
# Turn Up Network

This chapter explains how to turn up and test Cisco ONS 15454 SDH networks, including point-to-point networks, linear add drop multiplexers (ADMs), subnetwork connection protection rings (SNCPs), and multiplex section-shared protection rings (MS-SPRings).

## Before You Begin

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

1. NTP-D35 Verify Node Turn Up, page 6-2—Complete this procedure before beginning network turn up.
2. NTP-D124 Provision a Point-to-Point Network, page 6-3—Complete as needed.
3. NTP-D173 Point-to-Point Network Acceptance Test, page 6-7—Complete this procedure after you create a point-to-point network.
4. NTP-D38 Provision a Linear ADM Network, page 6-12—Complete as needed.
5. NTP-D174 Linear ADM Network Acceptance Test, page 6-13—Complete this procedure after you create a linear ADM.
6. NTP-D40 Provision MS-SPRing Nodes, page 6-15—Complete this procedure to provision ONS 15454 SDHs in a two-fiber or four-fiber multiplex section-shared protection rings (MS-SPRings).
7. NTP-D41 Create the MS-SPRing, page 6-18—Complete this procedure after provisioning the MS-SPRing nodes.
8. NTP-D175 Two-Fiber MS-SPRing Acceptance Test, page 6-22—Complete this procedure after you create a two-fiber MS-SPRing.
9. NTP-D176 Four-Fiber MS-SPRing Acceptance Test, page 6-29—Complete this procedure after you create a four-fiber MS-SPRing.
10. NTP-D44 Provision SNCP Nodes, page 6-36—Complete as needed.
11. NTP-D177 SNCP Acceptance Test, page 6-37—Complete this procedure after you create an subnetwork connection protection (SNCP) ring.
12. NTP-D217 Provision an SNCP Dual Ring Interconnect, page 6-40—As needed, complete this procedure after you provision an SNCP ring.
13. NTP-D218 Provision an Integrated SNCP Dual Ring Interconnect, page 6-42—As needed, complete this procedure after you provision an SNCP ring.
14. NTP-D258 Provision an Open-Ended SNCP, page 6-44—As needed, complete this procedure after you provision an SNCP.

15. NTP-D259 Open-Ended SNCP Acceptance Test, page 6-46—As needed, complete this procedure after you provision an open-ended SNCP.
16. NTP-D46 Subtend an SNCP from an MS-SPRing, page 6-48—Complete as needed.
17. NTP-D47 Subtend an MS-SPRing from an SNCP, page 6-50—Complete as needed.
18. NTP-D48 Subtend an MS-SPRing from an MS-SPRing, page 6-50—Complete as needed.
19. NTP-D172 Create a Logical Network Map, page 6-52—Complete as needed.

# NTP-D35 Verify Node Turn Up

| | |
|---|---|
| **Purpose** | This procedure verifies that an ONS 15454 SDH is ready for network turn up before adding it to a network. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | Chapter 4, "Turn Up Node" |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24. If you are already logged in, continue with Step 2.

**Step 2** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 3** Verify that the SW Version and Defaults in the node view status area match the software version and NE defaults shown in your site plan. If either is not correct, complete the following procedures as needed:

- If the software is not the correct version, install the correct version from the ONS 15454 SDH software CD. Upgrade procedures are located in the *Cisco ONS 15454 SDH Software Upgrade Guide*. Follow the upgrade procedures appropriate to the software currently installed on the node. TCC2 cards can also be ordered with the latest software release.
- If the node defaults are not correct, import the network element defaults. Refer to *Cisco ONS 15454 SDH Network Element Defaults* for Software R4.6.

**Step 4** Click the **Provisioning > General** tabs. Verify that all general node information settings match the settings of your site plan. If not, see the "NTP-D81 Change Node Management Information" procedure on page 12-2.

**Step 5** Click the **Provisioning > Timing** tabs. Verify that timing settings match the settings of your site plan. If not, see the "NTP-D85 Change Node Timing" procedure on page 12-23.

**Step 6** Click the **Provisioning > Network** tabs. Ensure that the IP settings and other CTC network access information is correct. If not, see the "NTP-D201 Change CTC Network Access" procedure on page 12-4.

**Step 7** Click the **Provisioning > Protection** tabs. Verify that all protection groups have been created according to your site plan. If not, see the "NTP-D203 Modify or Delete Card Protection Settings" procedure on page 12-15.

**Step 8** Click the **Provisioning > Security** tabs. Verify that all users have been created and their security levels and policies match the settings indicated by your site plan. If not, see the "NTP-D205 Modify Users and Change Security" procedure on page 12-25.

**Step 9** If SNMP is provisioned on the node, click the **Provisioning > SNMP** tabs. Verify that all SNMP settings match the settings of your site plan. If not, see the "NTP-D87 Change SNMP Settings" procedure on page 12-33.

**Step 10** Provision the network using the applicable procedure shown in the "Before You Begin" section on page 6-1.

**Stop. You have completed this procedure.**

# NTP-D124 Provision a Point-to-Point Network

| | |
|---|---|
| **Purpose** | This procedure provisions two ONS 15454 SDHs in a point-to-point (terminal) network. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | NTP-D35 Verify Node Turn Up, page 6-2 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 on an ONS 15454 SDH in the network where you want to provision a point-to-point configuration.

**Step 2** Click the **Provisioning > Protection** tabs. Verify that 1+1 protection is created for the STM-N cards. Complete the "DLP-D73 Create a 1+1 Protection Group" task on page 4-30 if protection has not been created.

**Step 3** Repeat Steps 1 and 2 for the second point-to-point node.

**Step 4** Verify that the working and protect cards in the 1+1 protection groups correspond to the physical fiber connections between the nodes, that is, verify that the working card in one node connects to the working card in the other node, and that the protect card in one node connects to the protect card in the other node.

**Step 5** Complete the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4 for the working STM-N port on both point-to-point nodes.

**Note** DCC terminations are not provisioned on the protect ports.

**Note** If the point-to-point nodes are not connected to a LAN, you will need to create the DCC terminations using a direct (craft) connection to the node. Remote provisioning is possible only after all nodes in the network have DCC terminations provisioned to in-service STM-N ports.

**Step 6** Complete the "DLP-D214 Change the Service State for a Port" task on page 6-6 to put the protect card in-service.

**Step 7** Verify that timing is set up at both point-to-point nodes. If not, complete the "NTP-D28 Set Up Timing" procedure on page 4-22 for one or both of the nodes. If a node uses line timing, make its working STM-N the timing source. The system will automatically choose the corresponding protect STM-N card as the protect timing source. This will be visible in the Maintenance > Timing tab.

**Step 8** Complete the "NTP-D173 Point-to-Point Network Acceptance Test" procedure on page 6-7.

**Stop. You have completed this procedure.**

# DLP-D464 Provision SDH DCC Terminations

| | |
|---|---|
| **Purpose** | This task creates the SDH Data Communications Channel terminations required for alarms, administration data, signal control information and messages. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Note** When SDCC is provisioned, an LDCC termination is allowed on the same port, but is not recommended. Using SDCC and LDCC on the same port is only needed during a software upgrade if the software version does not support LDCC. You can provision SDCCs and LDCCs on different ports in the same node.

**Step 1** In node view, click the **Provisioning > DCC/GCC/OSC > SDCC** tabs.

**Step 2** Click **Create.**

**Step 3** In the Create SDCC Terminations dialog box click the ports where you want to create the DCC termination. To select more than one port, press the Shift key or the Ctrl key.

**Note** SDCC refers to the regenerator section DCC, which is used for ONS 15454 SDH DCC terminations. The SDH-multiplex SDCCs and the regenerator SDCC (when not used as a DCC termination by the ONS 15454 SDH) can be provisioned as DCC tunnels. See the "DLP-D313 Create a DCC Tunnel" task on page 8-98.

**Step 4** In the Port State area, click the **Set to IS** radio button.

**Step 5** Verify that the Disable OSPF on DCC Link check box is unchecked.

**Step 6** Click **OK**.

**Note** EOC (DCC Termination Failure) and LOS (Loss of Signal) alarms appear until you create all network DCC terminations and put the DCC termination STM-N ports in service.

**Step 7** Return to your originating procedure (NTP).

# DLP-D467 Provision SDH LDCC Terminations

| | |
|---|---|
| **Purpose** | This task creates the SDH Line Data Communications Channel terminations used for tunneling third-party vendor equipment communications through an ONS 15454 SDH network. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Note** When LDCC is provisioned, an SDCC termination is allowed on the same port, but is not recommended. Using SDCC and LDCC on the same port is only needed during a software upgrade if the software version does not support LDCC. You can provision SDCCs and LDCCs on different ports in the same node.

**Step 1** In node view, click the **Provisioning > DCC/GCC/OSC > LDCC** tabs.

**Step 2** Click **Create.**

**Step 3** In the Create LDCC Terminations dialog box click the ports where you want to create the LDCC termination. To select more than one port, press the Shift key or the Ctrl key.

**Note** LDCC refers to the multiplex section DCC, which is used for ONS 15454 SDH DCC terminations. The SDH-multiplex section DCCs and the regenerator section DCC (when not used as a DCC termination by the ONS 15454 SDH) can be provisioned as DCC tunnels. See the "DLP-D313 Create a DCC Tunnel" task on page 8-98.

**Step 4** In the Port State area, click the **Set to IS** radio button.

**Step 5** Verify that the Disable OSPF on DCC Link check box is unchecked.

**Step 6** Click **OK**.

**Note** MS-EOC (Multiplex Section DCC Termination Failure) and LOS (Loss of Signal) alarms appear until you create all network DCC terminations and put the DCC termination STM-N ports in service.

**Step 7** Return to your originating procedure (NTP).

# DLP-D214 Change the Service State for a Port

| | |
|---|---|
| **Purpose** | This task puts a port in service or removes a port from service. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Note** To provision Ethernet ports, see the "DLP-D220 Provision E-Series Ethernet Ports" task on page 8-70 or the "DLP-D222 Provision G-Series Ethernet Ports" task on page 8-90.

**Step 1** In node view on the shelf graphic, double-click the card with the port(s) you want to put in or out of service. The card view appears.

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

**Step 3** In the State area, choose one of the following:

- IS—The port is in-service.
- OOS—The port is out-of-service. Traffic is not passed on the port until the service state is changed to IS, OOS_MT, or OOS_AINS.
- OOS_MT—The port is in a maintenance state. The maintenance state does not interrupt traffic flow, but alarm reporting is suppressed and loopbacks are allowed. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab. Use OOS_MT for testing or to suppress alarms temporarily. Change the state to IS, OOS, or OOS_AINS when testing is complete.
- OOS_AINS—The port is in an auto-inservice state; alarm reporting is suppressed, but traffic is carried and loopbacks are allowed. After the soak period passes, the port changes to IS. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab.

**Step 4** If you set State to OOS-AINS, set the soak period time in the AINS Soak field. This is the amount of time that the port will stay in OOS-AINS after the signal is continuously received before changing to IS.

**Step 5** Click **Apply**.

**Step 6** As needed, repeat this task for each port.

**Step 7** Return to your originating procedure (NTP).

# NTP-D173 Point-to-Point Network Acceptance Test

| | |
|---|---|
| **Purpose** | This procedure tests a point-to-point network. |
| **Tools/Equipment** | Test set/cables appropriate to the test circuit you will create. |
| **Prerequisite Procedures** | NTP-D124 Provision a Point-to-Point Network, page 6-3 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 at one of the point-to-point nodes. The node (default) view appears. If you are already logged in, continue with Step 2.

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

**Step 3** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

c. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the alarm information.

**Step 4** Click the **Conditions** tab.

a. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

b. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the conditional information.

**Step 5** On the network map, double-click one point-to-point node to open it in node view.

**Step 6** Create a test circuit from the login node to the other point-to-point node:

- For VC4 circuits, complete the "NTP-D188 Create an Automatically Routed High-Order Circuit" procedure on page 8-47. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC3 circuits, complete the "NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit" procedure on page 8-22. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC12 circuits, complete the "NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit" procedure on page 8-7. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.

**Step 7** Configure the test set for the test circuit type you created:

- VC4 or VC4-nc—If you are testing a VC4 circuit or a VC4-nc circuit on an STM-N card, you must have a direct optical interface to the ONS 15454 SDH. Set the test set for STM-N. For information about configuring your test set, consult your test set user guide.
- VC3—If you are testing a clear channel E3/DS3I, you must have a patch panel or a direct E3/DS3I interface to the ONS 15454 SDH. Set the test set for clear channel E3/DS3I. For information about configuring your test set, consult your test set user guide.
- VC12—If you are testing an E1, you must have a patch panel or a direct E1 interface to the ONS 15454 SDH. Set the test set for E1. For information about configuring your test set, consult your test set user guide.

**Step 8** Verify the integrity of all patch cables that will be used in this test by connecting one end to the test set transmit (Tx) connector and the other end to the test set receive (Rx) connector. If the test set does not run error-free, check the cable for damage and check the test set to make sure it is set up correctly before going to the next step.

**Step 9** Create a physical loopback at the circuit destination card. To do so, attach one end of a patch cable to the destination port's transmit (Tx) connector; attach the other end to the port's receive (Rx) connector.

**Step 10** At the circuit source card:

**a.** Connect the transmit (Tx) connector of the test set to the receive (Rx) connector on the circuit source card.

**b.** Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector on the circuit source card.

**Step 11** Verify that the test set shows a clean signal. If a clean signal is not present, repeat Steps 6 through 10 to make sure the test set and cabling are configured correctly.

**Step 12** If a node fails any test, repeat the test while verifying correct setup and configuration. If the test fails again, refer to the next level of support.

**Step 13** Inject BIT errors from the test set. Verify that the errors appear at the test set, indicating a complete end-to-end circuit.

