



Turn Up Network

This chapter explains how to turn up and test a Cisco ONS 15454 dense wavelength division multiplexing (DWDM) network. For DWDM topology reference information and span loss tables, see [Chapter 18, “Network Reference.”](#)

There are two main DWDM network types: metro core, where the channel power is equalized and dispersion compensation is applied, and metro access, where the channels are not equalized and dispersion compensation is not applied. The DWDM network topologies supported are hubbed rings, multihubbed rings, meshed rings, linear configurations, and single-span links. The DWDM node types supported are hub, terminal, optical add/drop multiplexing (OADM), reconfigurable optical add/drop multiplexing (ROADM) anti-amplified spontaneous emissions (ASE), and line amplifier. For DWDM and hybrid node turn-up procedures, see [Chapter 3, “Turn Up a Node.”](#)



Note

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

Before You Begin

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

1. [NTP-G51 Verify DWDM Node Turn-Up, page 6-2](#)—Complete this procedure before beginning network turn-up.
2. [NTP-G52 Verify Node-to-Node Connections, page 6-3](#)—Complete this procedure next.
3. [NTP-G53 Set Up Timing, page 6-4](#)—Complete this procedure next.
4. [NTP-G54 Provision and Verify a DWDM Network, page 6-8](#)—Complete this procedure next.
5. [NTP-G56 Verify the OSNR, page 6-12](#)—Complete as needed.
6. [NTP-G57 Create a Logical Network Map, page 6-15](#)—Complete as needed.

NTP-G51 Verify DWDM Node Turn-Up

Purpose	This procedure verifies that each ONS 15454 is ready for DWDM network turn-up before adding nodes to a network. This procedure applies to all ROADM, OADM, and line amplifier nodes.
Tools/Equipment	None
Prerequisite Procedures	Chapter 3, “Turn Up a Node”
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

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- Step 1** Log into an ONS 15454 on the network that you will test. See the [“DLP-G46 Log into CTC” task on page 2-25](#). If you are already logged in, proceed to Step 2.
- Step 2** Click the **Alarms** tab.
- Verify that the alarm filter is not turned on. See the [“DLP-G128 Disable Alarm Filtering” task on page 8-28](#) as necessary.
 - Verify that no equipment (EQPT) alarms appear. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.
- Step 3** Verify that the software version shown in the node view status area matches your site plan. (The status area is located to the left of the shelf graphic.) If the software is not the correct version, install the correct version from the ONS 15454 software CD. Upgrade procedures are located in the release-specific software upgrade document. Follow the upgrade procedures appropriate to the software currently installed on the node. TCC2/TCC2P cards can also be ordered with the latest software release.
- Step 4** Click the **Provisioning > General** tabs. Verify that all general node information settings are correct according to documentation provided by the network administrator. If not, see the [“NTP-G80 Change Node Management Information” procedure on page 10-6](#).
- Step 5** Click the **Provisioning > Network** tabs. Ensure that the IP settings and other Cisco Transport Controller (CTC) network access information is correct according to documentation provided by the network administrator. If not, see the [“NTP-G81 Change CTC Network Access” procedure on page 10-18](#).
- Step 6** Click the **Provisioning > Protection** tabs. Verify that all required protection groups have been created according to documentation provided by the network administrator. If not, see the [“NTP-G33 Create a Y-Cable Protection Group” procedure on page 5-10](#) or the [“NTP-G83 Modify or Delete Card Protection Settings” procedure on page 10-31](#).
- Step 7** Click the **Provisioning > Security** tabs. Verify that all users have been created and that their security levels are correct according to documentation provided by the network administrator. If not, see the [“NTP-G88 Modify Users and Change Security” procedure on page 10-45](#).
- Step 8** If Simple Network Management Protocol (SNMP) is provisioned on the node, click the **Provisioning > SNMP** tabs. Verify that all SNMP settings are correct according to documentation provided by the network administrator. If not, see the [“NTP-G89 Change SNMP Settings” procedure on page 10-61](#).
- Step 9** Repeat this procedure at each node in the network.
- Stop. You have completed this procedure.**
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NTP-G52 Verify Node-to-Node Connections

