC_CSM.pmthresholds.ms.nearend.1day.ES	864	0	86400
OSC_CSM.pmthresholds.ms.nearend.1day.SES	4	0	86400
OSC_CSM.pmthresholds.ms.nearend.1day.UAS	10	0	86400
OSC_CSM.pmthresholds.rs.nearend.15min.BBE	10000	0	138600
OSC_CSM.pmthresholds.rs.nearend.15min.EB	10000	0	138600
OSC_CSM.pmthresholds.rs.nearend.15min.ES	500	0	900
OSC_CSM.pmthresholds.rs.nearend.15min.SES	500	0	900
OSC_CSM.pmthresholds.rs.nearend.1day.BBE	100000	0	13305600
OSC_CSM.pmthresholds.rs.nearend.1day.EB	100000	0	13305600
OSC_CSM.pmthresholds.rs.nearend.1day.ES	5000	0	86400
OSC_CSM.pmthresholds.rs.nearend.1day.SES	5000	0	86400

D.3.2 ETSI Node Default Settings

Table D-23 lists the Cisco ONS 15454 node-level default settings for the Cisco ONS 15454. Cisco provides the following types of settings pre provisioned for each Cisco ONS 15454 node:

- SNCP settings determine whether SNCP circuits have SD BER and SF BER monitoring enabled, are revertive, and what the reversion time is.
- Craft Access Only allows CTC connectivity to the node only through the craft access port.
- CTC IP Display Suppression prevents display of node IP addresses in CTC.
- Defaults Description lists the current defaults file on the node.
- Enable Firewall enables or disables the use of a firewall for accessing the node.
- Enable Proxy enables or disables the use of a proxy server with the node.
- IIOP Listener Port sets the IIOP listener port number.
- LCD IP Setting sets the node LCD screen to display the node IP address and use the buttons on the LCD panel, only display the IP address, or suppress display of the IP address.
- Login Warning Message warns users at the login screen about the possible legal or contractual ramifications of accessing equipment, systems, or networks without authorization.
- NTP SNTP Server sets the IP address of the NTP SNTP server to be used with the node.
- Time Zone sets the time zone where the node is located.
- Use DST enables or disables the use of Daylight Savings Time.
- Use NTP SNTP Server enables or disables the use of the specified NTP SNTP server with the node.
- LMSP protection settings determine whether or not LMSP-protected circuits have bidirectional switching, are revertive, and what the reversion time is.
- MS-SPRing Protection Settings determine whether MS-SPRing-protected circuits are revertive and what the reversion time is at both the ring and span levels.

- Y Cable Protection Settings determine whether Y-Cable protected circuits have bidirectional switching, are revertive, and what the reversion time is.
- Security Policy settings determine the failed logins before lockout, idle user timeout for each user level, lockout duration, manual unlock user level enabled, password reuse timeout and threshold, and single session per user for the node security.
- BITS Timing settings determine the AIS threshold, coding, and framing for BITS1 and BITS2 timing.
- General Timing settings determine the mode (internal or external), quality of RES, revertive, reversion time, and SSM message set for node timing.

Table D-23 Node Default Settings (ETSI)

Default Name	Default Value	Minimum	Maximum
NODE.circuits.sncp.HO_SDBER	1e-006		
NODE.circuits.sncp.HO_SFBER	0.0001		
NODE.circuits.sncp.LO_SDBER	1e-005		
NODE.circuits.sncp.LO_SFBER	0.001		
NODE.circuits.sncp.ReversionTime	5		
NODE.circuits.sncp.Revertive	FALSE		
NODE.circuits.State	unlocked, automaticInService		
NODE.general.DefaultsDescription	Factory Defaults		
NODE.general.IIOPListenerPort	57790	0	65535
NODE.general.NtpSntpServer	0.0.0.0		
NODE.general.TimeZone	(GMT-08:00) Pacific Time (US & Canada), Tijuana		
NODE.general.UseDST	TRUE		
NODE.network.general.AlarmMissingBackplaneLAN	FALSE		
NODE.network.general.CtcIpDisplaySuppression	FALSE		
NODE.network.general.GatewaySettings	None		
NODE.network.general.LcdIpSetting	Allow Configuration		
NODE.powerMonitor.EHIBATVG_48V	-56.5		
NODE.powerMonitor.EHIBATVG_60V	-72		
NODE.powerMonitor.ELWBATVG_48V	-40.5		
NODE.powerMonitor.ELWBATVG_60V	-50		
NODE.protection.lmsp.BidirectionalSwitching	FALSE		
NODE.protection.lmsp.ReversionTime	5		
NODE.protection.lmsp.Revertive	FALSE		
NODE.protection.msspr.RingReversionTime	5		
NODE.protection.msspr.RingRevertive	TRUE		
NODE.protection.msspr.SpanReversionTime	5		
NODE.protection.msspr.SpanRevertive	TRUE		

Table D-23 Node Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
NODE.protection.splitter.ReversionTime	5		
NODE.protection.splitter.Revertive	FALSE		
NODE.protection.ycable.ReversionTime	5		
NODE.protection.ycable.Revertive	FALSE		
NODE.security.access.LANAccess	Front & Backplane		
NODE.security.access.RestoreTimeout	5	0	60
NODE.security.dataComm.CtcBackplaneIpDisplaySuppression	TRUE		
NODE.security.dataComm.DefaultTCCEthernetIP	10.10.0.1		
NODE.security.dataComm.DefaultTCCEthernetIPNetmask	24		
NODE.security.dataComm.LcdBackplaneIpSetting	Display Only		
NODE.security.dataComm.SecureModeLocked	FALSE		
NODE.security.dataComm.SecureModeOn	FALSE		
NODE.security.idleUserTimeout.Maintenance	0.041666666667		
NODE.security.idleUserTimeout.Provisioning	0.020833333333		
NODE.security.idleUserTimeout.Retrieve	0		
NODE.security.idleUserTimeout.Superuser	0.010416666667		
NODE.security.legalDisclaimer.LoginWarningMessage	WARNING This system is restricted to authorized users for business purposes. Unauthorized<p>access is a violation of the law. This service may be monitored for administrative<p>and security reasons. By proceeding, you consent to this monitoring.		
NODE.security.other.DisableInactiveUser	FALSE		
NODE.security.other.InactiveDuration	45	20	90
NODE.security.other.PMClearingPrivilege	Provisioning		
NODE.security.other.SingleSessionPerUser	FALSE		
NODE.security.passwordAging.EnforcePasswordAging	FALSE		
NODE.security.passwordAging.maintenance.AgingPeriod	45	20	90
NODE.security.passwordAging.maintenance.WarningPeriod	5	2	20
NODE.security.passwordAging.provisioning.AgingPeriod	45	20	90
NODE.security.passwordAging.provisioning.WarningPeriod	5	2	20
NODE.security.passwordAging.retrieve.AgingPeriod	45	20	90
NODE.security.passwordAging.retrieve.WarningPeriod	5	2	20
NODE.security.passwordAging.superuser.AgingPeriod	45	20	90

Table D-23 Node Default Settings (ETSI) (continued)

Default Name	Default Value	Minimum	Maximum
NODE.security.passwordAging.superuser.WarningPeriod	5	2	20
NODE.security.passwordChange.CannotChangeNewPassword	FALSE		
NODE.security.passwordChange.CannotChangeNewPasswordForNDays	20	20	95
NODE.security.passwordChange.PreventReusingLastNPasswords	1	1	10
NODE.security.passwordChange.RequirePasswordChangeOnFirstLoginToNewAccount	FALSE		
NODE.security.shellAccess.EnableShellPassword	FALSE		
NODE.security.shellAccess.SSH	FALSE		
NODE.security.shellAccess.TelnetPort	23	23	9999
NODE.security.userLockout.FailedLoginsBeforeLockout	5	0	10
NODE.security.userLockout.LockoutDuration	0.020833333333	0	600
NODE.security.userLockout.ManualUnlockBySuperuser	FALSE		
NODE.timing.bits-1.AdminSSMIn	STU		
NODE.timing.bits-1.AISThreshold	G812L		
NODE.timing.bits-1.Coding	HDB3		
NODE.timing.bits-1.CodingOut	HDB3		
NODE.timing.bits-1.FacilityType	E1		
NODE.timing.bits-1.FacilityTypeOut	E1		
NODE.timing.bits-1.Framing	FAS+CAS+CRC		
NODE.timing.bits-1.FramingOut	FAS+CAS+CRC		
NODE.timing.bits-1.Sa bit	4		
NODE.timing.bits-1.State	unlocked		
NODE.timing.bits-1.StateOut	unlocked		
NODE.timing.bits-2.AdminSSMIn	STU		
NODE.timing.bits-2.AISThreshold	G812L		
NODE.timing.bits-2.Coding	HDB3		
NODE.timing.bits-2.CodingOut	HDB3		
NODE.timing.bits-2.FacilityType	E1		
NODE.timing.bits-2.FacilityTypeOut	E1		
NODE.timing.bits-2.Framing	FAS+CAS+CRC		
NODE.timing.bits-2.FramingOut	FAS+CAS+CRC		
NODE.timing.bits-2.Sa bit	4		
NODE.timing.bits-2.State	unlocked		
NODE.timing.bits-2.StateOut	unlocked		
NODE.timing.general.Mode	External		

D.3.3 ETSI CTC Default Settings

Table D-24 lists the CTC-level default settings for the Cisco ONS 15454. Cisco provides the following types of settings preprovisioned for CTC.

- Create circuits with the Auto route check box selected by default
- Create TL1-like circuits—instructs the node to create only cross-connects, allowing the resulting circuits to be in an upgradable state.
- Choose a default network map (which country)

Table D-24 CTC Default Settings (ETSI)

Default Name	Default Value
CTC.circuits.AutoRoute	TRUE
CTC.circuits.CreateLikeTL1	FALSE
CTC.network.Map	United States

Numerics

1:1 protection A electrical card protection scheme that pairs a working card with a protect card of the same type in an adjacent slot. If the working card fails, the traffic from the working card switches to the protect card. When the failure on the working card is resolved, traffic reverts back to the working card if this option is set. This protection scheme is specific to electrical cards.

1+1 protection An optical card protection scheme that pairs a single working card with a single dedicated protect card. A term specific to optical cards.

1:N protection An electrical card protection scheme that allows a single protect card to provide protection for several working cards. If a working card fails, the traffic from the working card switches to the protect card.When the failure on the working card is resolved, traffic reverts to the working card.

10BaseT Standard 10-Mbps local area network over unshielded twisted pair copper wire.

100BaseT Standard 100-Mbps local Ethernet network.

100BaseTX Specification of 100BaseT that supports full duplex operation.

A

access drop Point where network devices can access the network.

access identifier *See* AID.

ACO alarm cutoff.

active card A card that is working or carrying traffic. A card provisioned as working can be an active card or, after a protection switch, a protect card can be an active card.

ACT/STBY Active/Standby.

add/drop multiplexer *See* ADM.

address mask Bit combination used to describe the portion of an IP address that refers to the network or subnet and the portion that refers to the host. Sometimes referred to as mask. *See also* subnet mask.

ADM add/drop multiplexer. ADMs aggregate or groom SONET traffic at various speeds. An ADM has three or more nodes.

agent **1.** Generally, software that processes queries and returns replies on behalf of an application.

2. In a network management system, a process that resides in all managed devices and reports the values of specified variables to management stations.

AEP Alarm Expansion Panel.

AID access identifier. An access code used in TL1 messaging that identifies and addresses specific objects within the ONS 15454. These objects include individual pieces of equipment, transport spans, access tributaries, and others. *See also* TID.

AIP alarm interface panel.

ALS Automatic laser shutdown. A protocol that, in the event a remote link is broken, automatically reduces the optical output power of remote transmitters.

alternate mark inversions *See* AMI.

ANS automatic node setup.

AMI alternate mark inversion. Line-code format used on T1 circuits that transmits ones by alternate positive and negative pulses. Zeros are represented by 01 during each bit cell and ones are represented by 11 or 00, alternately, during each bit cell. AMI requires that the sending device maintain ones density. Ones density is not maintained independently of the data stream. Sometimes called binary-coded alternate mark inversion.

AMP Champ Short name for the backplane electrical interface assembly equipped with AMP Champ connectors.

ANSI American National Standards Institute.

AOTF Acoustic-Optic Tunable Filter. Wavelength filter used to add/drop specific channels within the MSTP under software control.

APC automatic power control.

APD avalanche photodiode.

APS automatic protection switching. SONET switching mechanism that routes traffic from working lines to protect lines if a line card failure or fiber cut occurs.

