



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 instructions on using Cisco 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.

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 3-3](#)—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 3-10](#)—Continue with this procedure to set the node battery power thresholds.
5. [NTP-G26 Set Up CTC Network Access, page 3-11](#)—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 3-23](#)—Continue with this procedure to provision the IP address, default router, subnet mask, and network configuration settings.
7. [NTP-G132 Provision OSI, page 3-25](#)—Continue with this procedure if the ONS 15454 will be installed in networks with third-party, Open Systems Interconnection (OSI)-based network elements (NEs).
8. [NTP-G28 Set Up SNMP, page 3-35](#)—Complete this procedure if Simple Network Management Protocol (SNMP) will be used for network monitoring.
9. [NTP-G29 Preprovision a Slot, page 3-37](#)—Complete this procedure to preprovision the ONS 15454 slots.
10. [NTP-G30 Install the DWDM Cards, page 3-39](#)—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.
11. [NTP-G31 Install the DWDM Dispersion Compensating Units, page 3-41](#)—Complete this procedure to install a dispersion compensating unit (DCU).
12. [NTP-G32 Install the Transponder and Muxponder Cards, page 3-43](#)—Complete this procedure to install transponder (TXP) and muxponder (MXP) cards.
13. [NTP-G123 Install the Filler Cards, page 3-47](#)—Complete this procedure to install ONS 15454 filler cards.
14. [NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs, page 3-48](#)—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 3-72](#)—Complete this procedure, as needed, to connect TXP cards to a terminal, hub, or reconfigurable optical add/drop multiplexing (ROADM) node.
16. [NTP-G141 Install Fiber-Optic Cables for Y-Cable Protection Modules, page 3-79](#)—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 3-80](#)—Complete this procedure to calculate the DWDM cable connections.
18. [NTP-G138 Import a Cisco MetroPlanner Configuration File, page 3-82](#)—Complete this procedure next.
19. [NTP-G37 Run Automatic Node Setup, page 3-83](#)—Complete this procedure next.
20. [NTP-G38 Provision OSC Terminations, page 3-84](#)—Complete this procedure next.
21. [NTP-G39 Verify OSCM and OSC-CSM Transmit Power, page 3-86](#)—Complete this procedure next.

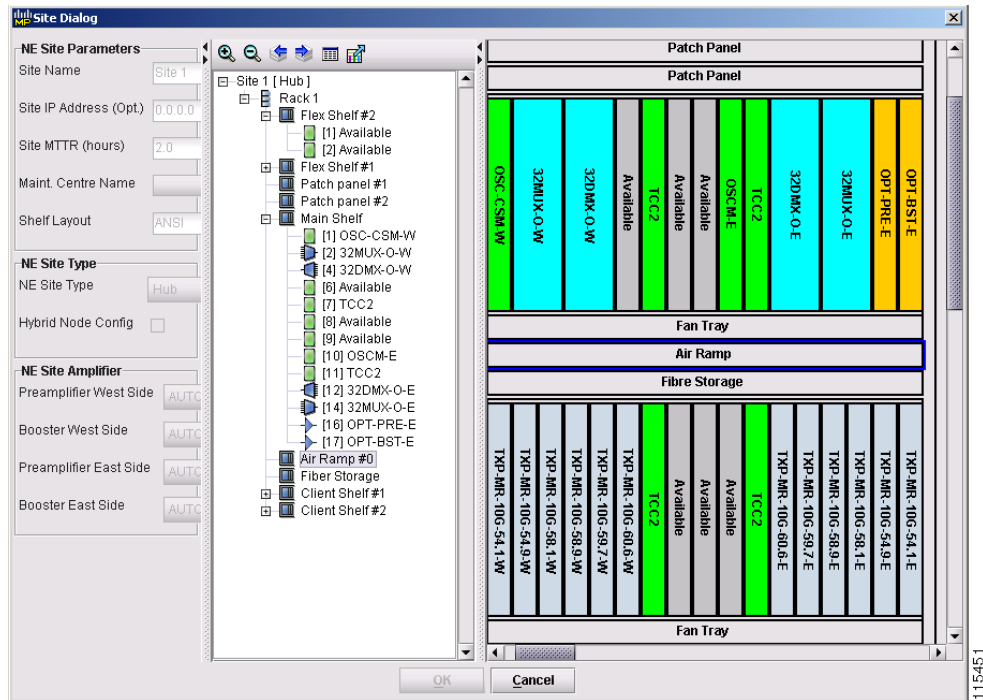
NTP-G139 Verify Cisco MetroPlanner Reports and Files

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 Cisco 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 all 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
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), output power, optical thresholds, and amplifier configuration parameters.
Internal Connections	Table	Identifies the patchcords 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 turn-up, 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 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 turn-up.
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	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 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 1-73](#) 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 2-25](#) 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 3-7](#) 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 10-45](#).

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 2-25
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 “[20.1 User IDs and Security Levels](#)” section on [page 20-1](#) 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 10-45](#).

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 2-25
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 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. 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 [“20.1 User IDs and Security Levels” section on page 20-1](#) 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 10-45](#).

- Step 5** In the Select Applicable Nodes area, 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

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- Step 1** Complete the [“DLP-G46 Log into CTC” task on page 2-25](#) 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” task on page 3-82](#), the CTC node name and the Cisco 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—(Optional) Enter the node latitude: N (north) or S (south), degrees, and minutes.
 - Longitude—(Optional) Enter the node longitude: E (east) or W (west), degrees, and minutes.
- 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 8-11](#).


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 3-12](#)), 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 22, “Management 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 list 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 3-10](#).

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 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.

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- Step 1** Complete the [“DLP-G46 Log into CTC” task on page 2-25](#) 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.**
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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, Internet Inter-Orb Protocol (IIOP) 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

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- Step 1** Complete the [“DLP-G46 Log into CTC” task on page 2-25](#). If you are already logged in, continue with [Step 2](#).
- Step 2** Complete the [“DLP-G56 Provision IP Settings” task on page 3-12](#) 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 3-15](#) for instructions. However, you cannot use the LCD to provision any other network settings.

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- 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 3-17](#).


Note

Secure mode is not available if TCC2 cards are installed.

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- Step 4** If static routes are needed, complete the [“DLP-G58 Create a Static Route” task on page 3-18](#). For more information about static routes, see [Chapter 22, “Management 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 3-19](#).
- 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 3-22](#).

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 2-25
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 3-15.
 - 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 end network element (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 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 3-23](#) 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 [“22.2.7 Scenario 7: Provisioning the ONS 15454 Proxy Server” section on page 22-12](#). In SOCKS proxy server networks, the ONS 15454 is either an ENE, a 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 the Enable SOCKS proxy server on port check box is unchecked, 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 option is the same as the GNE option, except that 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.	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).		
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.		
	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.
Memory test (1 to 2 minutes).		
TCC2/TCC2P updated with new network information.		
The active TCC2/TCC2P becomes the standby TCC2/TCC2P.		

- 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 1-73
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None


Note

You cannot perform this task if the LCD IP Display field 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 3-12 to view or change the LCD IP Display field.


Note

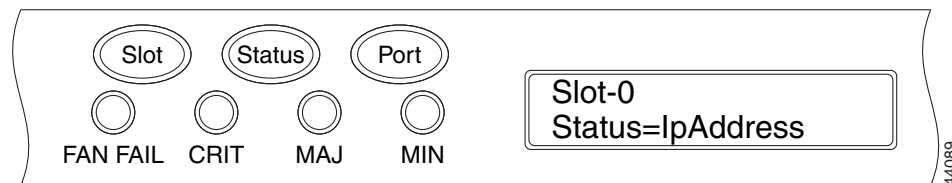
The LCD reverts to normal display mode after 5 seconds of button inactivity.

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:

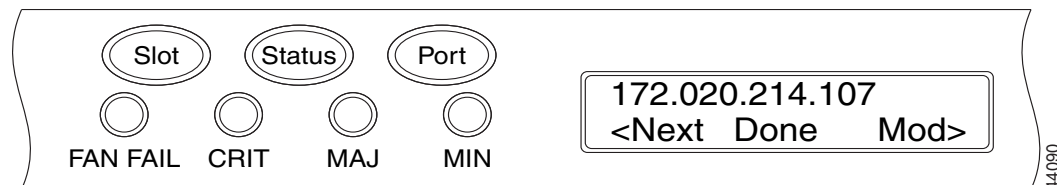
- To change the node IP address, Status=IpAddress ([Figure 3-2](#))
- To change the node network mask, Status=Net Mask
- To change the default router IP address, Status=Default Rtr

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*



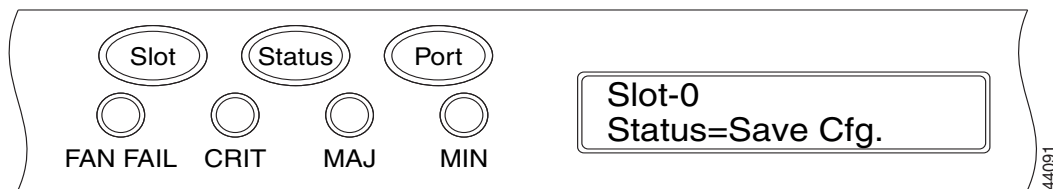
Step 4 Push the **Slot** button to move to the digit of the IP address or subnet mask that you want to change. The selected digit flashes.

**Tip**

The Slot, Status, and Port button positions correspond to the positions of the commands shown 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.

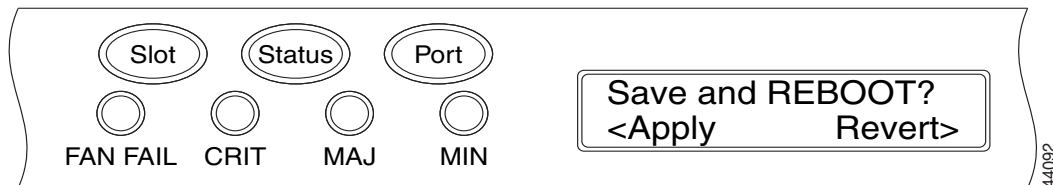
- Step 5** Press the **Port** button to cycle the IP address or subnet mask to the correct digit.
- Step 6** When the change is complete, press the **Status** button to return to the Node menu.
- Step 7** Repeatedly press the **Port** button until the Save Configuration option appears ([Figure 3-4](#)).

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 13-2 DLP-G46 Log into CTC, page 2-25
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 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 10 In the CTC Alerts dialog box, click **Close**. Wait for the reboot to finish. (This might 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. In 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 one of the following conditions exists:

- 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 2-25](#)

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 22, “Management 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 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 2-25 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](#).

- Click the **No Authentication** button.
- 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.
- 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.

- Under OSPF Area Range Table, click **Create**.
- 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 3-14](#) 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 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 2-25 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](#).
- Click the **No Authentication** button.
 - 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.
 - 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.
- In the RIP Address Summary area, click **Create**.
 - 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.
 - Click **OK**.
- Step 7** Return to your originating procedure (NTP).
-

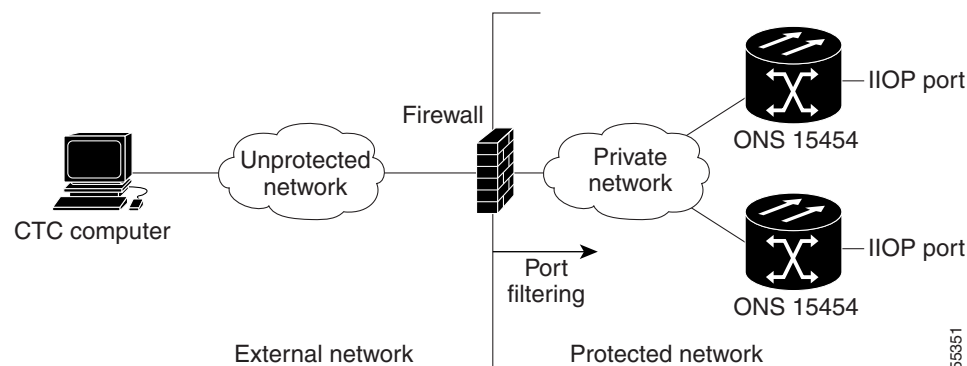
NTP-G27 Set Up the ONS 15454 for Firewall Access

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 2-25](#) 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 3-24](#).

