



# Cisco Transport Controller Operation

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This chapter describes Cisco Transport Controller (CTC), the software interface for the Cisco ONS 15454. For CTC set up and login information, refer to the *Cisco ONS 15454 Procedure Guide*.

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## 8.1 CTC Software Delivery Methods

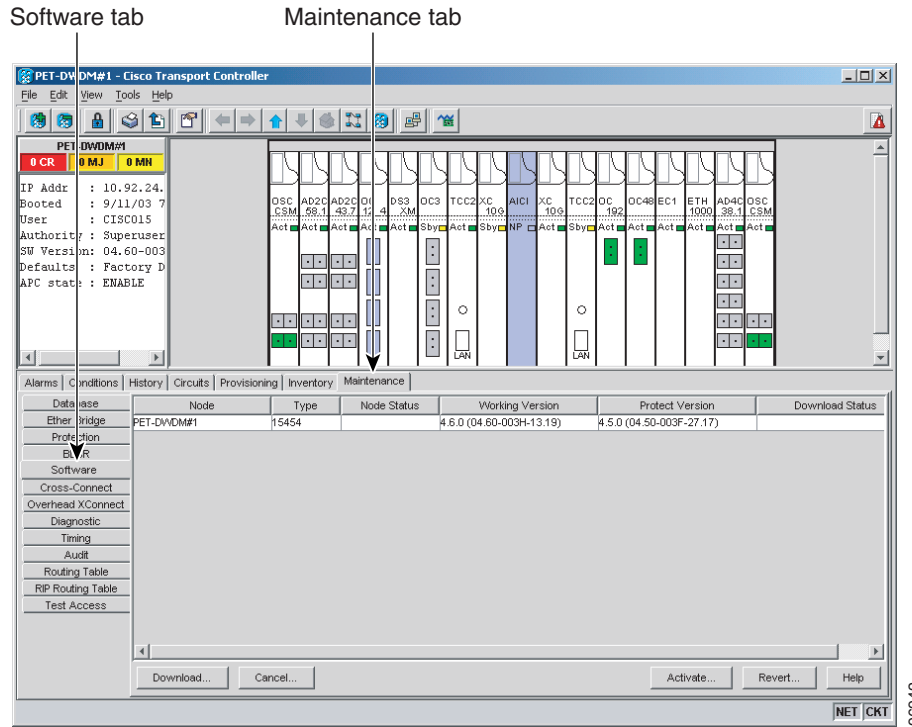
ONS 15454 provisioning and administration is performed using the CTC software. CTC is a Java application that is installed in two locations; CTC is stored on the Advanced Timing, Communications, and Control (TCC2) card or the Advanced Timing, Communications, and Control Plus (TCC2P) card, and it is downloaded to your workstation the first time you log into the ONS 15454 with a new software release.

### 8.1.1 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 cards.

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 8-1](#)).

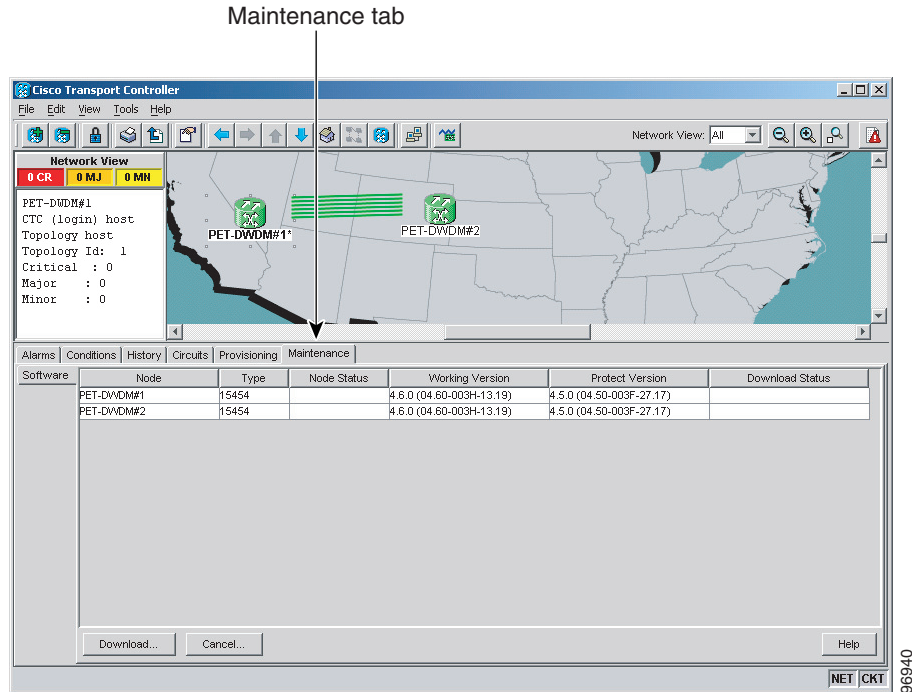
Figure 8-1 CTC Software Versions, Node View



