Configuring Hardware

This chapter describes the various NE configuration procedures that can be managed by Cisco Prime Optical. It contains the following sections:

Overview

For Prime Optical to communicate with NEs, certain configuration tasks must be performed on the NEs. Until these configuration tasks are completed, Prime Optical cannot contact the NEs, and no management can begin.

Before Prime Optical can manage NEs, the following conditions must be met:

- Ethernet—Management Ethernet port must be configured.
- Password—Current privileged command password must be configured.
- Telnet—Gigabit Route Processor (GRP) should accept a Telnet session.
- SNMP—GRP must be SNMP-manageable.

Configuration management functions control, identify, retrieve data from, and provide data to network resources to deliver customer services. Configuration management includes broad categories traditionally known as network planning and engineering, installation, network and service provisioning, service planning and negotiation, and status and control.

Using the NE Explorer to Configure Optical NEs

Step 1 In the Domain Explorer window, select the NE that you want to configure.

Note Not all NEs have an associated NE Explorer. See Table 1-14 on page 1-31 for more information.

Step 2 Choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 3 In the NE Explorer tree, click the top-level NE node to open the node properties pane.

Step 4 Click the tab (or subtab) that corresponds to the setting(s) you want to change. Modify the settings. For drop-down lists, select an item from the list. For numerics or editable text fields, double-click the field and type the new number or text. Click **Apply**.

Configuring Routing Protocols on Optical NEs

This section describes how to configure the various routing protocols supported by Prime Optical. This section contains the following information:

Specifying a Routing Protocol

Prime Optical allows you to choose a routing protocol for the LAN interface for CTC-based NEs. You can choose one of the following:

- Open Shortest Path First (OSPF)
- Routing Information Protocol (RIP)
- SNMP

By default, no routing protocol is specified.

Viewing Routing Tables for CTC-Based NEs

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **Routing Table** subtab. The following table provides field descriptions.

Table 5-1 Field Descriptions for the Routing Table

Field	Description
Destination	Displays the IP address of the destination network or host.
Mask	Displays the subnet mask used to reach the destination network or host.
Gateway	Displays the IP address of the gateway used to reach the destination network or host.
Usage	Displays the number of times the listed route has been used.
Interface	Displays the node interface used to access the destination.

Creating Static Routes for CTC-Based NEs

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **Static Routes** subtab.

Step 4 Click **Create**. The Create New Static Route dialog box opens. The following table provides descriptions.

Step 5 After making your selections, click **OK**.

Table 5-2 Field Descriptions for the Create New Static Route Dialog Box

Field	Description
Destination IP	Enter the IP address of the computer running Prime Optical.
Length	Enter the subnet mask length (a decimal number representing the subnet mask length, in bits).
Subnet Mask	Enter the subnetwork mask IP address.
Next Hop	Enter the IP address of the router port or the node IP address if the Prime Optical computer is connected to the node directly.
Cost	Enter the number of hops between the NE and the computer running Prime Optical.

Using OSPF with CTC-Based NEs

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **OSPF** subtab.

Step 4 Complete the following fields. Fields shown depend on the type of NE selected.

- DCC OSPF Area ID—Number that identifies the NE as a unique OSPF area. It can be between 0.0.0.0 and 255.255.255.255. The number must be unique to the LAN OSPF area.
- SDCC Metric—Cost of sending packets across the SDCC, which is used by OSPF routers to calculate the shortest path.
- LDCC Metric—Cost of sending packets across the LDCC, which is used by OSPF routers to calculate the shortest path.
- OSPF Active on LAN—When checked, it enables the OSPF topology to be advertised to OSPF routers on the LAN.
- LAN Port Area ID—OSPF area ID for the router port where the NE is connected. This number is different from the DCC OSPF Area ID.
- Authentication Type—Displays either one of the following:
  - Simple Password—If the router where the NE is connected uses authentication.
  - No Authentication—If the router where the NE is connected does not use authentication.
- Authentication Key—Displays the OSPF key (or password) if authentication is enabled.
- Confirm Authentication Key—Re-enter the OSPF authentication key to confirm it.
- Router Priority—Designated router for a subnet.
- Hello Interval—Number of seconds between OSPF hello packet advertisements sent by OSPF routers. The Cisco default is 10 seconds.
- Dead Interval—Number of seconds that will pass while an OSPF router's packets are not visible before its neighbors declare the router down. The Cisco default is 40 seconds.
- Transit Delay—Service speed. The Cisco default is 1 second.
- Retransmit Int—Time that will elapse before a packet is resent. The Cisco default is 5 seconds.

- LAN Metric—Cost for sending packets across the LAN. Values should be greater than zero.

Step 5 Click **Apply**.

Creating an OSPF Area Range

Note The ONS 15305 R3.0 does not support OSPF area ranges.

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **OSPF** subtab and check the OSPF Active on LAN check box. (See Using OSPF with CTC-Based NEs, page 5-4 for more information.)

Step 4 Click **Apply**.

Step 5 Click the **OSPF Area Range** subtab.

Step 6 Click **Create**. The Create OSPF Area Range dialog box opens. The following table provides descriptions.

Step 7 After making your selections, click **OK**.

Note If no range address is created when enabling OSPF on a LAN from Prime Optical, you must manually provision the OSPF area range address for the respective range area IDs, as described in this procedure. Alternatively, enable OSPF from CTC so that the range address is created when OSPF is enabled. This is a known issue that has been tracked using DDTS number CSCin62975.

Table 5-3 Field Descriptions for the Create OSPF Area Range Dialog Box

Field	Description
Range Address	Enter the area IP address for the NEs that reside within the OSPF area. For example, if the 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 NEs. This is either the ID in the DCC OSPF Area ID field or the ID in the Area ID for LAN Port field. The ID cannot be 0.0.0.0.
Mask Length	Enter the subnet mask length.
Mask	Enter the subnet mask.
Advertise	Check this check box if you want the area range to be advertised.

Deleting an OSPF Area Range

Note The ONS 15305 R3.0 does not support OSPF area ranges.

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **OSPF Area Range** subtab.

Step 4 Select the OSPF area range from the table; then, click **Delete**.

Step 5 Click **OK** in the confirmation message box.

Managing OSPF Virtual Links

The following sections describe how to manage OSPF virtual links.

Note The ONS 15305 R3.0 does not support OSPF virtual links.

Viewing OSPF Virtual Links

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **OSPF Virtual Links** subtab. The following information is displayed:

- Neighbor—Router ID of the Area 0 router.
- Transit Delay—Service speed. The Cisco default is 1 second.
- Retransmit Interval—Time that will elapse before a packet is resent. The Cisco default is 5 seconds.
- Hello Interval—Number of seconds between OSPF hello packet advertisements sent by OSPF routers.
- Dead Interval—Number of seconds that will pass while the packets of an OSPF router are not visible before its neighbors declare the router down.
- Authentication Type—Authentication type.
- Auth Key—Authentication key.

Creating an OSPF Virtual Link

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **OSPF** subtab and check the OSPF Active on LAN check box. (See Using OSPF with CTC-Based NEs, page 5-4 for more information.)

Step 4 Click **Apply**.

Step 5 Click the **OSPF Virtual Links** subtab.

Step 6 Click **Create**. The Create New Virtual Link dialog box opens and allows you to define a link between OSPF area border routers. The following table provides descriptions.

Step 7 After making your selections, click **OK**.

Table 5-4 Field Descriptions for the Create New Virtual Link Dialog Box

Field	Description
Neighbor	Specify the IP address of the Area 0 router.
Transit Delay	Specify the service speed. The Cisco default is 1 second.
Retransmit Interval	Specify the time that will elapse before a packet is resent. The Cisco default is 5 seconds.
Hello Interval	Specify the number of seconds between OSPF hello packet advertisements. The Cisco default is 10 seconds.
Dead Interval	Specify the number of seconds that will pass while the packets of an OSPF router are not visible before its neighbors declare the router down. The Cisco default is 40 seconds.
Authentication Type	Specify the authentication type. Select **Simple Password** if the router where the NE is connected uses authentication. Otherwise, select **No Authentication**.
Authentication Key	Enter the OSPF key (password) if authentication is enabled.
Confirm Authentication Key	Reenter the authentication key to confirm it.

Modifying an OSPF Virtual Link

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **OSPF Virtual Links** subtab.

Step 4 Select an OSPF virtual link to modify; then click **Edit**.

Step 5 The Modify Virtual Link dialog box opens. Modify the following:

- Neighbor—Enter the new IP address.
- Transit Delay—Indicates the service speed.
- Retransmit Delay—Sets the time that will elapse before a packet is resent.
- Hello Interval—Sets the number of seconds between OSPF hello packet advertisements sent by OSPF routers.
- 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.

- Authentication Type—Select the authentication type. Select either No Authentication or Simple Authentication.
- Auth Key—If Simple Authentication is selected as authentication type, enter the authentication key.
- Confirm Auth Key—Re-enter the authentication key.

Step 6 Click **OK**.

Deleting an OSPF Virtual Link

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **OSPF Virtual Links** subtab.

Step 4 Select an OSPF virtual link to delete; then, click **Delete**.

Step 5 Click **Yes** in the confirmation dialog box.

Using RIP

Step 1 In the Domain Explorer tree, select an ONS 15310 CL, ONS 15310 MA SONET, ONS 15310 MA SDH, ONS 15327, ONS 15454 SONET, or ONS 15454 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **RIP** subtab.

Step 4 Complete the following:

- RIP Active—Check to enable RIP.
- RIP Type—Select the RIP version from the drop-down list.
- Metric—Select a number between 1 and 15. This represents the number of hops.
- Authentication Type—By default, RIP is set to **No Authentication**. If the router that the NE is connected to requires authentication, set this to **Simple Password**.
- Authentication Key—If the Authentication Type is set to Simple Password, enter the password.
- Confirm Authentication Key—Re-enter the password to confirm it.