Purpose	This procedure verifies optical service channel (OSC) terminations between nodes and checks span attenuation. This procedure applies to all ROADMs, OADM, and line amplifier locations.
Tools/Equipment	None
Prerequisite Procedures	NTP-G51 Verify DWDM Node Turn-Up, page 6-2
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

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- Step 1** Check to see if fiber is connected to the OPT-BST or OSC-CSM LINE RX and TX ports. If yes, continue with [Step 2](#). If not, complete the following tasks:
- Clean the fiber using the “[NTP-G115 Clean Fiber Connectors](#)” procedure on page 13-25.
 - Install the fiber using the “[DLP-G65 Install Fiber-Optic Cables for OSC Link Terminations Between Two Adjacent Nodes](#)” task on page 3-51.
- Step 2** Verify the network fiber connections:
- The east Line TX ports connect to the west Line RX ports of the adjacent node.
 - The west Line RX ports connect to the east Line TX ports of the adjacent node.
 - The west Line TX ports connect to the east Line RX ports of the adjacent node.
 - The east Line RX ports connect to the west Line TX ports of the adjacent node.
- Step 3** Complete the “[DLP-G46 Log into CTC](#)” task on page 2-25 at a network node.
- Step 4** Click the **Provisioning > Comm Channels > OSC** tabs. Verify that OSC terminations were created for the east and west OSC-CSM or OSCM cards and that the port state is In-Service and Normal (IS-NR [ANSI])/Unlocked-enabled (ETSI). If so, continue with [Step 5](#). If OSC terminations are not created, complete the “[NTP-G38 Provision OSC Terminations](#)” procedure on page 3-84.
- Step 5** Complete the “[NTP-G76 Verify Optical Span Loss Using CTC](#)” procedure on page 10-2. If the measured span loss is within the minimum and maximum expected span loss values, continue with [Step 6](#). If not, clean the fiber connected to the OPT-BST or OSC-CSM on both ends of the span, then repeat the “[NTP-G76 Verify Optical Span Loss Using CTC](#)” task on page 10-2. If the span loss is within the minimum and maximum expected span loss values, continue with [Step 6](#). If not, contact your next level of support.
- Step 6** Repeat Steps [2](#) through [5](#) at each network node.
- Stop. You have completed this procedure.**
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NTP-G53 Set Up Timing

Purpose	This procedure provisions the ONS 15454 timing.
Tools/Equipment	None
Prerequisite Procedures	NTP-G51 Verify DWDM Node Turn-Up, page 6-2
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

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- Step 1** Complete the “[DLP-G46 Log into CTC](#)” task on page 2-25 at the node where you will set up timing. If you are already logged in, continue with [Step 2](#).
- Step 2** Complete the “[DLP-G95 Set Up External or Line Timing](#)” task on page 6-4 if an external building integrated timing supply (BITS) source is available. This is the common ONS 15454 timing setup procedure.
- Step 3** If an external BITS source is not available, complete the “[DLP-G96 Set Up Internal Timing](#)” task on page 6-7. This task can only provide Stratum 3 timing.
- Step 4** Repeat this procedure at each node in the network.
- Stop. You have completed this procedure.**
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DLP-G95 Set Up External or Line Timing

Purpose	This task defines the ONS 15454 timing source (external or line).
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-25
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

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- Step 1** In node view, click the **Provisioning > Timing > General** tabs.
- Step 2** In the General Timing area, complete the following information:
- Timing Mode—Choose **External** if the ONS 15454 derives its timing from a BITS source wired to the backplane pins (ANSI) or a MIC-C/T/P FMEC (ETSI); choose **Line** if timing is derived from an OSC-CSM or OSCM card that is optically connected to the timing node. A third option, Mixed, allows you to set external and line timing references.



Note Because Mixed timing might cause timing loops, Cisco does not recommend its use. Use this mode with care.

