

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

This chapter explains how to turn up and test Cisco ONS 15454 networks, including point-to-point networks, linear add-drop multiplexers (ADM)s, path protection configurations, and bidirectional line switched rings (BLSRs).

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Before You Begin

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

1. NTP-A35 Verify Node Turn-Up-Complete this procedure before beginning network turn-up.
2. NTP-A124 Provision a Point-to-Point Network-Complete as needed.
3. NTP-A173 Point-to-Point Network Acceptance Test-Complete this procedure after you provision a point-to-point network.
4. NTP-A38 Provision a Linear ADM Network-Complete as needed.
5. NTP-A174 Linear ADM Network Acceptance Test-Complete this procedure after you provision a linear ADM.
6. NTP-A40 Provision BLSR Nodes-Complete this procedure to provision ONS 15454 nodes in a two-fiber or four-fiber BLSR.
7. NTP-A126 Create a BLSR-Complete this procedure after you provision the BLSR nodes.
8. NTP-A175 Two-Fiber BLSR Acceptance Test-Complete this procedure after you create a two-fiber BLSR.
9. NTP-A176 Four-Fiber BLSR Acceptance Test-Complete this procedure after you create a four-fiber BLSR.
10. NTP-A178 Provision a Traditional BLSR Dual-Ring Interconnect-As needed, complete this procedure after you provision a BLSR.
11. NTP-A179 Provision an Integrated BLSR Dual-Ring Interconnect-As needed, complete this procedure after you provision a BLSR.
12. NTP-A44 Provision Path Protection Nodes-Complete as needed.
13. NTP-A225 Open-Ended Path Protection Acceptance Test-Complete this procedure after you create a path protection.
14. NTP-A216 Provision a Traditional Path Protection Dual-Ring Interconnect-As needed, complete this procedure after you provision a path protection.
15. NTP-A217 Provision an Integrated Path Protection Dual-Ring Interconnect-As needed, complete this procedure after you provision a path protection.
16. NTP-A180 Provision a Traditional BLSR/Path Protection Dual-Ring Interconnect-As needed, complete this procedure after you provision a path protection and BLSR.
17. NTP-A209 Provision an Integrated BLSR/Path Protection Dual-Ring Interconnect-As needed, complete this procedure after you provision a path protection and BLSR.
18. NTP-A224 Provision an Open-Ended Path Protection Configuration-As needed, complete this procedure after you provision a path protection.
19. NTP-A225 Open-Ended Path Protection Acceptance Test-As needed, complete this procedure after you provision an open-ended path protection.
20. NTP-A46 Subtend a Path Protection Configuration from a BLSR-Complete as needed.
21. NTP-A47 Subtend a BLSR from a Path Protection Configuration-Complete as needed.
22. NTP-A48 Subtend a BLSR from a BLSR-Complete as needed.
23. NTP-A172 Create a Logical Network Map-Complete as needed.

NTP-A35 Verify Node Turn-Up

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

Security Level	Provisioning or higher
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1. Complete the "[DLP-A60 Log into CTC](#)" task on the network you will test. 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-A227 Disable Alarm Filtering](#)" task on page 19-18 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 Troubleshooting Guide* for procedures.
3. Verify that the SW Version and Defaults shown 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 Cisco ONS 15454 software CD. Upgrade procedures are located in a release-specific software upgrade document. 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 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-A81 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-A85 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-A201 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-A203 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-A205 Modify Users and Change Security](#).
9. If Simple Network Management Protocol (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-A87 Change SNMP Settings](#).
10. Provision the network using the applicable procedure shown in the [Before You Begin](#).
Stop. You have completed this procedure.

NTP-A124 Provision a Point-to-Point Network

Purpose	This procedure provisions two ONS 15454s in a 1+1 point-to-point (terminal) network.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

1. Complete the "[DLP-A60 Log into CTC](#)" task on an ONS 15454 in the network where you want to provision a point-to-point configuration. If you are already logged in, continue with Step 2.
2. Click the **Provisioning > Protection** tabs. Verify that 1+1 protection is created for the OC-N cards. Complete the "[DLP-A73 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-A377 Provision Section DCC Terminations](#)" task for the working OC-N port on both point-to-point nodes. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-A378 Provision Line DCC Terminations](#)" task.
 - 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 OC-N ports.
6. Complete the "[DLP-A214 Change the Service State for a Port](#)" task to put the protect card in-service.
7. As needed, complete the "[DLP-A380 Provision a Proxy Tunnel](#)" task.
8. As needed, complete the "[DLP-A381 Provision a Firewall Tunnel](#)" task.
9. As needed, complete the "[DLP-A367 Create a Provisionable Patchcord](#)" task.
10. Verify that timing is set up at both point-to-point nodes. If not, complete the [NTP-A28 Set Up Timing](#) for one or both of the nodes. If a node uses line timing, make its working OC-N card the timing source. The system will automatically choose the corresponding protect OC-N card as the protect timing source. This will be visible in the **Maintenance > Timing** tab.
11. Complete the [NTP-A173 Point-to-Point Network Acceptance Test](#).
 - Stop. You have completed this procedure.**

NTP-A173 Point-to-Point Network Acceptance Test

Purpose	This procedure tests a point-to-point network.
Tools/Equipment	Test set and cables appropriate to the test circuit you will create
Prerequisite Procedures	NTP-A124 Provision a Point-to-Point Network
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Caution! This procedure might be service affecting if performed on a node carrying traffic.

1. Complete the "[DLP-A60 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-A227 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 Troubleshooting Guide* if necessary.
 3. Complete the "[DLP-A532 Export CTC Data](#)" task to export alarm data.
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 Troubleshooting Guide* if necessary.
 2. Complete the "[DLP-A532 Export CTC Data](#)" task to export the condition information.
5. On the network map, double-click a 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 DS-1 circuits, complete the [NTP-A181 Create an Automatically Routed DS-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For DS-3 circuits, complete the [NTP-A184 Create an Automatically Routed DS-3 or EC-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For OC-N circuits, complete the [NTP-A343 Create an Automatically Routed Optical Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
7. Configure the test set for the test circuit type you created:
 - ◆ DS-1-If you are testing a DS-1 that is not multiplexed, you must have a DSX-1 panel or a direct DS-1 interface to the ONS 15454. Set the test set for DS-1. For information about configuring your test set, consult your test set user guide.
 - ◆ DS-3-If you are testing a clear channel DS-3, you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for clear channel DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ DS3XM-If you are testing a DS-1 circuit on a DS3XM-6 or DS3XM-12 card you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for a multiplexed DS-3. Next, choose the DS-1 to test on the multiplexed DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ OC-N-If you are testing an OC-N circuit, set the test set for the applicable circuit size. 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 the other 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 Step 9.
 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 Tx connector; attach the other end to the port's Rx connector.
 10. At the circuit source card:
 1. Connect the Tx connector of the test set to the Rx connector on the circuit source card.
 2. Connect the test set Rx connector to the circuit Tx connector on the circuit source card.
 11. Verify that the test set has 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-A356 TCC2/TCC2P Card Active/Standby Switch Test"](#) task.
 15. Complete the ["DLP-A255 Cross-Connect Card Side Switch Test"](#) task.
 16. Complete the ["DLP-A88 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-A227 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 Troubleshooting Guide* if necessary.
 3. Complete the ["DLP-A532 Export CTC Data"](#) task to export the alarms 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-A333 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.

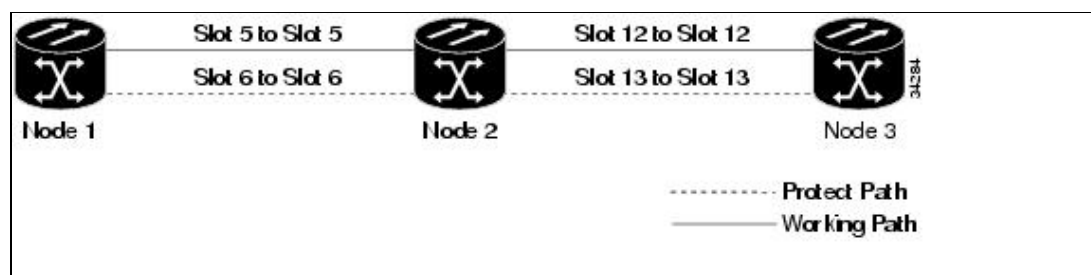
NTP-A38 Provision a Linear ADM Network

Purpose	This procedure provisions three or more ONS 15454s in a linear add-drop multiplexer (ADM) configuration.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

1. Complete the "[DLP-A60 Log into CTC](#)" task at an ONS 15454 where you want to provision in a linear ADM network. If you are already logged in, continue with Step 2.

[Figure 5-1](#) shows three ONS 15454s 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 OC-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 OC-N cards at the node. If the protection group has not been created, complete the "[DLP-A73 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-A377 Provision Section DCC Terminations](#)" task for the working OC-N ports on each linear ADM node. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-A378 Provision Line 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 in-service OC-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-A380 Provision a Proxy Tunnel"](#) task.
7. As needed, complete the ["DLP-A381 Provision a Firewall Tunnel"](#) task.
8. As needed, complete the ["DLP-A367 Create a Provisionable Patchcord"](#) task.
9. Verify that the timing has been set up at each linear node. If not, complete the [NTP-A28 Set Up Timing](#). If a node is using line timing, use its working OC-N card as the timing source.
10. Complete the [NTP-A174 Linear ADM Network Acceptance Test](#).

Stop. You have completed this procedure.

NTP-A174 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-A38 Provision a Linear ADM Network
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

1. Complete the ["DLP-A60 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-A227 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 Troubleshooting Guide* if necessary.
 3. Complete the ["DLP-A532 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 Troubleshooting Guide* if necessary.
 2. Complete the ["DLP-A532 Export CTC Data"](#) task to export the conditions 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 DS-1 circuits, complete the [NTP-A181 Create an Automatically Routed DS-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For DS-3 circuits, complete the [NTP-A184 Create an Automatically Routed DS-3 or EC-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For OC-N circuits, complete the [NTP-A343 Create an Automatically Routed Optical Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
7. Configure the test set for the test circuit type you created:
 - ◆ DS-1 card-If you are testing a DS-1 that is not multiplexed, you must have a DSX-1 panel or a direct DS-1 interface into the ONS 15454. Set the test set for DS-1. For information about configuring your test set, consult your test set user guide.
 - ◆ DS-3-If you are testing a clear channel DS-3, you must have a DSX-3 panel or a direct DS-3 interface into the ONS 15454. Set the test set for clear channel DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ DS3XM-If you are testing a DS-1 circuit on a DS3XM-6 or DS3XM-12 card you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for a multiplexed

DS-3, then choose the DS-1 to test on the multiplexed DS-3. For information about configuring your test set, consult your test set user guide.

