

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).

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## 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-Complete this procedure before beginning network turn-up.
2. NTP-D124 Provision a Point-to-Point Network-Complete as needed.
3. NTP-D339 Point-to-Point Network Acceptance Test-Complete this procedure after you create a point-to-point network.
4. NTP-D38 Provision a Linear ADM Network-Complete as needed.
5. NTP-D340 Linear ADM Network Acceptance Test-Complete this procedure after you create a linear ADM.
6. NTP-D40 Provision MS-SPRing Nodes-Complete this procedure to provision ONS 15454 SDHs in a two-fiber or four-fiber MS-SPRing.
7. NTP-D41 Create the MS-SPRing-Complete this procedure after provisioning the MS-SPRing nodes.
8. NTP-D341 Two-Fiber MS-SPRing Acceptance Test-Complete this procedure after you create a two-fiber MS-SPRing.
9. NTP-D342 Four-Fiber MS-SPRing Acceptance Test-Complete this procedure after you create a four-fiber MS-SPRing.
10. NTP-D304 Provision a Traditional MS-SPRing Dual-Ring Interconnect-As needed, complete this procedure after you provision a MS-SPRing.
11. NTP-D305 Provision an Integrated MS-SPRing Dual-Ring Interconnect-As needed, complete this procedure after you provision a MS-SPRing.
12. NTP-D44 Provision SNCP Nodes-Complete as needed.
13. NTP-D343 SNCP Acceptance Test-Complete this procedure after you create an SNCP ring.
14. NTP-D217 Provision a Traditional SNCP Dual-Ring Interconnect-As needed, complete this procedure after you provision an SNCP ring.
15. NTP-D218 Provision an Integrated SNCP Dual-Ring Interconnect-As needed, complete this procedure after you provision an SNCP ring.
16. NTP-D306 Provision a Traditional MS-SPRing/SNCP Dual-Ring Interconnect-As needed, complete this procedure after you provision an SNCP and MS-SPRing.
17. NTP-D307 Provision an Integrated MS-SPRing/SNCP Dual-Ring Interconnect-As needed, complete this procedure after you provision an SNCP and MS-SPRing.
18. NTP-D258 Provision an Open-Ended SNCP-As needed, complete this procedure after you provision an SNCP.
19. NTP-D344 Open-Ended SNCP Acceptance Test-As needed, complete this procedure after you provision an open-ended SNCP.
20. NTP-D46 Subtend an SNCP from an MS-SPRing-Complete as needed.
21. NTP-D47 Subtend an MS-SPRing from an SNCP-Complete as needed.
22. NTP-D48 Subtend an MS-SPRing from an MS-SPRing-Complete as needed.
23. NTP-D172 Create a Logical Network Map-Complete as needed.

## NTP-D35 Verify Node Turn-Up

<b>Purpose</b>	This procedure verifies that an ONS 15454 SDH is ready for network turn up before adding it to a network.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<u>Turn Up a Node</u>
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Superuser only

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1. Complete the "[DLP-D60 Log into CTC](#)" task. If you are already logged in, continue with Step 2.
  2. Click the **Alarms** tab.
    1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
    2. 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.
  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 a release-specific upgrade document. Follow the upgrade procedures appropriate to the software currently installed on the node. TCC2/TCC2P cards can also be ordered with the latest software release.
    - ◆ If the node defaults are not correct, import the network element defaults. Refer to the "Network Element Defaults" appendix in the *Cisco ONS 15454 SDH Reference Manual*.
  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](#).
  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](#).
  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](#).
  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](#).
  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](#).
  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](#).
  10. Provision the network using the applicable procedure shown in the [Before You Begin](#).
- Stop. You have completed this procedure.**

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

<b>Purpose</b>	This procedure provisions two ONS 15454 SDHs in a 1+1 point-to-point (terminal) network.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<a href="#">NTP-D35 Verify Node Turn-Up</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. Complete the "[DLP-D60 Log into CTC](#)" task on an ONS 15454 SDH in the network where you want to provision a point-to-point configuration.
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 if protection has not been created.
3. Repeat Steps 1 and 2 for the second point-to-point node.
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.
5. Complete the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task for the working STM-N port on both point-to-point nodes. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-D364 Provision Multiplex-Section DCC Terminations](#)" task.
    - Note:** Data communications channel (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 Unlocked-enabled STM-N ports.
  6. Complete the "[DLP-D214 Change the Service State for a Port](#)" task to put the protect card in the Unlocked-enabled service state.
  7. As needed, complete the "[DLP-D81 Provision a Proxy Tunnel](#)" task.
  8. As needed, complete the "[DLP-D90 Provision a Firewall Tunnel](#)" task.
  9. Verify that timing is set up at both point-to-point nodes. If not, complete the [NTP-D28 Set Up Timing](#) 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.
  10. Complete the [NTP-D339 Point-to-Point Network Acceptance Test](#).
    - Stop. You have completed this procedure.**

## NTP-D339 Point-to-Point Network Acceptance Test

<b>Purpose</b>	This procedure tests a point-to-point network.
<b>Tools/Equipment</b>	Test set/cables appropriate to the test circuit you will create.
<b>Prerequisite Procedures</b>	<a href="#">NTP-D124 Provision a Point-to-Point Network</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. Complete the "[DLP-D60 Log into CTC](#)" task at one of the point-to-point nodes. The node (default) view appears. If you are already logged in, continue with Step 2.
2. From the View menu, choose **Go to Network View**.
3. Click the **Alarms** tab.
  1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
  2. 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.
  3. Complete the "[DLP-D147 Export CTC Data](#)" task to export the alarm information.
4. Click the **Conditions** tab.
  1. 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.
  2. Complete the "[DLP-D147 Export CTC Data](#)" task to export the conditional information.
5. On the network map, double-click one point-to-point node to open it in node view.
6. Create a test circuit from the login node to the other point-to-point node:
  - ◆ For VC4 circuits, complete the [NTP-D323 Create an Automatically Routed High-Order Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.

- ◆ For VC3 circuits, complete the [NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC12 circuits, complete the [NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC11 circuits, complete the [NTP-D334 Create an Automatically Routed Low-Order VC11 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
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.
    - ◆ VC11-If you are testing a VC11 circuit on an STM-N or MRC-12 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.
  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.
  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.
  10. At the circuit source card:
    1. Connect the transmit (Tx) connector of the test set to the receive (Rx) connector on the circuit source card.
    2. Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector on the circuit source card.
  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.
  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.
  13. Inject BIT errors from the test set. Verify that the errors appear at the test set, indicating a complete end-to-end circuit.
  14. Complete the ["DLP-D254 TCC2/TCC2P Card Active/Standby Switch Test"](#) task.
  15. Complete the ["DLP-D255 Cross-Connect Card Side Switch Test"](#) task.
  16. Complete the ["DLP-D88 Optical 1+1 Protection Test"](#) task.
  17. Set up and complete a bit error rate (BER) test. Use the existing configuration and follow your site requirements for the specified length of time. Record the test results and configuration.
  18. Remove any loopbacks, switches, or test sets from the nodes after all testing is complete.
  19. From the View menu, choose **Go to Network View**.
  20. Click the **Alarms** tab.
    1. Verify that the alarm filter is not on. See the ["DLP-D227 Disable Alarm Filtering"](#) task as necessary.
    2. 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.

3. Complete the "[DLP-D147 Export CTC Data](#)" task to export the alarm information.
21. Repeat Steps 9 through 20 for the other point-to-point node.
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.
23. Delete the test circuit. See the "[DLP-D27 Delete Circuits](#)" task.

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.**

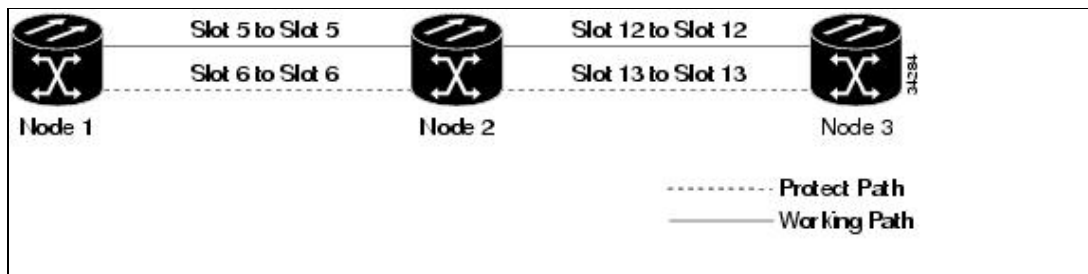
## NTP-D38 Provision a Linear ADM Network

<b>Purpose</b>	This procedure provisions three or more ONS 15454 SDHs in a linear ADM configuration.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<a href="#">NTP-D35 Verify Node Turn-Up</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. Complete the "[DLP-D60 Log into CTC](#)" task 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 5-1](#) 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 5-1: Linear ADM Configuration**



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.
3. Repeat Steps 1 and 2 for all other nodes that you will include in the linear ADM.
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.
5. Complete the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task for the working STM-N ports on each linear ADM node. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-D364 Provision Multiplex-Section DCC Terminations](#)" task.

**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

Unlocked-enabled STM-N ports.

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

6. As needed, complete the "[DLP-D81 Provision a Proxy Tunnel](#)" task.
7. As needed, complete the "[DLP-D90 Provision a Firewall Tunnel](#)" task.
8. Verify that timing has been set up at each linear node. If not, complete the [NTP-D28 Set Up Timing](#). If a node is using line timing, use its working STM-N card as the timing source.
9. Complete the [NTP-D340 Linear ADM Network Acceptance Test](#).

