



Add and Remove Nodes

This chapter explains how to add and remove Cisco ONS SDH 15454 nodes from multiplex section-shared protection rings (MS-SPRings) and subnetwork connection protection (SNCP) rings.

Before You Begin

Before performing any of the following procedures, complete the [“NTP-D195 Document Existing Provisioning” procedure on page 7-2](#). Also investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* as necessary.

This section lists VC4 the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. [NTP-D12 Add an MS-SPRing Node, page 14-2](#)—Complete as needed.
2. [NTP-D213 Remove an MS-SPRing Node, page 14-10](#)—Complete as needed.
3. [NTP-D105 Add an SNCP Node, page 14-14](#)—Complete as needed.
4. [NTP-D106 Remove an SNCP Node, page 14-16](#)—Complete as needed.

NTP-D12 Add an MS-SPRing Node

Purpose	This procedure expands an MS-SPRing 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 MS-SPRing. 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

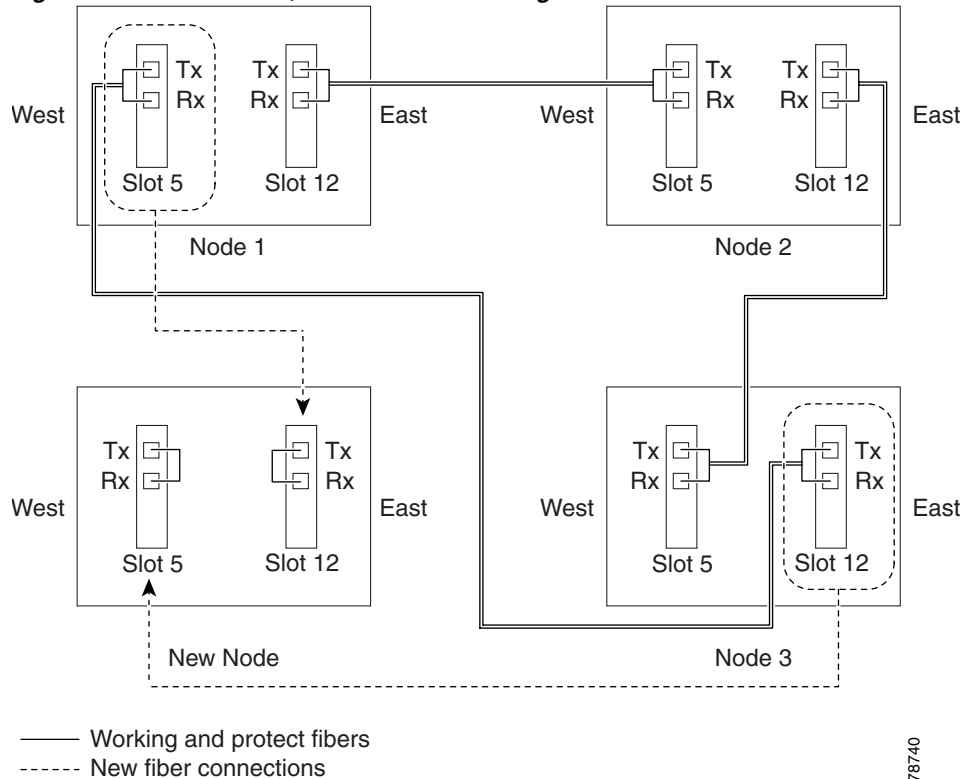

Caution

Adding an MS-SPRing node can be service affecting and should be performed during a maintenance window.

Step 1

Draw a diagram of the MS-SPRing where you will add the node. In the diagram, identify the east and west MS-SPRing STM-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 MS-SPRing that uses Slots 5 and 12 for the MS-SPRing trunk cards. The dashed arrow shows the new fiber connections that will be made to add the fourth node to the MS-SPRing.