Step 5 If you want to create an address summary, complete the following steps:

a. Click **Create**. Complete the address summary only if the NE is a gateway network element (GNE) with multiple end NEs attached and IP addresses in different subnets.

b. In the Create RIP Address Summary dialog box that opens, create aggregate addresses, which will be represented in the routing table by a summary address. Table 5-5 provides descriptions. The NEs use the IP summary address for RIP to advertise a summarized local IP address pool on the NE so that the address pool can be provided to clients.

c. After making your selections, click **OK**. The RIP address information is displayed in the RIP Address Summary table.

Step 6 If you want to delete a RIP address, complete the following steps:

a. Select the RIP address from the RIP Address Summary table and click **Delete**.

b. Click **Yes** in the confirmation dialog box.

Step 7 Click **Apply**.

Note Both the OSPF and RIP tabs are enabled if no routing advertisement is enabled. If either OSPF or RIP is enabled, the other routing protocol is disabled.

Table 5-5 Field Descriptions for the Create RIP Address Summary Dialog Box

Field	Description
Summary Address	Specify the IP address of the RIP summary. This field is set to the NE IP address, with an applied mask of 255.255.255.0. For example, if the NE IP address is 10.20.30.15, the summary address is 10.20.30.0.
Mask Length	Enter the subnet mask length. The valid range is from 1 to 24.
Mask Address	*Display only.* View the subnet mask address, which is 255.255.255.0 by default.
Cost	Enter the hop count metric (the number of hops between the NE and the destination). The valid range is from 1 to 15. The smaller the number of hops, the higher the priority.

Viewing the RIP Routing Table

Step 1 In the Domain Explorer tree, select an ONS 15310 CL, ONS 15310 MA SONET, ONS 15310 MA SDH, ONS 15327, ONS 15454 SONET, or ONS 15454 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **RIP Routing Table** subtab. The RIP Routing table is displayed with the following information:

- Destination—*Display only.* The IP address of the destination network or host.
- Mask—*Display only.* The subnet mask used to reach the destination host or network.
- Gateway—*Display only.* The IP address of the gateway used to reach the destination network or host.
- Cost—*Display only.* The hop count metric. The valid range is 1 to 15.

Creating and Modifying an SDCC, LDCC, or GCC Termination on Transponder Cards

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane of the NE Explorer, click one of the following tabs. Tabs shown depend on the type of NE selected.

- DCC—DCC (Data Communications Channel) carries provisioning and maintenance data/information between network elements in the SONET overhead.
- DCC/GCC/OSC—GCC (General Communications Channel) is used for transponders and muxponders in dense wavelength division multiplexing (DWDM) applications. Optical Service Channel (OSC) is a bidirectional channel that connects two adjacent nodes in a DWDM ring.

  For more information on GCC see, Create, Edit, and Delete GCC, page 6-17.
- LDCC—LDCC (Line Data Communications Channel or Line DCC) is a 576-kb/s data communications channel embedded in the section overhead for OAM&P traffic between two NEs.
- SDCC—SDCC (Section Data Communications Channel or Section DCC) is a 192-kb/s data communications channel embedded in the section overhead for OAM&P traffic between two NEs.

Step 3 Click the subtab that corresponds to the termination that you want to create or modify. For example, to create or modify an LDCC termination, click the **LDCC** subtab.

Step 4 Complete one of the following options, depending on whether you want to create a new termination or modify an existing one:

- Click the **Create** button above the Transponder area. The Create *SDCC, LDCC, GCC, or OSC* dialog box opens and allows you to create new terminations on transponder cards. The following table provides descriptions.

  Note The fields shown in the Create *SDCC, LDCC, GCC, or OSC* dialog box depend on the type of termination that is being created. The fields shown also depend on the NE type.

- Select an existing termination and click the **Edit** button above the Transponder area. The Edit *SDCC, LDCC, GCC, or OSC* dialog box opens and allows you to modify existing terminations on transponder cards. The following table provides descriptions.

  Note The fields shown in the Edit *SDCC, LDCC, GCC, or OSC* dialog box depend on the type of termination that is being modified. The fields shown also depend on the NE type.

Step 5 After making your selections, click **OK**.

Table 5-6 Field Descriptions for the Create or Modify SDCC, LDCC, GCC, or OSC Dialog Box

Tab	Description
SDCC/LDCC Info	(*Available for SDCC and LDCC terminations*) Displays the slot and port number of the SDCC or LDCC termination. **Note** For OTU2_XP cards, the card name might be shown as XP_4_10G_LINE_CARD.
GCC Terminations	(*Available for GCC terminations*) Displays the slot and port number of the GCC termination. **Note** For OTU2_XP cards, the card name might be shown as XP_4_10G_LINE_CARD.
OSPF Disabled on Link	Indicates whether Open Shortest Path First (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.
Foreign	If checked, it means that the far-end node is a non-ONS node.
Admin State	Indicates the SDCC or LDCC port state. Select one of the following: **Note** Admin state options that appear in the drop-down list depend on the NE type. • Leave Unchanged • IS • OOS MT • IS AINS
Layer3/Layer 2 Config	
Layer3 (Layer2) Config	Select one of the following: • OSI (LAPD)—When selected, all fields in the OSI Subnet and LAPD areas are enabled. The Layer 3 protocol used for the DCC is OSI (IP not applicable); the Layer 2 protocol is LAPD. The OSI (LAPD) option applies only to SDCC and is disabled for all other DCC types. • IP (PPP)—When selected, all fields in the OSI Subnet and LAPD areas are disabled. The Layer 3 protocol used for the DCC is IP only; the Layer 2 protocol is PPP. • OSI and IP (PPP)—When selected, only the fields in the OSI Subnet area are enabled. The Layer 3 protocol includes both OSI and IP, but the Layer 2 protocol remains as PPP. **Note** When editing an existing DCC, you can toggle between the IP (PPP) and OSI and IP (PPP) options if either option exists on the DCC. **Note** If the DCC is configured as OSI (LAPD), you cannot modify the Layer 3/Layer 2 configuration.
OSI Subnet	
Router Number	The OSI virtual router where the subnet (SDCC or LDCC) is provisioned.
IS-IS Cost	Sets the cost for sending packets on the subnet. This is used by OSPF routers to calculate the shortest path.
ISH	Sets the Intermediate System Hello (ISH) protocol data unit (PDU) propagation frequency. Intermediate system NEs send ISHs to other ESs and ISs to inform them about the NETs they serve. The Cisco default is 10 seconds. The range is from 10 to 1000 seconds.
ESH	Sets the End System Hello (ESH) propagation frequency. End system NEs transmit ESHs to inform other ESs and ISs about the NSAPs they serve. The Cisco default is 10 seconds. The range is from 10 to 1000 seconds.

Table 5-6 Field Descriptions for the Create or Modify SDCC, LDCC, GCC, or OSC Dialog Box (continued)

Tab	Description
IIH	Sets the Intermediate System to Intermediate System Hello PDU propagation frequency. The IS-IS Hello PDUs establish and maintain adjacencies between ISs. The Cisco default is 3 seconds. The range is from 1 to 600 seconds.
LAPD	
Acknowledgement	Indicates the Link Access Protocol on the D channel (LAPD) acknowledgement type. Select either: • Acknowledged Information Transfer Service (AITS) • Unacknowledged Information Transfer Service (UITS)
T200	Shows the time between Set Asynchronous Balanced Mode (SABM) frame transmissions. The range is from 0.2 to 20 seconds.
T203	Shows the maximum time between LAPD frame exchanges. The range is from 4 to 120 seconds.
Mode	Indicates the LAPD frame command/response role. Values are: • Network • User
MTU	Sets the maximum transfer unit (MTU).

Creating and Modifying an SDCC, LDCC, GCC, or OSC Termination on SONET or SDH Cards

Step 1 In the Domain Explorer tree, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane of the NE Explorer, click one of the following tabs. Tabs shown depend on the type of NE selected.

- DCC—DCC carries provisioning and maintenance data/information between network elements in the SONET overhead.
- DCC/GCC/OSC—GCC is used for transponders and muxponders in DWDM applications. OSC is a bidirectional channel that connects two adjacent nodes in a DWDM ring.

  For more information on GCC, see Create, Edit, and Delete GCC, page 6-17.
- LDCC—LDCC is a 576-kb/s data communications channel embedded in the section overhead for OAM&P traffic between two NEs.
- SDCC—SDCC is a 192-kb/s data communications channel embedded in the section overhead for OAM&P traffic between two NEs.

Step 3 Click the subtab that corresponds to the termination that you want to create or modify. For example, to create or modify an LDCC termination, click the **LDCC** subtab.

Step 4 Complete one of the following options, depending on whether you want to create a new termination or modify an existing one:

- Click the **Create** button above the SONET/SDH area. The Create *SDCC, LDCC, GCC, or OSC* dialog box opens and allows you to create new terminations on SONET or SDH cards. The following table provides descriptions.

  Note The fields shown in the Create *SDCC, LDCC, GCC, or OSC* dialog box depend on the type of termination that is being created. The fields shown also depend on the NE type.

- Select an existing termination and click the **Edit** button above the SONET/SDH area. The Edit *SDCC, LDCC, GCC, or OSC* dialog box opens and allows you to modify existing terminations on SONET or SDH cards. The following table provides descriptions.

  Note The fields shown in the Edit *SDCC, LDCC, GCC, or OSC* dialog box depend on the type of termination that is being modified. The fields shown also depend on the NE type.

Step 5 After making your selections, click **OK**.

Table 5-7 Field Descriptions for the Create or Edit SDCC, LDCC, GCC, or OSC Dialog Box

Field	Description
SDCC/LDCC Info	(*Available for SDCC and LDCC terminations*) Displays the slot and port number of the SDCC or LDCC termination.
GCC Terminations	(*Available for GCC terminations*) Displays the slot and port number of the GCC termination.
OSC Terminations	(*Available for OSC terminations*) Displays the slot and port number of the OSC termination.
OSPF Disabled on Link	Indicates whether Open Shortest Path First (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.
Foreign	If checked, it means that the far-end node is a non-ONS node.
Admin State	Indicates the SDCC or LDCC port state. Select one of the following: **Note** Admin state options that appear in the drop-down list depend on the NE type. • Leave Unchanged • IS • OOS MT • IS AINS
GCC Rate	(*Available for GCC terminations*) Select the GCC rate.