[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.

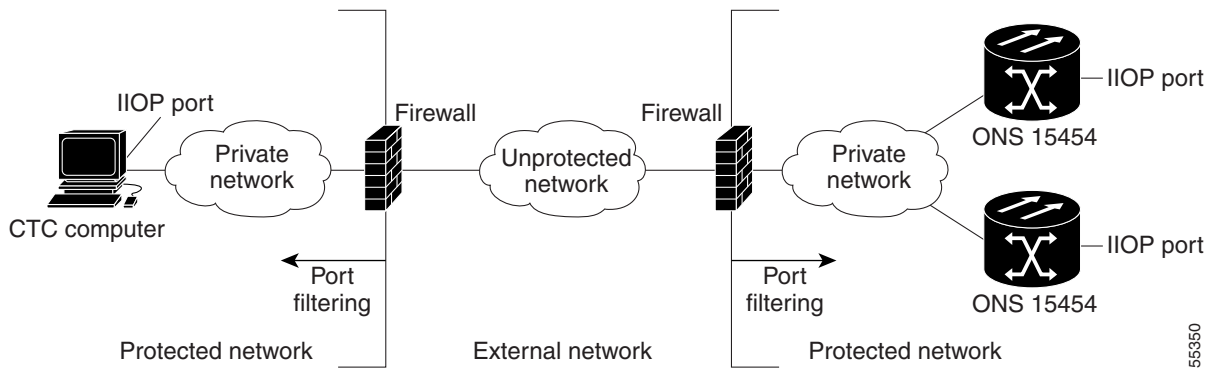
Figure 3-6 Nodes Behind a Firewall



- 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 3-25](#).

[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 2-25
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 the check box 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 2-25
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-G132 Provision OSI

Purpose	This procedure provisions the ONS 15454 so it can be networked with other vendor NEs that use the OSI protocol stack for data communications network (DCN) communications. This procedure provisions the TID Address Resolution Protocol (TARP), OSI routers, manual area addresses, subnetwork points of attachment, and IP-over-OSI tunnels.
Tools/Equipment	None
Prerequisite Procedures	NTP-G15 Install the Common Control Cards, page 1-72
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

**Caution**

This procedure requires an understanding of OSI protocols, parameters, and functions. Before you begin, review the OSI reference sections in [Chapter 22, “Management Connectivity Reference.”](#)

**Caution**

Do not begin this procedure until you know the role of the ONS 15454 within the OSI and IP network.

**Note**

This procedure requires provisioning of non-ONS equipment including routers and third party NEs. Do not begin until you have the capability to complete that provisioning.

Step 1 Complete the [“DLP-G46 Log into CTC” task on page 2-25](#) at the node where you want to provision the OSI routing mode. If you are already logged in, continue with Step 2.

Step 2 As needed, complete the following tasks:

- [DLP-G283 Provision OSI Routing Mode, page 3-27](#)—Complete this task first.
- [DLP-G284 Provision the TARP Operating Parameters, page 3-28](#)—Complete this task second.
- [DLP-G285 Add a Static TID to NSAP Entry to the TARP Data Cache, page 3-30](#)—Complete this task as needed.
- [DLP-G287 Add a TARP Manual Adjacency Table Entry, page 3-31](#)—Complete this task as needed.
- [DLP-G288 Provision OSI Routers, page 3-31](#)—Complete this task as needed.
- [DLP-G289 Provision Additional Manual Area Addresses, page 3-32](#)—Complete this task as needed.
- [DLP-G290 Enable the OSI Subnet on the LAN Interface, page 3-33](#)—Complete this task as needed.
- [DLP-G291 Create an IP-Over-CLNS Tunnel, page 3-34](#)—Complete this task as needed.

Stop. You have completed this procedure.

DLP-G283 Provision OSI Routing Mode

Purpose	This task provisions the OSI routing mode. Complete this task when the ONS 15454 is connected to networks with third party NEs that use the OSI protocol stack for DCN communication.
Tools/Equipment	None
Prerequisite Procedures	NTP-G15 Install the Common Control Cards, page 1-72 DLP-G46 Log into CTC, page 2-25
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher


Caution

Do not complete this task until you confirm the role of the node within the network. It will be either an ES, IS Level 1, or IS Level 1/Level 2. This decision must be carefully considered. For additional information about OSI provisioning, refer to the “Management Network Connectivity” chapter of the *Cisco ONS 15454 Reference Manual*.


Caution

Link State Protocol (LSP) buffers must be the same at all NEs within the network, or loss of visibility might occur. Do not modify the LSP buffers unless you confirm that all NEs within the OSI have the same buffer size.


Caution

LSP buffer sizes cannot be greater than the LAP-D maximum transmission unit (MTU) size within the OSI area.


Note

For ONS 15454 nodes, three virtual routers can be provisioned. The node primary Network Service Access Point (NSAP) address is also the Router 1 primary manual area address. To edit the primary NSAP, you must edit the Router 1 primary manual area address. After you enable Router 1 on the Routers subtab, the Change Primary Area Address button is available to edit the address.

Step 1 In node view, click the **Provisioning > OSI** tabs.

Step 2 Choose a routing mode:

- End System—The ONS 15454 performs OSI end system (ES) functions and relies upon an intermediate system (IS) for communication with nodes that reside within its OSI area.


Note

The End System routing mode is not available if more than one virtual router is enabled.

- Intermediate System Level 1—The ONS 15454 performs OSI IS functions. It communicates with IS and ES nodes that reside within its OSI area. It depends upon an IS L1/L2 node to communicate with IS and ES nodes that reside outside its OSI area.

- Intermediate System Level 1/Level 2—The ONS 15454 performs IS functions. It communicates with IS and ES nodes that reside within its OSI area. It also communicates with IS L1/L2 nodes that reside in other OSI areas. Before choosing this option, verify the following:
 - The node is connected to another IS Level 1/Level 2 node that resides in a different OSI area.
 - The node is connected to all nodes within its area that are provisioned as IS L1/L2.

Step 3 If needed, change the LSP data buffers:

- L1 LSP Buffer Size—Adjusts the Level 1 link state PDU buffer size. The default is 512. It should not be changed.
- L2 LSP Buffer Size—Adjusts the Level 2 link state PDU buffer size. The default is 512. It should not be changed.

Step 4 Return to your originating procedure (NTP).

DLP-G284 Provision the TARP Operating Parameters

Purpose	This task provisions the TARP operating parameters including TARP protocol data unit (PDU) propagation, timers, and loop detection buffer (LDB).
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-25
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 In node view, click the **Provisioning > OSI > TARP > Config** tabs.

Step 2 Provision the following parameters, as needed:

- TARP PDUs L1 Propagation—If checked (default), TARP Type 1 PDUs that are received by the node and are not excluded by the LDB are propagated to other NEs within the Level 1 OSI area. (Type 1 PDUs request a protocol address that matches a target identifier [TID] within a Level 1 routing area.) The propagation does not occur if the NE is the target of the Type 1 PDU, and PDUs are not propagated to the NE from which the PDU was received.



Note The TARP PDUs L1 Propagation parameter is not used when the Node Routing Area (on the Provisioning > OSI > Main Setup tab) is set to End System.

- TARP PDUs L2 Propagation—If checked (default), TARP Type 2 PDUs that are received by the node and are not excluded by the LDB are propagated to other NEs within the Level 2 OSI areas. (Type 2 PDUs request a protocol address that matches a TID within a Level 2 routing area.) The propagation occurs if the NE is not the target of the Type 2 PDU, and PDUs are not propagated to the NE from which the PDU was received.



Note The TARP PDUs L2 Propagation parameter is only used when the Node Routing Area is provisioned to Intermediate System Level 1/Level 2.

- TARP PDUs Origination—If checked (default), the node performs all TARP origination functions including:
 - TID to NSAP resolution requests (originate TARP Type 1 and Type 2 PDUs)
 - NSAP to TID requests (originate Type 5 PDUs)
 - TARP address changes (originate Type 4 PDUs)



Note TARP Echo and NSAP to TID are not supported.

- TARP Data Cache—If checked (default), the node maintains a TARP data cache (TDC). The TDC is a database of TID to NSAP pairs created from TARP Type 3 PDUs received by the node and modified by TARP Type 4 PDUs (TID to NSAP updates or corrections). TARP 3 PDUs are responses to Type 1 and Type 2 PDUs. The TDC can also be populated with static entries entered on the TARP > Static TDC tab.



Note This parameter is only used when the TARP PDUs Origination parameter is enabled.

- L2 TARP Data Cache—If checked (default), the TIDs and NSAPs of NEs originating Type 2 requests are added to the TDC before the node propagates the requests to other NEs.



Note The TARP Data Cache parameter is designed for Intermediate System Level 1/Level 2 nodes that are connected to other Intermediate System Level 1/Level 2 nodes. Enabling the parameter for Intermediate System Level 1 nodes is not recommended.

- LDB—If checked (default), enables the TARP loop detection buffer. The LDB prevents TARP PDUs from being sent more than once on the same subnet.



Note The LDP parameter is not used if the Node Routing Mode is provisioned to End System or if the TARP PDUs L1 Propagation parameter is not enabled.

- LAN TARP Storm Suppression—If checked (default), enables TARP storm suppression. This function prevents redundant TARP PDUs from being unnecessarily propagated across the LAN network.
- Send Type 4 PDU on Startup—If checked, a TARP Type 4 PDU is originated during the initial ONS 15454 startup. Type 4 PDUs indicate that a TID or NSAP change has occurred at the NE. (The default setting is not enabled.)
- Type 4 PDU Delay—Sets the amount of time that will pass before the Type 4 PDU is generated when Send Type 4 PDU on Startup is enabled. 60 seconds is the default. The range is 0 to 255 seconds.



Note The Send Type 4 PDU on Startup and Type 4 PDU Delay parameters are not used if TARP PDUs Origination is not enabled.

- LDB Entry—Sets the TARP loop detection buffer timer. The loop detection buffer time is assigned to each LDB entry for which the TARP sequence number (tar-seq) is zero. The default is 5 minutes. The range is 1 to 10 minutes.

- **LDB Flush**—Sets the frequency period for flushing the LDB. The default is 5 minutes. The range is 0 to 1440 minutes.
- **T1**—Sets the amount of time to wait for a response to a Type 1 PDU. Type 1 PDUs seek a specific NE TID within an OSI Level 1 area. The default is 15 seconds. The range is 0 to 3600 seconds.
- **T2**—Sets the amount of time to wait for a response to a Type 2 PDU. TARP Type 2 PDUs seek a specific NE TID value within OSI Level 1 and Level 2 areas. The default is 25 seconds. The range is 0 to 3600 seconds.
- **T3**—Sets the amount of time to wait for an address resolution request. The default is 40 seconds. The range is 0 to 3600 seconds.
- **T4**—Sets the amount of time to wait for an error recovery. This timer begins after the T2 timer expires without finding the requested NE TID. The default is 20 seconds. The range is 0 to 3600 seconds.



Note The T1, T2, and T4 timers are not used if TARP PDUs Origination is not enabled.

Step 3 Click **Apply**.

Step 4 Return to your originating procedure (NTP).

DLP-G285 Add a Static TID to NSAP Entry to the TARP Data Cache

Purpose	This task adds a static TID to NSAP entry to the TDC. The static entries are required for NEs that do not support TARP and are similar to static routes. For a specific TID, you must force a specific NSAP.
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-25
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioner or higher

Step 1 In node view, click the **Provisioning > OSI > TARP > Static TDC** tabs.

Step 2 Click **Add Static Entry**.