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

## NTP-D340 Linear ADM Network Acceptance Test

<b>Purpose</b>	This procedure tests a linear ADM network.
<b>Tools/Equipment</b>	Test set and cables appropriate to the test circuit you will create.
<b>Prerequisite Procedures</b>	<a href="#">NTP-D38 Provision a Linear ADM Network</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. Complete the "[DLP-D60 Log into CTC](#)" task on a node in the linear ADM network you are testing. If you are already logged in, continue with Step 2.
2. From the View menu, choose **Go to Network View**.
3. Click the **Alarms** tab.
  1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
  2. 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*.
  3. Complete the "[DLP-D147 Export CTC Data](#)" task to export alarm information.
4. Click the **Conditions** tab.
  1. 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.
  2. Complete the "[DLP-D147 Export CTC Data](#)" task to export condition information.
5. On the network map, double-click the linear ADM node you are testing to open it in node view.
6. Create a test circuit from that node to an adjacent linear ADM node.
  - ◆ For VC4 circuits, complete the [NTP-D323 Create an Automatically Routed High-Order Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC3 circuits, complete the [NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC12 circuits, complete the [NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC11 circuits, complete the [NTP-D334 Create an Automatically Routed Low-Order VC11 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
7. Configure the test set for the test circuit type you created:

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- ◆ 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.
  - ◆ VC11-If you are testing a VC11 circuit on an STM-N or MRC-12 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.
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.
  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.
  10. At the circuit source card:
    1. Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.
    2. Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.
  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.
  12. Inject BIT errors from the test set. Verify that the errors appear at the test set, indicating a complete end-to-end circuit.
  13. Complete the "[DLP-D254 TCC2/TCC2P Card Active/Standby Switch Test](#)" task.
  14. Complete the "[DLP-D255 Cross-Connect Card Side Switch Test](#)" task.
  15. Complete the "[DLP-D88 Optical 1+1 Protection Test](#)" task to test the STM-N port protection group switching.
  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.
  17. Remove any loopbacks, switches, or test sets from the nodes after all testing is complete.
  18. In network view, click the **Alarms** tab.
    1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
    2. 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.
  19. Delete the test circuit. See the "[DLP-D27 Delete Circuits](#)" task.
  20. In network view, double-click the next linear ADM node to open it in node view and repeat Steps 6 through 19.
  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

<b>Purpose</b>	This procedure provisions ONS 15454 SDH nodes for an MS-SPRing.
<b>Tools/Equipment</b>	None

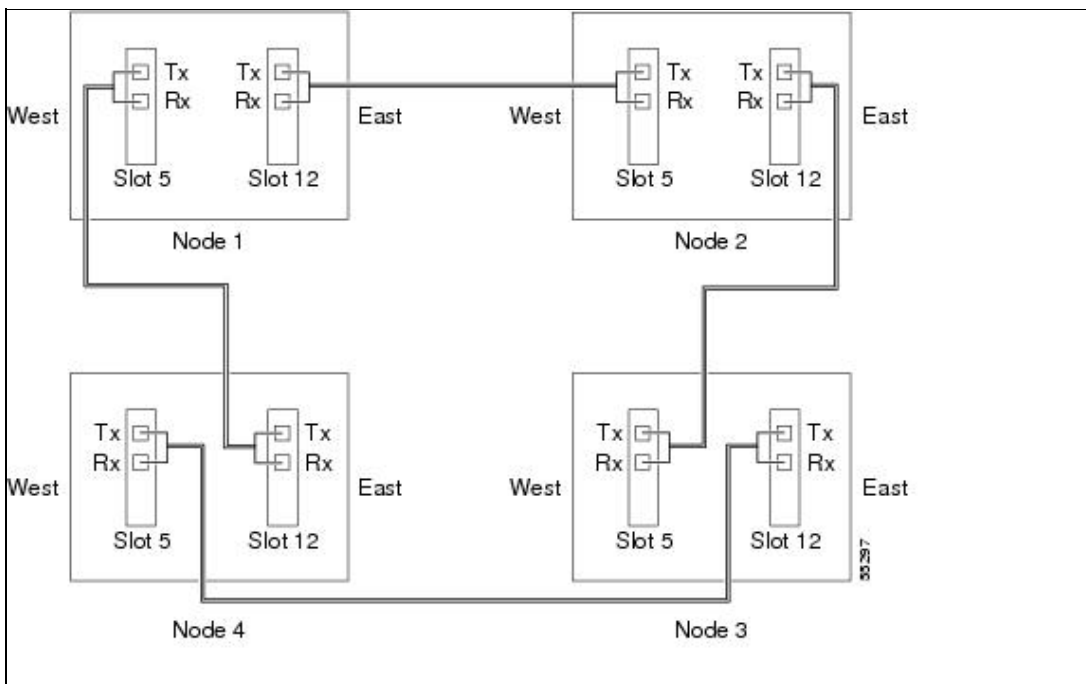


<b>Prerequisite Procedures</b>	<u>NTP-D35 Verify Node Turn-Up</u>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. Complete the "DLP-D338 Install Fiber-Optic Cables for MS-SPRing Configurations" task, verifying that the following rules are observed:

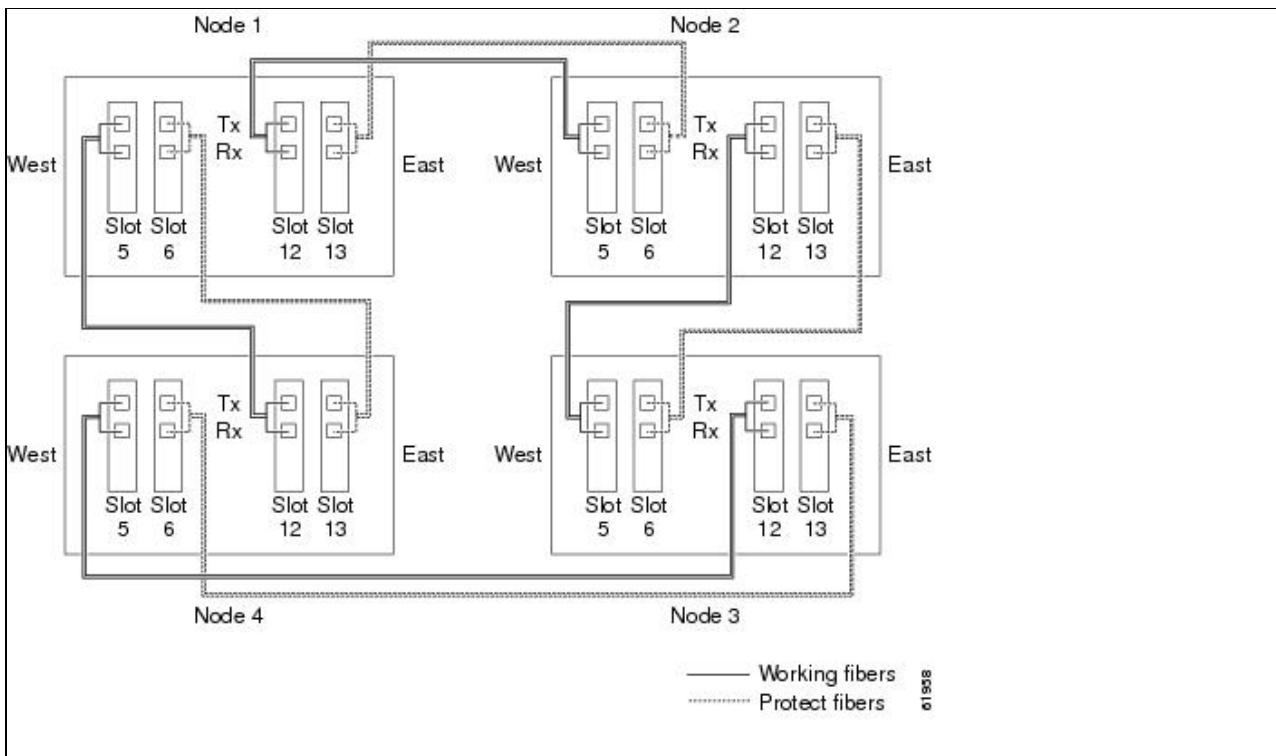
- ◇ Verify that the east port at one node is connected to the west port on an adjacent node, and this east to west port connection is used at all MS-SPRing nodes, similar to Figure 5-2. In the figure, the STM-N drop card on the left side of the shelf is the west port, and the drop card on the right side of the shelf is considered the east port.

**Figure 5-2: 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 5-3. 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 5-3: Four-Node, Four-Fiber MS-SPRing Fiber Connection Example**



2. Log into an ONS 15454 SDH that you want to configure in an MS-SPRing. See the "[DLP-D60 Log into CTC](#)" task. If you are already logged in, continue with Step 3.
3. Complete the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task. 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 Unlocked-enabled STM-N ports.

4. For four-fiber MS-SPRings, complete the "[DLP-D214 Change the Service State for a Port](#)" task to put the protect STM-N cards/ports in the Unlocked-enabled service state.
5. 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.
6. If an MS-SPRing span passes through third-party equipment that cannot transparently transport the K3 byte, complete the "[DLP-D366 Remap the K3 Byte](#)" task. This task is not necessary for most users.
7. As needed, complete the "[DLP-D81 Provision a Proxy Tunnel](#)" task.
8. As needed, complete the "[DLP-D90 Provision a Firewall Tunnel](#)" task.
9. Complete the [NTP-D41 Create the MS-SPRing](#).