- **SSM Message Set**—For DWDM nodes, choose the Generation 2 synchronization status messaging (SSM) option. Generation 1 is used only by SONET or SDH ONS 15454s that are connected to equipment that does not support Generation 2.
- **Quality of RES**—If your 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 that the timing reference is higher than a Stratum 3 and lower than a Stratum 2. See [Chapter 20, “Security Reference”](#) for more information about SSM, including definitions of the SONET timing levels.
- **Revertive**—Select this check box if you want the ONS 15454 to revert to a primary reference source after the conditions that caused it to switch to a secondary timing reference are corrected.
- **Revertive Time**—If Revertive is checked, choose the amount of time that the ONS 15454 will wait before reverting to its primary timing source. Five minutes is the default.

Step 3 In the Reference Lists area, complete the following information:



Note

Reference Lists defines 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's BITS Out pins on the backplane (ANSI) or FMEC (ETSI). 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 Reference**—Allows you to define three timing references (Ref 1, Ref 2, Ref 3). The node uses Reference 1 unless a failure occurs to 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. Reference 3 is the Stratum 3 clock provided on the TCC2/TCC2P card. The options displayed depend on the Timing Mode setting.
 - If the Timing Mode is set to External, your options are BITS-1, BITS-2, and Internal Clock.
 - If the Timing Mode is set to Line, your options are the node's working OSCM cards, OSC-CSM cards, muxponder (MXP) cards, and Internal Clock. Choose the cards/ports that are directly or indirectly connected to the node wired to the BITS source. Set Reference 1 to the card that is closest to the BITS source. For example, if Slot 5 is connected to the node wired to the BITS source, choose Slot 5 as Reference 1.
 - If the Timing Mode is set to Mixed, both BITS references and OSC or MXP cards are available, allowing you to set a mixture of external BITS clocks and OSC or MXP cards as timing references.
- **BITS-1 Out/BITS-2 Out**—Sets the timing references for equipment wired to the BITS Out backplane (ANSI) or FMEC (ETSI) pins. BITS-1 Out and BITS-2 Out are enabled when BITS-1 Out and BITS-2 Out facilities are put in service. If Timing Mode is set to external, choose the OSC or MXP card used to set the timing. If Timing Mode is set to Line, you can choose an OSC or MXP card or choose NE Reference to have the BITS-1 Out and/or BITS-2 Out follow the same timing references as the network element (NE).



Note

All MXP card client ports are available for timing regardless of the card's termination mode. MXP trunk ports can be a timing reference when ITU-T G.709 is set to OFF and the Termination Mode is set to LINE.

Step 4 Click **Apply**.

Step 5 Click the **BITS Facilities** tab.

Step 6 In the BITS Facilities area, 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.

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

Step 7 If the BITS In State for BITS-1 and BITS-2 is set to OOS, continue with [Step 8](#). If the BITS In State is set to IS for either BITS-1 or BITS-2, complete the following information:

- **Coding**—Set to the coding used by your BITS reference, either B8ZS (binary 8-zero substitution) or AMI (alternate mark inversion).
- **Framing**—Set to the framing used by your BITS reference, either ESF (Extended Super Frame) or SF (D4) (Super Frame).
- **Sync Messaging**—Check to enable SSM. SSM is not available if Framing is set to SF (D4).
- **AIS Threshold**—If SSM is disabled or SF (D4) is used, set the quality level at which a node sends an alarm indication signal (AIS) from the BITS-1 Out and BITS-2 Out backplane (ANSI) or FMEC (ETSI) pins. An AIS is raised when the optical source for the BITS reference falls to or below the SSM quality level defined in this field.
- **LBO**—If you are timing an external device connected to the BITS Out pins, set the distance between the device and the ONS 15454. Options are: 0-134 ft. (default), 124-266 ft., 267-399 ft., 400-533 ft., and 534-655 ft. Line build out (LBO) relates to the BITS cable length.

Step 8 Click **Apply**.



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

Step 9 Return to your originating procedure (NTP).