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Select the Maintenance > Software tabs in network view to display the software versions installed on all the network nodes (Figure 8-2).

**Figure 8-2** CTC Software Versions, Network View



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## 8.1.2 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.

## 8.2 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* for a comprehensive list of TL1 commands.

## 8.3 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.

You can change the JRE version on the Preferences dialog box JRE tab. 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 8-1](#) shows JRE compatibility with ONS 15454 software releases.

**Table 8-1 JRE Compatibility**

ONS Software Release	JRE 1.2.2 Compatible	JRE 1.3 Compatible	JRE 1.4 Compatible
ONS 15454 Release 2.2.1 and earlier	Yes	No	No
ONS 15454 Release 2.2.2	Yes	Yes	No
ONS 15454 Release 3.0	Yes	Yes	No
ONS 15454 Release 3.1	Yes	Yes	No
ONS 15454 Release 3.2	Yes	Yes	No
ONS 15454 Release 3.3	Yes	Yes	No
ONS 15454 Release 3.4	No	Yes	No
ONS 15454 Release 4.0 <sup>1</sup>	No	Yes	No
ONS 15454 Release 4.1	No	Yes	No
ONS 15454 Release 4.5	No	Yes	No

**Table 8-1** JRE Compatibility (continued)

ONS Software Release	JRE 1.2.2 Compatible	JRE 1.3 Compatible	JRE 1.4 Compatible
ONS 15454 Release 4.6	No	Yes	Yes
ONS 15454 Release 5.0	No	No	Yes

1. Software Releases 4.0 and later notify you if an older version of the JRE is running on your PC or UNIX workstation.

**Note**

To avoid network performance issues, Cisco recommends managing a maximum of 50 nodes concurrently with CTC. The 50 nodes can be on a single DCC or split across multiple DCCs. Cisco does not recommend running multiple CTC sessions when managing two or more large networks.

To manage more than 50 nodes, Cisco recommends using Cisco Transport Manager (CTM). If you do use CTC to manage more than 50 nodes, you can improve performance by adjusting the heap size; see the “General Troubleshooting” chapter of the *Cisco ONS 15454 Troubleshooting Guide*. You can also create login node groups; see the “Connect the PC and Log Into the GUI” chapter of the *Cisco ONS 15454 Procedure Guide*.

[Table 8-2](#) 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 8-2** Computer Requirements for CTC

Area	Requirements	Notes
Processor (PC only)	Pentium 4 processor or equivalent	A faster CPU is recommended if your workstation runs multiple applications or if CTC manages a network with a large number of nodes and circuits.
RAM	512 MB or more	A minimum of 1 GB is recommended if your workstation runs multiple applications or if CTC manages a network with a large number of nodes and circuits.
Hard drive	20 GB hard drive with 50 MB of space available	CTC application files are downloaded from the TCC2/TCC2P to your computer’s Temp directory. These files occupy 5 to 10 MB of hard drive space.
Operating system	<ul style="list-style-type: none"> <li>PC: Windows 98, Windows NT 4.0, Windows 2000, or Windows XP</li> <li>Workstation: Ultra 10 Sun running SunOS 6, 7, or 8</li> </ul>	—