- ◆ OC-N-If you are testing an OC-N circuit, set the test set for the applicable circuit size. 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 Tx connector and the other end to the test set 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 Tx connector; attach the other end to the destination port's Rx connector.
- 10. At the circuit source card:
 1. Connect the Tx connector of the test set to the circuit Rx connector.
 2. Connect the test set Rx connector to the circuit 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-A356 TCC2/TCC2P Card Active/Standby Switch Test](#)" task.
- 14. Complete the "[DLP-A255 Cross-Connect Card Side Switch Test](#)" task.
- 15. Complete the "[DLP-A88 Optical 1+1 Protection Test](#)" task to test the OC-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-A227 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 Troubleshooting Guide* if necessary.
- 19. Delete the test circuit. See the "[DLP-A333 Delete Circuits](#)" task.
- 20. Repeat Steps 6 through 19 for the next linear ADM node you are testing.
- 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.

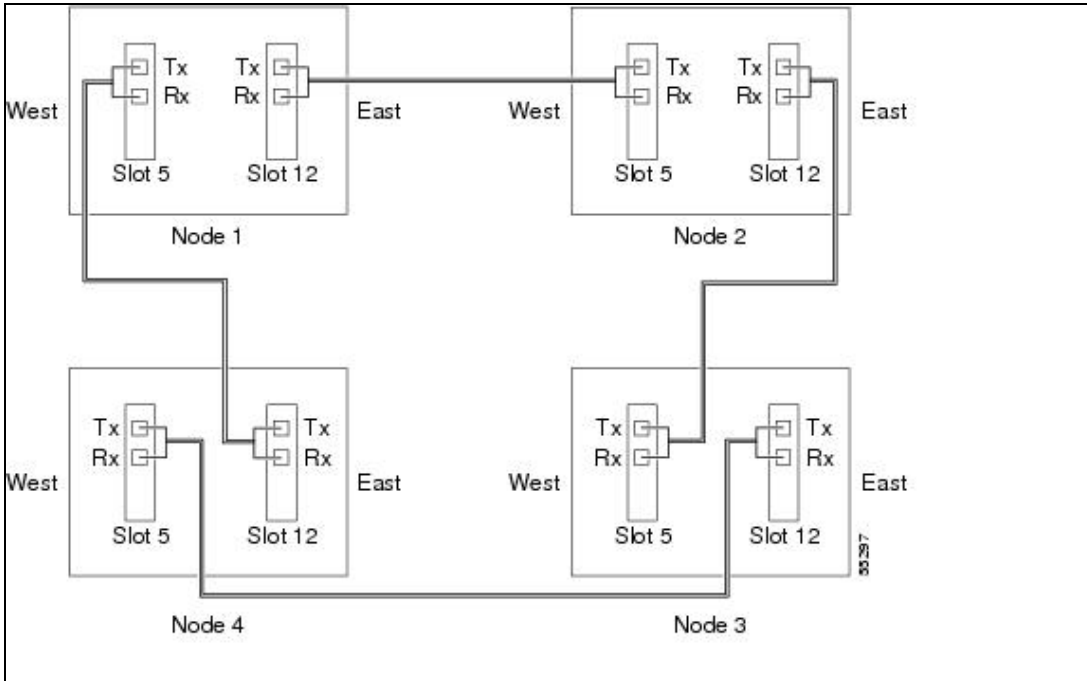
NTP-A40 Provision BLSR Nodes

Purpose	This procedure provisions ONS 15454 nodes for a BLSR.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

1. Complete the "[DLP-A44 Install Fiber-Optic Cables for BLSR 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 BLSR nodes, similar to [Figure 5-2](#). In the

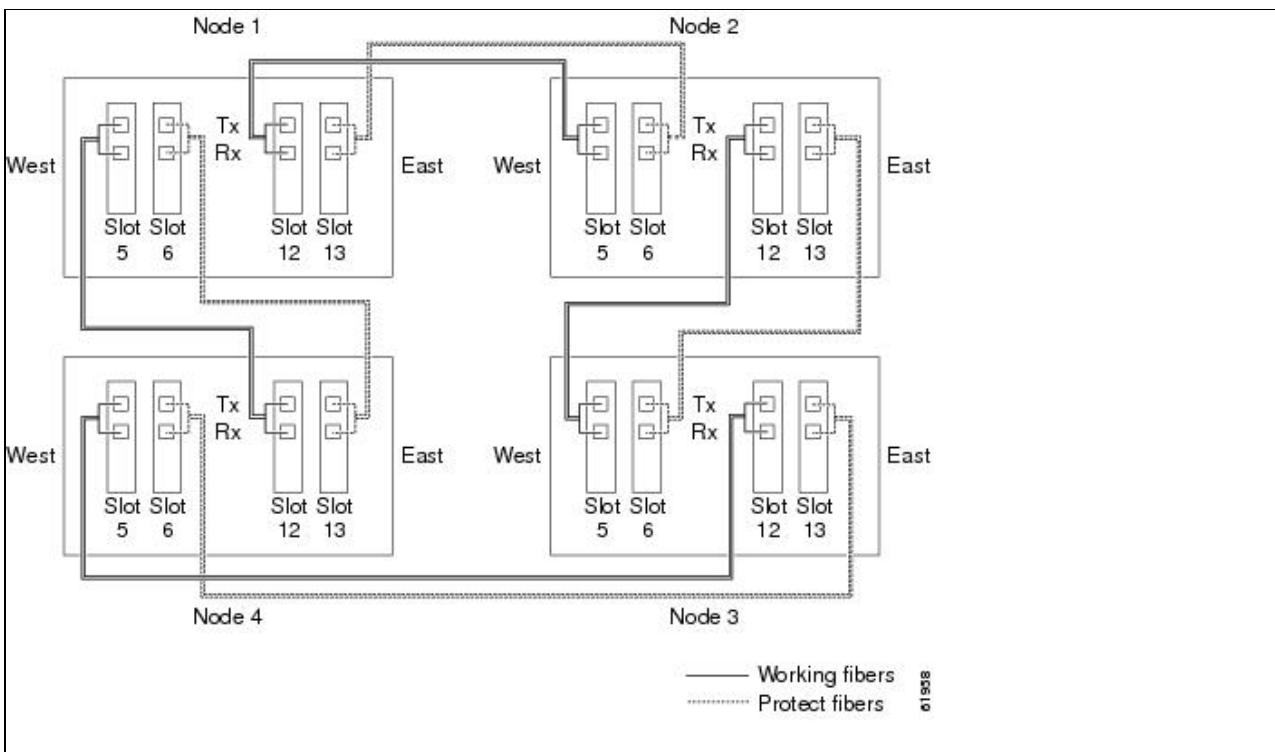
figure, the OC-N drop card on the left side of the shelf is the west port, and the drop card on the right side of the shelf is considered the east port.

Figure 5-2: Four-Node, Two-Fiber BLSR Fiber Connection Example



- For four-fiber BLSRs, 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 BLSR Fiber Connection Example



2. Log into an ONS 15454 that you want to configure in a BLSR. See the "[DLP-A60 Log into CTC](#)" task. If you are already logged in, continue with Step 3.
3. Complete the "[DLP-A377 Provision Section DCC Terminations](#)" task. Provision the two ports/cards that will serve as the BLSR ports at the node. For four-fiber BLSRs, provision the DCC terminations on the OC-N cards that will carry the working traffic, but do not provision DCCs on the protect cards.

Note: If an ONS 15454 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 IS-NR OC-N ports.

4. For four-fiber BLSRs, complete the "[DLP-A214 Change the Service State for a Port](#)" task to put the protect OC-N cards/ports in service.
5. Repeat Steps 2 through 4 at each node that will be in the BLSR. 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. As needed, complete the "[DLP-A380 Provision a Proxy Tunnel](#)" task.
7. As needed, complete the "[DLP-A381 Provision a Firewall Tunnel](#)" task.
8. As needed, complete the "[DLP-A367 Create a Provisionable Patchcord](#)" task.
9. If a BLSR span passes through third-party equipment that cannot transparently transport the K3 byte, complete the "[DLP-A89 Remap the K3 Byte](#)" task. This task is not necessary for most users.
10. Complete the [NTP-A126 Create a BLSR](#).

Stop. You have completed this procedure.

NTP-A126 Create a BLSR

Purpose	This procedure creates a BLSR at each BLSR-provisioned node.
Tools/Equipment	None
Prerequisite Procedures	NTP-A40 Provision BLSR Nodes
Required/As Needed	As needed; required to complete BLSR provisioning
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

1. Complete the "[DLP-A60 Log into CTC](#)" task at a node on the network where you will create the BLSR.
2. Complete one of the following tasks:
 - ◆ [DLP-A328 Create a Two-Fiber BLSR Using the BLSR Wizard](#) - Use this task to create a two-fiber BLSR using the CTC BLSR wizard. The BLSR wizard checks to see that each node is ready for BLSR provisioning, then provisions all the nodes at once. Using the BLSR wizard is recommended.
 - ◆ [DLP-A362 Create a Four-Fiber BLSR Using the BLSR Wizard](#)-Use this task to create a four-fiber BLSR using the CTC BLSR wizard. The BLSR wizard checks to see that each node is ready for BLSR provisioning, then provisions all the nodes at once. Using the BLSR wizard is recommended.
 - ◆ [DLP-A329 Create a Two-Fiber BLSR Manually](#)- Use this task to provision a two-fiber BLSR manually at each node that will be in the BLSR.
 - ◆ [DLP-A363 Create a Four-Fiber BLSR Manually](#)-Use this task to provision a four-fiber BLSR manually at each node that will be in the BLSR.
3. Complete the [NTP-A175 Two-Fiber BLSR Acceptance Test](#) or the [NTP-A176 Four-Fiber BLSR Acceptance Test](#).

Stop. You have completed this procedure.

NTP-A175 Two-Fiber BLSR Acceptance Test

Purpose	This procedure tests a two-fiber BLSR.
Tools/Equipment	Test set and cables appropriate for the test circuit
Prerequisite Procedures	<u>NTP-A40 Provision BLSR Nodes</u> <u>NTP-A126 Create a BLSR</u>
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 OC-N trunk (span) card of Node 1.