DLP-G96 Set Up Internal Timing

Purpose	This task sets up internal timing (Stratum 3) for an ONS 15454.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-25
Required/As Needed	As needed (use only if a BITS source is not available)
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher



Caution

Internal timing is Stratum 3 and is not intended for permanent use. All ONS 15454 SONET or SDH nodes should be timed to a Stratum 2 or better primary reference source. Internal timing is appropriate for DWDM nodes.

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- Step 1** In node view, click the **Provisioning > Timing > General** tabs.
- Step 2** In the General Timing area, enter the following:
- Timing Mode—Set to **External**.
 - SSM Message Set—Set to **Generation 1**.
 - Quality of RES—Does not apply to internal timing.
 - Revertive—Does not apply to internal timing.
 - Revertive Time—Does not apply to internal timing.
- Step 3** In the Reference Lists area, enter the following information:
- NE Reference
 - 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 4** Click **Apply**.
- Step 5** Click the **BITS Facilities** tab.
- Step 6** In the BITS Facilities area, change the BITS In State and BITS Out State to **OOS** for BITS 1 and BITS 2. Disregard the other BITS Facilities settings; they are not relevant to internal timing.
- Step 7** Click **Apply**.
- Step 8** Return to your originating procedure (NTP).
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NTP-G54 Provision and Verify a DWDM Network

Purpose	This procedure verifies the performance of all cable connections and cards in a network topology. You can also use this procedure to troubleshoot any problems with DWDM network setup.
Tools/Equipment	Test set or protocol analyzer Cisco MetroPlanner Traffic Matrix
Prerequisite Procedures	DLP-G277 Provision a Multirate PPM, page 5-3 DLP-G278 Provision the Optical Line Rate, page 5-6 NTP-G96 Modify Line Settings and PM Parameter Thresholds for TXP_MR_10G and TXP_MR_10E Cards, page 5-12 NTP-G97 Modify Line Settings and PM Parameter Thresholds for MXP_2.5G_10G and MXP_2.5G_10E Cards, page 5-31 NTP-G98 Modify Line Settings and PM Parameter Thresholds for TXP_MR_2.5G and TXPP_MR_2.5G Cards, page 5-48 NTP-G99 Modify Line Settings and PM Parameter Thresholds for MXP_MR_2.5G and MXPP_MR_2.5G Cards, page 5-65
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

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- Step 1** Complete the [“DLP-G46 Log into CTC” task on page 2-25](#) to log into an ONS 15454 on the network.
- Step 2** Click the **Alarms** tab:
- Verify that the alarm filter is not turned on. See the [“DLP-G128 Disable Alarm Filtering” task on page 8-28](#) as necessary.
 - Verify that no equipment (EQPT) alarms appear. If equipment failure alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* or the *Cisco ONS 15454 SDH Troubleshooting Guide* for procedures.
- Step 3** Using the Cisco MetroPlanner Traffic Matrix (see [Table 3-1 on page 3-3](#)) for your site, identify the first channel (ITU wavelength) to be provisioned. Use the transponder (TXP), MXP, or line card that corresponds to the selected wavelength.
- Step 4** As needed, complete the [“DLP-G99 Create a Provisionable Patchcord” task on page 6-11](#). This is an optional step requiring data communications channel (DCC) connectivity between the node and subtended client shelf or generic communications channel (GCC) connectivity between the TXPs.
- Step 5** Create the optical channels at all sites according to the Cisco MetroPlanner Traffic Matrix. Complete the [“DLP-G105 Provision DWDM Optical Channel Network Connections” task on page 7-10](#).


Note

Every time a channel is created on the DWDM network, the amplifiers automatically calculate the optical output power to maintain a constant power level on each channel. Automatic power control (APC) also starts every 60 minutes. If the span length changes, APC modifies amplifier gains and express variable optical attenuation (VOA). For more information about APC, see the [“18.4 Automatic Power Control” section on page 18-18](#).

- Step 6** Select one of the nodes and go to node view.

Step 7 If an OPT-PRE is installed, complete the following steps. If not, continue with [Step 8](#).

- a. Display the OPT-PRE card in card view.
- b. Click the **Provisioning > Opt.Ampli.Line > Parameters** tabs.
- c. Locate the Port 2 Signal Output Power. Verify that this value is equal to or higher than the Channel Power Ref value, which you can view by scrolling to the right. If so, continue with [Step d](#). If the value is lower, contact your next level of support.



