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 convert from one SONET topology to another in a Cisco ONS 15454 network. For initial network turn up, see Turn Up a Network.

Contents

- 1 Before You Begin
- 2 NTP-A335 Convert a 1+1 Point-to-Point to a Linear ADM Automatically
  - 2.1 Figure 13-1: Selecting Protection Group Ports
  - 2.2 Figure 13-2: Refibering the Protect Path
- 3 NTP-A154 Convert a 1+1 Point-to-Point to a Linear ADM Manually
- 4 NTP-A303 Convert an Unprotected Point-to-Point or 1+1 Linear ADM to a Two-Fiber BLSR Automatically
- 5 NTP-A155 Convert a 1+1 Point-to-Point or a Linear ADM to a Two-Fiber BLSR Manually
  - 5.1 Figure 13-3: Linear ADM to BLSR Conversion
- 6 NTP-A342 Convert a Point-to-Point or Linear ADM to a Path Protection Configuration Automatically
- 7 NTP-A156 Convert a Point-to-Point or Linear ADM to a Path Protection Configuration Manually
- 8 NTP-A267 Convert a Path Protection Configuration to a Two-Fiber BLSR Automatically
- 9 NTP-A210 Convert a Path Protection Configuration to a Two-Fiber BLSR Manually
- 10 NTP-A211 Convert a Two-Fiber BLSR to a Four-Fiber BLSR Automatically
- 11 NTP-A159 Modify a BLSR

Before You Begin

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

1. NTP-A335 Convert a 1+1 Point-to-Point to a Linear ADM Automatically-Complete as needed.
2. NTP-A154 Convert a 1+1 Point-to-Point to a Linear ADM Manually-Complete as needed if the in-service topology upgrade wizard is not available or you need to back out of the wizard.
3. NTP-A303 Convert an Unprotected Point-to-Point or 1+1 Linear ADM to a Two-Fiber BLSR Automatically-Complete as needed.
4. NTP-A155 Convert a 1+1 Point-to-Point or a Linear ADM to a Two-Fiber BLSR Manually-Complete as needed if the in-service topology upgrade wizard is not available or you need to back out of the wizard.
5. NTP-A342 Convert a Point-to-Point or Linear ADM to a Path Protection Configuration Automatically-Complete as needed.
6. NTP-A156 Convert a Point-to-Point or Linear ADM to a Path Protection Configuration Manually-Complete as needed if the in-service topology upgrade wizard is not available or you need to back out of the wizard.
7. NTP-A267 Convert a Path Protection Configuration to a Two-Fiber BLSR Automatically-Complete as needed.
8. NTP-A210 Convert a Path Protection Configuration to a Two-Fiber BLSR Manually-Complete as needed if the in-service topology upgrade wizard is not available or you need to back out of the wizard.
9. NTP-A211 Convert a Two-Fiber BLSR to a Four-Fiber BLSR Automatically-Complete as needed.
10. NTP-A159 Modify a BLSR-Complete as needed to change the BLSR ring name, ring or span reversion times, or node ID.

NTP-A335 Convert a 1+1 Point-to-Point to a Linear ADM Automatically

Purpose	This procedure converts a 1+1 point-to-point (terminal) configuration (two nodes) to a 1+1 linear add-drop multiplexer (ADM) (3 nodes) without losing traffic.
Tools/Equipment	Compatible hardware Attenuators might be needed for some applications.
Prerequisite Procedures	This procedure requires that the node to be added is reachable (has IP connectivity with CTC). Two technicians who can communicate with each other during the upgrade might be needed if the PC running CTC and the ONS 15454 nodes are not at the same location.
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Note: OC-N transmit and receive levels should be in their acceptable range as shown in the specifications for each card in the Table 2-5.

Note: If overhead circuits exist on the network, this procedure is service affecting. The overhead circuits will drop traffic and have a status of PARTIAL after the upgrade is complete.

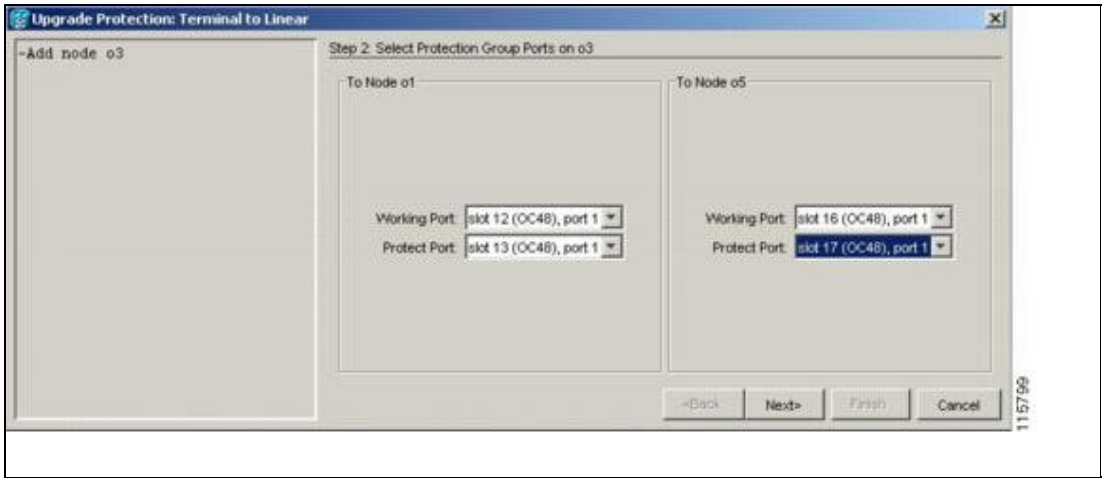
1. Complete the "DLP-A60 Log into CTC" task at one of the two point-to-point nodes. If you are already logged in, continue with Step 2.
2. In network view, right-click the span between the two nodes where you want to add the new node. A dialog box appears.
3. Select **Upgrade Protection**. A drop-down list appears.
4. Select **Terminal to Linear** and the first page of the Upgrade Protection: Terminal to Linear wizard appears.
5. The first page of the wizard lists the following conditions for adding a new node:

    - The terminal network has no critical or major alarms.
    - The node that you will add has no critical or major alarms.
    - The node has compatible software version with that of the terminal nodes.
    - The node has four unused optical ports matching the speed of the 1+1 protection and no communication channel has been provisioned on these four ports.
    - Fiber is available to connect the added node to the terminal nodes.

    If all of these conditions are met and you wish to continue with the procedure, click Next.
    Note: If you are attempting to add an unreachable node, you must first log in to the unreachable node using a separate CTC session and configure that node. Delete any existing protection groups as described in the "DLP-A155 Delete a Protection Group" task. Delete any existing DCC terminations as described in the "DLP-A156 Delete a Section DCC Termination" task and the "DLP-A359 Delete a Line DCC Termination" task.

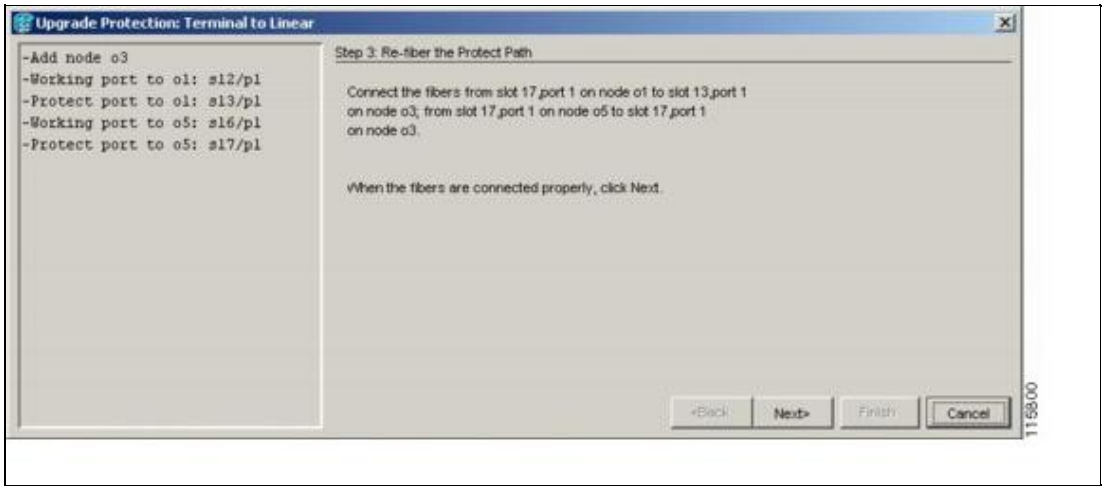
6. Enter the node host name or IP address or choose the name of the new node from the drop-down list. If you type in the name, make sure it is identical to the actual node name. The node name is case sensitive.
7. Click **Next**. The Select Protection Group Ports page (Figure 13-1) appears.

Figure 13-1: Selecting Protection Group Ports



8. Select the working and protect ports on the new node in the drop-down lists that you want to connect to each terminal node.
9. Click **Next**. The Re-fiber the Protected Path dialog box appears (Figure 13-2).

Figure 13-2: Refibering the Protect Path



10. Follow the instructions in the Re-fiber the Protected Path dialog box for connecting the fibers between the nodes.
11. When the fibers are connected properly, click **Next**. The Update Circuit(s) on *Node-Name* dialog box appears.

    Note: The Back button is not enabled in the wizard. You can click the Cancel button at this point and choose the Yes button if you want to cancel the Upgrade Protection procedure. If the procedure fails after you have physically moved the fiber-optic cables, you must restore the fiber-optic cables to the original positions and verify (through CTC) that traffic is on the working path of the nodes before restarting the process. To check traffic status, go to node view, click the **Maintenance > Protection** tabs. In the Protection Groups area, click the 1+1 protection group. You can see the status of the traffic in the Selected Group area.
12. Click Next on the Update Circuit(s) on *Node-Name* page to continue with the procedure.
13. The Force Traffic to Protect Path page states that it is about to force the traffic from the working to protect path for the terminal nodes. When you are ready to proceed, click Next.

14. Follow each step as instructed by the wizard as it guides you through the process of refibering the working path between nodes and forcing the traffic back to the working path.
15. The Force Traffic to Working Path page states that it is about to force the traffic from the protect to working path for the terminal nodes. When you are ready to proceed, click Next.
16. The Completed page appears. This page is the final one in the process. Click Finish.

