The Cisco® Optical Technology Advanced (OPT300) training course teaches the skills necessary to deploy advanced features of the Cisco ONS 15454 Multiservice Transport Platform (MSTP) and Cisco Network Convergence System (NCS) 2000 Series networks.

This course covers how to use the Cisco Transport Planner Design Tool for creating network topologies, how to create advanced topologies, and how to use advanced dense wavelength-division multiplexing (DWDM) features such as G.709 encapsulation, generic framing protocol G.7041, Layer 1 circuits, quality of service, crossponder networks using T1 over Ethernet, and encryption. Cards used in this course include the ONS 15454 40-Channel Wavelength Cross-Connect (WXC), 100G transponders, 10 Gigabit muxponder and transponder, 10G Data Multiplexer Enhanced, Any-Rate Muxponder and Crossponder, 10GE-XP and GE-XP Enhanced, 100G and 200G transponder and muxponder, and the Cisco 10G network encryption cards.

Duration
3 days

Target Audience
This course is designed for technical professionals who need to know how to deploy data over a DWDM network. Targeted roles include:

- Designers
- System engineers and implementation staff
- Network operations center personnel
- Technical support personnel who are involved with the deployment, operation, and maintenance of Cisco ONS 15454 MSTP and Cisco NCS 2000 Series systems
- Channel partners and resellers
Course Objectives

At the end of the course, you should be able to:

- Identify the purpose of the Transport Planner
- Start and operate the Cisco Transport Controller to provision and maintain ONS 15454 and NCS 2000 Series systems
- Describe problems with interconnecting circuits between rings, the ONS 15454 MSTP 40/80-channel manual multiring feature, and hardware components
- Perform the ONS 15454 MSTP node turn-up procedure
- Describe the optical channel network connection (OCHNC) prerequisite requirements for provisioning circuits in an ONS 15454 MSTP network
- Describe the single-module reconfigurable optical add/drop (SMR ROADM)-based configurations
- Describe the OCHNC circuit provisioning for SMR rings
- Identify the advantages G.709 encapsulation brings to optical transponder cards
- Describe the 10G transponder and muxponder cards
- Install and provision the any-rate cards
- Describe the any-rate muxponder crossponder cards (AR MXP/XP) cards
- Identify the principles of Ethernet related to the operation of Cisco optical networking products
- Configure the 10GE_XP/XPE and GE_XP/XPE cards, install Layer 1 circuits, and read the performance counters for Layer 1 Gigabit Ethernet circuits
- Describe ingress policing and basic egress queuing strategies, and implement the customer QoS scheme into the ONS 15454 crossponder network
- List the 10GE_XP and GE_XP card options
- Define the fundamentals of the T1, DS1, and DS3 circuits
- Describe the 100-Gbps and 200-Gbps cards
- Turn up an encrypted network and test to ensure that information being passed is secure
- Add a node to an existing DWDM ring
- Describe the ONS 15454 MSTP Troubleshooting Guide

Course Prerequisites

- Completion of Cisco Fundamentals of Fiber Optics Technology (FFOT) video training
- Cisco Optical Technology Intermediate (OPT200) course

To locate Cisco courses that cover the listed prerequisites, go to the Cisco Training and Events webpage at [http://www.cisco.com/web/learning/index.html](http://www.cisco.com/web/learning/index.html).
Course Outline

- Module 1: Cisco Transport Planner Design Tool
  - Getting Started with the Transport Planner
  - Using the Transport Planner
  - Generating the Final Files

- Module 2: Cisco Transport Controller Operations
  - Exploring the Fundamentals of the Transport Controller
  - Discovering the Transport Controller Views
  - Working with Windows Within Windows
  - Provisioning the Shelf
  - Maintaining the Shelf

- Module 3: Manual Multiring and Mesh Network Using the ONS 15454 40-WXC Card
  - Manual Multiring
  - Back-to-Back Transponders
  - Mesh Network Concepts
  - Mesh Network Example
  - Multiring Details
  - Patch Panel and Amplifiers
  - Mesh Cards
  - 50-GHz Interleaver

- Module 4: Node Turn-Up
  - Cisco Transport Planner Configuration Source File
  - Procedure for Releases 9.1 and Later
  - Provision the Optical Service Channel (OSC)
  - Verify OSC Transmit Power
  - Create and Delete Connections

- Module 5: OCHNC Circuits
  - OCHNC Prerequisites
  - Create an OCHNC
  - Circuit States
  - Verify the Amplifiers
  - Verify the Remaining OCHNC Tasks
  - View Power Levels in a WSS/WXC Mesh Network