Note If the OPT-PRE is not carrying traffic, the values will not match.

- d. Repeat Steps [a](#) through [c](#) for the second OPT-PRE, if one is installed. If not, continue with [Step 8](#).

Step 8 If an OPT-BST is installed, complete the following steps. If not, continue with [Step 9](#).

- a. Display the OPT-BST card in card view.
- b. Click the **Provisioning > Opt.Ampli.Line > Parameters** tabs.
- c. Locate the Port 6 Signal Output Power. Verify that this value is equal to or higher than the Channel Power Ref value, which you can view by scrolling to the right. If so, continue with [Step d](#). If the value is lower, contact your next level of support.



Note If the OPT-BST is not carrying traffic, the values will not match.

- d. Repeat Steps [a](#) through [c](#) for the second OPT-BST, if one is installed. If not, continue with [Step 9](#).

Step 9 If the node is a fixed OADM with AD-xC-xx.x or AD-xB-xx.x cards installed, and it has a circuit that is carrying traffic for the first time, complete one of the following procedures. If not, continue with [Step 10](#).

- If the circuit is terminated inside the node, change to node view (single-node mode) or multishelf view (multishelf mode) and click the **Provisioning > WDM-ANS > Provisioning** tabs. In the Selector area, click the **West Pin > Pin AD Stage** parameters. Verify that the value matches the value shown in the COM RX port of the first OADM card in your circuit heading west to east, ± 2 dB. If the values are outside of the error margins, contact your next level of support.
- If the circuit passes through the node, change to node view (single-node mode) or multishelf view (multishelf mode) and click the **Provisioning > WDM-ANS > Provisioning** tabs. Click the **West Pin > Pin AD Stage** parameters. Verify that the value matches the value shown in the COM RX port for the first OADM card in your circuit heading west to east, ± 2 dB. Click **East Pin** and then **Port AD Stage**. Verify that the value matches the value shown in the COM TX port for the first OADM card in your circuit heading west to east, ± 1 dB. If the values are outside of the ± 1 dB error margins, contact your next level of support.
- If the circuit starts from the node, change to node view (single-node mode) or multishelf view (multishelf mode) and click the **Provisioning > WDM-ANS > Provisioning** tabs. Click the **East Pin** and then the **Pin AD Stage** parameters. Verify that the value matches the value shown in the COM TX port for the first OADM card in your circuit heading west to east, ± 1 dB. If the values are outside of the error margins, contact your next level of support.

Step 10 Check the received power range:

- a. Navigate to the node where the first TXP, MXP, or line card is installed.
- b. Display the TXP, MXP, or line card in card view.
- c. Complete the “[DLP-G136 Clear Selected PM Counts](#)” task on page 9-7.
- d. Click the **Performance > Optics PM** tabs.

- e. Record the values shown in the RX Optical Pwr field.
- f. Click the **Provisioning > Optics Thresholds** tabs.
- g. Verify that the value in Step e falls between the values shown for the RX Power High and RX Power Low. If so, continue with [Step 11](#). If not, complete one of the following.
 - Power lower than range—Clean the trunk fiber at the patch panel and on the TXP or MXP. Repeat Steps e through g. If the power is still too low, contact your next level of support.
 - Power higher than range—Add attenuation to the fiber and repeat Steps e through g.

Step 11 Perform a short-term bit error rate (BER) test:

- a. Complete the “[DLP-G136 Clear Selected PM Counts](#)” task on page 9-7 for the TXP, MXP, or line card.
- b. Display the TXP, MXP, or line card in card view.
- c. Click the **Performance > Payload PM** tabs, or, if OTN is provisioned, the **Performance > OTN PM** tabs.
- d. Perform a short-term BER test using a test signal from a test set or protocol analyzer.
- e. Monitor the payload performance monitoring (PM) for at least 10 minutes for errors.



Note

To see an accurate PM count, the BER test results must be consistent with the transmitted bit rate for at least 10 minutes.