Table 5-7 Field Descriptions for the Create or Edit SDCC, LDCC, GCC, or OSC Dialog Box (continued)

Field	Description
Layer3/Layer 2 Config	
Layer3 (Layer2) Config	Select one of the following: • OSI (LAPD)—When selected, all fields in the OSI Subnet and LAPD areas are enabled. The Layer 3 protocol used for the DCC is OSI (IP not applicable); the Layer 2 protocol is LAPD. The OSI (LAPD) option applies only to SDCC and is disabled for all other DCC types. • IP (PPP)—When selected, all fields in the OSI Subnet and LAPD areas are disabled. The Layer 3 protocol used for the DCC is IP only; the Layer 2 protocol is PPP. • OSI and IP (PPP)—When selected, only the fields in the OSI Subnet area are enabled. The Layer 3 protocol includes both OSI and IP, but the Layer 2 protocol remains as PPP. **Note** When editing an existing DCC, you can toggle between the IP (PPP) and OSI and IP (PPP) options if either option exists on the DCC. **Note** If the DCC is configured as OSI (LAPD), you cannot modify the Layer 3/Layer 2 configuration.
OSI Subnet	
Router Number	The OSI virtual router where the subnet (SDCC, LDCC, GCC, or OSC) is provisioned.
IS-IS Cost	Sets the cost for sending packets on the subnet. This is used by OSPF routers to calculate the shortest path.
ISH	Sets the Intermediate System Hello (ISH) protocol data unit (PDU) propagation frequency. Intermediate system NEs send ISHs to other ESs and ISs to inform them about the NETs they serve. The Cisco default is 10 seconds. The range is from 10 to 1000 seconds.
ESH	Sets the End System Hello (ESH) propagation frequency. End system NEs transmit ESHs to inform other ESs and ISs about the NSAPs they serve. The Cisco default is 10 seconds. The range is from 10 to 1000 seconds.
IIH	Sets the Intermediate System to Intermediate System Hello PDU propagation frequency. The IS-IS Hello PDUs establish and maintain adjacencies between ISs. The Cisco default is 3 seconds. The range is from 1 to 600 seconds.
LAPD	
Acknowledgement	Indicates the Link Access Protocol on the D channel (LAPD) acknowledgement type. Select either: • Acknowledged Information Transfer Service (AITS) • Unacknowledged Information Transfer Service (UITS)
T200	Shows the time between Set Asynchronous Balanced Mode (SABM) frame transmissions. The range is from 0.2 to 20 seconds.
T203	Shows the maximum time between LAPD frame exchanges. The range is from 4 to 120 seconds.
Mode	Indicates the LAPD frame command/response role. Values are: • Network • User
MTU	Sets the maximum transfer unit (MTU).

Creating a DCC Tunnel Connection

The Create DCC Tunnel Connection dialog box allows you to create new DCC tunnel connections for the ONS 15454 SONET R3.3 and earlier.

Step 1 In the Domain Explorer tree, select the R3.3 or earlier ONS 15454 SONET NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane of the NE Explorer, click the **DCC/GCC/OSC** tab.

Step 3 Click the **DCC Tunnel Connection** subtab.

Step 4 Click **Create**. The Create dialog box opens. The following table provides descriptions.

Step 5 After making your selections, click **OK**.

Table 5-8 Field Descriptions for the Create DCC Tunnel Connection Dialog Box

Field	Description
From A	Select a beginning interface for the DCC tunnel.
From B	Select an ending interface for the DCC tunnel.

Using SNMP

Changing the SNMP Community String—CTC-Based NEs

Use the SNMP Trap Destination dialog box in CTC to provision community names for all SNMP requests (for example, get, next, bulk, and set) for CTC-based NEs R3.3 and later. Any SNMP request that uses a community name that matches a community name in the list of provisioned SNMP trap destinations is considered valid.

If an SNMP request contains an invalid community name (one that does not match a provisioned community name), the request is dropped silently. The MIB variable snmpInBadCommunityNames increments, and an authenticationFailure trap is sent.

Due to security concerns, the community names *public* and *private* do not have the special meaning that they have in most SNMP interfaces.

Configuring SNMP for CTC-Based NEs

Step 1 Select a CTC-based NE in the Domain Explorer tree and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab; then, click the **SNMP** subtab. Fields shown depend on the type of NE that is selected.

Step 3 To allow SNMP proxy, check the **Allow SNMP Proxy** check box.

Step 4 To use the SNMP management software with the NE, check the **Allow SNMP Set** check box.

Step 5 Click **Apply**.

Step 6 Click **Create**. The Create SNMP Trap Destination dialog box opens. The following table provides descriptions.

Step 7 After making your selections, click **OK**.

Step 8 Click **Apply**.

Table 5-9 Field Descriptions for the Create SNMP Trap Destination Dialog Box

Field	Description
IP Address	Enter the IP address of your NMS.
Community Name	Enter the SNMP community name. For a description of SNMP community names, refer to the SNMP information in the NE reference guide. **Note** The community name is a form of authentication and access control. The community name assigned to the ONS 15600 is case-sensitive and must match the community name of the NMS.
UDP Port	Set the UDP port for SNMP. The Cisco default port is 162. Allowed UDP port values are 162, 391, and values between 1024 and 65535.
Trap Version	Set the Trap Version field for either SNMPv1 or SNMPv2. See your NMS documentation to determine whether to use SNMPv1 or SNMPv2.
Max Traps per Second *(not applicable to all NEs)*	Enter the maximum number of traps per second that will be sent to the SNMP manager. A zero value indicates that there is no maximum and all traps are sent to the SNMP manager.

Creating an SNMP Community—ONS 15216 EDFA2

The Create SNMP Community View dialog box allows you to create an SNMP community for the ONS 15216 EDFA2.

Note SNMP views are supported only for EDFA2 R2.4.0. The SNMP tab is not present in the EDFA2 R2.1.1 and R2.3.0.

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **SNMP Community Table** subtab.

Step 4 Click **Create**. The Create SNMP Community View dialog box opens. The following table provides descriptions.

Table 5-10 Field Descriptions for the Create SNMP Community View Dialog Box

Field	Description
Community Name	Enter the SNMP community name.
Privileges	Enter the access privileges that govern what management operations a particular community can perform. These privileges are expressed as a sum of values, where each value represents a particular operation. See Table 5-11 for the SNMP operation decimal values.
IP Address	Enter the IP address from which network management traffic for the new SNMP community originates.
Subnet Mask	Enter the subnet mask for the source IP address.

Step 5 After making your selections, click **OK** in the Create SNMP Community View dialog box.

Step 6 Click **Apply** in the node properties pane. The new SNMP community is listed in the SNMP Community table.

The following table displays the decimal values for the different SNMP operations. For example, 255 is the sum of all decimal values and specifies access to all SNMP operations. This sum is the default private community. 247 is the sum for all SNMP operations with the exception of the Set operation. This sum is the default public community.

Table 5-11 SNMP Operation Decimal Values

SNMP Operation	Decimal Values
Get	1
GetNext	2
Response (enable for all community strings)	4
Set	8
SNMPv1-Trap	16
GetBulk	32
Inform (enable for all community strings)	64
SNMPv2-Trap (enable for all community strings)	128

Modifying an SNMP Community—ONS 15216 EDFA2

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **SNMP Community Table** subtab.

Step 4 In the SNMP Community table, select the SNMP community to modify.

Step 5 Double-click a specific field and modify the following:

- Community Name—New community string.
- View Index—New index number.

- Privilege—New access privilege that governs what management operations a particular community can perform. These privileges are expressed as a sum of values, where each value represents a particular operation. See Table 5-11 for the SNMP operation decimal values.
- IP Address—New IP address from which network management traffic for the new SNMP community originates.
- Subnet Mask—New subnet mask for the source IP address.
- Status—*Display only.*

Step 6 Click **Apply**.

Deleting an SNMP Community—ONS 15216 EDFA2

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **SNMP Community Table** subtab.

Step 4 In the SNMP Community table, select an SNMP community to delete.

Step 5 Click **Delete**; then, click **OK**.

Step 6 Click **Apply**.

Creating an SNMP Trap Destination—ONS 15216 EDFA2

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **Trap Destination Table** subtab.

Step 4 Click **Create**. The Create Trap Destination dialog box opens. The following table provides descriptions.

Step 5 After making your selections, click **OK**.

Step 6 Click **Apply** in the node properties pane. The new SNMP trap destination is listed in the Trap Destination table.

Table 5-12 Field Descriptions for the Create Trap Destination Dialog Box

Field	Description
IP Address	Type the SNMP trap destination IP address.
UDP Port	Set the trap destination User Datagram Protocol (UDP) port for SNMP.

Table 5-12 Field Descriptions for the Create Trap Destination Dialog Box (continued)

Field	Description
Community Name	Type the SNMP community name.
Version	Enter the trap version number.

Modifying an SNMP Trap Destination—ONS 15216 EDFA2

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **Trap Destination Table** subtab.

Step 4 In the Trap Destination table, select the SNMP trap destination to modify.

Step 5 Double-click a specific field and modify the following:

- IP Address—IP address of the SNMP trap destination.
- UDP Port—UDP port number of the SNMP trap destination.
- Community Name—SNMP trap destination community string name.
- Version—Select the version from the pull-down menu.
- View Index—New index number.
- Status—*Display only.*

Step 6 Click **Apply**.

Deleting an SNMP Trap Destination—ONS 15216 EDFA2

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **Trap Destination Table** subtab.

Step 4 In the Trap Destination table, select an SNMP trap destination to delete.

Step 5 Click **Delete**; then, click **OK**.

Step 6 Click **Apply**.

Creating an SNMP View—ONS 15216 EDFA2

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **SNMP Views** subtab.

Step 4 Click **Create**. The Create SNMP View dialog box opens. The following table provides descriptions.

Step 5 After making your selections, click **OK**.

