



Add and Remove Nodes



Note

The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This chapter explains how to add and remove Cisco ONS 15454 nodes from bidirectional line switched rings (BLSRs) and path protection configurations.

Before You Begin

Before performing any of the following procedures, complete the [“NTP-A195 Document Existing Provisioning” procedure on page 7-2](#). Also investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 Troubleshooting Guide* as necessary.

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

1. [NTP-A102 Add a BLSR Node, page 14-2](#)—Complete as needed.
2. [NTP-A213 Remove a BLSR Node, page 14-10](#)—Complete as needed.
3. [NTP-A105 Add a Path Protection Configuration Node, page 14-14](#)—Complete as needed.
4. [NTP-A106 Remove a Path Protection Configuration Node, page 14-16](#)—Complete as needed.

NTP-A102 Add a BLSR Node

Purpose	Use this procedure to expand a BLSR by adding a node.
Tools/Equipment	Fiber for new node connections
Prerequisite Procedures	Cards must be installed and node turn-up procedures completed on the node that will be added to the BLSR. See Chapter 2, “Install Cards and Fiber-Optic Cable,” and Chapter 4, “Turn Up Node.”
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher


Caution

Adding a BLSR node can be service affecting and should be performed during a maintenance window.

Step 1

Draw a diagram of the BLSR where you will add the node. In the diagram, identify the east and west BLSR OC-N trunk (span) cards that will connect to the new node. This information is essential to complete this procedure without error. [Figure 14-1](#) shows a drawing of a three-node, two-fiber BLSR that uses Slots 5 and 12 for the BLSR trunk cards. The dashed arrow shows the new fiber connections that will be made to add the fourth node to the BLSR.

Figure 14-1 Three-Node, Two-Fiber BLSR Before a Fourth Node Is Added

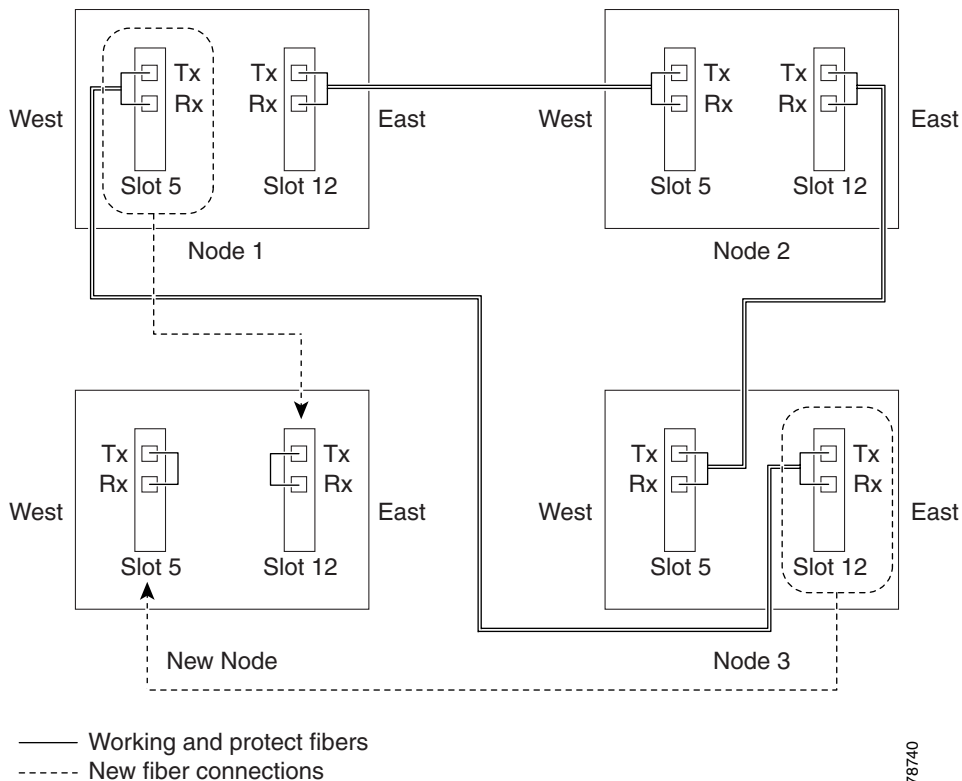
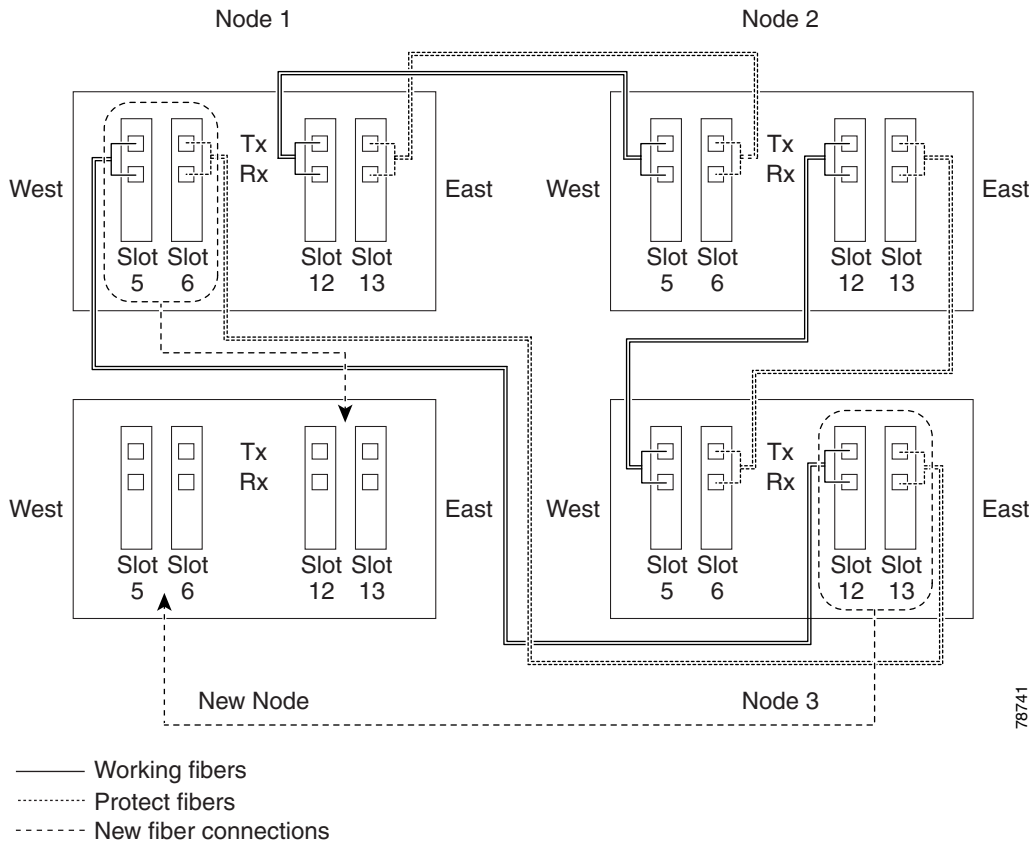