APSB alarm protection switching byte.

ARP Address Resolution Protocol.

ASIC application-specific integrated circuit.

Asynchronous Transfer Mode *See* ATM.

ATAG autonomous message tag. Sequential number generated by the system tat is used for TL1 message sequencing. *See also* CTAG.

ATM Asynchronous Transfer Mode. The international standard for cell relay, in which multiple service types (such as voice, video, or data) are conveyed in fixed-length (53-byte) cells. Fixed-length cells allow cell processing to occur in hardware, thereby reducing transit delays. ATM is designed to take advantage of high-speed transmission media such as E3, SONET, and T3.

attenuation The decrease in signal strength in an optical fiber caused by absorption and scattering. Attenuation can be calculated to express the signal loss between two points, or the total signal loss of a telecommunications system or segment.

automatic laser shutdown *See* ALS.

automatic protection switching *See* APS.

autonomous message tag *See* ATAG.

AWG American Wire Gauge, or arrayed waveguide grating

B

B8ZS binary 8-zero substitution. A line-code type, used on T1 circuits, that substitutes a special code whenever eight consecutive zeros are sent over the link. This code is then interpreted at the remote end of the connection. This technique guarantees ones density independent of the data stream. Sometimes called bipolar 8-zero substitution.

backbone The part of the network that carries the heaviest traffic or joins LANs together.

BER bit error rate. Ratio of received bits that contain errors.

bidirectional line switched ring *See* BLSR.

binary-coded alternate mark inversion *See* AMI.

binary 8-zero substitution *See* B8ZS.

BIP bit interleaved parity. In ATM, a method used to monitor errors on a link. A check bit or word is sent in the link overhead for the previous block or frame. Bit errors in the payload can then be detected and reported as maintenance information.

bit error rate *See* BER.

bit interleaved parity *See* BIP.

bit rate Speed at which bits are transmitted, usually expressed in bits per second.

BITS building integrated timing supply. A single building master timing supply that minimizes the number of synchronization links entering an office.

BLSR bidirectional line switched ring. A SONET ring architecture that provides working and protection fibers between nodes. If the working fiber between nodes is cut, traffic is automatically routed onto the protection fiber. *Compare with* path protection.

blue band Dense wavelength division multiplexing (DWDM) wavelengths are broken into two distinct bands: red and blue. DWDM cards for the ONS 15454 operate on wavelengths between 1530.33 nm and 1542.94 nm in the blue band. The blue band is the lower frequency band.

BNC Bayonet Neill-Concelman (coaxial cable bayonet-locking connector).

BPDU bridge protocol data unit.

bridge Device that connects and passes packets between two network segments that use the same communications protocol. In general, a bridge will filter, forward, or flood an incoming frame based on the MAC address of that frame. *See also* MAC address.

broadcast Data packet that will be sent to all nodes on a network. Broadcasts are identified by a broadcast address. *Compare with* multicast *and* unicast. *See also* broadcast address.

broadcast address Special address reserved for sending a message to all stations. Generally, a broadcast address is a MAC destination address of all ones. *See also* MAC address.

broadcast storm Undesirable network event in which many broadcasts are sent simultaneously across all network segments. A broadcast storm uses substantial network bandwidth and, typically, causes network timeouts.

building integrated timing supply *See* BITS.

bus Common physical signal path composed of wires or other media across which signals can be sent from one part of a computer to another.

C

C2 byte The C2 byte is the signal label byte in the synchronous transport signal (STS) path overhead. This byte tells the equipment what the SONET payload envelope contains and how it is constructed. See also *SONET.*

CAT-5 Category 5 (cabling).

C-Band conventional band. In optical networks, a range of wavelengths between 1535 nm and 1565 nm.

CCITT Comité Consultatif International Télégraphique et Téléphoniques. Formerly ITU.

CEV Controlled Environment Vaults.

Cisco Transport Controller *See* CTC.

Cisco Transport Manager *See* CTM.

CLEI Common Language Equipment Identification code.

CLNP Connectionless Network Protocol.

cm centimeter.

CMIP Common Management Information Protocol.

COE Central Office Environment.

collision In Ethernet, the result of two nodes transmitting simultaneously. The frames from each device impact and are damaged when they meet on the physical media.

concatenation A mechanism for allocating contiguous bandwidth for payload transport. Through the use of concatenation pointers, multiple OC-1s can be linked together to provide contiguous bandwidth through the network, from end to end.

Coordinated Universal Time *See* UTC.

CORBA Common Object Request Broker Architecture.

correlation tag *See* CTAG.

CPE Customer Premise Equipment.

crosspoint A set of physical or logical contacts that operate together to extend the speech and signal channels in a switching network.

CTAG correlation tag. A unique identifier given to each input command by the TL1 operator. When the ONS 15454 system responds to a specific command, it includes the command's CTAG in the reply. This eliminates discrepancies about which response corresponds to which command. *See also* ATAG.

CTC Cisco Transport Controller. A Java-based graphical user interface (GUI) that allows operation, administration, maintenance, and provisioning (OAM&P) of the ONS 15454 using an Internet browser.

CTM Cisco Transport Manager. A Java-based network management tool used to support large Cisco 15000-class networks.

D

data communications channel *See* DCC.

data communications network *See* DCN.

DCC data communications channel. Used to transport information about OAM&P over a SONET interface. DCC can be located in SDCC or LDCC. *See also* LDCC *and* SDCC.

DCN data communications network. An out-of-band network that provides connectivity between network elements and their respective operations support systems (OSS).

DCS Distributed Communications System.

DCU dispersion compensation unit.

default router If the ONS 15454 must communicate with a device on a network to which the ONS 15454 is not connected, packets are sent to this router to be distributed.

demultiplex To separate multiple multiplexed input streams from a common physical signal back into multiple output streams. *Compare with* multiplex.

demultiplexer A device used to demultiplex signals.

demux An abbreviation used for demultiplex or demultiplexer.

dense wavelength division multiplexing *See* DWDM.

destination The endpoint where traffic exits an ONS 15454 network. Endpoints can be paths (STS or STS/VT for optical card endpoints), ports (for electrical circuits, such as DS1, VT, DS3, STS), or cards (for circuits on DS1 and Ethernet cards). *See also* STS *and* VT.

DHCP Dynamic Host Configuration Protocol.

Digital Signal Cross-Connect Frame *See* DSX.

DNS Domain Name Service.

DRAM dynamic random-access memory.

drop See *destination*.

DS-1 digital signal level 1. A framing specification used in transmitting digital signals at 1.544-Mbps on a T1 facility (in the United States) or at 2.108-Mbps on an E1 facility (in Europe).

DS-3 digital signal level 3. Framing specification used for transmitting digital signals at 44.736 Mbps on a T3 facility.

DSX (Digital Signal Cross-Connect Frame). A manual bay or panel where different electrical signals are wired. A DSX permits cross-connections by patchcords and plugs.

DWDM dense wavelength division multiplexing. A technology that increases the information carrying capacity of existing fiber optic infrastructure by transmitting and receiving data on different light wavelengths. Many of these wavelengths can be combined on a single strand of fiber.

DWDM node An ONS 15454 running Software Release 4.5, or later. *Compare with* non-DWDM node.

E

EDFA erbium doped fiber amplifier. A type of fiber optical amplifier that transmits a light signal through a section of erbium-doped fiber and amplifies the signal with a laser pump diode. EDFA is used in transmitter booster amplifiers, in-line repeating amplifiers, and receiver preamplifiers.

EFCA Electrical Facility Connection Assembly.

EFT Electrical Fast Transient/Burst.

EIA electrical interface assembly. Provides backplane connection points for the DS-1, DS-3, and EC-1 cards.

EIA/TIA-232 Electronic Industries Association/Telecommunications Industry Association Recommended Standard No. 232.

electrical interface assembly *See* EIA.

electromagnetic interference *See* EMI.

ELR Extended Long Reach.

EMC electromagnetic compatibility.

EMI electromagnetic interference. Interference by electromagnetic signals that can cause reduced data integrity and increased error rates on transmission channels.

EML Element Manager Layer.

EMS Element Management System.

ENE end network element.

envelope The part of messaging that varies in composition from one transmittal step to another. It identifies the message originator and potential recipients, documents its past, directs its subsequent movement by the Message Transfer System (MTS), and characterizes its content.

EOW express orderwire. A permanently connected voice circuit between selected stations for technical control purposes.

erbium doped fiber amplifier *See* EDFA.

ERDI Enhanced Remote Defect Indicator.

ES errored seconds.

ESD electrostatic discharge.

ESH End System Hello.

ESF Extended Super Frame.

Ethernet switch A type of Ethernet LAN device that increases aggregate LAN bandwidth by allowing simultaneous switching of packets between switch ports. Ethernet switches subdivide previously shared LAN segments into multiple networks with fewer stations per network.

ETSI European Telecommunications Standards Institute.

express orderwire *See* EOW.

extended SNCP extended subnetwork connection protection). Extends the protection scheme of a subnetwork connection protection ring (SNCP) beyond the basic ring configuration to the meshed architecture of several interconnecting rings. *See also* SNCP.

external timing reference A timing reference obtained from a source external to the communications system, such as one of the navigation systems. Many external timing references are referenced to Coordinated Universal Time (UTC).

F

falling threshold A falling threshold is the counterpart to a rising threshold. When the number of occurrences drops below a falling threshold, this triggers an event to reset the rising threshold. *See also* rising threshold.

FC Failure count.

FDDI Fiber Distributed Data Interface. A LAN standard, defined by ANSI X3T9.5, specifying a 100-Mbps token-passing network using fiber optic cable, with transmission distances of up to 2 km. FDDI uses a dual-ring architecture to provide redundancy.

FE Frame Bit Errors.

FEC forward error correction.

FG1 Frame Ground #1 (pins are labeled “FG1,” “FG2,” etc.)

Fiber Distributed Data Interface *See* FDDI.

FMEC Front Mount Electrical Connection.

frame Logical grouping of information sent as a data link layer unit over a transmission medium. Often refers to the header and trailer, used for synchronization and error control that surrounds the user data contained in the unit.

FSB Field Service Bulletin.

G

gateway An electronic repeater device that intercepts and steers electrical signals from one network to another.

GBIC Gigabit Interface Converter. A hot-swappable input/output device that plugs into a Gigabit Ethernet port to link the port with the fiber-optic network.

Gbps gigabits per second.

GBps gigabytes per second.

GCC generic communications channel.

Gigabit Interface Converter *See* GBIC.

GNE gateway network element.

GR-253-CORE Telcordia General Requirements #253 Council of Registrars.

GR-1089 Telcordia General Requirement 1089, *Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment.*

GUI graphical user interface.

H

hard reset The physical removal and insertion of a TCC2/TCC2P card, also known as reseating a card or performing a card pull.

HDLC high-level data link control. Bit-oriented, synchronous, data-link layer protocol developed by the International Standards Organization (ISO). HDLC specifies a data encapsulation method on synchronous serial links using frame characters and checksums.

high-level data link control *See* HDLC.

hop A hop is a way to quantify the "length" of a network route to decide which redundant route is selected. Typically, each path segment through a routing network device is considered one hop. For example, if an ENE is connected to a GNE that is connected to a router, the ENE has two hops to the router—one from itself to the GNE and a second from the GNE to the router. To ensure that a certain route is used only when all other routes are exhausted, assign it an unusually high hop count.

host number The part of an IP address used to address an individual host within the network or subnetwork.

hot swap The process of replacing a failed component while the rest of the system continues to function normally.

I

IEC **1.** InterExchange Carrier.

2. International Electrotechnical Commission.

IEEE Institute of Electrical and Electronics Engineers.

IETF Internet Engineering Task Force.

Internet protocol *See* IP.

I/O input/output.

IP Internet protocol. Network layer protocol in the TCP/IP stack offering a connectionless internetwork service. IP provides features for addressing, type-of-service specification, fragmentation and reassembly, and security.

IPPM intermediate-path performance monitoring.

IP address A 32-bit address assigned to a host using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as 4 octets separated by periods (dotted decimal format). Each address consists of a network number, an optional subnetwork number, and a host number.

ITU-T International Telecommunication Union–Telecommunication Standards Sector.

J

JRE Java Runtime Environment.

K

K byte Automatic protection-switching byte located in the SONET line overhead and monitored by equipment for an indication to switch to protection.

L

LAN local area network. High-speed, low-error, data network covering a relatively small geographic area. LANs connect workstations, peripherals, terminals, and other devices in a single building or other geographically limited area. Ethernet, FDDI, and Token Ring are widely used LAN technologies.