Stop. You have completed this procedure.

NTP-A154 Convert a 1+1 Point-to-Point to a Linear ADM Manually

Purpose	This procedure upgrades a 1+1 point-to-point configuration (two nodes) to a linear ADM configuration (three or more nodes) manually, that is, without using the in-service topology upgrade wizard. Use this procedure if the wizard is unavailable or if you need to back out of the wizard.
Tools/Equipment	None
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 is service-affecting.

Note: Optical transmit and receive levels should be in their acceptable range as shown in the specifications section for each card in Table 2-5.

Note: In a point-to-point configuration, two OC-N cards are connected to two OC-N cards on a second node. The working OC-N ports have data communications channel (DCC) terminations, and the OC-N cards are in a 1+1 protection group.

1. Complete the "DLP-A60 Log into CTC" task at one of the two point-to-point nodes. If you are already logged in, continue with Step 2.
2. Complete the "DLP-A298 Check the Network for Alarms and Conditions" task.
3. Log into the node that will be added to the point-to-point configuration (the new node).
   Note: If you are attempting to add an unreachable node you must first log in to the unreachable node using a separate CTC session and configure that node. Delete any existing protection groups as described in the "DLP-A155 Delete a Protection Group" task. Delete any existing DCC terminations as described in the "DLP-A156 Delete a Section DCC Termination" task or the "DLP-A359 Delete a Line DCC Termination" task.
4. Complete the NTP-A323 Verify Card Installation to ensure that the new node has two OC-N cards with the same rate as the point-to-point nodes.
5. Complete the NTP-A35 Verify Node Turn-Up for the new node.
6. Physically connect the fibers between the point-to-point node and the new node. The fiber connections should be connected from working card to working card and protect card to protect card.
7. On the new node, create a 1+1 protection group for the OC-N cards in the point-to-point node that will connect to the point-to-point node. See the "DLP-A73 Create a 1+1 Protection Group" task.
8. Complete the "DLP-A377 Provision Section DCC Terminations" task for the working OC-N cards in the new node that will connect to the linear ADM network. Alternatively, if additional bandwidth is needed for CTC management, complete the "DLP-A378 Provision Line DCC Terminations" task.
   Note: DCC failure alarms appear until you create DCC terminations in the point-to-point node during Step 9.

9. In node view, display the point-to-point node that will connect to the new node.
10. Complete the NTP-A323 Verify Card Installation to ensure that the point-to-point node has OC-N cards installed that can connect to the new node.
11. Create a 1+1 protection group for the OC-N cards that will connect to the new node. See the "DLP-A73 Create a 1+1 Protection Group" task for instructions.
12. Create DCC terminations on the working OC-N card that will connect to the new node. See the "DLP-A377 Provision Section DCC Terminations" task.
13. From the View menu, choose **Go to Node View** to open the new node in node view.
14. Complete the NTP-A28 Set Up Timing for the new node. If the new node is using line timing, make the working OC-N card the timing source.
15. From the View menu, choose **Go to Network View**. Verify that the newly created linear ADM configuration is correct. One green span line should appear between each linear node.
16. 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 alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* for procedures.
17. Repeat the procedure to add an additional node to the linear ADM.

    Stop. You have completed this procedure.

NTP-A303 Convert an Unprotected Point-to-Point or 1+1 Linear ADM to a Two-Fiber BLSR Automatically

Purpose	This procedure converts an unprotected point-to-point (two nodes) or linear ADM (three or more nodes) to a two-fiber bidirectional line switched ring (BLSR) without disrupting traffic.
Tools/Equipment	None
Prerequisite Procedures	NTP-A44 Provision Path Protection Nodes
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note: Before beginning this procedure, you should have a unique ring name to identify the new BLSR and a unique node ID number for each node in the ring.

Note: Before beginning this procedure, optical transmit and receive levels should be in their acceptable range as shown in Table 2-5.

Note: If overhead circuits exist on the network, this procedure is service affecting. The overhead circuits will drop traffic and have a status of PARTIAL after the upgrade is complete.

1. Complete the "DLP-A60 Log into CTC" task at a node on the point-to-point or linear ADM. If you are already logged in, continue with Step 2.
2. Complete the "DLP-A298 Check the Network for Alarms and Conditions" task.
3. Complete the "DLP-A155 Delete a Protection Group" task at the nodes that support the point-to-point or linear ADM span to remove any protection groups that may exist.
4. Complete the "DLP-A377 Provision Section DCC Terminations" task at the nodes that support the point-to-point or linear ADM span. Provision the slot in each node that is not already in the SDCC Terminations list.