1. Complete the "DLP-A60 Log into CTC" task at one of the ONS 15454s on the BLSR 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-A227 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 Troubleshooting Guide* if necessary.
 3. Complete the "DLP-A532 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 Troubleshooting Guide* if necessary.
 2. Complete the "DLP-A532 Export CTC Data" task to export the conditions information.
5. On the network view, double-click Node 1.
6. Complete the "DLP-A217 BLSR Exercise Ring Test" task.
7. Create a test circuit from Node 1 to the node connected to the east OC-N trunk (span) card of Node 1. (This node will be called Node 2.)
 - ◆ For DS-1 circuits, complete the NTP-A181 Create an Automatically Routed DS-1 Circuit. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For DS-3 circuits, complete the NTP-A184 Create an Automatically Routed DS-3 or EC-1 Circuit. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For OC-N circuits, complete the NTP-A343 Create an Automatically Routed Optical Circuit. When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
8. Configure the test set for the test circuit type you created:
 - ◆ DS-1-If you are testing a DS-1 that is not multiplexed, you must have a DSX-1 panel or a direct DS-1 interface into the ONS 15454. Set the test set for DS-1. For information about configuring your test set, consult your test set user guide.
 - ◆ DS-3-If you are testing a clear channel DS-3, you must have a DSX-3 panel or a direct DS-3 interface into the ONS 15454. Set the test set for clear channel DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ DS3XM-If you are testing a DS-1 circuit on a DS3XM-6 or DS3XM-12 card you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for a multiplexed

DS-3, then choose the DS-1 to test on the multiplexed DS-3. For information about configuring your test set, consult your test set user guide.

- ◆ OC-N-If you are testing an OC-N circuit, set the test set for the applicable circuit size. 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 Tx connector to the test set 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. To do so, attach one end of a patch cable to the destination port's Tx connector; attach the other end to the port's Rx connector.
- 11. At the circuit source card:
 1. Connect the Tx connector of the test set to the circuit Rx connector.
 2. Connect the test set Rx connector to the circuit Tx connector.
- 12. Verify that the test set shows a clean signal. If a clean signal does not appear, repeat Steps 7 through 11 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-A356 TCC2/TCC2P Card Active/Standby Switch Test](#)" task.
- 15. Complete the "[DLP-A255 Cross-Connect Card Side Switch Test](#)" task.

Although a service interruption under 60 ms might 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-A91 BLSR 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-A333 Delete Circuits](#)" task for the test circuit.
- 19. Repeating Steps 5 through 18 for Nodes 2 and higher, work your way around the BLSR, testing each node and span in the ring. Create 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 VT Tunnels](#).

Stop. You have completed this procedure.

NTP-A176 Four-Fiber BLSR Acceptance Test

Purpose	This procedure tests a four-fiber BLSR.
Tools/Equipment	Test set and cables appropriate to the test circuit you will create
Prerequisite Procedures	NTP-A40 Provision BLSR Nodes NTP-A126 Create a BLSR
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Caution! This procedure might be service affecting if performed on a node carrying traffic.

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

1. Complete the "[DLP-A60 Log into CTC](#)" task on the BLSR 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-A227 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 Troubleshooting Guide* if necessary.
 3. Complete the "[DLP-A532 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 Troubleshooting Guide* if necessary.
 2. Complete the "[DLP-A532 Export CTC Data](#)" task to export the conditions information.
5. On the network map, double-click Node 1.
6. Complete the "[DLP-A92 Four-Fiber BLSR Exercise Span Test](#)" task.
7. Complete the "[DLP-A217 BLSR Exercise Ring Test](#)" task.
8. Create a test circuit between Node 1 and Node 2.
 - ◆ For DS-1 circuits, complete the [NTP-A181 Create an Automatically Routed DS-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For DS-3 circuits, complete the [NTP-A184 Create an Automatically Routed DS-3 or EC-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For OC-N circuits, complete the [NTP-A343 Create an Automatically Routed Optical Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
9. Configure the test set for the test circuit type you created:
 - ◆ DS-1-If you are testing a DS-1 that is not multiplexed, you must have a DSX-1 panel or a direct DS-1 interface into the ONS 15454. Set the test set for DS-1. For information about configuring your test set, consult your test set user guide.
 - ◆ DS-3-If you are testing a clear channel DS-3, you must have a DSX-3 panel or a direct DS-3 interface into the ONS 15454. Set the test set for clear channel DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ DS3XM-If you are testing a DS-1 circuit on a DS3XM-6 or DS3XM-12 card you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for a multiplexed DS-3, then choose the DS-1 to test on the multiplexed DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ OC-N-If you are testing an OC-N circuit, set the test set for the applicable circuit size. 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 Tx connector and the other end of the cable to the test set 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 Tx connector; attach the other end to the port's Rx connector.
12. At the circuit source card:
 1. Connect the Tx connector of the test set to the circuit Rx connector.
 2. Connect the test set Rx connector to the circuit 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. Complete the "[DLP-A356 TCC2/TCC2P Card Active/Standby Switch Test](#)" task.

16. Complete the "[DLP-A255 Cross-Connect Card Side Switch Test](#)" task.
17. Complete the "[DLP-A91 BLSR Switch Test](#)" task to test the BLSR protection switching at Node 1.
18. Complete the "[DLP-A93 Four-Fiber BLSR 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-A333 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 OC-N trunk (span) card of Node 2, which is Node 3. Work your way around the BLSR 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-A227 Disable Alarm Filtering](#)" task as necessary.
 2. Verify that no unexplained alarms appear. If unexplained alarms appear, resolve them before continuing. Refer to the Cisco ONS 15454 Troubleshooting Guide if necessary.
 3. Complete the "[DLP-A532 Export CTC Data](#)" task to export the alarm information.
24. Click the **Conditions** tab.
 1. Verify that no unexplained conditions appear. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* if necessary.
 2. Complete the "[DLP-A532 Export CTC Data](#)" task to export the 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 VT Tunnels](#).

Stop. You have completed this procedure.

NTP-A178 Provision a Traditional BLSR Dual-Ring Interconnect

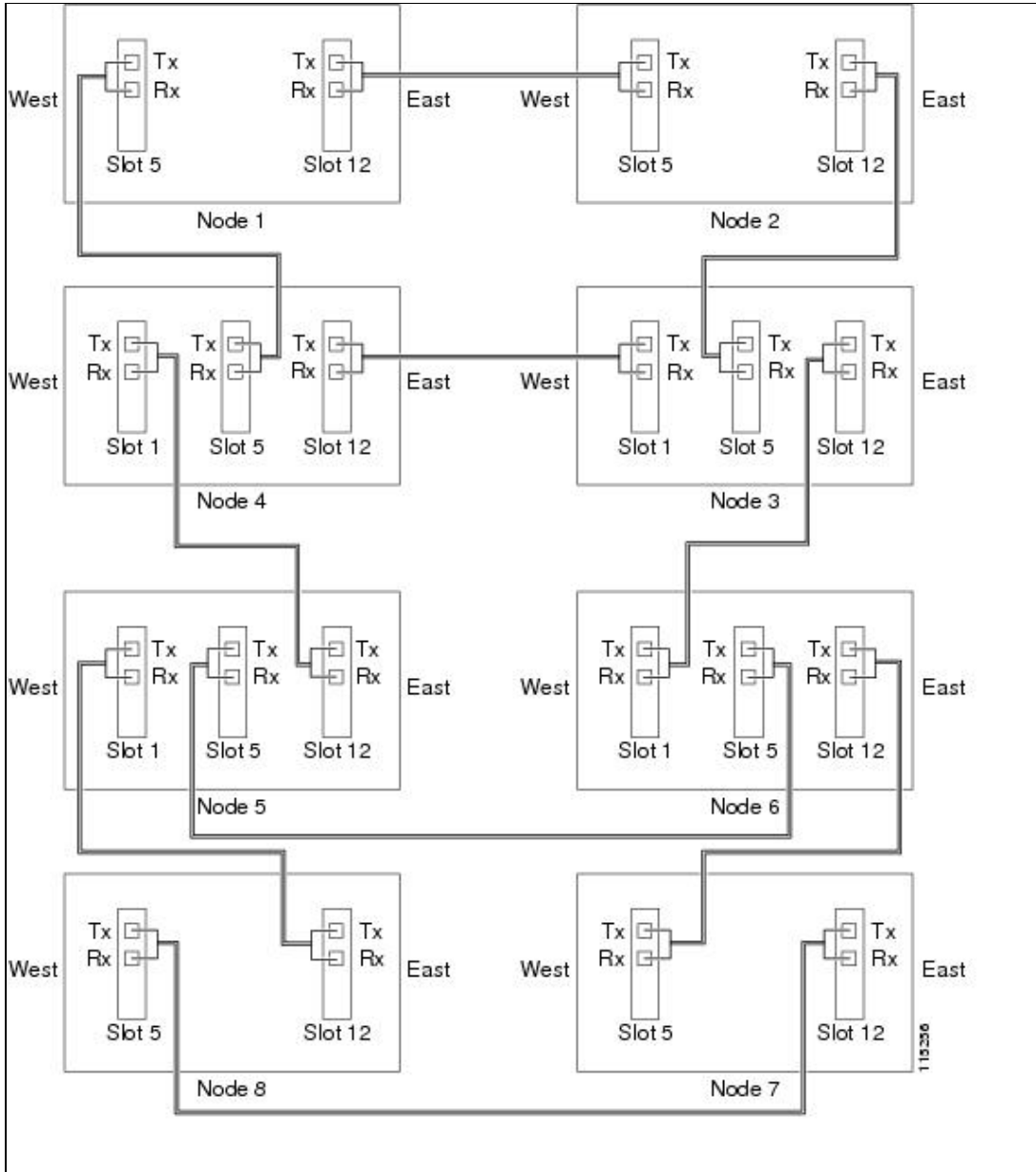
Purpose	This procedure provisions BLSRs in a traditional dual-ring interconnect (DRI) topology. DRIs interconnect two or more BLSRs to provide an additional level of protection. Two-fiber and four-fiber BLSRs can be mixed in a traditional BLSR DRI network.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
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.

1. Complete the "[DLP-A60 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 BLSRs that you will interconnect in a BLSR DRI. If the BLSRs are created, go to Step 3.
 1. Complete the [NTP-A40 Provision BLSR Nodes](#) to provision the BLSRs.
 2. Complete the [NTP-A126 Create a BLSR](#) to create the BLSRs.
 3. Complete the [NTP-A175 Two-Fiber BLSR Acceptance Test](#) to test two-fiber BLSRs.
 4. Complete the [NTP-A176 Four-Fiber BLSR Acceptance Test](#) to test four-fiber BLSRs.