LBO line build out. The distance between an external timing device connected to the BITS Out pins and the ONS 15454.

LCD (Liquid Crystal Display). An alphanumeric display using liquid crystal sealed between two pieces of glass. LCDs conserve electricity.

LDCC Line data communications channel.

Line Alarm Indication Signal *See* AIS-L.

line build out *See* LBO.

line layer Refers to the segment between two SONET devices in the circuit. The line layer deals with SONET payload transport, and its functions include multiplexing and synchronization. Sometimes called a maintenance span.

line terminating equipment *See* LTE.

line timing mode A node that derives its clock from the SONET lines.

link budget The difference between the output power and receiver power of an optical signal expressed in decibels (dB). Link refers to an optical connection and all of its component parts (optical transmitters, repeaters, receivers, and cables).

link integrity The network communications channel has link integrity if it is intact.

Liquid Crystal Display *See* LCD.

local area network *See* LAN.

local orderwire *See* LOW.

lockout A method of switching traffic from one card to another, or one span to another (BLSRs), that prevents traffic from reverting to the card or span where the lockout is applied. The lockout overrides other manual switching connections (Force, Manual, and Exercise).

loopback test Test that sends signals, and then directs them back toward their source from some point along the communications path. Loopback tests are often used to test network interface usability.

LOW local orderwire. A communications circuit between a technical control center and selected terminal or repeater locations.

LTE line terminating equipment. Refers to line cards that terminate the line signal in the ONS 15454.

LVDS Low-Voltage Differential Signal.

M

MAC Media Access Control.

MAC address Standardized data link layer address that is required for every port or device that connects to a LAN. Other devices in the network use these addresses to locate specific ports in the network and to create and update routing tables and data structures. MAC addresses are six bytes long and are controlled by the IEEE. Also known as the hardware address, MAC-layer address, and physical address.

ISH Intermediate System Hello.

Maintenance user A security level that limits user access to maintenance options only. *Compare with* Superuser, Provisioning user, *and* Retrieve user.

managed device A network node that contains a Subnetwork Management Protocol (SNMP) agent and resides on a managed network. Managed devices include routers, access servers, switches, bridges, hubs, computer hosts, and printers.

managed object In network management, a network device that can be managed by a network management protocol. Sometimes called an MIB object.

Management Information Base *See* MIB.

mapping A logical association between one set of values, such as addresses on one network, with quantities or values of another set, such as devices on another network.

Mbps megabits per second.

MBps megabytes per second.

MetroPlanner Cisco MetroPlanner is a network design tool that provides a means to construct and test wavelength division multiplexing (WDM) optical networks in a modeled graphical environment.

MHz megahertz.

MIB Management Information Base. Database of network management information that is used and maintained by a network management protocol such as SNMP or Common Management Information Protocol (CMIP). The value of a MIB object can be changed or retrieved using SNMP or CMIP commands, usually through a GUI network management system. MIB objects are organized in a tree structure that includes public (standard) and private (proprietary) branches.

MIME Multipurpose Internet Mail Extensions.

MPO Multifiber Push-On (connector).

MS multiplex section.

MS-FERF multiplex section far-end receive failure.

MSP Multiplex Section Protection.

MS-SPRing multiplex section-shared protection ring. SDH ring architecture that provides working and protection fibers between nodes. If the working fiber between nodes is cut, traffic is automatically rerouted onto the protection fiber.

MTS Message Transfer System

multicast Single packets copied by the network and sent to a specific subset of network addresses. *Compare with* unicast *and* broadcast.

multiplex payload Generates section and line overhead, and converts electrical/optical signals when the electrical/optical card is transmitting.

multiplex section-shared protection ring *See* MS-SPRing.

multiplex To combine multiple signals so that they can be transmitted simultaneously across a single physical channel. Compare *demultiplex.*

multiplexer A device used to multiplex signals.

mux An abbreviation used for multiplex or multiplexer.

muxed multiplexed. See *multiplex*.

N

NE network element. In an Operations Support System (OSS), a single piece of telecommunications equipment used to perform a function or service integral to the underlying network.

NEBS Network Equipment Building Systems.

NEL Network Element Layer.

network management system *See* NMS.

network number Part of an IP address that specifies the network where the host belongs.

NIC network interface card

NML Network Management Layer.

NMS network management system. System that executes applications that monitor and control managed devices. NMSs provide the bulk of the processing and memory resources required for network management.

node In this manual, the term "node" usually refers to an ONS 15454. A node is the endpoint of a network connection or a junction common to two or more lines in a network. Nodes can be processors, controllers, or workstations. Nodes, which vary in routing and other functional capabilities, can be interconnected by links, and serve as control points in the network. Node is sometimes used generically to refer to any entity that can access a network.

non-DWDM node An ONS 15454 running Software Release 4.1 or earlier. *Compare with* DWDM node.

NSAP Network Service Access Point.

NSP Node Service Protocol.

NTD Node Topology Discovery.

O

OADM optical add/drop multiplexer

OAM&P operation, administration, maintenance, and provisioning. Provides the facilities and personnel required to manage a network.

OC optical carrier.

OCHNC optical channel network connection.

OOS AS Out of Service Assigned.

operation, administration, maintenance, and provisioning *See* OAM&P.

optical amplifier A device that amplifies an optical signal without converting the signal from optical to electrical and back again to optical energy.

optical receiver An opto-electric circuit that detects incoming lightwave signals and converts them to the appropriate signal for processing by the receiving device.

orderwire Equipment that establishes voice contact between a central office and carrier repeater locations. *See also* EOW *and* LOW.

OSCM Optical Service Channel Module.

OSI Open Systems Interconnection.

OSNR optical signal-to-noise ratio

OSPF Open Shortest Path First.

OSS Operations Support System.

OTN optical transport network

output contacts (controls) Triggers that drive visual or audible devices such as bells and lights. Output contacts can control other devices such as generators, heaters, and fans.

P

passive devices Components that do not require external power to manipulate or react to electronic output. Passive devices include capacitors, resisters, and coils.

Path layer The segment between the originating equipment and the terminating equipment. This path segment might encompass several consecutive line segments or segments between two SONET devices.

Path-Protected Mesh Network *See* PPMN.

Path Protection Path-switched SONET rings that employ redundant, fiber- optic transmission facilities in a pair configuration. One fiber transmits in one direction and the backup fiber transmits in the other. If the primary ring fails, the backup takes over. *Compare with* BLSR.

payload Portion of a cell, frame, or packet that contains upper-layer information (data).

PCM pulse code modulation.

PCMCIA Personal Computer Memory Card International Association.

PCN Product Change Notice.

PDI-P STS Payload Defect Indication–Path.

ping packet Internet grouper. Internet Control Message Protocol (ICMP) echo message and its reply. Often used in IP networks to test the reachability of a network device.

pointer justification In SONET, the mechanism used to compensate for frequency and phase variations. Pointer justification counts indicate timing errors on SONET networks.

POP point of presence.

PM performance monitoring.

PPM pluggable port module.

PPMN Path-Protected Mesh Network. Extends the protection scheme of a path protection beyond the basic ring configuration to the meshed architecture of several interconnecting rings.

priority queuing Routing feature that divides data packets into two queues: one low-priority and one high-priority.

protect card A card in a protection pair or scheme that is provisioned as a protect card to the working card. If the working card fails, the protect card becomes active. *See also* working card.

Provisioning user A security level that allows the user to access only provisioning and maintenance options in CTC. *See also* Superuser, Maintenance user, *and* Retrieve user.

PSC Protection Switching Count.

PSD Protection Switching Duration.

PTE path-terminating equipment.

Q

queue In routing, a backlog of packets waiting to be forwarded over a router interface.

R

RAM random-access memory.

RDI-L Remote Defect Indication–Line.

red band DWDM wavelengths are broken into two distinct bands: red and blue. The red band is the higher frequency band. The red band DWDM cards for the ONS 15454 operate on wavelengths between 1547.72 nm and 1560.61 nm.

RES reserved.

Retrieve user A security level that allows the user to retrieve and view CTC information but not set or modify parameters. *Compare with* Superuser, Maintenance user, *and* Provisioning user.

revertive switching A process that sends electrical interfaces (traffic) back to the original working card after the card comes back online.

ring Connection of two or more nodes in a logically circular topology. Information is passed sequentially between active nodes. *See also* switching, ring.

rising threshold The number of occurrences (collisions) that must be exceeded to trigger an event.

RJ-45 Registered Jack #45 (8-pin).

RMA Return Materials Authorization.

RMON (remote monitoring). Allows network operators to monitor the health of the network with an NMS. RMON watches several variables, such as Ethernet collisions, and triggers an event when a variable crosses a threshold in the specified time interval.

RS-232 *See* EIA/TIA-232.

Rx receive.

S

SC Fiber connector, push-pull type.

SCI Serial Communication Interface.

SCL System Communications Link.

SCSI Small Computer System Interface.

SDCC Section data communications channel.

SDH Synchronous Digital Hierarchy. European standard that defines a set of rate and format standards that are transmitted using optical signals over fiber. SDH is similar to SONET, with a basic SDH rate of 155.52 Mbps. *Compare with* SONET.

SEF Severely Errored Frame.

SELV Safety Extra-Low Voltage.

SES Severely Errored Seconds.

SF Super Frame.

SFP small form factor plugle

Simple Network Management Protocol *See* SNMP.

Simple Network Time Protocol *See* SNTP.

SML Service Management Layer.

SMF single-mode fiber.

SNCP Subnetwork Connection Protection. Path-switched SDH rings that employ redundant, fiber-optic transmission facilities in a pair configuration. One fiber transmits in one direction and the backup fiber transmits in the other. If the primary ring fails, the backup takes over.

SNMP Simple Network Management Protocol. Network management protocol used almost exclusively in TCP/IP networks. SNMP monitors and controls network devices and manages configurations, statistics collection, performance, and security.

SNTP Simple Network Time Protocol. Using an SNTP server ensures that all ONS 15454 network nodes use the same date and time reference. The server synchronizes alarm timing during power outages or software upgrades.

soft reset A soft reset reloads the operating system, application software, etc., and reboots the TCC2/TCC2P card. It does not initialize the ONS 15454 application-specific integrated circuit (ASIC) hardware.

SONET Synchronous Optical Network. High-speed synchronous network specification developed by Telcordia Technologies, Inc. and designed to run on optical fiber. STS-1 is the basic building block of SONET. Approved as an international standard in 1988.

source The endpoint where traffic enters an ONS 15454 network. Endpoints can be a path (STS or STS/VT for optical card endpoints), port (for electrical circuits, such as DS1, VT, DS3, or STS), or card (for circuits on DS1 and Ethernet cards). *See also* STS *and* VT.

span An optical path between two nodes. *See also* switching, span.

spanning tree A loop-free subset of a network topology. See also *STA* and *STP*.

spanning-tree algorithm *See* STA.

Spanning Tree Protocol *See* STP.

SPE synchronous payload envelope. A SONET term describing the envelope that carries the user data or payload.

SRB source-route bridging.

SSM synchronization status messaging. A SONET protocol that communicates information about the quality of the timing source using the S1 byte of the line overhead.

STA spanning-tree algorithm. An algorithm used by the Spanning Tree Protocol (STP) to create a spanning tree. *See also* spanning tree *and* STP.

standby card A card that is not active or carrying traffic. A standby card can be a protect card or, after a protection switch, a working card can be a standby card.

static route A route that is manually entered into a routing table. Static routes take precedence over routes chosen by all dynamic routing protocols.

STP **1.** shielded twisted-pair.

2. Spanning Tree Protocol. Bridge protocol that uses the spanning-tree algorithm to enable a learning bridge to dynamically work around loops in a network topology by creating a spanning tree. *See also* spanning tree *and* STA.

STS Synchronous Transport Signal. Used generically when speaking of SONET signals.

STS-1 Synchronous Transport Signal level 1. Basic building block signal of SONET, operating at 51.84 Mbps for transmission over OC-1 fiber. Faster SONET rates are defined as STS-*n*, where *n* is a multiple of 51.84 Mbps. *See also* SONET.

subnet mask A 32-bit address mask used in IP to indicate the bits of an IP address that are used for the subnet address. Sometimes referred to simply as mask. *See also* IP address.

subnetwork In IP networks, a network confined to a particular subnet address. Subnetworks are networks segmented by a network administrator in order to provide a multilevel, hierarchical routing structure while shielding the subnetwork from the addressing complexity of attached networks. Sometimes called a subnet.