5. From the Tools menu, choose Topology Upgrade > Convert Path Protection to BLSR. In the Topology Conversion dialog box, set the BLSR properties:
   - Ring Type-(Display only.) The default is two-fiber.
   - Speed-Choose the BLSR ring speed: OC-12, OC-48, or OC-192. The speed must match the OC-N speed of the BLSR trunk (span) cards.
     Note: If you are creating an OC-12 BLSR and will eventually upgrade it to OC-48 or OC-192, use the single-port OC-12 cards (OC12 IR/STM4 SH 1310, OC12 LR/STM4 SH 1310, or OC12 LR/STM4 LH 1550).
   - Ring Name-Assign a ring name. The name can be from 1 to 6 characters in length. Any alphanumeric string is permissible, and upper and lower case letters can be combined. Do not use the character string "All" in either upper or lower case letters. This is a TL1 keyword and will be rejected. Do not choose a name that is already assigned to another BLSR.
   - Reversion time-Set the amount of time that will pass before the traffic reverts to the original working path following a ring switch. The default is 5 minutes. Ring reversions can be set to Never.
6. Click **Next**. If the network graphic appears, go to Step 7.
   If CTC determines that a BLSR cannot be created, for example, not enough optical cards are installed or it finds circuits with path protection selectors, a "Cannot Create BLSR" message appears. If this occurs, complete the following steps:
   1. Click **OK**.
   2. In the Create BLSR window, click **Excluded Nodes**. Review the information explaining why the BLSR could not be created, then click **OK**.
   3. Depending on the problem, click **Back** to start over or click **Cancel** to cancel the operation.
   4. Complete the NTP-A40 Provision BLSR Nodes, making sure all steps are completed accurately, then start this procedure again.
7. In the network graphic, double-click a BLSR span line. If the span line is DCC connected to other BLSR cards that constitute a complete ring, the lines turn blue. If the lines do not form a complete ring, double-click span lines until a complete ring is formed. Click **Next.**
8. The Path Protection to BLSR Topology Conversion dialog box appears. The dialog box states that the system is about to force traffic to the shortest path protection paths. Click Next.
9. Another dialog box appears, stating that the force has been applied to the shortest path protection path. Click Finish.
   If the BLSR window appears with the BLSR you created, go to the next step. If a "Cannot Create BLSR" or "Error While Creating BLSR" message appears:
   1. Click **OK**.
   2. In the Create BLSR window, click **Excluded Nodes**. Review the information explaining why the BLSR could not be created, then click **OK**.
   3. Depending on the problem, click **Back** to start over or click **Cancel** to cancel the operation.
   4. Complete the NTP-A40 Provision BLSR Nodes, making sure all steps are completed accurately, then start this procedure again.
      Note: Some or all of the following alarms might briefly appear during BLSR setup: E-W MISMATCH, RING MISMATCH, APSCIMP, APSDFLTK, and BLSROSYNC.
10. Verify the following:
    - On the network view graphic, a green span line appears between all BLSR nodes.
    - All E-W MISMATCH, RING MISMATCH, APSCIMP, DFLTK, and BLSROSYNC alarms are cleared. See the *Cisco ONS 15454 Troubleshooting Guide* for alarm troubleshooting.
      Note: The numbers in parentheses after the node name are the BLSR node IDs assigned by CTC. Every ONS 15454 in a BLSR is given a unique node ID, 0 through 31. To change it, complete the "DLP-A326 Change a BLSR Node ID" task.
      Stop. You have completed this procedure.

NTP-A155 Convert a 1+1 Point-to-Point or a Linear ADM to a Two-Fiber BLSR Manually

Purpose	This procedure upgrades a 1+1 point-to-point configuration (two nodes) or a linear ADM configuration (three or more nodes) to a two-fiber BLSR manually, that is, without using the in-service topology upgrade wizard. Use this procedure if the wizard is unavailable or if you need to back out of the wizard.
Tools/Equipment	None
Prerequisite Procedures	NTP-A124 Provision a Point-to-Point Network or NTP-A38 Provision a Linear ADM Network
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Note: Optical transmit and receive levels should be in their acceptable range as shown in Table 2-5.

Caution! Traffic is not protected during this procedure.

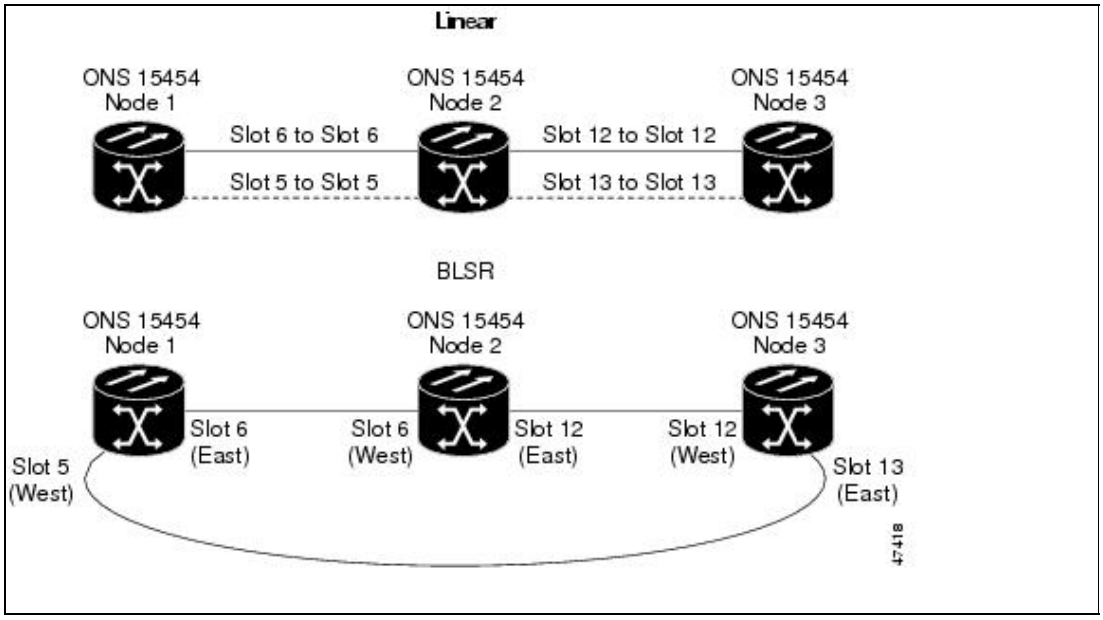
1. Complete the "DLP-A60 Log into CTC" task at one of the nodes that you want to convert from a point-to-point or ADM to a BLSR. If you are already logged in, continue with Step 2.
2. According to local site practice, complete the NTP-A108 Back Up the Database for each node in the configuration.
3. Complete the "DLP-A298 Check the Network for Alarms and Conditions" task.
4. On the network map, right-click a span adjacent to the node you are logged into. A shortcut menu appears.
5. From the shortcut menu, click **Circuits**. The Circuits on Span window appears.
6. Verify that the total number of active STS circuits does not exceed 50 percent of the span bandwidth. In the Circuits column there is a block titled "Unused." This number should exceed 50 percent of the span bandwidth.