**Step 14** Complete the "DLP-D254 TCC2 Card Active/Standby Switch Test" task on page 6-9.

**Step 15** Complete the "DLP-D255 Cross-Connect Card Side Switch Test" task on page 6-10.

**Step 16** Complete the "DLP-D88 Optical 1+1 Protection Test" task on page 6-11.

**Step 17** Set up and complete a BER test. Use the existing configuration and follow your site requirements for the specified length of time. Record the test results and configuration.

**Step 18** Remove any loopbacks, switches, or test sets from the nodes after all testing is complete.

**Step 19** From the View menu, choose **Go to Network View**.

**Step 20** Click the **Alarms** tab.

**a.** Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

**b.** Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**c.** Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the alarm information.

**Step 21** Repeat Steps 9 through 20 for the other point-to-point node.

**Step 22** If a node fails any test, repeat the test while verifying correct setup and configuration. If the test fails again, refer to the next level of support.

**Step 23** Delete the test circuit. See the "DLP-D27 Delete Circuits and DWDM Optical Channel Network Connections" task on page 11-17.

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

**Stop. You have completed this procedure.**

# DLP-D254 TCC2 Card Active/Standby Switch Test

| | |
|---|---|
| **Purpose** | This task verifies that the TCC2 cards can effectively switch from one to another. |
| **Tools/Equipment** | The test set specified by the acceptance test procedure, connected and configured as specified in the acceptance test procedure. |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** From the View menu, choose **Go to Network View**.

**Step 2** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 3** Click the **Conditions** tab. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide*.

**Step 4** On the network view map, double-click the node containing the TCC2 cards you are testing to open the node in node view.

**Step 5** Make a note of which TCC2 card is active and which is standby by examining the LEDs on the shelf graphic. TCC2 cards are installed in Slot 7 and Slot 11. The active TCC2 card has a green ACT LED, and the standby TCC2 card has an amber SBY LED.

**Step 6** On the shelf graphic, right-click the active TCC2 card and choose **Reset** from the shortcut menu.

**Step 7** In the Resetting Card dialog box, click **Yes**. After 20 to 40 seconds, a "lost node connection, changing to network view" message appears.

**Step 8** Click **OK**. On the network view map, the node where you reset the TCC2 card will be gray.

**Step 9** After the node icon turns green (within 1 to 2 minutes), double-click it. On the shelf graphic, observe the following:

- The previous standby TCC2 card has a green ACT LED.
- The previous active TCC2 card LEDs go through the following LED sequence: NP (card not present), Ldg (software is loading), amber SBY LED (TCC2 card is in standby mode). The LEDs should complete this sequence within 5 to 10 minutes.

**Step 10** Verify that traffic on the test set connected to the node is still running. If a traffic interruption occurs, do not continue, refer to your next level of support.

**Step 11** Repeat Steps 2 through 10 to return the active/standby TCC2 cards to their configuration at the start of the procedure.

**Step 12** Verify that the TCC2 cards appear as noted in Step 5.

**Step 13** Return to your originating procedure (NTP).

# DLP-D255 Cross-Connect Card Side Switch Test

| | |
|---|---|
| **Purpose** | This task verifies that the XC10G and XCVXL cards can effectively switch service (active to standby and standby to active). |
| **Tools/Equipment** | The test set specified by the acceptance test procedure, connected and configured as specified in the acceptance test procedure. |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Caution** Always wait 60 seconds between cross-connect card (side) switches.

**Step 1** From the View menu, choose **Go to Network View**.

**Step 2** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 3** Click the **Conditions** tab. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 4** On the network map, double-click the node containing the cross-connect cards you are testing to open it in node view.

**Step 5** Click the **Maintenance > Cross-Connect** tabs.

**Step 6** In the Cross-Connect Cards area, make a note of the active and standby slots.

**Step 7** On the shelf graphic, verify that the active cross-connect card shows a green ACT LED and the standby cross-connect card shows an amber SBY LED. If these conditions are not present, review the "DLP-D333 Install the XC10G, XCVXL 10G, or XCVXL 2.5G Cards" task on page 2-9 or contact your next level of support.

**Step 8** Click **Switch**.

**Step 9** In the Confirm Switch dialog box, click **Yes**.

**Step 10** Verify that the active slot noted in Step 6 becomes the standby slot, and that the standby slot becomes the active slot. The switch should appear within 1 to 2 seconds.

**Step 11** Verify that traffic on the test set connected to the node is still running. Some bit errors are normal, but traffic flow should not be interrupted. If a traffic interruption occurs, do not continue. Refer to your next level of support.

**Step 12** Wait 60 seconds, then repeat Steps 7 through 9 to return the active/standby slots to their configuration at the start of the procedure.

**Step 13** Verify that the cross-connect card appears as you noted in Step 6.

**Step 14** Return to your originating procedure (NTP).

# DLP-D88 Optical 1+1 Protection Test

| | |
|---|---|
| **Purpose** | This task verifies that a 1+1 protection group will switch traffic properly. |
| **Tools/Equipment** | The test set specified by the acceptance test procedure. |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24; a test circuit created as part of the topology acceptance test. |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** From the View menu, choose **Go to Network View**.

**Step 2** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 3** Click the **Conditions** tab. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 4** On the network map, double-click the node containing the 1+1 protection group you are testing to open it in node view.

**Step 5** Switch the working port:

a. Click the **Maintenance > Protection** tabs.

b. In the Protection Groups area, click the 1+1 protection group.

c. Click the working port. Next to Switch Commands, click the **Force** button.

d. At the Confirm Manual Operation dialog box, click **Yes**.

e. In the Selected Group area, verify that the following appears:

- Protect port - Protect/Active [FORCE_SWITCH_TO_PROTECT] [PORT STATE]
- Working port - Working/Standby [FORCE_SWITCH_TO_PROTECT], [PORT STATE]

**Step 6** Verify that traffic on the test set connected to the node is still running. Some bit errors are normal, but traffic flow should not be interrupted. If a traffic interruption occurs, complete Step 7, then refer to your next level of support. If a traffic interruption does not occur, continue with the next step.

**Step 7** Clear the switch on the working port:

a. Next to Switch Commands, click **Clear**.

b. In the Confirm Clear Operation dialog box, click **Yes**.

**Step 8** Switch the protect port:

a. In the Selected Group area, click the protect port.

b. Next to Switch Commands, click the **Force** button.

c. At the Confirm Force Operation dialog box, click **Yes**.

d. In the Selected Group area, verify that the following appears:

- Protect port - Protect/Active [FORCE_SWITCH_TO_WORKING], [PORT STATE]
- Working port - Working/Standby [FORCE_SWITCH_TO_WORKING], [PORT STATE]

**Step 9** Verify that traffic on the test set connected to the node is still running. If a traffic interruption occurs, complete Step 10 and refer to your next level of support.

**Step 10** Clear the switch on the protect port:

a. Next to Switch Commands, click **Clear**.

b. At the Confirm Clear Operation dialog box, click **Yes**.

c. In the Selected Group area, verify the following states:

- Protect port - Protect/Standby
- Working port - Working/Active

**Step 11** Return to your originating procedure (NTP).

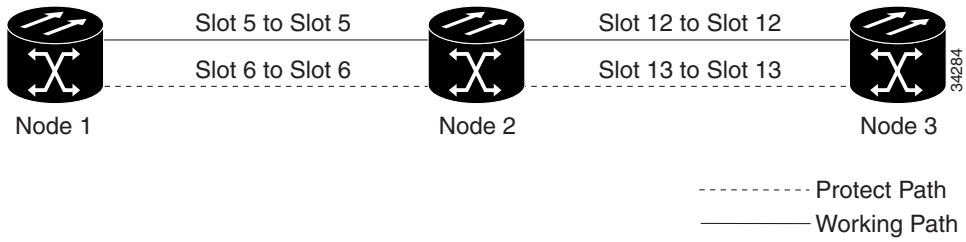
# NTP-D38 Provision a Linear ADM Network

| | |
|---|---|
| **Purpose** | This procedure provisions three or more ONS 15454 SDHs in a linear add-drop multiplexer (ADM) configuration. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | NTP-D35 Verify Node Turn Up, page 6-2 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 at an ONS 15454 SDH where you want to provision a linear ADM network. If you are already logged in, continue with Step 2.

Figure 6-1 shows three ONS 15454 SDHs in a linear ADM configuration. In this example, working traffic flows from Slot 5/Node 1 to Slot 5/Node 2, and from Slot 12/Node 2 to Slot 12/Node 3. Slots 6 and 13 contain the protect STM-N cards. Slots 5 and 6 and Slots 12 and 13 are in 1+1 protection.

*Figure 6-1 Linear ADM Configuration*




**Step 2** Click the **Provisioning > Protection** tabs. Verify that 1+1 protection is created for the STM-N cards at the node. If the protection group has not been created, complete the "DLP-D73 Create a 1+1 Protection Group" task on page 4-30.

**Step 3** Repeat Steps 1 and 2 for all other nodes that you will include in the linear ADM.

**Step 4** Verify that the working and protect cards in the 1+1 protection groups correspond to the physical fiber connections between the nodes, that is, working cards are fibered to working cards and protect cards are fibered to protect cards.

**Step 5** Complete the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4 for the working STM-N ports on each linear ADM node.

**Note** If linear ADM nodes are not connected to a LAN, you will need to create the DCC terminations using a direct (craft) connection to the node. Remote provisioning is possible only after all nodes without LAN connections have DCC terminations provisioned to in-service STM-N ports.

**Note** Terminating nodes (Nodes 1 and 3 in Figure 6-1) will have one DCC termination, and intermediate nodes (Node 2 in Figure 6-1) will have two DCC terminations (Slots 5 and 12 in the example).

**Step 6** Verify that timing has been set up at each linear node. If not, complete the "NTP-D28 Set Up Timing" procedure on page 4-22. If a node is using line timing, use its working STM-N card as the timing source.

**Step 7** Complete the "NTP-D174 Linear ADM Network Acceptance Test" procedure on page 6-13.

**Stop. You have completed this procedure.**

# NTP-D174 Linear ADM Network Acceptance Test

| | |
|---|---|
| **Purpose** | This procedure tests a linear ADM network. |
| **Tools/Equipment** | Test set and cables appropriate to the test circuit you will create. |
| **Prerequisite Procedures** | NTP-D38 Provision a Linear ADM Network, page 6-12 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 on a node in the linear ADM network you are testing. If you are already logged in, continue with Step 2.

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

**Step 3** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

c. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export alarm information.

**Step 4** Click the **Conditions** tab.

a. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

b. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export condition information.

**Step 5** On the network map, double-click the linear ADM node you are testing to open it in node view.

**Step 6** Create a test circuit from that node to an adjacent linear ADM node.

- For VC4 circuits, complete the "NTP-D188 Create an Automatically Routed High-Order Circuit" procedure on page 8-47. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC3 circuits, complete the "NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit" procedure on page 8-22. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC12 circuits, complete the "NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit" procedure on page 8-7. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.

**Step 7** Configure the test set for the test circuit type you created:

- VC4 or VC4-nc—If you are testing a VC4 circuit or a VC4-nc circuit on an STM-N card, you must have a direct optical interface into the ONS 15454 SDH. Set the test set for STM-N. For information about configuring your test set, consult your test set user guide.
- VC3—If you are testing a clear channel E3/DS3I, you must have a patch panel or a direct E3/DS3I interface into the ONS 15454 SDH. Set the test set for clear channel E3/DS3I. For information about configuring your test set, consult your test set user guide.
- VC12—If you are testing an E1, you must have a patch panel or a direct E1 interface to the ONS 15454 SDH. Set the test set for E1. For information about configuring your test set, consult your test set user guide.

**Step 8** Verify the integrity of all patch cables that will be used in this test by connecting one end to the test set transmit (Tx) connector and the other end to the test set receive (Rx) connector. If the test set does not run error-free, check the cable for damage and check the test set to make sure it is set up correctly before going to the next step.

**Step 9** Create a physical loopback at the circuit destination card. To do so, attach one end of a patch cable to the destination port's transmit (Tx) connector; attach the other end to the destination port's receive (Rx) connector.

**Step 10** At the circuit source card:

a. Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.

b. Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.

**Step 11** Verify that the test set shows a clean signal. If a clean signal does not appear, repeat Steps 6 through 10 to make sure the test set and cabling are configured correctly.

**Step 12** Inject BIT errors from the test set. Verify that the errors appear at the test set, indicating a complete end-to-end circuit.

**Step 13** Complete the "DLP-D254 TCC2 Card Active/Standby Switch Test" task on page 6-9.

**Step 14** Complete the "DLP-D255 Cross-Connect Card Side Switch Test" task on page 6-10.

**Step 15** Complete the "DLP-D88 Optical 1+1 Protection Test" task on page 6-11 to test the STM-N port protection group switching.

**Step 16** Set up and complete a BER test. Use the existing configuration and follow your site requirements for length of time. Record the test results and configuration.

**Step 17** Remove any loopbacks, switches, or test sets from the nodes after all testing is complete.

**Step 18** In network view, click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 19** Delete the test circuit. See the "DLP-D27 Delete Circuits and DWDM Optical Channel Network Connections" task on page 11-17.

**Step 20** In network view, double-click the next linear ADM node to open it in node view and repeat Steps 6 through 19.

**Step 21** If a node fails any test, repeat the test while verifying correct setup and configuration. 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 application.