3. Verify that the BLSR DRI interconnect nodes have OC-N cards installed and have fiber connections to the other interconnect nodes:
 - ◆ The OC-N cards that will connect the BLSRs 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 BLSR DRI.

Figure 5-4: Traditional Two-Fiber BLSR DRI Fiber Connection Example



Stop. You have completed this procedure.

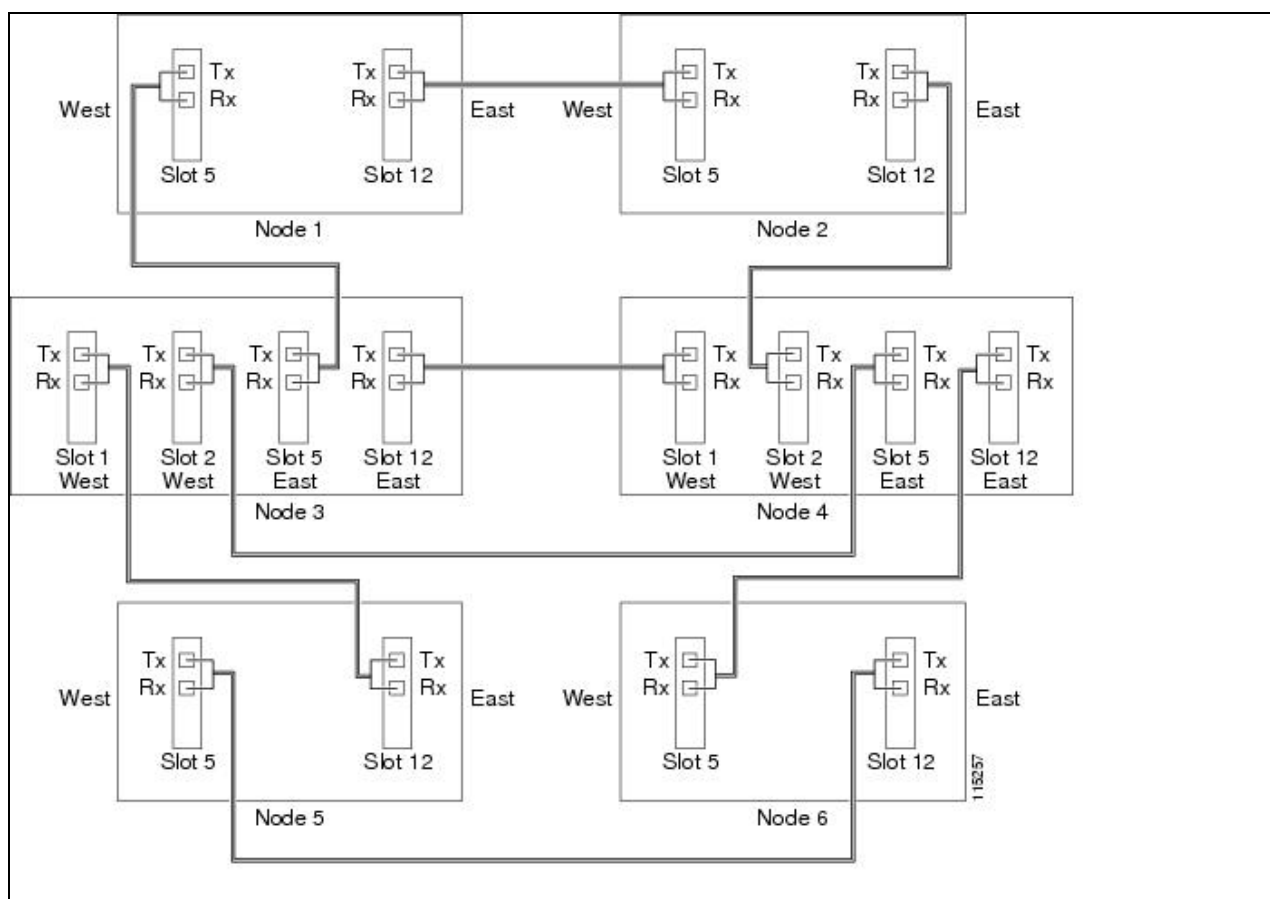
NTP-A179 Provision an Integrated BLSR Dual-Ring Interconnect

Purpose	This procedure provisions BLSRs in an integrated DRI topology.
Tools/Equipment	None
Prerequisite Procedures	<u>NTP-A35 Verify Node Turn-Up</u>

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

1. Complete the "[DLP-A60 Log into CTC](#)" task at a node in the BLSR DRI network. If you are already logged in, continue with Step 2.
2. Complete the following steps if you have not provisioned the BLSRs that you will interconnect in a BLSR DRI. If the BLSRs are created, go to Step 3.
 1. Complete the [NTP-A40 Provision BLSR Nodes](#) to provision the BLSRs.
 2. Complete the [NTP-A126 Create a BLSR](#) to create the BLSRs.
 3. Complete the [NTP-A175 Two-Fiber BLSR Acceptance Test](#) to test two-fiber BLSRs.
 4. Complete the [NTP-A176 Four-Fiber BLSR Acceptance Test](#) to test four-fiber BLSRs.
3. Verify that the BLSR DRI node has OC-N cards installed and has fiber connections to the other interconnect node:
 - ◆ The OC-N cards that will connect the BLSRs 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 BLSR DRI configuration.

Figure 5-5: Integrated Two-Fiber BLSR DRI Example



Stop. You have completed this procedure.

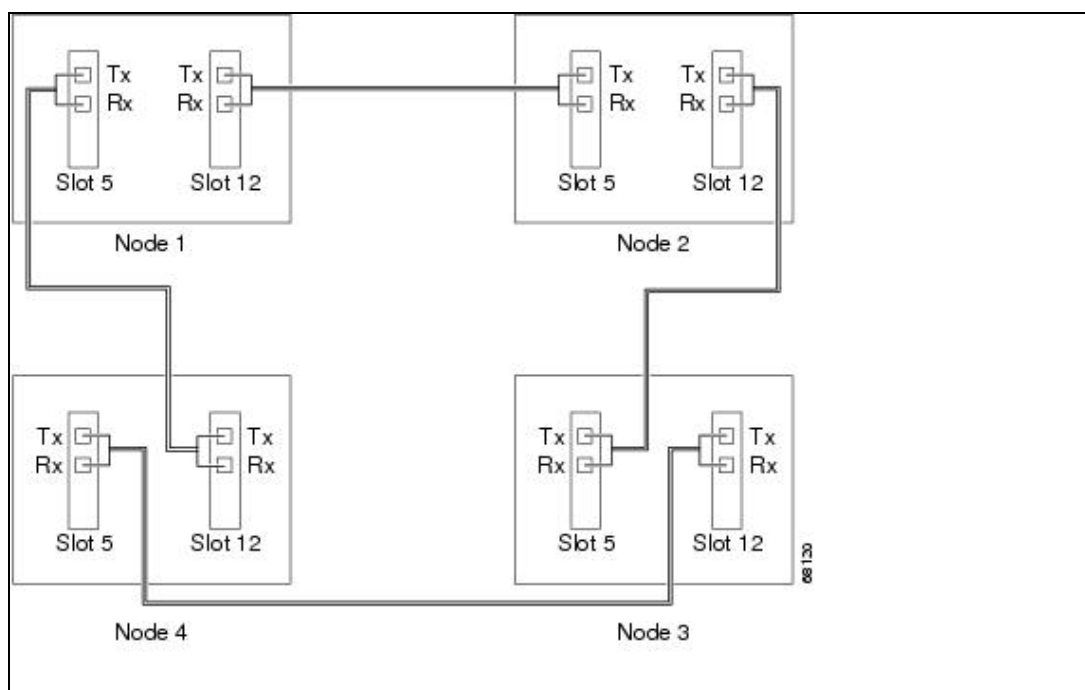
NTP-A44 Provision Path Protection Nodes

Purpose	This procedure provisions nodes for inclusion in a path protection configuration.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Note: Path protection is the default ONS 15454 topology. It is available as soon as you install the path protection OC-N cards, connect the OC-N fibers, and create the DCC terminations. Unlike the BLSRs, ONS 15454 path protection configurations do not require explicit setup.

1. Verify that the fiber is correctly connected to the path protection trunk (span) OC-N cards similar to [Figure 5-6](#). See the "[DLP-A43 Install Fiber-Optic Cables for Path Protection Configurations](#)" task.

Figure 5-6: Path Protection Fiber Connection Example



2. Log into an ONS 15454 in the path protection you are turning up. See the "[DLP-A60 Log into CTC](#)" task. If you are already logged in, continue with Step 3.
3. Complete the "[DLP-A377 Provision Section DCC Terminations](#)" task for the two cards/ports that will serve as the path protection ports on the node, for example, Slot 5 (OC-48)/Node 1 and Slot 12 (OC-48)/Node 1. (Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-A378 Provision Line DCC Terminations](#)" task.)

Note: If an ONS 15454 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 OC-N ports.

4. Repeat Steps 2 and 3 for each node in the path protection.
5. As needed, complete the "[DLP-A380 Provision a Proxy Tunnel](#)" task.
6. As needed, complete the "[DLP-A381 Provision a Firewall Tunnel](#)" task.

7. As needed, complete the ["DLP-A367 Create a Provisionable Patchcord"](#) task.
8. Complete the [NTP-A177 Path Protection Acceptance Test](#).

Stop. You have completed this procedure.

NTP-A177 Path Protection Acceptance Test

Purpose	This procedure tests a path protection configuration.
Tools/Equipment	Test set and cables appropriate to the test circuit you will create.
Prerequisite Procedures	NTP-A44 Provision Path Protection Nodes
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Caution! This procedure might be service affecting if performed on a node carrying traffic.