   If the span is an OC-48, no more than 24 STSs can be provisioned on the span. If the span is an OC-192, no more than 96 STSs can be provisioned on the span. If the span is an OC-12, no more than 6 STSs can be provisioned on the span.

Caution! If the upper STSs are in use, this procedure cannot be completed. Bandwidth must be 50 percent unassigned to convert to a BLSR. Refer to local procedures for relocating circuits if these requirements are not met.

7. Repeat Steps 4 through 6 for each node in the point-to-point or linear ADM that you will convert to a BLSR. When all nodes comply with Step 6, proceed to the next step.
8. For every node in the point-to-point or linear ADM network that you want to convert to a BLSR, complete the following tasks:
   1. Complete the "DLP-A189 Verify that a 1+1 Working Slot is Active" task for every 1+1 protection group that supports a span in the point-to-point or linear ADM network.
   2. Complete the "DLP-A155 Delete a Protection Group" task at each port that supports the point-to-point or linear ADM span.
   3. Complete the "DLP-A214 Change the Service State for a Port" task to put the protect ports out of service at each node that supports the point-to-point or linear ADM span.
9. (Linear ADM only.) Physically remove the protect fibers from all nodes in the linear ADM; for example, the fiber running from Node 2/Slot 13 to Node 3/Slot 13 (as shown in Figure 13-3) can be removed.

Figure 13-3: Linear ADM to BLSR Conversion



10. Create the ring by connecting the protect fiber from one end node to the protect port on the other end node. For example, the fiber between Node 1/Slot 5 and Node 2/Slot 5 (as shown in Figure 13-3) can be rerouted to connect Node 1/Slot 5 to Node 3/Slot 13.

    Note: If you need to remove any OC-N cards from the shelf, do so now. In this example, cards in Node 2/Slots 5 and 13 can be removed. See the NTP-A116 Remove and Replace a Card.
11. From the network view, click the **Circuits** tab and complete the "DLP-A532 Export CTC Data" task to save the circuit data to a file on your hard drive.
12. Complete the "DLP-A377 Provision Section DCC Terminations" task at the end nodes. Provision the slot in each node that is not already in the SDCC Terminations list (in the Figure 13-3 example, Port 1 of Node 1/Slot 5 and Port 1 of Node 3/Slot 13).
13. For circuits provisioned on an STS that is now part of the protection bandwidth (STSs 7 to 12 for an OC-12 BLSR, STSs 25 to 48 for an OC-48 BLSR, and STSs 97 to 192 for an OC-192 BLSR), delete and recreate each circuit:
    1. Complete the "DLP-A333 Delete Circuits" task for one circuit.
    2. Create the circuit on STSs 1 to 6 for an OC-12 BLSR, STSs 1 to 24 for an OC-48 BLSR, or STSs 1 to 96 for an OC-192 BLSR on the fiber that served as the protect fiber in the linear ADM. See the NTP-A344 Create a Manually Routed Optical Circuit for instructions.
    3. Repeat Substeps 1 and 2 for each circuit residing on a BLSR protect STS.
14. Complete the NTP-A126 Create a BLSR to put the nodes into a BLSR.

    Stop. You have completed this procedure.

NTP-A342 Convert a Point-to-Point or Linear ADM to a Path Protection Configuration Automatically

Purpose	This procedure upgrades a point-to-point or linear ADM to a path protection configuration without disrupting traffic. You can upgrade STS, VT, and VT tunnel circuits to path protection. This option is a single circuit operation.
Tools/Equipment	None
	NTP-A124 Provision a Point-to-Point Network

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

Note: When upgrading VT tunnels, CTC does not convert the VT tunnel to path protection, but instead creates a secondary tunnel for the alternate path. The result is two unprotected VT tunnels using alternate paths.

Note: If overhead circuits exist on the network, this procedure is service affecting. The overhead circuits will drop traffic and have a status of PARTIAL after the upgrade is complete.