**Stop. You have completed this procedure.**

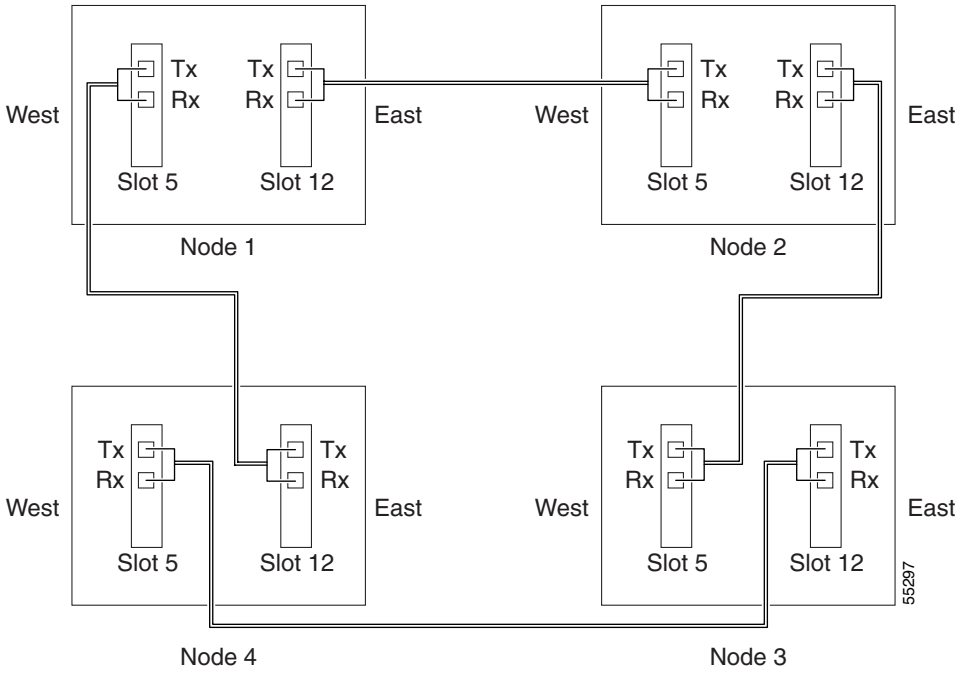
# NTP-D40 Provision MS-SPRing Nodes

| | |
|---|---|
| **Purpose** | This procedure provisions ONS 15454 SDH nodes for a multiplex section-shared protection ring (MS-SPRing). |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | NTP-D35 Verify Node Turn Up, page 6-2 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D338 Install Fiber-Optic Cables for MS-SPRing Configurations" task on page 2-37, verifying that the following rules are observed:

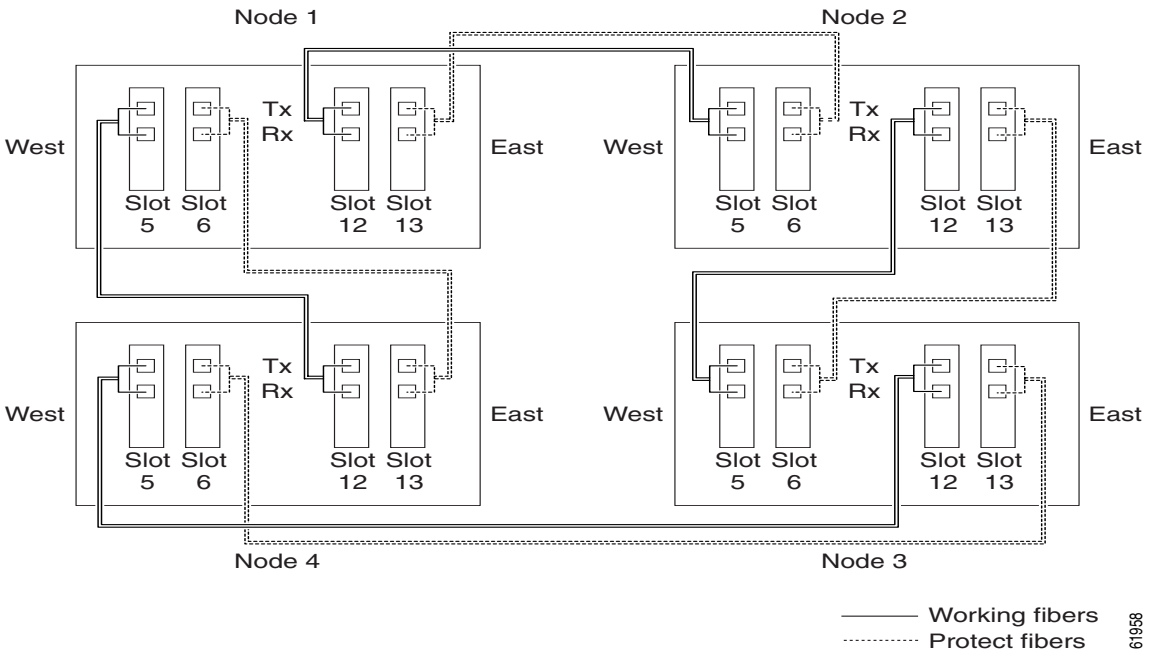
- Verify that the east port at one node is connected to the west port on an adjacent node, and this east to west port connection is used at all MS-SPRing nodes, similar to Figure 6-2. In the figure, the STM-N drop card on the left side of the shelf is the west port, and the drop card on the right side of the shelf is considered the east port.

***Figure 6-2 Four-Node, Two-Fiber MS-SPRing Fiber Connection Example***




- For four-fiber MS-SPRings, verify that the same east port to west port connection is used for the working and protect fibers, similar to Figure 6-3. Verify that the working and protect card connections are not mixed. The working cards are the cards where you will provision the DCC terminations.

*Figure 6-3 Four-Node, Four-Fiber MS-SPRing Fiber Connection Example*




**Step 2** Log into an ONS 15454 SDH that you want to configure in an MS-SPRing. See the "DLP-D60 Log into CTC" task on page 3-24. If you are already logged in, continue with Step 3.

**Step 3** Complete the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4. Provision the two ports/cards that will serve as the MS-SPRing ports at the node. For four-fiber MS-SPRings, provision the DCC terminations on the STM-N cards that will carry the working traffic, but do not provision DCCs on the protect cards.

**Note** If an ONS 15454 SDH is not connected to a corporate LAN, DCC provisioning must be performed through a direct (craft) connection to the node. Remote provisioning is possible only after all nodes in the network have DCCs provisioned to in-service STM-N ports.

**Step 4** For four-fiber MS-SPRings, complete the "DLP-D214 Change the Service State for a Port" task on page 6-6 to put the protect STM-N cards/ports in service.

**Step 5** If an MS-SPRing span passes through third-party equipment that cannot transparently transport the K3 byte, complete the "DLP-D89 Remap the K3 Byte" task on page 6-18. This task is not necessary for most users.

**Step 6** Repeat Steps 2 through 4 at each node that will be in the MS-SPRing. Verify that the EOC (DCC Termination Failure) and LOS (Loss of Signal) are cleared after DCCs are provisioned on all nodes in the ring.

**Step 7** Complete the "NTP-D41 Create the MS-SPRing" procedure on page 6-18.

**Stop. You have completed this procedure.**

# DLP-D89 Remap the K3 Byte

| | |
|---|---|
| **Purpose** | This task provisions the K3 byte. Do not remap the K3 byte unless specifically required to run an ONS 15454 SDH MS-SPRing through third-party equipment. This task is unnecessary for most users. |
| **Tools/Equipment** | STM-16 cards must be installed on the MS-SPRing span that you will remap. |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Caution** If you remap the K3 byte, remap to the same extended byte (Z2, E2, or F1) on either side of the span.

**Step 1** In node view, double-click the STM-16 card that connects to the third-party equipment.

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

**Step 3** Click **MS-SPRing Ext Byte** and choose the alternate byte: Z2, E2, or F1.

**Step 4** Click **Apply**.

**Step 5** Four-fiber MS-SPRing only, repeat Steps 2 through 4 for each protect card.

**Step 6** Repeat this task at the node and card on the other end of the MS-SPRing span.

**Note** The extension byte chosen in Step 3 should match at both ends of the span.

**Step 7** Return to your originating procedure (NTP).

# NTP-D41 Create the MS-SPRing

| | |
|---|---|
| **Purpose** | This procedure creates an MS-SPRing at each MS-SPRing-provisioned node. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | NTP-D35 Verify Node Turn Up, page 6-2<br>NTP-D40 Provision MS-SPRing Nodes, page 6-15 |
| **Required/As Needed** | As needed; required to complete MS-SPRing provisioning |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 at a node on the network where you will create the MS-SPRing.

**Step 2** Complete one of the following tasks:

- DLP-D468 Create an MS-SPRing Using the MS-SPRing Wizard, page 6-19 – Use this task to create the MS-SPRing using the CTC MS-SPRing wizard. The MS-SPRing wizard checks to see that each node is ready for MS-SPRing provisioning, then provisions all the nodes at once. Using the MS-SPRing wizard is recommended.
- DLP-D469 Create an MS-SPRing Manually, page 6-21 – Use this task to provision the MS-SPRing manually at each node that will be in the MS-SPRing.

**Step 3** Complete the "NTP-D175 Two-Fiber MS-SPRing Acceptance Test" procedure on page 6-22 or the "NTP-D176 Four-Fiber MS-SPRing Acceptance Test" procedure on page 6-29.

**Stop. You have completed this procedure.**

# DLP-D468 Create an MS-SPRing Using the MS-SPRing Wizard

| | |
|---|---|
| **Purpose** | This task creates an MS-SPRing using the MS-SPR wizard. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | As needed; required to complete MS-SPring setup |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Step 1** From the View menu, choose **Go to Network View**.

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

**Step 3** Click **Create MS-SPRing**.

**Step 4** In the MS-SPRing Creation dialog box, set the MS-SPRing properties:

- Ring Type—Choose the MS-SPRing type, either two-fiber or four-fiber.
- Speed—Choose the MS-SPRing speed: STM-4 (two-fiber MS-SPRing only), STM-16, or STM-64. The speed must match the STM-N speed of the MS-SPRing trunk (span) cards.

**Note** If you are creating an STM-4 MS-SPRing and will eventually upgrade it to STM-16 or STM-64, use the single-port STM-4 cards (OC12 IR/STM4 SH 1310, OC12 IR/STM4 SH 1310, or OC12 IR/STM4 SH 1310). You cannot upgrade an MS-SPRing on a four-port STM-4 (OC12/STM4-4) because STM-16 and STM-64 cards are single-port.

- Ring Name—Assign a ring name. The name can be from 1 to 6 characters in length. Any alphanumeric character string is permissible, and upper and lower case letters can be combined. Do not use the character string "All" in either upper or lower case letters, this is a TL1 keyword and will be rejected. Do not choose a name that is already assigned to another MS-SPRing.
- Reversion time—Set the amount of time that will pass before the traffic reverts to the original working path following a ring switch. The default is 5 minutes. Ring reversions can be set to Never.

For four-fiber MS-SPRings only, complete the following:

- Span Reversion—Set the amount of time that will pass before the traffic reverts to the original working path following a span switch. The default is 5 minutes. Span reversions can be set to Never.

**Step 5** Click **Next**. If the network graphic appears, go to Step 6. If CTC determines that an MS-SPRing cannot be created, for example, not enough optical cards are installed or it finds circuits with SNCP selectors, a "Cannot Create MS-SPRing" message appears. If this occurs, complete the following steps:

a. Click **OK**.

b. In the Create MS-SPRing window, click **Excluded Nodes**. Review the information explaining why the MS-SPRing could not be created, then click **OK**.

c. Depending on the problem, click **Back** to start over or click **Cancel** to cancel the operation.

d. Complete the "NTP-D40 Provision MS-SPRing Nodes" procedure on page 6-15, making sure all steps are completed accurately, then start this procedure again.

**Step 6** In the network graphic, double-click an MS-SPRing span line. If the span line is DCC connected to other MS-SPRing cards constituting a complete ring, the lines turn blue and the Finish button appears. If the lines do not form a complete ring, double-click span lines until a complete ring is formed. When the ring is DCC connected, go to Step 7 if you are completing a four-fiber MS-SPRing or go to Step 8 if you are completing a two-fiber MS-SPRing.

**Step 7** Four-fiber MS-SPRings, click **Next**. In the Protect Port Selection section, choose the protect ports from the West Protect and East Protect columns. Go to the next step.

**Step 8** Click **Finish**. If the MS-SPRing window appears with the MS-SPRing you created, go to Step 9. If a "Cannot Create MS-SPRing" or "Error While Creating MS-SPRing" message appears:

a. Click **OK**.

b. On the Create MS-SPRing window, click **Excluded Nodes**. Review the information explaining why the MS-SPRing could not be created, then click **OK**.

c. Depending on the problem, click **Back** to start over or click **Cancel** to cancel the operation.

d. Complete the "NTP-D40 Provision MS-SPRing Nodes" procedure on page 6-15, making sure all steps are completed accurately, then start this procedure again.

**Note** Some or all of the following alarms may briefly appear during MS-SPRing setup: E-W MISMATCH, RING MISMATCH, APSCIMP, APSDFLTK, or MSSP-OSYNC.

**Step 9** Verify the following:

- On the network view graphic, a green span line appears between all MS-SPRing nodes.
- All E-W MISMATCH, RING MISMATCH, APSCIMP, DFLTK, and MSSP-OSYNC alarms are cleared. See the *Cisco ONS 15454 SDH Troubleshooting Guide* for alarm troubleshooting.

**Note** The numbers in parentheses after the node name are the MS-SPRing node IDs assigned by CTC. Every ONS 15454 SDH in an MS-SPRing is given a unique node ID, 0 through 31. To change it, complete the "DLP-D24 Change an MS-SPRing Node ID" task on page 15-12.

**Step 10** Return to your originating procedure (NTP).

# DLP-D469 Create an MS-SPRing Manually

| | |
|---|---|
| **Purpose** | This task creates an MS-SPRing at each MS-SPRing-provisioned node without using the MS-SPRing wizard. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Step 1** In node view, click the **Provisioning > Ring** tabs.

**Step 2** Click **Create**.

**Step 3** On the Suggestion dialog box, click **OK**.

**Step 4** In the Create MS-SPRing dialog box, set the MS-SPRing properties:

- Ring Type—Choose the MS-SPRing ring type, either two-fiber or four-fiber.
- Ring Name—Assign a ring name. You must use the same ring name for each node in the MS-SPRing. Any alphanumeric character string is permissible, and upper and lower case letters can be combined. Do not use the character string “All” in either upper or lower case letters, this is a TL1 keyword and will be rejected. Do not choose a name that is already assigned to another MS-SPRing.
- Node ID—Choose a Node ID from the pull-down menu (0 through 31). The Node ID identifies the node to the MS-SPRing. Nodes in the same MS-SPRing must have unique Node IDs.
- Reversion time—Set the amount of time that will pass before the traffic reverts to the original working path. The default is 5 minutes. All nodes in an MS-SPRing must have the same reversion time setting.
- West Line—Assign the west MS-SPRing port for the node from the pull-down menu.