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

## NTP-D41 Create the MS-SPRing

<b>Purpose</b>	This procedure creates an MS-SPRing at each MS-SPRing-provisioned node.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<a href="#">NTP-D35 Verify Node Turn-Up</a>

Figure 5-3: Four-Node, Four-Fiber MS-SPRing Fiber Connection Example

	<u>NTP-D40 Provision MS-SPRing Nodes</u>
<b>Required/As Needed</b>	As needed; required to complete MS-SPRing provisioning
<b>Onsite/Remote</b>	Onsite or remote
<b>Security Level</b>	Provisioning or higher

1. Complete the "DLP-D60 Log into CTC" task at a node on the network where you will create the MS-SPRing.
2. Complete one of the following tasks:
  - ◆ DLP-D468 Create a Two-Fiber MS-SPRing Using the MS-SPRing Wizard-Use this task to create a two-fiber 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-D14 Create a Four-Fiber MS-SPRing Using the MS-SPRing Wizard-Use this task to create a four-fiber 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 a Two-Fiber MS-SPRing Manually-Use this task to provision a two-fiber MS-SPRing manually at each node that will be in the MS-SPRing.
  - ◆ DLP-D28 Create a Four-Fiber MS-SPRing Manually-Use this task to provision a four-fiber MS-SPRing manually at each node that will be in the MS-SPRing.
3. Complete the NTP-D341 Two-Fiber MS-SPRing Acceptance Test or the NTP-D342 Four-Fiber MS-SPRing Acceptance Test.

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

## NTP-D341 Two-Fiber MS-SPRing Acceptance Test

<b>Purpose</b>	This procedure tests a two-fiber MS-SPRing.
<b>Tools/Equipment</b>	Test set and cables appropriate for the test circuit
<b>Prerequisite Procedures</b>	<u>NTP-D40 Provision MS-SPRing Nodes</u> <u>NTP-D41 Create the MS-SPRing</u>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	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.

1. Complete the "DLP-D60 Log into CTC" task at one of the ONS 15454 SDHs on the MS-SPRing you are testing. If you are already logged in, continue with Step 2.
2. From the View menu, choose **Go to Network View**.
3. Click the **Alarms** tab.
  1. Verify that the alarm filter is not on. See the "DLP-D227 Disable Alarm Filtering" task as necessary.
  2. 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.
  3. Complete the "DLP-D147 Export CTC Data" task to export the alarm information.
4. Click the **Conditions** tab.

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1. 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.
2. Complete the "DLP-D147 Export CTC Data" task to export the conditions information.
5. On the network map, double-click Node 1.
6. Complete the "DLP-D217 MS-SPRing Exercise Ring Test" task.
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-D323 Create an Automatically Routed High-Order Circuit. When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC3 circuits, complete the NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit. When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC12 circuits, complete the NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit. When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC11 circuits, complete the NTP-D334 Create an Automatically Routed Low-Order VC11 Circuit. When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
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.
  - ◆ VC11-If you are testing a VC11 circuit on an STM-N or MRC-12 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.
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.
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.
11. At the circuit source card:
  1. Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.
  2. Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.
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.
13. Inject BIT errors from the test set. Verify that the errors appear at the test set, verifying a complete end-to-end circuit.
14. Complete the "DLP-D254 TCC2/TCC2P Card Active/Standby Switch Test" task.
15. Complete the "DLP-D255 Cross-Connect Card Side Switch Test" task.

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.
16. Complete the "DLP-D91 MS-SPRing Switch Test" task at Node 1.

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.
18. Complete the "[DLP-D27 Delete Circuits](#)" task for the test circuit.
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.
20. After you test the entire ring, remove any loopbacks and test sets from the nodes.
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 [Create Circuits and Low-Order Tunnels](#).

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

## NTP-D342 Four-Fiber MS-SPRing Acceptance Test

<b>Purpose</b>	This procedure tests a four-fiber MS-SPRing.
<b>Tools/Equipment</b>	Test set and cables appropriate to the test circuit you will create
<b>Prerequisite Procedures</b>	<a href="#">NTP-D40 Provision MS-SPRing Nodes</a> <a href="#">NTP-D41 Create the MS-SPRing</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	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.

1. Complete the "[DLP-D60 Log into CTC](#)" task on the MS-SPRing you are testing. (This node will be called Node 1.) If you are already logged in, continue with Step 2.
2. From the View menu, choose **Go to Network View**.
3. Click the **Alarms** tab.
  1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
  2. 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.
  3. Complete the "[DLP-D147 Export CTC Data](#)" task to export alarm information.
4. Click the **Conditions** tab.
  1. 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.
  2. Complete the "[DLP-D147 Export CTC Data](#)" task to export conditions information.
5. On the network map, double-click Node 1.
6. Complete the "[DLP-D92 Four-Fiber MS-SPRing Exercise Span Test](#)" task.
7. Complete the "[DLP-D217 MS-SPRing Exercise Ring Test](#)" task.
8. Create a test circuit between Node 1 and Node 2.
  - ◆ For VC4 circuits, complete the [NTP-D323 Create an Automatically Routed High-Order Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.

- ◆ For VC3 circuits, complete the NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit. When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC12 circuits, complete the NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit. When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC11 circuits, complete the NTP-D334 Create an Automatically Routed Low-Order VC11 Circuit. When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
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.
  - ◆ VC11-If you are testing a VC11 circuit on an STM-N or MRC-12 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.
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.
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.
12. At the circuit source card:
1. Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.
  2. Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.
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.
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.
15. This step will lock out both of the spans on the node where you perform this task. Complete the "DLP-D254 TCC2/TCC2P Card Active/Standby Switch Test" task.
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.
17. Complete the "DLP-D91 MS-SPRing Switch Test" task to test the MS-SPRing protection switching at Node 1.
18. Complete the "DLP-D93 Four-Fiber MS-SPRing Span Switching Test" task at Node 1.
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.
20. Complete the "DLP-D27 Delete Circuits" task for the test circuit.
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.
22. After you test the entire ring, remove any loopbacks and test sets from the nodes.
23. Click the **Alarms** tab.

1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
  2. 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.
  3. Complete the "[DLP-D147 Export CTC Data](#)" task to export alarm information.
24. Click the **Conditions** tab.
1. 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.
  2. Complete the "[DLP-D147 Export CTC Data](#)" task to export conditions information.
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 [Create Circuits and Low-Order Tunnels](#).
- Stop. You have completed this procedure.**

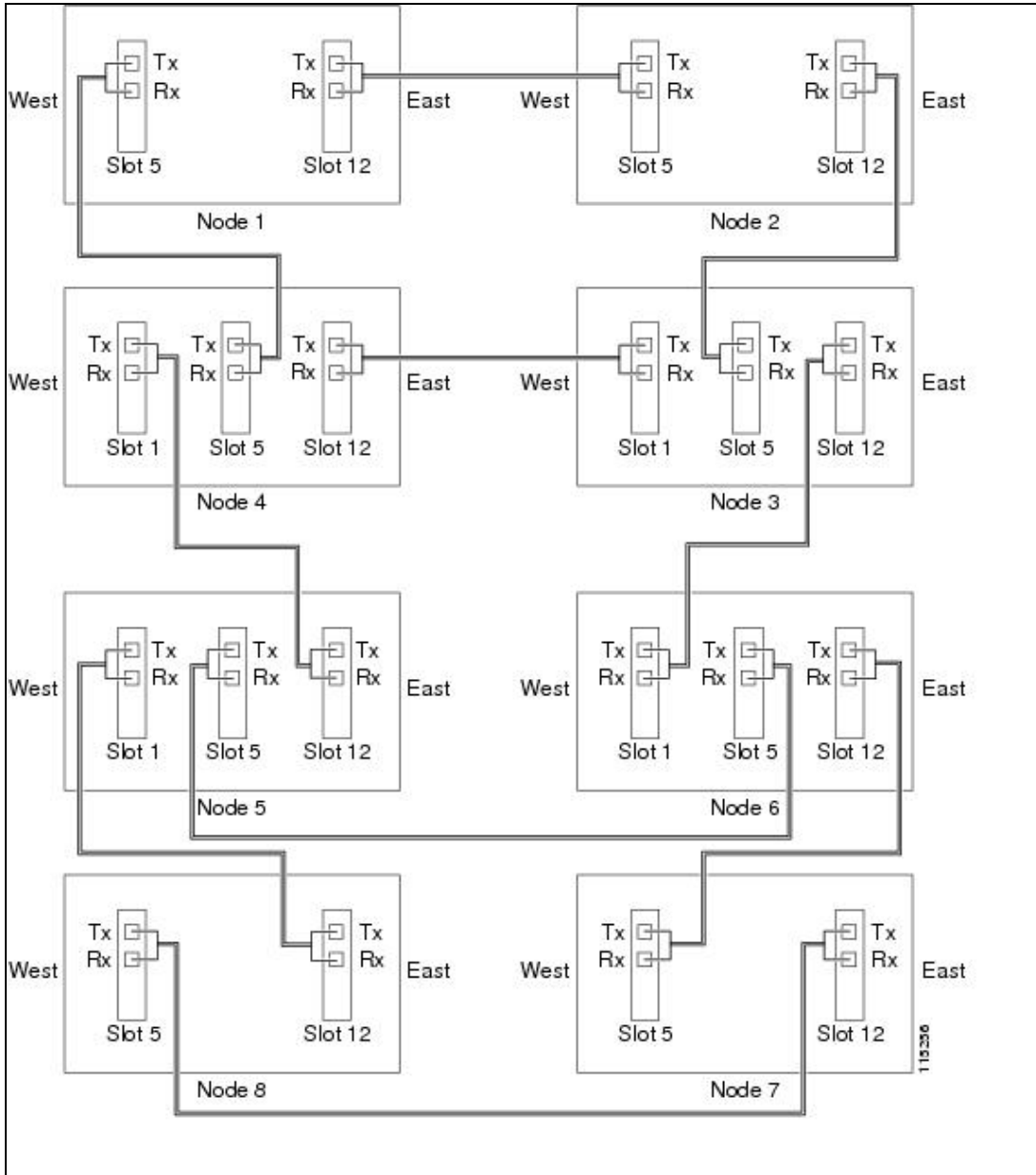
## NTP-D304 Provision a Traditional MS-SPRing Dual-Ring Interconnect