1. Complete the "DLP-A60 Log into CTC" task at a node on the point-to-point or linear ADM. If you are already logged in, continue with Step 2.
2. If the point-to-point or linear ADM is 1+1 protected, complete the "DLP-A155 Delete a Protection Group" task. If the point-to-point or linear ADM is unprotected, continue with Step 4.
3. Complete the "DLP-A377 Provision Section DCC Terminations" task at the protect cards in all nodes that will be part of the path protection configuration. Alternatively, if additional bandwidth is needed for CTC management, complete the "DLP-A378 Provision Line DCC Terminations" task.
4. From either network or node view, click the **Circuits** tab. Click the circuit you want to upgrade to select it.
5. From the Tools menu, choose **Topology Upgrade > Convert Unprotected to Path Protection**.
6. To set the path protection parameters, complete the "DLP-A218 Provision Path Protection Selectors" task.

   Note: When upgrading point-to-point or linear ADM circuits to a path protection topology, a traffic hit of greater than 300ms occurs if the "Provision working go & return on primary path" routing option is not checked in the Circuit Attributes pane.
7. Click **Next**.
8. Complete one of the following tasks:
   1. To route the new path protection circuit manually, complete "DLP-A397 Manually Route a Path Protection Circuit for a Topology Upgrade" task.
   2. To route the new path protection circuit automatically, complete "DLP-A398 Automatically Route a Path Protection Circuit for a Topology Upgrade" task.

   Stop. You have completed this procedure.

NTP-A156 Convert a Point-to-Point or Linear ADM to a Path Protection Configuration Manually

Purpose	This procedure upgrades a point-to-point system to a path protection configuration manually, that is, without using the in-service topology upgrade wizard. Use this procedure if the wizard is unavailable or if you need to back out of the wizard.
Tools/Equipment	None
Prerequisite Procedures	NTP-A124 Provision a Point-to-Point Network or NTP-A38 Provision a Linear ADM Network
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Caution! This procedure is service affecting. All circuits are deleted and reprovisioned.

1. Complete the "DLP-A60 Log into CTC" task at a node on the point-to-point or linear ADM. If you are already logged in, continue with Step 2.
2. Complete the "DLP-A298 Check the Network for Alarms and Conditions" task.
3. Complete the "DLP-A189 Verify that a 1+1 Working Slot is Active" task for each node.
4. Complete the "DLP-A155 Delete a Protection Group" task for each 1+1 protection group that supports the point-to-point or linear ADM span.
5. Complete the "DLP-A377 Provision Section DCC Terminations" task at the protect cards in all nodes that will be part of the path protection configuration. Alternatively, if additional bandwidth is needed for CTC management, complete the "DLP-A378 Provision Line DCC Terminations" task.
6. Complete the "DLP-A333 Delete Circuits" task and the NTP-A343 Create an Automatically Routed Optical Circuit to delete and recreate the circuits one at a time.

   Note: A path protection configuration is the default configuration if the cards installed are installed and the DCCs are configured.

   Stop. You have completed this procedure.

NTP-A267 Convert a Path Protection Configuration to a Two-Fiber BLSR Automatically

Purpose	This procedure converts a path protection configuration to a two-fiber BLSR without disrupting traffic.
Tools/Equipment	None
Prerequisite Procedures	NTP-A44 Provision Path Protection Nodes
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note: Open-ended path protection and path protection dual-ring interconnect (DRI) configurations do not support in-service topology upgrades.

Note: Before beginning this procedure, you should have a unique ring name to identify the new BLSR and a unique node ID number for each node on the ring.

Note: Before beginning this procedure, optical transmit and receive levels should be in their acceptable range as shown in Table 2-5.

Note: If overhead circuits exist on the network, this procedure is service affecting. The overhead circuits will drop traffic and have a status of PARTIAL after the upgrade is complete.

1. Complete the "DLP-A60 Log into CTC" task at a node on the path protection configuration. If you are already logged in, continue with Step 2.
2. Complete the "DLP-A298 Check the Network for Alarms and Conditions" task.
3. In the Path Protection to BLSR Topology Conversion dialog box, set the BLSR properties:
   - Ring Type-(Display only.) The default is two-fiber.
   - Speed-Choose the BLSR ring speed: OC-12, OC-48, or OC-192. The speed must match the OC-N speed of the BLSR trunk (span) cards.
     Note: If you are creating an OC-12 BLSR and will eventually upgrade it to OC-48 or OC-192, use the single-port OC-12 cards (OC12 IR/STM4 SH 1310, OC12 LR/STM4 SH 1310, or OC12 LR/STM4 LH 1550).