Subnetwork Connection Protection *See* SNCP.

subtending rings SONET rings that incorporate nodes that are also part of an adjacent SONET ring.

Superuser A security level that can perform all of the functions of the other security levels as well as set names, passwords, and security levels for other users. A Superuser is usually the network element administrator. *Compare with* Retrieve user, Maintenance user, *and* Provisioning user.

switching, span Span switching occurs when a working span fails. Traffic switches to the protect fibers between the nodes and then returns to the working fibers. Multiple span switches can occur at the same time.

switching, ring Ring switching occurs when a span switch cannot recover traffic, such as when both the working and protect fibers fail on the same span. In a ring switch, traffic is routed to the protect fibers throughout the full ring.

SWS SONET WAN switch.

SXC SONET Cross Connect ASIC.

synchronization status messaging *See* SSM.

Synchronous Digital Hierarchy *See* SDH.

Synchronous Optical Network *See* SONET.

synchronous payload envelope *See* SPE.

Synchronous Transport Signal *See* STS.

T

T1 T1 transmits DS-1-formatted data at 1.544 Mbps through the telephone-switching network using AMI or B8ZS coding. *See also* AMI, B8ZS, *and* DS-1.

TAC Cisco Technical Assistance Center.

target identifier *See* TID.

TBOS Telemetry Byte Oriented Serial protocol.

TCA threshold crossing alert.

TCC+ Timing Communications and Control + Card.

TCP/IP Transmission Control Protocol/Internet Protocol.

TDM time-division multiplexing. Allocates bandwidth on a single wire for information from multiple channels based on preassigned time slots. Bandwidth is allocated to each channel regardless of whether the station has data to transmit.

TDS time-division switching.

Telcordia Telcordia Technologies, Inc., formerly named Bellcore. Eighty percent of the U.S. telecommunications network depends on software invented, developed, implemented, or maintained by Telcordia.

TID target identifier. Identifies the particular network element (in this case, the ONS 15454) where each TL1 command is directed. The TID is a unique name given to each system at installation. *See also* AID.

time-division multiplexing *See* TDM.

TL1 Transaction Language 1.

TLS transparent LAN services. Provides private network services across a SONET backbone.

TMN Telecommunication Management Network.

transponder Optional device in a DWDM system that provides the conversion of one optical wavelength to a precision narrow band wavelength. *See also* DWDM.

trap Message sent by an SNMP agent to an NMS (CTM), console, or terminal to indicate the occurrence of a significant event, such as an exceeded threshold. See also *CTM*.

tributary The lower-rate signal directed into a multiplexer for combination (multiplexing) with other low rate signals to form an aggregate higher rate level.

trunk Network traffic travels across this physical and logical connection between two switches. A backbone is composed of a number of trunks. *See also* backbone.

TSA time-slot assignment.

TSI time-slot interchange.

tunnel Secure communication path between two peers, such as two nodes.

tunneling Architecture that is designed to provide the services necessary to implement any standard point-to-point encapsulation scheme.

Tx transmit.

U

UAS Unavailable Seconds.

UBIC-H Universal Backplane Interface Connector-Horizontal. The UBIC-H EIAs provide up to 112 transmit and receive connections through 16 SCSI connectors per side (A and B). The UBIC-H EIAs are designed to support DS-1, DS-3, and EC-1 signals.

UBIC-V Universal Backplane Interface Connector-Vertical. The UBIC-V EIAs provide up to 112 transmit and receive connections through 16 SCSI connectors per side (A and B). The UBIC-V EIAs are designed to support DS-1, DS-3, and EC-1 signals.

UDC user data channel.

UDP/IP User Datagram Protocol/Internet Protocol.

UID user identifier.

unicast The communication of a single source to a single destination. *Compare with* broadcast *and* multicast.

Universal Backplane Interface Connector-Horizontal *See* UBIC-H.

Universal Backplane Interface Connector-Vertical *See* UBIC-V.

UPC Ultra Physical Contact.

upstream Set of frequencies used to send data from a subscriber to the head end.

UTC Coordinated Universal Time. Time zone at zero degrees longitude. Formerly called Greenwich Mean Time (GMT) and Zulu time.

UTP unshielded twisted-pair.

V

VDC volts direct current.

virtual fiber A fiber that carries signals at different rates and uses the same fiber-optic cable.

virtual ring Entity in a source-route bridging (SRB) network that logically connects two or more physical rings together either locally or remotely. The concept of virtual rings can be expanded across router boundaries.

virtual wire Routes external alarms to one or more alarm collection centers across the SONET transport network.

VLAN virtual LAN. Group of devices located on a number of different LAN segments that are configured (using management software) to communicate as if they were attached to the same wire. Because VLANs are based on logical instead of physical connections, they are extremely flexible.

VOA variable optical attenuator.

VPN Virtual Private Network. Enables IP traffic to travel securely over a public TCP/IP network by encrypting all traffic from one network to another. A VPN uses "tunneling" to encrypt all information at the IP level. *See also* tunneling.

VT Virtual Tributary. A structure designed for the transport and switching of sub-DS3 payloads. *See also* tributary.

VT1.5 A Virtual Tributary that equals 1.544 Mbps.

VT layer The VT layer, or electrical layer, occurs when the SONET signal is broken down into an electrical signal.

VT tunnel Allows electrical circuits to pass through ONS 15454 nodes without using ONS 15454 cross-connect card capacity.

W

W watt.

WAN wide area network.

working card A card that is provisioned as an active, primary card. Traffic cards in a protection pair are provisioned as working or protect. *See also* protect card.

WPP Wavelength Path Provisioning.

X

X.25 Protocol providing devices with direct connections to a packet-switched network.

Y

Y-cable protection Two cards connected together with a Y cable to form a protection group.

Numerics

1+1 optical card protection
  summary GL-1
1:1 electrical card protection
  description GL-1
1:N electrical card protection
  description GL-1
100 Base T GL-1
100 Base TX GL-1
10 Base T GL-1
32DMX card
  block diagrams 15-54
  change administrative state 11-23, 11-27
  change optical channel settings 11-26
  change optical channel thresholds 11-29
  change optical line settings 11-23
  change optical line thresholds 11-25
  description 15-52
  faceplate 15-53
  input power class 15-6
  LEDs 15-55
  modify line settings and PM thresholds 11-22
  monitor performance 9-12
  port calibration 15-55
  power monitoring 15-55
  power requirements B-5
  reset 12-10
  ROADM 15-54
  specifications B-18
  temperature range B-7
  terminal node acceptance test 4-5
  verify power 4-41
32DMX-O card
  block diagrams 15-51
  change administrative state 11-23, 11-27
  change optical channel settings 11-26
  change optical channel thresholds 11-29
  change optical line settings 11-23
  change optical line thresholds 11-25
  description 15-49
  faceplate 15-50
  fiber clip 3-44, 3-47, 3-48, 3-58, 3-62
  input power class 15-6
  install 3-27
  LEDs 15-52
  modify line settings and change PM thresholds 11-22
  port calibration 15-51
  power monitoring 15-51
  power requirements B-5
  reset 12-10
  service state transitions C-3
  specifications B-17
  temperature range B-7
  terminal and hub node acceptance test 4-2
  verify power 4-40
32MUX-O card
  block diagrams 15-47
  change administrative state 11-23, 11-27
  change optical channel settings 11-26
  change optical channel thresholds 11-29
  change optical line settings 11-23
  change optical line thresholds 11-25
  channel plan 15-47
  description 15-45
  faceplate 15-46

fiber clip 3-44, 3-47, 3-48, 3-58, 3-62
install 3-27
LEDs 15-49
modify line settings and change PM thresholds 11-22
port calibration 15-49
power monitoring 15-49
power requirements B-5
reset 12-10
service state transitions C-3
specifications B-17
temperature range B-7
terminal and hub node acceptance test 4-2
verify power 4-39
32WSS card
block diagrams 15-79
change administrative state 11-33, 11-38
change optical channel parameters 11-32
change optical channel thresholds 11-35
change optical line parameters 11-37
change optical line thresholds 11-39
description 15-76
faceplate 15-78
install 3-27
LEDs 15-81
modify line settings and PM thresholds 11-31
port calibration 15-81
power monitoring 15-81
power requirements B-6
reset 12-10
service state transitions C-3
specifications B-32
temperature range B-7
terminal node acceptance test 4-5
4MD-xx.x card
block diagram 15-57
change administrative state 11-23, 11-27
change optical channel settings 11-26
change optical channel thresholds 11-29
change optical line settings 11-23
change optical line thresholds 11-25
description 15-55
faceplate 15-56
input power 15-6
install 3-27
LEDs 15-58
modify line settings and PM thresholds 11-22
monitor performance 9-14
port calibration 15-58
power monitoring 15-58
power requirements B-5
service state transitions C-3
specifications B-20
temperature range B-7
verify pass-through connection power 4-50
wavelength pairs 15-58

A

acceptance tests
ANSI-ASE hub node 4-20
asymmetric line node with OSC-CSM and OSCM cards 4-30
ROADM node 4-8, 4-12, 4-16, 4-18
shelf connections 1-75
shelf installation acceptance test 1-74
symmetric line node with OSC-CSM cards 4-26
symmetric line node with OSCM cards 4-23
symmetric OADM node with OSC-CSM cards 4-35
symmetric OADM node with OSCM cards 4-33
symmetric passive OADM node with OSC-CSM cards 4-37
terminal and hub node with 32MUX-O and 32DMX-O cards 4-2
terminal node with 32WSS and 32DMX cards 4-5
access drop GL-1
access identifier (TL1) GL-2
ACO 14-46
active (definition) GL-1

AD-1B-xx.x card
block diagrams 15-72
description 15-70
faceplate 15-71
install 3-27
LEDs 15-73
monitor performance 9-17
port calibration 15-72
power monitoring 15-72
power requirements B-6
reset 12-10
service state transition C-3
specifications B-25
temperature range B-7
verify output express power 4-45
verify pass-through connection power 4-48
AD-1C-xx.x card
block diagrams 15-61
description 15-59
faceplate 15-60
input power 15-6
install 3-27
LEDs 15-62
monitor performance 9-15
port calibration 15-61
power monitoring 15-61
power requirements B-5
reset 12-10
service state transitions C-3
specifications B-21
temperature range B-7
verify output express power 4-46
verify pass-through connection 4-49
AD-2C-xx.x card
block diagrams 15-64
description 15-62
faceplate 15-63
input power 15-6
install 3-27
LEDs 15-65
monitor performance 9-15
port calibration 15-65
power monitoring 15-65
power requirements B-5
reset 12-10
service state transitions C-3
specifications B-22
temperature range B-7
verify output express power 4-46
verify pass-through connection 4-49
wavelength pairs 15-64
AD-4B-xx.x card
block diagrams 15-75
description 15-73
faceplate 15-74
install 3-27
LEDs 15-76
monitor performance 9-17
port calibration 15-76
power monitoring 15-75
power requirements B-6
reset 12-10
service state transitions C-3
specifications B-28
temperature range B-7
verify output express power 4-45
verify pass-through connection power 4-48
AD-4C-xx.x card
block diagram 15-68
description 15-66
faceplate 15-67
input power 15-6
install 3-27
LEDs 15-69
monitor performance 9-15
port calibration 15-69
power monitoring 15-69
power requirements B-5

reset 12-10
service state transitions C-3
specifications B-23
temperature range B-7
verify output express power 4-46
verify pass-through connection 4-49
wavelength pairs 15-68
administrative states A-12
administrative states *see* service states
AEP
see also AIC-I card
connect external wire-wrap panel 1-57
description 14-30
install on backplane 1-43
I-Temp B-6
pin assignments 1-46, 14-32
power requirements B-5
printed circuit board assembly 14-31
specifications B-10
wire-wrap connections 1-45
agent GL-2
AIC-I card
see also external alarms, external controls
see also pin assignments
description 15-16
faceplate and block diagram (illustration) 15-17
install 1-73
LEDs 15-17
modify settings 11-41
power requirements B-5
specifications B-9
temperature range B-6
virtual wires 20-13
AID GL-2
AINS Soak
32WSS card 11-34, 11-39
MXP_2.5G_10G and MXP_2.5G_10E cards 5-29
MXP_MR_2.5G and MXPP_MR_2.5G cards 5-59
OSCM and OSC-CSM cards 11-5
TXP_MR_10G and TXP_MR_10E cards 5-11
TXP_MR_2.5G and TXPP_MR_2.5G cards 5-32, 5-43
AIP
description 14-29
location 14-27
replace 12-32, 14-29
air filter
description 14-43
inspect, clean, and replace 12-19
install external brackets 1-11
install filter 1-11
location 1-40
requirement 1-40
air ramp
ANSI placement overview 14-3
ETSI placement overview 14-6
install 1-19
typical site layout 14-18
AIS 6-6
alarm expansion panel *see* AEP
alarm filtering
description 20-3
disable 8-27
enable 8-25
filter tool 20-3
modify 8-25
alarm indication signal *see* AIS
alarm interface panel *see* AIP
alarm profiles
apply 20-11
apply to cards and nodes 8-22
apply to ports 8-20
button definitions 20-9
change row display 20-10
create 8-16, 20-8
delete 8-22
description 20-7
edit 20-10
modify 20-8

