Provisioning Cards

This chapter provides instructions on how to provision a subset of Cisco Prime Optical-supported cards. For more information on card provisioning, see the NE-related documentation.

This chapter contains the following sections:

How Do I Provision Cards?

Where supported, use the NE Explorer to view and provision card settings.

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the card that you want to provision.

Step 3 In the slot properties pane, click the tab or subtab that corresponds to the settings that you want to modify. For detailed information on the different tabs and subtabs available for each card, see:

- Appendix C, “Slot Properties Pane Information—Common, DWDM, Electrical, and Ethernet Cards”
- Appendix D, “Slot Property Information—FC_MR-4, FMEC, Multirate, and Optical Cards”

Step 4 Modify the settings. For drop-down lists, select an item from the list. For numerics, double-click the field and type the new number.

Step 5 Click **Apply**.

Common Cards

For the common cards supported in Prime Optical and the NEs that contain common cards, see Common Cards, page C-1.

DWDM Cards

For the DWDM cards supported in Prime Optical and the NEs that contain DWDM cards, see DWDM Cards, page C-92.

Provisioning Pluggable Entities on DWDM Cards

Step 1 Select a CTC-based NE in the Domain Explorer tree and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the DWDM card that you want to provision and click the **PPM** tab.

Step 3 Click **Create**. Depending on the selection context, one of the following dialog boxes opens; fields vary accordingly:

- Create PPM
- Create Port

Step 4 In the PPM No. field, select the PPM number from the drop-down list.

Step 5 In the PPM Type field, select the type of PPM from the drop-down list. (This field is not visible in the Create Port dialog box.)

Step 6 In the Port Rate field, select the port rate from the drop-down list. (This field is not visible in the Create PPM dialog box.)

Step 7 Click **OK**.

Electrical Cards

For the electrical cards supported in Prime Optical and the NEs that contain electrical cards, see Slot Properties—WSE, page C-596.

Converting DS1-14 Cards from 1:1 to 1:N Protection

Note This procedure assumes that DS1-14 cards are installed in slots 1 through 6 and/or slots 12 through 17. The DS1-14 cards in slots 3 and 15, which are the protection slots, will be replaced with DS1N-14 cards. The ONS 15454 must run CTC Release 2.0 or later. The procedure also requires at least one DS1N-14 card and a protection group with DS1-14 cards.

Step 1 Select the NE in the Domain Explorer; then, choose **Configuration > NE Explorer**.

Step 2 In NE node property sheet, click the **Protection** tab.

Step 3 In the **Protection Groups** subtab, select the protection group containing slot 3 or slot 15 (where the DS1N-14 card will be installed).

Step 4 Be sure that the slot that is being upgraded is not carrying working traffic. In the **Operations** tab, look at the Protection Groups Details. The protect slot must be Protect/Standby and not Protect/Active. If the protect slot status is Protect/Active, complete the following steps to switch traffic to the working card:

a. In the Protection Group Details list, click the protect card.

b. In the Switch Commands area, click **Switch**.

The working slot should change to Working/Active and the protect slot should change to Protect/Standby. If they do not change, do not continue. Troubleshoot the working card and slot to determine why the card cannot carry working traffic.

c. In the Switch Commands area, click **Clear**.

Step 5 Repeat Step 1 to Step 4 for each protection group that you want to convert.

Step 6 Verify that no standing alarms exist for any of the DS1-14 cards that will be converted. If alarms exist that cannot be cleared, contact the next level of support.

Step 7 Click the **Protection Groups** subtab.

Step 8 Click the 1:1 protection group that contains the cards that will be moved into the new protection group.

Step 9 Click **Delete**.

Step 10 When the confirmation dialog box opens, click **OK**.

Note Deleting the 1:1 protection groups will not disrupt service. However, no protection bandwidth exists for the working circuits until the 1:N protection procedure is completed. Therefore, complete this procedure as quickly as possible.

Step 11 If needed, repeat Step 6 to Step 10 for any other protection groups.

Step 12 Physically remove the DS1-14 card from slot 3 or slot 15. This generates an improper removal alarm.

Step 13 In the node view, right-click the slot that held the removed card and choose **Delete card** from the drop-down list. Wait for the card to disappear from the node view.

Step 14 Physically insert a DS1N-14 card into the same slot.

Step 15 Verify that the card boots up properly.

Step 16 Choose **Configuration > CTC-Based SONET NEs > Equipment Inventory Table** and verify that the new card appears as a DS1N-14 card.

Step 17 Click the node view in the NE Explorer tree.

Step 18 Click the **Protection** tab; then, click the **Protection Groups** subtab.

Step 19 Click **Create**. The Create Protection Group dialog box opens.

Step 20 (Optional) In the Name field, enter a name for the protection group.

Step 21 In the Type field, choose **1:N (card)** from the drop-down list.

Step 22 In the Protect Module field, choose the protection slot from the drop-down list.

The Create Protection Group dialog box shows the protect card in the Protect Card field and the available cards in the Available Cards field.

Step 23 Verify that the DS1N-14 card appears in the Protect Card field.

Step 24 In the Available Cards list, highlight the card that will be included in the protection group. Click the arrow (>>) to move the card to the Working Cards list.

Step 25 In the Reversion Time field, choose the reversion time from the drop-down list.

Step 26 Click **OK**.

Step 27 When the confirmation dialog box opens, click **Yes**.

The protection group should appear in the Protection Groups list on the Protection subtab.