Step 6 Click **Apply** in the node properties pane. The new SNMP view is listed in the SNMP Views table.

Table 5-13 Field Descriptions for the Create SNMP View Dialog Box

Field	Description
View Index	Enter the view index number, which is a unique value for each MIB view.
Subtree	Enter an object identifier that designates a subtree element in the MIB hierarchy.
Mask	Enter the bit mask that identifies objects in the subtree.
Type	From the pull-down menu, select the flag that specifies the status of the view. Values are included and excluded.

Modifying an SNMP View—ONS 15216 EDFA2

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **SNMP Views** subtab.

Step 4 In the SNMP Views table, select the SNMP view to modify.

Step 5 Double-click a specific field and modify the following:

- View Index—*Display only.*
- Subtree—*Display only.*
- Mask—Modify the bit mask that identifies objects in the subtree.
- Type—From the pull-down menu, select the flag that specifies the status of the view.
- Status—*Display only.*

Step 6 Click **Apply**.

Deleting an SNMP View—ONS 15216 EDFA2

Step 1 In the Domain Explorer, select an ONS 15216 EDFA2 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **SNMP Views** subtab.

Step 4 In the SNMP Views table, select an SNMP view to delete.

Step 5 Click **Delete**; then, click **OK**.

Step 6 Click **Apply**.

Creating an SNMP Trap Destination—ONS 15216 EDFA3

Step 1 In the Domain Explorer, select an ONS 15216 EDFA3 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click **Add Row**. The Create Trap Destination table opens. The following table provides descriptions.

Step 4 After making your selections, click **OK**.

Step 5 Click **Apply** in the node properties pane. The new SNMP trap destination is listed in the Trap Destination table.

Note A maximum of 10 SNMP hosts can be configured for the EDFA3. (The EDFA2 has no such restriction.)

Table 5-14 Field Descriptions for the Trap Destination Table Subtab

Field	Description
IP Address	Enter the trap destination IP address.
UDP Port	Set the trap destination UDP port for SNMP.
Community Name	Enter the SNMP trap destination community string name.
Version	Enter the trap version number.

Modifying an SNMP Trap Destination—ONS 15216 EDFA3

Step 1 In the Domain Explorer, select an ONS 15216 EDFA3 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **Trap Destination Table** subtab.

Step 4 In the Trap Destination table, select the SNMP trap destination to modify.

Step 5 Double-click a specific field and modify the following:

- IP Address—IP address of the SNMP trap destination.
- UDP Port—UDP port number of the SNMP trap destination.
- Community Name—SNMP trap destination community string name.

- Version—Select the version from the pull-down menu.

Step 6 Click **Apply**.

Deleting an SNMP Trap Destination—ONS 15216 EDFA3

Step 1 In the Domain Explorer, select an ONS 15216 EDFA3 and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **SNMP** tab.

Step 3 Click the **Trap Destination Table** subtab.

Step 4 In the Trap Destination table, select an SNMP trap destination to delete; then, click **Delete Row**.

Step 5 Click **Apply**.

Configuring FTP Hosts for CTC-Based NEs

The following sections describe how to configure database backup or restore and software download to an ENE when a firewall is enabled. You can provision a list of legal FTP hosts for which the firewall opens for all FTP commands. You can configure the FTP hosts to expire after a certain amount of time, after which time the FTP relay resumes blocking all FTP access for the ENEs.

Creating an FTP Host

Step 1 In a CTC-based GNE/ENE configuration with proxy/firewall enabled, select one of the following NEs in the Domain Explorer tree and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool):

- ONS 15310 CL
- ONS 15310 MA SONET
- ONS 15310 MA SDH
- ONS 15454 SONET
- ONS 15454 SDH
- ONS 15600 SONET
- ONS 15600 SDH

Step 2 In the node properties pane, click the **Network** tab; then, click the **FTP Hosts** subtab.

Step 3 Click the **Create** button. The Create New FTP Host dialog box opens.

Note You can create up to a maximum of 12 FTP hosts.

Step 4 Configure the fields described in the following table.

Step 5 Click **OK**. The new FTP host is created and appears in the FTP Hosts subtab.

Table 5-15 Field Descriptions for the Create New FTP Host Dialog Box

Field	Description
FTP Host Address	Enter the FTP host IP address.
Prefix Length	Specify the FTP host subnet mask length.
Enable FTP Relay	Check this check box to enable FTP relay. If FTP relay is disabled, the FTP Relay Timer field is dimmed.
FTP Relay Timer	Enter the number of minutes for the FTP relay to continue, after which time the FTP relay resumes blocking all FTP access for the ENEs.

Creating FTP Hosts on Multiple NEs Simultaneously

Use the FTP Hosts Creation wizard to create FTP hosts on multiple NEs simultaneously in a GNE/ENE firewall environment.

Step 1 In a CTC-based GNE/ENE configuration with proxy/firewall enabled, choose **Administration > Bulk FTP Configuration** in the Domain Explorer. The FTP Hosts Creation wizard opens.

Step 2 In the Add FTP Hosts pane, click **Add Row**. For each new FTP host, configure the following information:

- FTP host address—Enter the IP address for the FTP host.
- Prefix length—Specify the subnet mask length for the FTP host.
- FTP relay—Enable or disable FTP relay. If FTP relay is disabled, the FTP Relay Timer field is dimmed.
- FTP relay timer—Enter the number of minutes for the FTP relay to continue, after which time the FTP relay resumes blocking all FTP access for the ENEs.

Step 3 Repeat Step 2 for each new FTP host that you want to create. If you make a mistake, select the row and click **Delete Selected Row**. When you are finished, click **Next**.

Step 4 In the Save the FTP Hosts pane, complete the following substeps:

a. In the Available NEs list, select the NEs on which to add the new FTP hosts and click **Add**. The NEs move to the Selected NEs list.

b. In the Job Comments area, enter comments about the bulk FTP host creation, if needed.

c. In the Time (*time zone*) area, set a time for the operation. Click **Now** to begin FTP host creation immediately, or click **At Time** and specify when to begin the operation. You can specify a time based on 5-minute increments. The time zone can be GMT, a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box.

d. Click **Finish**.

Step 5 To view the results of the operation, check the Job Monitor table (**Administration > Job Monitor**). After the bulk FTP host creation succeeds, the details are displayed in the NE Explorer node properties pane > Network tab > FTP Hosts subtab for each NE.

Modifying an FTP Host

Step 1 In the Domain Explorer tree, select the NE that contains the FTP that you want to modify and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab; then, click the **FTP Hosts** subtab.

Step 3 Modify the following fields in the FTP Hosts subtab:

- FTP Host Address—*Display only.*
- Prefix Length—*Display only.*
- Enable FTP Relay—Check this check box to enable FTP relay. If FTP relay is disabled, the FTP Relay Timer field is dimmed.
- FTP Relay Timer—Modify the number of minutes for the FTP relay to continue, after which time the FTP relay resumes blocking all FTP access for the ENEs.

Step 4 Click **Apply**. The modified FTP host appears in the FTP Hosts subtab.

Deleting an FTP Host

Step 1 In the Domain Explorer tree, select the NE that contains the FTP host and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab; then, click the **FTP Hosts** subtab.

Step 3 Select the FTP host that you want to delete; then, click the **Delete** button.

Step 4 In the confirmation dialog box, click **Yes**. The FTP host disappears from the FTP Hosts subtab.

Specifying the Preferred Copy—ONS 15600 SONET or ONS 15600 SDH

Step 1 In the Domain Explorer tree, select the ONS 15600 SONET or ONS 15600 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Maintenance** tab.

Step 3 In the **Preferred Copy** subtab > Data Copy area, select the preferred data from the Preferred Data pull-down list.

Step 4 Click **Apply**.

Enabling Intermediate Path Performance Monitoring

Most CTC-based networks use line-terminating equipment (LTE) to enable intermediate path performance monitoring (IPPM). IPPM allows you to transparently monitor a transmission signal originating from any equipment without terminating the channel of that signal. To use IPPM, create the STS circuit on the DS-N cards; then, enable IPPM on the EC1-12 or OC-N cards that carry the circuit.

Note IPPM occurs only on STS paths that have IPPM enabled; threshold crossing alerts (TCAs) are raised only for PM parameters on the IPPM-enabled paths. The monitored IPPM parameters are STS CV-P, STS ES-P, STS SES-P, STS UAS-P, and STS FC-P.

Note IPPM is not supported for the CTC-based ONS 15305 R3.0.

Step 1 In the Domain Explorer, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 Select an LTE card. The following table lists the LTE cards.

Table 5-16 Traffic Cards that Terminate the Line (LTE Cards)

NE	Line-Terminating Equipment	
ONS 15327	XTC-14	XTC-28-3
	OC3 IR4 1310	OC12 IR 1310
	OC12 LR 1550	OC48 IR 1310
	OC48 LR 1550	—

Table 5-16 Traffic Cards that Terminate the Line (LTE Cards) (continued)

NE	Line-Terminating Equipment	
ONS 15454 SONET	**Electrical LTE**	
	EC1-12	DS1-14
	DS1N-14	DS3-12
	DS3N-12	DS3-12E
	DS3N-12E	DS3XM-6
	DS3i/DS3iN	—
	Optical LTE	
	OC3 IR 4/STM1 SH 1310	OC3 IR/STM1 SH 1310-8
	OC12 IR/STM4 SH 1310	OC12 LR/STM4 LH 1310
	OC12 LR/STM4 LH 1550	OC12 IR/STM4 SH 1310-4
	OC48 IR 1310	OC48 LR 1550
	OC48 IR/STM16 SH AS 1310	OC48 LR/STM16 LH AS 1550
	OC48 ELR/STM16 EH 100 GHz	OC48 ELR 200 GHz
	OC192 SR/STM64 IO 1310	OC192 IR/STM64 SH 1550
	OC192 LR/STM64 LH 1550	OC192 LR/STM64 LH ITU 15xx.xx
	TXP_MR_10G	MXP_2.5G_10G
ONS 15454 SDH	**Electrical LTE**	
	E1-N-14	E1-42
	E3-12	DS3i-N-12
	STM1E-12	—
	Optical LTE	
	OC3 IR 4/STM1 SH 1310	OC3 IR/STM1 SH 1310-8
	OC12 IR/STM4 SH 1310	OC12 LR/STM4 LH 1310
	OC12 LR/STM4 LH 1550	OC12 IR/STM4 SH 1310-4
	OC48 IR/STM16 SH AS 1310	OC48 LR/STM16 LH AS 1550
	OC48 ELR/STM16 EH 100 GHz	OC192 SR/STM64 IO 1310
	OC192 IR/STM64 SH 1550	OC192 LR/STM64 LH 1550
	OC192 LR/STM64 LH ITU 15xx.xx	—
ONS 15600	OC48/STM16 LR/LH 16 Port 1550	OC192/STM64 LR/LH 4 Port 1550

Step 3 Click the **STS** tab.