alarms
alarm contact connections 14-45
change default severities *see* alarm profiles
change time zone 8-10, 20-2
delete cleared alarms from display 8-13, 20-3
entries in session 20-5
filtering *see* alarm filtering
history 8-8, 8-9, 20-5
history, column descriptions 20-6
history, retrieve 20-7
incompatibility alarms 12-28
interface specifications B-2
overview 20-1
provision for MXP_2.5G_10G and MXP_2.5G_10E card client ports 5-35
provision for MXP_2.5G_10G and MXP_2.5G_10E card trunk ports 5-34
provision for TXP_MR_2.5G and TXPP_MR_2.5G card client ports 5-48
provision for TXP_MR_2.5G and TXPP_MR_2.5G card trunk ports 5-47
provision MXP_MR_2.5G and MXPP_MR_2.5G client port thresholds 5-65
provision MXP_MR_2.5G and MXPP_MR_2.5G trunk port thresholds 5-64
provision on TXP_MR_10G and TXP_MR_10E client ports 5-20
provision on TXP_MR_10G and TXP_MR_10E trunk ports 5-19
raise (unsuppress) 8-30
suppress 8-28, 20-11
synchronize 8-11, 20-3
troubleshoot *see Cisco ONS 15454 Troubleshooting Guide*
view 8-5, 8-6, 20-2
view alarm counts on LCD 8-14, 20-2
alarm severities
change *see* alarm profiles
description 20-7
options in alarm profiles 20-10
alerts 2-32, A-8
AMI 6-6, GL-2
AMP champ 1-58
amplified TDM node
description 16-26
amplifier cards
see OPT-BST card
see OPT-BST-E card
see OPT-PRE card
anti-ASE
acceptance test 4-20
description 16-10
any-to-any rings 17-3
APC *see* automatic power control
ARP sniffing *see* automatic host detection
ATM GL-3
audit trail
off-load records 12-13
security description 19-6
view records 12-11
automatic host detection 2-16
automatic laser shutdown
change maintenance settings 11-10, 11-21
description 17-24
MXP_2.5G_10E card 15-105
MXP_2.5G_10G card 15-98
MXP_MR_2.5G and MXPP_MR_2.5G cards 15-111
OSC-CSM 15-29
TXP_MR_10E card 15-87
TXP_MR_10G card 15-83
TXP_MR_2.5G and TXPP_MR_2.5G cards 15-93
automatic node setup
description 16-29
parameters 16-31
parameters by node type 16-36
provision parameters 16-33
run 3-73
view parameters 16-33
automatic power control
at the amplifier card level 17-18

at the node and network levels 17-19
description 17-17
disable 10-4
enable 10-4
interval 6-8
manage 10-3, 17-20
refresh 10-5
automatic protection switching
definition GL-2

B

B8ZS 6-6, GL-3
backbone GL-3
backplane
AEP connections 1-45
alarm wire connections 1-52
connection overview 14-44
covers, overview 14-26
IP address *see* secure mode
LAN wire connections 1-55
lower cover, description 14-27
lower cover, remove 1-26, 12-33
lower cover, replace 12-36
rear cover, description 14-28
rear cover, install 1-62
sheet metal cover, remove 1-27
timing wire connections 1-54
TL1 craft interface connections 1-56
band filter OADM cards
see AD-1B-xx.x card
see AD-4B-xx.x cards
bandwidth B-1
battery termination 1-38
bay assembly 14-6
BER 6-9
definition GL-3
bit error rate see BER GL-3
BITS
ANSI interface specifications B-3
BITS Out references 6-5, 10-34
definition GL-4
external node timing source 19-7
external timing pin assignments 1-54
facilities 6-5, 10-34
pin field assignments 14-46
timing setup 6-4
blade *see* card
BLSR
definition GL-4
bottom brackets *see* air filter, external brackets
bridge GL-4
broadcast
address GL-4
storm GL-4
browsers
see also Internet Explorer
see also Netscape Navigator
installation overview 18-3
register with the Java plug-in 2-5, 2-8
required versions 2-2
bus GL-4

C

C2 byte GL-4
cabinet compartment *see* front door
cables
calculate cable connections 3-70
clean fiber connectors 12-22, 12-23
fiber management 14-37, 14-39
install fiber on DWDM cards 3-39
routing and management 14-36
specifications for XFP ports B-50
tie-down bar 14-40
card protection
see splitter protection
see Y-cable protection

cards
active GL-1
colors in node view 18-7
compatibility 15-5
install muxponder 3-31
install transponder 3-31
interface classes 15-6
part number A-12
protection *see* splitter protection
protection *see* Y-cable protection
put ports in/ out of service 7-17
replacement 14-50
reseat GL-9
reset using CTC 12-9
revision number A-12
serial number A-12
slot requirements 14-49
slots *see* slots
standby GL-17
symbol and slot correspondence 14-50
working GL-21
card view
change views A-2
description 18-12, A-1
list of tabs 18-13
CAT-5 cable *see* LAN cable
channel allocation plan 15-8
channel filter OADM cards
see AD-1C-xx.x card
see AD-2C-xx.x card
see AD-4C-xx.x card
circuits
see also overhead circuits
destination GL-6
disable circuit discovery 2-27
DWDM *see* OCHNC
effect of a node name change 12-5
source (definition) GL-17
states *see* service states
CISCO15 2-26
Cisco MetroPlanner *see* MetroPlanner
Cisco Transport Controller *see* CTC
CLEI code A-12
CLETOP 12-23
clock
change time 10-7
reset 1-37
set time 3-9
collision GL-5
colors
cards 18-7, 18-9
FMECs 18-8
nodes 18-12
common control cards
see AIC-I card
see TCC2 card
see TCC2P card
compatibility
card 15-5
JRE 18-4
SFP 15-118
computer *see* PC setup
concatenation GL-5
conditions
change time zone 8-10, 20-2
column descriptions 20-4
control display of 20-4
description 20-3
display 20-4
filter 20-5
history 20-7
retrieve 20-4
view 8-11
connected rings 17-4
CORBA 3-23
corporate LAN connection
description 18-6
provision 2-21

cost 3-18, 3-19, 10-14, 20-9
covers
see backplane
see FMEC cover
craft connection
automatic host detection 2-16
choose type 2-9
description 18-6
DHCP 2-13
static IP addresses 2-11
crimp tool 1-38
crosspoint GL-5
CTAG GL-5
CTC
see also PC setup
toolbar icons *see* toolbar icons
alerts 2-32
back up 12-2
change network access 10-9
computer requirements 18-4
determine version 2-25
document existing provisioning 8-2
export data 8-4
firewall access 3-21
incompatibility alarm 2-25
installation overview 18-3
install CD-ROM 2-3
log in 2-24
node setup 3-8
print data 8-2
reset cards 12-9
revert to earlier load 18-15
set up network access 3-10
specifications B-2
verify software release 1-72
version mismatch among multiple nodes 2-25
views *see* network view, node view, card view
C-Temp ranges B-6
CTM GL-5

D

database
back up 12-2
description 18-15
MAC address 14-29
parameters that are not backed up 12-2
parameters that are not restored 12-5
restore 12-3
restore node and card defaults 12-4
revert 18-15
data communications channel *see* DCC
datagrams 20-4
date
change setting 10-7
default 1-36
provision 3-9
daylight savings time 3-9
DCC
AIC-I compatibility 15-21
disable autodiscovery 2-27
metric (OSPF) 3-19
OSPF Area ID 3-19
pin assignments 15-21
terminations, definition GL-6
viewing connections 18-11
DCU
hub node 16-2
install DCU chassis 1-65
install DCUs 3-30
OPT-PRE card 15-35
overview 15-2
typical rack layout 14-16
default router
change 10-10
change using LCD 3-14
definition GL-6
enter IP address 3-12
initially provision 3-11

modify in secure mode 10-12
demultiplex GL-6
dense wavelength division multiplexing *see* DWDM
destination GL-6
host 20-4
routing table 20-24
DHCP
change request recipient 10-10
configuration note 2-13
enable 3-12
provision 2-13
provision server 3-11
scenario 20-3
diagnostics, offload 12-13
dialog box, do not display 10-20
disaster recovery 12-4
dispersion compensating unit *see* DCU
DNS configuration 2-11, 2-14, 2-17, 2-21
documentation
of CTC provisioning 8-2
domains
add a node 10-19
create 10-18
manage 10-19
move 10-19
rename 10-19
drops
access drop GL-1
definition GL-6
DWDM
see also DWDM cards
blue band GL-4
calculate cable connections 3-70
create connections 3-71
definition GL-6
delete connections 3-72
EDFA GL-7
fiber tray 14-39
hybrid nodes 16-14
monitor performance 9-8 to 9-18
nodes 16-1
optional hardware 1-64
provision a network 6-7
rack layouts 14-16
topologies 17-1 to 17-17, B-1
transponder GL-19
TXP_MR_10E card trunk interface 15-86
DWDM cards
see also 32DMX card
see also 32DMX-O card
see also 32MUX-O card
see also 32WSS card
see also 4MD-xx.x card
see also AD-1B-xx.x card
see also AD-1C-xx.x card
see also AD-2C-xx.x card
see also AD-4B-xx.x card
see also AD-4C-xx.x card
see also OPT-BST card
see also OPT-BST-E card
see also OPT-PRE card
see also OSC-CSM card
see also OSCM card
channel allocation plan 15-8
fibering 3-39
install 3-27
LED behavior during install 3-29
power requirements B-5
reset 12-10
service state transitions C-3
dynamic host configuration protocol *see* DHCP

E

E-FEC 15-87, 15-100, 15-103, 15-104
EIA interface specifications B-3
electrical codes 14-2
EMI GL-7

enhanced forward error correction *see* E-FEC
enterprise LAN *see* corporate LAN
environmental specifications B-4
equipment
DWDM 1-64
inventory A-12
supplied by Cisco (ANSI) 1-3
supplied by Cisco (ETSI) 1-4
user-supplied (ANSI) 1-3
user-supplied (ETSI) 1-5
ESD plug input 1-20
Ethernet
switch (definition) GL-8
ETR_CLO service
verify topologies for 5-6
events
see alarms
see conditions
express channel connections 4-43, 4-44
express orderwire see orderwire
external alarms
see also AIC-I card
change 11-41
description 15-18
overview 20-12
pin assigments using external wire-wrap panel 1-58
pin assignments with AEP 14-33
pin assignments without AEP 1-48
provision 8-31, 20-12
wiring 1-47, 1-52
wiring description 14-46
external controls
see also AIC-I card
change 11-42
description 15-18
overview 20-12
pin assignments with AEP 14-34
pin assignments without AEP 1-48
provision 8-31, 20-13
wiring 1-47, 1-52
wiring description 14-46
external firewall 20-25
external LAN interface B-2
external network element 3-12, 3-17, 10-13
external switching commands
apply a Force Y-cable or splitter protection switch 10-25
apply a lock-on 10-26
apply a lockout 10-27
apply a Manual Y-cable or splitter protection switch 10-25
clear a lock-on or lockout 10-28
clear a Y-cable or splitter protection switch 10-26
external timing reference see timing
external timing *see* timing
external wire-wrap panel 1-57