- Module 6: MSTP M6 SMR-Based Rings
  - SMR-Based Configurations
  - 4-Degree Mesh Using SMR-2
  - Functional View in Release 10.1 and Later
  - Viewing Individual Channel Power Levels
• Module 7: OCHNC Circuits in SMR
  ◦ OCHNC Prerequisites
  ◦ Create an OCHNC
  ◦ Circuit States
• Module 8: G.709 Encapsulation 10G and 100G Transponder Settings
  ◦ ITU-T G.709 Standard
  ◦ Optical Transport Unit (OTU) Options in 10G Transponder
  ◦ OTU Options in 100G Transponder
• Module 9: 10 Gigabit Muxponder and Transponder Cards
  ◦ 10G Transponder and Muxponder Cards
  ◦ 10G Transponders
  ◦ Muxponders
  ◦ 10x10 Card
  ◦ Installing 10G Circuit with 10x10 Card
  ◦ Performance Monitoring Capabilities
• Module 10: Generic Framing Protocol G.7041, Multiplexer Cards, and Encapsulation Options
  ◦ Standard G.7041
  ◦ Cards Using GFP
• Module 11: Any-Rate Muxponder and Crossponder Cards
  ◦ Discovering the Any-Rate Cards
  ◦ Exploring Any-Rate Allowed Payloads
  ◦ Reviewing the Any-Rate Card Modes
  ◦ Reviewing Any-Rate Mixed Modes
  ◦ Provisioning the Any-Rate Cards
• Module 12: Ethernet and VLANs
  ◦ Ethernet
  ◦ Virtual LANs
• Module 13: 10GE-XP and GE-XP Enhanced Cards, Settings, and Circuits
  ◦ Layer 1
  ◦ 10GE_XP and GE_XP Card Options
  ◦ 10GE_XP/XPE and GE_XP/XPE Pluggable Port Modules and G.709 Settings
  ◦ Provisioning Items Common to 10GE_XP/XPE and GE_XP/XPE
  ◦ 10GE_XP/XPE and GE_XP/XPE Circuits
  ◦ 10GE_XP/XPE and GE_XP/XPE Performance Counts
• Module 14: Quality of Service
  ◦ Quality of Service
  ◦ Example Crossponder Settings
• Module 15: XP-E Cards Protected Ring, CoS Marking by Port, Customer VLAN, and QoS
  ◦ Setting the 10GE_XP and GE_XP Card Options
  ◦ Configuring the Layer 2 Circuit Using OCH-Trail
  ◦ Provisioning Layer 2 Settings for Connectivity
  ◦ Creating Layer Circuit from Network Layer 2 Window
• Module 16: T1 over Ethernet in a Crossponder Network
  ◦ Exploring the Constant Bit Rate DS1 and DS3
  ◦ Investigating T1/T3 over Fast Ethernet
  ◦ Installing the T1 over Ethernet SFP and the Physical Interface
  ◦ Installing the T1 over Ethernet in the Crossponder Network
• Module 17: 100 and 200 Gigabit Transponders and Muxponders
  ◦ 100- and 200-Gbps Cards
  ◦ Client Port Types
  ◦ Card Configurations
• Module 18: Cisco 10G Network Encryption Card
  ◦ Examining the Wire Speed Encryption (WSE) Card
  ◦ Modes of Operation
  ◦ Security Management
  ◦ Protection
  ◦ Installation and Turn-Up of the WSE Card
• Module 19: Add-a-Node Design and Installation
  ◦ Adding a New Node in Cisco Transport Planner
  ◦ Create Installation Package
  ◦ Insert New Node
  ◦ Add Circuits into New Node
• Module 20: Basic Troubleshooting
  ◦ ONS 15454 DWDM Troubleshooting Guide
  ◦ Hierarchy of Alarms
  ◦ Functional View

Lab Outline
• Lab 1: Start the Cisco Transport Planner Software and Create a DWDM Network
• Lab 2: Configure the Cisco Transport Controller and Display Network
• Lab 3: Establish 6-Node 40- and 80-Channel Mesh Networks
• Lab 4: Create Circuits and View Power Levels in 40 and 80 WXC Networks
• Lab 5: Establish 6-Node SMR1 and SMR2 Mesh Networks
• Lab 6: Create Circuits and View Power Levels in SMR1 and SMR2 Networks
- Lab 7: Establish 10G Transponder Circuits
- Lab 8: Any-Rate Muxponder and Crossponder Options 8:2 configuration
- Lab 9: 1G and 10G Crossponder Layer 1 Network
- Lab 10: 1G and 10G Enhanced Crossponder Layer Two-Ring Configuration
- Lab 11: Circuits to Carry T1 over Ethernet
- Lab 12: 100 Gigabit Transponders and 10x10 Muxponders
- Lab 13: 10G Encryption Card Circuit
- Lab 14: Add a Node to a 6-Node Mesh Network
- Lab 15: MSTP Troubleshooting

Registration Email
For more information about schedules and registration for this course, contact aeskt_registration@cisco.com.

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