Note

For information about using a test set or protocol analyzer, refer to the test set or protocol analyzer user guide.

Step 12 Repeat Steps 6 through 11 for all sites that have add/drop traffic.

Step 13 If a node fails any test, verify correct setup and configuration and then repeat the test. If the test fails again, refer to the next level of support.

After all tests are successfully completed and no alarms exist in the network, the network is ready for service.

Stop. You have completed this procedure.

DLP-G99 Create a Provisionable Patchcord

Purpose	This task creates a provisionable patchcord, also called a virtual link. They appear as dashed lines in CTC network view. For the specific situations in which a patchcord is necessary, see the “22.3 Provisionable Patchcords” section on page 22-21 .
Tools/Equipment	OC-N, TXP, MXP, OADM, MUX, and DMX cards
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-25
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher


Note

This task requires DCC connectivity between the node and the subtended client shelves, or GCC connectivity between the TXPs.


Note

An optical port requires two patchcords when the remote end is Y-cable protected or is an add/drop multiplexer or multiplexer/demultiplexer port.

- Step 1** In node view, click the **Provisioning > Comm Channels > Provisionable Patchcords** tabs. If you are in network view, click the **Provisioning > Provisionable Patchcords** tabs.
- Step 2** Click **Create**. The Provisionable Patchcord dialog box appears.
- Step 3** In the Origination Node area, complete the following:
- If you are in node view, the Origination Node defaults to the current node. If you are in network view, click the desired origination node from the drop-down list.
 - Type a patchcord identifier (0 through 32767) in the TX and RX ID fields.
 - Click the desired origination slot/port from the list of available slots/ports.
- Step 4** In the Termination Node area, complete the following:
- Click the desired termination node from the drop-down list. If the remote node has not previously been discovered by CTC but is accessible by CTC, type the name of the remote node.
 - Type a patchcord identifier (0 through 32767) in the TX and RX ID fields. The origination and termination IDs must be different if the patchcord is set up between two cards on the same node.
 - Click the desired termination slot/port from the list of available slots/ports. The origination port and the termination port must be different.
- Step 5** If you need to provision transmit (Tx) and receive (Rx) separately for multiplexer/demultiplexer cards, check the **Separate Tx/Rx** check box. If not, continue with [Step 6](#). The origination and termination TX ports are already provisioned. Complete the following to provision the RX ports:
- In the Origination Node area, type a patchcord identifier (0 through 32767) in the RX ID field. The origination TX and RX IDs and the termination TX and RX IDs must be different.
 - Click the desired origination slot/port from the list of available slots/ports.
 - In the Termination Node area, type a patchcord identifier (0 through 32767) in the RX ID field. The origination TX and RX IDs and the termination TX and RX IDs must be different.

- d. Click the desired termination slot/port from the list of available slots/ports.
- Step 6** Click **OK**.
- Step 7** If you provisioned a patchcord on a port in a 1+1 protection group, a dialog box appears to ask if you would like to provision the peer patchcord. Click **Yes**. Repeat Steps 3 through 6.
- Step 8** Return to your originating procedure (NTP).
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NTP-G56 Verify the OSNR

Purpose	This procedure verifies the optical signal-to-noise ratio (OSNR). The OSNR is the ratio between the signal power level and the noise power level.
Tools/Equipment	Optical spectrum analyzer
Prerequisite Procedures	DLP-G46 Log into CTC, page 2-25
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

- Step 1** Complete the “[DLP-G46 Log into CTC](#)” task on page 2-25 at an ONS 15454 on the network.
- Step 2** Using an optical spectrum analyzer, check the received OSNR for each transmitted channel on both ends of the span. Identify the last OSC-CSM, OPT-PRE, or OPT-BST MON port that the channel passes through before the channel is dropped. If OPT-PRE cards are installed with an OPT-BST or OSC-CSM card, use the OPT-PRE MON port.