<b>Purpose</b>	This procedure provisions MS-SPRings in a traditional dual-ring interconnect (DRI) topology. DRIs interconnect two or more MS-SPRings to provide an additional level of protection. Two-fiber and four-fiber MS-SPRings can be mixed in a traditional MS-SPRing DRI network.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<a href="#">NTP-D35 Verify Node Turn-Up</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

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

1. Complete the "[DLP-D60 Log into CTC](#)" task. If you are already logged in, continue with Step 2.
2. Complete the following steps if you have not provisioned the MS-SPRings that you will interconnect in an MS-SPRing DRI. If the MS-SPRing are created, go to Step 3.
  1. Complete the [NTP-D40 Provision MS-SPRing Nodes](#) to provision the MS-SPRings.
  2. Complete the [NTP-D41 Create the MS-SPRing](#) to create the MS-SPRings.
  3. Complete the [NTP-D341 Two-Fiber MS-SPRing Acceptance Test](#) to test two-fiber MS-SPRings.
  4. Complete the [NTP-D342 Four-Fiber MS-SPRing Acceptance Test](#) to test four-fiber MS-SPRings.
3. Verify that the MS-SPRing DRI interconnect nodes have STM-N cards installed and have fiber connections to the other interconnect nodes:
  - ◆ The STM-N cards that will connect the MS-SPRings must be installed at the interconnect nodes.
  - ◆ The interconnect nodes must have fiber connections. [Figure 5-4](#) shows an example of fiber connections for a traditional two-fiber MS-SPRing DRI.

Figure 5-4: Traditional Two-Fiber MS-SPRing DRI Fiber Connection Example



Stop. You have completed this procedure.

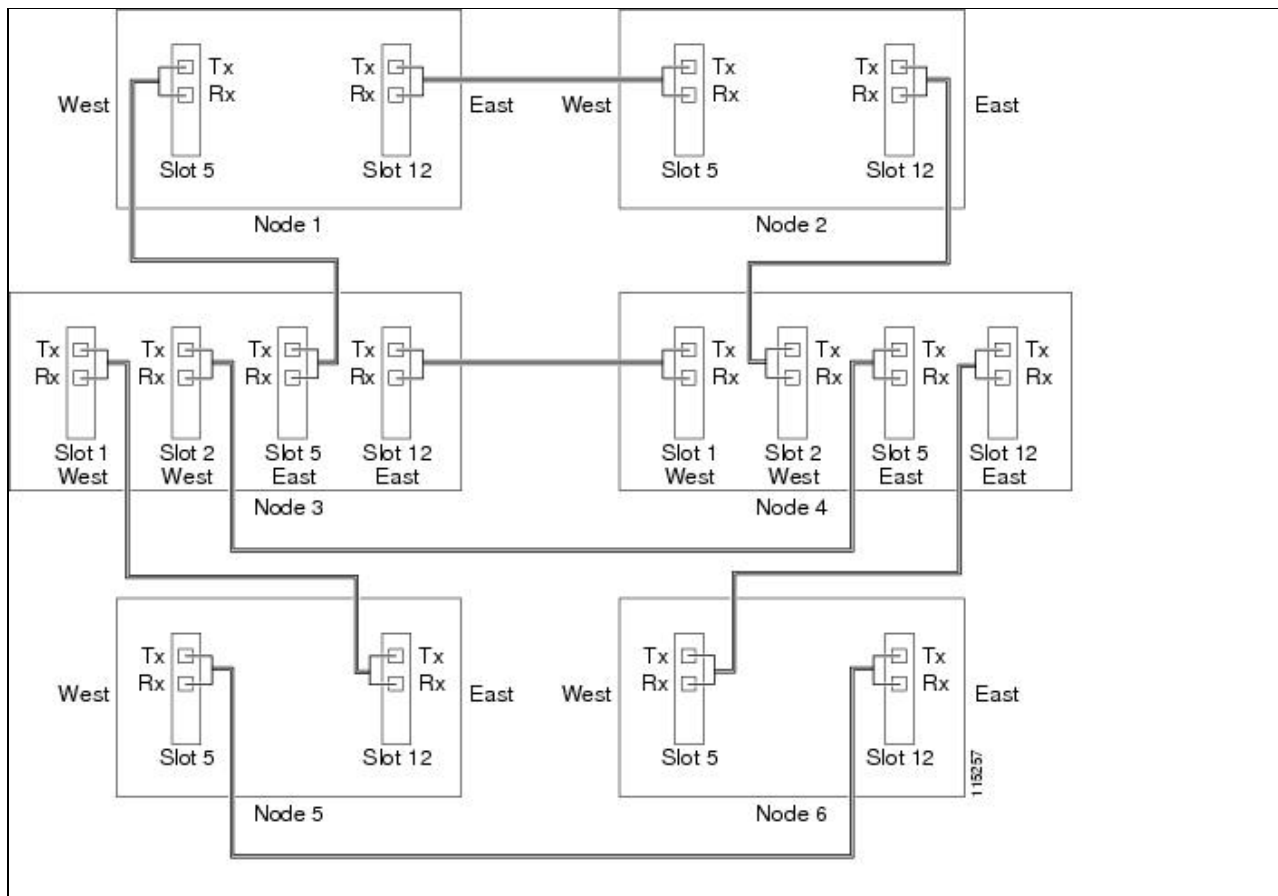
## NTP-D305 Provision an Integrated MS-SPRing Dual-Ring Interconnect

<b>Purpose</b>	This procedure provisions MS-SPRings in an integrated DRI topology.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<u>NTP-D35 Verify Node Turn-Up</u>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher



1. Complete the "[DLP-D60 Log into CTC](#)" task at a node in the MS-SPRing DRI network. If you are already logged in, continue with Step 2.
2. Complete the following steps if you have not provisioned the MS-SPRings that you will interconnect in an MS-SPRing DRI. If the MS-SPRings are created, go to Step 3.
  1. Complete the [NTP-D40 Provision MS-SPRing Nodes](#) to provision the MS-SPRings.
  2. Complete the [NTP-D41 Create the MS-SPRing](#) to create the MS-SPRings.
  3. Complete the [NTP-D341 Two-Fiber MS-SPRing Acceptance Test](#) to test two-fiber MS-SPRings.
  4. Complete the [NTP-D342 Four-Fiber MS-SPRing Acceptance Test](#) to test four-fiber MS-SPRings.
3. Verify that the MS-SPRing DRI interconnect node has STM-N cards installed and has fiber connections to the other interconnect node:
  - ◆ The STM-N cards that will connect the MS-SPRings must be installed at the two interconnect nodes.
  - ◆ The two interconnect nodes must have the correct fiber connections. [Figure 5-5](#) shows an example of an integrated two-fiber MS-SPRing DRI configuration.

**Figure 5-5: Integrated Two-Fiber MS-SPRing DRI Example**



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

## NTP-D44 Provision SNCP Nodes

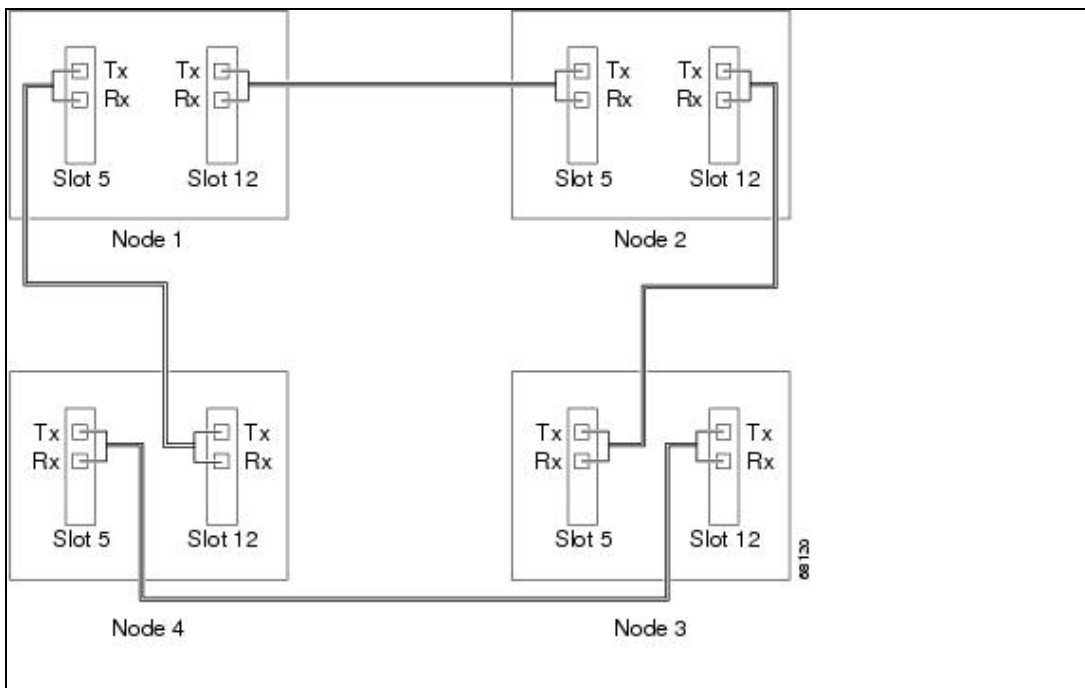
<b>Purpose</b>	This procedure provisions nodes for inclusion in an SNCP ring.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<a href="#">NTP-D35 Verify Node Turn-Up</a>

<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	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.