Step 3 In the Add Static Entry dialog box, enter the following:

- **TID**—Enter the TID of the NE. (For ONS nodes, the TID is the Node Name parameter on the node view Provisioning > General tab.)
- **NSAP**—Enter the OSI NSAP address in the NSAP field or, if preferred, click **Use Mask** and enter the address in the Masked NSAP Entry dialog box.

Step 4 Click **OK** to close the Masked NSAP Entry dialog box, if used, and then click **OK** to close the Add Static Entry dialog box.

Step 5 Return to your originating procedure (NTP).

DLP-G287 Add a TARP Manual Adjacency Table Entry

Purpose	This task adds an entry to the TARP manual adjacency table (MAT). Entries are added to the MAT when the ONS 15454 must communicate across routers or NEs that lack TARP capability.
Tools/Equipment	None
Prerequisite procedures	DLP-G46 Log into CTC, page 2-25
Required/As needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

-
- Step 1** In node view, click the **Provisioning > OSI > TARP > MAT** tabs.
- Step 2** Click **Add**.
- Step 3** In the Add TARP Manual Adjacency Table Entry dialog box, enter the following:
- **Level**—Sets the TARP Type Code that will be sent:
 - **Level 1**—Indicates that the adjacency is within the same area as the current node. The entry generates Type 1 PDUs.
 - **Level 2**—Indicates that the adjacency is in a different area than the current node. The entry generates Type 2 PDUs.
 - **NSAP**—Enter the OSI NSAP address in the NSAP field or, if preferred, click **Use Mask** and enter the address in the Masked NSAP Entry dialog box.
- Step 4** Click **OK** to close the Masked NSAP Entry dialog box, if used, and then click **OK** to close the Add Static Entry dialog box.
- Step 5** Return to your originating procedure (NTP).
-

DLP-G288 Provision OSI Routers

Purpose	This task enables an OSI router and edits its primary manual area address.
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4 DLP-G46 Log into CTC, page 2-25
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher



Note

Router 1 must be enabled before you can enable and edit the primary manual area addresses for Routers 2 and 3.

**Note**

The Router 1 manual area address, System ID, and Selector “00” create the node NSAP address. Changing the Router 1 manual area address changes the node’s NSAP address.

**Note**

The System ID for Router 1 is the node MAC address. The System IDs for Routers 2 and 3 are created by adding 1 and 2 respectively to the Router 1 System ID. You cannot edit the System IDs.

-
- Step 1** Click the **Provisioning > OSI > Routers > Setup** tabs.
- Step 2** Chose the router you want provision and click **Edit**. The OSI Router Editor dialog box appears.
- Step 3** In the OSI Router Editor dialog box:
- Check **Enable Router** to enable the router and make its primary area address available for editing.
 - Click the manual area address, then click **Edit**.
 - In the Edit Manual Area Address dialog box, edit the primary area address in the Area Address field. If you prefer, click **Use Mask** and enter the edits in the Masked NSAP Entry dialog box. The address (hexadecimal format) can be 8 to 24 alphanumeric characters (0–9, a–f) in length.
 - Click **OK** successively to close the following dialog boxes: Masked NSAP Entry (if used), Edit Manual Area Address, and OSI Router Editor.
- Step 4** Return to your originating procedure (NTP).
-

DLP-G289 Provision Additional Manual Area Addresses

Purpose	This task provisions the OSI manual area addresses. One primary area and two additional manual areas can be created for each virtual router.
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4 DLP-G288 Provision OSI Routers, page 3-31 DLP-G46 Log into CTC, page 2-25
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

-
- Step 1** Click the **Provisioning > OSI > Routers > Setup** tabs.
- Step 2** Chose the router where you want provision an additional manual area address and click **Edit**. The OSI Router Editor dialog box appears.
- Step 3** In the OSI Router Editor dialog box:
- Check **Enable Router** to enable the router and make its primary area address available for editing.
 - Click the manual area address, then click **Add**.

- c. In the Add Manual Area Address dialog box, enter the primary area address in the Area Address field. If you prefer, click **Use Mask** and enter the address in the Masked NSAP Entry dialog box. The address (hexadecimal format) can be 2 to 24 alphanumeric characters (0–9, a–f) in length.
- d. Click **OK** successively to close the following dialog boxes: Masked NSAP Entry (if used), Add Manual Area Address, and OSI Router Editor.

Step 4 Return to your originating procedure (NTP).

DLP-G290 Enable the OSI Subnet on the LAN Interface

Purpose	This task enables the OSI subnetwork point of attachment on the LAN interface.
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4 DLP-G46 Log into CTC, page 2-25
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher



Note

OSI subnetwork points of attachment are enabled on DCCs when you create DCCs. See the “[NTP-G38 Provision OSC Terminations](#)” procedure on page 3-84 and the “[DLP-G76 Provision GCC Terminations](#)” task on page 7-14.



Note

The OSI subnetwork point of attachment cannot be enabled for the LAN interface if the OSI routing mode is set to ES.



Note

If Secure Mode is on, the OSI Subnet is enabled on the backplane LAN port, not the front TCC2P port.

Step 1 Click the **Provisioning > OSI > Routers > Subnet** tabs.

Step 2 Click **Enable LAN Subnet**.

Step 3 In the Enable LAN Subnet dialog box, complete the following fields:

- ESH—Sets the End System Hello (ESH) propagation frequency. End system NEs transmit ESHs to inform other ESs and ISs about the NSAPs it serves. The default is 10 seconds. The range is 10 to 1000 seconds.
- ISH—Sets the Intermediate System Hello (ISH) PDU propagation frequency. Intermediate system NEs send ISHs to other ESs and ISs to inform them about the IS NEs it serves. The default is 10 seconds. The range is 10 to 1000 seconds.
- IIH—Sets the Intermediate System to Intermediate System Hello (IIH) PDU propagation frequency. The IS-IS Hello PDUs establish and maintain adjacencies between ISs. The default is 3 seconds. The range is 1 to 600 seconds.

- **IS-IS Cost**—Sets the cost for sending packets on the LAN subnet. The IS-IS protocol uses the cost to calculate the shortest routing path. The default IS-IS cost for LAN subnets is 20. It normally should not be changed.
- **DIS Priority**—Sets the designated intermediate system (DIS) priority. In IS-IS networks, one router is elected to serve as the DIS (LAN subnets only). Cisco router DIS priority is 64. For the ONS 15454 LAN subnet, the default DIS priority is 63. It normally should not be changed.

Step 4 Click **OK**.

Step 5 Return to your originating procedure (NTP).

DLP-G291 Create an IP-Over-CLNS Tunnel

Purpose	This task creates an IP-over-Connectionless Network Service (CLNS) tunnel to allow ONS 15454 nodes to communicate across equipment and networks that use the OSI protocol stack.
Tools/Equipment	None
Prerequisite Procedures	NTP-G22 Verify Common Card Installation, page 3-4 DLP-G46 Log into CTC, page 2-25
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher



Caution

IP-over-CLNS tunnels require two endpoints. You will create one point on an ONS 15454. The other endpoint is generally provisioned on non-ONS equipment including routers and other vendor NEs. Before you begin, verify that you have the capability to create an OSI-over-CLNS tunnel on the other equipment location.

Step 1 Click the **Provisioning > OSI > Tunnels** tabs.

Step 2 Click **Create**.

Step 3 In the Create IP Over OSI Tunnel dialog box, complete the following fields:

- **Tunnel Type**—Choose a tunnel type:
 - **Cisco**—Creates the proprietary Cisco IP tunnel. Cisco IP tunnels add the CLNS header to the IP packets.
 - **GRE**—Creates a Generic Routing Encapsulation tunnel. GRE tunnels add the CLNS header and a GRE header to the IP packets.

The Cisco proprietary tunnel is slightly more efficient than the GRE tunnel because it does not add the GRE header to each IP packet. The two tunnel types are not compatible. Most Cisco routers support the Cisco IP tunnel, while only a few support both GRE and Cisco IP tunnels. You generally should create Cisco IP tunnels if you are tunneling between two Cisco routers or between a Cisco router and an ONS node.

**Caution**

Always verify that the IP-over-CLNS tunnel type you choose is supported by the equipment at the other end of the tunnel.

- **IP Address**—Enter the IP address of the IP-over-CLNS tunnel destination.
- **IP Mask**—Enter the IP address subnet mask of the IP-over-CLNS destination.
- **OSPF Metric**—Enter the OSPF metric for sending packets across the IP-over-CLNS tunnel. The OSPF metric, or cost, is used by OSPF routers to calculate the shortest path. The default is 110. Normally, it is not be changed unless you are creating multiple tunnel routes and want to prioritize routing by assigning different metrics.
- **NSAP Address**—Enter the destination NE or OSI router NSAP address.

Step 4 Click **OK**.

Step 5 Provision the other tunnel end point using the documentation provided by the manufacturer of the third party vendor NE.

Step 6 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 2-25](#) 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](#)):

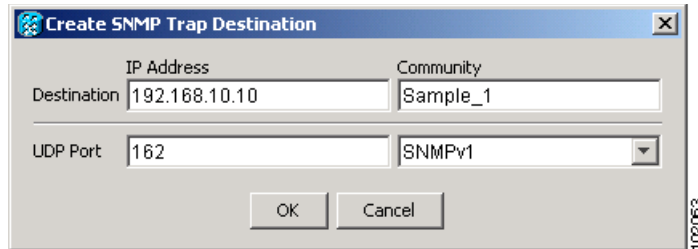
- **Destination IP Address**—Type the IP address of your network management system (NMS). If the node you are logged into is an ENE, set the destination address to the GNE.
- **Community**—Type the SNMP community name. For a description of SNMP community names, refer to the *Cisco ONS 15454 Troubleshooting 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 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 which version to use.

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 and 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, you can set up to three relays that send SNMP trap error counts back to NE for each trap destination address:
- Click the first trap destination IP address. The address and its community name appear in the Destination fields.
 - 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 3-3
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 2-25](#) 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 shortcut 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 shortcut 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 shortcut menu items, submenu items, and the card groups and menu options/cards that they reference.

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

Table 3-3 *CTC Add Card Menu for DWDM Cards (continued)*

Category	Option	Card
MD	32 DMX	32DMX
	32 DMXO	32DMX-O
	32 MUXO	32MUX-O
	32 WSS	32WSS
	4MD	4MD-xx.x
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, and 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 1-72 NTP-G14 Install DWDM Equipment, page 1-67 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
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**

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**

Complies with the US Federal Drug Administration Code of Federal Regulations Title 21, Sections 1040.10 and 1040.11, except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.

**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 NE default settings to be installed on the node, complete the “[NTP-G136 Import Network Element Defaults](#)” procedure on page 13-42. 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 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 might 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-xx.x or AD-xB-xx.x 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-xx.x or AD-xB-xx.x cards, CTC considers the node a terminal node. For more information, refer to [Chapter 16, “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 3-41](#) 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 1-72 NTP-G14 Install DWDM Equipment, page 1-67 NTP-G30 Install the DWDM Cards, page 3-39 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

**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**

Complies with the US Federal Drug Administration Code of Federal Regulations Title 21, Sections 1040.10 and 1040.11, except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.

**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 TXP and 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 1-72 NTP-G14 Install DWDM Equipment, page 1-67 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
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

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

Complies with the US Federal Drug Administration Code of Federal Regulations Title 21, Sections 1040.10 and 1040.11, except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.



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.



Note If you install the wrong card in a slot, complete the [“NTP-G107 Remove and Replace DWDM Cards” procedure on page 12-1](#).

- 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.



Note Until a TXP or MXP is provisioned, the card is in the standby condition and the ACT/STBY LED remains amber in color.

- 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-factor Pluggable (SFP or XFP) connector, complete one of the following tasks:
- [DLP-G63 Install an SFP or XFP, page 3-45](#)—Complete this task to install the physical SFP or XFP into the TXP or MXP.
 - [DLP-G273 Preprovision an SFP or XFP Slot, page 3-46](#)—(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 5-6](#).