Note For OSNR values for each card class, refer to [Chapter 16, “Card Reference.”](#)

- Step 3** If the OSNR is too low, check the following, depending on your node configuration:



Note The purpose of this step is not to improve the signal-to-noise ratio (SNR), but to match the per-channel power level within the RX port power range.

- Check the fiber connections between the OPT-BST or OSC-CSM and the OPT-PRE amplifier. If needed, clean the connectors. See the “[NTP-G115 Clean Fiber Connectors](#)” procedure on page 13-25.
- On the near-end OPT-BST amplifier, check the equalization of the added channels at the monitor output.
- On the OPT-PRE amplifier, check the output power on both COM TX and DC TX ports.
- On the far-end OPT-PRE amplifier, check the amplifier gain tilt at the monitor output.

If the OSNR is still too low, contact your next level of support.

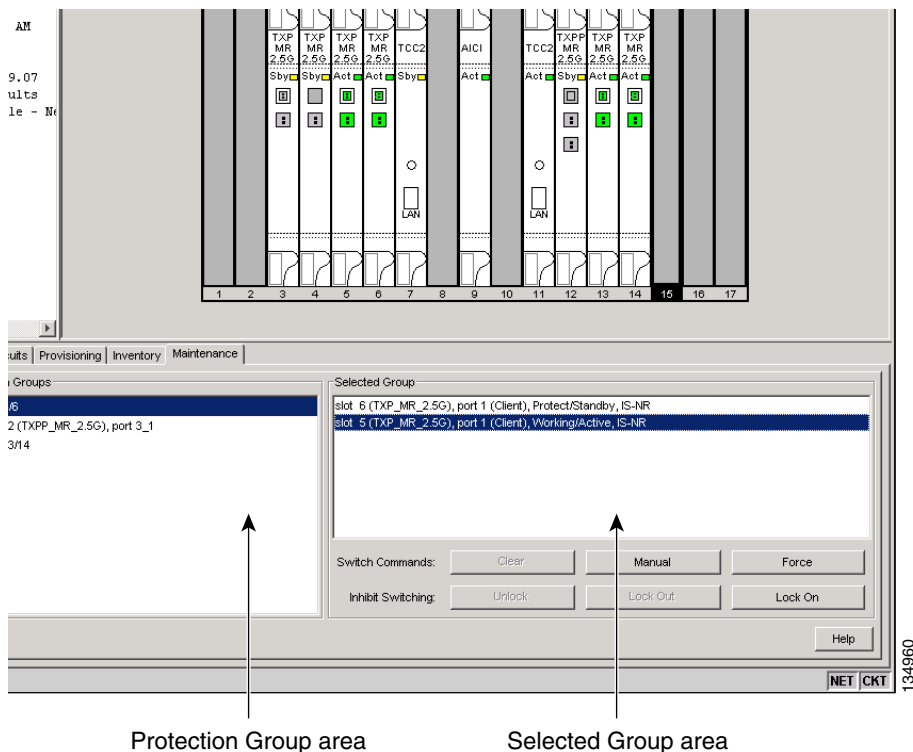
- Step 4** Repeat Steps 2 and 3 for all traffic in the network.

Stop. You have completed this procedure.

NTP-G142 Perform a Protection Switch Test

Purpose	This procedure tests the optical path, client transponders, and Y-cable protection groups in your system for proper operation. The test signals can be generated by either the actual client device or a test set, whichever is available. Cisco recommends that you repeat this test at each node in the network where protection group traffic is dropped.
Tools/Equipment	A list of protection groups. This information is provided in the Cisco MetroPlanner Traffic Matrix. A test set or actual client device that provides the required payload for the circuits that are provisioned.
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite; personnel are required to be on site at each end of the circuit under test.
Security Level	Provisioning or higher