Converting DS3-12 Cards from 1:1 to 1:N Protection

Note This procedure assumes that DS3-12 cards are installed in slots 1 through 6 and/or slots 12 through 17. The DS3-12 cards in slots 3 and 15, which are the protection slots, will be replaced with DS3N-12 cards. The ONS 15454 must run CTC Release 2.0 or later. This procedure also requires at least one DS3N-12 card and a protection group with DS3-12 cards.

Step 1 Select the NE in the Domain Explorer; then, choose **Configuration > NE Explorer**.

Step 2 In the NE node property sheet, click the **Protection** tab.

Step 3 In the **Protection Groups** subtab, select the protection group containing slot 3 or slot 15 (where the DS3N-12 card will be installed).

Step 4 Be sure that the slot that is being upgraded is not carrying working traffic. In the **Operations** tab, look at the Protection Groups Details. The protect slot must be Protect/Standby and not Protect/Active. If the protect slot status is Protect/Active, complete the following steps to switch traffic to the working card:

a. In the Protection Group Details list, click the protect card.

b. In the Switch Commands area, click **Switch**.

The working slot should change to Working/Active and the protect slot should change to Protect/Standby. If they fail to change, do not continue. Troubleshoot the working card and slot to determine why the card cannot carry working traffic.

c. In the Switch Commands area, click **Clear**.

Step 5 Repeat Step 1 to Step 4 for each protection group that you want to convert.

Step 6 Verify that no standing alarms exist for any of the DS3-12 cards that are being converted. If alarms exist that cannot be cleared, contact the next level of support.

Step 7 Click the **Protection Groups** subtab.

Step 8 Click the 1:1 protection group that contains the cards that will be moved into the new protection group.

Step 9 Click **Delete**.

Step 10 When the confirmation dialog box opens, click **OK**.

Note Deleting the 1:1 protection groups will not disrupt service. However, no protection bandwidth exists for the working circuits until the 1:N protection procedure is completed. Therefore, complete this procedure as quickly as possible.

Step 11 If needed, repeat Step 6 to Step 10 for each protection group.

Step 12 Physically remove the DS3-12 card from slot 3 or slot 15. This generates an improper removal alarm.

Step 13 In the node view, right-click the slot that held the removed card and choose **Delete card** from the drop-down list. Wait for the card to disappear from the node view.

Step 14 Physically insert a DS3N-12 card into the same slot.

Step 15 Verify that the card boots up properly.

Step 16 Choose **Configuration > CTC-Based SONET NEs > Equipment Inventory Table** and verify that the new card appears as a DS3N-12 card.

Step 17 Click the node view in the NE Explorer tree.

Step 18 Click the **Protection** tab; then, click the **Protection Groups** subtab.

Step 19 Click **Create**. The Create Protection Group dialog box opens.

Step 20 (Optional) In the Name field, enter a name for the protection group.

Step 21 In the Type field, choose **1:N (card)** from the drop-down list.

Step 22 In the Protect Module field, choose the protection slot from the drop-down list.

The Create Protection Group dialog box shows the protect card in the Protect Card field and the available cards in the Available Cards field.

Step 23 Verify that the DS3N-12 card appears in the Protect Card field.

Step 24 In the Available Cards list, highlight the card that will be included in the protection group. Click the arrow (>>) to move the card to the Working Cards list.

Step 25 In the Reversion Time field, choose a reversion time from the drop-down list.

Step 26 Click **OK**.

Step 27 When the confirmation dialog box opens, click **Yes**.

The protection group should appear in the Protection Groups list on the Protection subtab.

Converting E1-N-14 Cards from 1:1 to 1:N Protection

Note

- This procedure assumes that E1-N-14 cards are installed in slots 1 through 6 and/or slots 12 through 17. The E1-N-14 cards in slots 3 and 15, which are the protection slots, will be converted from 1:1 to 1:N protection. (E1-N-14 cards can work in 1:1 and 1:N protection schemes.)
- Be sure that the slot containing the E1-N-14 card is not carrying working traffic. Also, be sure that there are no existing alarms for the E1-N-14 card that you are converting.

Complete the following steps to convert E1-N-14 cards from 1:1 to 1:N protection:

Step 1 Select the NE in the Domain Explorer; then, choose **Configuration > NE Explorer**.

Step 2 In NE node property sheet, click the **Protection** tab.

Step 3 In the **Protection Groups** subtab, select the protection group containing slot 3 or slot 15 (where the E1-N-14 card will be installed).

Step 4 Be sure that the slot that is being upgraded is not carrying working traffic. In the **Operations** tab, look at the Protection Groups Details. The protect slot must be Protect/Standby and not Protect/Active. If the protect slot status is Protect/Active, complete the following steps to switch traffic to the working card:

a. In the Protection Group Details list, click the protect card.

b. In the Switch Commands area, click **Switch**.

The working slot should change to Working/Active and the protect slot should change to Protect/Standby. If they fail to change, do not continue. Troubleshoot the working card and slot to determine why the card cannot carry working traffic.

c. In the Switch Commands area, click **Clear**.

Step 5 Repeat Step 1 to Step 4 for each protection group that you want to convert.

Step 6 Verify that no standing alarms exist for any of the E1-N-14 cards that are being converted. If alarms exist that cannot be cleared, contact the next level of support.

Step 7 Click the **Protection Groups** subtab.

Step 8 Click the 1:1 protection group that contains the cards that will be moved into the new protection group.

Step 9 Click **Delete**.