**Table 8-2 Computer Requirements for CTC (continued)**

Area	Requirements	Notes
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.  Cisco recommends that you use JRE 1.4.2 for networks with Software R5.0 nodes. If CTC must be launched directly from nodes running software earlier than R5.0, Cisco recommends JRE 1.3.1_02.
Web browser	<ul style="list-style-type: none"> <li>PC: Netscape 4.76, Netscape 7.x, Internet Explorer 6.x</li> <li>UNIX Workstation: Netscape 4.76, Netscape 7.x</li> </ul>	For the PC, use JRE 1.4.2 with any supported web browser. For UNIX, use JRE 1.4.2 with Netscape 7.x or JRE 1.3.1_02 with Netscape 4.76.  Netscape 4.76 or 7.x is available at the following site: <a href="http://channels.netscape.com/ns/browsers/default.jsp">http://channels.netscape.com/ns/browsers/default.jsp</a>  Internet Explorer 6.x is available at the following site: <a href="http://www.microsoft.com">http://www.microsoft.com</a>
Java.policy file	A java.policy file modified for CTC	The java.policy file is modified by the CTC Installation Wizard included on the Cisco ONS 15454 software and documentation CDs.
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	—

## 8.4 ONS 15454 Connection

You can connect to the ONS 15454 in multiple ways. You can connect your PC directly the ONS 15454 (local craft connection) using the RJ-45 port on the TCC2/TCC2P card or the LAN pins on the backplane, 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 8-3](#) lists the ONS 15454 connection methods and requirements.

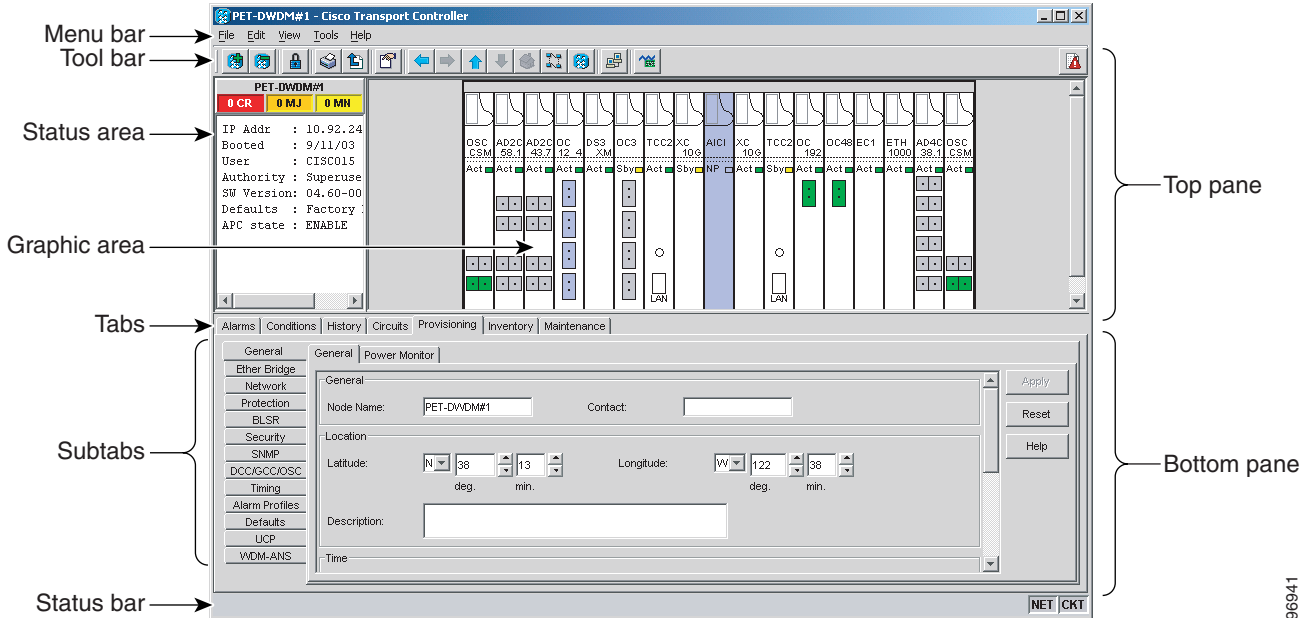
**Table 8-3 ONS 15454 Connection Methods**