-
- Step 1** Complete the [“DLP-G46 Log into CTC” task on page 2-25](#) at an ONS 15454 on the network.
- Step 2** Identify the Y-cable circuit to be tested by viewing the Traffic Matrix for your site. Locate the transponders in the ONS 15454 node that will be used for the protection group.
- Step 3** Verify that the Y-cable protection group is provisioned:
- In node view, click the **Provisioning > Protection** tabs.
 - In the Protect and Working areas, confirm the correct transponders are in the Y-cable protection group by viewing the slot number and card type.
 - If the required protection group is not provisioned, stop and perform [“NTP-G33 Create a Y-Cable Protection Group” procedure on page 5-10](#). Otherwise continue with [Step 4](#).
- Step 4** Repeat [Step 3](#) for each Y-cable protection group at this node. When all protection groups are verified, proceed to [Step 5](#).
- Step 5** Physically connect the transmitter of the client or test set to either Port 10 or Port 12 of the Y-cable module protecting the circuit under test. (See [Table 3-4 on page 3-79](#) and [Table 3-5 on page 3-80](#).)
- Step 6** If you connected the transmitter to Port 10, connect the client or test set receiver to Port 5 on the Y-cable module. If not, connect the client or test set receiver to Port 11 of the Y-cable module.
- Step 7** At the far-end site for the circuit under test, physically loop the Y-cable module as follows:
- If this is the first client on the Y-cable module, loop Port 10 to Port 5 on the far-end Y-cable module.
 - If this is the second client on the Y-cable module, loop Ports 11 and 12 on the far-end Y-cable module.
- Step 8** At the near-end site for the circuit under test, place the client device or test set into service and begin transmitting the required payload.
- Step 9** In CTC, display the near-end site in node view.
- Step 10** Click the **Maintenance > Protection** tabs ([Figure 6-1](#)).

Figure 6-1 Maintenance > Protection Tabs

Protection Group area

Selected Group area

- Step 11** In the Protection Groups area, highlight the protection group to be tested.
- Step 12** In the Selected Group area, identify the slot that is Active and the slot that is Standby.
- Step 13** Verify that the LED display on the physical cards in the shelf match the following:
- For the Active TXP card, record the slot number: _____. Verify the port LEDs are as follows:
 - DWDM port is green.
 - Client port is green.
 - For the Standby TXP card, record the slot number: _____. Verify port LEDs are as follows:
 - DWDM Port is green.
 - Client Port is not illuminated.
- Step 14** In the Selected Group area, highlight the Active transponder slot.
- Step 15** From the Switch Commands area below the Selected Group area, click **Manual**, then click **YES**.
- Step 16** From the Selected Group area, record the following information and verify the active and standby transponder slots are the opposite of [Step 13](#).
- Active TXP card slot number: _____
 - Standby TXP card slot number: _____
- Step 17** Verify that the LED displays on the physical cards in the shelf match the following:
- For the Active transponder slot LEDs:
 - DWDM port is green.
 - Client port is green.

b. For the Standby transponder slot LEDs:

- DWDM Port is green.
- Client Port is not illuminated.

Step 18 Confirm that the client or test set at the local site is operating normally with no alarms. If the test set is reporting active alarms, contact your next level of support.



Note It is normal to see a traffic hit on the test set during a protection switch.

Step 19 From the Switch Commands area below the Selected Group area, click **Clear**, then click **YES** to return the protection group to the original state.

Step 20 Repeat Steps 5 through 19 for each protection group at your site.

Stop. You have completed this procedure.

NTP-G57 Create a Logical Network Map

Purpose	This procedure allows a Superuser to create a consistent network view for all nodes on the network.
Tools	None
Prerequisite Procedures	This procedure assumes that network turn-up is complete.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Superuser

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

Step 2 From the View menu, choose **Go to Network View**.

Step 3 Change the position of the nodes in the network view according to your site plan.

- a. Click a node to select it, then press the **Ctrl** key while you drag and drop the node icon to a new location.
- b. Repeat Step a for each node you need to position.

Step 4 On the network view map, right-click and choose **Save Node Position** from the shortcut menu.

Step 5 Click **Yes** in the Save Node Position dialog box.

CTC opens a progress bar and saves the new node positions.

**Note**

Retrieve, Provisioning, and Maintenance users can move nodes on the network map, but only Superusers can save new network map configurations. To restore the view to a previously saved version of the network map, right-click the network view map and choose **Reset Node Position**.

Stop. You have completed this procedure.