Step 10 When the confirmation dialog box opens, click **OK**.

Note Deleting the 1:1 protection groups will not disrupt service. However, no protection bandwidth exists for the working circuits until the 1:N protection procedure is completed. Therefore, complete this procedure as quickly as possible.

Step 11 If needed, repeat Step 6 to Step 10 for each protection group.

Step 12 Click **Create**. The Create Protection Group dialog box opens.

Step 13 (Optional) In the Name field, enter a name for the protection group.

Step 14 In the Type field, choose **1:N (card)** from the drop-down list.

Step 15 Verify that the E1-N-14 card appears in the Protect Card field.

Step 16 In the Available Cards list, highlight the card that will be included in the protection group. Click the arrow (**>>**) to move the card to the Working Cards list.

Step 17 Click **OK**.

Step 18 When the confirmation dialog box opens, click **Yes**.

The protection group should appear in the Protection Groups list on the Protection subtab.

Converting DS3i-N-12 Cards from 1:1 to 1:N Protection

Note This procedure assumes that DS3i-N-12 cards are installed in slots 1 to 6 and/or slots 12 to 17.

Step 1 Select the NE in the Domain Explorer; then, choose **Configuration > NE Explorer**.

Step 2 In NE node property sheet, click the **Protection** tab.

Step 3 In the **Protection Groups** subtab, select the protection group containing slot 3 or slot 15 (where the DS3i-N-12 card will be installed).

Step 4 Be sure that the slot that is being upgraded is not carrying working traffic. In the **Operations** tab, look at the Protection Groups Details. The protect slot must be Protect/Standby and not Protect/Active. If the protect slot status is Protect/Active, complete the following steps to switch traffic to the working card:

a. In the Protection Group Details list, click the protect card.

b. In the Switch Commands area, click **Switch**.

The working slot should change to Working/Active and the protect slot should change to Protect/Standby. If they fail to change, do not continue. Troubleshoot the working card and slot to determine why the card cannot carry working traffic.

c. In the Switch Commands area, click **Clear**.

Step 5 Repeat Step 1 to Step 4 for each protection group that you want to convert.

Step 6 Verify that no standing alarms exist for any of the DS3i-N-12 cards that are being converted. If alarms exist that cannot be cleared, contact the next level of support.

Step 7 Click the **Protection Groups** subtab.

Step 8 Click the 1:1 protection group that contains the cards that will be moved into the new protection group.

Step 9 Click **Delete**.

Step 10 When the confirmation dialog box opens, click **OK**.

Note Deleting the 1:1 protection groups will not disrupt service. However, no protection bandwidth exists for the working circuits until the 1:N protection procedure is completed. Therefore, complete this procedure as quickly as possible.

Step 11 If needed, repeat Step 6 to Step 10 for each protection group.

Step 12 Verify that the card boots up properly.

Step 13 Click the node view in the NE Explorer tree.

Step 14 Click the **Protection** tab; then, click the **Protection Groups** subtab.

Step 15 Click **Create**. The Create Protection Group dialog box opens.

Step 16 (Optional) In the Name field, enter a name for the protection group.

Step 17 In the Type field, choose **1:N (card)** from the drop-down list.

Step 18 Verify that the DS3i-N-12 card appears in the Protect Card field.

Step 19 In the Available Cards list, highlight the card that will be included in the protection group. Click the arrow (**>>**) to move the card to the Working Cards list.

Step 20 Click **OK**.

Step 21 When the confirmation dialog box opens, click **Yes**.

The protection group should appear in the Protection Groups list on the Protection subtab.

Note When a manual OC-N protection switch is performed incorrectly, a warning message indicates that Prime Optical cannot perform the operation.

Resetting NE Thresholds to the Default Values

You can reset NE thresholds on electrical and optical cards.

Step 1 Select the NE in the Domain Explorer; then, choose **Configuration > NE Explorer**.

Step 2 Open the card slot property sheet for the electrical or optical card.

Step 3 Click the **Line** or **STS** tab.

Step 4 Click the threshold subtab that contains the values that you want to revert to the default.

Step 5 In the threshold subtab, click the **Reset to Default** button.

Step 6 At the confirmation prompt, click **Yes**.

Ethernet Cards

For the Ethernet cards supported in Prime Optical and the NEs that contain Ethernet cards, see Ethernet Cards, page C-748.

Provisioning E-Series Ethernet Ports for VLAN Membership

Caution The ONS 15305 CTC, ONS 15454 SONET, and ONS 15454 SDH propagate VLANs whenever a node appears on the same network view as another node, regardless of whether or not the nodes connect through data communication channels (DCCs). For example, if two ONS 15454 SONETs or ONS 15454 SDHs without DCC connectivity belong to the same Login Node Group, whenever CTC is launched from within this login node group, VLANs propagate from one to the other. This happens even though the ONS 15454 SONETs or ONS 15454 SDHs do not belong to the same ring.

Caution If a node is unreachable or out of service, and if the DCC connections used to reach the NE still exist, Prime Optical does not allow the deletion of a VLAN on the NE. You must delete the DCC connections before deleting a VLAN.

The ONS 15305 CTC, ONS 15327, ONS 15454 SONET, and ONS 15454 SDH allow configuration of the VLAN membership and Q-tag handling of individual Ethernet ports.

Step 1 Select an ONS 15305 CTC, ONS 15327, ONS 15454 SONET, or ONS 15454 SDH NE in the Domain Explorer tree and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the card that you want to provision and click the **VLAN** tab.

