



Add and Remove Cards and Nodes

This chapter provides procedures for adding and removing dense wavelength division multiplexing (DWDM) cards and nodes.



Note

Unless otherwise specified, “ONS 15454” refers to both ANSI and ETSI shelf assemblies.

Before You Begin

Before performing any of the following procedures, investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 SONET and DWDM Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* as necessary for general troubleshooting information and alarm or error descriptions.

This section lists the chapter procedures (NTPs). Turn to a procedure to view its tasks (DLPs).

1. [NTP-G107 Remove and Replace DWDM Cards, page 12-1](#)—Complete as needed.
2. [NTP-G127 Add an AD-xC-xx.x Card to an OADM Node, page 12-5](#)—Complete as needed.
3. [NTP-G129 Add a DWDM Node, page 12-7](#)—Complete as needed.
4. [NTP-G130 Remove a DWDM Node, page 12-9](#)—Complete as needed.

NTP-G107 Remove and Replace DWDM Cards

Purpose	This procedure removes and replaces DWDM cards installed in the ONS 15454 shelf and rack.
Tools/Equipment	None
Prerequisite Procedures	A card installation procedure
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher



Caution

Removing and replacing cards can be traffic affecting.

**Caution**

Do not use this procedure to replace a TCC2 or TCC2P card. To replace a TCC2/TCC2P card, refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 1 Complete the “[DLP-G46 Log into CTC](#)” task on page 2-25.

**Note**

If you cannot log into Cisco Transport Controller (CTC) and you need to remove a card, remove the card as described in [Step 5](#). After you log into CTC, troubleshoot the mismatched equipment alarm (MEA) with the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide*.

Step 2 Click the **Alarms** tab.

- a. Verify that the alarm filter is not on. See the “[DLP-G128 Disable Alarm Filtering](#)” task on page 8-28 as necessary.
- b. Verify that no unexplained alarms appear on the network. If alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Step 3 Complete the following tasks, as needed:

- If the card carries unprotected circuits, you must delete them. Complete the “[DLP-G106 Delete Optical Channel Network Connections](#)” task on page 7-12.
- If the card you want to replace is an active transponder (TXP) or muxponder (MXP) in a Y-cable protection group, complete the “[DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch](#)” task on page 10-35 to force traffic away from the TXP or MXP that you will remove. If the card you want to replace is the standby TXP or MXP in a Y-cable protection group, complete the “[DLP-G182 Apply a Lockout](#)” task on page 10-37 to prevent traffic from switching to the TXP or MXP that you will remove.
- If the card is used as a node timing reference, complete the “[NTP-G112 Change the Node Timing Reference](#)” procedure on page 13-17.
- If the card is an OSCM or OSC-CSM with an optical service channel (OSC) or any TXP, MXP cards with generic communications channel (GCC) termination, complete the “[NTP-G85 Modify or Delete OSC Terminations, GCC Terminations, and Provisionable Patchcords](#)” procedure on page 10-39.

**Note**

If you delete a card in CTC but do not remove it from the shelf, it will reboot and reappear in CTC.

Step 4 Complete the “[DLP-G254 Place OPT-BST and OPT-PRE Ports Out of Service](#)” task on page 12-3.

Step 5 Physically remove the card:

- a. Disconnect any cables.
- b. Open the card latches/ejectors.
- c. Use the latches/ejectors to pull the card forward and away from the shelf.

Step 6 Insert the new card using one of the following procedures as applicable:

- [NTP-G30 Install the DWDM Cards](#), page 3-39
- [NTP-G32 Install the Transponder and Muxponder Cards](#), page 3-43