**Note** The east and west ports must match the fiber connections and DCC terminations set up in the “NTP-D40 Provision MS-SPRing Nodes” procedure on page 6-15.

- East Line—Assign the east MS-SPRing port for the node from the pull-down menu.

For four-fiber MS-SPRings, complete the following:

- Span Reversion—Set the amount of time that will pass before the traffic reverts to the original working path following a span reversion. The default is 5 minutes. Span reversions can be set to Never. If you set a reversion time, the times must be the same for both ends of the span. That is, if Node A’s west fiber is connected to Node B’s east port, the Node A west span reversion time must be the same as the Node B east span reversion time. To avoid reversion time mismatches, Cisco recommends that you use the same span reversion time throughout the ring.
- West Protect—Assign the west MS-SPRing port that will connect to the west protect fiber from the pull-down menu.
- East Protect—Assign the east MS-SPRing port that will connect to the east protect fiber from the pull-down menu.

**Step 5** Click **OK**.

**Note** Some or all of the following alarms will appear until all the MS-SPRing nodes are provisioned: E-W MISMATCH, RING MISMATCH, APSCIMP, APSDFLTK, MS-SPRINGOSYNC. The alarms will clear after you configure all the nodes in the MS-SPRing.

**Step 6** From the View menu, choose **Go to Other Node**.

**Step 7** In the Select Node dialog box, choose the next node that you want to add to the MS-SPRing.

**Step 8** Repeat Steps 1 through 7 at each node that you want to add to the MS-SPRing. When all nodes have been added, continue with Step 9.

**Step 9** From the View menu, choose **Go to Network View**. After 10 to 15 seconds, verify the following:

- A green span line appears between all MS-SPRing nodes.
- All E-W MISMATCH, RING MISMATCH, APSCIMP, DFLTK, and MS-SPRINGOSYNC alarms are cleared.

**Step 10** Return to your originating procedure (NTP).

# NTP-D175 Two-Fiber MS-SPRing Acceptance Test

| | |
|---|---|
| **Purpose** | This procedure tests a two-fiber MS-SPRing. |
| **Tools/Equipment** | Test set and cables appropriate for the test circuit |
| **Prerequisite Procedures** | NTP-D40 Provision MS-SPRing Nodes, page 6-15<br>NTP-D41 Create the MS-SPRing, page 6-18 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Note** This procedure requires that you create test circuits and perform ring switches around the ring. For clarity, "Node 1" refers to the login node where you begin the procedure. "Node 2" refers to the node connected to the east STM-N trunk (span) card of Node 1, "Node 3" refers to the node connected to the east STM-N trunk card of Node 2, and so on.

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 at one of the ONS 15454 SDHs on the MS-SPRing you are testing. If you are already logged in, continue with Step 2.

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

**Step 3** Click the **Alarms** tab.

**a.** Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

**b.** Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**c.** Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the alarm information.

**Step 4** Click the **Conditions** tab.

a. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

b. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the conditions information.

**Step 5** On the network view, double-click Node 1.

**Step 6** Complete the "DLP-D217 MS-SPRing Exercise Ring Test" task on page 6-24.

**Step 7** Create a test circuit from Node 1 to the node connected to the east STM-N trunk card of Node 1. (This node will be called Node 2.)

- For VC4 circuits, complete the "NTP-D188 Create an Automatically Routed High-Order Circuit" procedure on page 8-47. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC3 circuits, complete the "NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit" procedure on page 8-22. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC12 circuits, complete the "NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit" procedure on page 8-7. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.

**Step 8** Configure the test set for the test circuit type you created:

- VC4 or VC4-nc—If you are testing a VC4 circuit or a VC4-nc circuit on an STM-N card, you must have a direct optical interface into the ONS 15454 SDH. Set the test set for STM-N. For information about configuring your test set, consult your test set user guide.
- VC3—If you are testing a clear channel E3/DS3I, you must have a patch panel or a direct E3/DS3I interface into the ONS 15454 SDH. Set the test set for clear channel E3/DS3I. For information about configuring your test set, consult your test set user guide.
- VC12—If you are testing an E1, you must have a patch panel or a direct E1 interface to the ONS 15454 SDH. Set the test set for E1. For information about configuring your test set, consult your test set user guide.

**Step 9** Verify the integrity of all patch cables that will be used in this test by connecting the test set transmit (Tx) connector to the test set receive (Rx) connector. If the test set does not run error-free, check the cable for damage and check the test set to make sure it is set up correctly before going to the next step.

**Step 10** Create a physical loopback at the circuit destination card: attach one end of a patch cable to the destination port's transmit (Tx) connector; attach the other end to the port's receive (Rx) connector.

**Step 11** At the circuit source card:

a. Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.

b. Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.

**Step 12** Verify that the test set shows a clean signal. If a clean signal is not present, repeat Steps 1 through 7 to make sure the test set and cabling are configured correctly.

**Step 13** Inject BIT errors from the test set. Verify that the errors appear at the test set, verifying a complete end-to-end circuit.

**Step 14** Complete the "DLP-D254 TCC2 Card Active/Standby Switch Test" task on page 6-9.

**Step 15** Complete the "DLP-D255 Cross-Connect Card Side Switch Test" task on page 6-10.

Although a service interruption under 60 ms may occur, the test circuit should continue to work before, during, and after the switches. If the circuit stops working, do not continue. Contact your next level of support.

**Step 16** Complete the "DLP-D91 MS-SPRing Switch Test" task on page 6-26 at Node 1.

**Step 17** Set up and complete a BER test on the test circuit. Use the existing configuration and follow your site requirements for length of time. Record the test results and configuration.

**Step 18** Complete the "DLP-D27 Delete Circuits and DWDM Optical Channel Network Connections" task on page 11-17 for the test circuit.

**Step 19** Repeating Steps 5 through 18 for Nodes 2 and higher, work your way around the MS-SPRing, testing each node and span in the ring. Work your way around the MS-SPRing creating test circuits between every two consecutive nodes.

**Step 20** After you test the entire ring, remove any loopbacks and test sets from the nodes.

**Step 21** If a node fails any test, repeat the test while verifying correct setup and configuration. 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 application. Continue with Chapter 8, "Create Circuits and Low-Order Tunnels."

**Stop. You have completed this procedure.**

# DLP-D217 MS-SPRing Exercise Ring Test

| | |
|---|---|
| **Purpose** | This task tests the MS-SPRing functionality without switching traffic. Ring exercise conditions (including the K-byte pass-through) are reported and cleared within 10 to 15 seconds. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Step 1** From the View menu, choose **Go to Network View**.

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

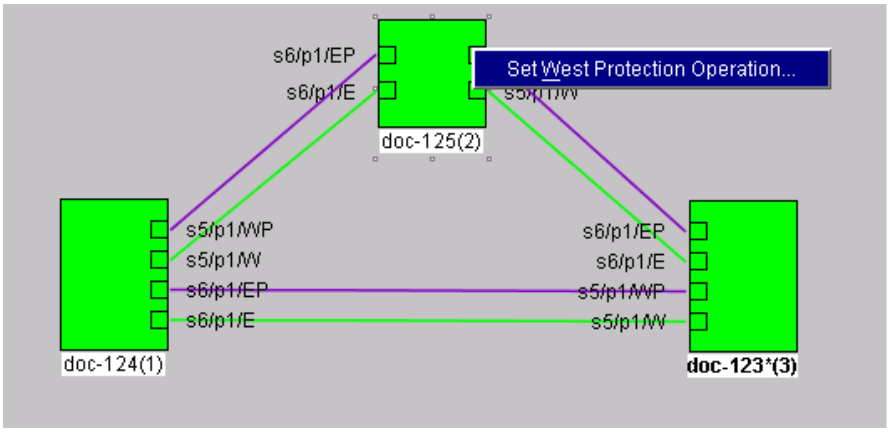
**Step 3** Click the row of the MS-SPRing you will exercise, then click **Edit**.

**Step 4** Exercise the west port:

**a.** Right-click the west port of any MS-SPRing node and choose **Set West Protection Operation**. Figure 6-4 shows an example. (To move a graphic icon, press **Ctrl** while you drag and drop it to a new location.)

**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 or protect ports.

*Figure 6-4 Protection Operation on a Three-Node MS-SPRing*




**b.** In the Set West Protection Operation dialog box, choose **EXERCISE RING** from the drop-down menu.

**c.** Click **OK**.

**d.** In the Confirm MS-SPRing Operation dialog box, click **Yes**.

On the network view graphic, an E appears on the MS-SPRing channel where you invoked the exercise. The E will appear for 10 to 15 seconds, then disappear.

**Step 5** Exercise the east port:

**a.** Right-click the east port of any MS-SPRing node and choose **Set East Protection Operation**.

**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 or protect ports.

**b.** In the Set East Protection Operation dialog box, choose **EXERCISE RING** from the drop-down menu.

**c.** Click **OK**.

**d.** In the Confirm MS-SPRing Operation dialog box, click **Yes**.

On the network view graphic, an E appears on the MS-SPRing channel where you invoked the exercise. The E will appear for 10-15 seconds, then disappear.

**Step 6** On the Cisco Transport Controller window, click the **History** tab. Verify that an EXERCISE-RING (Exercising Ring Successfully) condition appears for the node where you exercised the ring. Other conditions that appear include EXERCISE-RING-REQ, KB-PASSTHR, and FE-EXERCISING-RING.

If you do not see any MS-SPRing exercise conditions, click the **Filter** button and verify that filtering is not turned on. Also, check that alarms and conditions are not suppressed for a node or MS-SPRing drop cards. See the "NTP-D72 Suppress Alarms or Discontinue Alarm Suppression" procedure on page 9-33 for more information.

**Step 7** Click the **Alarms** tab.

**a.** Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 8** From the File menu, choose **Close** to close the MS-SPRing window.

**Step 9** Return to your originating procedure (NTP).

# DLP-D91 MS-SPRing Switch Test

| | |
|---|---|
| **Purpose** | This task verifies that protection switching is working correctly in an MS-SPRing. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** From the view menu choose **Go to Network View**.

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

**Step 3** Click the row of the MS-SPRing you will switch, then click **Edit**.

**Step 4** Initiate a Force Ring switch on the west port:

a. Right-click any MS-SPRing node west port and choose **Set West Protection Operation**. Figure 6-4 on page 6-25 shows an example. (To move a graphic icon, click it, then press **Ctrl** while you drag and drop it to a new location.)

**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 or protect port.

b. In the Set West Protection Operation dialog box, choose **FORCE RING** from the drop-down menu.

c. Click **OK**.

d. Click **Yes** in the two Confirm MS-SPRing Operation dialog boxes that appear.

On the network view graphic, an F appears on the working MS-SPRing channel where you invoked the Force Ring switch. The MS-SPRing span lines turn purple where the Force was invoked, and all span lines between other MS-SPRing nodes turn green.

**Step 5** Click the **Conditions** tab, then click **Retrieve**.

**Step 6** Verify that the following conditions are reported on the node where you invoked the switch on the west port:

- FORCE-REQ-RING—A Force Switch Request On Ring condition is reported against the span's working slot on the west side of the node.
- RING-SW-EAST—A Ring Switch Active on the east side condition is reported against the working span on the east side of the node.

**Note** Make sure the Filter button in the lower right corner of the window is off. Click the Node column to sort conditions by node.

**Step 7** Verify that the following conditions are reported on the node that is connected to the west line of the node where you performed the switch:

- FE-FRCDWKSWPR-RING—A Far-End Working Facility Forced to Switch to Protection condition is reported against the working span on the east side of the node.
- RING-SW-WEST—A Ring Switch Active on the west side condition is reported against the working span on the west side of the node.

**Step 8** (Optional) If you remapped the K3 byte to run an ONS 15454 MS-SPRing through third-party equipment, check the following condition. Verify a KBYTE-PASSTHRU condition reported on other nodes that are not connected to the west side of the node where you invoked the Force Ring switch.

**Step 9** Verify the MS-SPRing line status on each node:

a. From the view menu choose **Go to Node View**.

b. Click the **Maintenance > MS-SPRing** tabs.

c. Verify the following:

- The line states are shown as Stby/Stby on the west side of the node and Act/Act on the east side of the node where you invoked the Force Ring switch.
- The line states are shown as Stby/Stby on the east side of the node and Act/Act on the west side of the node that is connected to the west line of the node where you invoked the Force Ring switch.
- The line states are shown as Act/Act on both east and west sides of the remaining nodes in the ring.

**Step 10** From the view menu choose **Go to Network View**.

**Step 11** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 12** Display the MS-SPRing window where you invoked the Force Ring switch (the window may be hidden by the CTC window).

**Step 13** Clear the switch on the west port:

a. Right-click the west port of the MS-SPRing node where you invoked the Force Ring switch and choose **Set West Protection Operation**.

b. In the Set West Protection Operation dialog box, choose **CLEAR** from the drop-down menu.

c. Click **OK**.

d. Click **Yes** in the Confirm MS-SPRing Operation dialog box.

On the network view graphic, the Force Ring switch is removed, the F indicating the switch is removed, and the span lines between MS-SPRing nodes will be purple and green. The span lines may take a few moments to change color.

**Step 14** From network view, click the **Conditions** tab. Verify that all conditions raised in this procedure are cleared from the network. If unexplained conditions appear, resolve them before continuing.

**Step 15** Verify the MS-SPRing line status on each node:

a. From the view menu choose **Go to Node View**.

a. Click the **Maintenance > MS-SPRing** tabs.

b. Verify that the line states are shown as Act/Stby on both the east and west sides of each node in the ring.

