

Solution Overview

Cisco ONS 15454 Multiservice Transport Platform 7.0

The Cisco® ONS 15454 Multiservice Transport Platform (MSTP) sets the industry benchmark for dense wavelength-division multiplexing (DWDM) solutions by using proven Multiservice Provisioning Platform (MSPP) networking technologies from Cisco Systems® to deliver simple, fast, and intelligent DWDM capabilities and to lower capital and operating expenses.

Reconfigurable Optical Transport Solution

The industry-leading Cisco ONS 15454 MSTP (Figure 1) is a next-generation DWDM system that offers a widely deployed reconfigurable optical add/drop multiplexer (ROADM).

The Cisco ONS 15454 MSTP allows service providers, cable multiple system operators (MSOs), enterprises, education and governments to multiplex, transport, protect, and monitor time-division multiplexing (TDM), Ethernet, and storage area network (SAN) services while also providing the ability to reconfigure any wavelength to any site at any time.

Figure 1

Cisco ONS 15454 MSTP



The Cisco ONS 15454 MSTP transports any service from 100 Mbps to 40 Gbps, including SONET/SDH, 100/1000/10-Gigabit Ethernet, SAN, ATM, optical transport network (OTN), and video. The Cisco ONS 15454 MSTP employs fully band-tunable lasers and Small Form-Factor Pluggable/10-Gigabit Small Form-Factor Pluggable (SFP/XFP) client interfaces to lower the cost of sparing.

The Cisco Transport Controller and Cisco Transport Manager element management system (EMS) allow for full remote operation and provisioning of the Cisco ONS 15454 MSTP. Cisco MetroPlanner is used to accurately design, verify, order, install, and automatically set up the network.

Key Features and Benefits

The Cisco ONS 15454 MSTP provides capital and operational efficiency by addressing the increasing demand for multiple services, greater transport capacity, networking flexibility, multiple distance options, and management simplicity in a single platform. With innovative technology, the Cisco ONS 15454 MSTP introduces intelligence to metro DWDM transmission while meeting the continued need for greater bandwidth.

The Cisco ONS 15454 MSTP uses the operational simplicity introduced in the Cisco ONS 15454 MSPP to simplify and speed user operations for tasks such as initial ring turn-up, service provisioning, and network node and bandwidth upgrades. The Cisco ONS 15454 MSTP uses this architecture to introduce an unprecedented level of operational simplicity in metro DWDM networks. Using IP in the optical service channel and MSPP-like software, the Cisco ONS 15454 MSTP supports the following:

- Scalable wavelengths (1–64) for superior cost-versus-growth trade-off, with in-service growth to 128 wavelengths
- Transport of 150-Mbps to 40-Gbps wavelength services, as well as aggregated TDM and data services, for maximum service flexibility
- Flexible transmission capability up to 1240 miles (2000 kilometers) through the use of advanced amplification and Forward Error Correction (FEC) or Enhanced Forward Error Correction (EFEC) technologies to support a wide range of networking applications
- “Plug-and-play” card architecture for complete flexibility in configuring DWDM network elements: terminal nodes, optical add/drop nodes, line amplifiers, and dispersion compensation within amplified or unamplified networks
- High shelf density for high-bandwidth (10-Gbps) wavelength services
- Fully reconfigurable optical add/drop multiplexers (ROADMs) for superior network flexibility and reduced complexity
- Flexible add/drop capabilities, from 1- to full 128-channel granularity, supporting both band and channel OADMs
- Software-provisionable SFP and XFP client optics modules and full band wavelength tunability for reduced inventory of spares
- Fully automatic node and network setup with the possibility to use the intuitive Cisco MetroPlanner for PC-aided design, installation, and commissioning of the DWDM network
- Multilevel service monitoring using SONET/SDH and digital-wrapper (G.709) technology with an integrated optical service channel for unparalleled service reliability
- Network topology autodiscovery
- Integrated Cisco Transport Controller for network-based, point-and-click setup and regulation for rapid node and network activation
- Software-controlled optical power management for fully automated optical power control, especially during wavelength additions, site additions, and fast transient suppression in the case of a fiber cut
- Support by an advanced, cross-platform optical element management system, Cisco Transport Manager, for unified network operations and interface to a network management system (NMS) and operations support system (OSS)