- Step 7** Continue with the “[NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs](#)” procedure on [page 3-48](#).
- Step 8** Complete the following tasks or procedures, as needed:
- If you switched a Y-cable protection group in [Step 3](#), complete the “[DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch](#)” task on [page 10-36](#).
 - If you deleted circuits in [Step 3](#), complete the “[DLP-G105 Provision DWDM Optical Channel Network Connections](#)” task on [page 7-10](#).
 - If you switched the timing reference in [Step 3](#), complete the “[NTP-G112 Change the Node Timing Reference](#)” procedure on [page 13-17](#).
 - If you deleted an OSC or GCC termination in [Step 3](#), complete the “[NTP-G38 Provision OSC Terminations](#)” procedure on [page 3-84](#) or the “[DLP-G76 Provision GCC Terminations](#)” task on [page 7-14](#).
 - If you placed OPT-PRE or OPT-BST cards out of service, complete the “[DLP-G318 Place OPT-BST and OPT-PRE Ports In Service](#)” task on [page 12-4](#).
- Step 9** Click the **Alarms** tab.
- a. Verify that the alarm filter is not on. See the “[DLP-G128 Disable Alarm Filtering](#)” task on [page 8-28](#) as necessary.
 - b. Verify that no unexplained alarms appear on the network. If alarms appear, investigate and resolve them. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.

Stop. You have completed this procedure.

DLP-G254 Place OPT-BST and OPT-PRE Ports Out of Service

Purpose	This task places OPT-BST and OPT-PRE card ports out of service in preparation for card removal.
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** On the shelf graphic in CTC, double-click the OPT-BST or OPT-PRE card with the ports that you want to put out of service.
- Step 2** Click the **Provisioning > Optical Line > Parameters** tabs.
- Step 3** Under Admin State, choose **OOS,DSBLD (ANSI)** or **Locked,disabled (ETSI)** for each port that does not have an OOS-MA,DSBLD or Locked-disabled service state.
- Step 4** Click **Apply**.
- Step 5** In the confirmation dialog box, click **Yes**.
- Step 6** Click the **Provisioning > Opt Apli Line > Parameters** tabs.

- Step 7** Under Admin State, choose **OOS,DSBLD** or **Locked,disabled** (ETSI) for each port that does not have an OOS-MA,DSBLD or Locked,disabled service state.
- Step 8** Click **Apply**.
- Step 9** In the confirmation dialog box, click **Yes**.
- Step 10** Return to your originating procedure (NTP).
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DLP-G318 Place OPT-BST and OPT-PRE Ports In Service

Purpose	This task places OPT-BST and OPT-PRE card ports in service.
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** On the shelf graphic in CTC, double-click the OPT-BST or OPT-PRE card with the ports that you want to put in service.
- Step 2** Click the **Provisioning > Optical Line > Parameters** tabs.
- Step 3** Under Admin State, choose choose **IS** (ANSI) or **Unlocked** (ETSI) for Port 1 of the OPT-PRE or Ports 2 and 3 of the OPT-BST.
- Step 4** Click **Apply**.
- Step 5** In the confirmation dialog box, click **Yes**.
- Step 6** Return to your originating procedure (NTP).
-

NTP-G127 Add an AD-xC-xx.x Card to an OADM Node

Purpose	This procedure adds an AD-xC-xx.x card to an optical add/drop multiplexing (OADM) node.
Tools/Equipment	None
Prerequisite Procedures	Chapter 3, “Turn Up a Node” A Cisco MetroPlanner OADM site plan recalculated for the new OADM card
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher


Note

Do not begin this procedure until the Cisco MetroPlanner site plan has been recalculated with the new AD-xCxx.x card added to the OADM node.


Note

During this procedure, you will use TL1 commands to delete and recreate optical channel network connection (OCHNC) cross-connects. You might need to refer to the *Cisco ONS SONET TL1 Command Guide* or the *Cisco ONS 15454 SDH TL1 Command Guide*


Caution

This procedure will affect the service of unprotected circuits that pass through the OADM node.

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- Step 1** Complete the “[DLP-G46 Log into CTC](#)” task on page 2-25 at a node on the OADM network.
- Step 2** In node view, display the OADM node where you will add the card.
- Step 3** Click the **Circuits** tab.
- Step 4** Make a list of all OCHNCs that are carried on the express path for both east-to-west (E > W) and west-to-east (W > E) directions.
- Step 5** For OCHNCs identified in [Step 4](#) that are routed on the active path of a splitter or Y-cable protection group, force the traffic to the protect path in the opposite side of the ring using the “[DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch](#)” task on page 10-35.
- Step 6** Click the **Circuits** tab.
- Step 7** Complete the following steps for all OCHNCs carried on the express path that were identified in [Step 4](#):
- Choose the OCHNC circuit(s) and click **Edit**. (To choose multiple circuits, press the Shift key while you click the circuits.)
 - In the Edit Circuit dialog box, click the **State** tab.
 - In the Target Circuit Admin State drop-down list, choose **OOS,DSBLD (ANSI)** or **Locked,disabled (ETSI)**.
 - Click **Apply**.
 - Repeat Steps [a](#) through [d](#) for each OCHNC circuit.
- Step 8** From the Tools menu, choose **Open TL1 Session**.