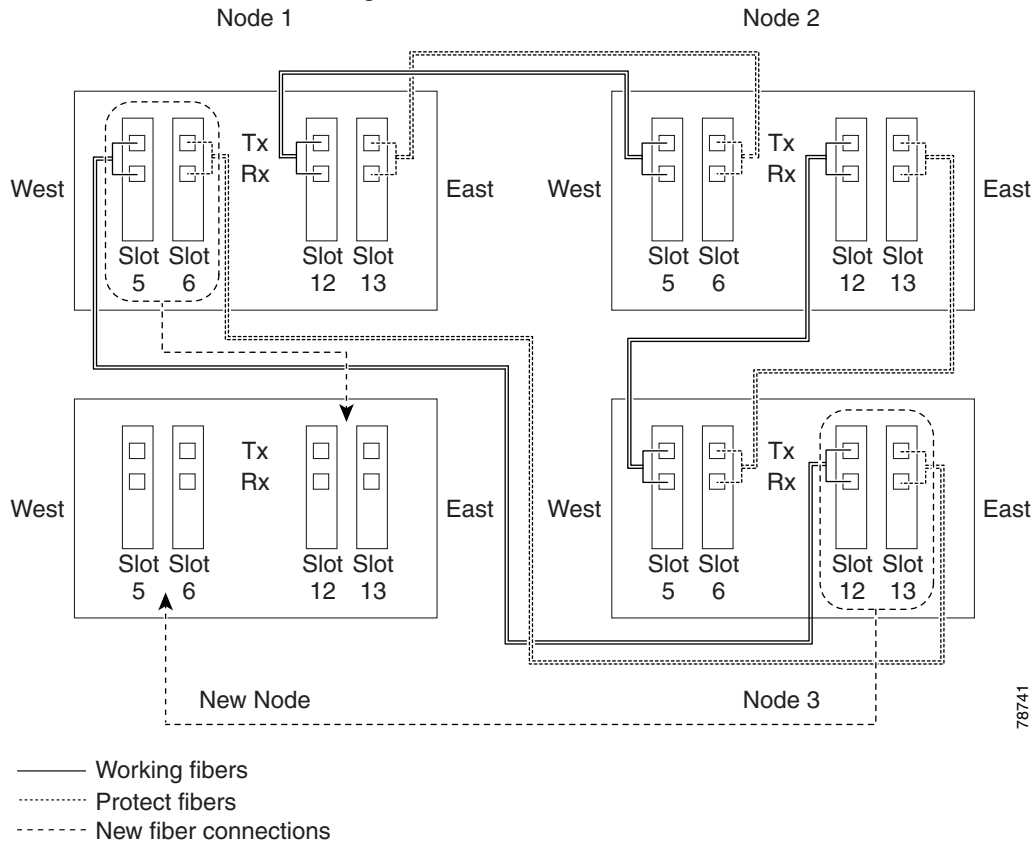
Figure 14-1 Three-Node, Two-Fiber MS-SPRing Before a Fourth Node Is Added



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

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



- Step 2** Verify the card installation on the new node using the “[NTP-D24 Verify Card Installation](#)” procedure on [page 4-2](#). Verify that the STM-N cards that will be the MS-SPRING trunk cards match the MS-SPRING optical rate. For example, if the MS-SPRING is STM-16, the new node must have STM-16 cards installed. If the STM-N cards are not installed or the optical rates do not match the MS-SPRING, complete the “[NTP-D16 Install the Optical Cards](#)” procedure on [page 2-12](#).
- 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-D35 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 SDH 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 SDH**
- Cost: **1**

See the [“DLP-D65 Create a Static Route”](#) task on page 4-13.

- Step 6** Log into a node that is in the MS-SPRing. See the [“DLP-D60 Log into CTC”](#) task on page 3-23.
- Step 7** Complete the [“DLP-D302 Check MS-SPRing or SNCP Alarms and Conditions”](#) task on page 14-6 to verify that the MS-SPRing 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 SDH Troubleshooting Guide*.
- Step 8** Click the **Provisioning > MS-SPRing** 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 MS-SPRing. 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-D60 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 SDH Troubleshooting Guide*.
- Step 13** Using the information recorded in Steps 9 and 10 and the diagram created in [Step 1](#), create an MS-SPRing on the new node. See the [“DLP-D242 Create an MS-SPRing on a Single Node”](#) task on page 14-6.
- Step 14** (Optional) Create test circuits, making sure they pass through the MS-SPRing trunk cards, and run test traffic through the node to ensure the cards are functioning properly. See the [“NTP-D189 Create a Manually Routed High-Order Circuit”](#) procedure on page 6-51 and the [“NTP-D62 Test High-Order Circuits”](#) procedure on page 6-59 for information.
- Step 15** Create the DCC terminations on the new node. See the [“DLP-D253 Provision SDH 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 MS-SPRing.