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

4. Click **Next**. If the network graphic appears, go to Step 5.
   If CTC determines that a BLSR cannot be created, for example, if not enough optical cards are installed or if it finds circuits with path protection selectors, a "Cannot Create BLSR" message appears. If this occurs, complete the following steps:
   1. Click **OK**.
   2. In the Create BLSR window, click **Excluded Nodes**. Review the information explaining why the BLSR could not be created, then click **OK**.
   3. Depending on the problem, click **Back** to start over or click **Cancel** to cancel the operation.
   4. Complete the NTP-A40 Provision BLSR Nodes, making sure all steps are completed accurately, then start this procedure again.
5. In the network graphic, double-click a BLSR span line. If the span line is DCC connected to other BLSR cards that constitute a complete ring, the lines turn blue. If the lines do not form a complete ring, double-click span lines until a complete ring is formed. Click **Next**.
6. The Path Protection to BLSR Topology Conversion dialog box appears. The dialog box states that the system is about to force traffic to the shortest path protection paths. Click **Next**.
7. Another dialog box appears, stating that the force has been applied to the shortest path protection path. Click Finish.
   If the BLSR window appears with the BLSR you created, go to Step 8. If a "Cannot Create BLSR" or "Error While Creating BLSR" message appears, complete the following:
   1. Click **OK**.
   2. In the Create BLSR window, click **Excluded Nodes**. Review the information explaining why the BLSR could not be created, then click **OK**.
   3. Depending on the problem, click **Back** to start over or click **Cancel** to cancel the operation.
   4. Complete the NTP-A40 Provision BLSR Nodes, making sure all steps are completed accurately, then start this procedure again.
   Note: Some or all of the following alarms might briefly appear during BLSR setup: E-W MISMATCH, RING MISMATCH, APSCIMP, APSDFLTK, and BLSROSYNC.
8. Verify the following:
   - On the network view graphic, a green span line appears between all BLSR nodes.
   - All E-W MISMATCH, RING MISMATCH, APSCIMP, DFLTK, and BLSROSYNC alarms are cleared. See the *Cisco ONS 15454 Troubleshooting Guide* for alarm troubleshooting.
   Note: The numbers in parentheses after the node name are the BLSR node IDs assigned by CTC. Every ONS 15454 in a BLSR is given a unique node ID, 0 through 31. To change it, complete the "DLP-A326 Change a BLSR Node ID" task.
   Stop. You have completed this procedure.

NTP-A210 Convert a Path Protection Configuration to a Two-Fiber BLSR Manually

Purpose	This procedure converts a path protection to a two-fiber BLSR manually, that is, without using the in-service topology upgrade wizard. Use this procedure if the wizard is unavailable or if you need to back out of the wizard.
Tools/Equipment	None
Prerequisite	NTP-A44 Provision Path Protection Nodes

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

Caution! This procedure is service affecting. All circuits in the ring are deleted and reprovisioned.

Caution! Read through this procedure completely before beginning the conversion.

Note: Prior to beginning this procedure, you should have a unique ring name to identify the new BLSR and a unique node ID number for each node on the ring.

Note: Prior to beginning this procedure, optical transmit and receive levels should be in their acceptable range as shown in Table 2-5.

1. Complete the "DLP-A60 Log into CTC" task at a node on the path protection configuration. If you are already logged in, continue with Step 2.
2. Complete the "DLP-A298 Check the Network for Alarms and Conditions" task.
3. On the network map, right-click a span adjacent to the node you are logged into. A shortcut menu appears.
4. From the shortcut menu, click **Circuits**. The Circuits on Span window appears.
5. Verify that the total number of active STS circuits does not exceed 50 percent of the span bandwidth. In the Circuits column there is a block titled "Unused." This number should exceed 50 percent of the span bandwidth.

   If the span is an OC-48, no more than 24 STSs can be provisioned on the span. If the span is an OC-192, no more than 96 STSs can be provisioned on the span. If the span is an OC-12, no more than 6 STSs can be provisioned on the span.

Caution! If the first half of the capacity is exceeded, this procedure cannot be completed. Bandwidth must be 50 percent unassigned to convert to BLSR. Refer to local procedures for relocating circuits if these requirements are not met.

6. Repeat Steps 1 through 5 for each node in the path protection configuration that you will convert to a BLSR. When all nodes comply with Step 5, continue with the next step.
7. Save all circuit information:
   1. In network view, click the **Circuits** tab.
   2. Record the circuit information using one of the following options:
      - From the File menu, click **Print** to print the circuits table. See the "DLP-A531 Print CTC Data" task for more information.
      - From the File menu, click **Export** and choose the data format: HTML, CSV (comma separated values), or TSV (tab separated values). Click **OK** and save the file in a temporary directory. See the "DLP-A532 Export CTC Data" task for more information.
8. Delete the circuits:
   1. In network view, click the **Circuits** tab. All circuits on the ring appear.
   2. With the Ctrl key pressed, click each circuit. Each line turns dark blue as it is selected.
   3. After all circuits have been selected, click **Delete**. Allow several minutes for processing; the actual length of time depends on the number of circuits in the network.
9. Complete the NTP-A126 Create a BLSR to create the BLSR.
10. To recreate the circuits, see Create Circuits and VT Tunnels. and choose the applicable procedure for the circuit type you want to enter.

Note: To add additional nodes to a BLSR, see the NTP-A350 Add a BLSR Node.

Stop. You have completed this procedure.

NTP-A211 Convert a Two-Fiber BLSR to a Four-Fiber BLSR Automatically

Purpose	This procedure upgrades a two-fiber BLSR to a four-fiber BLSR without disrupting traffic. The conversion will be easier if the same east and west configuration is used on all nodes being upgraded.
Tools/Equipment	None
Prerequisite Procedures	NTP-A126 Create a BLSR
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Note: BLSR DRI configurations do not support in-service topology upgrades.