**Step 16** Initiate a Force Ring switch on the east port:

a. Right-click the east port of the MS-SPRing node and choose **Set East Protection Operation**:

b. In the Set East Protection Operation dialog box, choose **FORCE RING** from the drop-down menu.

a. Click **OK**.

b. Click **Yes** in the two Confirm MS-SPRing Operation dialog boxes that appear.

On the network view graphic, an F appears on the working MS-SPRing channel where you invoked the Force Ring switch. The MS-SPRing span lines are purple where the Force was invoked, and all span lines between other MS-SPRing nodes are green. The span lines may take a few moments to change color.

**Step 17** Click the **Conditions** tab, then click **Retrieve**.

**Step 18** Verify that the following conditions are reported on the node where you invoked the Force Ring switch on the east port:

- FORCE-REQ-RING—A Force Switch Request On Ring condition is reported against the span's working slot on the east side of the node.
- RING-SW-WEST—A Ring Switch Active on the west side condition is reported against the working span on the east side of the node.

**Note** Make sure the Filter button in the lower right corner of the window is off. Click the Node column to sort conditions by node.

**Step 19** Verify that the following conditions are reported on the node that is connected to the east line of the node where you performed the switch:

- FE-FRCDWKSWPR-RING—A Far-End Working Facility Forced to Switch to Protection condition is reported against the working span on the west side of the node.
- RING-SW-EAST—A Ring Switch Active on the east side condition is reported against the working span on the west side of the node.

**Step 20** (Optional) If you remapped the K3 byte to run an ONS 15454 MS-SPRing through third-party equipment, check the following condition. Verify a KBYTE-PASSTHRU condition reported on other nodes that are not connected to the west side of the node where you invoked the Force Ring switch.

**Step 21** Verify the MS-SPRing line status on each node:

a. From the view menu, choose Go to Node view.

b. Click the **Maintenance > MS-SPRing** tabs.

c. Verify the following:

– The line states are shown as Stby/Stby on the east side of the node and Act/Act on the west side of the node where you invoked the Force Ring switch.

– The line states are shown as Stby/Stby on the west side of the node and Act/Act on the east side of the node that is connected to the east line of the node where you invoked the Force Ring switch.

- The line states are shown as Act/Act on both east and west sides of the remaining nodes in the ring.

**Step 22** From the view menu choose **Go to Network View**.

**Step 23** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide*.

**Step 24** Display the MS-SPRing window where you invoked the Force Ring switch (the window may be hidden by the CTC window).

**Step 25** Clear the Force Ring switch on the east port:

a. Right-click the west port of the MS-SPRing node where you invoked the Force Ring switch and choose **Set East Protection Operation**.

b. In the Set East Protection Operation dialog box, choose **CLEAR** from the drop-down menu.

c. Click **OK**.

d. Click **Yes** in the Confirm MS-SPRing Operation dialog box.

On the network view graphic, the Force Ring switch is removed, the F indicating the switch is removed, and the span lines between MS-SPRing nodes will be purple and green. The span lines may take a few moments to change color.

**Step 26** In network view, click the **Conditions** tab. Verify that all conditions raised in this procedure are cleared from the network. If unexplained conditions appear, resolve them before continuing.

**Step 27** Verify the MS-SPRing line status on each node:

a. From the view menu choose **Go to Node View**.

a. Click the **Maintenance > MS-SPRing** tabs.

b. Verify that the line states are shown as Act/Stby on both the east and west sides of each node in the ring.

**Step 28** From the File menu, choose **Close** to close the MS-SPRing window.

**Step 29** Return to your originating procedure (NTP).

# NTP-D176 Four-Fiber MS-SPRing Acceptance Test

| | |
|---|---|
| **Purpose** | This procedure tests a four-fiber MS-SPRing. |
| **Tools/Equipment** | Test set and cables appropriate to the test circuit you will create |
| **Prerequisite Procedures** | NTP-D40 Provision MS-SPRing Nodes, page 6-15<br>NTP-D41 Create the MS-SPRing, page 6-18 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Note** This procedure requires that you create test circuits and perform span switches around the ring. For clarity, "Node 1" refers to the login node where you begin the procedure. "Node 2" refers to the node connected to the east STM-N trunk (span) card of Node 1, "Node 3" refers to the node connected to the east STM-N trunk card of Node 2, and so on.

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 on the MS-SPRing you are testing. (This node will be called Node 1.) If you are already logged in, continue with Step 2.

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

**Step 3** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

c. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export alarm information.

**Step 4** Click the **Conditions** tab.

a. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

b. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export conditions information.

**Step 5** On the network map, double-click Node 1.

**Step 6** Complete the "DLP-D92 Four-Fiber MS-SPRing Exercise Span Test" task on page 6-32.

**Step 7** Complete the "DLP-D217 MS-SPRing Exercise Ring Test" task on page 6-24.

**Step 8** Create a test circuit between Node 1 and Node 2.

- For VC4 circuits, complete the "NTP-D188 Create an Automatically Routed High-Order Circuit" procedure on page 8-47. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC3 circuits, complete the "NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit" procedure on page 8-22. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC12 circuits, complete the "NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit" procedure on page 8-7. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.

**Step 9** Configure the test set for the test circuit type you created:

- VC4 or VC4-nc—If you are testing a VC4 circuit or a VC4-nc circuit on an STM-N card, you must have a direct optical interface into the ONS 15454 SDH. Set the test set for STM-N. For information about configuring your test set, consult your test set user guide.
- VC3—If you are testing a clear channel E3/DS3I, you must have a patch panel or a direct E3/DS3I interface into the ONS 15454 SDH. Set the test set for clear channel E3/DS3I. For information about configuring your test set, consult your test set user guide.
- VC12—If you are testing an E1, you must have a patch panel or a direct E1 interface to the ONS 15454 SDH. Set the test set for E1. For information about configuring your test set, consult your test set user guide.

**Step 10** Verify the integrity of all patch cables that will be used in this test by connecting one end of the cable to the test set transmit (Tx) connector and the other end of the cable to the test set receive (Rx) connector. If the test set does not run error-free, check the cable for damage and check the test set to make sure it is set up correctly before continuing.

**Step 11** Create a physical loopback at the circuit destination card. To do so, attach one end of a patch cable to the destination port's transmit (Tx) connector; attach the other end to the port's receive (Rx) connector.

**Step 12** At the circuit source card:

**a.** Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.

**b.** Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.

**Step 13** Verify that the test set shows a clean signal. If a clean signal does not appear, repeat Steps 6 through 12 to make sure the test set and cabling are configured correctly.

**Step 14** Inject global BIT errors from the test set. Verify that the errors appear at the test set, verifying a complete end-to-end circuit.

**Step 15** This step will lock out both of the spans on the node where you perform this task. Complete the "DLP-D254 TCC2 Card Active/Standby Switch Test" task on page 6-9.

**Step 16** This step will lock out both of the spans on the node where you perform this task. Complete the "DLP-D255 Cross-Connect Card Side Switch Test" task on page 6-10.

**Step 17** Complete the "DLP-D91 MS-SPRing Switch Test" task on page 6-26 to test the MS-SPRing protection switching at Node 1.

**Step 18** Complete the "DLP-D93 Four-Fiber MS-SPRing Span Switching Test" task on page 6-34 at Node 1.

**Step 19** Set up and complete a BER test on the test circuit between Node 1 and 2. Use the existing configuration and follow your site requirements for length of time. Record the test results and configuration.

**Step 20** Complete the "DLP-D27 Delete Circuits and DWDM Optical Channel Network Connections" task on page 11-17 for the test circuit.

**Step 21** At Node 2, repeat Steps 5 through 20, creating a test circuit between Node 2 and the node connected to the east STM-N trunk card of Node 2 (Node 3). Work your way around the MS-SPRing creating test circuits between every two consecutive nodes.

**Step 22** After you test the entire ring, remove any loopbacks and test sets from the nodes.

**Step 23** Click the **Alarms** tab.

**a.** Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

**b.** Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**c.** Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export alarm information.

**Step 24** Click the **Conditions** tab.

**a.** Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**b.** Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export conditions information.

**Step 25** If a node fails any test, repeat the test while verifying correct setup and configuration. 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 application. Continue with Chapter 8, "Create Circuits and Low-Order Tunnels."

**Stop. You have completed this procedure.**

# DLP-D92 Four-Fiber MS-SPRing Exercise Span Test

| | |
|---|---|
| **Purpose** | This task exercises a four-fiber MS-SPRing span. Ring exercise conditions (including the K-byte pass-through) are reported and cleared within 10 to 15 seconds. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** From the View menu, choose **Go to Network View**.

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

**Step 3** Click the MS-SPRing you will exercise, then click **Edit**.

**Step 4** Exercise the west span:

**a.** Right-click the west port of the four-fiber MS-SPRing node that you want to exercise and choose **Set West Protection Operation**. (To move a graphic icon, press **Ctrl** while you drag and drop it to a new location.)

**Note** The squares on the network map represent ports. Right-click a working port.

**b.** In the Set West Protection Operation dialog box, choose **EXERCISE SPAN** from the drop-down menu. Click **OK**.

**c.** In the Confirm MS-SPRing Operation dialog box, click **Yes**.

On the network view graphic, an E appears on the MS-SPRing channel where you invoked the exercise. The E will appear for 10 to 15 seconds, then disappear.

**Step 5** Click the **Conditions** tab, then click **Retrieve**.

**Step 6** Verify the following conditions:

- EXERCISING-SPAN—An Exercise Ring Successful condition is reported on the node where the span was exercised.
- FE-EX-SPAN—A Far-End Exercise Span Request condition is reported against the East span of the node connected to the West-side of the node where you exercised the span.
- KB-PASSTHR—If applicable, a K Byte Pass Though Active condition is reported.

**Note** Make sure the Filter button in the lower right corner of the window is off. Click the Node column to sort conditions by node.

**Step 7** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 8** Exercise the east span:

a. Right-click the east port of the four-fiber MS-SPRing node that you want to exercise and choose **Set East Protection Operation**.

b. In the Set East Protection Operation dialog box, choose **EXERCISE SPAN** from the drop-down menu. Click **OK**.

c. In the Confirm MS-SPRing Operation dialog box, click **Yes**.

On the network view graphic, an E appears on the MS-SPRing channel where you invoked the exercise. The E will appear for 10 to 15 seconds, then disappear.

**Step 9** From the File menu, choose **Close**.

**Step 10** Click the **Conditions** tab, then click **Retrieve**.

**Step 11** Verify the following conditions:

- EXERCISING-SPAN—An Exercise Ring Successful condition is reported on the node where the span was exercised.
- FE-EX-SPAN—A Far-End Exercise Span Request condition is reported against the East span of the node connected to the West-side of the node where you exercised the span.
- KB-PASSTHR—If applicable, a K Byte Pass Though Active condition is reported.

**Note** Make sure the Filter button in the lower right corner of the window is off. Click the Node column to sort conditions by node.

**Step 12** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 13** From the File menu, choose **Close** to close the MS-SPRing window.

**Step 14** Return to your originating procedure (NTP).

# DLP-D93 Four-Fiber MS-SPRing Span Switching Test

| | |
|---|---|
| **Purpose** | This task verifies that traffic will switch from working to protect fibers on a four-fiber MS-SPRing span. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite or remote |
| **Security Level** | Provisioning or higher |

**Step 1** From the View menu, choose **Go to Network View**.

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

**Step 3** Click **Edit**. An MS-SPRing window appears containing a graphic of the MS-SPRing.

**Note** If the node icons are stacked on the MS-SPRing graphic, press **Ctrl** while you drag and drop each one to a new location so you can see the MS-SPRing port information clearly.

**Step 4** Initiate a switch on the west span:

a. Right-click the west port of the four-fiber MS-SPRing node that you want to exercise and choose **Set West Protection Operation**. Figure 6-4 on page 6-25 shows an example.

**Note** For four-fiber MS-SPRings, the squares on the network map represent ports. Right-click a working port.

b. In the Set West Protection Operation dialog box, choose **FORCE SPAN** from the drop-down menu. Click **OK**.

c. Click **Yes** in the two Confirm MS-SPRing Operation dialog boxes that appear.

On the network view graphic, an F appears on the MS-SPRing channel where you invoked the protection switch. The MS-SPRing span lines turn purple where the Force was invoked, and all span lines between other MS-SPRing nodes turn green.

**Step 5** Click the **Conditions** tab.

a. Click **Retrieve**.

b. Verify that a SPAN-SW-WEST (Span Switch West) condition is reported on the node where you invoked the Force switch, and a SPAN-SW-EAST (Span Switch East) condition is reported on the node connected to the west line of the node where you performed the switch. Make sure the Filter button in the lower right corner of window is off.

**Step 6** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 7** Display the MS-SPRing window where you invoked the Force Span switch (the window may be hidden by the CTC window).

**Step 8** Clear the west switch:

a. Right-click the west port of the MS-SPRing node where you invoked the Force Span switch and choose **Set West Protection Operation**.

b. In the Set West Protection Operation dialog box, choose **CLEAR** from the drop-down menu. Click **OK**.

c. Click **Yes** in the Confirm MS-SPRing Operation dialog box.

On the network view graphic, the Force Span switch is removed, the F disappears, and the span lines between MS-SPRing nodes will be purple and green. The span lines may take a few moments to change color.

**Step 9** Initiate a switch on the east span:

a. Right-click the east port of MS-SPRing node and choose **Set East Protection Operation**.

b. In the Set East Protection Operation dialog box, choose **FORCE SPAN** from the drop-down menu. Click **OK**.

c. Click **Yes** in the two Confirm MS-SPRing Operation dialog boxes that appear.

On the network view graphic, an F appears on the MS-SPRing channel where you invoked the Force Span switch. The MS-SPRing span lines are purple where the Force was invoked, and all span lines between other MS-SPRing nodes are green. The span lines may take a few moments to change color.