Step 3 To put a port in a VLAN, click the port and choose **Tagged** or **Untag**.

If a port is a member of only one VLAN, go to the row of that VLAN and choose **Untag** from the Port column. Choose **--** for all the other VLAN rows in that Port column. The VLAN with **Untag** selected can connect to the port, but other VLANs cannot access that port.

If a port is a trunk port, it connects multiple VLANs to an external device, such as a switch, that also supports trunking. A trunk port must have tagging (802.1Q) enabled for all the VLANs that connect to that external device. Choose **Tagged** at all VLAN rows that need to be trunked. Choose **Untag** at one or more VLAN rows in the trunk port column that do not need to be trunked; for example, the default VLAN. Each Ethernet port must be attached to at least one untagged VLAN. The following table describes the port settings.

Table 6-1 Port Settings

Setting	Description
--	A port marked with this symbol does not belong to the VLAN.
Untag	The node will tag ingress frames and strip tags from egress frames.
Tagged	The node will handle ingress frames according to VLAN ID; egress frames will not have their tags removed.

Step 4 After each port is in the appropriate VLAN, click **Apply**.

Note If Tagged is chosen, the attached external devices must recognize IEEE 802.1Q VLANs.

Note Both ports on an individual E1000-2 or E1000-2-G card cannot be members of the same VLAN.

Specifying the ML-Series Card Username and Password

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 Click **Security Properties**; then, click one of the following:

- **CTC-Based SDH** tab > **ONS 15454 SDH**, **ONS 15600 SDH**, **ONS 15305 CTC**, or **ONS 15310 MA SDH** subtab
- **CTC-Based SONET** tab > **ONS 15454**, **ONS 15600**, **ONS 15327**, **ONS 15310 CL**, or **ONS 15310 MA** subtab

Step 3 In the Server - ML Series Card Connection area, enter the username and password. Retype the password as confirmation.

Note The Prime Optical barebone Cisco IOS configuration file uses CTM123+ as the predefined password. By default, the same password is set in the Control Panel at installation.

Step 4 Click **Save**.

Modifying Configuration Settings for the ML-Series Cards—ONS 15310 MA SONET, ONS 15310 MA SDH, ONS 15454 SONET, and ONS 15454 SDH

Full Cisco IOS configuration synchronization is performed automatically by Prime Optical to keep the NE and the Prime Optical Data Provisioning Service synchronized. Full configuration resynchronization might be delayed depending on the usage of the Prime Optical server. For the Prime Optical server deployed as the monitoring server, the recommended value for the delay parameter is 120 seconds. For the Prime Optical server deployed as the provisioning server, the recommended value for the delay parameter is 10 minutes (for example, 600 seconds). The default value is provided in the Control Panel > NE Service > CTC-Based SONET NEs or CTC-Based SDH NEs > NE Service pane > L2 Service Resync Delay field. For example, for the CTC-based SONET or CTC-based SDH network service, the default L2 Service Resync Delay value is 600 seconds.

To upload or download a configuration file for the ML-series card:

Step 1 Select an ONS 15310 MA SONET, ONS 15310 MA SDH, ONS 15454 SONET, or ONS 15454 SDH NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the ML card.

Step 3 Click the **Configuration** tab. The following parameters are displayed:

- Source—Source of the configuration file.
- Host—Host machine where the configuration file is stored or the location where the file will be downloaded.
- Filename—Name of the configuration file.
- Directory—Directory on the host machine for the configuration file.
- Time Stamp—Date and time of the file upload or download.

Note These parameters are initially grayed out or disabled. When a file download or upload is completed, the fields display the parameters of the download or upload. These parameters are related to the newly loaded barebone configuration file. Once a change is made to the barebone configuration file, the fields are cleared.

Step 4 To download the file from the Timing Communications and Control (TCC) card to the host machine:

a. In the **Configuration** subtab, click **TCC>>File**. The Download from TCC dialog box opens.

b. Select the location of the file to download. Click either the **Local** or the **Server** radio button.

Step 5 To upload the file from the host machine to the TCC card:

a. In the **Configuration** subtab, click **File>> TCC**. The Upload to TCC dialog box opens.

b. Select the location of the file to upload. Click either the **Local** or **Server** radio button.

Note If you select Local, the file is first copied to the Prime Optical server and then uploaded to the TCC card. The host refers to the server; the directory refers to the directory on the server where the file resides.

Step 6 Be sure to reset the ML-series cards after uploading a Cisco IOS startup config file to a TCC card.

Step 7 To launch the command-line interface (CLI), click **Launch CLI**.

Creating RMON Thresholds

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the card.

Step 3 Depending on the card selected, click the **Thresholds** tab or **Line** tab > **RMON Thresholds** or **RPR Span** subtab.

Step 4 Click **Create**. The Create RMON Thresholds dialog box opens. The following table provides descriptions. Fields shown depend on the type of NE that is selected.

Step 5 Click **OK**.

Table 6-2 Field Descriptions for the Create RMON Thresholds Dialog Box

Field	Description
Slot	Choose the appropriate card.
Port	Choose the applicable port on the card you selected.
Variable	Choose the MIB variable to monitor.
Alarm Type	Indicate whether the event will be triggered by the rising threshold, falling threshold, or both the rising and falling thresholds.
Sample Type	Depending on the type of data module used by the NE, choose Relative, Absolute, or Delta. • Relative restricts the threshold to use the number of occurrences in the user-set sample period. • Absolute sets the threshold to use the total number of occurrences, regardless of time period. • Delta tests the delta between samples.
Sample Period	Specify the sample period, in seconds.