Figure 14-2 shows a sample drawing of a four-fiber BLSR. The dashed arrow shows the new fiber connections that will be made to add the fourth node. For four-fiber BLSRs, two fiber sets will be reconnected, the working fiber and the protect fiber.

Figure 14-2 Three-Node, Four-Fiber BLSR Before a Fourth Node is Added



- Step 2** Verify the card installation on the new node using the “[NTP-A24 Verify Card Installation](#)” procedure on page 4-2. Verify that the OC-N cards that will be the BLSR trunk cards match the BLSR optical rate. For example, if the BLSR is OC-48, the new node must have OC-48 cards installed. If the OC-N cards are not installed or the optical rates do not match the BLSR, complete the “[NTP-A16 Install the Optical Cards](#)” procedure on page 2-13.
- Step 3** Verify that fiber is available to connect the new node to the existing nodes. Refer to the diagram drawn in [Step 1](#).
- Step 4** Complete the “[NTP-A35 Verify Node Turn Up](#)” procedure on page 5-2. In order to have CTC visibility to the new node after it is added, you must be an authorized user on the node and you must have IP connectivity to the node.
- Step 5** Check to see if the new node IP address is on the same subnet as other nodes in the network. If two or more PCs are directly connected to different nodes that belong to the same subnet and Craft Access Only is not checked under Gateway Settings, add static routes on the gateway ONS 15454 nodes, using the following settings:
- Destination IP address: **Local PC IP address**
 - Net Mask: **255.255.255.255**

- Next Hop: **IP address of the Cisco ONS 15454**
- Cost: **1**

See the “[DLP-A65 Create a Static Route](#)” task on page 4-14. To view Gateway Settings, see the “[DLP-A249 Provision IP Settings](#)” task on page 4-9.

- Step 6** Log into a node that is in the BLSR. See the “[DLP-A60 Log into CTC](#)” task on page 3-23.
- Step 7** Complete the “[DLP-A302 Check BLSR or Path Protection Configuration Alarms and Conditions](#)” task on page 14-6 to verify that the BLSR is free of major alarms or problems. If trouble is indicated (for example, a major alarm exists), resolve the problem before proceeding. See [Chapter 7, “Manage Alarms”](#) or, if necessary, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 8** Click the **Provisioning > BLSR** tabs.
- Step 9** On paper, record the Ring ID, Ring Type, Line Rate, Ring Reversion, and Span Reversion (4 Fiber).
- Step 10** From the Node column, record the Node IDs in the BLSR. The Node IDs are the numbers in parenthesis next to the node name.
- Step 11** Log into the new node:
- If the node has a LAN connection and is displayed on the network map, from the View menu, choose **Go to Other Node**, then enter the new node.
 - If the new node is not connected to the network, log into it using the “[DLP-A60 Log into CTC](#)” task on page 3-23.
- Step 12** Click the **Alarms** tab. Verify that no critical or major alarms are present, nor any facility alarms, such as LOS, LOF, AIS-L, SF, and SD. If trouble is indicated (for example, a major alarm exists), resolve the problem before proceeding. See [Chapter 7, “Manage Alarms”](#) or, if necessary, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 13** Using the information recorded in Steps 9 and 10 and the diagram created in [Step 1](#), create a BLSR on the new node. See the “[DLP-A242 Create a BLSR on a Single Node](#)” task on page 14-6.
- Step 14** (Optional) Create test circuits, making sure they pass through the BLSR trunk cards, and run test traffic through the node to ensure the cards are functioning properly. See the “[NTP-A189 Create a Manually Routed Optical Circuit](#)” procedure on page 6-47 and the “[NTP-A62 Test Optical Circuits](#)” procedure on page 6-55 for information.
- Step 15** Create the DCC terminations on the new node. See the “[DLP-A253 Provision SONET DCC Terminations](#)” task on page 5-5.



Note Creating the DCC terminations causes the SDCC Termination Failure and Loss of Signal alarms to appear. These alarms will remain active until you connect the node to the BLSR.



Note If you map the K3 byte to another byte (such as E2), you must remap the line cards on either side of the new node to the same byte. See the “[DLP-A89 Remap the K3 Byte](#)” task on page 5-17.