Note If you map the K3 byte to another byte (such as E2), you must remap the trunk cards on either side of the new node to the same byte. See the [“DLP-D89 Remap the K3 Byte”](#) task on page 5-17.

- Step 16** Log into an MS-SPRing node that will connect to the new node. See [“DLP-D60 Log into CTC”](#) task on page 3-23.
- Step 17** Referring to the diagram created in [Step 1](#), complete the [“DLP-D303 Initiate an MS-SPRing Force Ring Switch”](#) 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-D303 Initiate an MS-SPRing Force Ring Switch”](#) 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 SDH 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 3, 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 1, 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 MS-SPRings, connect the protect fibers.
- Step 22** Display the newly added node in node view.
- Step 23** Click the **Provisioning > MS-SPRing** tabs.
- Step 24** Click **Ring Map**. Verify that the new node appears on the Ring Map with the other MS-SPRing nodes, then click **OK**.
- Step 25** From the View menu, choose **Go to Network View** and check the following:
- Click the **Provisioning > MS-SPRing** tabs. Verify that the new node is displayed in the Node column.
 - Click the **Alarms** tab. Verify that MS-SPRing 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 under the Node column, or if MS-SPRing alarms are displayed, log into the new node and verify that the MS-SPRing 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 SDH 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 SDH Troubleshooting Guide*.
- Step 29** Click the **History** tab. Verify that MS-SPRing_RESYNC conditions are displayed for every node in the MS-SPRing.
- Step 30** Complete the “[DLP-D194 Clear an MS-SPRing Force Switch - Ring](#)” task on [page 14-9](#) to remove the ring switch from the east and west MS-SPRing lines.
- Step 31** (Optional) Complete the “[NTP-D175 Two-Fiber MS-SPRing Acceptance Test](#)” procedure on [page 5-20](#).
- Stop. You have completed this procedure.**
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DLP-D302 Check MS-SPRing or SNCP Alarms and Conditions

Purpose	This task checks an MS-SPRing or a SNCP ring for alarms and conditions before performing any major administrative change to the MS-SPRing such as adding and removing nodes.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 Log into CTC, page 3-23
Required/As Needed	Required before performing any major change to the MS-SPRing.
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 MS-SPRing or SNCP ring 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 an MS-SPRing, 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-D242 Create an MS-SPRing on a Single Node

Purpose	This task creates an MS-SPRing on a single node. The task is used when you add a node to an existing MS-SPRing or when you delete and then recreate an MS-SPRing temporarily from one node.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 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 > MS-SPRing** tabs.
- Step 3** In the Suggestion dialog box, click **OK**.
- Step 4** In the Create MS-SPRing dialog box, enter the MS-SPRing information:
- Ring Type—Enter the ring type (either 2 Fiber or 4 Fiber) of the MS-SPRing.
 - Ring ID—Enter the MS-SPRing ring ID. If the node is being added to an MS-SPRing, use the MS-SPRing ring ID.
 - Node ID—Enter the node ID. If the node is being added to an MS-SPRing, use an ID that is not used by other MS-SPRing nodes.

- Ring Reversion—Enter the ring reversion time of the existing MS-SPRing.
- West Line—Enter the slot on the node that will connect to the existing MS-SPRing via the node's west line (port).
- East Line—Enter the slot on the node that will connect to the existing MS-SPRing via the node's east line (port).

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

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

Step 5 Click **OK**.

Step 6 Return to your originating procedure (NTP).



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

DLP-D303 Initiate an MS-SPRing Force Ring Switch

Purpose	This task performs an Force Ring protection switch on an MS-SPRing.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher



Caution Traffic is not protected during a Force Ring protection switch.

