



## Q & A

# Cisco ONS 15454 Multiservice Transport Platform Release 7.0

**Q.** What are the new capabilities of Release 7.0 for the Multiservice Transport Platform?

**A.** With Release 7.0, Cisco Systems® is introducing new hardware and software optical products that will give customers more flexibility and availability. New features in the Cisco® ONS 15454 Multiservice Transport Platform (MSTP) Release 7.0 include:

- New 32 channel L-band reconfigurable optical add-drop multiplexer (ROADM)
- New 10-Gbps data muxponder
- Full C- and L-band tunability on 10-Gbps transponder and muxponder cards
- ESCON support on 2.5-Gbps data muxponder
- Multishelf management (MSM)
- Network-level alarm correlation
- Mesh/multiring upgradability
- New tools for MetroPlanner – Cisco optical network design tool
  - 40-Gbps design and transport support
  - “Alien wavelength” support, a function that promotes interoperability by allowing the MSTP to accept wavelengths from external devices (routers, switches, etc.), and eliminate the need for transponders

**Q.** What do the new features of MSTP Release 7 do?

**A.** L-Band ROADM Support:

- The L-band optical booster (**OPT-BST-L**) is a single slot L-band DWDM erbium-doped fiber amplifier (EDFA) with Optical Service Channel (OSC) add-and-drop capability.
- The L-band optical amplifier (**OPT-AMP-L**) is a double slot L-band DWDM optical preamplifier module, and consists of a two-stage EDFA with midstage access loss (MSL) for an external dispersion compensation unit (DCU) and optical service channel add-and-drop capability. The card is provisionable as a preamplifier or booster amplifier.
- The L-band 32-Channel Wavelength Selective Switch (**32-WSS-L**) module is a double-slot card and performs channel add/drop processing within the Cisco ONS 15454 DWDM node. The 32-WSS-L works in conjunction with the L-band 32-channel demultiplexer (**32-DMX-L**) to implement ROADM functionality within the L band. A ROADM network element uses two 32-WSS-L cards (two slots each) and two 32-DMX-L cards (one slot each), for a total of six slots in the chassis.

Transponders/Muxponders:

- Single-slot multirate transponder cards (**TXP-MR-10E-C** and **TXP-MR-10E-L**) supporting 10 Gigabit Ethernet, 10-Gbps Fibre Channel, OC-192, and STM-64. Transponders support enhanced Forward Error Correction (eFEC) and are fully tunable across the entire C-band or L-band spectrum, as designated.

- Single-slot muxponder cards (**MXP-2.5G-10E-C** and **MXP-2.5G-10E-L**) supporting aggregation and transport of four 2.5-Gbps signals (OC-48/STM-16) into a 10-Gbps wavelength. Transponders support eFEC and are fully tunable across the entire C-band or L-band spectrum, as designated.
- Single-slot data muxponder cards (**10DME-C** and **10DME-L**) supporting aggregation and transport of eight different client interface ports into a 10-Gbps wavelength. These innovative new cards support:
  - 8 x 1 Gigabit Ethernet
  - 8 x 1-Gbps Fibre Channel/FICON/ISC-1
  - 4 x 2-Gbps Fibre Channel/FICON/ISC-3
  - 2 x 4-Gbps Fibre Channel
  - Distance extension
  - Oversubscription (up to 8 x 2-Gbps Fibre Channel)
  - Interoperate with ML-1000-2 (ML with generic framing)
  - Oversubscription (4 x 4-Gbps Fibre Channel)

These data muxponders support eFEC and are fully tunable across the entire C-band or L-band spectrum, as designated.