- Step 16** Log into a BLSR node that will connect to the new node. See “[DLP-A60 Log into CTC](#)” task on page 3-23.
- Step 17** Referring to the diagram created in [Step 1](#), complete the “[DLP-A303 Initiate a BLSR Force Switch - Ring](#)” task on page 14-7 on the node that will connect to the new node on its west line (port).
- Step 18** Referring to the diagram created in [Step 1](#), complete the “[DLP-A303 Initiate a BLSR Force Switch - Ring](#)” task on page 14-7 on the node that will connect to the new node on its east line (port).

- Step 19** Click the **Alarms** tab. If unexpected critical or major alarms are displayed, resolve them before you continue. If necessary, refer to the alarm troubleshooting procedures in the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 20** Following the diagram created in [Step 1](#), remove the fiber connections from the two nodes that will connect to the new node.
- Remove the west fiber from the node that will connect to the east port of the new node. In the [Figure 14-1](#) example, this is Node 1/Slot 5, and in [Figure 14-2](#) this is Node 1, Slots 5 and 6.
 - Remove the east fiber from the node that will connect to the west port of the new node. In the [Figure 14-1](#) example, this is Node 3/Slot 12, and in [Figure 14-2](#) this is Node 3, Slots 12 and 13.
- Step 21** Connect fibers from the adjacent nodes to the new node following the diagram created in [Step 1](#). Connect the west port to the east port and the east port to the west port. For 4-fiber BLSRs, connect the protect fibers.
- Step 22** Display the newly added node in node view.
- Step 23** Click the **Provisioning > BLSR** tabs.
- Step 24** Click **Ring Map**. Verify that the new node appears on the Ring Map with the other BLSR nodes, then click **OK**.
- Step 25** From the View menu, choose **Go to Network View** and check the following:
- Click the **Provisioning > BLSR** tabs. Verify that the new node is displayed under the Node column.
 - Click the **Alarms** tab. Verify that BLSR alarms such as RING MISMATCH, E-W MISMATCH, PRC-DUPID (duplicate node ID), and APSCDFLTK (default K) are not displayed.
- If the new node does not appear in the Node column, or if BLSR alarms are displayed, log into the new node and verify that the BLSR is provisioned on it correctly with the information from [Steps 9](#) and [10](#). If the node still does not appear, or if alarms persist, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 26** Click the **Circuits** tab. Wait until all the circuits are discovered. The circuits that pass through the new node will be shown as incomplete.
- Step 27** In network view, right-click the new node and choose **Update Circuits With The New Node** from the shortcut menu. Verify that the number of updated circuits displayed in the dialog box is correct.
- Step 28** If incomplete circuits are still displayed, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 29** Click the **History** tab. Verify that BLSR_RESYNC conditions are displayed for every node in the BLSR.
- Step 30** Complete the “[DLP-A194 Clear a BLSR Force Switch - Ring](#)” task on [page 14-9](#) to remove the ring switch from the east and west BLSR lines.
- Step 31** (Optional) Complete the “[NTP-A175 Two-Fiber BLSR Acceptance Test](#)” procedure on [page 5-20](#) or the “[NTP-A176 Four-Fiber BLSR Acceptance Test](#)” procedure on [page 5-26](#).
- Stop. You have completed this procedure.**
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DLP-A302 Check BLSR or Path Protection Configuration Alarms and Conditions

Purpose	Use this task to check a BLSR or a path protection configuration for alarms and conditions before performing any major administrative change to the ring such as adding and removing nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	Required before performing any major change to the ring.
Onsite/Remote	Onsite
Security Level	Provisioning or higher

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- Step 1** From the View menu, choose **Go to Network View**. Verify that all BLSR or path protection configuration spans on the network map are green.
- Step 2** Click the **Alarms** tab. Verify that no critical or major alarms are present, nor any facility alarms, such as LOS, LOF, AIS-L, SF, and SD. In a BLSR, these facility conditions might be reported as minor alarms. Make sure the Filter button in the lower right corner of the window is off (not indented).
- Step 3** Click the **Conditions** tab and click **Retrieve Conditions**. Verify that no ring switches are active. Make sure the Filter button in the lower right corner of the window is off (not indented).
- Step 4** Return to the originating procedure (NTP).
-

DLP-A242 Create a BLSR on a Single Node

Purpose	Use this task to create a BLSR on a single node. The task is used when you add a node to an existing BLSR or when you delete and then recreate a BLSR temporarily on one node.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

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- Step 1** Display the node view.
- Step 2** Click the **Maintenance > BLSR** tabs.
- Step 3** In the Suggestion dialog box, click **OK**.
- Step 4** In the Create BLSR dialog box, enter the BLSR information:
- Ring Type—Enter the ring type (either 2 Fiber or 4 Fiber) of the BLSR.
 - Ring ID—Enter the BLSR ring ID. If the node is being added to a BLSR, use the BLSR ring ID.
 - Node ID—Enter the node ID. If the node is being added to a BLSR, use an ID that is not used by other BLSR nodes.
 - Ring Reversion—Enter the ring reversion time of the existing BLSR.

- West Line—Enter the slot on the node that will connect to the existing BLSR via the node's west line (port).
- East Line—Enter the slot on the node that will connect to the existing BLSR via the node's east line (port).

If you are adding the node to a four-fiber BLSR, complete the following for the second set of fibers:

- Span Reversion—Enter the span reversion time of the existing BLSR.
- West Line—Enter the slot on the node that will connect to the existing BLSR via the node's west line.
- East Line—Enter the slot on the node that will connect to the existing BLSR via the node's east line.