In addition to the integrated software features, the Cisco ONS 15454 MSTP is supported by Cisco MetroPlanner, a simple but powerful network design tool. Cisco MetroPlanner is a user-friendly PC application for modeling Cisco DWDM networks; it optimizes the deployment based on the user’s network parameters. In addition to network design, Cisco MetroPlanner also reduces operational expenses by simplifying network deployments through the following:

- Simple drag-and-drop user operation
- Optimized services and units deployment in case of topology or traffic matrix changes for a deployed network (delta planning)

- Fully flexible network design that takes advantage of the flexibility provided by ROADM (in the optical domain) and by the multirate cards (in the service and application domain)
- Automatic equipment selection
- Layered graphical views of network, wavelength services, and node views
- Detailed port-to-port fiber-cabling table
- Bill-of-material output
- Exportable configuration files, which can be uploaded to the Cisco Transport Controller craft tool for automated node-provisioning setup for quick network activation

Features and Specifications

Tables 1 and 2 outline the features and specifications of the Cisco ONS 15454 MSTP.

Table 1. Cisco ONS 15454 MSTP Features

Feature	Description
Network configurations	<ul style="list-style-type: none"> • ROADM, any wavelength any site mesh • Linear add/drop/point to point • Optical rings • Hub/multihub
System capacity	<ul style="list-style-type: none"> • Up to 128 wavelengths growth in-service
Network	<ul style="list-style-type: none"> • Up to 20 nodes per ring/linear network • Up to 1243-mile (2000-km) network unregenerated • Up to 20 ROADM nodes per network • Auto-healing/auto-power balancing • In-line optical amplifier • Self-discovering and intelligent control plane
Services	<ul style="list-style-type: none"> • SONET/SDH <ul style="list-style-type: none"> – OC-3/OC-3c/STM-1 – OC-12/OC-12c/STM-4 – OC-48/OC-48c/STM-16 – OC-192/OC-192c/STM-64 – OC-768/OC-768c/STM-256 • Ethernet <ul style="list-style-type: none"> – 100-Mbps Fast Ethernet – Gigabit Ethernet – 10-Gigabit Ethernet (LAN/WAN physical layer) • Storage <ul style="list-style-type: none"> – ESCON – Fibre Channel/FICON (1 Gb/2 Gb/4 Gb/10 Gb) – ISC-1/ISC-3 – ETR/CLO • Video <ul style="list-style-type: none"> – D1-SDI