Step 1 Display the network view.

Step 2 Click the **Provisioning > MS-SPRing** tabs.

Step 3 Click **Edit**.

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

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

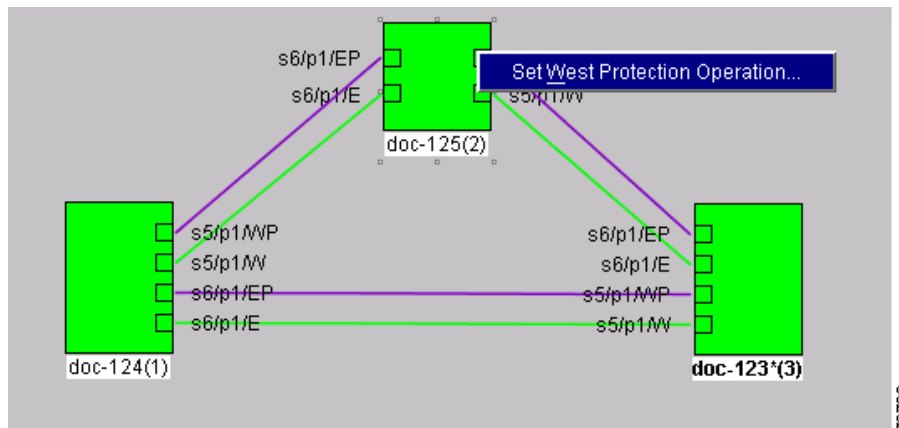
**Note**

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 MS-SPRing node icons are based on the network view node icon positions.

**Note**

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

Figure 14-3 Invoking a Protection Operation on a Three-Node MS-SPRing



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

On the network graphic, an F is displayed on the working MS-SPRing channel where you invoked the protection switch. The span lines change color to reflect the forced traffic. Green span lines indicate the new MS-SPRing 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 MS-SPRing port and choose **Set East Protection Operation**.

**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 MS-SPRing node icons are based on the network view node icon positions.

**Note**

For two-fiber MS-SPRings, the squares on the node icons represent the MS-SPRing working and protect channels. You can right-click either channel. For four-fiber MS-SPRings, 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 MS-SPRing Operation dialog boxes that display.

On the network graphic, an F is displayed on the working MS-SPRing channel where you invoked the protection switch. The span lines change color to reflect the forced traffic. Green span lines indicate the new MS-SPRing 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).
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DLP-D194 Clear an MS-SPRing Force Switch - Ring

Purpose	This task removes a Force switch from an MS-SPRing port.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 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 > MS-SPRing** tabs.
- Step 3** Click **Edit**.
- Step 4** To clear a Force switch on the west line:
- a. Right-click the MS-SPRing 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 MS-SPRing Operation dialog box, click **Yes**.
- Step 5** To clear a Force switch on the east line:
- a. Right-click the MS-SPRing 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 MS-SPRing Operation dialog box, click **Yes**.
- On the MS-SPRing network graphic, a green and a purple span line connects each node. This is the normal display for MS-SPRings when protection operations are not invoked.
- Step 6** From the File menu, choose **Close**.

Step 7 Return to your originating procedure (NTP).

NTP-D213 Remove an MS-SPRing Node

Purpose	This procedure removes a node from an MS-SPRing.
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. You will also verify that they do not enter and exit the node on different VC4s and/or VC3s or VC12. If they do, you will delete and recreate the circuits, and traffic will be lost during this time.