F

factory configuration, restore 12-4
falling threshold GL-8
fan-tray air filter *see* air filter
fan-tray assembly
description 14-41
fan failure 14-43
fan speed 14-42
install 1-40
power cable 12-34
remove to replace air filter 12-20
replace 12-27
far-end laser control *see* FELC
FEC 15-87, 15-104
FELC 15-116
ferrites 1-74, 14-50
fiber
capacity 14-38
clean adapters 12-24
clips 3-44, 3-47, 3-48, 3-51, 3-53, 3-58, 3-62

management 14-37
patch panel 1-65
storage shelf 1-66
filler cards
description 14-35
faceplate (illustration) 14-36
install 3-35
filtering, alarm *see* alarm filtering
filter stopper 1-12
firewall
change IIOP listener port 10-10
external firewall description 20-25
provision access 3-11
provision IIOP listener port 3-23
set up 3-21
shortcut A-5
SNMP 3-25
firewall tunnels
add a tunnel 7-15
delete a tunnel 10-15
flange 1-12, 14-5
FlexLayer
see also Y-cable protection
block diagram 14-11
hardware part numbers 1-67
install modules 1-67
install shelf 1-66
install Y-cable modules in FlexLayer chassis 1-69
modules 14-10
system description 14-9
two-channel drop component connector mapping 14-12
FMEC
see FMEC cover
see MIC-A/P FMEC
see MIC-C/T/P FMEC
FMEC cover
install and close 1-61
open 1-24
overview 14-2
remove 1-25
Force switch *see* external switching commands
foreign node settings
change GCC 10-29
open GNE 20-27
provision a proxy tunnel 7-14
provision GCC terminations 7-13
specify IP address 10-30
forward error correction *see* FEC
frame-ground pin 1-56
framing 6-6, 10-34
front door
description 14-19
label 14-23
open 1-20
remove 1-21, 12-19
replace 12-25
front mount electrical connection *see* FMEC
fuse and alarm panel
100 amp 1-13, 1-15, 1-17, 1-31, 1-39
80 amp 1-13, 1-15, 1-17, 1-31, 1-39
description 14-2
location 14-5, 14-8
measure and cut cables 1-37

G

G.709 *see* OTN
gateway GL-8
default 20-7
on routing table 20-24
returning MAC address 20-4
gateway network element 3-12, 3-17, 10-13
gateway settings *see* proxy server
GCC
change GCC terminations 10-29
delete GCC terminations 10-30
foreign termination 7-14, 7-15
OSPF Area ID 3-19

provision GCC terminations 7-13
Y-cable protection 15-83, 15-87, 15-93
generic communications channel *see* GCC
glossary GL-1
GNE
dual GNEs 20-18
load balancing 20-18
open GNE 20-27
see also gateway network element
ground
see also office ground
connect to ANSI shelf 1-33
connect to ETSI shelf 1-32
description 14-43
ground posts 14-44
install 1-30
ground strap
avoid interference with cards 12-26
detach 1-22
illustration 14-21

H

hard reset GL-9, GL-10
hello interval 3-19, 3-20
hop 3-18, 10-14, 20-9
hubbed rings 17-2
hub node
ANS parameters 16-36
convert pass-through connections 10-32
CTC icon A-3
description 16-1
install fiber 3-45
hybrid node, convert from DWDM 10-43

I

idle time 3-6
idle user timeout 19-5
IIOP listener port
change 10-10
provision on the node 3-23
provision on the PC 3-23
select while provisioning IP settings 3-12
installation
see also rack
see also shelf assembly
acceptance test 1-74
air ramp *see* air ramp
alarm expansion panel *see* AEP
CTC installation overview 18-3
DCU *see* DCU
DWDM hardware 1-64
fan-tray assembly *see* fan-tray assembly
fiber patch panel shelf 1-65
fiber storage shelf 1-66
FlexLayer modules 1-67
FlexLayer shelf 1-66
install Y-cable protection modules 1-69
list of procedures 1-1
overview 14-2
power and ground 1-30, 14-43
required tools (ANSI) 1-3
required tools (ETSI) 1-4
wires *see* wires
Internet Explorer
see also browser
disable proxy service 2-22
log in 2-25
Internet protocol *see* IP
inventory 18-14, A-12
IP
see also IP address
change settings 10-10
create IP-encapsulated tunnel 7-16
environments 20-1
provision IP settings 3-11

requirements 20-2
subnetting 20-1
IP address
change using LCD 3-14
enable dual-IP address capability 3-16
host number GL-9
lock secure mode (dual IP addresses) 10-11
log in 2-25
modify backplane IP settings 10-11
NMS 3-24
repair 7-21
scenarios 20-2 to 20-22
select IP address for log in 2-26
set up network information 3-11
static IP addresses 2-11
suppress display 10-10
IP-encapsulated tunnel
create 7-16
delete 7-21
repair 7-21
ISC service
verify topologies for 5-6
I-Temp ranges B-6

J

J0 section trace 7-22
Java plug-in security warning 2-26, 2-27
jitter 15-105, 15-116
JRE
overview 18-4
change version 2-31
install 2-3, 2-6
reinitialization requirement 12-4
requirements 18-5

K

K byte GL-10
Kepnut 1-22

L

LAN
connection points 14-47
definition GL-10
modems 2-23
OSPF activity 3-19
pin assignments 14-47
wires 1-51, 1-55
LAN cable
connect computer to corporate LAN port 2-21
connect computer to ONS 15454 2-10
connect modem to TCC2/TCC2P card, backplane, or FMEC 2-23
connect to backplane 1-55
connect to MIC-C/T/P 1-28, 1-51
connect to TCC2/TCC2P card 2-10
crimp 2-10
description 18-5
laser warning 14-25, 14-26
latitude 3-8
LCD
change default router 3-14
change IP address 3-14
change network mask 3-14
provision network settings 3-10
verify software version 1-72
view alarm counts 8-14, 20-2
line amplifier node
ANS parameters 16-38
CTC icon A-3
description 16-11
hybrid 16-24
install fiber 3-49

linear ADM
definition GL-1
linear configurations
description 17-5
optical performance 17-8, 17-10, 17-12
line timing *see* timing
link budget GL-11
listener port *see* IIOP listener port
lock-on *see* external switching commands
lockout *see* external switching commands
lock washer 12-25
log in 2-24
login legal disclaimer 10-8
login node groups
add a node to current session 2-29
create 2-28
delete a node 2-30
delete from a specified group 2-30
shortcut A-5
view 2-27, 18-11
longitude 3-8
loopback
definition GL-11

M

MAC address
AIP 14-29
clear table 19-3
definition GL-11
proxy ARP 20-4
retrieve table 19-3
view 3-12
maintenance user *see* security
managed device GL-11
managed object GL-11
management, tilt and gain 17-28
management information base *see* MIB
Manual switch *see* external switching commands
map *see* network view
meshed rings 17-4
MetroPlanner
import a configuration file 3-72
installation parameters 17-33
internal connections 3-40
provision a network 6-8
requirement 1-65, 3-1
MIB GL-12
Ethernet RMON 9-32
SNMP 3-25
MIC-A/P FMEC
block diagram 15-22
description 15-21
faceplate 15-22
install 1-28
install alarm wires 1-47
pinouts 15-22 to 15-24
power requirements B-5
specifications B-11
temperature range B-6
MIC-C/T/P FMEC
description 15-24
install 1-28
install LAN wires 1-51
install timing wires 1-50
power requirements B-5
specifications B-12
temperature range B-6
modem interface B-2
module *see* card
mounting brackets
description 14-4
mount rear cover 1-63
reverse 1-10
multicast GL-12
multi-hubbed rings 17-2
multiplex GL-12
multiplexer and demultiplexer cards

see 32DMX card
see 32DMX-O card
see 32MUX-O card
see 4MD-xx.x card
muxed see multiplex
muxponder cards
see MXP_2.5G_10E card
see MXP_2.5G_10G card
see MXP_MR_2.5G card
see MXPP_MR_2.5G card
MXP_2.5G_10E card
see also PPMs
see also SFPs
ALS **15-105**
block diagram **15-102**
change administrative state **5-28, 5-32**
change card settings **5-26**
change line OTN settings **5-36**
change line settings **5-28**
change line threshold settings **5-33**
change section trace settings **5-30**
change trunk settings **5-31**
client interface monitoring **15-104**
client interfaces **15-102**
create RMON thresholds **9-32**
create Y-cable protection **3-36**
description **15-99**
DWDM interface **15-102**
E-FEC **15-100, 15-103**
faceplate **15-101**
features **15-100**
install **3-31**
jitter **15-105**
lamp test **15-106**
LEDs **15-106**
modify line settings and PM thresholds **5-25**
monitor performance **9-18**
multiplexing function **15-102**
onboard traffic generation **15-106**
port-level LEDs **15-106**
port state transitions **C-11**
power requirements **B-6**
provision client port alarm **5-35**
provision TCA thresholds **5-34, 5-35**
provision trunk port alarm **5-34**
reset **12-10**
service state transitions **C-7**
SONET/SDH overhead byte processing **15-104**
specifications **B-44**
temperature range **B-7**
timing **6-5**
timing synchronization **15-103**
trunk wavelengths **15-104**
view optics parameters **9-21**
wavelength identification **15-104**
Y-cable protection **15-103**
MXP_2.5G_10G card
see also PPMs
see also SFPs
ALS **15-98**
block diagram **15-98**
change administrative state **5-28, 5-32**
change card settings **5-26**
change line OTN settings **5-36**
change line settings **5-28**
change line threshold settings **5-33**
change section trace settings **5-30**
change trunk settings **5-31**
create RMON thresholds **9-32**
create Y-cable protection **3-36, 6-5**
description **15-95**
faceplate **15-97**
GCC terminations **7-13**
install **3-31**
LEDs **15-99**
modify line settings and PM thresholds **5-25**
monitor performance **9-18**
port-level LEDs **15-99**

port state transitions C-11
power requirements B-6
provision client port alarm 5-35
provision TCA thresholds 5-34, 5-35
provision trunk port alarm 5-34
reset 12-10
service state transitions C-7
specifications B-37
temperature range B-7
timing synchronization 15-98
view optics parameters 9-21
Y-cable description 15-114
Y-cable protection 15-98
MXP_MR_2.5G and MXPP_MR_2.5G cards
ALS 15-111
MXP_MR_2.5G card
block diagram 15-111
change administrative state 5-56, 5-59
change card settings 5-54
change distance extension settings 5-57
change line settings 5-55
change line threshold settings 5-61
change OC-48/STM-16 settings 5-58
change section trace settings 5-60
client interface data rates 15-108
create RMON thresholds (MIBs) 9-32
create Y-cable protection 3-36
description 15-106
faceplate 15-110
install 3-31
LEDs 15-113
modify line settings and PM thresholds 5-53
monitor performance 9-18
port-level LEDs 15-113
port state transitions C-11
power requirements B-6
provision a UDC circuit 7-19
provision client port alarm 5-65
provision TCA thresholds 5-64, 5-65
provision trunk port alarm 5-64
reset 12-10
safety labels 15-111
service state transitions C-7
specifications B-41
temperature range B-7
timing 6-5
versions 15-107
view optics parameters 9-21
Y-cable description 15-114
MXPP_MR_2.5G card
see also splitter protection
block diagram 15-111
change administrative state 5-56, 5-59
change card settings 5-54
change distance extension settings 5-57
change line settings 5-55
change line threshold settings 5-61
change OC-48/STM-16 settings 5-58
change section trace settings 5-60
client interface data rates 15-108
create RMON thresholds (MIBs) 9-32
create Y-cable protection 3-36
description 15-106
faceplate 15-110
install 3-31
LEDs 15-113
modify line settings and PM thresholds 5-53
monitor performance 9-18
port-level LEDs 15-113
port state transitions C-11
power requirements B-6
provision a UDC circuit 7-19
provision client port alarm 5-65
provision TCA thresholds 5-64, 5-65
provision trunk port alarm 5-64
reset 12-10
safety labels 15-111
service state transitions C-7

specifications B-41
temperature range B-7
timing 6-5
versions 15-107
view optics parameters 9-21

N

NE defaults
description D-1
ANSI card default settings D-2
ANSI CTC default settings D-42
ANSI node default settings D-38
edit 12-38
ETSI card default settings D-43
ETSI CTC default settings D-85
ETSI node default settings D-81
export 12-40
import 12-39
restore 12-4
Netscape Navigator
see also browser
disable proxy service 2-22
log in 2-25
test connection during UNIX setup 2-20
network element
definition GL-12
see node
network element defaults *see* NE defaults
networks
automatic power control 17-19
building circuits 7-1
convert connections during upgrade 10-32
DWDM topologies 17-1 to 17-17
gain tilt compensation (without ROADM nodes) 17-31
gain tilt compensation (with ROADM nodes) 17-33
optical performance 17-6
optical safety 17-24
set up basic information 3-11
set up CTC network access 3-10
timing example 19-7
network time protocol 3-8
network view
description 18-11
add nodes to map *see* domains
apply a custom background image (map) 10-18
change the background color 10-16
change the default network map 10-17
change views A-2
create a customized network view 6-14
delete users 10-41
description A-1
node icons A-2
node status (icon colors) 18-12
security levels per tab 19-4
switch between TDM and DWDM network views 10-21
tasks A-10
node
1+1 protected flexible terminal 16-14
add to current session 2-29
amplified TDM 16-26
automatic power control 17-19
change access 10-38
change contact information 10-7
change date 10-7
change management information 10-6
change name 10-7
change time 10-7
definition GL-13
delete from current session 2-30
hybrid 16-14
hybrid line amplifier 16-24
hybrid OADM 16-23
hybrid terminal 16-21
icons A-3
lock secure mode (dual IP addresses) 10-11
remove power 13-1
scalable terminal 16-18

security mode 3-16
set up name, date, time, and contact information 3-8
verify connections 6-3
verify turn-up 6-1
node services protocol 17-1
node view
change views A-2
description 18-7, A-1
security levels per tab 19-1
shortcuts A-10
non-ONS node *see* foreign node settings
NSP 17-1
NTP server 3-8