1. Verify that the fiber is correctly connected to the SNCP trunk (span) STM-N cards similar to [Figure 5-6](#). See the "[DLP-D337 Install Fiber-Optic Cables for SNCP Configurations](#)" task for more information.

**Figure 5-6: SNCP Fiber Connection Example**



2. Log into an ONS 15454 SDH in the SNCP you are turning up. See the "[DLP-D60 Log into CTC](#)" task. If you are already logged in, continue with Step 3.
3. Complete the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task 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. (Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-D364 Provision Multiplex-Section DCC Terminations](#)" task.)

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

4. Repeat Steps 2 and 3 for each node in the SNCP.
5. As needed, complete the "[DLP-D81 Provision a Proxy Tunnel](#)" task.
6. As needed, complete the "[DLP-D90 Provision a Firewall Tunnel](#)" task.
7. Complete the [NTP-D343 SNCP Acceptance Test](#).

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

## NTP-D343 SNCP Acceptance Test

<b>Purpose</b>	This procedure tests an SNCP ring.
<b>Tools/Equipment</b>	Test set and cables appropriate to the test circuit you will create.
<b>Prerequisite Procedures</b>	<a href="#">NTP-D44 Provision SNCP Nodes</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. Complete the "[DLP-D60 Log into CTC](#)" task at one of the ONS 15454 SDHs on the SNCP you are testing. If you are already logged in, continue with Step 2.
2. From the View menu, choose **Go to Network View**.
3. Click the **Alarms** tab.
  1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
  2. 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.
  3. Complete the "[DLP-D147 Export CTC Data](#)" task to export alarm information.
4. Click the **Conditions** tab.
  1. 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.
  2. Complete the "[DLP-D147 Export CTC Data](#)" task to export conditions information.
5. On the network map, double-click the node that you logged into in Step 1.
6. Create a test circuit from that node to the next adjacent SNCP node.
  - ◆ For VC4 circuits, complete the [NTP-D323 Create an Automatically Routed High-Order Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC3 circuits, complete the [NTP-D54 Create an Automatically Routed Low-Order VC3 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC12 circuits, complete the [NTP-D81 Create an Automatically Routed Low-Order VC12 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC11 circuits, complete the [NTP-D334 Create an Automatically Routed Low-Order VC11 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
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.
  - ◆ VC11-If you are testing a VC11 circuit on an STM-N or MRC-12 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.

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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.
9. Create a physical loopback at the circuit destination card:
  1. Attach one end of a patch cable to the destination port's transmit (Tx) connector.
  2. Attach the other end to the port's receive (Rx) connector.
10. At the circuit source card:
  1. Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.
  2. Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.
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.
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.
13. Complete the "[DLP-D254 TCC2/TCC2P Card Active/Standby Switch Test](#)" task.
14. Complete the "[DLP-D255 Cross-Connect Card Side Switch Test](#)" task.
15. From the View menu, choose **Go to Network View**.
16. Click one of the two spans leaving the circuit source node.
17. Complete the "[DLP-D94 SNCP Protection Switching Test](#)" task to test the SNCP protection switching function on this span.
18. In network view, click the other circuit source span and repeat Step 17.
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.
20. Complete the "[DLP-D27 Delete Circuits](#)" task for the test circuit.
21. Remove any loopbacks, switches, or test sets from the nodes after all testing is complete.
22. Click the **Alarms** tab.
  1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
  2. 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.
  3. Complete the "[DLP-D147 Export CTC Data](#)" task to export alarm information.
23. Click the **Conditions** tab.
  1. 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.
  2. Complete the "[DLP-D147 Export CTC Data](#)" task to export conditions information.
24. Repeat Steps 6 through 23 for each node on the network.
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 [Create Circuits and Low-Order Tunnels](#).  
**Stop. You have completed this procedure.**

## NTP-D217 Provision a Traditional SNCP Dual-Ring Interconnect

<b>Purpose</b>	This procedure provisions SNCP rings in a traditional DRI topology. DRIs interconnect two or more SNCPs to provide an additional level of protection.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<a href="#">NTP-D35 Verify Node Turn-Up</a>

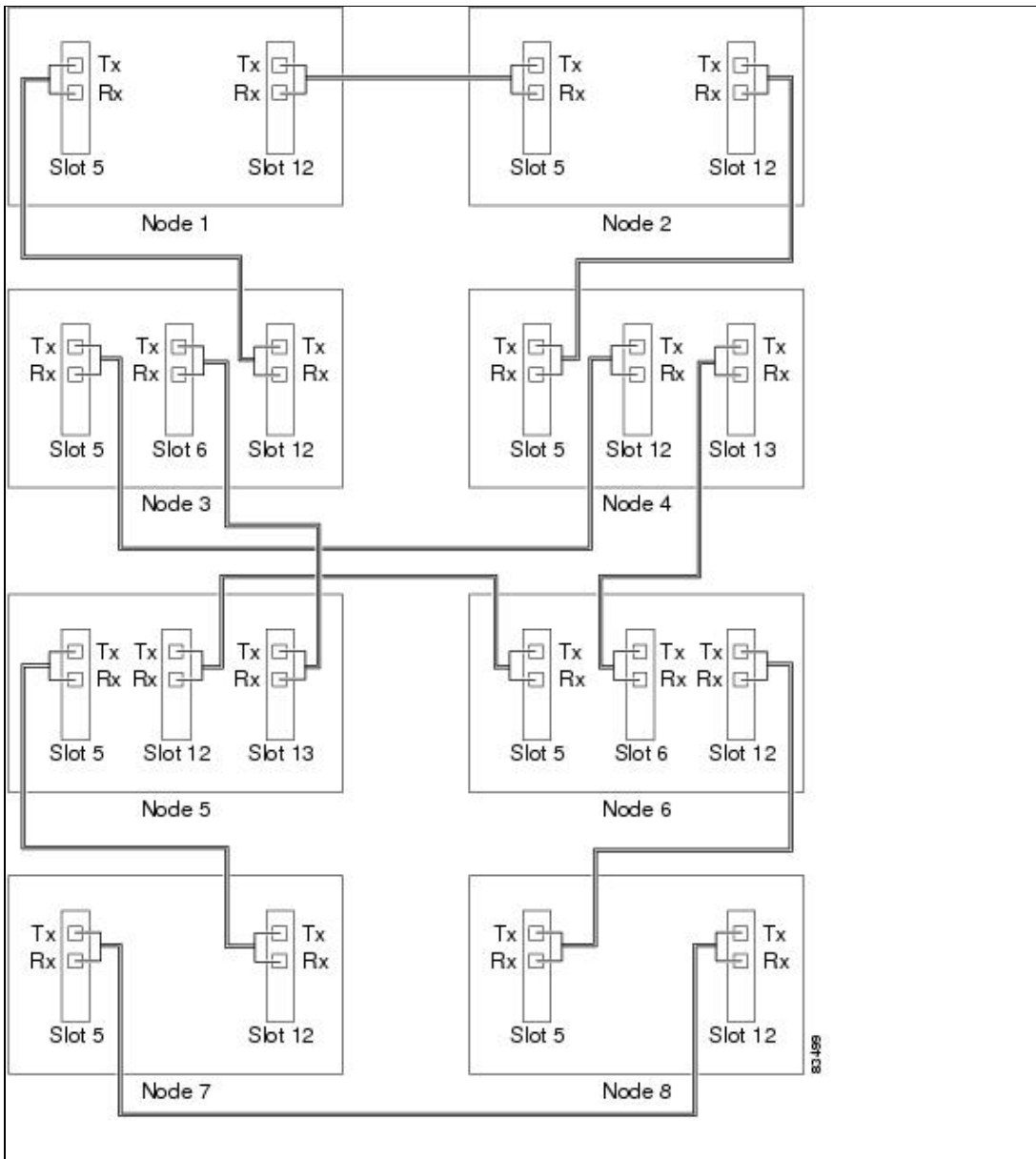
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

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

1. Complete the "DLP-D60 Log into CTC" task. If you are already logged in, continue with Step 2.
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.
  1. Complete the NTP-D44 Provision SNCP Nodes to provision the SNCPs.
  2. Complete the NTP-D343 SNCP Acceptance Test to test the SNCPs.
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 5-7. 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 5-7: SNCP DRI Fiber Connection Example**