1. Complete the ["DLP-A60 Log into CTC"](#) task at one of the ONS 15454s on the path protection configuration 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-A227 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 Troubleshooting Guide* if necessary.
 3. Complete the ["DLP-A532 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 Troubleshooting Guide* if necessary.
 2. Complete the ["DLP-A532 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 next adjacent path protection node.
 - ◆ For DS-1 circuits, complete the [NTP-A181 Create an Automatically Routed DS-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For DS-3 circuits, complete the [NTP-A184 Create an Automatically Routed DS-3 or EC-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For OC-N circuits, complete the [NTP-A343 Create an Automatically Routed Optical Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
7. Configure the test set for the test circuit type you created:
 - ◆ DS-1-If you are testing a DS-1 that is not multiplexed, you must have a DSX-1 panel or a direct DS-1 interface into the ONS 15454. Set the test set for DS-1. For information about configuring your test set, consult your test set user guide.
 - ◆ DS-3-If you are testing a clear channel DS-3, you must have a DSX-3 panel or a direct DS-3 interface into the ONS 15454. Set the test set for clear channel DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ DS3XM-If you are testing a DS-1 circuit on a DS3XM-6 or a DS3XM-12 card you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for a multiplexed DS-3, then choose the DS-1 to test on the multiplexed DS-3. For information about configuring your test set, consult your test set user guide.

- ◆ OC-N-If you are testing an OC-N circuit, set the test set for the applicable circuit size. 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 Tx connector and the other end to the test set 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 Tx connector.
 2. Attach the other end to the port's Rx connector.
- 10. At the circuit source card:
 1. Connect the Tx connector of the test set to the circuit Rx connector.
 2. Connect the test set Rx connector to the circuit Tx connector.
- 11. Verify that the test set has 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. To verify that you have a complete end-to-end circuit, verify that the errors appear at the test set.
- 13. Complete the "[DLP-A356 TCC2/TCC2P Card Active/Standby Switch Test](#)" task.
- 14. Complete the "[DLP-A255 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-A94 Path Protection Configuration Protection Switching Test](#)" task to test the path 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-A333 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-A227 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 Troubleshooting Guide* if necessary.
 3. Complete the "[DLP-A532 Export CTC Data](#)" task to export the 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 Troubleshooting Guide* if necessary.
 2. Complete the "[DLP-A532 Export CTC Data](#)" task to export the conditions information.
- 24. Repeat Steps 5 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 VT Tunnels](#).

Stop. You have completed this procedure.

NTP-A216 Provision a Traditional Path Protection Dual-Ring Interconnect

Purpose	This procedure provisions path protection configurations in a traditional DRI topology. DRIs interconnect two or more path protection configurations to provide an
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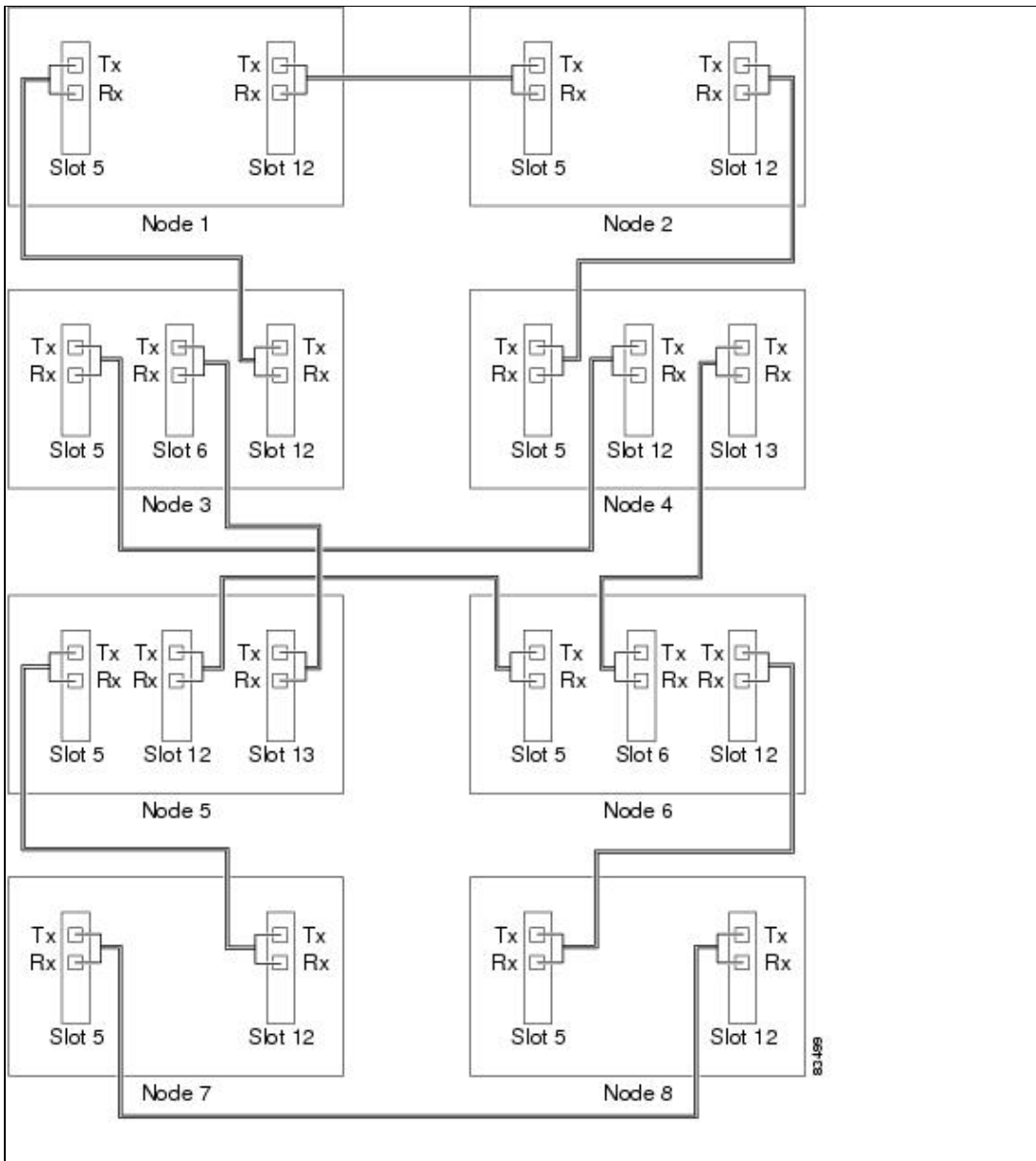
	additional level of protection.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

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

1. Complete the "[DLP-A60 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 path protection configurations that you will interconnect in a path protection DRI. If the path protection configurations are created, go to Step 3.
 1. Complete the [NTP-A44 Provision Path Protection Nodes](#) to provision the path protection configurations.
 2. Complete the [NTP-A177 Path Protection Acceptance Test](#) to test the path protection configurations.

Note: All path protection configurations that will be interconnected must have the same OC-N rate.
3. Verify that the path protection DRI interconnect nodes have OC-N cards installed and have fiber connections to the other interconnect node:
 - ◆ The OC-N cards that will connect the path protection must be installed at the interconnect nodes. The OC-N cards in the path protection 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 a path protection DRI with two rings, Nodes 1 through 4 and 5 through 8. In the example, an additional OC-N is installed in Slot 13 at Node 4 and connected to an OC-N in Slot 6 at Node 6. Nodes 3 and 5 are interconnected with OC-N cards in Slot 6 (Node 3) and Slot 13 (Node 5).

Figure 5-7: Traditional Path Protection DRI Fiber Connection Example



Stop. You have completed this procedure.

NTP-A217 Provision an Integrated Path Protection Dual-Ring Interconnect

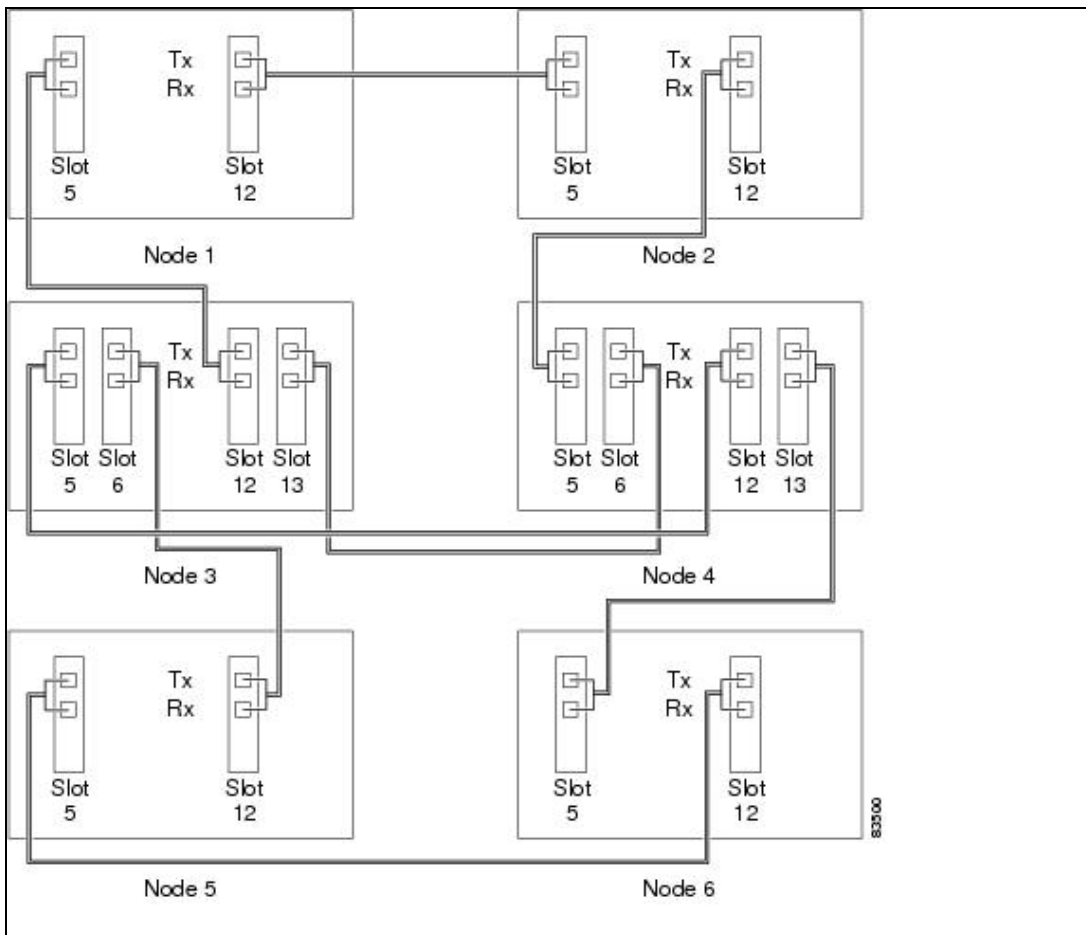
Purpose	This procedure provisions path protection configurations in an integrated DRI topology. In the integrated DRI, the path protection OC-N trunk cards for both path protection configurations are installed on the same shelf.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Figure 5-7: Traditional Path Protection DRI Fiber Connection Example

1. Complete the "[DLP-A60 Log into CTC](#)" task at a node in the path protection DRI network. If you are already logged in, continue with Step 2.
2. Complete the following steps if you have not provisioned the path protection configurations that you will interconnect in a path protection DRI. If the path protection configurations are created, continue with Step 3.
 1. Complete the [NTP-A44 Provision Path Protection Nodes](#) to provision the path protection configurations.
 2. Complete the [NTP-A177 Path Protection Acceptance Test](#) to test the path protection configurations.