Step 5 Click **OK**.

Step 6 Return to your originating procedure (NTP).



Note Alarms are displayed and the BLSR is displayed as Incomplete until the node is connected to other BLSR nodes.

DLP-A303 Initiate a BLSR Force Switch - Ring

Purpose	Use this task to perform a BLSR Force protection operation on a BLSR port.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher



Caution

The Force Switch Away command overrides normal protective switching mechanisms. Applying this command incorrectly can cause traffic outages.



Caution

Traffic is not protected during a Force protection switch.

Step 1 Display the network view.

Step 2 Click the **Provisioning > BLSR** tabs.

Step 3 Click **Edit**.

Step 4 To apply a Force switch to the west line:

- a. Right-click the west BLSR port where you want to switch the BLSR traffic and choose **Set West Protection Operation** ([Figure 14-3](#)).

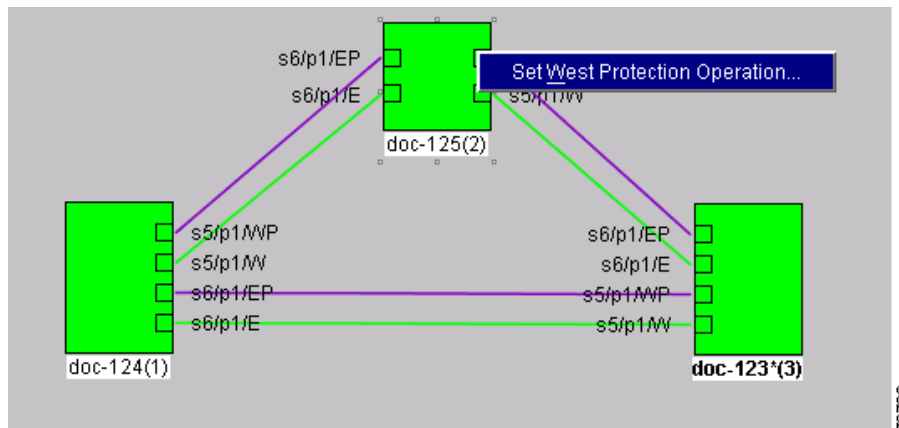


Note If node icons overlap, drag and drop the icons to a new location. You can also return to network view and change the positions of the network node icons, because BLSR node icons are based on the network view node icon positions.



Note For two-fiber BLSRs, the squares on the node icons represent the BLSR working and protect channels. You can right-click either channel. For four-fiber BLSRs, the squares represent ports. Right-click either working port.

Figure 14-3 Invoking a Protection Operation on a Three-Node BLSR



- b. In the Set West Protection Operation dialog box choose **FORCE RING** from the pull-down menu. Click **OK**.
- c. Click **Yes** in the two Confirm BLSR Operation dialog boxes that appear.

On the network graphic, an F is displayed on the working BLSR channel where you invoked the protection switch. The span lines change color to reflect the forced traffic. Green span lines indicate the new BLSR path, and the lines between the protection switch are purple.

Performing a Force switch generates several conditions including FORCED-REQ-RING, FORCED-REQ-RING, and WKSWPR.

Step 5 To apply a Force switch to the east line:

- a. Right-click the east BLSR port and choose **Set East Protection Operation**.



Note If node icons overlap, drag and drop the icons to a new location or return to network view and change the positions of the network node icons, since BLSR node icons are based on the network view node icon positions.



Note For two-fiber BLSRs, the squares on the node icons represent the BLSR working and protect channels. You can right-click either channel. For four-fiber BLSRs, the squares represent ports. Right-click either working port.

- b. In the Set East Protection Operation dialog box, choose **FORCE RING** from the pull-down menu. Click **OK**.
- c. Click **Yes** in the two Confirm BLSR Operation dialog boxes that display.

On the network graphic, an F is displayed on the working BLSR channel where you invoked the protection switch. The span lines change color to reflect the forced traffic. Green span lines indicate the new BLSR path, and the lines between the protection switch are purple.

Performing a Force switch generates several conditions including FORCED-REQ-RING, FORCED-REQ-RING, and WKSWPR.

- Step 6** From the File menu, choose **Close**.
- Step 7** Return to your originating procedure (NTP).
-

DLP-A194 Clear a BLSR Force Switch - Ring

Purpose	Use this task to remove a Force switch from a BLSR port.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

- Step 1** Display the network view.
- Step 2** Click the **Provisioning > BLSR** tabs.
- Step 3** Click **Edit**.
- Step 4** To clear a Force switch on the west line:
- a. Right-click the BLSR west port where you want to clear the protection switch and choose **Set West Protection Operation**. Ports with a Force switch applied are marked with an F.
 - b. In the Set West Protection Operation dialog box, choose **CLEAR** from the pull-down menu. Click **OK**.
 - c. In the Confirm BLSR Operation dialog box, click **Yes**.
- Step 5** To clear a Force switch on the east line:
- a. Right-click the BLSR east port where you want to clear the protection switch and choose **Set East Protection Operation**. Ports with a Force switch applied are marked with an F.
 - b. In the Set East Protection Operation dialog box, choose **CLEAR** from the pull-down menu. Click **OK**.
 - c. In the Confirm BLSR Operation dialog box, click **Yes**.
- On the BLSR network graphic, a green and a purple span line connects each node. This is the normal display for BLSRs when protection operations are not invoked.
- Step 6** From the File menu, choose **Close**.

Step 7 Return to your originating procedure (NTP).