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

## NTP-D218 Provision an Integrated SNCP Dual-Ring Interconnect

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

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

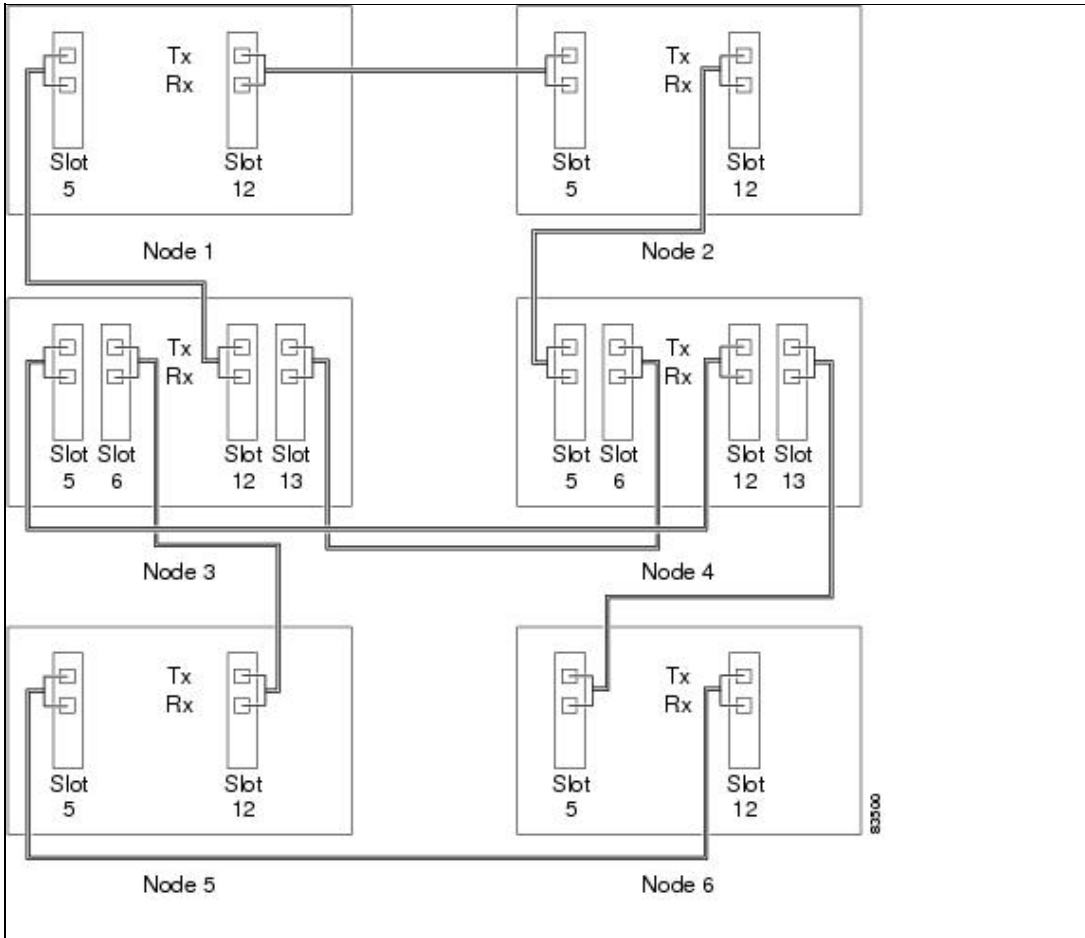
1. Complete the [NTP-D44 Provision SNCP Nodes](#) to provision the SNCPs.
2. Complete the [NTP-D343 SNCP Acceptance Test](#) to test the SNCPs.

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

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 5-8](#). This example shows an SNCP DRI with two rings.

**Figure 5-8: Integrated SNCP DRI Example**



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

## NTP-D306 Provision a Traditional MS-SPRing/SNCP Dual-Ring Interconnect

<b>Purpose</b>	This procedure provisions an MS-SPRing and an SNCP in a traditional DRI topology. DRIs interconnect ring topologies to provide an additional level of protection.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<a href="#">NTP-D35 Verify Node Turn-Up</a>
<b>Required/As Needed</b>	As needed

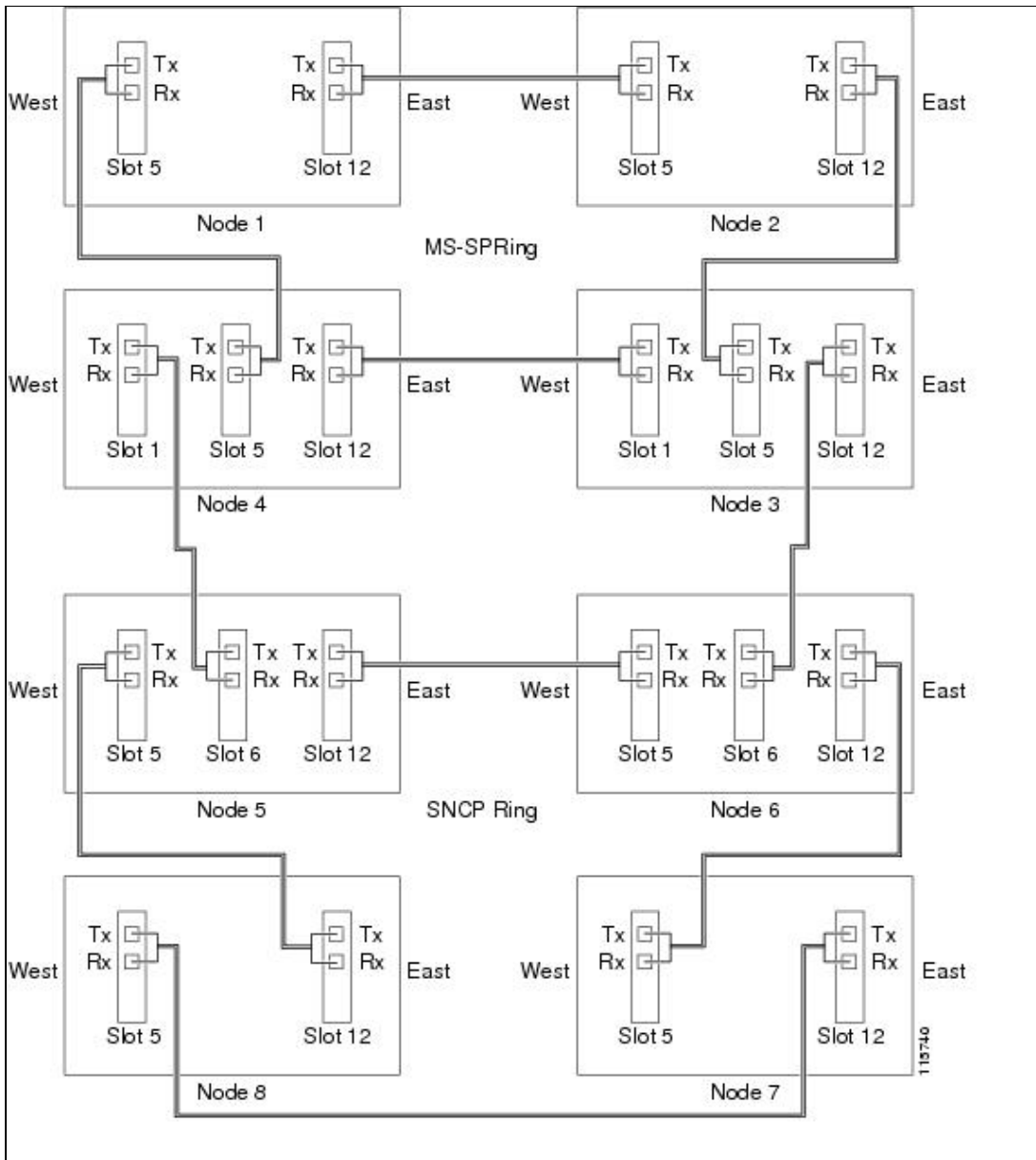
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

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

1. Complete the "[DLP-D60 Log into CTC](#)" task. If you are already logged in, continue with Step 2.
2. Complete the following steps if you have not provisioned the MS-SPRing and SNCP that you will interconnect in a traditional DRI. If the MS-SPRing and SNCP are created, go to Step 3.
  1. To provision and test the MS-SPRing, complete the following procedures:
    - ◇ [NTP-D40 Provision MS-SPRing Nodes](#)
    - ◇ [NTP-D41 Create the MS-SPRing](#)
    - ◇ [NTP-D341 Two-Fiber MS-SPRing Acceptance Test](#)
    - ◇ [NTP-D342 Four-Fiber MS-SPRing Acceptance Test](#)
  2. To provision and test the SNCP, complete the following procedures:
    - ◇ [NTP-D44 Provision SNCP Nodes](#)
    - ◇ [NTP-D343 SNCP Acceptance Test](#)
3. Verify that the 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 MS-SPRing and SNCP 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 5-9](#).