- Step 9** In the Select Node dialog box, choose the OADM node where you will add the AD-xCxx.x card and click **OK**.
- Step 10** In the TL1 dialog box, use the **DLT-WLEN** command to delete the OCHNC cross-connects for the express path OCHNCs listed in [Step 4](#), as follows:
- ```
DLT-WLEN:[<TID>]:<AID>:<CTAG>[:::CMDMDE=<CMDMDE>];
```
- where:
- <AID> is the wavelength AID per ring direction from the wavelength (WLEN) section.
  - <CMDMDE> indicates the command execution mode.
- For additional information, including valid command values, refer to the *Cisco ONS SONET TL1 Command Guide* or the *Cisco ONS 15454 SDH TL1 Command Guide*.
- Step 11** Close the TL1 session.
- Step 12** In node view, click the **Provisioning > WDM-ANS > Connections** tabs.
- Step 13** Highlight the two express connections that carry the circuits passing through the node. (The express connections are the only ones connecting an EXP\_TX port on the last west-side OADM card, W > E, with an EXP\_RX port on the first east-side OADM card, W > E.)
- Step 14** Click **Delete**.
- Step 15** Remove the physical express cables between the EXP\_TX and EXP\_RX ports specified in [Step 13](#).
- Step 16** Insert the new AD-xCxx.x card in the slot identified by your Cisco MetroPlanner site plan.
- Step 17** Complete the “[NTP-G34 Install Fiber-Optic Cables on DWDM Cards and DCUs](#)” procedure on [page 3-48](#) for the OADM node, following the new internal connections table generated by Cisco MetroPlanner.
- Step 18** Complete the “[NTP-G36 Calculate Cable Connections](#)” procedure on [page 3-80](#).
- Step 19** Import the recalculated OADM site parameters. See the “[NTP-G138 Import a Cisco MetroPlanner Configuration File](#)” task on [page 3-82](#).
- Step 20** In node view, click the **Provisioning > WDM-ANS > Port Status** tabs.
- Step 21** Click **Launch ANS**.
- Step 22** From the Tools menu, choose **Open TL1 Session**.
- Step 23** In the Select Node dialog box, choose the OADM node and click **OK**.
- Step 24** In the TL1 dialog box, use the **ENT-WLEN** command to create the OCHNC cross-connects that were deleted in [Step 10](#), as follows:
- ```
ENT-WLEN:[<TID>]:<AID>:<CTAG>:::[SIZE=<SIZE>]:[<PST>],[<SST>];
```
- where:
- <AID> is the wavelength AID.
 - <SIZE> is the circuit size allocated on this wavelength.
 - <PST> is the primary state.
 - <SST> is the secondary state.
- For additional information and a list of valid command values, see the *Cisco ONS SONET TL1 Command Guide* or the *Cisco ONS 15454 SDH TL1 Command Guide*.
- Step 25** Close the TL1 dialog box.
- Step 26** In node view, click the **Circuits** tab.

- Step 27** Complete the following steps for all OCHNCs set to OOS,DSBLD or Locked,disabled in [Step 7](#):
- Choose the OCHNC circuit(s) and click **Edit**. To choose multiple circuits, press the Shift key while you click the circuits.
 - In the Edit Circuit dialog box, click the **State** tab.
 - In the Target Circuit Admin State window, choose **IS,AINS** (ANSI) or **Unlocked,automaticInService** (ETSI).
 - Click **Apply**.
- Step 28** Complete the “[DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch](#)” task on [page 10-36](#) for OCHNCs that were switched to the opposite side of the ring as part of a splitter or Y-cable protection group.
- Stop. You have completed this procedure.**
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NTP-G129 Add a DWDM Node

Purpose	This procedure adds a DWDM node to an existing Multi-Service Transport Platform (MSTP) network.
Tools/Equipment	None
Prerequisite Procedures	Chapter 3, “Turn Up a Node” A Cisco MetroPlanner network plan recalculated for the new node
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher



Note

Do not begin this procedure until the Cisco MetroPlanner network plan has been updated and recalculated with the new DWDM node.