Table 6-2 Field Descriptions for the Create RMON Thresholds Dialog Box (continued)

Field	Description
Rising Thresholds	Enter the appropriate number of occurrences for the rising threshold. **Note** For a rising type of alarm, the measured value must move from below the falling threshold to above the rising threshold. For example, if a network is running below a falling threshold of 400 collisions every 15 seconds and a problem causes 1001 collisions in 15 seconds, the excess occurrences trigger an alarm.
Falling Thresholds	Enter the appropriate number of occurrences for the falling threshold. In most cases, the falling threshold is set lower than the rising threshold. A falling threshold is the counterpart to a rising threshold. When the number of occurrences is above the rising threshold and then drops below a falling threshold, it resets the rising threshold. For example, when the network problem that caused 1001 collisions in 15 minutes subsides and creates only 799 collisions in 15 minutes, occurrences fall below a falling threshold of 800 collisions. This resets the rising threshold so that if network collisions again spike over 1000 per 15 minute period, an event again triggers when the rising threshold is crossed. An event is triggered only the first time a rising threshold is exceeded (otherwise a single network problem might cause a rising threshold to be exceeded multiple times and cause a flood of events).

Creating Segments

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the GE_XP or 10GE_XP card.

Step 3 Click the **REP** tab > **Segment** subtab.

Step 4 Click **Create**. The Create Segment dialog box opens.

Step 5 Enter the segment ID in the Segment field. Valid values are from 1 to 1024.

Step 6 From the Port drop-drown list, choose a REP port that must belong to this segment.

Note A REP port can belong to only one segment.

Step 7 From the Port Role area, choose whether you want to configure the port as an edge port or a regular port. The options are:

- Edge—The port is configured as an edge port.
  - Check the **Primary** check box to configure the edge port as a primary edge port.
  - Uncheck the **Primary** check box to configure the edge port as a secondary edge port.
  - Check the **Preferred** check box to configure the edge port as a preferred alternate port.
  - Check the **NoNeighbor** check box if the edge port must not have a neighbor port. REP does not check for neighbor adjacency.
- None—The port is configured as a regular port. If you choose this option, Segment Topology Change Notifications (STCN) and VLAN Load Balancing (VLB) configurations are disabled.

  Check the **Preferred** check box to configure the regular port as a preferred alternate port.

Step 8 From the STCN area, configure the destination of STCN messages:

a. Check the **Enable** check box to enable sending STCN messages.

b. From the **Port** drop-down list, do one of the following:

- Choose the STCN port to send STCN messages.
- Enter the segment ID in the Segment field to send STCN messages. The STCN port and REP port must be unique.

Step 9 From the VLAN Load Balancing area, configure VLB:

a. Check the **Enable** check box to enable VLB.

b. Enter a single SVLAN or range of SVLANs in the SVLAN field.

c. Enter the REP Port ID in the REP PortId field.

d. Check the **Preferred** check box to identify the preferred alternate port for VLAN load balancing.

Step 10 From the VLB Preempt Delay area, enter the trigger delay for automatic VLB activation. Valid values are from 15 to 300 seconds.

Step 11 Click **Next**.

Step 12 Enter the details of the second port to add it to the segment. Repeat Step 6 through Step 10 when the first port is configured as a regular port and the second port is configured as a primary edge port. Repeat Step 6 and Step 7 when the first port is configured as a primary edge port and the second port is configured as a regular port.

Step 13 Click **Finish**.

Editing Segments

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the GE_XP or 10GE_XP card.

Step 3 Click the **REP** tab > **Segment** subtab.

The list of segments appears.

Step 4 Choose a segment from the list of segments that you want to edit.

Step 5 Click **Edit**. The Edit Segment dialog box opens.

Note You can edit only the STCN and VLB entries for a segment.

Step 6 Segment ID—*Display only.* Displays the Segment ID.

Step 7 Port—*Display only.* Displays the REP port that belongs to this segment.

Step 8 In the Port Role area (which is display only), the details of the edge port or regular port is displayed.

Step 9 From the STCN area, modify the destination of STCN messages:

a. Check the **Enable** check box to enable sending STCN messages.

b. From the **Port** drop-down list, do one of the following:

- Choose the STCN port to send STCN messages.
- Modify the segment ID in the Segment field to send STCN messages. The STCN port and REP port must be unique.

Step 10 From the VLAN Load Balancing area, modify VLB:

a. Check the **Enable** check box to enable VLB.

b. Modify a single SVLAN or range of SVLANs in the SVLAN field.

c. Modify the REP Port ID in the REP PortId field.

d. Check the **Preferred** check box to identify the preferred alternate port for VLAN load balancing.

Step 11 From the VLB Preempt Delay area, modify the trigger delay for automatic VLB activation. Valid values are from 15 to 300 seconds.

Step 12 Click **Next**.

Step 13 Modify the details of the second port in the segment, if required.

Step 14 Click **Finish**.

Creating Configurations

Note The Creating Configuration procedure is applicable to the WSE card.

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the 10x10G_LC, 100G_LC_C, or CFP_LC card.

Step 3 Click the **Card** tab.

For the 10x10G_LC card:

1. Click **Create**. The Configure Operating Mode dialog box opens.
2. From the Configuration Mode drop-down list, choose the configuration.