**Figure 5-9: Traditional MS-SPRing to SNCP DRI Fiber Connection Example**





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

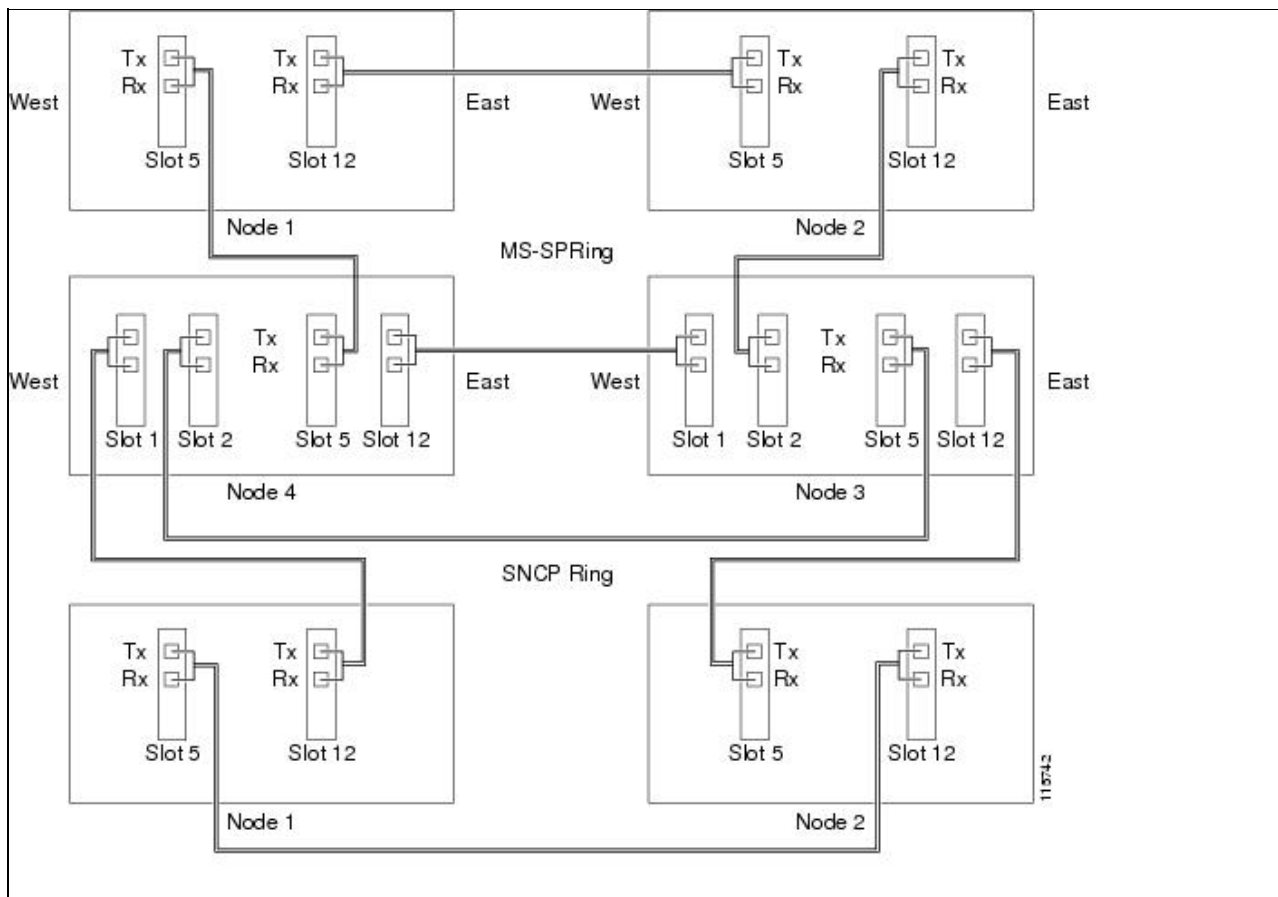
## **NTP-D307 Provision an Integrated MS-SPRing/SNCP Dual-Ring Interconnect**

<b>Purpose</b>	This procedure provisions an MS-SPRing and an SNCP in an integrated DRI topology.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<u>NTP-D35 Verify Node Turn-Up</u>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

Figure 5-9: Traditional MS-SPRing to SNCP DRI Fiber Connection Example

1. Complete the "[DLP-D60 Log into CTC](#)" task at a node in the MS-SPRing and SNCP DRI network. If you are already logged in, continue with Step 2.
2. Complete the following steps if you have not provisioned the MS-SPRing and SNCP that you will interconnect in an integrated DRI. If the MS-SPRing and SNCP are created, continue with Step 3.
  1. To provision and test the MS-SPRing, complete the following:
    - ◇ [NTP-D40 Provision MS-SPRing Nodes](#)
    - ◇ [NTP-D41 Create the MS-SPRing](#)
    - ◇ [NTP-D341 Two-Fiber MS-SPRing Acceptance Test](#)
    - ◇ [NTP-D342 Four-Fiber MS-SPRing Acceptance Test](#)
  2. To provision and test the SNCP, complete the following:
    - ◇ [NTP-D44 Provision SNCP Nodes](#)
    - ◇ [NTP-D343 SNCP Acceptance Test](#)
3. Verify that the MS-SPRing and 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 MS-SPRing and SNCP 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 5-10](#).

**Figure 5-10: Integrated MS-SPRing to SNCP DRI Example**



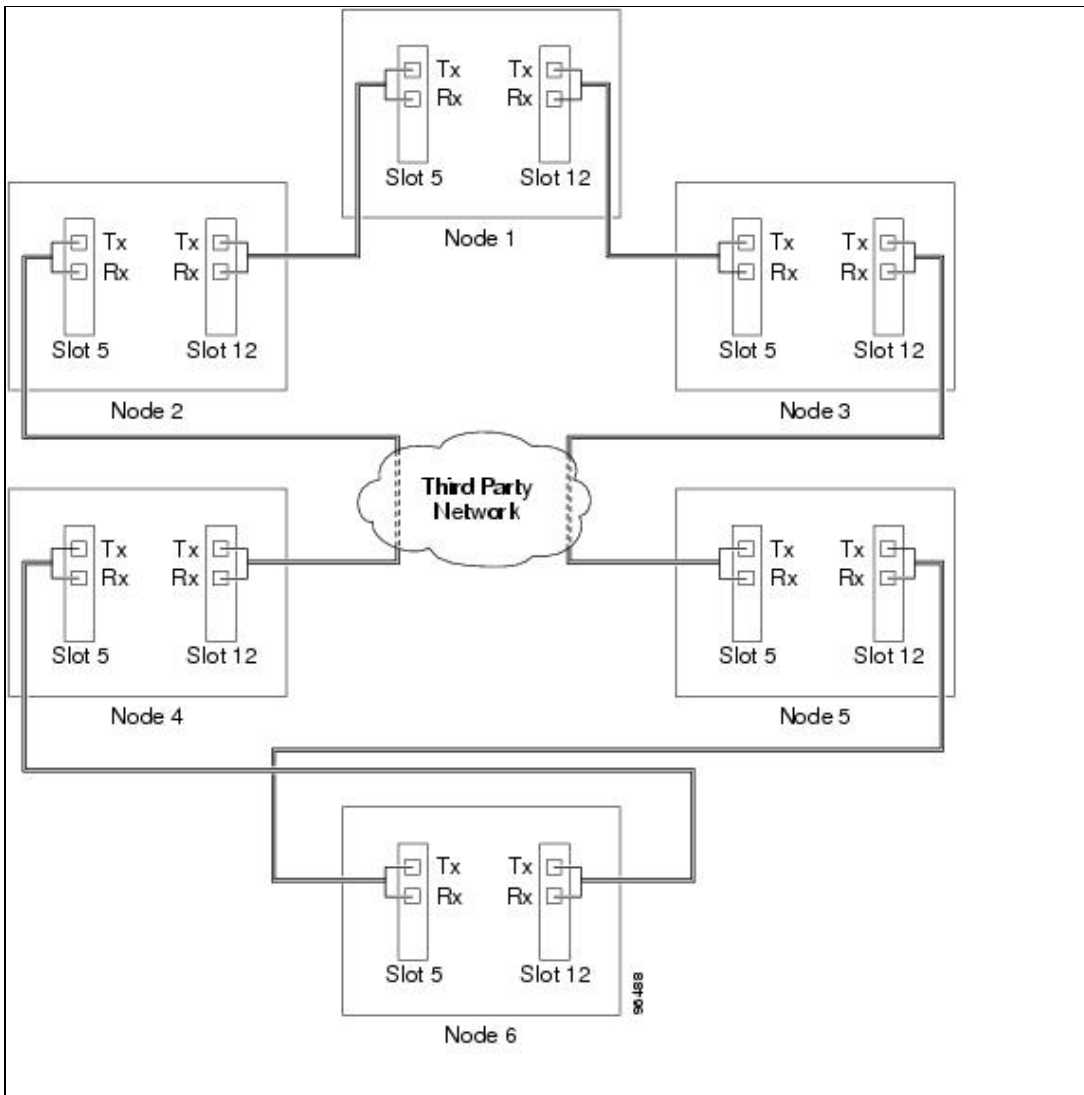
**Stop. You have completed this procedure.**

## NTP-D258 Provision an Open-Ended SNCP

<b>Purpose</b>	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 a third-party network.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	<a href="#">NTP-D35 Verify Node Turn-Up</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. Verify that the fiber is correctly connected to the SNCP trunk (span) STM-N cards at each open-ended SNCP node. [Figure 5-11](#) 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 5-11: ONS 15454 SDH Open-Ended SNCPs Fiber Connection Example**



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 to 8 available.
3. Log into an ONS 15454 SDH in the SNCP you are turning up. See the "[DLP-D60 Log into CTC](#)" task. If you are already logged in, continue with Step 4.
4. Complete the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task for the ONS 15454 SDH cards/ports that are connected to another ONS 15454 SDH. (Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-D364 Provision Multiplex-Section DCC Terminations](#)" task.) Do not create a DCC or MS-DCC termination for the card/port that connects to the third-party equipment. For example, in [Figure 5-11](#) 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 MS-DCC provisioning must be performed through a direct (craft) connection. Remote provisioning is possible only after all nodes in the network have DCC or MS-DCC terminations provisioned to Unlocked-enabled STM-N ports.

5. Repeat Steps 3 and 4 for each node in the SNCP.

Figure 5-11: ONS 15454 SDH Open-Ended SNCPs Fiber Connection Example

6. As needed, complete the "[DLP-D81 Provision a Proxy Tunnel](#)" task.
7. As needed, complete the "[DLP-D90 Provision a Firewall Tunnel](#)" task.
8. 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.
9. Complete the [NTP-D344 Open-Ended SNCP Acceptance Test](#).