NTP-A213 Remove a BLSR Node

Purpose	Use this procedure to remove a node from a BLSR.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher



Caution

The following procedure minimizes traffic outages during node removals. You will delete all circuits that originate and terminate on the node that will be removed. In addition, you will verify that circuits passing through the node do not enter and exit the node on different STSs and/or VTs. If they do, you will delete and recreate the circuits, and traffic will be lost during this time.

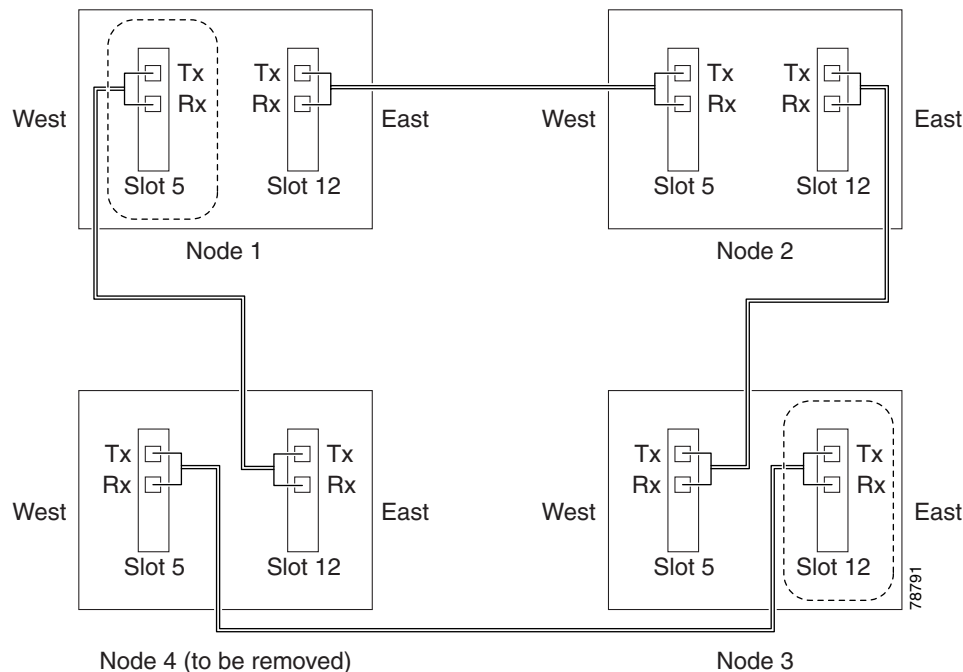


Caution

If you remove a node that is the only BITS timing source for the ring, you also remove the only source of synchronization for all the nodes in that ring. Circuits that leave the ring to connect to other networks synchronized to a Stratum 1 clock will experience a high level of pointer adjustments, which might adversely affect traffic performance.

- Step 1** Log into a node on the BLSR. Do not log into the node that you will remove. See the “[DLP-A60 Log into CTC](#)” task on page 3-23 for instructions.
- Step 2** Create a diagram of the BLSR where you will remove the node. You can draw the BLSR manually, or print it from CTC by performing the following steps:
- a. From the View menu, choose **Go to Network View**.
 - b. Click the **BLSR** tab, click the BLSR, then click **Edit**.
 - c. In the BLSR window, verify that all the port information is visible. If not, press **Ctrl** and drag the node icons to a new location so the information can be viewed.
 - d. From the File menu, choose **Print**.
 - e. Close the BLSR window by choosing **Close** from the File menu.
- Step 3** Referring to the BLSR diagram, identify the following:
- The node that is connected via its west port to the target (removal) node. For example, if you were removing Node 4 in [Figure 14-4](#), Node 1 is the node connected via its west port to Node 4.
 - The node that is connected via its east port to the target (removal) node. In [Figure 14-4](#), Node 3 is the node connected via its east port to Node 4.

Figure 14-4 Four-Node, Two-Fiber BLSR Before a Node Is Removed



- Step 4** Complete the “[DLP-A302 Check BLSR or Path Protection Configuration Alarms and Conditions](#)” task on page 14-6 to verify that the BLSR is free of alarms. If trouble is indicated (for example, a major alarm exists), resolve the problem before proceeding. See [Chapter 7, “Manage Alarms”](#) or, if necessary, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 5** From the View menu, choose **Go to Other Node**. Choose the node that you will remove and click **OK**.
- Step 6** Click the **Circuits** tab. If the Scope setting is set to Network, choose **Node** from the Scope pull-down menu. Make sure the Filter button is off (not indented) to ensure that all circuits are visible.
- Step 7** Delete all circuits that originate or terminate on the node. See the “[NTP-A152 Delete Circuits](#)” procedure on page 9-16.
- Step 8** Complete the “[DLP-A304 Verify Pass-Through Circuits](#)” task on page 14-12 to verify that circuits passing through the target node enter and exit the node on the same STS and/or VT.
- Step 9** From the View menu, choose **Go to Network View**.
- Step 10** Referring to the diagram created in [Step 1](#), complete the “[DLP-A303 Initiate a BLSR Force Switch - Ring](#)” task on page 14-7 at each node that connects to the target (removal) node to force traffic away from it. You must perform a Force switch at each port connected to the target node. For example, in [Figure 14-4](#), you would perform a Force switch on the east port of Node 3 and the west port of Node 1.
- Step 11** Click the **Alarms** tab. If unexpected critical or major alarms are displayed, resolve them before you continue. If necessary, refer to the alarm troubleshooting procedures in the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 12** Remove the fiber connections between the node being removed and the two neighboring nodes.
- Step 13** Reconnect the fiber of the two neighboring nodes directly, west port to east port. For example in [Figure 14-4](#), the east port of Node 3 (Slot 12) connects to the west port of Node 1 (Slot 5).
- Step 14** If you do not plan to add the removed node to a BLSR in the future, complete the “[DLP-A196 Delete a BLSR from a Single Node](#)” task on page 14-14. If you will add the node to a BLSR in the future, go to [Step 15](#).