Method	Description	Requirements
Local craft	Refers to onsite network connections between the CTC computer and the ONS 15454 using one of the following: <ul style="list-style-type: none"> <li>The RJ-45 (LAN) port on the TCC2/TCC2P card</li> <li>The LAN pins on the ONS 15454 backplane</li> <li>A hub or switch to which the ONS 15454 is connected</li> </ul>	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.	<ul style="list-style-type: none"> <li>The ONS 15454 must be provisioned for LAN connectivity, including IP address, subnet mask, and default gateway.</li> <li>The ONS 15454 must be physically connected to the corporate LAN.</li> <li>The CTC computer must be connected to the corporate LAN that has connectivity to the ONS 15454.</li> </ul>
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 <i>Cisco ONS SONET TL1 Command Guide</i> .
Remote	Refers to a connection made to the ONS 15454 using a modem.	<ul style="list-style-type: none"> <li>A modem must be connected to the ONS 15454.</li> <li>The modem must be provisioned for the ONS 15454. To run CTC, the modem must be provisioned for Ethernet access.</li> </ul>

## 8.5 CTC Window

The CTC window appears after you log into an ONS 15454 (Figure 8-3). 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 8-3 Node View (Default Login View)



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## 8.5.1 Node View

Node view, shown in [Figure 8-3](#), 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; the name of the current logged-in user; and the security level of the user; software version; and the network element default setup.

### 8.5.1.1 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 8-4](#)).

**Table 8-4 Node View Card Colors**

Card Color	Status
Gray	Slot is not provisioned; no card is installed.
Violet	Slot is provisioned; no card is installed.
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.

The wording on a card in node view shows the status of a card (Active, Standby, Loading, or Not Provisioned). [Table 8-5](#) lists the card statuses.



**Table 8-5 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 8-6](#) lists the port colors and their service states. For more information about port service states, see [Appendix B, “Administrative and Service States.”](#)

**Table 8-6 Node View Card Port Colors and Service States**

Port Color	Service State	Description
Blue	OOS-MA,LPBK	(Out-of-Service and Management, Loopback) 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 <a href="#">Figure 8-4</a> and <a href="#">Figure 8-5</a> ). 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.
Blue	OOS-MA,MT	(Out-of-Service and Management, Maintenance) 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 OOS-MA,MT for testing or to suppress alarms temporarily. Change the state to IS-NR, OOS-MA,DSBLD, or OOS-AU,AINS when testing is complete.
Gray	OOS-MA,DSBLD	(Out-of-Service and Management, Disabled) The port is out-of-service and unable to carry traffic. Loopbacks are not allowed in this service state.

**Table 8-6 Node View Card Port Colors and Service States (continued)**

Port Color	Service State	Description
Green	IS-NR	(In-Service and Normal) The port is fully operational and performing as provisioned. The port transmits a signal and displays alarms; loopbacks are not allowed.
Violet	OOS-AU,AINS	(Out-of-Service and Autonomous, Automatic In-Service) 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 OOS-AU,AINS state for the duration of the soak period. After the soak period ends, the port service state changes to IS-NR.  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 when a signal is received for the length of time provisioned in the soak field.