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

## NTP-D344 Open-Ended SNCP Acceptance Test

<b>Purpose</b>	This procedure tests an open-ended SNCP ring.
<b>Tools/Equipment</b>	Test set and cables appropriate to the test circuit you will create.
<b>Prerequisite Procedures</b>	<a href="#">NTP-D258 Provision an Open-Ended SNCP</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. Complete the "[DLP-D60 Log into CTC](#)" task 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.
2. From the View menu, choose **Go to Network View**.
3. Click the **Alarms** tab.
  1. Verify that the alarm filter is not on. See the "[DLP-D227 Disable Alarm Filtering](#)" task as necessary.
  2. 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.
  3. Complete the "[DLP-D147 Export CTC Data](#)" task to export the alarm information.
4. Click the **Conditions** tab.
  1. 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.
  2. Complete the "[DLP-D147 Export CTC Data](#)" task to export the conditions information.
5. On the network map, double-click the node that you logged into in Step 1.
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 5-11](#), 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-D323 Create an Automatically Routed High-Order Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC3 circuits, complete the [D54 Create an Automatically Routed Low-Order VC3 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC12 circuits, complete the [D81 Create an Automatically Routed Low-Order VC12 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.
  - ◆ For VC11 circuits, complete the [D334 Create an Automatically Routed Low-Order VC11 Circuit](#). When you set the circuit state, choose **Unlocked** and check the **Apply to drop ports** check box.

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.
8. Repeat Step 6 to create a second circuit at the terminating node on the other side of the third-party network. In [Figure 5-11](#), 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.
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.
  - ◆ VC11-If you are testing a VC11 circuit on an STM-N or MRC-12 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.
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.
11. Create a physical loopback at the circuit destination card:
  1. Attach one end of a patch cable to the destination port's transmit (Tx) connector.
  2. Attach the other end to the port's receive (Rx) connector.
12. At the circuit source card:
  1. Connect the transmit (Tx) connector of the test set to the circuit receive (Rx) connector.
  2. Connect the test set receive (Rx) connector to the circuit transmit (Tx) connector.
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.
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.
15. Complete the ["DLP-D254 TCC2/TCC2P Card Active/Standby Switch Test"](#) task.
16. Complete the ["DLP-D255 Cross-Connect Card Side Switch Test"](#) task.
17. From the View menu, choose **Go to Network View**.
18. Click one of the two spans leaving the circuit source node.
19. Complete the ["DLP-D94 SNCP Protection Switching Test"](#) task to test the SNCP protection switching function on this span.
20. In network view, click the other circuit source span and repeat Step 19.
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.
22. Complete the ["DLP-D27 Delete Circuits"](#) task for the test circuit.
23. Remove any loopbacks, switches, or test sets from the nodes after all testing is complete.
24. In network view, click the **Alarms** tab.
  1. Verify that the alarm filter is not on. See the ["DLP-D227 Disable Alarm Filtering"](#) task as necessary.
  2. 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.
  3. Complete the ["DLP-D147 Export CTC Data"](#) task to export the alarm information.
25. In network view, click the **Conditions** tab.

1. 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.
2. Complete the "[DLP-D147 Export CTC Data](#)" task to export the conditions information.
26. Repeat Steps 6 through 25 for each node that will be a source or destination for circuits traversing the third-party network.
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 [Create Circuits and Low-Order Tunnels](#).

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

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

<b>Purpose</b>	This procedure subtends an SNCP ring from an existing MS-SPRing.
<b>Tools/Equipment</b>	One MS-SPRing node must have STM-N cards and fibers to carry the SNCP.
<b>Prerequisite Procedures</b>	<a href="#">NTP-D341 Two-Fiber MS-SPRing Acceptance Test</a> , or <a href="#">NTP-D342 Four-Fiber MS-SPRing Acceptance Test</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

1. In the node that will subtend the SNCP (Node 3 in [Figure 5-12](#)), 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 STM-N Cards and Connectors](#). If they are already installed, continue with Step 2.
2. Attach fibers from these cards to the SNCP trunk cards on the neighbor SNCP node or nodes. In [Figure 5-12](#), 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.

**Figure 5-12: SNCP Subtended from an MS-SPRing**

[Output/71274.jpg](#)

3. Complete the "[DLP-D60 Log into CTC](#)" task at the ONS 15454 SDH that will subtend the SNCP (Node 3 in the example).
4. Complete the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task for each STM-N card that will carry the SNCP.
5. Log into the SNCP node that connects to the node in Step 3.
6. Complete the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task for each STM-N card that will carry the SNCP. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-D364 Provision Multiplex-Section DCC Terminations](#)" task.
7. As needed, complete the "[DLP-D81 Provision a Proxy Tunnel](#)" task.
8. As needed, complete the "[DLP-D90 Provision a Firewall Tunnel](#)" task.
9. Repeat Step 6 for each node in the SNCP.
10. From the View menu, choose **Go To Network View** to view the subtending rings.
11. Complete the [NTP-D343 SNCP Acceptance Test](#).

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

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

<b>Purpose</b>	This procedure subtends an MS-SPRing from an existing SNCP ring.
<b>Tools/Equipment</b>	One SNCP node must have STM-N cards and fibers to carry the MS-SPRing.
<b>Prerequisite Procedures</b>	<a href="#">NTP-D44 Provision SNCP Nodes</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

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 5-12](#), Node 3, Slots 5 and 12). See the [NTP-D16 Install STM-N Cards and Connectors](#).
2. Attach fibers from the cards in Step 1 to the MS-SPRing trunk cards on another MS-SPRing node or nodes. In [Figure 5-12](#), 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.
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. If you are already logged in, continue with Step 4.
4. Create the DCCs on both STM-N trunk cards (east and west) that will carry the MS-SPRing. See the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-D364 Provision Multiplex-Section DCC Terminations](#)" task.
5. Create the subtending MS-SPRing:
  1. Complete the [NTP-D40 Provision MS-SPRING Nodes](#) 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.
  2. Complete the [NTP-D41 Create the MS-SPRING](#). Include the node in Step 3 (the node that will subtend the MS-SPRing) in the MS-SPRING.
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

<b>Purpose</b>	This procedure subtends an MS-SPRing from an existing MS-SPRING.
<b>Tools/Equipment</b>	One MS-SPRING node must have STM-N cards and fibers needed to carry the second MS-SPRING.
<b>Prerequisite Procedures</b>	<a href="#">NTP-D40 Provision MS-SPRING Nodes</a> <a href="#">NTP-D41 Create the MS-SPRING</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	Provisioning or higher

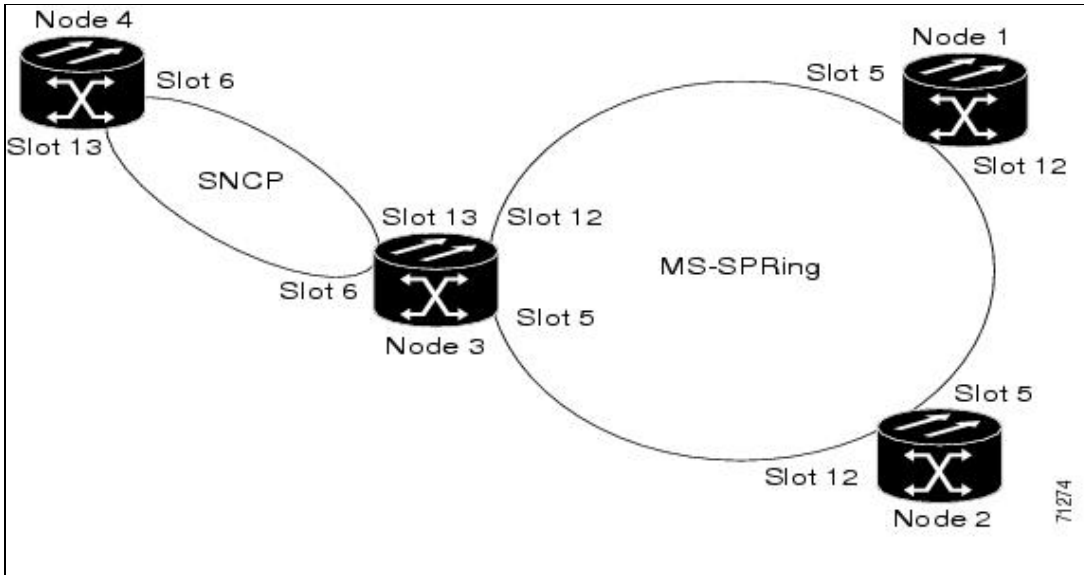
**Note:** This procedure assumes that all nodes are configured for the MS-SPRING. If you need to add a node to an MS-SPRING, see the [NTP-D359 Add an MS-SPRING Node](#).

1. Complete the "[DLP-D60 Log into CTC](#)" task at the node that will subtend the MS-SPRING. If you are already logged in, continue with Step 2.
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 STM-N Cards and Connectors](#) and the [NTP-D19 Install Fiber-Optic Cables on Optical Cards](#).



**Figure 5-13** 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 5-13: MS-SPRing Subtended from an MS-SPRing**



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 5-13**, 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.
4. Create the DCCs on the first STM-N card that will carry the MS-SPRing. See the "[DLP-D363 Provision Regenerator-Section DCC Terminations](#)" task. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-D364 Provision Multiplex-Section DCC Terminations](#)" task.
5. Repeat Step 4 for the second STM-N trunk card that will carry the MS-SPRing.
6. Complete the [NTP-D40 Provision MS-SPRing Nodes](#) 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.
7. If the subtending MS-SPRing is not already created, complete the [NTP-D41 Create the MS-SPRing](#) 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.

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

**Figure 5-14** shows an example of two subtending MS-SPRings.

**Figure 5-14: View Subtended MS-SPRings on the Network Map**



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

## NTP-D172 Create a Logical Network Map

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

1. Complete the "[DLP-D60 Log into CTC](#)" task 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.
2. From the View menu, choose **Go to Network View**.
3. Change the position of the nodes in the network view according to your site plan.
  1. Click a node to select it, then press the **Ctrl** key while you drag and drop a node icon to a new location.
  2. Repeat Substep 1 for each node you need to position.
4. On the network view map, right-click and choose **Save Node Position**.
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.**