Note

During this procedure, you will use TL1 commands to delete and recreate OCHNC cross-connects. You might need to refer to the *Cisco ONS SONET TL1 Command Guide* or the *Cisco ONS 15454 SDH TL1 Command Guide*.



Caution

To complete this procedure, a span will be disconnected where the new node is added. This will affect the service of any unprotected circuits that pass through that span.

- Step 1** If the Cisco MetroPlanner network design has not been updated and recalculated for the new node and client services, update and recalculate it now, following the procedures in the Cisco MetroPlanner documentation.
- Step 2** Identify the fiber span that must be disconnected to insert the new node.
- Step 3** Complete the “[DLP-G46 Log into CTC](#)” task on [page 2-25](#) at a DWDM node that is active on the network.

- Step 4** In network view, click the **Circuits** tab.
- Step 5** Identify the OCHNCs that are carried on the fiber span that you identified in [Step 2](#) in both the east-to-west and west-to-east directions.
- Step 6** If the OCHNC circuit is on the active path and is protected by a splitter or Y-cable protection group, complete the “[DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch](#)” task on [page 10-35](#) to force traffic away from the span where the node will be added. If not, continue with [Step 7](#).
- Step 7** For each circuit identified in [Step 5](#) that was not switched in [Step 6](#) (unprotected circuits), complete the following steps:
- Select the circuit and click **Edit**.
 - In the Edit Circuit dialog box, click the **State** tab.
 - In the Target Circuit Admin State field, choose choose **OOS,DSBLD** (ANSI) or **Locked,disabled** (ETSI).
- Step 8** Remove the fibers from the cards at the adjacent nodes that will connect to the new node.
- Step 9** At the node that will be added, complete the following procedures and tasks:
- [NTP-G22 Verify Common Card Installation](#), page 3-4
 - [NTP-G26 Set Up CTC Network Access](#), page 3-11
 - [NTP-G30 Install the DWDM Cards](#), page 3-39
 - [NTP-G36 Calculate Cable Connections](#), page 3-80
 - [NTP-G138 Import a Cisco MetroPlanner Configuration File](#), page 3-82
 - [NTP-G37 Run Automatic Node Setup](#), page 3-83
 - Node acceptance tests in [Chapter 4](#), “[Perform Node Acceptance Tests](#)”
- Step 10** Create cross-connects on the new node for all circuits identified in [Step 5](#):
- From the Tools menu, choose **Open TL1 Session**.
 - In the Select Node dialog box, choose the new node and click **OK**.
 - In the TL1 dialog box, use the **ENT-WLEN** command to create the OCHNC cross-connects for each unprotected pass-through circuit as follows:
ENT-WLEN:[<TID>]:<AID>:<CTAG>:::[SIZE=<SIZE>]:[<PST>],[<SST>];
where:
 - <AID> is the wavelength AID.
 - <SIZE> is the circuit size allocated on this wavelength.
 - <PST> is the primary state.
 - <SST> is the secondary state.
For additional information and a list of valid command values, see the *Cisco ONS SONET TL1 Command Guide* or the *Cisco ONS 15454 SDH TL1 Command Guide*.
 - Close the TL1 dialog box.
 - Repeat [Step 7](#) to change the circuits placed in OOS-DSLBD or Locked,disabled back in service by choosing **IS,AINS** (ANSI) or **Unlocked,automaticInService** (ETSI).in the Target Circuit Admin State field.
- Step 11** Complete the “[DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch](#)” task on [page 10-36](#) for the circuits that were switched in [Step 7](#).

- Step 12** Complete the “[DLP-G106 Delete Optical Channel Network Connections](#)” task on page 7-12 for circuits identified in [Step 5](#) that will not be part of the traffic matrix after the node is added.
- Step 13** Divide the circuits that existed previously into two groups: those that will terminate in the new node and those that will pass through it.
- Step 14** For circuits that will terminate in the new node, complete the “[DLP-G106 Delete Optical Channel Network Connections](#)” task on page 7-12 and then the “[DLP-G105 Provision DWDM Optical Channel Network Connections](#)” task on page 7-10.
- Step 15** Complete the “[DLP-G105 Provision DWDM Optical Channel Network Connections](#)” task on page 7-10 to create new circuits.