Step 4 Click the **STS Config** subtab.

Step 5 Check the **IPPM Enabled** check box.

Step 6 Click **Apply**.

Enabling Pointer Justification Count Monitoring for CTC-Based NEs

Note Pointer justification count monitoring is not available for the ONS 15600 SONET and ONS 15600 SDH NEs.

Pointers are used in CTC-based NEs to compensate for frequency and phase variations. They provide a way to align the phase variations in STS and VT payloads. Pointer justification counts indicate timing differences on SONET networks.

There are positive pointer justification count (PPJC) and negative pointer justification count (NPJC) parameters. PPJC is a count of path-detected (PPJC-Pdet) or path-generated (PPJC-Pgen) positive pointer justifications. NPJC is a count of path-detected (NPJC-Pdet) or path-generated (NPJC-Pgen) negative pointer justifications depending on the specific PM name.

A consistent pointer justification count indicates clock synchronization problems between nodes. A difference between the counts means the node transmitting the original pointer justification has timing variations with the node detecting and transmitting this count. Positive pointer adjustments occur when the frame rate of the synchronous payload envelope (SPE) is too slow in relation to the rate of the STS-1.

To enable performance monitoring of the pointer justification count:

Step 1 In the Domain Explorer, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 Select an LTE card. See Table 5-16 for a list of LTE cards.

Step 3 Click the **Line** tab.

Step 4 Click the **Line Config** subtab.

Step 5 Double-click the **PJStsMon#** field and select a number:

- The value *Off* means pointer justification monitoring is disabled.
- The values *1* to *n* are the STS numbers on one port. One STS per port can be enabled from the PJStsMon# menu, as follows:
  - EC1-12 PJStsMon# card field: 0 or 1 can be selected on a total of 12 ports.
  - OC-3 PJStsMon# card field: 1, 2, or 3 can be selected on a total of 4 ports.
  - OC-12 PJStsMon# card field: Between 1 and 12 can be selected on 1 port.
  - OC-48 PJStsMon# card field: Between 1 and 48 can be selected on 1 port.
  - OC-192 PJStsMon# card field: Between 1 and 192 can be selected on 1 port.

Step 6 Click **Apply**.

Changing the Power Monitoring Threshold for the ONS 15454 SONET and ONS 15454 SDH

Step 1 In the Domain Explorer tree, select an ONS 154545 SONET or ONS 15454 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **General** tab.

Step 3 Click the **Power Monitor** subtab.

Step 4 In the Voltage Thresholds area, select the threshold for the following:

- ELWBATVG—Very low battery voltage.
- LWBATVG—Low battery voltage. Available on ONS 15454 SONET only.
- HIBATVG—High battery voltage. Available on ONS 15454 SONET only.
- EHIBATVG—Very high battery voltage.
- Current Voltage Environment—*Display only.*

Note You can set thresholds in 0.5 VDC increments.

Step 5 Click **Apply**.

Changing the Power Monitoring Threshold for the ONS 15600 SONET and ONS 15600 SDH

Step 1 In the Domain Explorer tree, select an ONS 15600 SONET or ONS 15600 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **General** tab.

Step 3 Click the **Power Monitor** subtab.

Step 4 In the Voltage Thresholds area, select the threshold for the following:

- ELWBATVG—Very low battery voltage.
- LWBATVG—Low battery voltage. Available on ONS 15600 SONET only.
- HIBATVG—High battery voltage. Available on ONS 15600 SONET only.
- EHIBATVG—Very high battery voltage.
- Current Voltage Environment—*Display only.*

Note You can set thresholds in 0.5 VDC increments.

Step 5 Click **Apply**.

Creating an Ethernet Threshold

The Create Ethernet Threshold dialog box allows you to create new Ethernet thresholds for the G1000-2, G1000-4, ETH100, ETH1000, and ML-series cards for ONS 15327, ONS 15454 SONET, and ONS 15454 SDH NEs.

Step 1 In the Domain Explorer, select a CTC-based NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the NE Explorer tree, select an Ethernet card.

Step 3 Click the **Thresholds** tab.

Step 4 Click **Create**. The Create Ether Thresholds dialog box opens. The following table provides descriptions.

Step 5 After making your selections, click **OK**.

Step 6 Click **Apply**.

Table 5-17 Field Descriptions for the Create Ethernet Thresholds Dialog Box

Field	Description
Slot	Select a slot for the new Ethernet threshold.
Port	Select a port for the selected slot. If you select All, the threshold is created on all ports for that slot. This operation might take several minutes to complete.
Variable	Select a variable for the new Ethernet threshold. The list of variables differs based on the type of card that is installed in the slot selected in the Slot field.
Alarm Type	Select an alarm type for the new Ethernet threshold. Available alarm types are Rising, Falling, and Rising and Falling.
Sample Type	Select a sample type for the new Ethernet threshold. Available sample types are Relative and Absolute.
Sample Period	Enter a sample period for the new Ethernet threshold. The sample period is measured in seconds.
Rising Threshold	Enter a rising threshold for the new Ethernet threshold. The value must be equal to or greater than the Falling Threshold value.
Falling Threshold	Enter a falling threshold for the new Ethernet threshold. The value must be equal to or less than the Rising Threshold value.

Synchronizing the Network

Use the NE Explorer to synchronize the CTC-based NEs in your network. The following sections describe the synchronization settings in detail.

Synchronization Settings for the ONS 15310 CL, ONS 15310 MA SONET, ONS 15327, ONS 15454 SONET, and ONS 15600 SONET

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 Prime Optical server usage. For more information, see Chapter 7, "Provisioning Services and Connections."

Synchronization status messaging (SSM) is a SONET protocol that communicates information about the quality of the timing source. SSM messages are carried on the S1 byte of the SONET Line layer. These messages enable SONET devices to automatically select the highest quality timing reference and to avoid timing loops.

SSM messages are either Generation 1 or Generation 2. Generation 1 is the first and most widely deployed SSM message set. Generation 2 is a newer version. If SSM is enabled, consult the timing reference documentation to determine which message set to use. The following tables show the Generation 1 and Generation 2 message sets.

Table 5-18 SSM Generation 1 Message Set

Message	Quality	Description
PRS	1	Primary reference source—Stratum 1
STU	2	Synchronization traceability unknown
ST2	3	Stratum 2
ST3	4	Stratum 3
SMC	5	SONET minimum clock
ST4	6	Stratum 4
DUS	7	Do not use for timing synchronization
RES	—	Reserved; quality level set by user

Table 5-19 SSM Generation 2 Message Set

Message	Quality	Description
PRS	1	Primary reference source—Stratum 1
STU	2	Synchronization traceability unknown
ST2	3	Stratum 2
TNC	4	Transit node clock
ST3E	5	Stratum 3E
ST3	6	Stratum 3
SMC	7	SONET minimum clock
ST4	8	Stratum 4
DUS	9	Do not use for timing synchronization
RES	—	Reserved; quality level set by user

Note Alarms relating to PM collection indicate that the load on the system is high. Reduce the load on the system before proceeding.

Setting Up External or Line Timing for CTC-Based SONET NEs

Step 1 Select an ONS 15310 CL, ONS 15310 MA SONET, ONS 15327, ONS 15454 SONET, or ONS 15600 SONET NE and choose **Configuration > NE Explorer**.

Step 2 In the node property pane, click the **Timing** tab. Fields shown depend on the NE that is selected.

Step 3 In the General Timing section of the **General** subtab, complete the following information:

- Timing Mode—Set to **External** if the NE derives its timing from a building integrated timing supply (BITS) source wired to the backplane pins; set to **Line** if timing is derived from an OC-N card that is optically connected to the timing node. A third option, **Mixed**, allows users to set external and line timing references.

Caution Because mixed timing can cause timing loops, Cisco does not recommend its use. Use this mode with care.

Note The Mixed option is not applicable to the ONS 15600 SONET.

- SSM Message Set—Choose the message set level supported by the network. If a Generation 1 node receives a Generation 2 message, the message will be mapped down to the next available Generation 1. For example, an ST3E message becomes an ST3.
- Revertive—If checked, the NE reverts to a primary reference source after the conditions that caused it to switch to a secondary timing reference are corrected.
- Reversion Time—If Revertive is checked, indicate the amount of time that the NE will wait before reverting back to its primary timing source.
- Quality of RES—If the timing source supports the reserved S1 byte, set the timing quality here. (Most timing sources do not use RES.) Qualities are displayed in descending quality order as ranges. For example, ST3 < RES < ST2 means the timing reference is higher than a Stratum 3 and lower than a Stratum 2.

Step 4 In the BITS Facilities section of the **General** subtab, complete the following information:

Note The BITS Facilities section sets the parameters for BITS1 and BITS2 timing references. Many of these settings are determined by the timing source manufacturer. If the equipment is timed through BITS Out, set the timing parameters to meet the requirements of the equipment.

- In State—If Timing Mode is set to External or Mixed, set In State for BITS 1 and/or BITS 2 to in service (IS), depending on whether one or both BITS input pin pairs on the backplane are connected to the external timing source. If Timing Mode is set to Line, set the In State to **OOS** (Out of Service).
- Out State—If equipment is connected to the node's BITS output pins on the backplane and you want to time the equipment from a node reference, set Out State for BITS 1 and/or BITS 2 to **IS**, depending on which BITS output pins are used for external equipment. If equipment is not attached to the BITS output pins, set the Out State to **OOS**.