Feature	Description
	<ul style="list-style-type: none"> – HDTV – C-Cor DV-6000 (2.38-Gbps)
Interfaces	<ul style="list-style-type: none"> • Optical transponders/muxponders <ul style="list-style-type: none"> – Full C-band or L-band tunable optics <ul style="list-style-type: none"> 10-Gbps Enhanced Multirate Transponder 4 x 2.5-Gbps Enhanced Muxponder (OTN) 10-Gbps Data Muxponder (8-port) – 400-GHz C-band tunable optics <ul style="list-style-type: none"> 10-Gbps Enhanced Multirate Transponder 4 x 2.5-Gbps Enhanced Muxponder (OTN) 2.5-Gbps Multirate Transponder 2.5-Gbps Multirate Protected Transponder 2.5-Gbps Multiservice Aggregation Card 2.5-Gbps Multiservice Protected Aggregation Card • Optical DWDM Line Cards <ul style="list-style-type: none"> – 10-Gbps ITU Line Card – 2.5-Gbps ITU Line Card • Optical DWDM Pluggable <ul style="list-style-type: none"> – 10GE ITU XenPaks – 2.5-Gbps ITU SFPs – GE ITU GBICs • Alien wavelength support and modeling
Advanced intelligent software features	<ul style="list-style-type: none"> • Network topology autodiscovery • Point-and-click node and network setup and regulation • Automatic network optical power management and monitoring • Single management interface (single IP address) for all the shelves in a node • Network-level alarm correlation for a quick and easy troubleshooting (G.798-based)
User Interface: Cisco Transport Controller	<ul style="list-style-type: none"> • Integrated node and subnetwork craft GUI • Layered graphical views: network, wavelength, node, shelf, card • User-provisionable graphics and fonts <ul style="list-style-type: none"> – Background maps – Color schemes • A-to-Z wavelength circuit routing, creation, and tracking • Network autodiscovery with provisionable subnetwork domain control • System inventory • PC-based client • Familiar browser interface – Netscape Navigator or Microsoft Internet Explorer • Complete performance monitoring support <ul style="list-style-type: none"> – 15-minute (32 entries) and 24-hour (two entries) – Per-channel power monitoring (alien or native) – SONET/SDH layer – ITU-T G.709 layer (including FEC/EFEC)

Feature	Description
	<ul style="list-style-type: none"> – Client interface type-specific (Ethernet/SAN) – Threshold-crossing alerts threshold setting
Alarm monitoring and reporting	<ul style="list-style-type: none"> • Shelf LEDs – Critical, major, minor, remote • Card LEDs – Card failure, active/standby state, signal fail • Cisco Transport Controller craft interface <ul style="list-style-type: none"> – Layered graphical views with real-time alarm text and coloring: network, wavelength, node, shelf, card – Multiple technology views including DWDM and SONET/SDH with MSTP integration • Environmental alarm contacts <ul style="list-style-type: none"> – 4-alarm output contact closures (standard) – critical, major, minor, remote – Up to 48 provisionable alarm contacts in systems equipped with Alarm Interface Controller (AIC-I)
Network security features	<ul style="list-style-type: none"> • Four-level user control with provisionable timeout durations – superuser, provisioning, maintenance, retrieve • Multiple user names and logged-in users
Maintenance features	<ul style="list-style-type: none"> • Remote software downloads and in-service, hitless activation • Loopback • Database backup and restore • Lamp test
Additional features	<ul style="list-style-type: none"> • 100-Mbps user data channel (Fast Ethernet) using optical supervisory channel (OSC) • Front-only (ETSI) or front and rear access (ANSI) shelf assembly options • A and B monitored DC power inputs
Timing and synchronization	<ul style="list-style-type: none"> • Two external timing-source inputs (SONET, T1, and SDH E-1, 2 MHz) • Line timing • Two timing-source outputs (recovered from line optics) • Internal Stratum 3 holdover • Synchronous status-messaging support

Table 2. Cisco ONS 15454 MSTP Specifications

Specification	Description
Compliance and certifications	<ul style="list-style-type: none"> • Network Equipment Building Standards (NEBS) Level 3 compliance • Operations Systems Modification of Intelligent Network Elements (OSMINE) certifications • Storage-vendor qualification and certifications • ITU-T and CE Mark compliance
Physical dimensions (H x W x D)	<ul style="list-style-type: none"> • ANSI shelf assembly <ul style="list-style-type: none"> – 18.5 x 17.6 x 12.0 in. – 470 x 445 x 305 mm • ETSI shelf assembly <ul style="list-style-type: none"> – 24.3 x 17.5 x 11 in. – 616.5 x 445 x 280 mm
Weight per shelf	<ul style="list-style-type: none"> • Less than 101 lb (46 kg)
Power input	<ul style="list-style-type: none"> • –40.5 to –56.7V DC



For More Information

For more information about the Cisco ONS 15454 MSTP, visit www.cisco.com/en/US/products/hw/optical/ps2006/ps5320/index.html or contact your local account representative.

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