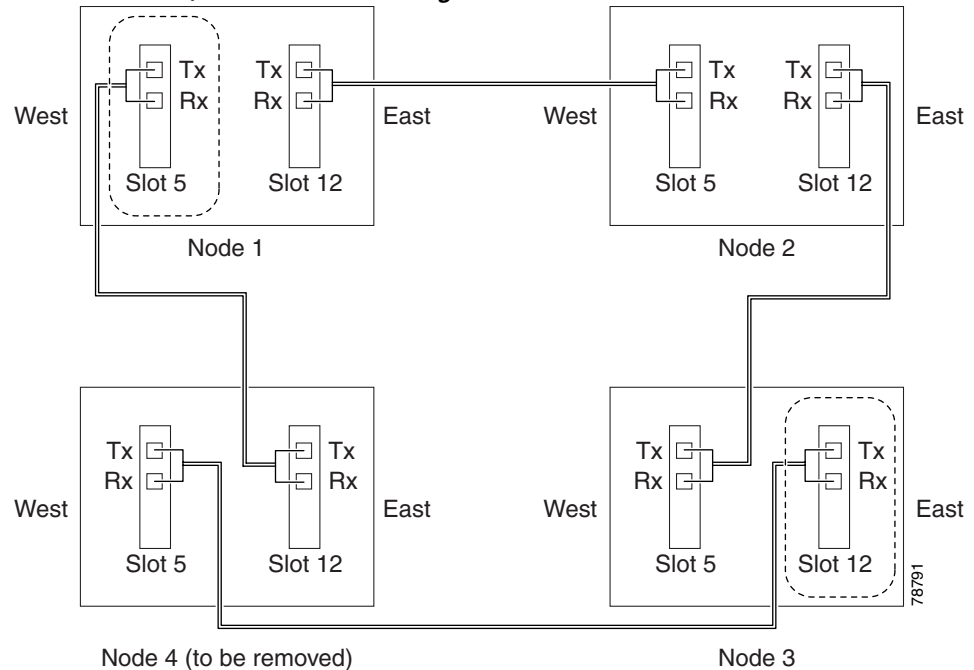


Caution

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 MS-SPRing. Do not log into the node that you will remove. See the [“DLP-D60 Log into CTC” task on page 3-23](#) for instructions.
- Step 2** Create a diagram of the MS-SPRing where you will remove the node. You can draw the MS-SPRing manually, or print it from CTC by performing the following steps:
- From the View menu, choose **Go to Network View**.
 - Click the **MS-SPRing** tab, click the MS-SPRing, then click **Edit**.
 - In the MS-SPRing 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.
 - From the File menu, choose **Print**.
 - Close the MS-SPRing window by choosing **Close** from the File menu.
- Step 3** Referring to the MS-SPRing 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 connected via its west port to Node 4.
 - The node that is connected through its east port to the node that will be removed. In [Figure 14-4](#), Node 3 is connected via its east port to Node 4.

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



- Step 4** Complete the [“DLP-D302 Check MS-SPRing or SNCP Alarms and Conditions”](#) task on page 14-6 to verify that the MS-SPRing 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 SDH 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-D152 Delete Circuits” procedure on page 9-13](#).
- Step 8** Complete the [“DLP-D304 Verify MS-SPRing Pass-Through Circuits”](#) task on page 14-12 to verify that circuits passing through the node to be deleted enter and exit the node on the same VC4 and/or VC3 or VC12.
- Step 9** From the View menu, choose **Go to Network View**.
- Step 10** Referring to the diagram created in [Step 1](#), complete the [“DLP-D303 Initiate an MS-SPRing Force Ring Switch”](#) 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 SDH Troubleshooting Guide*.
- Step 12** Remove the fiber connections between the target node 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](#), you would connect the east port of Node 3 (Slot 12) to the west port of Node 1 (slot 5).
- Step 14** (Optional) On the removed node, complete the [“DLP-D196 Delete an MS-SPRing from a Single Node”](#) task on page 14-14 to remove the MS-SPRing from the former MS-SPRing node.