**Figure 8-4 Terminal Loopback Indicator****Figure 8-5 Facility Loopback Indicator**

### 8.5.1.2 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).

### 8.5.1.3 Node View Tabs

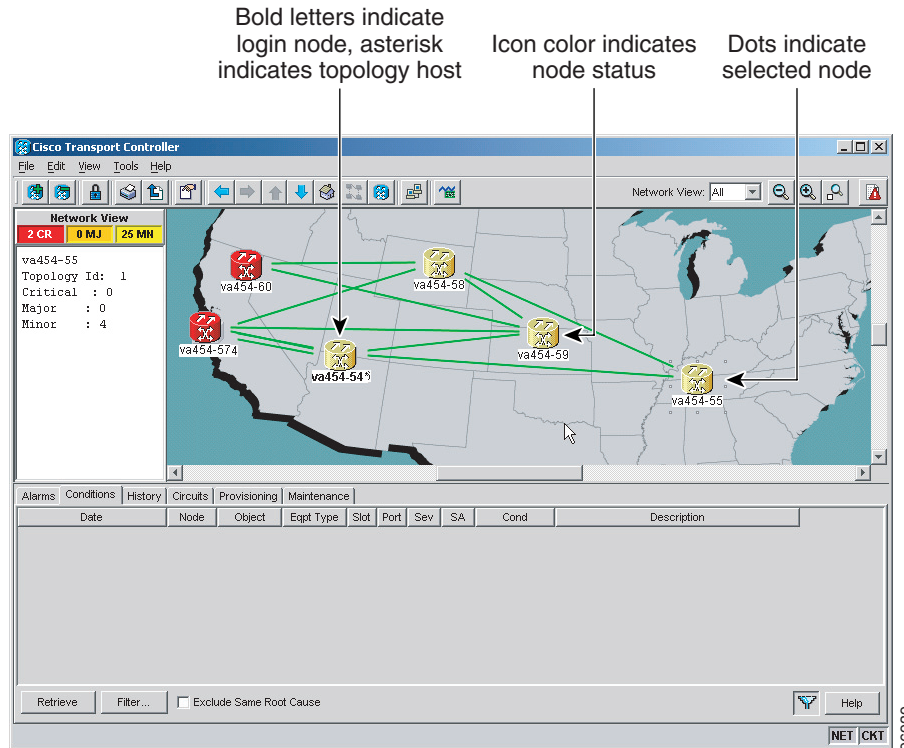
Table 8-7 lists the tabs and subtabs available in the node view.

**Table 8-7 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 card service state. For more information on card service states, see <a href="#">Appendix B, “Administrative and Service States.”</a>	—
Maintenance	Performs maintenance tasks for the node.	Database, Ether Bridge, Protection, BLSR, Software, Cross-Connect, Overhead XConnect, Diagnostic, Timing, Audit, Routing Table, RIP Routing Table, Test Access, DWDM

## 8.5.2 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 8-6](#)).

**Figure 8-6** 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 8-8). 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 8-8** 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 8-9, indicates the node alarm status.

**Table 8-9 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 8-10 lists the tabs and subtabs available in network view.

**Table 8-10 Network View Tabs and Subtabs**

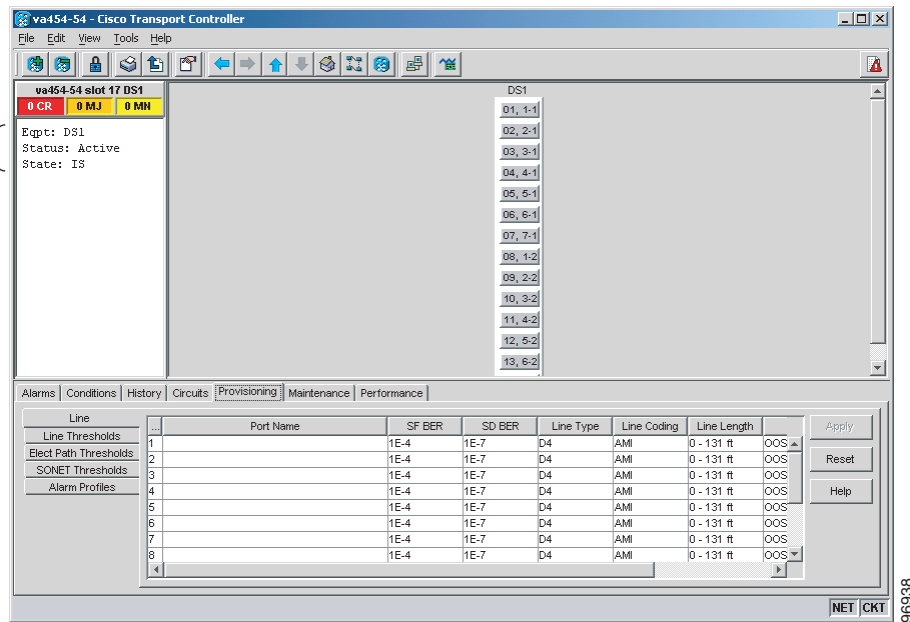
Tab	Description	Subtabs
Alarms	Lists current alarms (CR, MJ, MN) for the network and updates them in real time.	—
Conditions	Displays a list of standing conditions on the network.	—
History	Provides a history of network alarms including date, type, and severity of each alarm.	—
Circuits	Creates, deletes, edits, filters, and searches for network circuits.	—
Provisioning	Provisions security, alarm profiles, bidirectional line switched rings (BLSRs), and overhead circuits.	Security, Alarm Profiles, BLSR, Overhead Circuits, Provisionable Patchcords (PPC)
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