**Step 10** Click the **Conditions** tab.

a. Click **Retrieve**.

b. Verify that a SPAN-SW-EAST (Span Switch East) condition is reported on the node where you invoked the Force switch, and a SPAN-SW-WEST (Span Switch West) condition is reported on the node connected to the west line of the node where you performed the switch. Make sure the Filter button in the lower right corner of window is off.

**Step 11** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

**Step 12** Display the MS-SPRing window where you invoked the Force Span switch (the window may be hidden by the CTC window).

**Step 13** Clear the switch on the east span:

a. Right-click the east port of the MS-SPRing node where you invoked the Force Span switch and choose **Set East Protection Operation**.

b. In the Set East Protection Operation dialog box, choose **CLEAR** from the drop-down menu. Click **OK**.

c. Click **Yes** in the Confirm MS-SPRing Operation dialog box.

On the network view graphic, the Force Span switch is removed, the F indicating the switch is removed, and the span lines between MS-SPRing nodes will be purple and green. The span lines may take a few moments to change color.

**Step 14** From the File menu, choose **Close** to close the MS-SPRing window.

**Step 15** Return to your originating procedure (NTP).

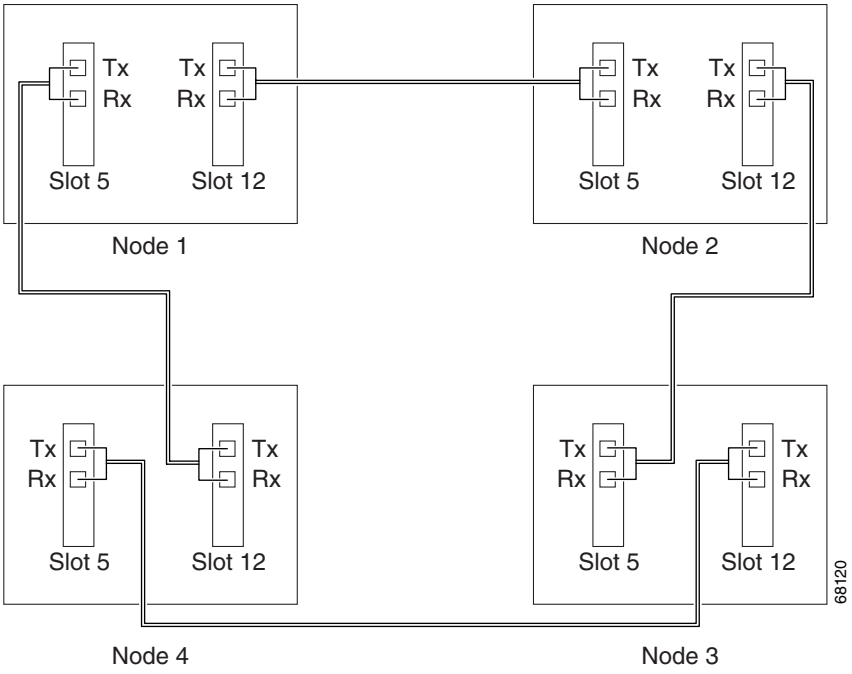
# NTP-D44 Provision SNCP Nodes

| | |
|---|---|
| **Purpose** | This procedure provisions nodes for inclusion in a subnetwork connection protection (SNCP) ring. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | NTP-D35 Verify Node Turn Up, page 6-2 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Note** SNCP is the default ONS 15454 SDH topology. It is available as soon as you install the SNCP STM-N cards, connect the STM-N fibers, and create the DCC terminations. Unlike the MS-SPRings, ONS 15454 SDH SNCPs do not require explicit set up.

**Step 1** Verify that the fiber is correctly connected to the SNCP trunk (span) STM-N cards similar to Figure 6-5.

*Figure 6-5 SNCP Fiber Connection Example*




**Step 2** Log into an ONS 15454 SDH in the SNCP you are turning up. See the "DLP-D60 Log into CTC" task on page 3-24. If you are already logged in, continue with Step 3.

**Step 3** Complete the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4 or "DLP-D467 Provision SDH LDCC Terminations" task on page 6-5 for the two cards/ports that will serve as the SNCP ports on the node, for example, Slot 5 (STM-16)/Node 1 and Slot 12 (STM-16)/Node 1.

**Note** If an ONS 15454 SDH is not connected to a corporate LAN, DCC or LDCC provisioning must be performed through a direct (craft) connection. Remote provisioning is possible only after all nodes in the network have DCC or LDCC terminations provisioned to in-service STM-N ports.

**Step 4** Repeat Steps 2 and 3 for each node in the SNCP.

**Step 5** Complete the "NTP-D177 SNCP Acceptance Test" procedure on page 6-37.

**Stop. You have completed this procedure.**

# NTP-D177 SNCP Acceptance Test

| | |
|---|---|
| **Purpose** | This procedure tests an SNCP ring. |
| **Tools/Equipment** | Test set and cables appropriate to the test circuit you will create. |
| **Prerequisite Procedures** | NTP-D44 Provision SNCP Nodes, page 6-36 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 at one of the ONS 15454 SDHs on the SNCP you are testing. If you are already logged in, continue with Step 2.

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

**Step 3** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

c. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export alarm information.

**Step 4** Click the **Conditions** tab.

a. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

b. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export conditions information.

**Step 5** On the network map, double-click the node that you logged into in Step 1.

**Step 6** Create a test circuit from that node to the next adjacent SNCP node.

- For VC4 circuits, complete the "NTP-D188 Create an Automatically Routed High-Order Circuit" procedure on page 8-47. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC3 circuits, complete the "NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit" procedure on page 8-22. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.

- For VC12 circuits, complete the "NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit" procedure on page 8-7. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.

**Step 7** Configure the test set for the test circuit type you created:

- VC4 or VC4-nc—If you are testing a VC4 circuit or a VC4-nc circuit on an STM-N card, you must have a direct optical interface into the ONS 15454 SDH. Set the test set for STM-N. For information about configuring your test set, consult your test set user guide.
- VC3—If you are testing a clear channel E3/DS3I, you must have a patch panel or a direct E3/DS3I interface into the ONS 15454 SDH. Set the test set for clear channel E3/DS3I. For information about configuring your test set, consult your test set user guide.
- VC12—If you are testing an E1, you must have a patch panel or a direct E1 interface to the ONS 15454 SDH. Set the test set for E1. For information about configuring your test set, consult your test set user guide.

**Step 8** Verify the integrity of all patch cables that will be used in this test by connecting one end to the test set transmit (Tx) connector and the other end to the test set receive (Rx) connector. If the test set does not run error-free, check the cable for damage and check the test set to make sure it is set up correctly before continuing.

**Step 9** Create a physical loopback at the circuit destination card:

**a.** Attach one end of a patch cable to the destination port's transmit (Tx) connector.

**b.** Attach the other end to the port's receive (Rx) connector.

**Step 10** At the circuit source card:

**a.** Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.

**b.** Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.

**Step 11** Verify that the test set shows a clean signal. If a clean signal does not appear, repeat Steps 1 through 6 to make sure the test set and cabling are configured correctly.

**Step 12** Inject BIT errors from the test set. To verify that you have a complete end-to-end circuit, verify that the errors appear at the test set.

**Step 13** Complete the "DLP-D254 TCC2 Card Active/Standby Switch Test" task on page 6-9.

**Step 14** Complete the "DLP-D255 Cross-Connect Card Side Switch Test" task on page 6-10.

**Step 15** From the View menu, choose **Go to Network View**.

**Step 16** Click one of the two spans leaving the circuit source node.

**Step 17** Compete the "DLP-D94 SNCP Protection Switching Test" task on page 6-39 to test the SNCP protection switching function on this span.

**Step 18** In network view, click the other circuit source span and repeat Step 17.

**Step 19** Set up and complete a BER Test. Use the existing configuration and follow your site requirements for the length of time. Record the test results and configuration.

**Step 20** Complete the "DLP-D27 Delete Circuits and DWDM Optical Channel Network Connections" task on page 11-17 for the test circuit.

**Step 21** Remove any loopbacks, switches, or test sets from the nodes after all testing is complete.

**Step 22** Click the **Alarms** tab.

**a.** Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

c. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export alarm information.

**Step 23** Click the **Conditions** tab.

a. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

b. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export conditions information.

**Step 24** Repeat Steps 6 through 23 for each node on the network.

**Step 25** If a node fails any test, repeat the test while verifying correct setup and configuration. 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 application. Continue with Chapter 8, "Create Circuits and Low-Order Tunnels."

**Stop. You have completed this procedure.**

# DLP-D94 SNCP Protection Switching Test

| | |
|---|---|
| **Purpose** | This task verifies that an SNCP span is switching correctly. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | DLP-D60 Log into CTC, page 3-24 |
| **Required/As Needed** | Required |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Note** Although a service interruption under 60 ms may occur, the test circuit should continue to work before, during, and after the switches. If the circuit stops working, do not continue. Contact your next level of support.

**Step 1** From the View menu, choose **Go to the Network View**.

**Step 2** Right-click a network span and choose **Circuits**.

The Circuits on Span dialog box shows the SNCP circuits, including circuit names, locations, and a color code showing which circuits are active on the span.

**Step 3** Initiate the span switch:

a. Click the **Perform SNCP span switching** field and choose **FORCE SWITCH AWAY** from the drop-down menu.

b. Click **Apply**.

c. In the Confirm SNCP Switch dialog box, click **Yes**.

d. In the Protection Switch Result dialog box, click **OK**.

In the Circuits on Span dialog box, the Switch State for all circuits is Force. Unprotected circuits will not switch.

**Step 4** Clear the switch:

a. Click the **Perform SNCP span switching** field and choose **CLEAR** from the drop-down menu.

b. Click **Apply**.

c. In the Confirm SNCP Switch dialog box, click **Yes**.

d. 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 5** Return to your originating procedure (NTP).

# NTP-D217 Provision an SNCP Dual Ring Interconnect

| | |
|---|---|
| **Purpose** | This procedure provisions SNCP rings in a dual ring interconnect (DRI) topology. DRIs interconnect two or more SNCPs to provide an additional level of protection. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | NTP-D35 Verify Node Turn Up, page 6-2 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Note** To route circuits on the DRI, you must check the Dual Ring Interconnect check box during circuit creation.

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24. If you are already logged in, continue with Step 2.

**Step 2** Complete the following steps if you have not provisioned the SNCPs that you will interconnect in an SNCP DRI. If the SNCPs are created, continue with Step 3.

a. Complete the "NTP-D44 Provision SNCP Nodes" procedure on page 6-36 to provision the SNCPs.

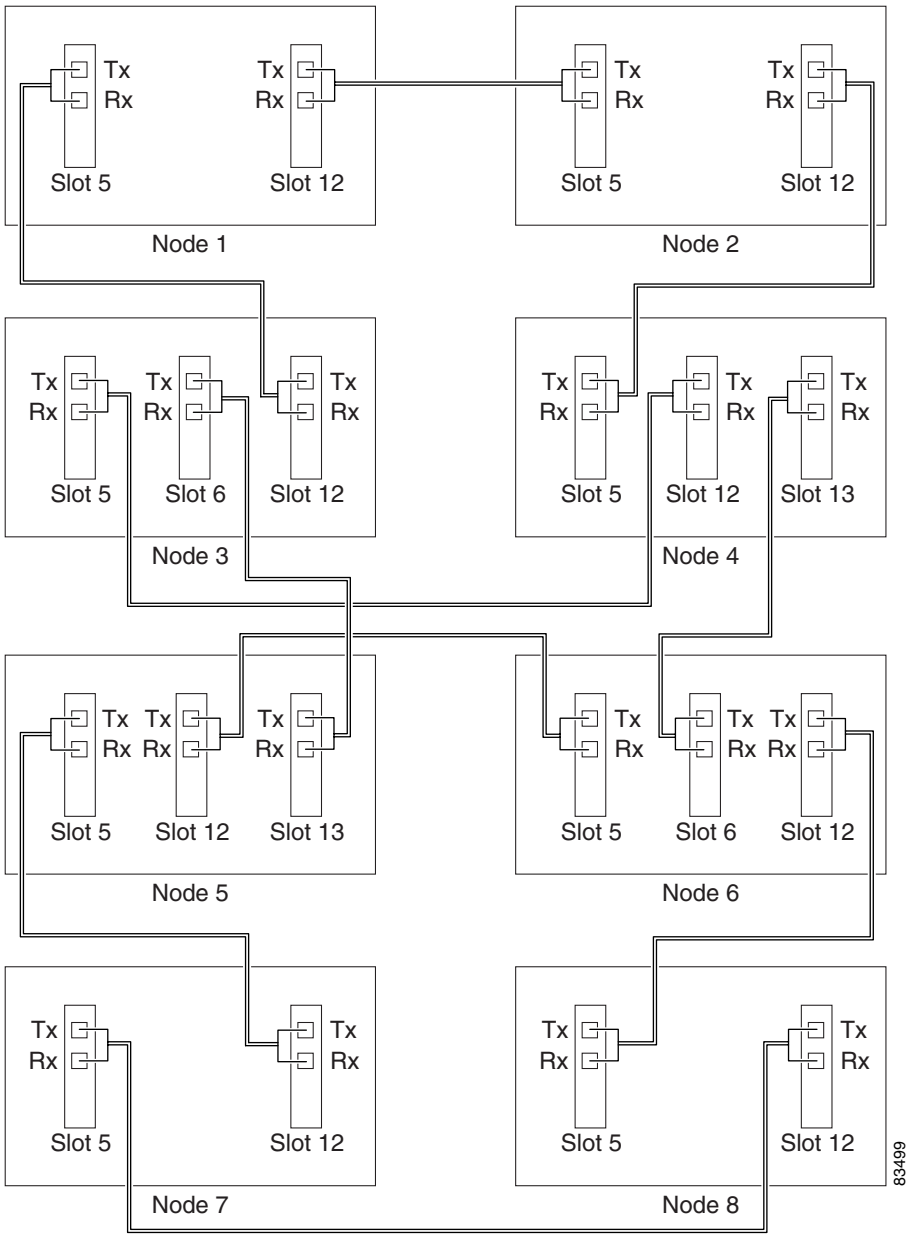
b. Complete the "NTP-D177 SNCP Acceptance Test" procedure on page 6-37 to test the SNCPs.