- Coding—Set to the coding used by the BITS reference: **B8ZS** (binary 8-zero substitution) or **AMI** (alternate mark inversion).
- Framing—Set to the framing used by the BITS reference: **ESF** (Extended Superframe) or **SF(D4)** (Super Frame). SSM is not available with Super Frame.
- Sync Messaging—Check to enable SSM.
- AIS Threshold (Not applicable to the ONS 15600 SONET)—Sets the quality level where a node sends an alarm indication signal (AIS) from the BITS 1 Out and BITS 2 Out backplane pins. When a node times at or below the AIS threshold quality, an AIS is sent. This is used when SSM is disabled or when the frame is SF.
- LBO (Not applicable to the ONS 15600 SONET)—If you are timing an external device connected to the BITS Out pins, set the distance between the device and the NE. Options are 0-133 ft. (Cisco default), 134-266 ft., 267-399 ft., 400-533 ft., and 534-655 ft.

Step 5 In the **Reference List** subtab, complete the following information:

Note Reference lists define up to three timing references for the node and up to six BITS Out references. BITS Out references define the timing references used by equipment that can be attached to the node BITS Out pins on the backplane. If you attach equipment to BITS Out pins, you normally attach it to a node with Line mode because equipment near the External timing reference can be directly wired to the reference.

- NE References—Define up to three timing references (Ref-1, Ref-2, Ref-3). The node uses Reference 1 unless a failure occurs on that reference, in which case the node uses Reference 2. If that fails, the node uses Reference 3, which is typically set to Internal Clock. This is the Stratum 3 clock provided on the TCC+/TCC2 card. The options displayed depend on the Timing Mode setting:
  - Timing Mode set to External—Options are BITS1, BITS2, and Internal Clock.
  - Timing Mode set to Line—Options are the node's working OC-N cards (non-DWDM nodes), OSC cards (DWDM nodes), and Internal Clock. Select the cards and ports that are directly or indirectly connected to the node wired to the BITS source; that is, the node's trunk (span) cards. Set Reference 1 to the trunk card that is closest to the BITS source. For example, if slot 5 is connected to the node wired to the BITS source, select slot 5 as Reference 1.
  - Timing Mode set to Mixed—Both BITS and optical cards are available, which allows you to set a mixture of external BITS and OC-N trunk cards as timing references.
- BITS 1 Out/BITS 2 Out—Define the timing references for equipment wired to the BITS Out backplane pins. BITS 1 Out and BITS 2 Out are enabled when BITS 1 and BITS 2 facilities are put in service. If Timing Mode is set to external, choose the OC-N card used to set timing. If Timing Mode is set to Line, you can choose an OC-N card or choose NE reference to have BITS 1 out and/or BITS 2 Out follow the same timing reference as the NE.

Step 6 In the **Status** subtab, complete the following information:

- NE Clock
  - NE Reference—Set the NE timing reference to internal, BITS 1, or BITS 2.
  - Status—*Display only.* Displays the status of the NE clock.
  - Operations—Execute a switch on the NE timing reference.
- BITS 1 OUT
  - BITS 1 Out—Set the BITS 1 Out timing reference.
  - Status—*Display only.* Displays the status of the BITS 1 out timing reference.

  - Operations—Execute a switch on the BITS 1 out timing reference.
- BITS 2 OUT
  - BITS 2 Out—Set the BITS 2 Out timing reference.
  - Status—*Display only.* Displays the status of the BITS 2 out timing reference.
  - Operations—Execute a switch on the BITS 2 out timing reference.

Step 7 In the **Timing Report** subtab, you can view the timing status report summary for the node.

Step 8 Click **Apply**.

Note Refer to the relevant ONS 15310 CL, ONS 15310 MA, ONS 15327, ONS 15454, or ONS 15600 troubleshooting guide for timing-related alarms.

Setting Up Internal Timing for CTC-Based SONET NEs

If no BITS source is available, set up internal timing by timing all nodes in the ring from the internal clock of one node.

Caution Internal timing is Stratum 3 and not intended for permanent use. All nodes should be timed to a Stratum 2 or better primary reference source.

Complete the following steps to set up internal timing for CTC-based SONET NEs:

Step 1 Select an ONS 15310 CL, ONS 15310 MA SONET, ONS 15327, ONS 15454 SONET, or ONS 15600 SONET NE and choose **Configuration > NE Explorer**.

Step 2 In the node property pane, click the **Timing** tab. Fields shown depend on the NE that is selected.

Step 3 In the General Timing section of the **General** subtab, enter the following information:

- Timing Mode—Set to **External**.
- SSM Message Set—Set to **Generation 1**.
- Revertive—Not relevant for internal timing; the default setting (checked) is sufficient.
- Reversion Time—The default setting is sufficient.
- Quality of RES—Set to **RES=DUS**.

Step 4 In the BITS Facilities section of the **General** subtab, enter the following information:

- In State—Set BITS 1 and BITS 2 to **OOS**.
- Out State—Set BITS 1 and BITS 2 to **OOS**.
- Coding—Not relevant for internal timing. The default (B8ZS) is sufficient.
- Framing—Not relevant for internal timing. The default (ESF) is sufficient.
- Sync Messaging—Checked.
- AIS Threshold—Not available.
- LBO—Not relevant.

Step 5 In the **Reference List** subtab, enter the following information:

- NE References
  - Ref-1—Set to **Internal Clock**.
  - Ref-2—Set to **Internal Clock**.
  - Ref-3—Set to **Internal Clock**.
- BITS 1 Out/BITS 2 Out—Set to **None**.

Step 6 Click **Apply**.

Step 7 In the Domain Explorer tree, select the node that you set up in Step 1 through Step 6 and choose **Configuration > NE Explorer**.

Step 8 In the **Timing** tab, enter the same information that was entered in Step 3, except for the following:

- In the General Timing section of the **General** subtab, set the Timing Mode field to **Line**.
- In the NE References section of the **Reference List** subtab:
  - Ref-1—Set to the OC-N trunk (span) card (non-DWDM node) or OSC card (DWDM) with the closest connection to the node.
  - Ref-2—Set to the OC-N trunk (span) card (non-DWDM node) or OSC card (DWDM) with the next closest connection to the node.
  - Ref-3—Set to **Internal Clock**.

Step 9 Click **Apply**.

Step 10 Repeat Step 3 through Step 9 for each node in the ring that will be timed from the internal clock of the selected node.

Synchronization Settings for the ONS 15310 MA SDH, ONS 15454 SDH, and ONS 15600 SDH

SSM communicates information about the quality of the timing source. SSM messages are carried on the S1 byte of the SDH section overhead. These messages enable SDH devices to automatically select the highest quality timing reference and to avoid timing loops.

SSM messages are either Generation 1 or Generation 2. Generation 1 is the first and most widely deployed SSM message set. Generation 2 is a newer version. If you enable SSM for the ONS 15454 SDH, consult your timing reference documentation to determine which message set to use. The following table shows the SDH message set.

Table 5-20 SDH SSM Message Set

Message	Quality	Description
G811	1	Primary reference clock
STU	2	Synchronization traceability unknown
G812T	3	Transit node clock traceable
G812L	4	Local node clock traceable

Table 5-20 SDH SSM Message Set (continued)

Message	Quality	Description
SETS	5	Synchronous equipment
DUS	6	Do not use for timing synchronization

Note Alarms relating to PM collection indicate that the load on the system is high. Reduce the load on the system before proceeding.

Setting Up External or Line Timing for CTC-Based SDH NEs

Step 1 Select an ONS 15310 MA SDH, ONS 15454 SDH, or ONS 15600 SDH NE and choose **Configuration > NE Explorer**.

Step 2 In the node property pane, select the **Timing** tab. Fields shown depend on the NE that is selected.

Step 3 In the General Timing section of the **General** subtab, complete the following information:

- Timing Mode
  - For the ONS 15310 MA SDH and ONS 15454 SDH:

    Choose **External** if the ONS 15310 MA SDH or ONS 15454 SDH NE derives its timing from an MIC-C/T/P FMEC; choose **Line** if timing is derived from an STM-N card (non-DWDM node) or OSC card (DWDM node) that is optically connected to the timing node. A third option, **Mixed**, allows you to set external and line timing references.
  - For the ONS 15600 SDH:

    Choose **External** if the ONS 15600 SDH NE derives its timing from a BITS source wired to the backplane; choose **Line** if timing is derived from an STM-N card that is optionally connected to the timing node. A third option, **Mixed**, allows you to set external and line timing references.

Caution Because mixed timing may cause timing loops, Cisco does not recommend its use. Use this mode with care.

- Revertive—If checked, the NE reverts to a primary reference source after the conditions that caused it to switch to a secondary timing reference are corrected.
- Reversion Time—If Revertive is checked, indicate the amount of time the NE will wait before reverting to its primary timing source.
- SSM Message Set (Applicable to the ONS 15600 SDH)—Enabled only if T1 signal type is selected. Choose the message set level supported by the network.

Step 4 In the BITS Facilities section of the **General** subtab, complete the following information:

Note The BITS Facilities section sets the parameters for your BITS 1 and BITS 2 timing references. Many of these settings are determined by the timing source manufacturer. If equipment is timed through BITS Out, you can set timing parameters to meet the requirements of the equipment.