O

OADM node
acceptance test 4-33, 4-35, 4-37
ANS parameters 16-38
check power values 6-9
convert pass-through connections 10-32
CTC icon A-3
description 16-4
hybrid 16-23
install fiber 3-54
optical performance 17-8
verify add and drop connections 4-51, 4-54
verify express channel connections 4-43, 4-44
verify OSC-CSM power 4-42
verify pass-through channel connections 4-47
OAM&P access 18-6
OC-48/STM-16 settings, change for MXP_MR_2.5G and MXPP_MR_2.5G cards 5-58
OCHNC
circuit status 7-5
create 7-9
delete 7-9, 7-12
filter 7-6
locate and view 7-2
provision 7-10
search 7-2
service state transitions C-6
view 7-3
view alarms on OCHNCs 8-14
view on a span 7-8
office ground
connect to ANSI shelf 1-33
connect to ETSI shelf 1-32
office power
connect to ANSI shelf 1-36
connect to ETSI shelf 1-35
turn on and verify 1-39
open GNE
description 20-27
Open Shortest Path First *see* OSPF
OPT-BST card
alarm profiles 20-11
automatic laser shutdown 17-24
automatic power control 17-18
block diagram 15-40
change administrative state 11-13, 11-16
change ALS settings 11-21
change optical amplifier line settings 11-15
change optical channel threshold settings 11-17
change optical line settings 11-12
change optical line thresholds 11-14
description 15-38
faceplate 15-39
fiber clip 3-44, 3-47, 3-48, 3-53, 3-58, 3-62
gain tilt control 17-29
install 3-27
LEDs 15-41
modify line settings and PM thresholds 11-11
monitor performance 9-11
port calibration 15-40
power monitoring 15-40
power requirements B-5
reset 12-10

service state transitions C-3
specifications B-15, B-16
temperature range B-7
verify laser and power 4-39
OPT-BST-E card
automatic laser shutdown 17-24
block diagrams 15-44
description 15-41
faceplate 15-43
gain tilt control 17-29
LEDs 15-45
port calibration 15-44
power monitoring 15-44
optical add/drop multiplexer
see 32WSS card
see AD-1B-xx.x card
see AD-1C-xx.x card
see AD-2C-xx.x card
see AD-4B-xx.x card
see AD-4C-xx.x card
see OADM node
optical amplifier cards
see OPT-BST card
see OPT-BST-E card
see OPT-PRE card
optical channel network connections *see* OCHNC
optical performance 17-6
optical service channel cards
see OSC-CSM card
see OSCM card
optical service channel *see* OSC
OPT-PRE card
automatic power control 17-18
block diagrams 15-37
change administrative state 11-13, 11-16
change optical amplifier line settings 11-15
change optical channel threshold settings 11-17
change optical line settings 11-12
change optical line thresholds 11-14
description 15-35
faceplate 15-36
fiber clip 3-44, 3-47, 3-48, 3-53, 3-58, 3-62
gain tilt control 17-29
install 3-27
LEDs 15-38
modify line settings and PM thresholds 11-11
monitor performance 9-11
port calibration 15-37
power monitoring 15-37
power requirements B-5
reset 12-10
service state transitions C-3
specifications B-14
temperature range B-7
verify laser and power 4-40
orderwire
change settings 11-43
delete 7-21
description 15-19
EOW (definition) GL-7
OSCM and OSC-CSM cards 15-25
pin assignments 15-20
provision 7-18
OSC
delete OSC terminations 10-30
description 15-25
install fiber for OSC link terminations 3-42
OSC port service state transitions C-6
provision terminations 3-74
OSC-CSM card
asymmetric line node acceptance test 4-30
automatic laser shutdown 17-26
block diagram 15-32
change administrative state 11-4, 11-7
change ALS settings 11-10
change optical line parameters 11-6
change OSC settings 11-2
change OSC thresholds 11-5

description 15-29
faceplate 15-31
install 3-27
LEDs 15-34
monitor performance 9-9
power monitoring 15-33
power requirements B-5
reset 12-10
service state transitions C-3
specifications B-14
symmetric line node acceptance test 4-26
symmetric OADM node acceptance test 4-35
symmetric passive OADM node acceptance test 4-37
temperature range B-7
verify add and drop connections 4-54
verify incoming power 4-42
verify power 4-41, 4-42
verify transmit power 3-76
OSCM card
asymmetric line node acceptance test 4-30
block diagrams 15-28
change administrative state 11-4, 11-7
change ALS settings 11-10
change optical line parameters 11-6
change OSC settings 11-2
change OSC thresholds 11-5
description 15-26
faceplate 15-27
fiber clip 3-44, 3-47, 3-48, 3-53, 3-58, 3-62
install 3-27
LEDs 15-29
monitor performance 9-9
power monitoring 15-28
power requirements B-5
reset 12-10
service state transitions C-3
specifications B-13
symmetric line node acceptance test 4-23
symmetric OADM node acceptance test 4-33
temperature range B-7
verify add and drop connections 4-51
verify transmit power 3-76
OSC regeneration node
CTC icon A-4
description 16-12
install fiber 3-51
OSNR
network applications 17-1
verify 6-11
OSPF
alternative to static routes 20-8
disable 10-14
IP addressing scenario 20-10
IP networking overview 20-2
provisionable patchcords 20-22
set up or change 3-18
OTDR 17-23
OTN
change OTN settings (ITU-T G.709, FEC, Trail Trace) 5-36, 5-51
change settings for TXP_MR_10G and TXP_MR_10E cards 5-22
enable ITU-T G.709 performance monitoring 9-19
enable OTN FEC performance monitoring 9-20
MXP_2.5G_10E card in termination mode 5-27
trunk bit rates with ITU-T G.709 enabled 15-89
view PMs 9-24
output contacts see AIC card, external controls
overhead circuits
see also IP-encapsulated tunnel
see also orderwire
see also user data channel
create 7-13
delete 7-20, 7-21
modify 7-20
shortcut A-7

P

pass-through channel connections 4-47
passwords
  change 10-39, 10-40
  change security 10-36, 10-37
  create new user 3-6, 3-7
  login 2-26
path layer GL-14
path see spans
PCM 7-18, 15-19
PC setup
  see also craft connection
  connect PC to ONS 15454 2-1
  corporate LAN connection 2-21
  disable proxy service 2-22
  install browser 2-2
  local craft connection 2-9
  remote (modem) access 2-23
  requirements 2-3, 18-4
  run the CTC installation wizard 2-3, 2-6
performance, optical 17-6
performance monitoring
  see also individual cards
  clear current (displayed) counts 9-5
  clear stored counts 9-6
  PM clearing privilege 10-38
  refresh 15-minute intervals 9-2
  refresh counts, different port 9-8
  refresh one-day intervals 9-3
  set auto-refresh interval 9-7
  threshold crossing alert *see* TCA
  view far-end counts 9-5
  view near-end counts 9-4
pin assignments
  AEP 1-46, 14-32
  alarms, ANSI 1-53
  alarms, ETSI 1-48
  craft 1-57
  LAN, ANSI 1-56
  LAN, ETSI 1-51
  overview (ANSI) 14-44
  timing, ANSI 1-54
  timing, ETSI 1-50
  wire-wrap panel on the AEP 1-58, 1-59
ping 20-2, GL-14
pinned hex (Allen) key 1-20
plug-in unit *see* card
pointer justification GL-14
popup data 18-10
ports
  listener port *see* IIOP listener port
  assign name 7-9
  default UDP port for SNMP 10-47
  put optical ports in/ out of service 7-17
  TL1 port 18-4
  UDP 3-24
power
  see also office power
  BAT1 backplane power terminal 1-38
  coat bare conductors 1-38
  connect office power to ANSI shelf 1-36
  connect office power to ETSI shelf 1-35
  fan-tray assembly requirements 14-42
  measure voltage 1-76
  OSCM and OSC-CSM transmit power 3-76, 3-77, 3-78
  RET2 backplane power terminal 1-38
  set power monitor thresholds 3-9
  specifications B-3
  supply 1-30, 14-43
  verify 32DMX-O power 4-40
  verify 32DMX power 4-41
  verify 32MUX-O power 4-39
power monitoring 15-20
PPMs
  see also SFPs
  delete provisioning 5-7
  preprovision 3-33

provision a multirate PPM 5-2, 5-3
provision the optical line rate 5-3
priority queuing GL-15
protection, card
see splitter protection
see Y-cable protection
protocols
DHCP 3-12
IP 20-1
NTP 3-8
Proxy ARP *see* Proxy ARP
SNTP 3-8
SSM 19-8
provisionable patchcord
create 6-10
delete 10-31
description 20-22
provisioning user *see* security
Proxy ARP
description 20-1
enable an ONS 15454 gateway 20-4
use with static routes 20-6
proxy server
gateway settings, change 10-10
gateway settings, description 20-13
gateway settings, provision 3-12
provision settings 3-11
proxy service
disable using Internet Explorer 2-22
disable using Netscape 2-22
proxy tunnels
add a tunnel 7-14
delete a tunnel 10-15
PST C-1
PSTQ C-1
public-key security certificate 2-26, 2-27
pulse code modulation 7-18

Q

queue GL-15

R

rack
bay assembly 14-6
installation overview 14-3, 14-6
mount a single node 1-13, 1-15, 14-5, 14-7
mount multiple nodes 1-16, 14-5, 14-8
reversible mounting bracket 1-10, 14-4
RAM
PC requirements for CTC 2-3
UNIX requirements for CTC 2-6
rear cover 14-28
reinitialization tool
overview 12-4
UNIX 12-7
Windows 12-5
remote access
description 18-6
set up connection to the ONS 15454 2-23
remote monitoring *see* RMON
remote network monitoring GL-16
retrieve user *see* security
revert 18-15
revertive switching 3-38
revertive timing 6-4
rings
any-to-any 17-3
hubbed rings 17-2
meshed DWDM 17-4
multihubbed 17-2
optical performance for ROADM rings 17-12
RIP 3-20
rising threshold GL-15
RJ-11 connector 15-20
RMON GL-16

see also SNMP
create alarm thresholds 9-32
delete alarm thresholds 9-34
ROADM
32DMX card 15-54
32WSS card 15-76
ANS parameters 16-39
card requirements 15-54
CTC node icons A-4
gain tilt control 17-31, 17-33
install fiber 3-59
MXP_2.5G_10E card 15-102
node acceptance test 4-8, 4-12, 4-16, 4-18
node-type description 16-8
power equalization 17-22
view ROADM node power equilization 10-5
routing information protocol *see* RIP
routing table 20-24