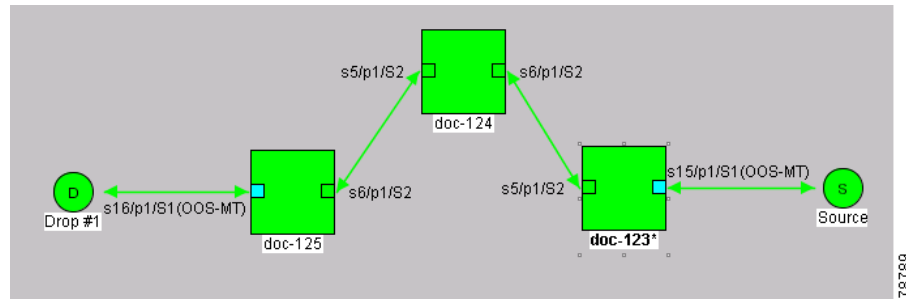
- Step 15** If you delete a node that was in a login node group, you will see incomplete circuits for that node in the CTC network view. (Although it is no longer part of the ring, the removed node still reports to CTC until it is no longer in a login node group.) Delete the node from the login node group:
- From the CTC Edit menu, choose **Preferences**.
 - On the Preferences dialog box, click the **Login Node Groups** tab.
 - Click the login node group tab containing the node you want to remove.
 - Click the node you want to remove, then click **Remove**.
 - Click **OK**.
- Step 16** Click the **History** tab. Verify that the BLSR_RESYNC condition is displayed for every node in the BLSR.
- Step 17** Complete the “[DLP-A194 Clear a BLSR Force Switch - Ring](#)” task on page 14-9 to remove the Force protection switches.
- Step 18** Complete the “[DLP-A195 Verify Timing in a Reduced Ring](#)” task on page 14-13.
- Step 19** (Optional) Complete the “[NTP-A175 Two-Fiber BLSR Acceptance Test](#)” procedure on page 5-20.
- Stop. You have completed this procedure.**
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DLP-A304 Verify Pass-Through Circuits

Purpose	Use this task to verify that circuits passing through a node that will be removed from a BLSR or path protection configuration enter and exit the node on the same STS and/or VT.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC , page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

- Step 1** On the CTC Circuits window, choose a circuit that passes through the BLSR or path protection configuration node that will be removed and click **Edit**.
- Step 2** In the Edit Circuits window, check **Show Detailed Map**.
- Step 3** Verify that the STS and VT mapping on the node’s east and west ports are the same. For example, if a circuit mapping on the west port s5/p1/S1 (Slot 5, Port 1, STS 1), verify that the mapping is STS 1 on the east port. If the circuit displays different STSs and/or VTs on the east and west ports, write down the name of the circuit. [Figure 14-5](#) shows a circuit passing through a node (doc-124) on the same STS (STS 2).

Figure 14-5 Verifying Pass-Through STSs



- Step 4** Repeat Steps 1 to 3 for each circuit displayed in the Circuits tab.
- Step 5** Delete and recreate each circuit recorded in Step 3 that entered/exited the node on different STSs. To delete the circuit, see the “NTP-A152 Delete Circuits” procedure on page 9-16. To create the circuit, see Chapter 6, “Create Circuits and VT Tunnels.”
- Step 6** Return to your originating procedure (NTP).

DLP-A195 Verify Timing in a Reduced Ring

Purpose	Use this task to verify timing in the ring where you removed a node.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite/remote
Security Level	Provisioning or higher

- Step 1** Click the **Provisioning > Timing** tabs.
- Step 2** Observe the Timing Mode field to see the type of timing (Line, External, Mixed) that has been set for that node.
- Step 3** Scroll down to the Reference Lists and observe the NE Reference fields to see the timing references provisioned for that node.
- Step 4** If the removed node was the only BITS timing source, perform the following:
- Look for another node on the ring that can be used as a BITS source and set that node’s Timing Mode to **External**. Choose that node as the primary timing source for all other nodes in the ring. See the “[DLP-A157 Change the Node Timing Source](#)” task on page 10-19.
 - If no node in the reduced ring can be used as a BITS source, choose one node to be your internal timing source. Set that node’s Timing Mode to **External**, set the BITS 1 and 2 State to **OOS**, and set the NE Reference to **Internal**. Then, choose line timing for all other nodes in the ring. This forces the first node to be their primary timing source. (See the “[DLP-A157 Change the Node Timing Source](#)” task on page 10-19.)



Note This type of timing conforms to Stratum 3 requirements and is not considered optimal.

- Step 5** If the removed node was not the only BITS timing source, provision the adjacent nodes to line timing using SONET links (east and west) as timing sources, traceable to the node with external BITS timing. See the “[NTP-A28 Set Up Timing](#)” procedure on page 4-21.
- Step 6** Return to your originating procedure (NTP).
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DLP-A196 Delete a BLSR from a Single Node

Purpose	Use this task to delete a BLSR from a node after you remove the node from the BLSR.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC , page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

- Step 1** In node view, display the node that was removed from the BLSR.
- Step 2** Click the **Provisioning > BLSR** tabs.
- Step 3** Highlight the ring and click **Delete**.
- Step 4** In the Suggestion dialog box, click **OK**.
- Step 5** In the confirmation message, confirm that this is the ring you want to delete. If so, click **Yes**.
- Step 6** Return to your originating procedure (NTP).
-