- Facility Type—Choose the facility type that applies to the signal supported in your market. For example, 64 KHz is used in Japan. E1, 2.048 MHz, and 64 KHz are physical signal modes used to transmit the external clock (from a GPS, for example) to BITS.
- In State—If Timing Mode is set to External or Mixed, set In State for BITS 1 and/or BITS 2 to in service (IS), depending whether one or both BITS input pin pairs on the backplane are connected to the external timing source. If Timing Mode is set to Line, set In State to Locked.
- Out State—If equipment is connected to the node's BITS output pins on the backplane and you want to time the equipment from a node reference, set Out State for BITS 1 and/or BITS 2 to IS, depending on which BITS output pins are used for external equipment. If equipment is not attached to the BITS output pins, set Out State to Locked.
- State (Applicable to the ONS 15600 SDH)—For nodes using external timing, set State to Unlocked.
- Coding—Choose the coding used by your BITS reference: **HDB3** or **AMI**. If you selected 2.048 MHz or 64 KHz, the coding option is disabled.
- Framing—Choose the framing used by your BITS reference: **unframed**, **FAS**, **FAS + CAS**, **FAS + CRC**, or **FAS + CAS + CRC**. If you selected 2.048 MHz or 64 KHz, the framing option is disabled.
- Sync Messaging—Select the check box to enable SSM. SSM is used to deliver clock quality. SSM options supported in SDH are G811, STU, G812T, G812L, SETS, DUS (ordered from high quality to low quality). If you selected 2.048 MHz, 64 KHz, or E1 with FAS, or if FAS + CAS framing is provisioned, the SSM option is disabled.
- AIS Threshold (Applicable to the ONS 15310 MA SDH and ONS 15454 SDH)—Sets the quality level at which a node sends an alarm indication signal (AIS) from the BITS 1 Out and BITS 2 Out FMEC connectors. When a node times at or below the AIS threshold quality, an AIS is raised. (The AIS threshold is used when SSM is disabled or framing is set to unframed, FAS, or FAS + CAS.)
- LBO (Applicable to the ONS 15310 MA SDH and ONS 15454 SDH)—Choose a BITS cable length. Line build out (LBO) relates to the BITS cable length.
- Cable Type (Applicable to the ONS 15600 SDH)—Choose 75 ohm or 120 ohm.
- Sa bit—Choose one of 5 Sa bits (**4**, **5**, **6**, **7**, or **8**). The Sa bit transmits the SSM message. If you selected 2.048 MHz or 64 KHz, the Sa bit option is disabled.

Step 5 In the **Reference List** subtab, complete the following information:

Note Reference lists define up to three timing references for the node and up to six BITS Out references. BITS Out references define the timing references used by equipment attached to the node's MIC-C/T/P FMEC Timing A Out and Timing B Out connectors. If you attach equipment to the Timing A Out or Timing B Out connector, you normally attach it to a node with line mode because equipment near the external timing reference can be directly wired to the reference.

- NE References—Allows you to define three timing references (Ref-1, Ref-2, Ref-3). The node uses Reference 1 unless a failure occurs on that reference, in which case the node uses Reference 2. If Reference 2 fails, the node uses Reference 3, which is typically set to Internal Clock. The internal clock is the Stratum 3 clock provided on the TCC2. The options displayed depend on the Timing Mode setting:
  - Timing Mode set to External—Options are BITS 1, BITS 2, and Internal Clock.
  - Timing Mode set to Line—For the ONS 15310 MA SDH and ONS 15454 SDH, options are the node's working OC-N cards (non-DWDM nodes), OSC cards (DWDM nodes), and Internal Clock. For the ONS 15600 SDH, options are Internal Clock and the node's STM-N ports, except for the ports that have been specified as protection ports in 1+1 groups (Linear Multiplex

Section Protection [LMSP] groups). Select the cards and ports that are directly or indirectly connected to the node wired to the BITS source; that is, select the node's trunk cards. Set Reference 1 to the trunk card that is closest to the BITS source. For example, if Slot 5 is connected to the node wired to the BITS source, select Slot 5 as Reference 1.

  - Timing Mode set to Mixed—Both BITS and optical cards are available, allowing you to set a mixture of external BITS and optical trunk (span) cards as timing references.

- BITS 1 Out/BITS 2 Out References (Applicable to the ONS 15310 MA SDH and ONS 15454 SDH)—Define the timing references for equipment connected to the Timing A Out or Timing B Out FMEC connector. Normally, Timing Out is used with line nodes, so the options displayed are the working optical cards. Timing A Out and Timing B Out are enabled as soon as BITS 1 and BITS 2 facilities are placed in service.

Step 6 In the **Status** subtab, complete the following information:

- NE Clock
  - NE Reference—Set the NE timing reference to internal, BITS 1, or BITS 2.
  - Status—*Display only.* Displays the status of the NE clock.
  - Operations—Execute a switch on the NE timing reference.
- BITS 1 OUT
  - BITS 1 Out—Set the BITS 1 out timing reference.
  - Status—*Display only.* Displays the status of the BITS 1 out timing reference.
  - Operations—Execute a switch on the BITS 1 out timing reference.
- BITS 2 OUT
  - BITS 2 Out—Set the BITS 2 out timing reference.
  - Status—*Display only.* Displays the status of the BITS 2 out timing reference.
  - Operations—Execute a switch on the BITS 2 out timing reference.

Step 7 In the **Timing Report** subtab, you can view the timing status report summary for the node.

Step 8 Click **Apply**.

Note Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* or *Cisco ONS 15600 SDH Troubleshooting Guide* for timing-related alarms.

Setting Up Internal Timing for CTC-Based SDH NEs

If no BITS source is available, you can set up internal timing by timing all nodes in the ring from the internal clock of one node.

Caution Internal timing is Stratum 3 and not intended for permanent use. All nodes should be timed to a Stratum 2 or better primary reference source.

Complete the following steps to set up internal timing for CTC-based SDH NEs:

Step 1 Select an ONS 15310 MA SDH, ONS 15454 SDH, or ONS 15600 SDH NE and choose **Configuration > NE Explorer**.

Step 2 In the node property pane, select the **Timing** tab.

Step 3 In the General Timing section of the **General** subtab, enter the following information:

- Timing Mode—Choose **External**.
- Revertive—Not applicable for internal timing; the default setting (checked) is sufficient.
- Reversion Time—Not applicable; leave unchanged.

Step 4 In the BITS Facilities section of the **General** subtab, enter the following information:

- Facility Type—Choose the facility type that applies to the signal supported in your market. For example, 64 KHz is used in Japan. E1, 2.048 MHz, and 64 KHz are physical signal modes used to transmit the external clock (from a GPS, for example) to BITS.
- In State—Set BITS 1 and BITS 2 to **Locked**.
- Out State—Set BITS 1 and BITS 2 to **Locked**.
- State (Applicable to the ONS 15600 SDH)—Set BITS 1 and BITS 2 to **Locked**.
- Coding—Not relevant for internal timing; the default is sufficient.
- Framing—Not relevant for internal timing; the default is sufficient.
- Sync Messaging—Checked automatically. SSM is used to deliver clock quality. SSM options supported in SDH are G811, STU, G812T, G812L, SETS, DUS (ordered from high quality to low quality). If you selected 2.048 MHz or 64 KHz, the SSM option is disabled.
- AIS Threshold—Not relevant for internal timing.
- LBO—Not relevant for internal timing.
- Sa bit—Not relevant for internal timing.

Step 5 In the **Reference List** subtab, enter the following information:

- NE References
  - Ref-1—Set to **Internal Clock**.
  - Ref-2—Set to **Internal Clock**.
  - Ref-3—Set to **Internal Clock**.
- BITS 1 Out/BITS 2 Out (Applicable to the ONS 15310 MA SDH and ONS 1545 SDH)—Set to **None**.

Step 6 Click **Apply**.

Step 7 In the Domain Explorer tree, select the node that you set up in Step 1 to Step 6 and choose **Configuration > NE Explorer**.

Step 8 In the **Timing** tab, complete the following:

- In the General Timing section of the **General** subtab:
  - Timing Mode—Set to **Line**.
  - Revertive—Not applicable for internal timing; the default setting is sufficient.
  - Reversion Time—Not applicable for internal timing; the default setting is sufficient.
- In the NE References section of the **Reference List** subtab:

- Ref-1—Set to the STM-N trunk card with the closest connection to the node.
- Ref-2—Set to the STM-N trunk card with the next closest connection to the node.
- Ref-3—Set to **Internal Clock**.

Step 9 Click **Apply**.

Step 10 Repeat Steps 7 through 9 for each node that will be timed by the node.

Configuring the ONS 15216

Step 1 In the Domain Explorer tree, select the ONS 15216 NE that will be configured and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool). The NE Explorer window displays configuration information for the selected ONS 15216 NE.

Step 2 Make any necessary changes to the fields in the properties pane that corresponds to the NE or its components. Click **Apply** to save the changes to the Prime Optical database and apply the changes to the NE.

Configuring the ONS 15305 Earlier than R3.0

Within Prime Optical, use Cisco Edge Craft to configure ONS 15305 NEs earlier than R3.0. (For the ONS 15305 R3.0, use the Prime Optical NE Explorer. See Configuring the ONS 15305 R3.0, ONS 15310 CL, ONS 15310 MA SONET, ONS 15310 MA SDH, ONS 15327, ONS 15454 SONET, and ONS 15454 SDH, page 5-39.) Select the ONS 15305 NE in the Domain Explorer tree and choose **Configuration > ONS 15305 > Launch Cisco Edge Craft**. Refer to the "Installing the Cisco Prime Optical Client and Cisco Edge Craft" chapter in the *Cisco Prime Optical 9.8 Installation Guide* for instructions on how to start Cisco Edge Craft.

Note To configure ONS 15305 NEs through Cisco Edge Craft, refer to *Cisco Edge Craft Software Guide*.

Configuring the ONS 15305 R3.0, ONS 15310 CL, ONS 15310 MA SONET, ONS 15310 MA SDH, ONS 15327, ONS 15454 SONET, and ONS 15454 SDH

You can use the Prime Optical NE Explorer, CTC, or TL1 to configure CTC-based NEs.

Launching the Prime Optical NE Explorer

Step 1 In the Domain Explorer tree, select the NE that will be configured and choose **Configuration > NE Explorer**. The NE Explorer window displays configuration information about the selected NE.

Step 2 Make any necessary changes to the fields in the properties pane that corresponds to the NE or its components. Click **Apply** to save the changes to the Prime Optical database and apply the changes to the NE.