Note: All path protection configurations that will be interconnected must have the same OC-N rate.
3. Verify that the path protection DRI interconnect nodes have OC-N cards installed and have fiber connections to the other interconnect node:
 - ◆ The OC-N cards that will connect the path protection configurations must be installed at the interconnect nodes. The OC-N cards in the path protection 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 a path protection DRI with two rings.

Figure 5-8: Integrated Path Protection DRI Example



Stop. You have completed this procedure.

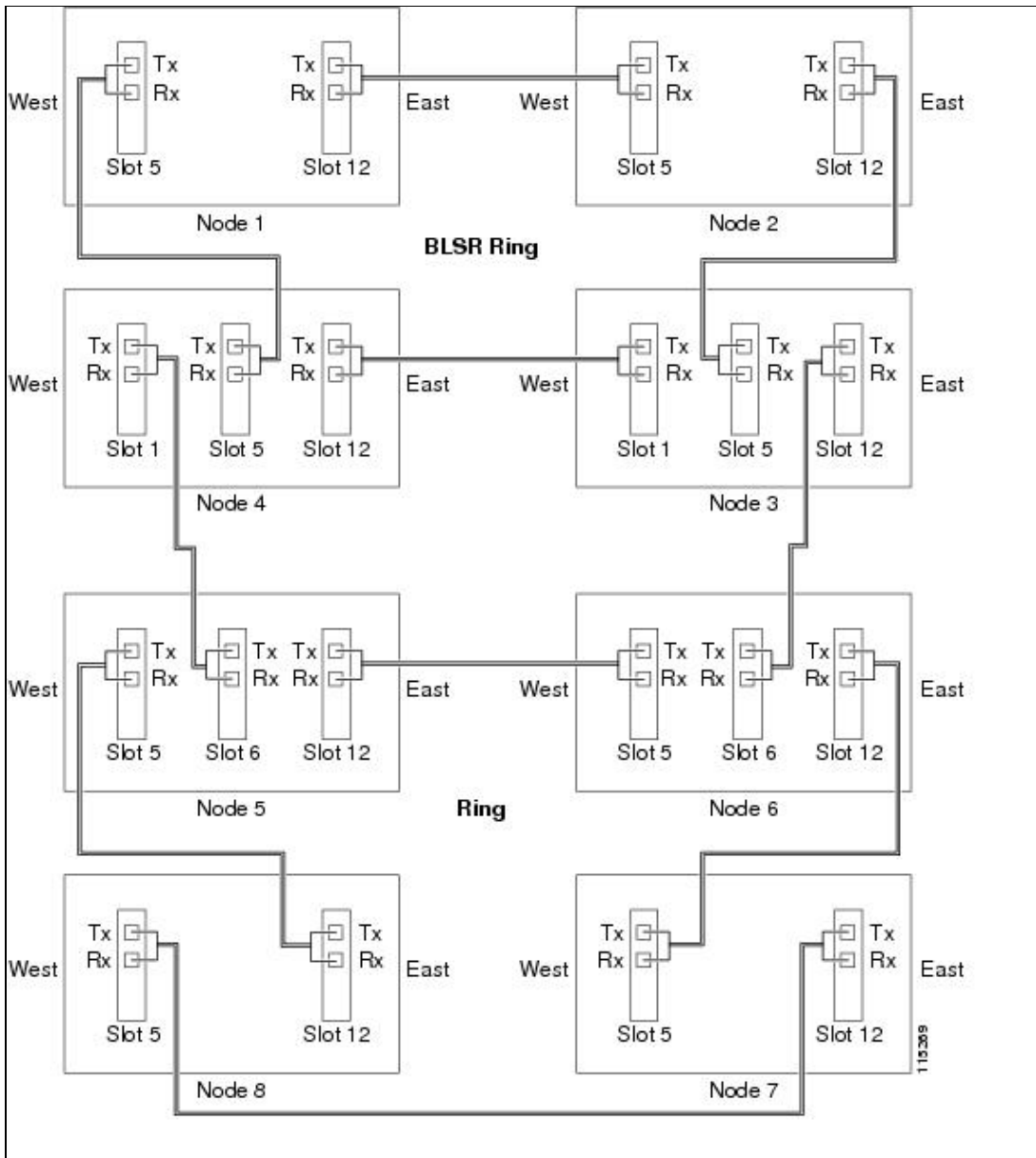
NTP-A180 Provision a Traditional BLSR/Path Protection Dual-Ring Interconnect

Purpose	This procedure provisions a BLSR and a path protection in a traditional DRI topology. DRIs interconnect ring topologies to provide an additional level of protection.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
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.

1. Complete the "[DLP-A60 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 BLSR and path protection that you will interconnect in a traditional DRI. If the BLSR and path protection are created, go to Step 3.
 1. To provision and test the BLSR, complete the following procedures:
 - ◇ [NTP-A40 Provision BLSR Nodes](#)
 - ◇ [NTP-A126 Create a BLSR](#)
 - ◇ [NTP-A175 Two-Fiber BLSR Acceptance Test](#)
 - ◇ [NTP-A176 Four-Fiber BLSR Acceptance Test](#)
 2. To provision and test the path protection, complete the following procedures:
 - ◇ [NTP-A44 Provision Path Protection Nodes](#)
 - ◇ [NTP-A177 Path Protection Acceptance Test](#)
3. Verify that the DRI interconnect nodes have OC-N cards installed and have fiber connections to the other interconnect node:
 - ◆ The OC-N cards that will connect the BLSR and path protection must be installed at the interconnect nodes. The OC-N cards in the path protection 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 BLSR to Path Protection DRI Fiber Connection Example



Stop. You have completed this procedure.

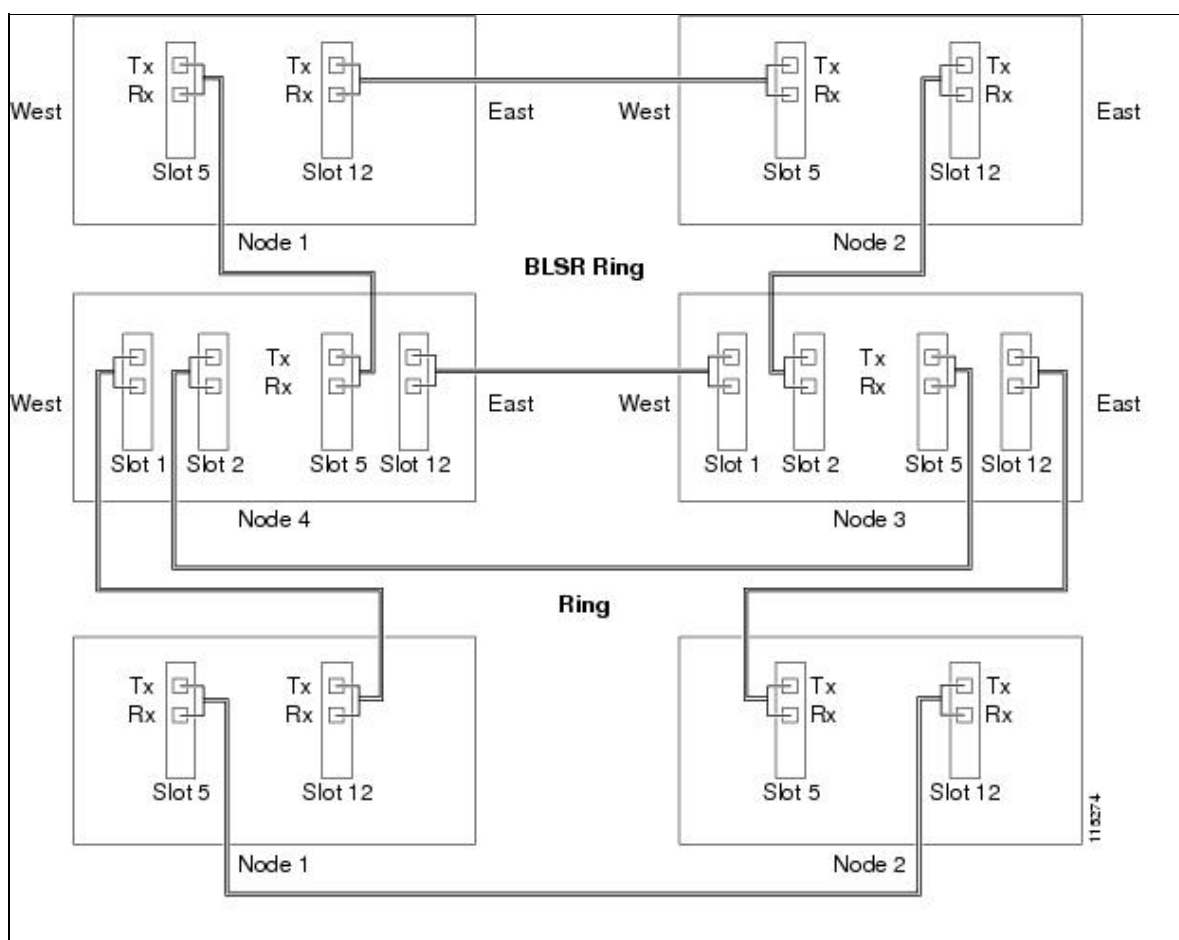
NTP-A209 Provision an Integrated BLSR/Path Protection Dual-Ring Interconnect

Purpose	This procedure provisions a BLSR and a path protection in an integrated DRI topology.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Figure 5-9: Traditional BLSR to Path Protection DRI Fiber Connection Example