**Note** All SNCPs that will be interconnected must have the same STM-N rate.

**Step 3** Verify that the SNCP DRI interconnect nodes have STM-N cards installed and have fiber connections to the other interconnect node:

- The STM-N cards that will connect the SNCPs must be installed at the interconnect nodes. The STM-N cards in the SNCP nodes and the interconnect nodes must be the same type.
- The interconnect nodes must have fiber connections. An example is shown in Figure 6-6. This example shows an SNCP DRI with two rings, Nodes 1 to 4 and 5 to 8. In the example, an additional STM-N is installed in Slot 13 at Node 4 and connected to an STM-N in Slot 6 at Node 6. Nodes 3 and 5 are interconnected with STM-N cards in Slot 6 (Node 3) and Slot 13 (Node 5).

*Figure 6-6 SNCP DRI Fiber Connection Example*




**Stop. You have completed this procedure.**

# NTP-D218 Provision an Integrated SNCP Dual Ring Interconnect

| | |
|---|---|
| **Purpose** | This procedure provisions SNCP rings in an integrated dual ring interconnect (DRI) topology. In the integrated DRI, the SNCP STM-N trunk span cards for both SNCPs are installed on the same shelf. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | NTP-D35 Verify Node Turn Up, page 6-2 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24. If you are already logged in, continue with Step 2.

**Step 2** Complete the following steps if you have not provisioned the SNCPs that you will interconnect in an SNCP DRI. If the SNCPs are created, continue with Step 3.

a. Complete the "NTP-D44 Provision SNCP Nodes" procedure on page 6-36 to provision the SNCPs.

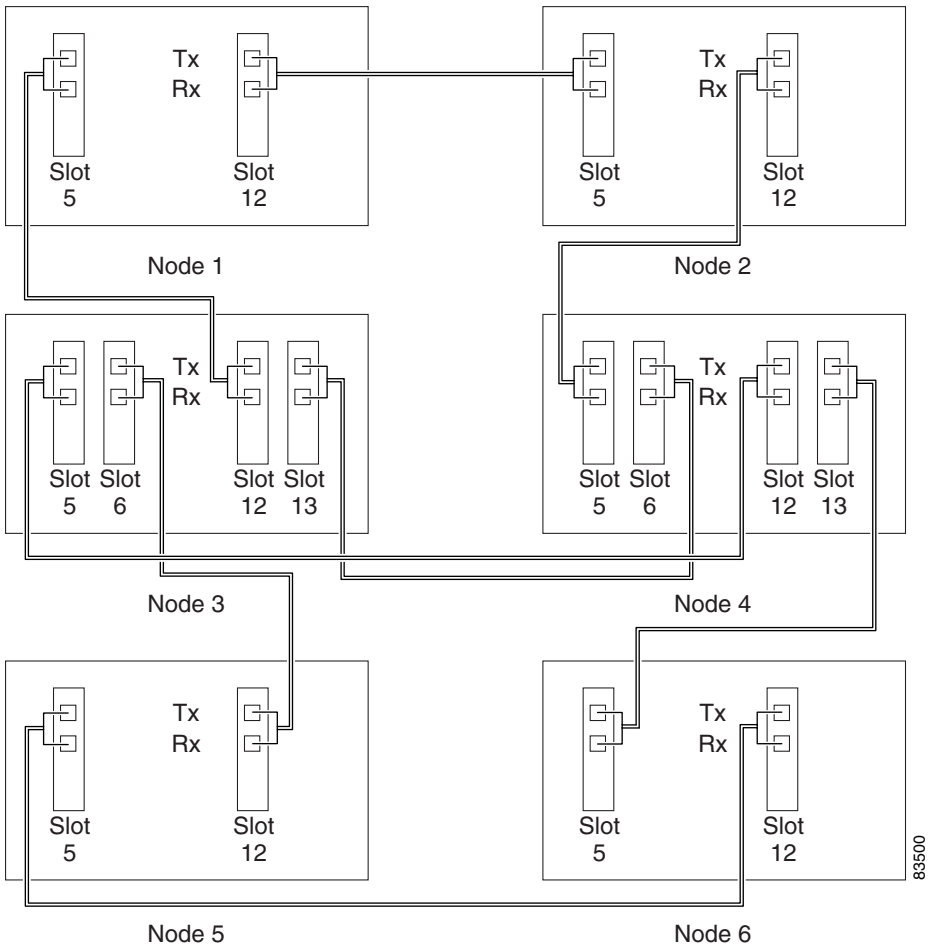
b. Complete the "NTP-D177 SNCP Acceptance Test" procedure on page 6-37 to test the SNCPs.

**Note** All SNCPs that will be interconnected must be at the same STM-N rate.

**Step 3** Verify that the SNCP DRI interconnect nodes have STM-N cards installed and have fiber connections to the other interconnect node:

- The STM-N cards that will connect the SNCPs must be installed at the interconnect nodes. The STM-N cards in the SNCP nodes and the interconnect nodes must be the same type.
- The interconnect nodes must have the correct fiber connections. An example is shown in Figure 6-7. This example shows an SNCP DRI with two rings.

*Figure 6-7 Integrated SNCP DRI Example*



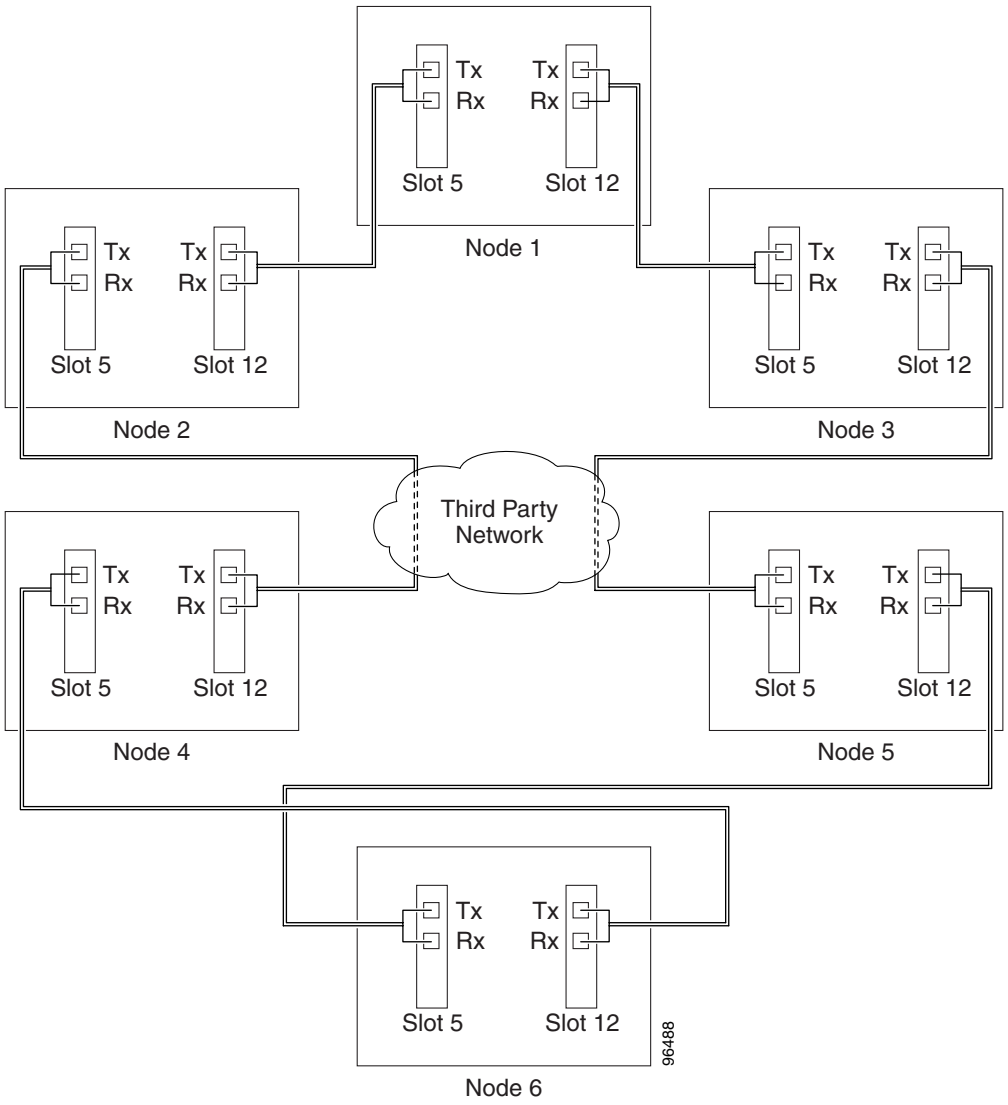

**Stop. You have completed this procedure.**

# NTP-D258 Provision an Open-Ended SNCP

| | |
|---|---|
| **Purpose** | This procedure provisions ONS 15454 SDH nodes in an open-ended SNCP connected to a third-party vendor network. This topology allows you to route a circuit from one ONS 15454 SDH network to another ONS 15454 SDH network through the third-party network. |
| **Tools/Equipment** | None |
| **Prerequisite Procedures** | NTP-D35 Verify Node Turn Up, page 6-2 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Verify that the fiber is correctly connected to the SNCP trunk (span) STM-N cards at each open-ended SNCP node. Figure 6-8 shows an example. Node 1 is connected to ONS 15454 SDH Nodes 2 and 3 through Slots 12 and 5. Trunk cards at Nodes 2 and 3 are connected to the third-party vendor equipment.

*Figure 6-8 ONS 15454 SDH Open-Ended SNCPs Fiber Connection Example*




**Step 2** Verify that the third-party cards or units to which the ONS 15454 SDH trunk cards are connected are the same STM-N rate as the ONS 15454 SDH trunk cards. The third-party time slots must match the ONS 15454 SDH card time slots to which they are connected. For example, if your trunk card is an STM-16, the third-party vendor card or unit must have VC4s 1-8 available.

**Step 3** Log into an ONS 15454 SDH in the SNCP you are turning up. See the "DLP-D60 Log into CTC" task on page 3-24. If you are already logged in, continue with Step 4.

**Step 4** Complete the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4 or the "DLP-D467 Provision SDH LDCC Terminations" task on page 6-5 for the ONS 15454 SDH cards/ports that are connected to another ONS 15454 SDH. Do not create a DCC or LDCC termination for the card/port that connects to the third-party equipment. For example, in Figure 6-8 DCC terminations are created at the following cards/ports:

- Nodes 1 and 6: Slot 5 and Slot 12
- Node 2 and 5: Slot 12

- Node 3 and 4: Slot 5

**Note** If an ONS 15454 SDH is not connected to a corporate LAN, DCC or LDCC provisioning must be performed through a direct (craft) connection. Remote provisioning is possible only after all nodes in the network have DCC or LDCC terminations provisioned to in-service STM-N ports.

**Step 5** Repeat Steps 3 through 4 for each node in the SNCP.

**Step 6** Following the documentation provided by the third-party vendor, provision the optical loop leading from the ONS 15454 SDH connection at one end to the ONS 15454 connection at the other end. In other words, you will create an open-ended SNCP using procedures for the third-party equipment.

**Step 7** Complete the "NTP-D259 Open-Ended SNCP Acceptance Test" procedure on page 6-46.

**Stop. You have completed this procedure.**

# NTP-D259 Open-Ended SNCP Acceptance Test

| | |
|---|---|
| **Purpose** | This procedure tests an open-ended SNCP ring. |
| **Tools/Equipment** | Test set and cables appropriate to the test circuit you will create. |
| **Prerequisite Procedures** | NTP-D258 Provision an Open-Ended SNCP, page 6-44 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 at the node that will be the source node for traffic traversing the third-party network. If you are already logged in, continue with Step 2.

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

**Step 3** Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

c. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the alarm information.

**Step 4** Click the **Conditions** tab.

a. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

b. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the conditions information.

**Step 5** On the network map, double-click the node that you logged into in Step 1.

**Step 6** Create a test circuit from that node to the STM-N trunk (span) cards on the nodes that connect to the third-party network. For example, in Figure 6-8 on page 6-45, a circuit is created from Node 1 to the Slot 5 STM-N card at Node 2, and a secondary circuit destination is created on the Slot 12 STM-N card at Node 3. For circuit creation procedures, complete one of the following:

- For VC4 circuits, complete the "NTP-D188 Create an Automatically Routed High-Order Circuit" procedure on page 8-47. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC3 circuits, complete the "NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit" procedure on page 8-22. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
- For VC12 circuits, complete the "NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit" procedure on page 8-7. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.

**Step 7** Create a circuit within the third-party network from ONS 15454 SDH connection ports to the second set of ONS 15454 SDH connection ports on both SNCP spans. Refer to the third-party equipment documentation for circuit creation procedures.

**Step 8** Repeat Step 6 to create a second circuit at the terminating node on the other side of the third-party network. In Figure 6-8, this is Node 6. However, this circuit will have two sources, one at Node 4/Slot 12, and one at Node 5/Slot 5. The destination will be a drop card on Node 6.

**Step 9** Configure the test set for the test circuit type you created:

- VC4 or VC4-nc—If you are testing a VC4 circuit or a VC4-nc circuit on an STM-N card, you must have a direct optical interface into the ONS 15454 SDH. Set the test set for STM-N. For information about configuring your test set, consult your test set user guide.
- VC3—If you are testing a clear channel E3/DS3I, you must have a patch panel or a direct E3/DS3I interface into the ONS 15454 SDH. Set the test set for clear channel E3/DS3I. For information about configuring your test set, consult your test set user guide.
- VC12—If you are testing an E1, you must have a patch panel or a direct E1 interface to the ONS 15454 SDH. Set the test set for E1. For information about configuring your test set, consult your test set user guide.