Launching CTC

Only the latest CTC release is launched from Prime Optical, regardless of the NE release you selected. If you need to use other CTC releases, launch CTC from a web browser and connect directly to the NE that has the required CTC release.

Step 1 In the Domain Explorer tree, Subnetwork Explorer tree, or Network Map, select the NE that will be configured and choose **Configuration > CTC-Based SONET NEs** or **CTC-Based SDH NEs > Launch CTC**.

Step 2 The Launch CTC dialog box opens with the Username and Password fields filled in with the values contained in the Cisco Prime Optical Users table for that user. If the CTC Username value for that user is empty in the Cisco Prime Optical Users table, the fields in the Launch CTC dialog box are empty; enter the username and password.

Step 3 Check the **Enable Socks Server** check box to set the CTC DSS property (ctc.proxy.designatedgnes), which contains all of the GNEs present in the network partition. This feature speeds up network discovery and enables the cross-launch of CTC on all NEs that are not directly connected to the LAN.

Step 4 Click **OK**.

Launching TL1

In the Domain Explorer tree, Subnetwork Explorer tree, or Network Map, select the NE that will be configured and choose **Configuration > CTC-Based SONET NEs** or **CTC-Based SDH NEs > Launch TL1 Interface**. This launches a Telnet session directed at the TL1 port on the NE.

Provisioning an ONS 15305 R3.0, ONS 15310 CL, ONS 15310 MA SONET, ONS 15310 MA SDH, ONS 15327, ONS 15454 SONET, or ONS 15454 SDH Card Slot

You can use this procedure to reset, delete, or change a card.

Step 1 In the Domain Explorer tree, select the NE that will be configured and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the tree view or in the shelf view of the node properties pane, right-click an unprovisioned slot and choose **Add Card** from the shortcut menu.

Step 3 Select the type of card. The list of cards in the Add Card menu depends on the NE and the slot selected.

Step 4 Click **OK** in the confirmation dialog box.

It might take several minutes for the newly provisioned card to be added on the NE. During this time, it is possible to add additional cards on the same slot. However, only the first card added will be shown in the NE Explorer tree view and in the shelf view.

Resetting a Card

Step 1 In the Domain Explorer tree, select the NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the tree view or in the shelf view of the node properties pane, right-click the card that you want to reset and choose **Reset Card** from the shortcut menu.

Step 3 Click **OK** in the confirmation dialog box.

Deleting a Card

Step 1 In the Domain Explorer tree, select the NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the tree view or in the shelf view of the node properties pane, right-click the card that you want to delete and choose **Delete Card** from the shortcut menu.

Note For the ONS 15310 CL, ONS 15310 MA SONET, and ONS 15310 MA SDH, you cannot delete the CTX card.

Step 3 Click **OK** in the confirmation dialog box.

Changing a Card

Step 1 In the Domain Explorer tree, select the NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the tree view or in the shelf view of the node properties pane, right-click the card that you want to change and choose **Change Card** from the shortcut menu.

Note For the ONS 15310 CL, ONS 15310 MA SONET, and ONS 15310 MA SDH, you cannot change the CTX card.

Step 3 Select the type of the new card. The list of cards in the Change Card menu depends on the slot selected.

Step 4 Click **OK** in the confirmation dialog box.

Tip If you receive a mismatched equipment alarm (MEA) after changing a card, troubleshoot the MEA with the *Cisco ONS 15454 Troubleshooting Guide*.

Inserting an AIS-V on an STS-1 SD-P

Note This procedure does not apply to the ONS 15454 SDH.

Step 1 In the Domain Explorer tree, select the ONS 15305 R3.0, ONS 15310 CL, ONS 15310 MA SONET, ONS 15327, or ONS 15454 SONET NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Identification** tab.

Step 3 In the AIS-V Insertion on STS-1 Signal Degrade-Path area, complete the following substeps:

- **a.** Check the **Insert AIS-V on STS-1 SD-P** check box to insert an AIS-V on the STS-1 Signal Degrade-Path.
- **b.** Click **OK** in the warning message dialog box.
- **c.** Select the SD-P BER from the drop-down list.

Step 4 Click **Apply**.

Changing Secure Config Mode—ONS 15454 SONET or ONS 15454 SDH

The TCC2P card supports secure config mode. When the secure mode is ON, the NE has two IP addresses, one for the backplane and one for the front port. The front port IP address is used by the DCC-connected NEs. The secure config mode feature applies to the ONS 15454 SONET R5.0 and ONS 15454 SDH R5.0 and later.

The Secure Config Mode subtab allows you to configure the secure config mode. The fields shown depend on whether the NE is in secure mode. For example, the Backplane Ethernet Port values are displayed only when the NE is in secure mode.

Step 1 In the Domain Explorer tree, select the ONS 15454 SONET or ONS 15454 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the node properties pane, click the **Network** tab.

Step 3 Click the **Secure Config Mode** subtab.

Step 4 Click the **Change Mode** button. The Change Secure Mode dialog box opens.

Note The Change Mode button is enabled only if an active TCC2P card exists on the NE.

Step 5 Complete one of the following options, depending on your configuration:

- If you are changing the secure mode from secure to nonsecure, fill in the fields described in Table 5-21.
- If you are changing the secure mode from nonsecure to secure, fill in the fields described in Table 5-22.

Step 6 Click **OK**.

Table 5-21 Field Descriptions for the Change Secure Mode Dialog Box when the NE Is Secure

Field	Description
Node IP Address	
Backplane LAN Port	Click this radio button to use the IP address currently assigned to the backplane LAN port as the IP address of the NE in normal (nonsecure) mode.
TCC LAN Port	Click this radio button to use the IP address currently assigned to the TCC LAN port as the IP address of the NE in normal (nonsecure) mode.
New IP Address	Click this radio button to use neither the backplane nor the TCC LAN port IP address, but instead assign a completely new IP address to the NE.
IP Address	(Available only if New IP Address is selected) Enter the backplane IP address.
Net/Subnet Mask Length	(Available only if New IP Address is selected) Enter the mask length of the secure IP address. Use the up or down arrows to change the mask length.
Default Router	(Available only if New IP Address is selected) Enter the address of the default router for this NE.
Gateway Settings	
Enable Proxy Server on Port	If checked, the ONS 15454 SONET or ONS 15454 SDH serves as a proxy for connections between the Prime Optical server and NEs that are DCC-connected to the proxy NE. The Prime Optical server establishes connections to DCC-connected nodes through the proxy node. The Prime Optical server can connect to nodes that it cannot directly reach from the host on which it runs. The proxy server uses port number 1080. If unchecked, the node does not proxy.
End Network Element (ENE)	(Available only if Enable Proxy Server on Port is checked) Enables the node to proxy as an ENE.
Gateway Network Element (GNE)	(Available only if Enable Proxy Server on Port is checked) Enables the node to proxy as a GNE.
Proxy-only	(Available only if Enable Proxy Server on Port is checked) Enables proxy only.

Table 5-22 Field Descriptions for the Change Secure Mode Dialog Box when the NE Is Not Secure

Field	Description
TCC Ethernet Port	
IP Address	Enter the TCC Ethernet port IP address.
Net/Subnet Mask Length	Enter the mask length of the secure IP address. Use the up or down arrows to change the mask length.
Backplane Ethernet Port	
IP Address	Enter the backplane Ethernet port IP address.
Default Router	Enter the address of the default router for this NE.
Subnet Mask	Enter the subnet mask of the secure IP address.
Gateway Settings	
Enable Proxy Server on Port	If checked, the ONS 15454 SONET or ONS 15454 SDH serves as a proxy for connections between the Prime Optical server and NEs that are DCC-connected to the proxy NE. The Prime Optical server establishes connections to DCC-connected nodes through the proxy node. The Prime Optical server can connect to nodes that it cannot directly reach from the host on which it runs. The proxy server uses port number 1080. **Note** When you are changing the config mode to secure, you cannot disable proxy. If unchecked, the node does not proxy.
End Network Element (ENE)	(Available only if Enable Proxy Server on Port is checked) Enables the node to proxy as an ENE.
Gateway Network Element (GNE)	(Available only if Enable Proxy Server on Port is checked) Enables the node to proxy as a GNE.
Proxy-only	(Available only if Enable Proxy Server on Port is checked) Enables proxy only.

Configuring the ONS 15600 SONET and ONS 15600 SDH

You can use the Prime Optical NE Explorer or CTC to configure ONS 15600 SONET and ONS 15600 SDH NEs.

Launching the Prime Optical NE Explorer

Step 1 In the Domain Explorer tree, select the ONS 15600 SONET or ONS 15600 SDH NE that will be configured and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool). The NE Explorer window displays configuration information about the selected ONS 15600 SONET or ONS 15600 SDH NE.

Step 2 Make any necessary changes to the fields in the properties pane that corresponds to the NE or its components. Click **Apply** to save the changes to the Prime Optical database and apply the changes to the NE.

Launching CTC

See Launching CTC, page 5-40, which also applies to ONS 15600 SONET and ONS 15600 SDH NEs.

Resetting a Card

Step 1 In the Domain Explorer tree, select the ONS 15600 SONET or ONS 15600 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 Click the **Shelf View** tab.

Step 3 On the shelf graphic, right-click a card and select either **Hard Reset Card** or **Soft Reset Card** from the shortcut menu.

Step 4 Click **OK** in the confirmation message box.

Deleting a Card

Step 1 In the Domain Explorer tree, select the ONS 15600 SONET or ONS 15600 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the tree view or in the shelf view of the node properties pane, right-click the card that you want to delete and choose **Delete Card** from the shortcut menu.

Step 3 Click **OK** in the confirmation dialog box.

Changing a Card

Step 1 In the Domain Explorer tree, select the ONS 15600 SONET or ONS 15600 SDH NE and choose **Configuration > NE Explorer** (or click the **Open NE Explorer** tool).

Step 2 In the tree view or in the shelf view of the node properties pane, right-click the card that you want to change and choose **Change Card** from the shortcut menu.

Step 3 Select the type of the new card. The list of cards in the Change Card menu depends on the slot selected.

Step 4 Click **OK** in the confirmation dialog box.