1. Complete the "[DLP-A60 Log into CTC](#)" task at a node in the BLSR and path protection DRI network. If you are already logged in, continue with Step 2.
2. Complete the following steps if you have not provisioned the BLSR and path protection that you will interconnect in an integrated DRI. If the BLSR and path protection are created, continue with Step 3.
 1. To provision and test the BLSR, complete the following procedures:
 - ◇ [NTP-A40 Provision BLSR Nodes](#)
 - ◇ [NTP-A126 Create a BLSR](#)
 - ◇ [NTP-A175 Two-Fiber BLSR Acceptance Test](#)
 - ◇ [NTP-A176 Four-Fiber BLSR Acceptance Test](#)
 2. To provision and test the path protection, complete the following procedures:
 - ◇ [NTP-A44 Provision Path Protection Nodes](#)
 - ◇ [NTP-A177 Path Protection Acceptance Test](#)
3. Verify that the BLSR and path protection DRI interconnect nodes have OC-N cards installed and have fiber connections to the other interconnect node:
 - ◆ The OC-N cards that will connect the BLSR and path protection must be installed at the interconnect nodes. The OC-N cards in the path protection 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 BLSR to Path Protection DRI Example



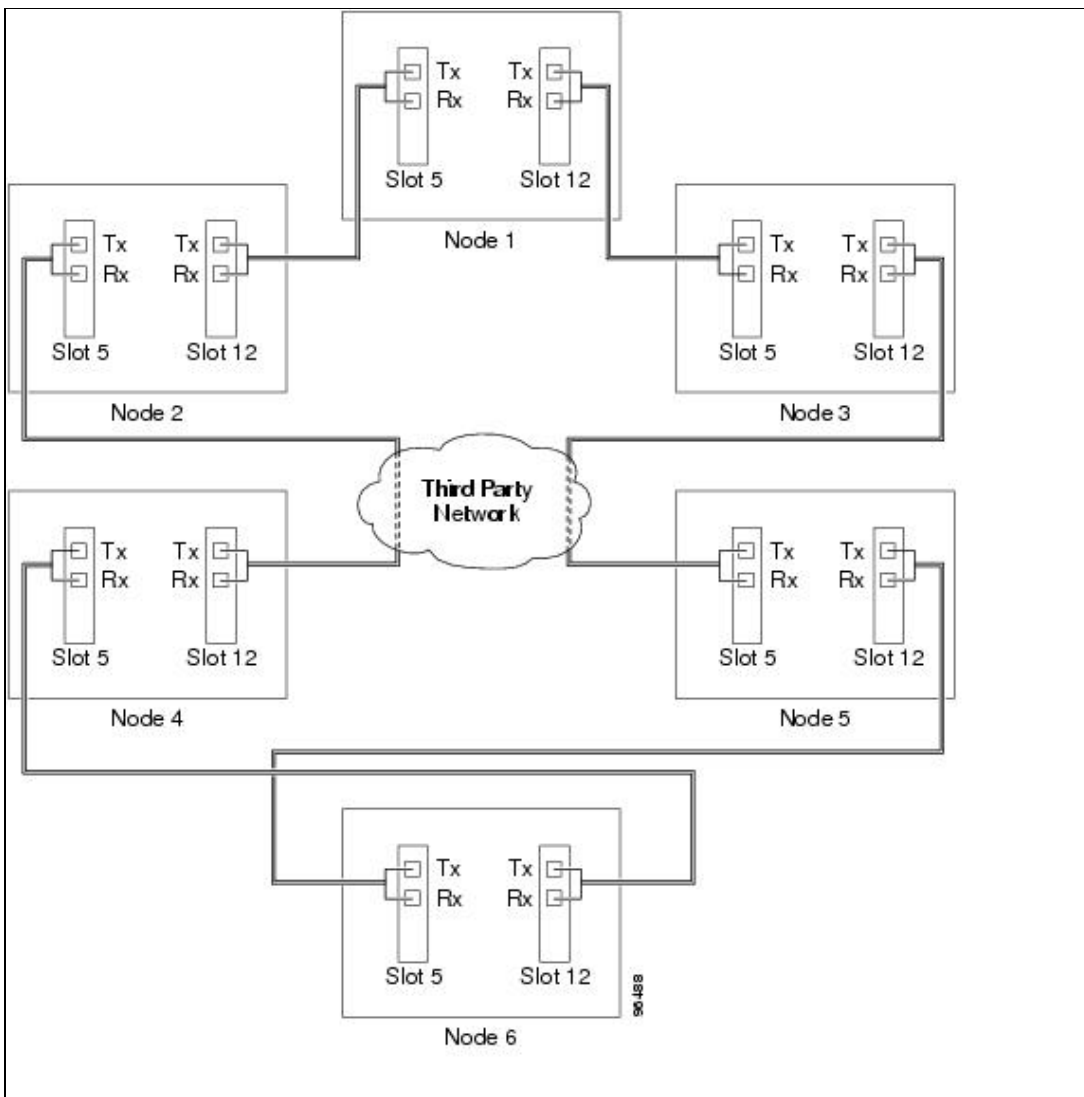
Stop. You have completed this procedure.

NTP-A224 Provision an Open-Ended Path Protection Configuration

Purpose	This procedure provisions ONS 15454 nodes in an open-ended path protection connected to a third-party vendor network. This topology allows you to route a circuit from one ONS 15454 network to another ONS 15454 network through the third-party network.
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn-Up
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

1. Verify that the fiber is correctly connected to the path protection trunk (span) OC-N cards at each open-ended path protection node. [Figure 5-11](#) shows an example. Node 1 is connected to ONS 15454 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 Open-Ended Path Protection Configurations Fiber Connection Example



2. Verify that the third-party cards to which the ONS 15454 trunk cards are connected are the same OC-N rate as the ONS 15454 trunk cards. The third-party time slots must match the ONS 15454 card time slots to which they are connected. For example, if your trunk card is an OC-48, the third-party vendor card or unit must have STSs 1 to 48 available.
3. Log into an ONS 15454 in the path protection you are turning up. See the "[DLP-A60 Log into CTC](#)" task. If you are already logged in, continue with Step 4.
4. Complete the "[DLP-A377 Provision Section DCC Terminations](#)" task for the ONS 15454 cards/ports that are connected to another ONS 15454. (Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-A378 Provision Line DCC Terminations](#)" task.) Do not create DCC or LDCC terminations 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 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 OC-N ports.

5. Repeat Steps 3 and 4 for each node in the path protection.
6. As needed, complete the "[DLP-A380 Provision a Proxy Tunnel](#)" task.

Figure 5-11: ONS 15454 Open-Ended Path Protection Configurations Fiber Connection Example 27

7. As needed, complete the ["DLP-A381 Provision a Firewall Tunnel"](#) task.
8. Following the documentation provided by the third-party vendor, provision the optical loop leading from the ONS 15454 connection at one end to the ONS 15454 connection at the other end. In other words, you will create an open-ended path protection using procedures for the third-party equipment.
9. Complete the [NTP-A225 Open-Ended Path Protection Acceptance Test](#).

Stop. You have completed this procedure.

NTP-A225 Open-Ended Path Protection Acceptance Test

Purpose	This procedure tests an open-ended path protection configuration.
Tools/Equipment	Test set and cables appropriate to the test circuit you will create.
Prerequisite Procedures	NTP-A224 Provision an Open-Ended Path Protection Configuration
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Caution! This procedure might be service affecting if performed on a node carrying traffic.

1. Complete the ["DLP-A60 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-A227 Disable Alarm Filtering"](#) task on page 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 Troubleshooting Guide* if necessary.
 3. Complete the ["DLP-A532 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 Troubleshooting Guide* if necessary.
 2. Complete the ["DLP-A532 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 OC-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 OC-N card at Node 2, and a secondary circuit destination is created on the Slot 12 OC-N card at Node 3. For circuit creation procedures, complete one of the following:
 - ◆ For DS-1 circuits, complete the [NTP-A181 Create an Automatically Routed DS-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For DS-3 circuits, complete the [NTP-A184 Create an Automatically Routed DS-3 or EC-1 Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
 - ◆ For OC-N circuits, complete the [NTP-A343 Create an Automatically Routed Optical Circuit](#). When you set the circuit state, choose **IS** and check the **Apply to drop ports** check box.
7. Create a circuit within the third-party network from ONS 15454 connection ports to the second set of ONS 15454 connection ports on both path protection 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:
 - ◆ DS-1-If you are testing a DS-1 that is not multiplexed, you must have a DSX-1 panel or a direct DS-1 interface into the ONS 15454. Set the test set for DS-1. For information about configuring your test set, consult your test set user guide.
 - ◆ DS-3-If you are testing a clear channel DS-3, you must have a DSX-3 panel or a direct DS-3 interface into the ONS 15454. Set the test set for clear channel DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ DS3XM-If you are testing a DS-1 circuit on a DS3XM-6 or DS3XM-12 card you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for a multiplexed DS-3, then choose the DS-1 to test on the multiplexed DS-3. For information about configuring your test set, consult your test set user guide.
 - ◆ OC-N-If you are testing an OC-N circuit, set the test set for the applicable circuit size. 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 Tx connector and the other end to the test set 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 Tx connector.
 2. Attach the other end to the port's Rx connector.
12. At the circuit source card:
 1. Connect the Tx connector of the test set to the circuit Rx connector.
 2. Connect the test set Rx connector to the circuit 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 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-A356 TCC2/TCC2P Card Active/Standby Switch Test](#)" task.
16. Complete the "[DLP-A255 Cross-Connect Card Side Switch Test](#)" task.

Although a service interruption under 60 ms might 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.
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-A94 Path Protection Configuration Protection Switching Test](#)" task to test the path 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-A333 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-A227 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 Troubleshooting Guide* if necessary.
 3. Complete the "[DLP-A532 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 Troubleshooting Guide* if necessary.
 2. Complete the "[DLP-A532 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 VT Tunnels](#).

Stop. You have completed this procedure.