- Single-slot multirate 2.5-Gbps data muxponder cards (**MXP-MR-2.5G** and **MXPP-MR-2.5G**) supporting aggregation and transport of eight different client interface ports into a 2.5-Gbps wavelength. These cards support the following mix of client signals, up to a combined bandwidth ceiling of 2.5 Gbps:
  - ESCON
  - Gigabit Ethernet
  - 1-Gbps Fibre Channel
  - 2-Gbps Fibre Channel
  - 1-Gbps FICON
  - 2-Gbps FICON

These cards are tunable to one of four adjacent grid channels, meaning eight versions of this card cover the entire C-band spectrum. There are two types of the data muxponder card: protected (**MXPP-MR-2.5G**) and unprotected (**MXP-MR-2.5G**).

#### Platform Enhancements:

- Multishelf management: The multishelf internal switch card (**MS-ISC-100T**) is an Ethernet switch used to implement transparent multishelf management of a node controller shelf and its related transponder shelves at one location.
- Mesh/multiring support: The mesh/multiring upgrade unit (**MMU**) supports mesh/multiring upgrades for ROADMs in both C band and L band. A mesh/multiring upgrade is the capability to optically bypass a given wavelength from one section of one network or ring to another section of another network or ring, without requiring optical-electrical-optical (OEO) regeneration. In each node, you need to install two MMUs, one for each data transmission direction.

**Q.** What is the difference between the existing Cisco ROADM solution and this newer L-Band ROADM?

**A.** The C band is the “center” transmission band, occupying the 1530 to 1562 nanometer (nm) wavelength range. The L band is the “long” transmission band, occupying the 1570 to 1620 nm range.

While the original Cisco ROADM solution operates in the C band, this newer version operates in the L band. Despite the difference in the wavelength band, practical functionality of the two different systems is virtually the same. The L-band system design is based on the proven architecture of the C-band system, of which more than 1000 Cisco units are deployed.

**Q.** Why would I want to use L-Band ROADM instead of C-Band ROADM?

**A.** This decision is a function of the type of fiber you plan to utilize with your ROADM network, because different types of optical fiber exhibit different efficiencies and characteristics at different wavelengths. L-band DWDM (1570 nm to 1620 nm) is well suited for use in networks that employ dispersion-shifted fiber or SMF-28 single-mode fiber.

**Q.** Some of the newly released transponder and muxponder cards look similar to some previously released cards, except the product part number ends with a -C or a -L. What is different about these newly released cards?

**A.** With the release of these new transponder and muxponder cards, Cisco is introducing a whole new level of function and flexibility. Each of the newly released cards with 10-Gbps functionality is fully tunable across the entire C-band or L-band spectrum. This enhanced flexibility means simpler networks, faster deployment, and reduction of necessary spares inventory, all of which contribute to better service and a lower total cost of ownership for the network.

**Q.** The single-slot multirate 2.5-Gbps data muxponders (MXP-MR-2.5G and MXPP-MR-2.5G) existed in Release 6.0. What’s new about these?

**A.** With Release 7.0, the functionality of these cards has been enhanced to now support Enterprise Systems Connection (ESCON) interface. This newly supported interface type is in addition to the other supported interfaces of Gigabit Ethernet, 1- and 2-Gbps Fibre Channel, and 1- and 2-Gbps FICON.

**Q.** Are these new cards compatible with previously released cards?

**A.** The new TXP-MR-10E-C is compatible with the TXP-MR-10Gs and TXP-MR-10Es. The new MXP-2.5G-10E-C is compatible with the MXP-2.5G-10Gs and MXP-2.5G-10Es cards. The enhancements previously explained for the MXP-MR-2.5G and MXPP-MR-2.5G cards apply to previously existing cards as well, provided the nodes operate on the new Release 7.0 software.

**Q.** It looks like the 10DME-C and 10DME-L cards support many different data center-oriented protocols. How can I protect my data transmission when utilizing these cards?

**A.** The 10DME cards support “Y cable protection” with some restrictions. The “Y cable protection” must be between the same card types, on the same port numbers, and using the same signal rate on each card.