   The card configuration options vary depending on the card. For more information about card configurations, see Table C-759. For more information about Operating Modes, see Table 6-3. Fields shown depend on the type of NE that is selected.
3. Click **Next**.

   The following happens in the Port Mappings area:

   – If you select MXP-10G or FANOUT, the configuration requires all the client ports. The CXP port is available for FANOUT mode only. Proceed to Step 5.

   – If you select TXP-10G, RGN-10G, or LOW-LATENCY, you can select the available ports. Click **Next** to view all the ports that are about to be configured.

Note The Create button is disabled once the MXP-10x10G- or FANOUT is created on the card mode. You cannot configure any other modes for the card, since it requires all ten client ports.

Note If you need to create some other card mode, delete the existing card mode that was created and create a new card mode.

For the CFP_LC card:

There are two operating modes for the CFP_LC card:

- CFP-TXP
- CFP-MXP

1. Click **Create**. The Configure Operating Mode dialog box opens.
2. From the Configuration Mode drop-down list, choose the configuration. The card configuration options vary depending on the card. For more information about the card configurations, see Table 6-3. For more information about Operating Modes, see Table C-759. Fields shown depend on the type of NE that is selected.
3. Click **Next** to map a peer card with the port.

Step 4 In the Configure Operating Mode window, to map a peer card with a port, drag and drop the peer card to the port field. CFP_LC supports two ports.

A maximum of two peer cards are available. You can also unmap the selected peer card from the port field. The selected peer card information along with the port details is displayed on the left side of the Configure Operating Mode window.

For CFP-MXP, the configuration uses two ports and one peer card only. You can map a peer card to both ports.

Note You can also map one more port to the card mode, since there is one more available port.

For 100G_LC_C card:

1. Click **Create**. The Configure Operating Mode dialog box opens.
2. Choose the configuration from the Configuration Mode drop-down list. The card configuration options vary depending on the card. For more information about the card configurations, see Table 6-3. For more information about Operating Modes, see Table C-759. Fields shown depend on the type of NE that is selected. Proceed to Step 5.

Note The TXP-100G card configuration does not require any peer card.

For WSE card:

1. Click **Create**. The Configure Operating Mode dialog box opens.
2. Choose the configuration from the Configuration Mode drop-down list. The card configuration options vary depending on the card. For more information about the card configurations, see Table 6-3. For more information about Operating Modes, see Table C-789. Fields shown depend on the type of NE that is selected. Proceed to Step 5.

Step 5 Click **Finish**.

The selected operating mode is provisioned on the 10x10G_LC, 100G_LC_C, and CFP_LC card. The selected operating mode information, along with the port details, is displayed on the left side of the Configure Operating Mode window.

Table 6-3 Field Descriptions for the Create Operating Mode Dialog Box

Field	Description
Configuration Mode	Choose one of the following card configuration options from the drop-down list: • TXP-10G (10x10G_LC)—Provisions the 10x10G_LC card as a standalone supporting multi-transponder functionality. The 10 Gb/s SFP+ ports are paired providing 10 G transponder functionality for each port pair. • RGN-10G (10x10G_LC)—Provisions the 10x10G_LC card as a standalone regenerator. • MXP-10x10G (10x10G_LC)—Provisions the 10x10G_LC card as a 10x10G muxponder. The 100G_LC_C card is connected through the Cisco ONS 15454 M6 or Cisco ONS 15454 M2 backplane to the 10x10G_LC card to support 10-port 10 G muxponder capabilities. **Note** For MXP-10x10G operating mode, you cannot proceed to completion unless a peer card is selected. • FANOUT (10x10G_LC)—Provisions the 10x10G_LC card as a standalone functionary. **Note** You cannot configure any other modes for the card, once a MXP-10x10G and FANOUT mode are configured. • LOW-LATENCY (10x10G_LC)—Provisions the 10x10G_LC card as a standalone functionary. It occupies only two ports and can coexist with other card modes such as RGN-10G and TXP-10G. It is possible to configure multiple pair of ports in LOW-LATENCY mode. There is no support for Terminal or Facility loopback on this mode, or for backplane loopback functionality on a card that has any ports in this mode. • CFP-TXP (CFP_LC)—Provisions the CF_LC card as a 100 G transponder. The CFP_LC card is connected to the 100G_LC_C card to support the 100GE-BASELR4 client interface for 100 Gb/s transponder capabilities. The CFP_LC card can be connected through the Cisco ONS 15454 M6 backplane with up to two 100G_LC_C cards placed in the upper and lower slots of the same shelf. • CFP-MXP (CFP_LC)—Provisions the CFP_LC card as a two-port 40G muxponder. The CFP_LC card is connected with the 100G_LC_LC card through the Cisco ONS 15454 M6 or Cisco ONS 15454 M2 backplane. • TXP-100G (100G_LC_C)—Provisions the 100G_LC_C card as a 100G standalone transponder. • RGN-100G (100G_LC_C)—Provisions the 100G_LC_C card as a regenerator. Two 100G_LC_C cards can be connected to work in back-to-back mode through the backplane in the same shelf. Regeneration is performed by leveraging the OTU4 backplane interconnection supported by the Cisco ONS 15454 M6 or Cisco ONS 15454 M2 chassis. • RGN-10G (5x10G Regenerator)—Provisions the WSE card as a regenerator. • TXP-10G (5x10G Transponder)—Provisions the WSE card as a standalone transponder.
Peer Card	Displays the shelf and slot number of the peer card that is set up for a specific card configuration. If the peer card is not set up, “N/A” is displayed. **Note** The MXP-10x10G, RGN-100G, CFP-MXP, and CFP-TXP operating modes support peer card configuration only.