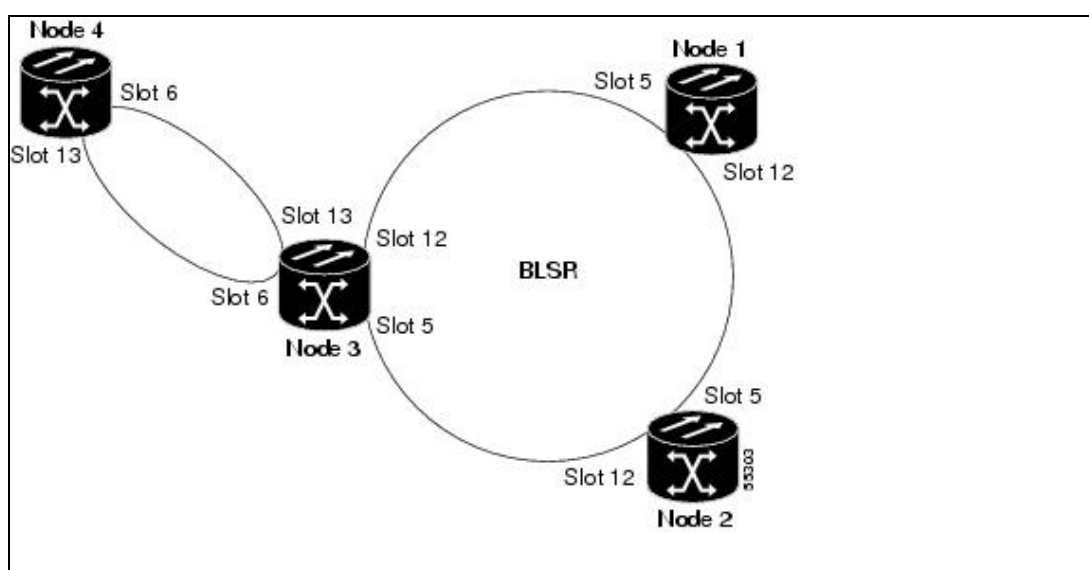
NTP-A46 Subtend a Path Protection Configuration from a BLSR

Purpose	This procedure subtends a path protection configuration from an existing BLSR.
Tools/Equipment	One BLSR node must have OC-N cards and fibers to carry the path protection.
Prerequisite Procedures	NTP-A175 Two-Fiber BLSR Acceptance Test or NTP-A176 Four-Fiber BLSR Acceptance Test
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Note: Path protection is the default ONS 15454 topology. It is available as soon as you install the path protection OC-N cards, connect the OC-N fibers, and create the DCC terminations. Unlike the BLSRs, ONS 15454 path protection configurations do not require explicit setup.

1. In the node that will subtend the path protection configuration (Node 3 in [Figure 5-12](#)), install the two OC-N cards that will serve as the path protection trunk (span) cards (Node 3, Slots 6 and 13). See the [NTP-A16 Install Optical Cards and Connectors](#). If they are already installed, continue with Step 2.
2. Attach fibers from these cards to the path protection trunk cards on the neighbor path protection 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.

Figure 5-12: Path Protection Subtended from a BLSR



3. Complete the "[DLP-A60 Log into CTC](#)" task at the ONS 15454 that will subtend the path protection

- configuration (Node 3 in the example).
4. Complete the "[DLP-A377 Provision Section DCC Terminations](#)" task for each OC-N card that will carry the path protection configuration. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-A378 Provision Line DCC Terminations](#)" task.
 5. Log into a path protection node that connects to the node in Step 3. (In [Figure 5-12](#), Node 4 is the only other node in the path protection configuration.)
 6. Complete the "[DLP-A377 Provision Section DCC Terminations](#)" task for each OC-N card that will carry the path protection configuration. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-A378 Provision Line DCC Terminations](#)" task.
 7. Repeat Step 6 for each node in the path protection configuration.
 8. As needed, complete the "[DLP-A380 Provision a Proxy Tunnel](#)" task.
 9. As needed, complete the "[DLP-A381 Provision a Firewall Tunnel](#)" task.
 10. From the View menu, choose **Go To Network View** to view the subtending rings.
 11. Complete the [NTP-A177 Path Protection Acceptance Test](#).

Stop. You have completed this procedure.

NTP-A47 Subtend a BLSR from a Path Protection Configuration

Purpose	This procedure subtends a BLSR from an existing path protection configuration.
Tools/Equipment	One path protection node must have OC-N cards and fibers to carry the BLSR
Prerequisite Procedures	NTP-A177 Path Protection Acceptance Test
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

1. In the path protection node that will subtend the BLSR, install the two OC-N cards that will serve as the BLSR trunk (span) cards (in [Figure 5-12](#), Node 3, Slots 5 and 12). See the [NTP-A16 Install Optical Cards and Connectors](#).
2. Attach fibers from the cards in Step 1 to the BLSR trunk cards on another BLSR node or nodes. In [Figure 5-12](#), Slot 5/Node 3 connects to Slot 12/Node 2, and Slot 12/Node 3 connects to Slot 5/Node 1.
3. Log into the ONS 15454 that will subtend the BLSR (the node in Step 1). See the "[DLP-A60 Log into CTC](#)" task. If you are already logged in, continue with Step 4.
4. Create the DCCs on both OC-N trunk cards (east and west) that will carry the BLSR. See the "[DLP-A377 Provision Section DCC Terminations](#)" task. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-A378 Provision Line DCC Terminations](#)" task.
5. Create the subtending BLSR:
 1. Complete the [NTP-A40 Provision BLSR Nodes](#) for each node that will be in the BLSR. If you have already provisioned the BLSR, perform this procedure for the subtending node only.
 2. Complete the [NTP-A126 Create a BLSR](#). Include the node in Step 3 (the node that will subtend the BLSR) in the BLSR.
6. From the View menu, choose **Go to the Network View** to see the subtending ring.

Stop. You have completed this procedure.

NTP-A48 Subtend a BLSR from a BLSR

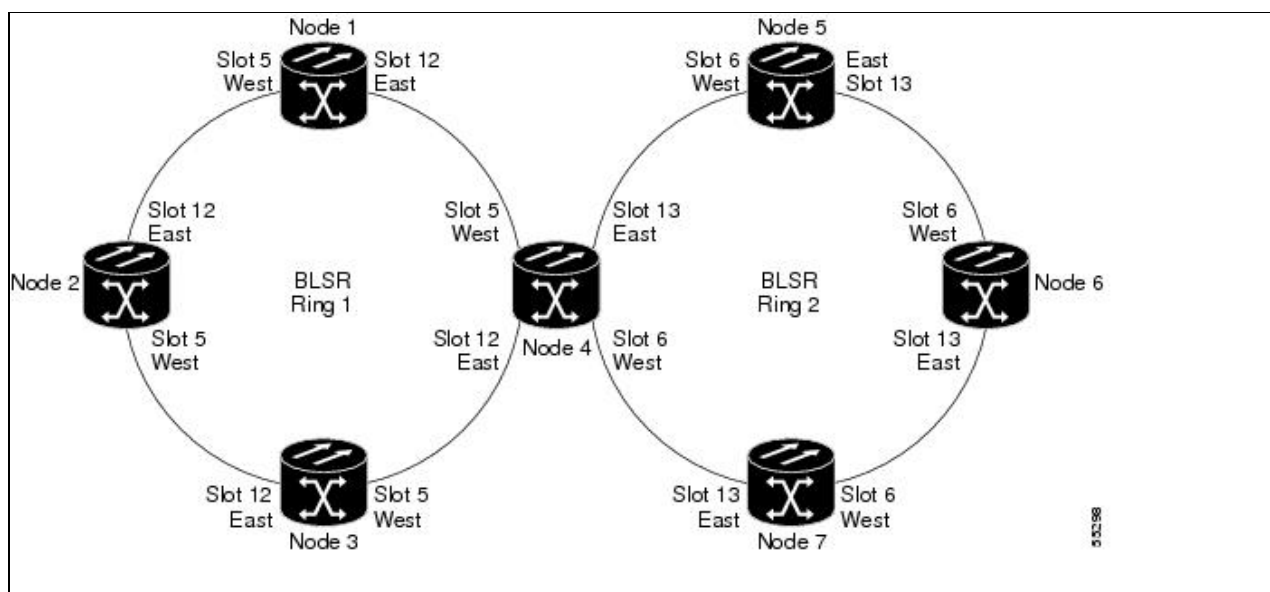
Purpose	This procedure subtends a BLSR from an existing BLSR.
Tools/Equipment	One BLSR node must have OC-N cards and fibers needed to carry the second BLSR.
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Note: This procedure assumes that all nodes are configured for the BLSR. If you need to add a node to a BLSR, see the [NTP-A350 Add a BLSR Node](#).

1. Complete the "[DLP-A60 Log into CTC](#)" task at the node that will subtend the BLSR (Node 4 in [Figure 5-13](#)). If you are already logged in, continue with Step 2.
2. Install the OC-N cards that will serve as the BLSR trunk (span) cards if they are not already installed. See the [NTP-A16 Install Optical Cards and Connectors](#).

[Figure 5-13](#) shows two BLSRs shared by one ONS 15454. 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 BLSR rings, 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: BLSR Subtended from a BLSR



3. Attach fibers from the trunk cards in the subtending node to the BLSR trunk cards on its two neighboring BLSR 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-A44 Install Fiber-Optic Cables for BLSR Configurations](#)" task.
4. Create the DCCs on the first OC-N card that will carry the BLSR. See the "[DLP-A377 Provision Section DCC Terminations](#)" task. Alternatively, if additional bandwidth is needed for CTC management, complete the "[DLP-A378 Provision Line DCC Terminations](#)" task.
5. Repeat Step 4 for the second OC-N trunk card that will carry the BLSR.
6. Complete the [NTP-A40 Provision BLSR Nodes](#) for each node that will be in the BLSR. If you have already provisioned the BLSR, perform this procedure for the subtending node only.

- If the subtending BLSR is not already created, complete the [NTP-A126 Create a BLSR](#) to provision the new BLSR. The subtending BLSR must have a ring name that differs from the ring name of the first BLSR.

Note: The subtending node can have one Node ID that is used in both BLSRs, or a different Node ID for each BLSR. For example, the same node can be Node 4 in BLSR 1 and Node 2 in BLSR 2.

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

[Figure 5-14](#) shows an example of two subtending BLSRs.

Figure 5-14: Subtended BLSRs on the Network Map



Stop. You have completed this procedure.

NTP-A172 Create a Logical Network Map

Purpose	This procedure positions nodes in the network view and 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

- Complete the ["DLP-A60 Log into CTC"](#) task on an ONS 15454 on the network where you want to create the network map. If you are already logged in, continue with Step 2.
- From the View menu, choose **Go to Network View**.
- Change the position of the nodes in the network view according to your site plan.
 - Click a node to select it, then press the **Ctrl** key while you drag and drop a node icon to a new location.
 - Deselect the previously selected node by clicking on any blank part of the network map area.
 - Repeat Substep 1 for each node you need to position.
- On the network view map, right-click and choose **Save Node Position**.
- Click **Yes** in the Save Node Position dialog box.

CTC displays 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.