Note: Two-fiber OC-48 or OC-192 BLSRs can be converted to four-fiber BLSRs. To convert, install two additional OC-48 or OC-192 cards at each two-fiber BLSR node, then log into CTC and convert the BLSR from two-fiber to four-fiber. The fibers that were divided into working and protect bandwidths for the two-fiber BLSR are now fully allocated for working BLSR traffic. A span upgrade can be performed before the two-fiber to four-fiber BLSR conversion.

Note: BLSR protection channel access (PCA) circuits, if present, will remain in their existing STSs. Therefore, they will be located on the working path of the four-fiber BLSR and will have full BLSR protection. To route PCA circuits on protection channels in the four-fiber BLSR, delete and recreate the circuits after the upgrade. For example, if you upgrade a two-fiber OC-48 BLSR to four-fiber, PCA circuits on the protection STSs (STSs 25 to 48) in the two-fiber BLSR will remain in their existing STSs, which are working STSs in the four-fiber BLSR. Deleting and recreating the OC-48 PCA circuits moves the circuits to STSs 1 to 24 in the protect bandwidth of the four-fiber BLSR. To delete circuits, see the "DLP-A333 Delete Circuits" task. To create circuits, see Create Circuits and VT Tunnels.

Note: Before beginning this procedure, optical transmit and receive levels should be in their acceptable range as shown in Table 2-5.

1. Complete the "DLP-A60 Log into CTC" task at one of the two-fiber nodes that you want to convert.
2. Complete the "DLP-A298 Check the Network for Alarms and Conditions" task.
3. Complete the NTP-A16 Install Optical Cards and Connectors to install two OC-48 or OC-192 cards at each BLSR node. You must install the same OC-N card rate as the two-fiber BLSR.
4. Connect the fiber to the new cards. Use the same east-west connection scheme that was used to create the two-fiber connections. See the NTP-A247 Install Fiber-Optic Cables.
5. Complete the "DLP-A214 Change the Service State for a Port" task to put the ports in service for each new OC-N card.
6. Test the new fiber connections using procedures standard for your site.
7. Convert the BLSR:
    1. Display the network view and click the **Provisioning > BLSR** tabs.
    2. Choose the two-fiber BLSR you want to convert then click the **Upgrade to 4 Fiber** button.
    3. In the Upgrade BLSR dialog box, set the amount of time that will pass before the traffic reverts to the original working path after the condition that caused the switch has been resolved. The default is 5 minutes.
    4. Click **Next**.

5. Assign the east and west protection ports:
   - West Protect-Select the west BLSR port that will connect to the west protect fiber from the drop-down list.
   - East Protect-Select the east BLSR port that will connect to the east protect fiber from the drop-down list.
6. Click **Finish**.

8. 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 alarms appear, investigate and resolve them before continuing. Refer to the *Cisco ONS 15454 Troubleshooting Guide* for procedures.
9. Complete the NTP-A176 Four-Fiber BLSR Acceptance Test.

   Stop. You have completed this procedure.

NTP-A159 Modify a BLSR

Purpose	This procedure changes a BLSR ring name, node ID, or ring and span reversion times.
Tools/Equipment	None
Prerequisite Procedures	NTP-A126 Create a BLSR
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

1. Complete the "DLP-A60 Log into CTC" task at a node in the BLSR you want to modify. If you are already logged in, continue with Step 2.
2. Complete the "DLP-A298 Check the Network for Alarms and Conditions" task.

   Note: Some or all of the following alarms appear during BLSR setup: E-W MISMATCH, RING MISMATCH, APSCIMP, APSDFLTK, and BLSROSYNC. The alarms clear after you configure all the nodes in the BLSR. For definitions of these alarms, see the *Cisco ONS 15454 Troubleshooting Guide*.
3. To change the BLSR ring name or the ring or span reversion times, complete the following steps. If you want to change a node ID, continue with Step 4.
   1. In network view, click the **Provisioning > BLSR** tabs.
   2. Click the BLSR you want to modify and click **Edit**.
   3. In the BLSR window, change any of the following:
      - Ring Name-Assign a ring name. The name can be from 1 to 6 characters in length. The alphanumeric character strings that can be used are 0 to 9 and A to Z. You can combine numbers and letters and use upper or lower case letters. Do not use the character string "All" in either upper or lower case letters because it is a TL1 keyword. Do not choose a name that is already assigned to another BLSR.
      - Reversion time-If needed, change the amount of time that will pass before the traffic reverts to the original working path after a ring switch.
      - Span Reversion-(Four-fiber BLSRs only.) If needed, change the amount of time that will pass before the traffic reverts to the original working path after a span switch.
   4. Click **Apply**.
   5. If you changed the ring name, the BLSR window closes automatically. If you only changed a reversion time, close the window by choosing **Close** from the File menu.

4. As needed complete the "DLP-A326 Change a BLSR Node ID" task; otherwise, continue with Step 5.
5. In network view, verify the following:
   - A green span line appears between all BLSR nodes.
   - All E-W MISMATCH, RING MISMATCH, APSCIMP, DFLTK, BLSROSYNC, and Node ID Mismatch alarms are cleared.
     Note: For definitions of these alarms, see the *Cisco ONS 15454 Troubleshooting Guide*.
     Stop. You have completed this procedure.