**Step 10** Verify the integrity of all patch cables that will be used in this test by connecting one end to the test set transmit (Tx) connector and the other end to the test set receive (Rx) connector. If the test set does not run error-free, check the cable for damage and check the test set to make sure it is set up correctly before continuing.

**Step 11** Create a physical loopback at the circuit destination card:

**a.** Attach one end of a patch cable to the destination port's transmit (Tx) connector.

**b.** Attach the other end to the port's receive (Rx) connector.

**Step 12** At the circuit source card:

**a.** Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.

**b.** Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.

**Step 13** Verify that the test set shows a clean signal. If a clean signal does not appear, repeat Steps 1 through 8 to make sure the test set and cabling are configured correctly.

**Step 14** Inject BIT errors from the test set. To verify that you have a complete end-to-end circuit, verify that the errors appear at the test set.

**Step 15** Complete the "DLP-D254 TCC2 Card Active/Standby Switch Test" task on page 6-9.

**Step 16** Complete the "DLP-D255 Cross-Connect Card Side Switch Test" task on page 6-10.

**Step 17** From the View menu, choose **Go to Network View**.

**Step 18** Click one of the two spans leaving the circuit source node.

**Step 19** Complete the "DLP-D94 SNCP Protection Switching Test" task on page 6-39 to test the SNCP protection switching function on this span.

**Step 20** In network view, click the other circuit source span and repeat Step 19.

**Step 21** Set up and complete a BER Test. Use the existing configuration and follow your site requirements for the length of time. Record the test results and configuration.

**Step 22** Complete the "DLP-D27 Delete Circuits and DWDM Optical Channel Network Connections" task on page 11-17 for the test circuit.

**Step 23** Remove any loopbacks, switches, or test sets from the nodes after all testing is complete.

**Step 24** In network view, click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task on page 9-32 as necessary.

b. Verify that no unexplained alarms appear on the network. If unexplained alarms appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

c. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the alarm information.

**Step 25** In network view, click the **Conditions** tab.

a. Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 SDH Troubleshooting Guide* if necessary.

b. Complete the "DLP-D423 Export CTC Data" task on page 9-4 to export the conditions information.

**Step 26** Repeat Steps 6 through 25 for each node that will be a source or destination for circuits traversing the third-party network.

**Step 27** If a node fails any test, repeat the test while verifying correct setup and configuration. 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 application. Continue with Chapter 8, "Create Circuits and Low-Order Tunnels."

**Stop. You have completed this procedure.**

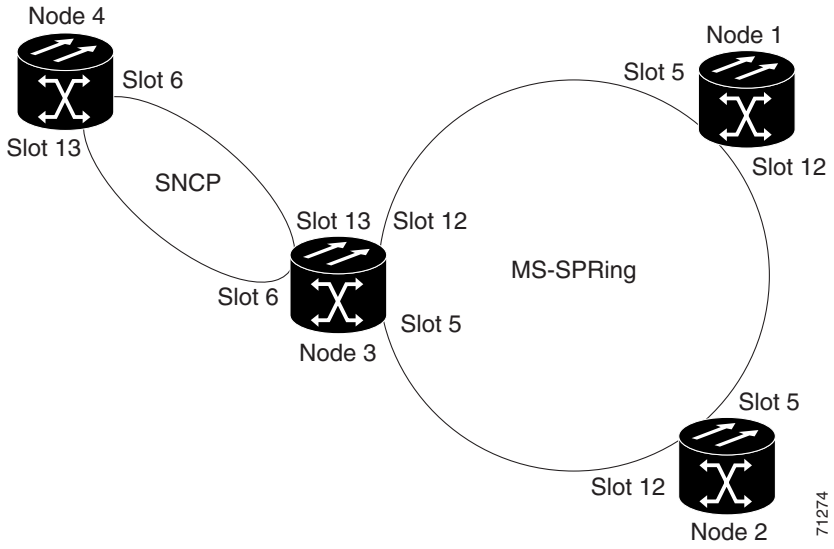
# NTP-D46 Subtend an SNCP from an MS-SPRing

| | |
|---|---|
| **Purpose** | This procedure subtends an SNCP ring from an existing MS-SPRing. |
| **Tools/Equipment** | One MS-SPRing node must have STM-N cards and fibers to carry the SNCP. |
| **Prerequisite Procedures** | NTP-D175 Two-Fiber MS-SPRing Acceptance Test, page 6-22 or NTP-D176 Four-Fiber MS-SPRing Acceptance Test, page 6-29 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** In the node that will subtend the SNCP (Node 3 in Figure 6-9), install the two STM-N cards that will serve as the SNCP trunk (span) cards (Node 3, Slots 6 and 13). See the "NTP-D16 Install the STM-N Cards" procedure on page 2-12. If they are already installed, continue with Step 2.

**Step 2** Attach fibers from these cards to the SNCP trunk cards on the neighbor SNCP node or nodes. In Figure 6-9, Node 3/Slot 6 connects to Node 4/Slot 13, and Node 3/Slot 13 connects to Node 4/Slot 6. See the "DLP-D337 Install Fiber-Optic Cables for SNCP Configurations" task on page 2-34.

***Figure 6-9 SNCP Subtended from an MS-SPRing***




**Step 3** Complete the "DLP-D60 Log into CTC" task on page 3-24 at the ONS 15454 SDH that will subtend the SNCP (Node 3 in the example).

**Step 4** Complete the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4 for each STM-N card that will carry the SNCP.

**Step 5** Log into the SNCP node that connects to the node in Step 3.

**Step 6** Complete the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4 for each STM-N card that will carry the SNCP.

**Step 7** Repeat Step 6 for each node in the SNCP.

**Step 8** From the View menu, choose **Go To Network View** to view the subtending rings.

**Step 9** Complete the "NTP-D177 SNCP Acceptance Test" procedure on page 6-37.

**Stop. You have completed this procedure.**

# NTP-D47 Subtend an MS-SPRing from an SNCP

| | |
|---|---|
| **Purpose** | This procedure subtends an MS-SPRing from an existing SNCP ring. |
| **Tools/Equipment** | One SNCP node must have STM-N cards and fibers to carry the MS-SPRing. |
| **Prerequisite Procedures** | NTP-D44 Provision SNCP Nodes, page 6-36 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

**Step 1** In the SNCP node that will subtend the MS-SPRing, install the two STM-N cards that will serve as the MS-SPRing trunk (span) cards (in Figure 6-9, Node 3, Slots 5 and 12). See the "NTP-D16 Install the STM-N Cards" procedure on page 2-12.

**Step 2** Attach fibers from the cards in Step 1 to the MS-SPRing trunk cards on another MS-SPRing node or nodes. In Figure 6-9, Node 3/Slot 5 connects to Node 2/Slot 12, and Node 3/Slot 12 connects to Node 1/Slot 5. See the "DLP-D338 Install Fiber-Optic Cables for MS-SPRing Configurations" task on page 2-37.

**Step 3** Log into the ONS 15454 SDH that will subtend the MS-SPRing (the node in Step 1). See the "DLP-D60 Log into CTC" task on page 3-24. If you are already logged in, continue with Step 4.

**Step 4** Create the DCCs on both STM-N trunk cards (east and west) that will carry the MS-SPRing. See the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4.

**Step 5** Create the subtending MS-SPRing:

a. Complete the "NTP-D40 Provision MS-SPRing Nodes" procedure on page 6-15 for each node that will be in the MS-SPRing. If you have already provisioned the MS-SPRing, perform this procedure for the subtending node only.

b. Complete the "NTP-D41 Create the MS-SPRing" procedure on page 6-18. Include the node in Step 3 (the node that will subtend the MS-SPRing) in the MS-SPRing.

**Step 6** From the View menu, choose **Go to the Network View** to see the subtending ring.

**Stop. You have completed this procedure.**

# NTP-D48 Subtend an MS-SPRing from an MS-SPRing

| | |
|---|---|
| **Purpose** | This procedure subtends an MS-SPRing from an existing MS-SPRing. |
| **Tools/Equipment** | One MS-SPRing node must have STM-N cards and fibers needed to carry the second MS-SPRing. |
| **Prerequisite Procedures** | NTP-D40 Provision MS-SPRing Nodes, page 6-15<br>NTP-D41 Create the MS-SPRing, page 6-18 |
| **Required/As Needed** | As needed |
| **Onsite/Remote** | Onsite |
| **Security Level** | Provisioning or higher |

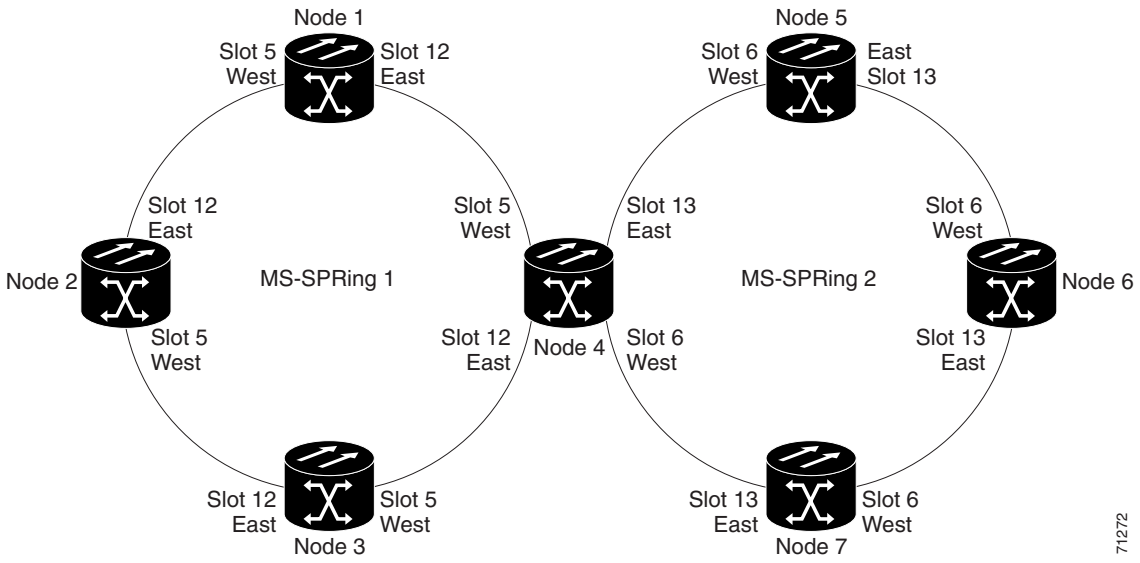
**Note** This procedure assumes that all nodes are configured for the MS-SPRing. If you need to add a node to an MS-SPRing, see the "NTP-D102 Add an MS-SPRing Node" procedure on page 16-1.

**Step 1** Complete the "DLP-D60 Log into CTC" task on page 3-24 at the node that will subtend the MS-SPRing. If you are already logged in, continue with Step 2.

**Step 2** Install the STM-N cards that will serve as the MS-SPRing trunk (span) cards if they are not already installed. See the "NTP-D16 Install the STM-N Cards" procedure on page 2-12 and the "NTP-D19 Install Fiber-Optic Cables on STM-N Cards" procedure on page 2-30.

Figure 6-10 shows two MS-SPRings shared by one ONS 15454 SDH. Ring 1 runs on Nodes 1, 2, 3, and 4. Ring 2 runs on Nodes 4, 5, 6, and 7 and represents the subtending ring added by this procedure. Two MS-SPRings, Ring 1 and Ring 2, are provisioned on Node 4. Ring 1 uses cards in Slots 5 and 12, and Ring 2 uses cards in Slots 6 and 13.

***Figure 6-10 MS-SPRing Subtended from an MS-SPRing***




**Step 3** Attach fibers from the trunk cards in the subtending node to the MS-SPRing trunk cards on its two neighboring MS-SPRing nodes. In Figure 6-10, Node 4/Slot 6 connects to Node 7/Slot 13, and Node 4/Slot 13 connects to Node 5/Slot 6. See the "DLP-D338 Install Fiber-Optic Cables for MS-SPRing Configurations" task on page 2-37.

**Step 4** Create the DCCs on the first STM-N card that will carry the MS-SPRing. See the "DLP-D464 Provision SDH DCC Terminations" task on page 6-4.

**Step 5** Repeat Step 4 for the second STM-N trunk card that will carry the MS-SPRing.

**Step 6** Complete the "NTP-D40 Provision MS-SPRing Nodes" procedure on page 6-15 for each node that will be in the MS-SPRing. If you have already provisioned the MS-SPRing, perform this procedure for the subtending node only.

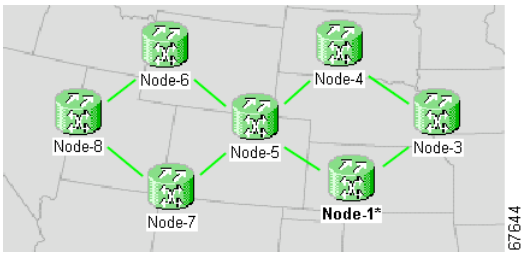
**Step 7** If the subtending MS-SPRing is not already created, complete the "NTP-D41 Create the MS-SPRing" procedure on page 6-18 to provision the new MS-SPRing. The subtending MS-SPRing must have a ring name that differs from the ring name of the first MS-SPRing.

**Note** The subtending node can have one Node ID that is used in both MS-SPRings, or a different Node ID for each MS-SPRing. For example, the same node can be Node 4 in MS-SPRing 1 and Node 2 in MS-SPRing 2.

**Step 8** From the View menu choose **Go to Network View** to see the subtending ring.

Figure 6-11 shows an example of two subtending MS-SPRings.

*Figure 6-11 View Subtended MS-SPRings on the Network Map*




**Stop. You have completed this procedure.**

# NTP-D172 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-D60 Log into CTC" task on page 3-24 on an ONS 15454 SDH 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 a 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**.

**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 on the network view map and choose Reset Node Position.

**Stop. You have completed this procedure.**