NTP-A105 Add a Path Protection Configuration Node

Purpose	Use this procedure to add a node to a path protection configuration.
Tools/Equipment	None
Prerequisite Procedures	Cards must be installed and node turn-up procedures completed on the node that will be added to the path protection configuration. See Chapter 2 , “ Install Cards and Fiber-Optic Cable ,” and Chapter 4 , “ Turn Up Node .”
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

- Step 1** Verify the card installation on the new node. See the “[NTP-A24 Verify Card Installation](#)” procedure on page 4-2. Check that the OC-N cards that will serve as the path protection configuration trunk (span) cards match the path protection configuration optical rate of the trunk cards to which the new node will be connected. For example, if the adjacent nodes have OC-48 trunk cards, the new node must have

OC-48 cards installed. If the OC-N cards are not installed or the rate does not match the rate of the adjacent node trunk cards, complete the “[NTP-A16 Install the Optical Cards](#)” procedure on page 2-13 to install them.

- Step 2** Verify that fiber is available to connect the new node to the existing nodes.
- Step 3** Complete the “[NTP-A35 Verify Node Turn Up](#)” procedure on page 5-2.
- Step 4** Log into a node in the path protection configuration where you want to add a node. See the “[DLP-A60 Log into CTC](#)” task on page 3-23 for instructions. In order to have CTC visibility to the new node after it is added, you must be an authorized user on the node and you must have IP connectivity to the node.
- Step 5** Check to see if the new node IP address is on the same subnet as other nodes in the network. If two or more PCs are directly connected to different nodes that belong to the same subnet and Craft Access Only is not checked under Gateway Settings, add static routes on the gateway ONS 15454 nodes, using the following settings:
- Destination IP address: **Local PC IP address**
 - Net Mask: **255.255.255.255**
 - Next Hop: **IP address of the Cisco ONS 15454**
 - Cost: **1**
- See the “[DLP-A65 Create a Static Route](#)” task on page 4-14. To view Gateway Settings, see the “[DLP-A249 Provision IP Settings](#)” task on page 4-9.
- Step 6** Complete the “[DLP-A302 Check BLSR or Path Protection Configuration Alarms and Conditions](#)” task on page 14-6 to verify that the path protection configuration is free of major alarms or problems. If trouble is indicated (for example, a major alarm exists), resolve the problem before proceeding. See [Chapter 7, “Manage Alarms”](#) or, if necessary, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 7** Log into the new node:
- If the node has a LAN connection and is displayed on the network map, from the View menu, choose **Go to Other Node**, then enter the new node.
 - If the new node is not connected to the network, log into it using the “[DLP-A60 Log into CTC](#)” task on page 3-23.
- Step 8** Click the **Alarms** tab. Verify that no critical or major alarms are present, nor any facility alarms, such as LOS, LOF, AIS-L, SF, and SD. If trouble is indicated (for example, a major alarm exists), resolve the problem before proceeding. See [Chapter 7, “Manage Alarms,”](#) or, if necessary, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 9** (Optional) Create test circuits, making sure they pass through the path protection configuration trunk cards, and run test traffic through the node to ensure that the cards are functioning properly. See the “[NTP-A189 Create a Manually Routed Optical Circuit](#)” procedure on page 6-47 and the “[NTP-A62 Test Optical Circuits](#)” procedure on page 6-55 for information.
- Step 10** Create the DCC terminations on the new node. See the “[DLP-A253 Provision SONET DCC Terminations](#)” task on page 5-5.
- Step 11** From the View menu, choose **Go to Network View**.
- Step 12** Complete the “[DLP-A197 Initiate a Path Protection Configuration Force Switch](#)” task on page 14-18 to switch traffic away from the span that will be broken to connect to the new node.

**Caution**

Traffic is not protected during a protection switch.

- Step 13** Two nodes will connect directly to the new node; remove their fiber connections:
- a. Remove the east fiber connection from the node that will connect to the west port of the new node.
 - b. Remove the west fiber connection from the node that will connect to the east port of the new node.
- Step 14** Replace the removed fibers with the fibers that are connected to the new node.
- Step 15** Log out of CTC and log back into a node in the network.
- Step 16** From the View menu, choose **Go to Network View** to display the path protection configuration nodes. The new node should appear in the network map. Wait for a few minutes to allow all the nodes to appear.
- Step 17** Click the **Circuits** tab and wait for all the circuits to appear, including spans. Count the number of incomplete circuits.
- Step 18** In the network view, right-click the new node and choose **Update Circuits With New Node** from the list of options. Wait for the confirmation dialog box to appear. Verify that the number of updated circuits displayed in the dialog box is correct.
- Step 19** Click the **Circuits** tab and verify that no incomplete circuits are displayed.
- Step 20** Use the “[DLP-A198 Clear a Path Protection Configuration Force Switch](#)” task on page 14-19 to clear the protection switch.
- Step 21** (Optional) Complete the “[NTP-A177 Path Protection Acceptance Test](#)” procedure on page 5-33.
- Stop. You have completed this procedure.**
-

NTP-A106 Remove a Path Protection Configuration Node

Purpose	Use this procedure to remove a node from a path protection configuration.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher



Caution

The following procedure minimizes traffic outages during node removals.



Caution

If you remove a node that is the only BITS timing source for the ring, you also remove the only source of synchronization for all the nodes in that ring. Circuits that connect to other networks which are synchronized to a Stratum 1 clock will experience a high level of pointer adjustments, which might adversely affect customer service.

- Step 1** Draw a diagram of the path protection configuration where you will remove the node. In the diagram, identify the following:
- The node that is connected through its west port to the node that will be removed.
 - The node that is connected through its east port to the node that will be removed.