Table 6-3 Field Descriptions for the Create Operating Mode Dialog Box (continued)

Field	Description
Port Mapping	Click the toggle button to select a port for configuration. Port Status options are as follows: • Available for Selection—You can select the ports for configuration. • Not Available/Invalid—Already selected or invalid for the chosen operating mode. • Selected for Configuration—Ports are selected for configuration.
Finish	Completes the card configuration and closes the dialog box.
Cancel	Cancels the card configuration and closes the dialog box.

Adding a Peer Card

Note The Adding Peer card procedure is applicable to the WSE card.

Note You can add another 100G_LC_C peer card to the CFP-TXP card configuration with only one peer card configured in the Create Configuration section. This option is available for CFP-TXP card mode only.

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the **Provisioning > Card** tab.

Step 3 Click the **Add Peer Card** button to open the dialog showing the available peer card and the port left out to be mapped.

Note The Add Peer button is enabled only if the CFP card is configured with CFP-TXP card mode with one peer card; otherwise, this button is disabled.

Step 4 Click **OK**.

The peer card and map are added to the available port. If the peer card is unavailable, you will see the following error message:

```
No peer cards are available to add. Create a peer card and try again.
```

Step 5 Click **OK**.

Create, Edit, and Delete GCC

This procedure creates, edits, and deletes the DWDM GCC terminations required for network setup when using the TXP and MXP cards. Perform this task before you create OCHCC or OCHNC circuits for the cards. In this task, you can also set up the node so that it has direct IP access to a far-end, non-ONS node over the GCC network.

Create GCC

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the CFP_LC card.

Step 3 Click the **Card** tab.

Step 4 Click **Create**. The Create Terminations dialog box appears.

Step 5 Select the ports where you want to create the GCC termination.

Step 6 Under Port Admin State area, select one of the following:

- Leave unchanged—Does not change the DCC/GCC termination port administrative state.
- Set to IS or Set to Unlocked—Puts the DCC/GCC termination port in service.
- Set OOS,DSLBD to IS,AINS (for ANSI) or Set Locked,disabled to Unlocked,automaticInService (for ETSI)—Changes a port that is currently out of service or locked to automatic in service.
- Set OOS,DSLBD to OOS,MT (for ANSI) or Set Locked,disabled to Locked,maintenance (for ETSI)—Changes a port that is currently out of service or locked to out of service for maintenance.

Note For GCC termination, default GCC rate is 192 kb/s and cannot be changed.

Step 7 In the Layer 3 area, do one of the following:

- Check the **IP** box only if the GCC is between the ONS 15454 and another ONS node, and only ONS nodes reside on the network. The GCC will use Point-to-Point Protocol (PPP).
- Check both the **IP** box and the **OSI and IP** box if the GCC 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 GCC will use PPP.

Step 8 If you checked OSI, complete the following substeps. If you checked IP only, continue with Step 9.

- Click **Next**.
- Provision the following fields:
  - Router—Choose the OSI router.
  - ESH—Sets the End System Hello (ESH) propagation frequency. End system (ES) NEs transmit ESHs to inform other ESs and intermediate systems (ISs) about the Network Service Access Points (NSAPs) that the ES NEs serve. The default is 10 seconds. The range is 10 to 1000 seconds.
  - ISH—Sets the Intermediate System Hello (ISH) protocol data unit (PDU) propagation frequency. IS NEs send ISHs to other ESs and ISs to inform them about the IS NEs that the IS NEs serve. 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 metric cost for LAN subnets is 60. The cost normally should not be changed.

Step 9 Click **Finish**. The following alarms appear until all the network DCC/GCC terminations are created and the ports are in service:

- GCC-EOC for GCC termination
- EOC for SDCC termination
- EOC-L for LDCC termination.

Edit GCC

This task modifies a GCC termination.You can enable or disable OSPF and the foreign node setting.

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the CFP_LC card.

Step 3 Click the **Card** tab.

Step 4 Select the GCC that you want to change.

Step 5 Click **Edit**. The Edit Termination dialog box appears.

Step 6 Complete the following as necessary:

- GCC Rate—(Display only) Indicates the communication channel rate.
- Disable OSPF on Link—If checked, OSPF is disabled on the link. OSPF should be disabled only when the slot and port connect to third-party equipment that does not support OSPF.
- Far End is Foreign—Check this box to specify that the DCC/GCC termination is a non-ONS node.
- Far end IP—If you checked the Far End is Foreign check box, type the IP address of the far-end node or leave the 0.0.0.0 default. An IP address of 0.0.0.0 means that any address can be used by the far end.

Step 7 Click **OK**.

Delete GCC

This task deletes the DWDM GCC terminations required for network setup when using TXP or MXP cards.

Step 1 Select an NE in the Domain Explorer and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the CFP_LC card.

Step 3 Click the **Card** tab.

Step 4 Select the GCC that you want to change.

Step 5 Click **Delete**. The Delete Termination dialog box appears.

Step 6 (Optional) To place ports out of service, check the **Set port OOS** check box.