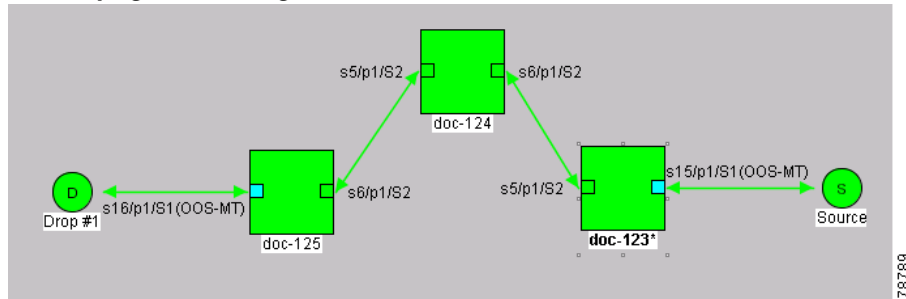
- Step 15** If you delete a node that was in a login node group, you will see incomplete circuits for that node in the CTC network view. (Although it is no longer part of the ring, the removed node still reports to CTC until it is no longer in a login node group.) Delete the node from the login node 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 MS-SPRing_RESYNC condition is displayed for every node in the MS-SPRing.
- Step 17** Complete the “[DLP-D194 Clear an MS-SPRing Force Switch - Ring](#)” task on page 14-9 to remove the force protection switches.
- Step 18** Complete the “[DLP-D195 Verify Timing in a Reduced Ring](#)” task on page 14-13.
- Step 19** (Optional) Complete the “[NTP-D175 Two-Fiber MS-SPRing Acceptance Test](#)” procedure on page 5-20.
- Stop. You have completed this procedure.**
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DLP-D304 Verify MS-SPRing Pass-Through Circuits

Purpose	This task verifies that circuits passing through a node that will be removed from an MS-SPRing enter and exit the node on the same VC4 and/or VC3 or VC12.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 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 MS-SPRing node that will be removed and click **Edit**.
- Step 2** In the Edit Circuits window, check **Show Detailed Map**.
- Step 3** Verify that the circuits have the same east and west port VC4, VC3, VC12 mapping. For example, if the circuit west port mapping is s5/p1/V1 (Slot 5, Port 1, VC4 1), verify that the east port is also VC4 1. If the circuit has different east/west VC4s and/or VC3 or VC12s, write down the name of the circuit. [Figure 14-5](#) shows a circuit passing through a node (doc-124) on the same VC4 (VC4 2).

Figure 14-5 Verifying Pass-Through VC4s



- 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 VC4s. To delete the circuit, see the “[NTP-D152 Delete Circuits](#)” procedure on page 9-13. To create the circuit, see Chapter 6, “[Create Circuits and Low-Order Tunnels](#).”
- Step 6** Return to your originating procedure (NTP).

DLP-D195 Verify Timing in a Reduced Ring

Purpose	This task verifies timing in the ring where you removed a node.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 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 List 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-D157 Change the Node Timing Source](#)” task on page 10-18.
 - 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-D157 Change the Node Timing Source](#)” task on page 10-18.)



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 SDH links (east and west) as timing sources, traceable to the node with external BITS timing. See the “[NTP-D28 Set Up Timing](#)” procedure on page 4-20.
- Step 6** Return to your originating procedure (NTP).
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DLP-D196 Delete an MS-SPRing from a Single Node

Purpose	This task deletes an MS-SPRing from a node after you remove the node from an MS-SPRing.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 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 MS-SPRing.
- Step 2** From node view, click the **Provisioning > MS-SPRing** 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).
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NTP-D105 Add an SNCP Node

Purpose	This procedure adds a node to an SNCP ring.
Tools/Equipment	None
Prerequisite Procedures	Cards must be installed and node turn-up procedures completed on the node that will be added to the SNCP ring. 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-D24 Verify Card Installation](#)” procedure on page 4-2. Check that the STM-N cards that will serve as the SNCP trunk (span) cards match the SNCP optical rate of the trunk cards to which the new node will be connected. For example, if the adjacent nodes have STM-16 trunk cards, the new node must have STM-16 cards installed. If the STM-N cards are not installed or the rate does not match the rate of the adjacent node trunk cards, complete the “[NTP-D16 Install the Optical Cards](#)” procedure on page 2-12 to install them.