**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 3-47](#).

**Note**

You will provision the TXP and MXP cards after you complete all node turn-up procedures. TXP and MXP provisioning procedures are provided in [Chapter 5, “Provision Transponder and Muxponder Cards.”](#)

**Note**

Until a TXP or MXP is provisioned, the card is in the standby condition and the ACT/STBY LED remains amber in color.

Stop. You have completed this procedure.

DLP-G63 Install an SFP or XFP

Purpose	This task installs SFP/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 3-43 DLP-G273 Preprovision an SFP or XFP Slot , page 3-46
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

**Note**

SFPs and XFPs are generically called PPMs in CTC. After installing the SFP/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/XFP is correct for your network and TXP or MXP card (see [Table 16-69 on page 16-118](#)). Check that you are installing compatible SFP/XFPs, for example, SX to SX or LX/LH to LX/LH.

Step 2 Install the SFP/XFP:

- 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 the SFP/XFP into the slot and then slide it 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-G273 Preprovision an SFP or XFP Slot

Purpose	This procedure provisions SFP/XFPs, which connect fiber to TXP and MXP cards. SFP/XFPs are referred to as PPMs in CTC.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-25
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 area, 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 option.
- Step 5** Click **OK**. The newly created port appears in the Pluggable Port Modules pane. The row in 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 in the pane turns white and the Actual Equipment Type column shows the equipment name.
- Step 6** Verify that the PPM appears in the list in 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** Click **OK**.
- Step 9** 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 3-43
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 5-8](#).

-
- Step 1** If a fiber is connected, disconnect the network fiber cable from the Gigabit Interface Converter (GBIC) SC-type connector or the 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 3-39 NTP-G31 Install the DWDM Dispersion Compensating Units, page 3-41 NTP-G32 Install the Transponder and Muxponder Cards, page 3-43
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-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 3-39 NTP-G31 Install the DWDM Dispersion Compensating Units, page 3-41 (as applicable) NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

**Warning**

Class I (CDRH) and Class 1M (IEC) laser products. Statement 1055

**Note**

Complies with the US Federal Drug Administration Code of Federal Regulations Title 21, Sections 1040.10 and 1040.11, except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.

**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 3-9 shows an example.

Figure 3-9 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			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	4dB		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 that you are provisioning. The table identifies the patchcords that you must cable by their endpoints. Position 1 identifies the fiber start point; Position 2 indicates the fiber endpoint. The patchcord endpoints 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 that 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 13-25](#) 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 3-51](#). Otherwise, continue with [Step 6](#).
- Step 6** On the front of the fiber-storage tray (usually installed below the node you are fiberizing), 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 15-35 on page 15-37](#)).
- 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 3-54](#)
 - [DLP-G67 Install Fiber-Optic Cables for a Terminal Node, page 3-56](#)
 - [DLP-G68 Install Fiber-Optic Cables for a Line Amplifier Node, page 3-58](#)
 - [DLP-G69 Install Fiber-Optic Cables for an OSC Regeneration Node, page 3-60](#)
 - [DLP-G70 Install Fiber-Optic Cables for an Amplified or Passive OADM Node, page 3-63](#)
 - [DLP-G71 Install Fiber-Optic Cables for an ROADM Node, page 3-68](#)
- 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 13-25 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None


Note

If you will perform 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:

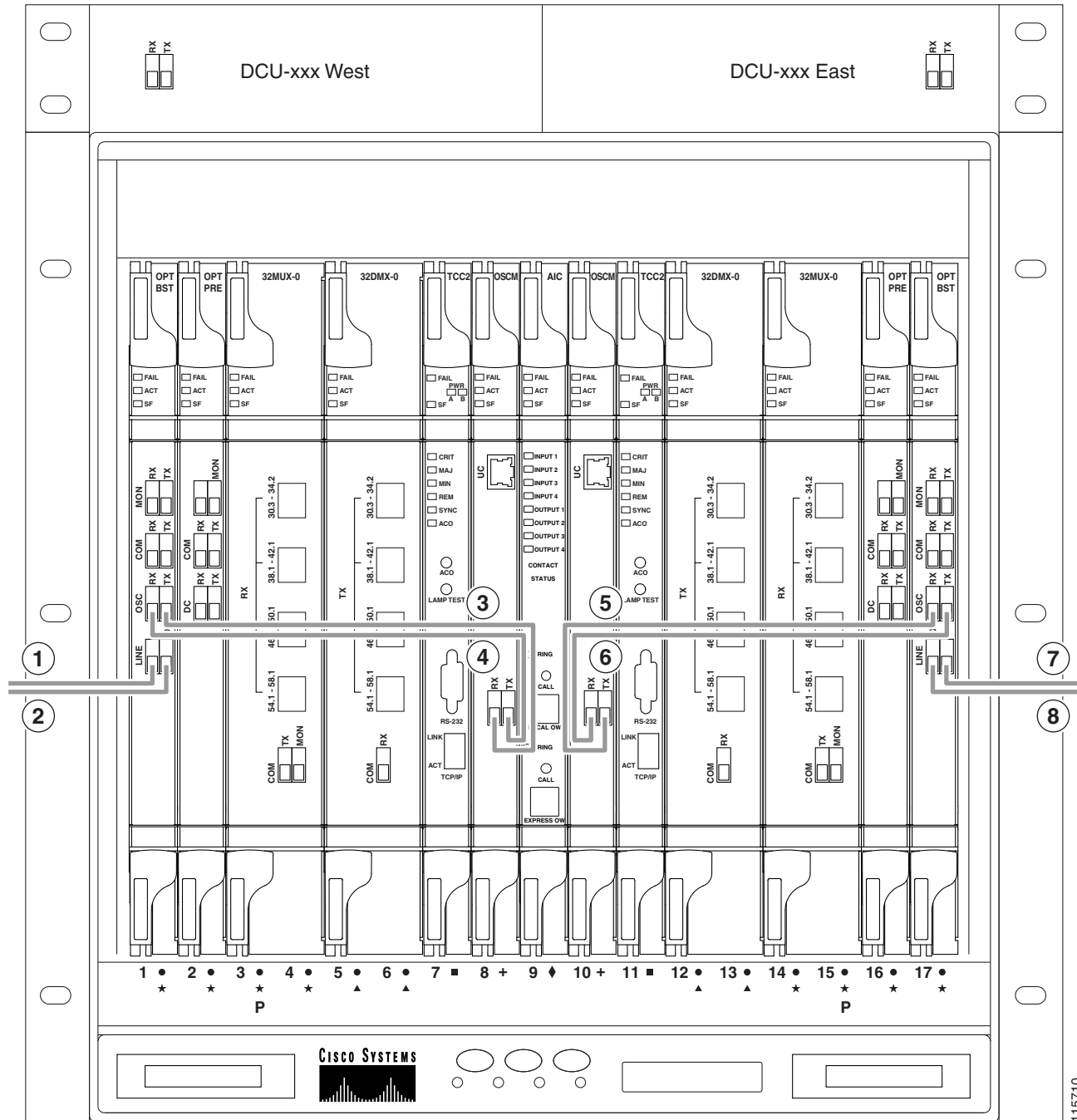
- The OPT-BST and the OSC-CSM are the only cards that directly interface with the line (span) fiber.
- The OSCM only carries optical service channels, not DWDM channels.
- The OSCM and the OSC-CSM cannot both be installed on the same side of the shelf (east or west). You can have different cards on each 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 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 3-10](#) 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 3-10 *Fibering OSC Terminations—Hub Node with OSCM Cards*



115710

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 15-35](#) on [page 15-37](#)).



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 that 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](#)” [procedure on page 3-84](#)) if 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 13-25 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
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

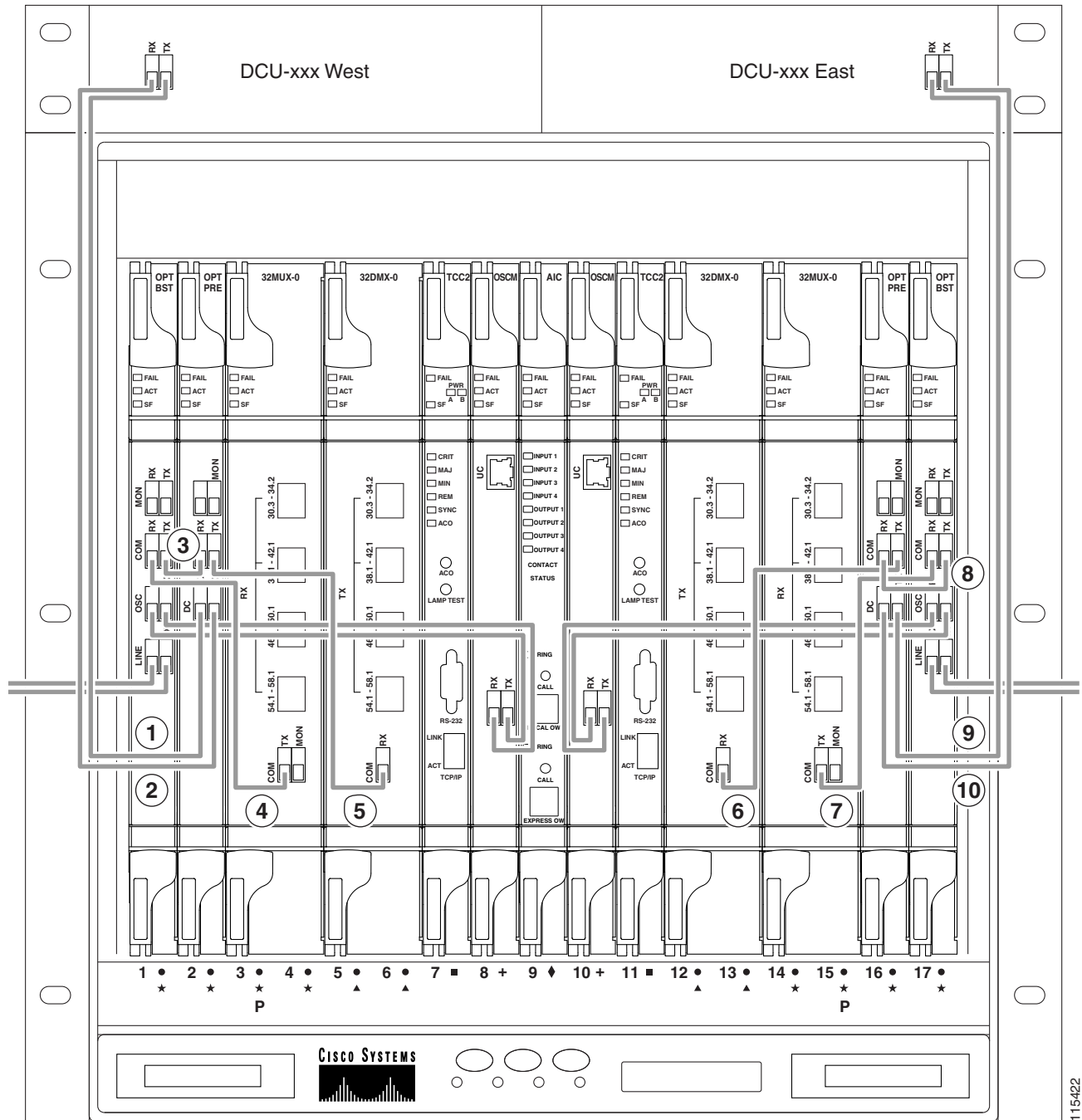
Refer to the Cisco MetroPlanner Internal Connections table (see [Table 3-1 on page 3-3](#)) for your site when completing connections. Before you begin hub node connections, read the following rules:

- 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 3-11](#) 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 3-11](#) is an example. Always install fiber-optic cables based on the Cisco MetroPlanner Internal Connections table for your site.

Figure 3-11 *Fibering a Hub Node*

115422

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 15-35 on page 15-37).
- Step 5** As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 15-38 on page 15-40).

**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 that 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](#)” procedure on page 3-84) if 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 2 through 7 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 13-25 NTP-G139 Verify Cisco MetroPlanner Reports and Files , page 3-3
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 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 15-35 on page 15-37](#)).