- Step 2** Log into a node in the network where you want to remove a path protection configuration node. See the “[DLP-A60 Log into CTC](#)” task on page 3-23 for instructions.
- Step 3** Complete the “[DLP-A302 Check BLSR or Path Protection Configuration Alarms and Conditions](#)” task on page 14-6 to verify that the path protection configuration is free of alarms. If trouble is indicated (for example, a major alarm exists), resolve the problem before proceeding. See Chapter 7, “[Manage Alarms](#)” or, if necessary, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 4** Complete the “[NTP-A152 Delete Circuits](#)” procedure on page 9-16 for circuits that originate or terminate in the node you will remove. (If a circuit has multiple drops, delete only the drops that terminate on the node you are deleting.)
- Step 5** Complete the “[DLP-A304 Verify Pass-Through Circuits](#)” task on page 14-12 to verify that circuits passing through the target node enter and exit the node on the same STS and/or VT.
- Step 6** Complete the “[DLP-A197 Initiate a Path Protection Configuration Force Switch](#)” task on page 14-18 for all spans connected to the node you are removing.



Caution Traffic is not protected during a forced protection switch.

- Step 7** Remove all fiber connections between the node being removed and the two neighboring nodes.
- Step 8** Reconnect the fiber of the two neighboring nodes directly, west port to east port.



Note If you delete a node that was in a login node group, you will see incomplete circuits for that node in CTC network view. (Although it is no longer part of the ring, the removed node still reports to CTC until it is no longer in a login node group.)

- Step 9** Exit CTC and log back in. See the “[DLP-A60 Log into CTC](#)” task on page 3-23 for instructions.
- Step 10** Log into each newly-connected node and click the **Alarms** tab. Verify that the span cards are free of alarms. Resolve any alarms before proceeding. Refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- Step 11** Complete the “[DLP-A195 Verify Timing in a Reduced Ring](#)” task on page 14-13.
- Step 12** Complete the “[DLP-A198 Clear a Path Protection Configuration Force Switch](#)” task on page 14-19 to clear the protection switch.
- Step 13** Click the **Circuits** tab and verify that no incomplete circuits are displayed.
- Step 14** (Optional) Complete the “[NTP-A177 Path Protection Acceptance Test](#)” procedure on page 5-33.

Stop. You have completed this procedure.

DLP-A197 Initiate a Path Protection Configuration Force Switch

Purpose	Use this task to switch all circuits on a path protection configuration span to another span.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher


Caution

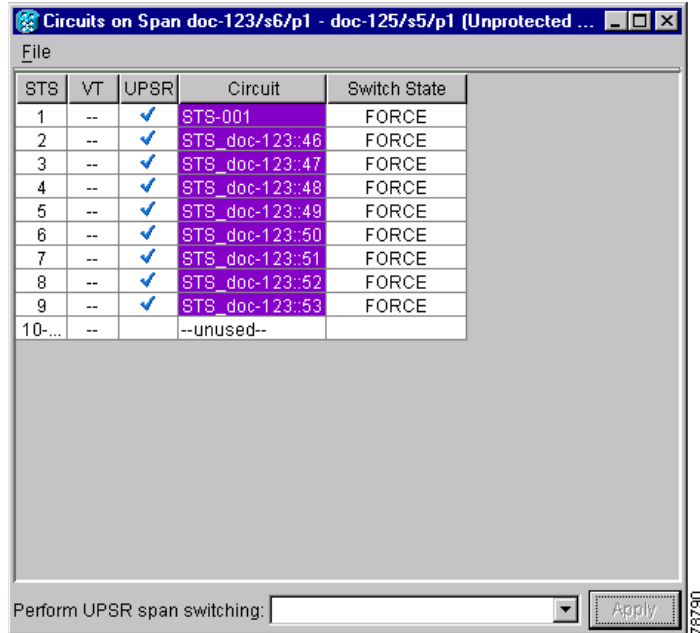
The Force Switch Away command overrides normal protective switching mechanisms. Applying this command incorrectly can cause traffic outages.


Caution

Traffic is not protected during a Force protection switch.

-
- Step 1** From the View menu in the node view, choose **Go to Network View**.
- Step 2** Right-click the span where you want to switch path protection configuration traffic away. Choose **Circuits** from the shortcut menu.
- Step 3** In the Circuits on Span dialog box, choose **FORCE SWITCH AWAY**. Click **Apply**.
- Step 4** In the Confirm UPSR Switch dialog box, click **Yes**.
- Step 5** In the Protection Switch Result dialog box, click **OK**.
- In the Circuits on Span window, the Switch State for all circuits is Force. [Figure 14-6](#) shows an example.

Figure 14-6 Circuits on Span Dialog Box with a Force Switch



Note A Force switch request on a span or card causes CTC to raise a FORCED-REQ condition. The condition clears when you clear the Force switch.

Step 6 Return to your originating procedure (NTP).

DLP-A198 Clear a Path Protection Configuration Force Switch

Purpose	Use this task to clear a Path Protection Configuration Force switch.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

- Step 1** From the View menu on node view, choose **Go to Network View**.
- Step 2** Right-click the span where you want to clear the switch. Choose **Circuits** from the shortcut menu.
- Step 3** In the Circuits on Span dialog box, choose **CLEAR** to remove the Force switch. Click **Apply**.
- Step 4** In the Confirm UPSR Switch dialog box, click **Yes**.
- Step 5** In the Protection Switch Result dialog box, click **OK**.
- In the Circuits on Span window, the Switch State for all path protection configuration circuits is CLEAR.

Step 6 Return to your originating procedure (NTP).