S

section trace
change MXP_2.5G_10G and MXP_2.5G_10E card settings 5-30
change settings for MXP_MR_2.5G and MXPP_MR_2.5G cards 5-60
change settings for TXP_MR_2.5G and TXPP_MR_2.5G cards 5-43
change TXP_MR_10G settings 5-13
create J0 7-22
secure mode
disable 10-12
enable 3-16
IP addressing scenario 20-20
lock 10-11
modify backplane IP settings 10-11
secure shell 19-6
security
see also audit trail
assign user levels 3-6, 3-7
change policy 10-35, 10-37
change security level 10-39, 10-40
enable secure mode 3-16
idle times 3-6
idle user timeout 19-5
lock secure mode (dual IP addresses) 10-11
modify settings 10-35
policies 19-5
requirements 19-1
set up 3-5
superuser privileges 19-5, 19-6
tasks per tab 19-2, 19-4
user level definitions 19-1
viewing 18-7
service states
administrative state description C-2
card state list A-12
card state transitions C-3
change administrative states 5-28, 5-32, 5-42, 5-56, 5-59, 11-4, 11-7, 11-13, 11-16, 11-23, 11-27, 11-33, 11-38
change card service state 11-44
change port service state 7-17
circuit states list 7-5
description C-1
equipment A-12
ports 18-8
SFPs
see also PPMs
compatibility 15-118
delete provisioning 5-7
description 15-118, 15-119
install 3-34
preprovision 3-33
remove 3-34
specifications 15-119, B-48
XFP specifications B-50
shelf assembly
see also installation

specifications B-1
ANSI, bay assembly 14-6
ANSI, description 14-3
ANSI, dimensions 14-4, B-4
ETSI, description 14-6
ETSI, dimensions 14-7, B-4
ETSI, mounting 14-7
inspect 1-7
install 1-8
unpack and inspect 1-6
verify 1-6
shell access 10-38
shutdown, automatic laser *see* automatic laser shutdown
simple network time protocol *see* SNTP
single-span link
description 17-6
optical performance 17-16
slots
AIC-I card 3-5
fiber management 14-37
FMEC slots 14-30
overview 14-48
preprovision 3-26
requirements 14-49
unused slots 14-1
Small Form-factor Pluggables *see* SFPs
SNMP
change settings 10-46
delete trap destination 10-47
modify trap destination 10-46
set up 3-24
SNTP 3-8
SOCKS *see* proxy server
software
see also CTC
verify software version 1-72
Solaris *see* UNIX
span loss
description 17-19
optical 10-2
verify 10-2, 17-23
spanning tree GL-17
spans
definition GL-17
splitter protection
definition 3-37
description 15-115
modify 10-23
TXP_MR_2.5G and TXPP_MR_2.5G cards 15-93
SSH 19-6
SSM
enable 6-6, 10-34
enable for OSCM and OSC-CSM cards 11-3
message set 6-4, 10-33
SST C-1
ST3 clock 19-7
standard constant 3-23
standoff kit 1-12
state *see* service state
static route
create 3-17
delete 10-14
IP addressing scenario 20-8
modify 10-13
RIP prerequisite 3-20
straight-through cable *see* LAN cable
subnet
CTC and nodes on different subnets 20-3
CTC and nodes on same subnet 20-2
multiple subnets on the network 20-7
using static routes 20-8
with Proxy ARP 20-4, 20-5
subnet mask GL-18
24-bit 20-25
32-bit 20-25
change 10-10
description 20-9
modify in secure mode 10-12

OSPF area range table 3-20
provision 3-11
provision in a static route 3-18
provision subnet mask length 3-12
routing table 20-24
Windows setup 2-12, 2-13
superuser *see* security
switch
see external switching commands
see timing
synchronization status messaging *see* SSM

T

tables
see also List of Tables
change format A-11
display hidden columns A-11
print data 8-2
resize columns A-11
sort A-11
tabs
overview 18-7
card view 18-14
Alarms 18-13
Circuits 18-13
Conditions 18-13
History 18-13
Maintenance 18-14
Performance 18-14
Provisioning 18-14
network view
Alarms 18-12, 19-4
Circuits 18-12, 19-4
Conditions 18-12, 19-4
History 18-12, 19-4
Maintenance 18-12, 19-5
Provisioning 18-12, 19-5
node view
Alarms 18-10, 19-2
Circuits 18-10, 19-2
Conditions 18-10, 19-2
History 18-10, 19-2
Inventory 18-10, 19-3
Maintenance 18-10, 19-3
Provisioning 18-10, 19-2
TCA 5-19, 5-20, 5-34, 5-35, 5-47, 5-48, 5-64, 5-65, 9-3
TCC2 card
card-level indicators 15-12
clear the database for disaster recovery 12-4
craft wires vs. EIA/TIA-232 port 1-57
database back up 12-2, 18-15
description 15-10
functionality 15-11
install 1-70
LAN port 2-10, 2-23
modem interface B-2
network-level indicators 15-12
power requirements B-5
reboot behavior 3-13
redundant installation 15-12
restore the database 12-3
soft reset 12-9, 18-14
software installation overview 18-1
specifications B-7
temperature range B-6
TL1 craft interface B-2
verify installation 3-4
TCC2P card
see also secure mode
clear the database for disaster recovery 12-4
database back up 12-2, 18-15
description 15-13
faceplate (figure) 15-14
functionality 15-15
LAN port 2-10, 2-23, 3-16, 10-12
LEDs 15-16
modem interface B-2

network-level LEDs 15-16
power requirements B-5
reboot behavior 3-13
restore the database 12-3
soft reset 12-9, 18-14
software installation overview 18-1
specifications B-8
temperature range B-6
TL1 craft interface B-2
verify installation 3-4
TCP/IP 2-11, 2-12, 2-13, 2-14, 2-15, 2-17, 2-18
TDM GL-19
TDM node, amplified 16-26
terminal lug 12-25, 12-26
terminal node
1+1 protected flexible 16-14
ANS parameters 16-37
CTC icons A-4
description 16-3
hybrid 16-21
install fiber 3-47
scalable 16-18
termination modes 15-117
test equipment
required for ANSI installation 1-4
required for ETSI installation 1-6
third-party equipment 14-2
time division multiplexing GL-19
timed out *see* idle time
time zone
display alarms and conditions using time zone 8-10
provision 3-9
timing
BITS *see* BITS
change node timing parameters 10-33
change node timing reference 12-14
clear a Manual or Force switch 12-15
connections 14-46
external, set up 6-4
external timing (definition) GL-8
internal, set up 6-6
line, set up 6-4
mode 6-5
NE reference 6-5
network timing example 19-7
node timing description 19-6
set node clock 3-9
set up 6-3
specifications B-3
SSM 19-8
switch a node timing reference 12-15
synchronization for the MXP_2.5G_10E card 15-103
synchronization for the MXP_2.5G_10G card 15-98
view timing report 12-16
TL1
AID definition GL-2
AID in CTC 20-6
ATAG GL-2
commands 18-4
connection 18-6
craft interface connection 1-56, 14-47
interface specifications B-2
pin assignments 1-57
TCC2 EIA/TIA-232 port connection 1-56
toolbar icon A-7
toolbar icons
add node A-5
delete selected node A-5
export A-5
go to home view A-6
go to network view A-6
go to next view A-6
go to other node A-6
go to parent view A-6
go to previous view A-6
go to selected object view A-6
lock node A-5
open TL1 connection A-7

preferences A-5
print A-5
zoom in A-6
zoom in selected area A-6
tools
required for ANSI installation 1-3, 1-4
required for ETSI installation 1-5
trace route 2-11, 2-16
traffic routing 20-24
transponder cards
see TXP_MR_10E card
see TXP_MR_10G card
see TXP_MR_2.5G card
see TXPP_MR_2.5G card
trap 3-25, GL-19
tributary GL-19
trunk GL-19
TXP_MR_10E card
ALS 15-87
block diagram 15-85
change card settings 5-9
change line settings 5-10
change line threshold settings 5-15, 5-16, 5-46, 5-62
change OTN settings 5-22
client interface 15-86
client-to-trunk mapping 15-87
create RMON thresholds 9-32
create Y-cable protection 3-36
description 15-84
DWDM trunk interface 15-86
E-FEC 15-87
faceplate 15-85
features 15-85
install 3-31
LEDs 15-88
modify line settings and PM thresholds 5-8
monitor performance 9-18
port-level LEDs 15-88
port state transitions C-11
power requirements B-6
provision client port alarm 5-20
provision TCA thresholds 5-19, 5-20
provision trunk port alarm 5-19
reset 12-10
service state transitions C-7
specifications B-46
temperature range B-7
view optics parameters 9-21
Y-cable protection 15-86
TXP_MR_10G card
block diagram 15-83
change card settings 5-9
change line settings 5-10
change line threshold settings 5-15, 5-16, 5-46, 5-62
change OTN settings 5-22
change section trace settings 5-13
create RMON thresholds 9-32
create Y-cable protection 3-36
description 15-82
faceplate 15-83
GCC terminations 7-13
install 3-31
LEDs 15-84
modify line settings and PM thresholds 5-8
monitor performance 9-18
port-level LEDs 15-84
port state transitions C-11
power requirements B-6
PPM caveat 5-5
provision client port alarm 5-20
provision TCA thresholds 5-19, 5-20
provision trunk port alarm 5-19
reset 12-10
service state transitions C-7
specifications B-35
temperature range B-7
view optics parameters 9-21
Y-cable description 15-114

Y-cable protection 15-83
TXP_MR_2.5G and TXPP_MR_2.5G cards
ALS 15-93
TXP_MR_2.5G card
block diagram 15-92
change administrative state 5-42
change line settings 5-42
change line threshold settings 5-45
change OTN settings 5-51
change section trace settings 5-43
create RMON thresholds (MIBs) 9-32
create Y-cable protection 3-36
description 15-88
faceplate 15-90
GCC terminations 7-13
install 3-31
ITU-T G.709 15-89
LEDs 15-94
modify line settings and PM thresholds 5-39
monitor performance 9-18
port-level LEDs 15-95
port state transitions C-11
power requirements B-6
provision client port alarm 5-48
provision for acceptance testing 4-4
provision TCA thresholds 5-47, 5-48
provision trunk port alarm 5-47
reset 12-10
safety labels 15-93
service state transitions C-7
specifications B-39
splitter protection 15-93
temperature range B-7
view optics parameters 9-21
Y-cable description 15-114
Y-cable protection 15-92
TXP_MRG_10G card
ALS 15-83
TXPP_MR_2.5G card
see also splitter protection
block diagram 15-92
change administrative state 5-42
change line settings 5-42
change line threshold settings 5-45
change OTN settings 5-51
change section trace settings 5-43
create RMON thresholds (MIBs) 9-32
description 15-88
faceplate 15-90
GCC terminations 7-13
install 3-31
ITU-T G.709 15-89
LEDs 15-94
modify line settings and PM thresholds 5-39
monitor performance 9-18
port-level LEDs 15-95
port state transitions C-11
power requirements B-6
provision client port alarm 5-48
provision TCA thresholds 5-47, 5-48
provision trunk port alarm 5-47
reset 12-10
safety labels 15-93
service state transitions C-7
specifications B-39
splitter protection 15-93
temperature range B-7
view optics parameters 9-21
Y-cable protection 15-92

U

UNIX
connect cable to ONS 15454 2-10
connect LAN cable from workstation to corporate LAN port 2-21
disable proxy service 2-22
restore factory parameters (NE defaults) 12-7

run the CTC installation wizard 2-6
set up craft connection to ONS 15454 2-19
software installation description 18-3
workstation requirements 2-6, 18-4
unpack 1-6
user data channel
create 7-19
delete 7-21
description 15-20
user-defined alarms
see external alarms
see external controls
users
see also security
change password or security settings 10-39, 10-40
create new user on a single node 3-6
create new users on multiple nodes 3-6
delete 10-40, 10-41
log out 10-42
security level definitions 19-1
set up 3-5

V

variable optical attenuator *see* VOA
views
see card view
see network view
see node view
virtual links *see* provisionable patchcords
virtual link table (OSPF) 3-20
virtual wires 20-13
VOA
see also automatic node setup
adjusting with automatic node setup 16-29
change for 32WSS card 11-33
change for multiplexer cards 11-27
change for OSCM and OSC-CSM cards 11-7
correct with APC 17-19
degrade or fail alarm 17-20
gain tilt control 17-29
in the OSCM card 15-28
voltage, measure 1-76
voltmeter 1-39, 1-76

W

WAN 20-2
warnings
Java plug-in security 2-26, 2-27
labels on MXP_MR_2.5G and MXPP_MR_2.5G cards 15-112
laser 14-25, 14-26, 15-93
WDM-ANS provisioning 16-34
WINS configuration 2-11, 2-14, 2-17, 2-21
wires
install alarm wires 1-47, 1-52
install LAN wires 1-51, 1-55
install timing wires 1-50, 1-54
install TL1 craft interface wires 1-56
wire-wrap panel, external 1-57
working card GL-21

X

XFPs *see* SFPs

Y

Y-cable modules
install cables 3-69
Y-cable protection
block diagram 14-14
connector mapping and labeling 14-15
delete 10-23
description 14-9, 15-114
install FlexLayer modules 1-67
install FlexLayer shelf 1-66

modify 10-22
module configuration 14-13
MXP_2.5G_10E card 15-103
MXP_2.5G_10G card 15-98
port mapping 14-15, 14-16
TXP_MR_10E card 15-86
TXP_MR_10G card 15-83
TXP_MR_2.5G and TXPP_MR_2.5G cards 15-92
Y-cable protection modules 1-69