Step 7 Click **Yes**. The following alarms will appear until all network terminations are deleted and the ports are out of service:

- GCC-EOC for GCC termination
- EOC for SDCC termination

- EOC-L for LDCC termination

E-Series Spanning Tree Protocol (IEEE 802.1D)

The ONS 15327, ONS 15454 SONET, and ONS 15454 SDH operate Spanning Tree Protocol (STP) according to IEEE 802.1D when an Ethernet card is installed. STP operates over all packet-switched ports, including Ethernet and ONS 15327, ONS 15454 SONET, or ONS 15454 SDH ports. On Ethernet ports, STP is disabled by default and can be enabled by checking the check box under the Port subtab of the **Provisioning** tab at the card-level view. On ONS 15327, ONS 15454 SONET, or ONS 15454 SDH interface ports, STP is active by default and cannot be disabled.

The Ethernet card can enable STP on the Ethernet ports to allow redundant paths to the attached Ethernet equipment. STP spans cards so that both equipment and facilities are protected against failure.

STP detects and eliminates network loops. When STP detects multiple paths between any two network hosts, STP blocks ports until only one path exists between any two network hosts. The single path eliminates possible bridge loops. This is crucial for shared packet rings, which naturally include a loop.

To remove loops, STP defines a tree that spans all of the switches in an extended network. STP forces certain redundant data paths into a standby (blocked) state. If one network segment in the STP becomes unreachable, the spanning-tree algorithm reconfigures the spanning-tree topology and reactivates the blocked path to reestablish the link. STP operation is transparent to end stations, which do not discriminate between connections to a single LAN segment and a switched LAN with multiple segments. The ONS 15327, ONS 15454 SONET, and ONS 15454 SDH support one STP instance per circuit and a maximum of eight STP instances per ONS 15327, ONS 15454 SONET, or ONS 15454 SDH.

Note When an Ethernet card is provisioned, the STP state might need to be updated. Click the **Update** button in the NE Explorer to update the STP state.

The ONS 15327, ONS 15454 SONET, or ONS 15454 SDH can operate multiple instances of STP to support VLANs in a looped topology. Separate circuits can be dedicated across the SONET ring for different VLAN groups (that is, one for private TLS services and one for Internet access). Each circuit runs its own STP to maintain VLAN connectivity in a multiring environment.

Viewing E-Series Spanning-Tree Configurations

Step 1 Select an ONS 15327, ONS 15454 SONET, or ONS 15454 SDH NE in the Domain Explorer tree and choose **Configuration > NE Explorer**.

Step 2 Click the **EtherBridge** tab.

Step 3 Click the **Spanning Tree Config** subtab. The spanning-tree configuration parameters are listed in the following table.

Table 6-4 Spanning-Tree Configuration Parameters

Parameter	Cisco Default Value	Value Range
Priority	32768	0–65535
Bridge Max Age	20 seconds	6–40 seconds
Bridge Hello Time	2 seconds	1–10 seconds
Bridge Forward Delay	15 seconds	4–30 seconds

Viewing E-Series Spanning-Tree Parameters

Step 1 Select an ONS 15327, ONS 15454 SONET, or ONS 15454 SDH NE in the Domain Explorer tree and choose **Configuration > NE Explorer**.

Step 2 Click the **EtherBridge** tab.

Step 3 Click the **Spanning Tree Status** subtab. The spanning-tree parameters are listed in the following table.

Table 6-5 Spanning-Tree Parameters

Parameter	Description
BridgeID	Unique identifier that transmits the configuration bridge protocol data unit (BPDU); the bridge ID is a combination of the bridge priority and the NE MAC address.
Topo Age	Amount of time in seconds since the last topology change.
Topo Changes	Number of times the spanning-tree topology has been changed since the node booted up.
Designated Root	The designated root of the spanning tree for a particular spanning-tree instance.
Root Cost	The total path cost to the designated root.
Root Port	Port used to reach the root.
Max Age	Maximum time that received-protocol information is retained before it is discarded.
Hello Time	Time interval, in seconds, between the transmission of configuration BPDUs by a bridge that is the spanning-tree root or is attempting to become the spanning-tree root.
Hold Time	Minimum time period, in seconds, that elapses during the transmission of configuration information about a given port.
Forward Delay	Time spent by a port in the listening state and the learning state.

FC_MR-4 Card

For the NEs that support the FC_MR-4 card, FC_MR-4 Card, page D-1.

FMEC Cards

For the FMEC cards supported in Prime Optical and the NEs that contain FMEC cards, see FMEC Cards, page D-7.

Multirate Cards

For the multirate cards supported in Prime Optical and the NEs that contain multirate cards, see Multirate Cards, page D-16.

Optical Cards

For the optical cards supported in Prime Optical and the NEs that contain optical cards, see Optical Cards, page D-74.

Provisioning an OC-N Card for ONS 15454 SONET

ONS 15454 SONET OC-3, OC-12, and OC-48 cards can be provisioned to support either SONET or SONET over SDH signals.

Step 1 Select an ONS 15454 SONET NE in the Domain Explorer tree and choose **Configuration > NE Explorer**.

Step 2 In the tree view of the NE Explorer window, select the OC-N card.

Step 3 Click the **Line** tab; then, click the **Line Config** subtab.

Step 4 In the EnableSyncMsg column, uncheck the check box.

Step 5 Be sure that the Admin state of the port is selected as OOS (only then can the SONET port be configured as SDH).

Step 6 In the **Type** column, choose **SDH**.

Step 7 Click **Apply**.

Resetting NE Thresholds to the Default Values

See Resetting NE Thresholds to the Default Values, page 6-8.