Step 5 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray ([Figure 15-38 on page 15-40](#)).

**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 that 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” procedure on page 3-84](#)) if 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 [2](#) through [7](#) 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 13-25 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
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:

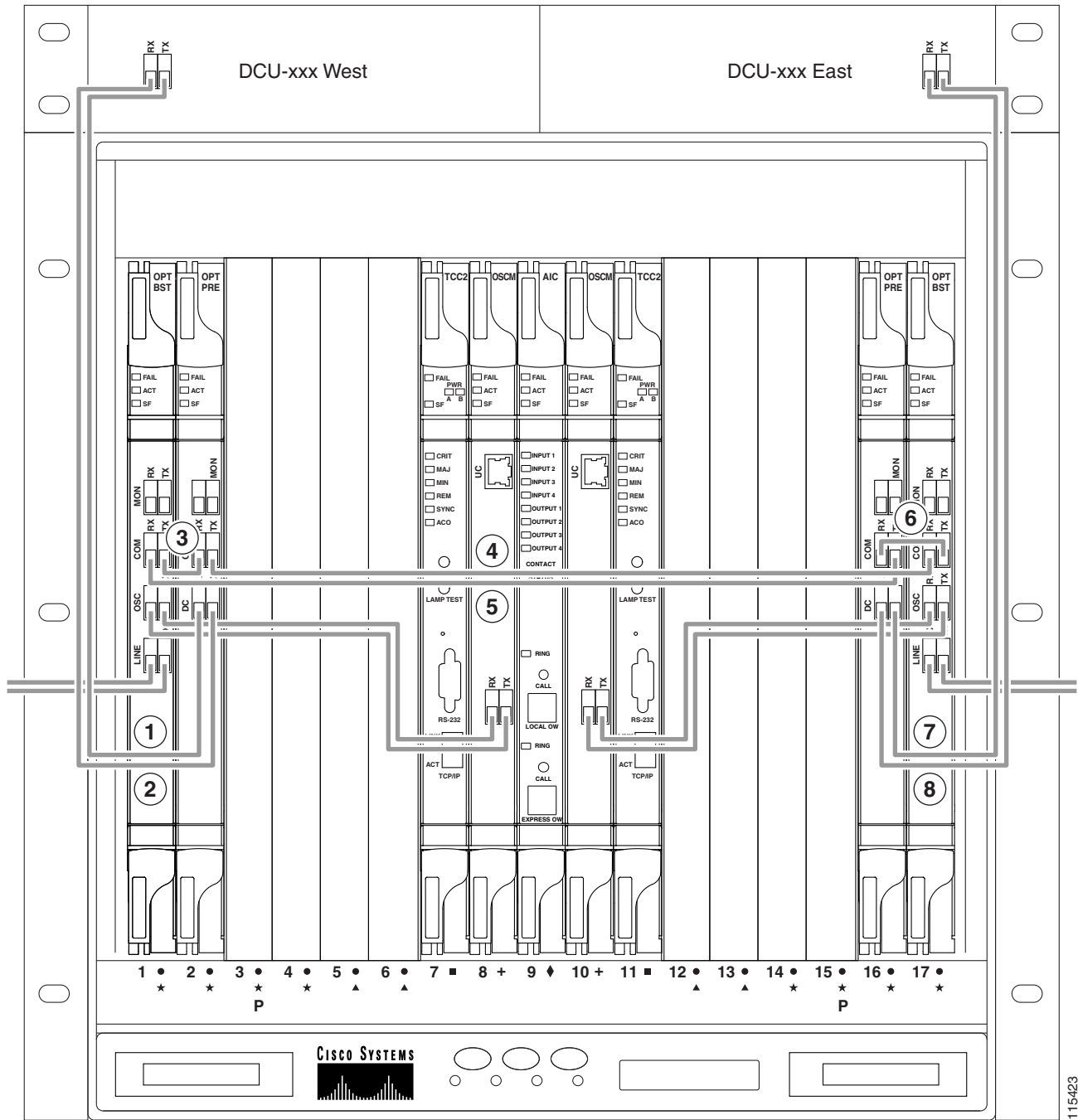
- Line amplifier node layout allows all combinations of OPT-PRE and OPT-BST and allows you to use asymmetrical card choices in west-to-east and east-to-west configurations. For a given line direction, you can configure the four following possibilities:
 - Only preamplification (OPT-PRE)
 - Only booster 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 3-12](#) shows an example of a line amplifier node with cabling.



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 Line Amplifier Node*

115423

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, +/- 1dB 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 15-35 on page 15-37).
- Step 5** As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray (Figure 15-38 on page 15-40).

**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 that 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](#)” procedure on page 3-84) if 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 2 through 7 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 13-25 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
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 and MXP cards.

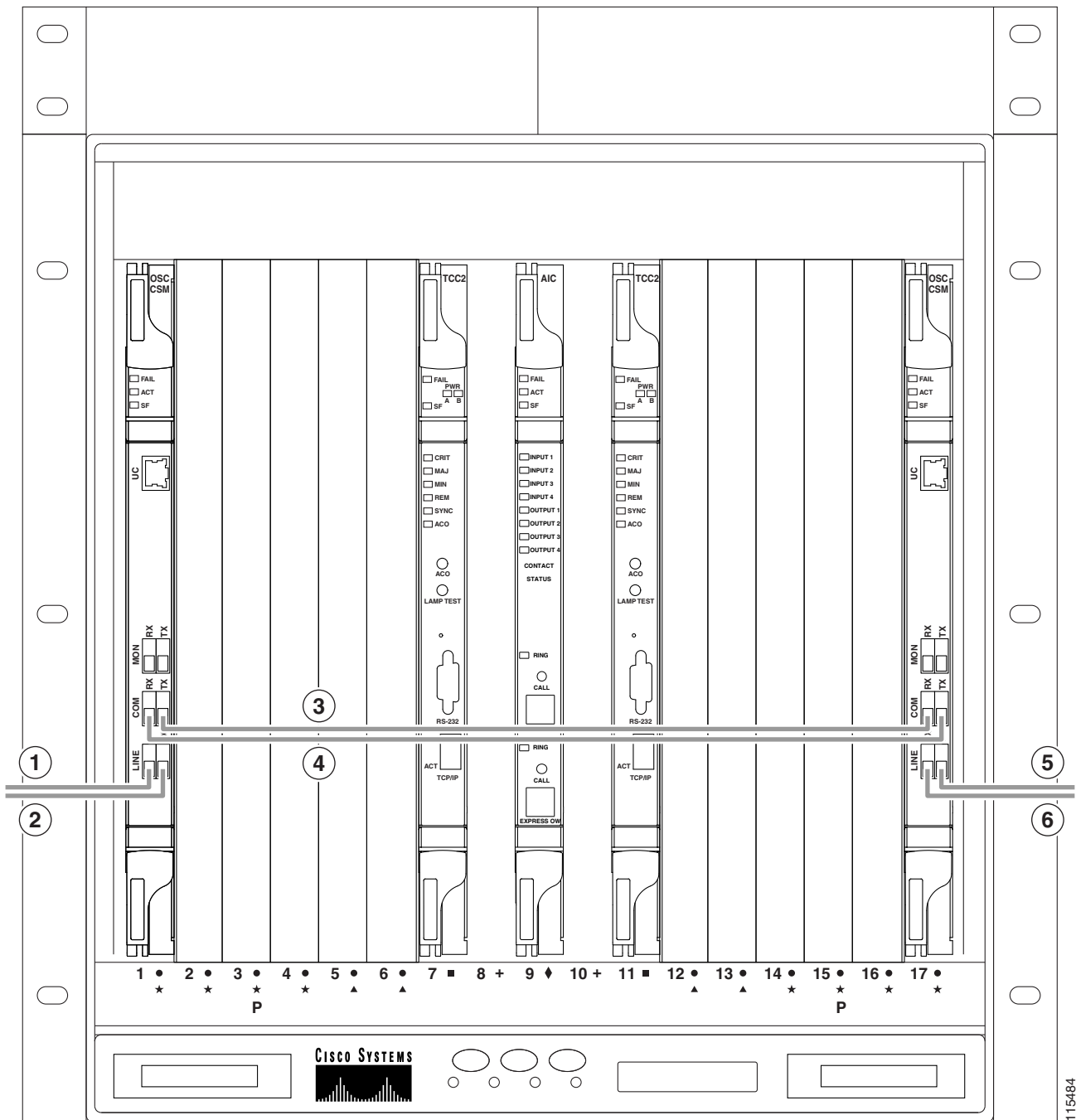
Figure 3-13 shows an example of an OSC regeneration node with cabling.



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 an OSC Regeneration Node*



115484

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 15-35 on page 15-37](#)).

Step 5 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray ([Figure 15-38 on page 15-40](#)).



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 that 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” procedure on page 3-84](#)) if 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 [2](#) through [7](#) 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 for installing 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 13-25 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
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-xx.x or AD-xB-xx.x 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-xx.x or AD-xB-xx.x cards that all belong to the west side (that is, they are daisy-chained).
 - The EXP port of the last AD-xC-xx.x or AD-xB-xx.x card on the west side is connected to the EXP port of the first AD-xC-xx.x or AD-xB-xx.x card on the east side.
 - The OPT-BST COM RX port is connected to the nearest (in slot position) AD-xC-xx.x or AD-xB-xx.x COM TX port.
 - The OPT-PRE COM TX port is connected to the nearest (in slot position) AD-xC-xx.x or AD-xB-xx.x 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-xx.x or AD-xB-xx.x card COM RX port is connected to the west OPT-PRE or OSC-CSM COM TX port.
- The first west AD-xC-xx.x or AD-xB-xx.x card COM TX port is connected to the west OPT-BST or OSC-CSM COM RX port.
- The first east AD-xC-xx.x or AD-xB-xx.x card COM RX port is connected to the east OPT-PRE or OSC-CSM COM TX port.
- The first east AD-xC-xx.x or AD-xB-xx.x 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-xx.x add/drop (RX or TX) ports are only connected to the following ports:
 - 4MD-xx.x COM TX or 4MD-xx.x COM RX ports
 - Another AD-xB-xx.x add/drop port (a pass-through configuration)
- An AD-xB-xx.x add/drop band port is only connected to a 4MD-xx.x 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-xx.x card.
- The AD-xB-xx.x and 4MD-xx.x 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:

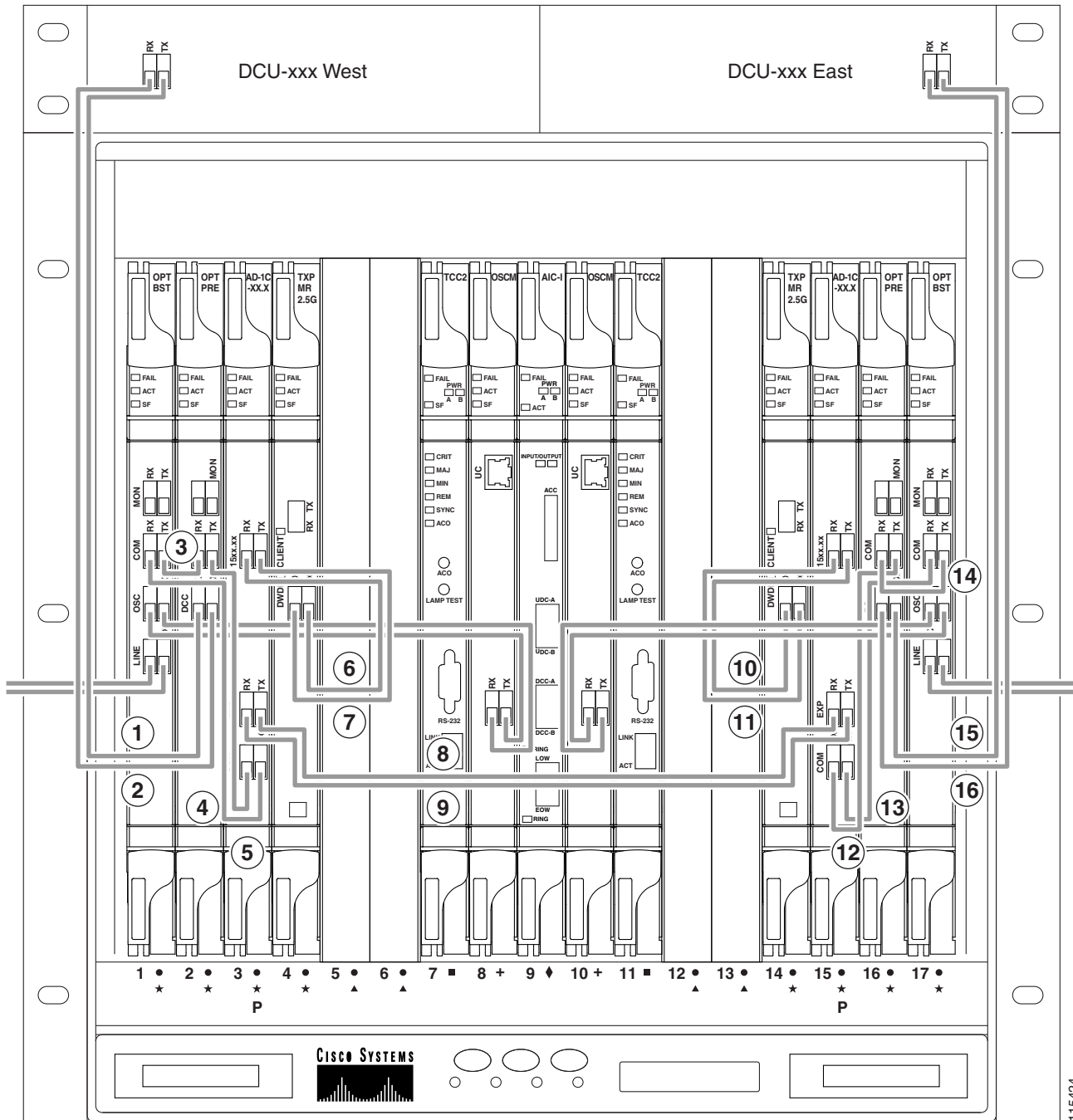
- Pass-through connections are only established between add and drop ports on the same band or channel and same line direction.
- Only connect AD-xC-xx.x or AD-xB-xx.x add/drop ports to other AD-xC-xx.x or AD-xB-xx.x add/drop ports (as pass-through configurations).
- An add (RX) port is only connected to a drop (TX) port.
- Only connect 4MD-xx.x client input/output ports to other 4MD-xx.x client input/output ports.
- A west AD-xB-xx.x drop (TX) port is connected to the corresponding west 4MD-xx.x COM RX port.
- A west AD-xB-xx.x add (RX) port is connected to the corresponding west 4MD-xx.x COM TX port.
- An east AD-xB-xx.x drop (TX) port is connected to the corresponding east 4MD-xx.x COM RX port.
- An east AD-xB-xx.x add (RX) port is connected to the corresponding east 4MD-xx.x COM TX port.

Figure 3-14 shows an example of an amplified OADM node with AD-1C-xx.x cards installed.



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 Amplified OADM Node*

115424

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

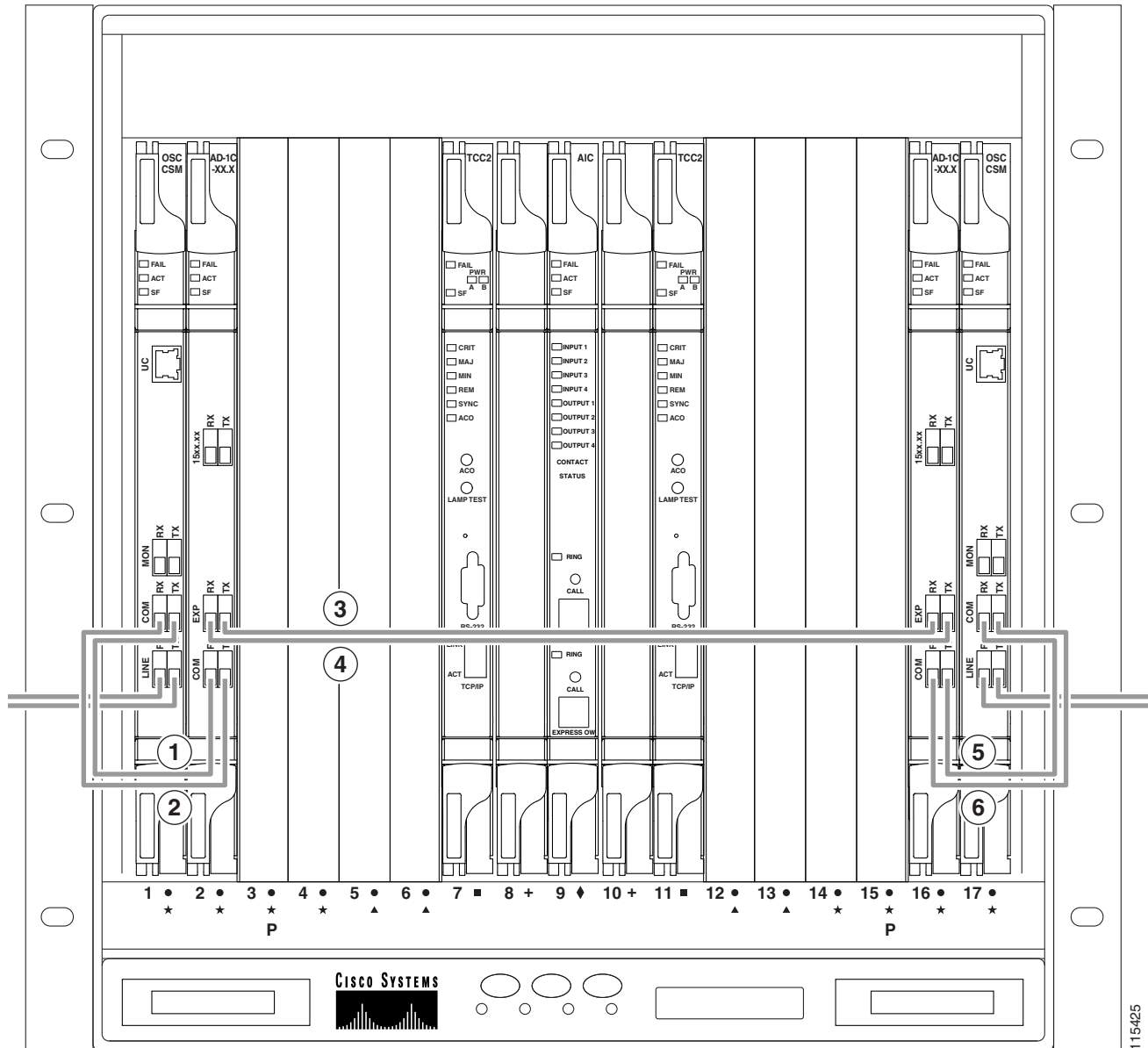
1. If a DCU is not installed, a 4-dB attenuator loop, +/- dB must be installed between the OPT-PRE DC ports.

Figure 3-15 shows an example of a passive OADM node with two 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 a Passive OADM Node*

115425

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 15-35 on page 15-37](#)).

Step 8 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray ([Figure 15-38 on page 15-40](#)).

**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 that 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](#)” [procedure on page 3-84](#)) if 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 [5](#) through [10](#) 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 for installing fiber-optic cables on an ROADM node in a DWDM shelf.
Tools	Fiber-optic cables
Prerequisite Procedures	NTP-G115 Clean Fiber Connectors, page 13-25 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
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:

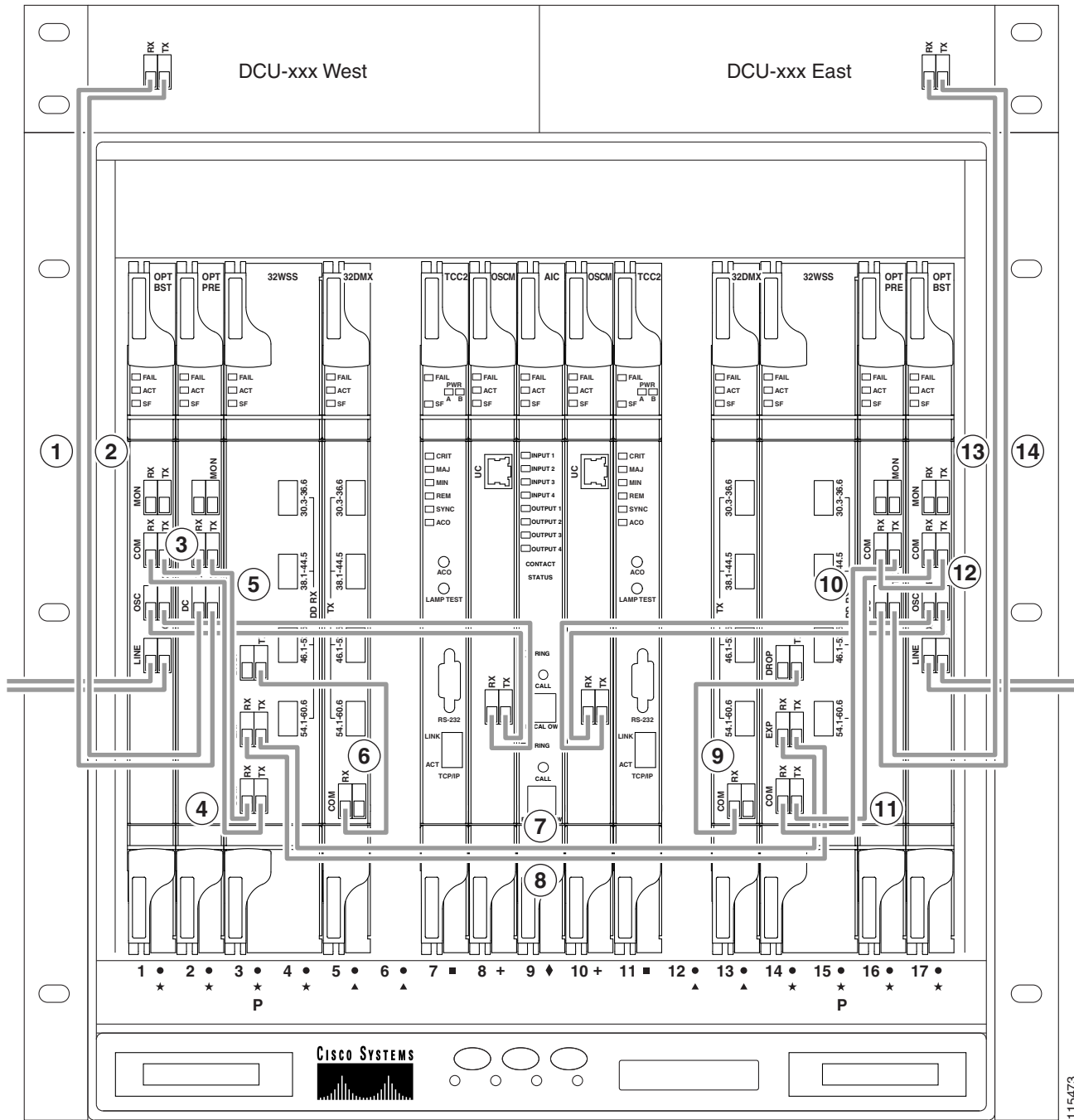
- The west OPT-BST or OSC-CSM COM TX port is connected to the west OPT-PRE COM RX port.
- The west OPT-PRE COM TX port is connected to the west 32WSS COM RX port.
- The west OPT-BST or OSC-CSM COM RX port is connected to the west 32WSS COM TX port.
- The west OPT-BST (if installed) OSC TX port is connected 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 3-16 shows an example of an amplified ROADM node with cabling.

**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 Fiberizing an ROADM Node



115473

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.

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 15-35 on page 15-37](#)).