- Step 2** Verify that fiber is available to connect the new node to the existing nodes.
- Step 3** Complete the “[NTP-D35 Verify Node Turn Up](#)” procedure on page 5-2.
- Step 4** Log into a node in the SNCP ring where you want to add the node. See the “[DLP-D60 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 SDH 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 SDH**
 - Cost: **1**
- See the “[DLP-D65 Create a Static Route](#)” task on page 4-13. To view Gateway Settings, see the “[NTP-D169 Set Up CTC Network Access](#)” procedure on page 4-7.
- Step 6** Complete the “[DLP-D302 Check MS-SPRing or SNCP Alarms and Conditions](#)” task on page 14-6 to verify that the SNCP ring 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 SDH 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, you need to log into it directly. See “[DLP-D60 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 SDH Troubleshooting Guide*.
- Step 9** (Optional) Create test circuits, making sure they pass through the SNCP trunk (span) cards, and run test traffic through the node to ensure that the cards are functioning properly. See the “[NTP-D189 Create a Manually Routed High-Order Circuit](#)” procedure on page 6-51 and the “[NTP-D62 Test High-Order Circuits](#)” procedure on page 6-59 for information.
- Step 10** Create the DCC terminations on the new node. See the “[DLP-D253 Provision SDH DCC Terminations](#)” task on page 5-5.
- Step 11** From the View menu, choose **Go to Network View**.
- Step 12** Complete the “[DLP-D197 Initiate an SNCP 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 SNCP 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-D198 Clear an SNCP Force Switch](#)” task on page 14-19 to clear the protection switch.
- Step 21** (Optional) Complete the “[NTP-D177 SNCP Acceptance Test](#)” procedure on page 5-34.
- Stop. You have completed this procedure.**
-

NTP-D106 Remove an SNCP Node

Purpose	This procedure removes a node from an SNCP ring.
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 SNCP ring 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 SNCP node. See the “[DLP-D60 Log into CTC](#)” task on page 3-23 for instructions.
- Step 3** Complete the “[DLP-D302 Check MS-SPRing or SNCP Alarms and Conditions](#)” task on page 14-6 to verify that the SNCP ring 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 SDH Troubleshooting Guide*.

- Step 4** Complete the “[NTP-D152 Delete Circuits](#)” procedure on page 9-13 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-D304 Verify MS-SPRing Pass-Through Circuits](#)” task on page 14-12 to verify that circuits, passing through the node to be deleted, enter and exit the node on the same VC4 and/or VC3 or VC12.
- Step 6** Complete the “[DLP-D197 Initiate an SNCP 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.
- Step 9** 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 10** Exit CTC and log back in. See the “[DLP-D60 Log into CTC](#)” task on page 3-23 for instructions.
- Step 11** Log into each newly-connected node and open the Alarms tab. Verify that the span cards are free of alarms. Resolve any alarms before proceeding. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide*.
- Step 12** Complete the “[DLP-D195 Verify Timing in a Reduced Ring](#)” task on page 14-13.
- Step 13** Complete the “[DLP-D198 Clear an SNCP Force Switch](#)” task on page 14-19 to clear the protection switch.
- Step 14** Click the **Circuits** tab and verify that no incomplete circuits are displayed.
- Step 15** (Optional) Complete the “[NTP-D177 SNCP Acceptance Test](#)” procedure on page 5-34.

Stop. You have completed this procedure.

DLP-D197 Initiate an SNCP Force Switch

Purpose	This task switches all circuits on an SNCP span.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 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.

- 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 SNCP 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 SNCP 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

STS	VT	UPSR	Circuit	Switch State
1	--	✓	STS-001	FORCE
2	--	✓	STS_doc-123:46	FORCE
3	--	✓	STS_doc-123:47	FORCE
4	--	✓	STS_doc-123:48	FORCE
5	--	✓	STS_doc-123:49	FORCE
6	--	✓	STS_doc-123:50	FORCE
7	--	✓	STS_doc-123:51	FORCE
8	--	✓	STS_doc-123:52	FORCE
9	--	✓	STS_doc-123:53	FORCE
10-...	--		--unused--	

Perform UPSR span switching:



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; it is informational only.

Step 6 Return to your originating procedure (NTP).

DLP-D198 Clear an SNCP Force Switch

Purpose	This task clears an SNCP Force switch.
Tools/Equipment	None
Prerequisite Procedures	DLP-D60 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 SNCP 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 SNCP circuits is CLEAR.
- Step 6** Return to your originating procedure (NTP).
-