## 8.5.3 Card View

The card view provides information about individual ONS 15454 cards. Use this window to perform card-specific maintenance and provisioning (Figure 8-7). 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, and the card status (active or standby), card service state if the card is present, and port service state (described in Table 8-6 on page 8-9). The information that appears and the actions you can perform depend on the card. For more information about card service states, see Appendix B, “Administrative and Service States.”

Figure 8-7 CTC Card View Showing a DS1 Card

Card identification and status



**Note**

CTC provides a card view for all ONS 15454 cards except the TCC2, TCC2P, XCVT, and XC10G cards. Provisioning for these common control cards occurs at the node view; therefore, no card view is necessary.

Use the card view tabs and subtabs shown in Table 8-11 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 8-11 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 8-11 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, or SONET STS, and Alarm Profiles  TXP and MXP cards: Card, Line, Line Thresholds (different threshold options are available for electrical and optical cards), Optics Thresholds, OTN, and Alarm Profiles  DWDM cards (subtabs depend on card type): Optical Line, Optical Chn, Optical Amplifier, Parameters, Optics Thresholds
Maintenance	Performs maintenance tasks for the card.	Loopback, Info, Protection, J1 Path Trace, AINS Soak (options depend on the card type), Automatic Laser Shutdown (TXP and MXP cards only)
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, Parameters, Optics Thresholds
Inventory	Displays an Inventory screen of the ports (TXP and MXP cards only).	—

**Note**

For TXP, MXP and DWDM card information, refer to the *Cisco ONS 15454 DWDM Installation and Operations Manual*.

## 8.6 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.

## 8.7 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.

**Note**

To avoid a node IP and secure IP ending up in the same domain after restoring a database, ensure that the node IP stored in the database differs in domain from that of the node in repeater mode. Also, after restoring a database, ensure that the node IP and secure IP differ in domain.

## 8.8 Software Revert

When you click the Activate button after a software upgrade, the TCC2/TCC2P copies the current working database and saves it in a reserved location in the TCC2/TCC2P flash memory. If you later 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.

**Note**

The TCC2/TCC2P card does not carry any software earlier than Software R4.0. You will not be able to revert to a software release earlier than Software R4.0 with TCC2/TCC2P cards installed.

The revert feature is useful if a maintenance window closes while you are upgrading CTC software. You can revert to the protect software load without losing traffic. When the next maintenance window opens, complete the upgrade and activate the new software load.

Circuits created and provisioning done after a software load is activated (upgraded to a higher software 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 (for example, 4.6.2 to 4.6.1), because maintenance releases use the same database.

To perform a supported (non-service-affecting) revert from Software R5.0, the release you want to revert to must have been working at the time you first activated Software R5.0 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



Release 5.0 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 card will reset, but will not be traffic affecting and will not change your database).