Step 5 As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray ([Figure 15-38 on page 15-40](#)).



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 that 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.



Note

Cards display an SF LED after the OSC terminations are created (see the [“NTP-G38 Provision OSC Terminations” procedure on page 3-84](#)) if 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 [2](#) through [7](#) 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 from 32MUX-O, 32WSS, 32DMX-O, and 32DMX cards in a terminal, hub, or ROADM node to the patch panel, 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: • One 32DMX-O card • One 32MUX-O card • One patch panel • Eight MPO cables: fiber-optic cables, terminated on one end with one multifiber push-on (MPO) connector and on the other end with eight LC-type connectors Hub node: • Two 32DMX-O cards • Two 2MUX-O cards • Two patch panels • Sixteen MPO cables: fiber-optic cables, terminated on one end with one MPO connector and on the other end with eight LC-type connectors ROADM node: • Two 32WSS cards • Two 32DMX cards • Two patch panels • Sixteen MPO cables: fiber-optic cables, terminated on one end with one MPO connector and on the other end with eight LC-type connectors Fiber-optic cables, terminated with a single LC-type connector on each end
Prerequisite Procedures	DLP-G28 Install the Fiber Patch-Panel Tray, page 1-68 DLP-G29 Install the Fiber-Storage Tray, page 1-69 NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs, page 3-48
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 TXP/MXP 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 3-74](#)
 - [DLP-G316 Install Fiber-Optic Cables from a TXP/MXP Node to the Patch Panel, page 3-78](#)
- 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 from 32MUX-O, 32WSS, 32DMX-O, and 32DMX cards in a terminal, hub, or ROADM node to the patch panel.
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: • One 32DMX-O card • One 32MUX-O card • One Patch panel • Eight MPO cables: fiber-optic cables, terminated on one end with one multifiber push-on (MPO) connector and on the other end with eight LC-type connectors Hub node: • Two 32DMX-O cards • Two 32MUX-O cards • Two patch panels • Sixteen MPO cables: fiber-optic cables, terminated on one end with one multifiber push-on (MPO) connector and on the other end with eight LC-type connectors ROADM node: • Two 32WSS cards • Two 32DMX cards • Two patch panels • Sixteen MPO cables: fiber-optic cables, terminated on one end with one multifiber push-on (MPO) connector and on the other end with eight LC-type connectors
Prerequisite Procedures	NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs, page 3-48
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

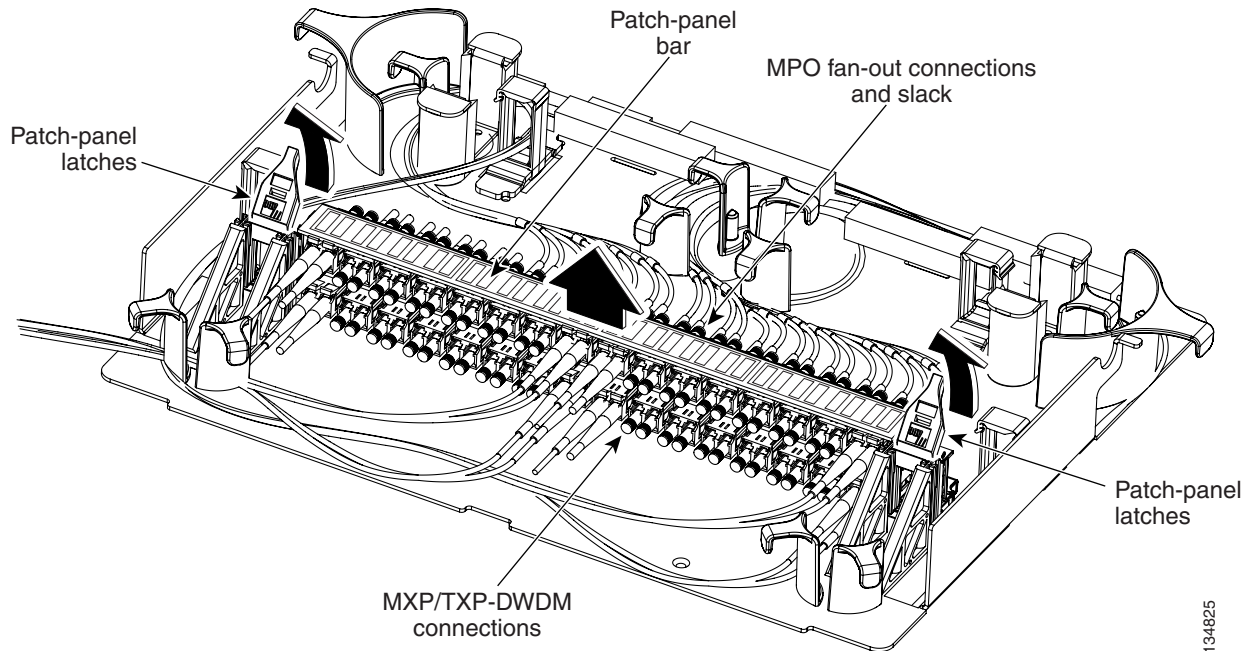

Note

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.

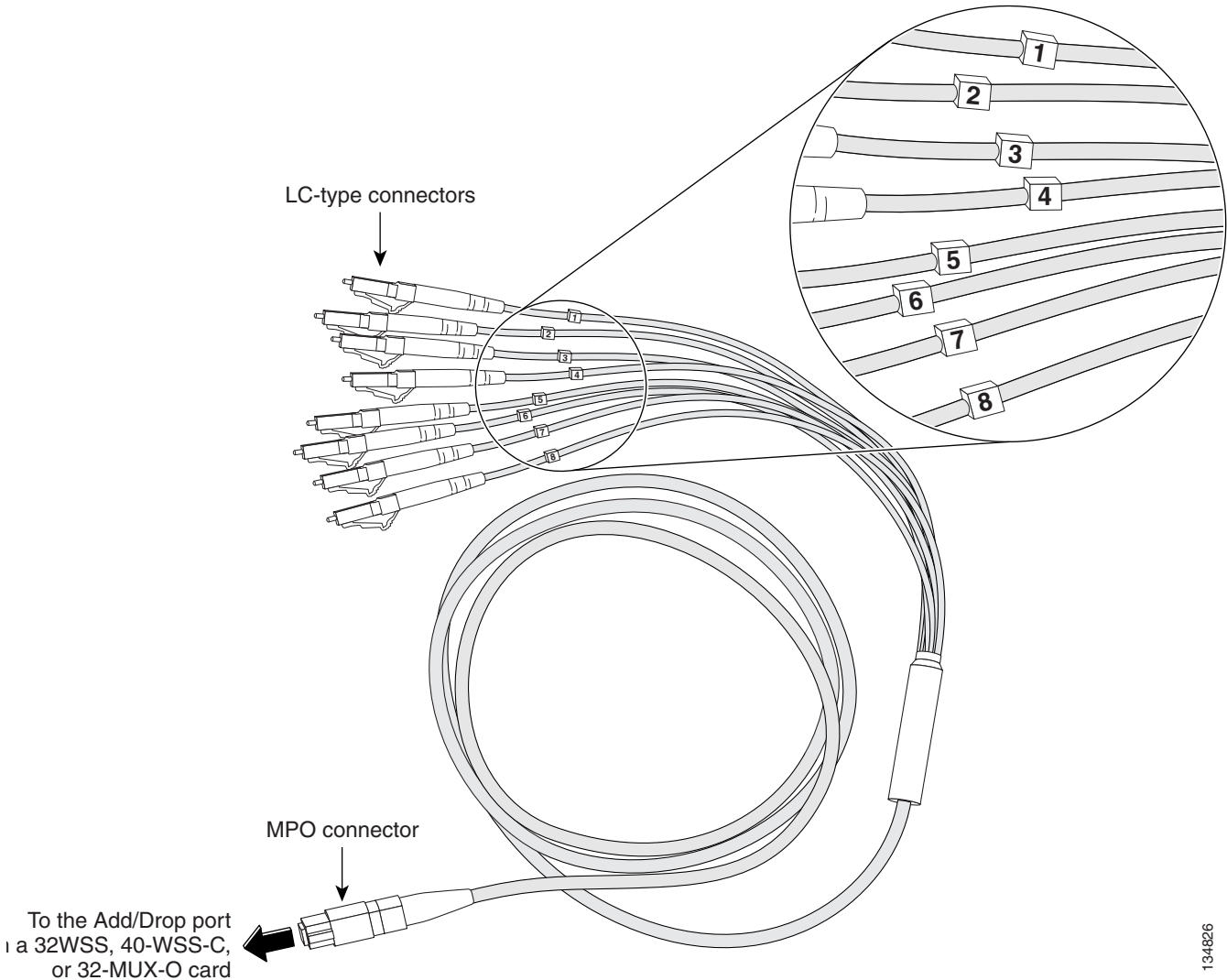
- Step 4** Choose either the east or west side of the shelf to cable the 32MUX-O and 32DMX-O cards (or the 32WSS and 32DMX cards for an ROADM node).

- 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 3-17).

Figure 3-17 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 3-18) into the top Add RX (30.3–36.6) port of the card. If you are connecting to the next MPO cable, plug it into the MPO connector below the previous MPO cable.

Figure 3-18 MPO Cable

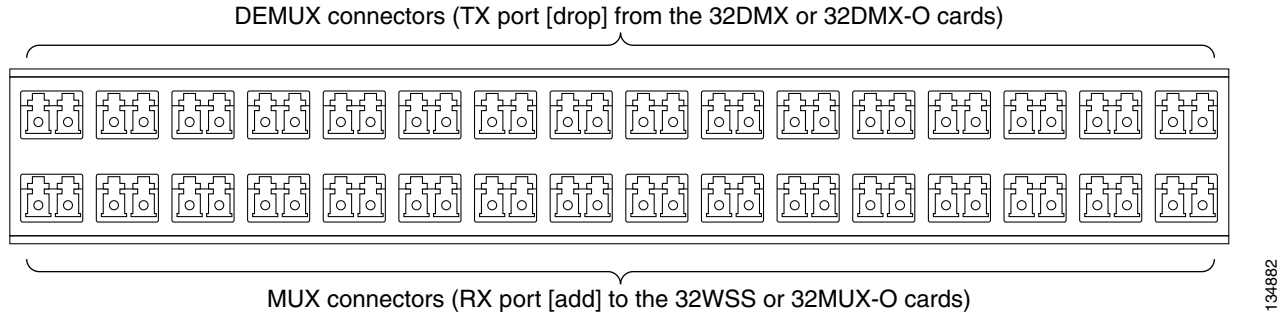
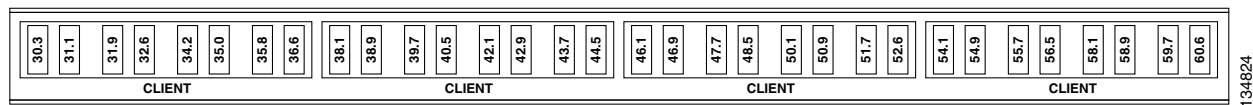
Step 7 Route the MPO cable slack through the patch-panel tray as necessary.

**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 that 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 3-19 shows the patch-panel connectors from the rear of the patch-panel tray. Figure 3-20 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 wavelength on the ITU grid.