**Q.** How is the multishelf internal switch card (MS-ISC-100T) interconnected with the shelf?

**A.** The MS-ISC-100T integrates management of up to eight shelves with a single target identifier (TID) and single IP address. The recommended configuration is to implement LAN redundancy using two MS-ISC-100T cards: one switch is connected to the Ethernet front-panel port of the Cisco ONS 15454 Timing, Communications, and Control v2 and 2-Plus (TCC2/TCC2P) card in Slot 7, and the other switch is connected to the Ethernet front-panel port of the TCC2/TCC2P card in Slot 11. The Ethernet configuration of the MS-ISC-100T card is part of the software package and is automatically loaded. The MS-ISC-100T card operates in Slots 1 to 6 and 12 to 17 on the node controller shelf; the recommended slots are Slot 6 and Slot 12.

**Q.** What advantages does multishelf management (MSM) offer?

**A.** Some key advantages include:

- Network-level alarm correlation (NLAC): Alarm correlation among DWDM layer cards and transponder layer cards, eliminating redundant and potentially misleading alarms.
- MSM 454 nodes will be exposed with only a single public IP address/TID for all client interfaces (CTC/TL-1/SNMP/HTTP) because multishelf internal LAN is separated from external Data Communications Network (DCN).
- Extends the A-Z provisioning feature to the optical channel terminations, reducing the steps needed to activate a service or wavelength in a DWDM network, which decreases the likelihood of human errors.
- Centralized software downloading and activation on upgrades.

**Q.** What is a “mesh/multiring network” and what are its advantages?

**A.** As DWDM and ROADMs continue to gain acceptance in the metropolitan-area networks of today, demand for configuration flexibility and network integration is becoming greater. The concept is a simple one: allow for the interconnection of circuits across multiple networks, without requiring optical-electrical-optical conversions. With the implementation of Release 7.0 and the new MMU cards, the Cisco MSTP solution will be positioned to automate A-Z circuit provisioning across multiple networks, and in the process, eliminate the need for transponders/muxponders at transition points between networks.

**Q.** Due to the limited amount of available slots in a ROADM shelf, can I implement multishelf management and mesh/multiring networking options at the same time? If I need MS-ISC-100Ts, which slots are available for the MMU cards needed at the ROADM site?

**A.** Yes, it is possible to implement both multishelf management and MMU at a ROADM site. In this case, you would utilize the MSC-ISC-100T units in the main ROADM shelf and the MMUs in a second shelf.

**Q.** What’s new with MetroPlanner for Release 7.0?

**A.** MetroPlanner is a Cisco optical network design tool. It models optical networks and optimizes current and new deployments based on network parameters and service requirements. New enhancements to MetroPlanner include:

- Improved design rules set
  - Support for L-band design rules
  - Support for multishelf management
- Support for new DWDM interfaces
  - 40-Gbps ITU transponder/muxponder
  - 10-Gbps data muxponder
  - 10-Gbps DWDM interfaces on switches and routers
  - Gigabit Ethernet DWDM Small Form-Factor Pluggables (SFPs)
  - Alien wavelength definition and support
- Network modification planning
  - Add new services or nodes to existing network
  - Add new clients or paths to an any-to-any network
  - Report required changes at node or network level

- Installation Support
  - Card preprovisioning
  - Support for node protection (East side/West side separation)
  - Support for mesh/multiring scalability for ROADM networks

**Q.** What is “alien wavelength” support?

**A.** Alien wavelength support is a functionality achieved through MetroPlanner which allows custom designed interfaces as input wavelengths directly into the MSTP system, eliminating the need for transponders. Each custom designed interface can accommodate many design parameters, including:

- Transmitter/receiver characteristics
- Bit rate
- Power sensitivity
- Transmit optical output power range
- Transmit wavelength stability

The utilization of this feature supports the interoperability of the MSTP with other unrelated optical products.

**Q.** How is alien wavelength support implemented?

**A.** MetroPlanner verifies the user-defined interface can be modeled on a card type already present in the software (interface model). If the user defined interface is not supported, a message will be displayed and the design will not be supported.

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