Stop. You have completed this procedure.

NTP-G130 Remove a DWDM Node

Purpose	This procedure removes a DWDM node from an MSTP network.
Tools/Equipment	None
Prerequisite Procedures	Chapter 3, “Turn Up a Node” A Cisco MetroPlanner network plan recalculated for the new node
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher



Note

Do not begin this procedure until the Cisco MetroPlanner network plan has been updated and recalculated with the DWDM node removed.



Note

During this procedure, you will use TL1 commands to delete and recreate OCHNC cross-connects. You might need to refer to the *Cisco ONS SONET TL1 Reference Guide* or the *Cisco ONS 15454 SDH TL1 Reference Guide*.



Caution

This procedure will affect the service of unprotected circuits that pass through the span where the node will be removed.

- Step 1** If the Cisco MetroPlanner network design has not been updated and recalculated with the node removed, update and recalculate it now, following the procedures in the Cisco MetroPlanner documentation.
- Step 2** Complete the “[DLP-G46 Log into CTC](#)” task on page 2-25 at the DWDM node that will be removed.
- Step 3** Click the **Circuits** tab.
- Step 4** Identify the OCHNCs that pass through or are added and dropped at the node that will be removed, in both east-to-west and west-to-east directions.

- Step 5** If OCHNC circuits pass through the node to be removed on the active path and are protected by a splitter or Y-cable protection group, navigate to a node connected to the node that will be removed and complete the “[DLP-G179 Apply a Force Y-Cable or Splitter Protection Switch](#)” task on page 10-35. Otherwise, continue with [Step 6](#).
- Step 6** Complete the following steps for each circuit identified in [Step 4](#) that was not switched in [Step 5](#):
- Select the circuit and click **Edit**.
 - In the Edit Circuit dialog box, click the **State** tab.
 - In the Target Circuit Admin State field, choose **OOS,DSBLD** (ANSI) or **Locked,disabled** (ETSI).
- Step 7** Delete the cross-connects on the node that will be removed for each circuit placed in the OOS-DSLBD or Locked,disabled state in [Step 6](#):
- From the Tools menu, choose **Open TL1 Session**.
 - In the Select Node dialog box, select the new node and click **OK**.
 - In the TL1 dialog box, use the **DLT-WLEN** command to delete the OCHNC cross-connects for each unprotected pass-through circuit as follows:

```
DLT-WLEN:[<TID>]:<AID>:<CTAG>:::[SIZE=<SIZE>]:[<PST>],[<SST>];
```

 where:
 - <AID> is the wavelength AID.
 - <SIZE> is the circuit size allocated on this wavelength.
 - <PST> is the primary state.
 - <SST> is the secondary state.
 For additional information and a list of valid command values, see the *Cisco ONS SONET TLI Reference Guide* or the *Cisco ONS 15454 SDH TLI Reference Guide*.
 - Close the TL1 dialog box.
 - Repeat [Step 6](#) to change the circuits placed in OOS-DSLBD back in service by changing the Target circuit Admin State field to **IS,AINS** (ANSI) or **Unlocked,automaticInService** (ETSI).
- Step 8** Complete the “[DLP-G180 Clear a Manual or Force Y-Cable or Splitter Protection Switch](#)” task on page 10-36 for the circuits that were switched in [Step 5](#).
- Step 9** Complete the “[DLP-G106 Delete Optical Channel Network Connections](#)” task on page 7-12 to delete circuits identified in [Step 4](#) that will terminate (add/drop) on the new DWDM node.
- Step 10** Complete the “[DLP-G105 Provision DWDM Optical Channel Network Connections](#)” task on page 7-10 to recreate circuits identified in [Step 4](#) that will terminate on the new DWDM node. Choose the new DWDM node as the start/end (add/drop, respectively) for each circuit.
- Step 11** Complete the “[DLP-G105 Provision DWDM Optical Channel Network Connections](#)” task on page 7-10 to create new circuits that originate or terminate in the new DWDM node.

Stop. You have completed this procedure.