Figure 3-19 Rear View of the Patch Panel**Figure 3-20 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 (30.3 -36.6) port 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 that 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 5 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 3-48
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

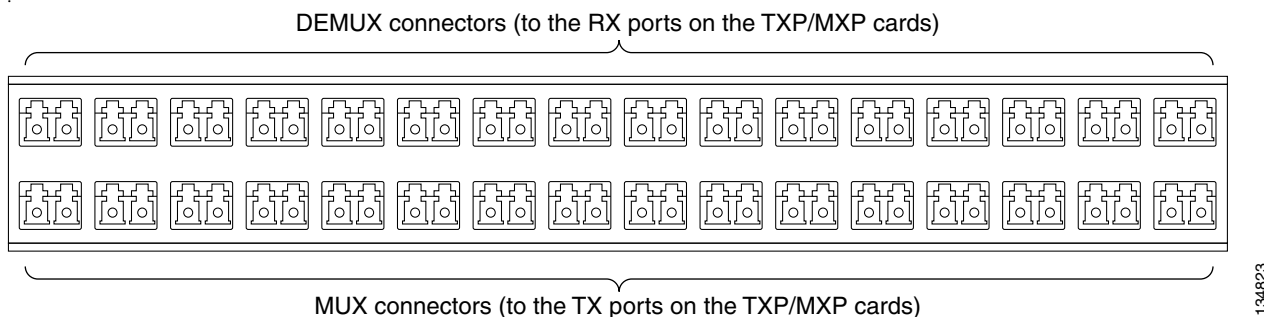
- Step 1** At the appropriate TXP/MXP card, plug a fiber-optic cable into the TX port of the DWDM connector.
- Step 2** As needed, route slack fiber-optic cable around the round cable retainers in the fiber-storage tray ([Figure 15-38 on page 15-40](#)).


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 that 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 3-20 on page 3-77](#) for a view of the wavelengths assigned to the patch-panel connectors). [Figure 3-21](#) shows the patch-panel connectors from the front of the patch-panel tray.

Figure 3-21 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 that 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 1-71 NTP-G32 Install the Transponder and Muxponder Cards, page 3-43
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None


Note

See the [“15.4 FlexLayer and Y-Cable Protection” section on page 15-9](#) for more information about Y-cable protection.

Step 1

Install fiber-optic cables between the TXP/MXP cards and the Y-cable module, and between the client device(s) and the 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 the TXP/MXP cards ([Figure 15-38 on page 15-40](#)).


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 that adequate cable slack remains.

To protect one client signal, connect the fiber-optic cables according to either [Table 3-4](#) or [Table 3-5](#). To protect two client signals using a single Y-cable module, connect the cables according to both [Table 3-4](#) and [Table 3-5](#).

Table 3-4 Cable Connections for Y-Cable Protection of First 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
TXP/MXP 2TX port	6
TXP/MXP 2RX port	7

Table 3-5 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 3-3
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

Step 1 Complete the “[DLP-G46 Log into CTC](#)” task on [page 2-25](#) 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 preprovisioned, CTC calculates the intra-shelf patchcords that are expected to be installed. If the cards are not compatible or are 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 3-39.
- 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 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 3-81 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 3-82.



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 2-25
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 2-25
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 3-3
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 you 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 2-25](#) at the node where you want to import the file. If you are already logged in, continue with [Step 2](#).
- 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 appears.
- 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.
- Step 5** Click **OK**.
- Step 6** Click **OK** on the import confirmation dialog box.

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, then click **Apply**.

Stop. You have completed this procedure.

NTP-G37 Run Automatic Node Setup

Purpose	This procedure runs the CTC DWDM ANS function. ANS adjusts the values of the variable optical attenuators (VOAs) 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 3-80 NTP-G138 Import a Cisco MetroPlanner Configuration File, page 3-82 NTP-G139 Verify Cisco MetroPlanner Reports and Files, page 3-3
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

- Step 1** Complete the “[DLP-G46 Log into CTC](#)” task on page 2-25 at the node where you want to run ANS. 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** tabs.
- 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 3-80 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.

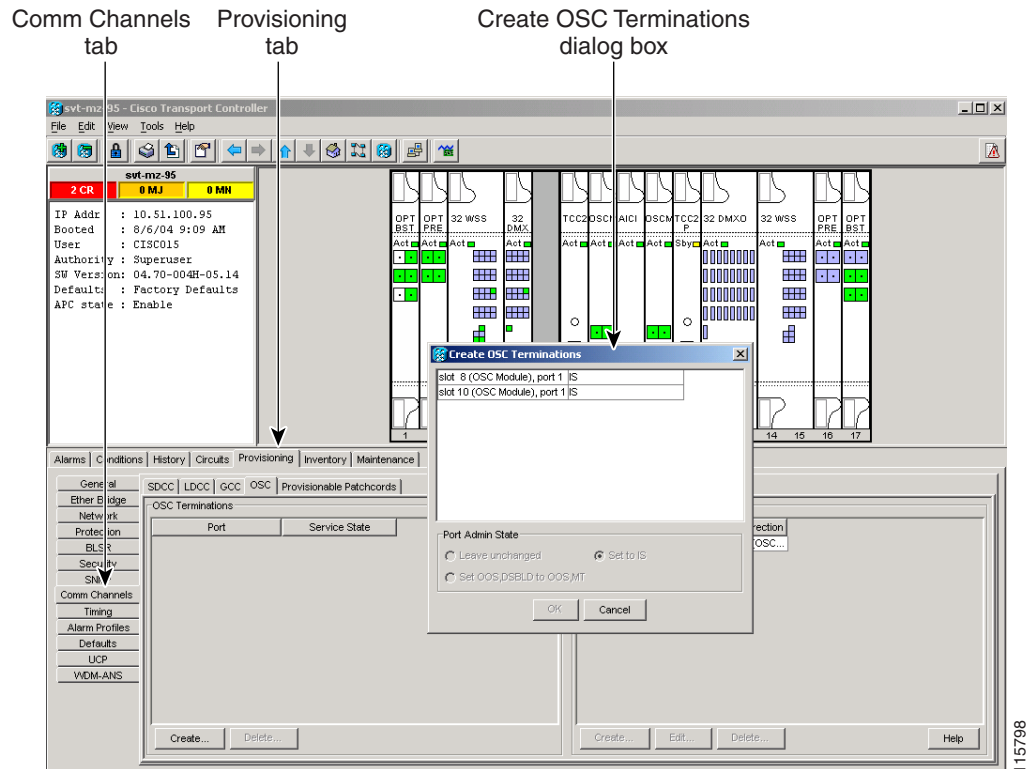
- **Fail - Port in IS State**—The parameter could not be calculated because the port is in service. This status should normally not appear at this point in node turn-up. If it does, display the card in card view, change the port administrative state to OOS,DSL B (ANSI) or Locked,disabled (ETSI), and repeat Steps 6 through 11.

Stop. You have completed this procedure.

NTP-G38 Provision OSC Terminations

Purpose	This procedure provisions the OSC terminations.
Tools/Equipment	None
Prerequisite Procedures	NTP-G138 Import a Cisco MetroPlanner Configuration File , page 3-82
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

-
- Step 1** Complete the “[DLP-G46 Log into CTC](#)” task on page 2-25 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 area, click **Create** ([Figure 3-22](#)).

Figure 3-22 OSC Terminations Area

- 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). Click **OK**.



Note OSC on the DWDM node uses a separate OC3/STM1 channel to transport the SDCC, which is used for ONS 15454 DCC terminations.

- Step 5** In the Layer 3 area, perform one of the following:
- Check only the IP box if the LDCC is between the ONS 15454 and another ONS node, and only ONS nodes reside on the network. The LDCC will use Point-to-Point Protocol (PPP).
 - Check both the IP and OSI boxes if the LDCC is between the ONS 15454 and another ONS node, and third party NEs that use the OSI protocol stack are on the same network. The LDCC will use PPP.
- Step 6** If you checked OSI, complete the following steps. If you checked only IP, continue with [Step 7](#).
- a. Click **Next**.
 - b. Provision the following fields:
 - Router—Choose the OSI router.
 - ESH—Set the ESH propagation frequency. End system NEs transmit ESHs to inform other ESs and ISs about the NSAPs they serve. The default is 10 seconds. The range is 10 to 1000 seconds.
 - ISH—Sets the ISH PDU propagation frequency. Intermediate system NEs send ISHs to other ESs and ISs to inform them about the IS NETs it serves. The default is 10 seconds. The range is 10 to 1000 seconds.

- **IIH**—Sets the IIH PDU propagation frequency. The IS-IS Hello PDUs establish and maintain adjacencies between ISs. The default is 3 seconds. The range is 1 to 600 seconds.
- **Metric**—Sets the cost for sending packets on the LAN subnet. The IS-IS protocol uses the cost to calculate the shortest routing path. The default metric cost for LAN subnets is 20. It normally should not be changed.

Step 7 Click **Finish**. 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.

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 OSCM and the OSC-CSM cards.
Tools/Equipment	None
Prerequisite Procedures	NTP-G37 Run Automatic Node Setup, page 3-83
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Superuser

- Step 1** Complete the “[DLP-G46 Log into CTC](#)” task on [page 2-25](#) 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** From the ALS Mode drop-down list, choose **Disable**. 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 3-87](#)
 - [DLP-G314 Verify OSCM Transmit Power, page 3-89](#)
- 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 6 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 2-25
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:
- In the Selector window on the left, expand the East Side parameters tree view.
 - Expand the RX category.
 - Expand the Amplifier category, then highlight **Working Mode**.
 - Record the EastSide.Rx.Amplifier.Working Mode parameter displayed in the right pane.
- For OSC-CSM cards installed on the west side:
- In the Selector window on the left, expand the West Side parameters tree view.
 - Expand the RX category.
 - Expand the Amplifier category, then highlight **Working Mode**.
 - Record the WestSide.Rx.Amplifier.Working Mode parameter displayed in the right 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 $-1.5 \text{ dBm} \pm 0.5 \text{ dBm}$. If so, continue with [Step 9](#). If not, complete the following steps:
- 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**.
 - Delete the two OSC channels using the [“DLP-G186 Delete an OSC Termination” task on page 10-41](#).
 - Complete the [“NTP-G37 Run Automatic Node Setup” procedure on page 3-83](#).

- d. Create the OSC channels using the “[NTP-G38 Provision OSC Terminations](#)” procedure on [page 3-84](#).
- e. Repeat Steps 3 through 6. 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. Complete the following steps to obtain the east and west add/drop power values:

- a. If an OSC-CSM card 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 in the right pane.
- e. If an OSC-CSM card is not installed on the west side, continue with Step 8. If an OSC-CSM card 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 in the right 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 (+/– 0.5 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 13-25](#).
- c. Delete the two OSC channels using the “[DLP-G186 Delete an OSC Termination](#)” task on [page 10-41](#).
- d. Complete the “[NTP-G37 Run Automatic Node Setup](#)” procedure on [page 3-83](#).
- e. Create the OSC channels using the “[NTP-G38 Provision OSC Terminations](#)” procedure on [page 3-84](#).
- 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 (NTP).

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 2-25
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 $-5 \text{ dBm} \pm 0.5 \text{ dBm}$. 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:
- In the Selector window on the left, expand the East Side parameters tree view.
 - Expand the RX category.
 - Expand the Amplifier category, then highlight **Working Mode**.
 - Record the EastSide.Rx.Amplifier.Working Mode parameter displayed in the right pane.
- For OCSM cards installed on the west side:
- In the Selector window on the left, expand the West Side parameters tree view.
 - Expand the RX category.
 - Expand the Amplifier category, then highlight **Working Mode**.
 - Record the WestSide.Rx.Amplifier.Working Mode parameter displayed in the right 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 $-5 \text{ dBm} \pm 0.5 \text{ dBm}$. If the value recorded in [Step 5](#) is Control Power, verify that the value recorded in [Step 3](#) is equal to $0.5 \text{ dBm} \pm 0.5 \text{ dBm}$. If the power level is not within this range, complete the following steps. Otherwise, continue with [Step 7](#).
- 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**.
 - Clean the optical connections. See the [“NTP-G115 Clean Fiber Connectors” procedure on page 13-25](#).
 - Complete the following procedures:
 - Delete the two OSC channels using the [“DLP-G186 Delete an OSC Termination” task on page 10-41](#).
 - Complete the [“NTP-G37 Run Automatic Node Setup” procedure on page 3-83](#).

- Create the OSC channels using the “[NTP-G38 Provision OSC Terminations](#)” procedure on [page 3-84](#).
- d. Repeat Steps 3 through 6. If the power level is still not within the specified range, contact your next level of support.

Step 7 Return to your originating procedure (NTP).
