CHAPTER 6

Create Circuits and VT Tunnels

This chapter explains how to create Cisco ONS 15310-CL and ONS 15310-MA electrical circuits, Virtual Tributary (VT) tunnels, optical circuits, and Ethernet circuits. For additional information about ONS 15310-CL and ONS 15310-MA circuits, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

Before You Begin

Before performing any of the following procedures, investigate all alarms and clear any trouble conditions. Refer to the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Troubleshooting Guide* as necessary.

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

1. NTP-C36 Verify Network Turn-Up, page 6-4—Complete this procedure before you create any circuits.
2. NTP-C37 Create an Automatically Routed DS-1 Circuit, page 6-6—Complete as needed.
3. NTP-C38 Create a Manually Routed DS-1 Circuit, page 6-10—Complete as needed.
4. NTP-C39 Create a Unidirectional DS-1 Circuit with Multiple Drops, page 6-12—Complete as needed.
5. NTP-C40 Create an Automatically Routed DS-3 or EC-1 Circuit, page 6-16—Complete as needed.
6. NTP-C41 Create a Manually Routed DS-3 or EC-1 Circuit, page 6-20—Complete as needed.
7. NTP-C42 Create a Unidirectional DS-3 or EC-1 Circuit with Multiple Drops, page 6-22—Complete as needed.
8. NTP-C46 Test Electrical Circuits, page 6-26—Complete this procedure after you create an electrical circuit.
9. NTP-C43 Create an Automatically Routed VT Tunnel, page 6-27—Complete as needed.
10. NTP-C44 Create a Manually Routed VT Tunnel, page 6-30—Complete as needed.
11. NTP-C45 Create a VT Aggregation Point, page 6-32—Complete as needed.
12. NTP-C47 Create an Automatically Routed Optical Circuit, page 6-34—Complete as needed.
13. NTP-C48 Create a Manually Routed Optical Circuit, page 6-39—Complete as needed.
14. NTP-C49 Create a Unidirectional Optical Circuit with Multiple Drops, page 6-41—Complete as needed.

15. NTP-C50 Test Optical Circuits, page 6-44—Complete this procedure after you create an optical circuit.
16. NTP-C51 Create an Automatically Routed VCAT Circuit, page 6-46—Complete as needed.
17. NTP-C52 Create a Manually Routed VCAT Circuit, page 6-52—Complete as needed.
18. NTP-C55 Create Overhead Circuits, page 6-55—Complete as needed to create data communications channel (DCC) tunnels, IP-encapsulated tunnels, and user data channel (UDC) circuits.
19. NTP-C140 Create a Server Trail, page 6-56—Complete as needed.

Table 6-1 defines ONS 15310-CL and ONS 15310-MA circuit creation terms and options.

Table 6-1 ONS 15310-CL and ONS 15310-MA Circuit Options

Circuit Option	Description
Source	The circuit source is where the circuit enters the ONS network.
Destination	The circuit destination is where the circuit exits an ONS network.
Automatic circuit routing	Cisco Transport Controller (CTC) routes the circuit automatically on the shortest available path based on routing parameters and bandwidth availability.
Manual circuit routing	Manual routing allows you to choose a specific path, not just the shortest path chosen by automatic routing. You can choose a specific synchronous transport signal (STS) or VT for each circuit segment and create circuits from work orders prepared by an operations support system (OSS) like the Telcordia Trunk Information Record Keeping System (TIRKS).
VCAT	Virtual concatenated (VCAT) circuits transport traffic using noncontiguous time division multiplexing (TDM) time slots, avoiding the bandwidth fragmentation problem that exists with contiguous concatenated (CCAT) circuits. The cards that support VCAT circuits are the CE-100T-8 and ML-100T-8 cards. For more information, refer to the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.
VT tunnel	VT tunnels allow VT1.5 circuits to pass through a node without utilizing cross-connect resources. VT circuits using VT tunnels use cross-connect capacity only at the source and destination nodes. One VT tunnel can carry 28 VT1.5 circuits.
VT aggregation point	VT aggregation points (VAPs) allow VT circuits to be aggregated into an STS for handoff to non-ONS networks or equipment, such as interoffice facilities (IOFs), switches, or digital access cross-connect systems (DACS). VAPs reduce VT matrix resource utilization at the node where the VT1.5s are aggregated onto the STS. This node is called the STS grooming end. The STS grooming end requires an OC-N port. VT aggregation points can be created on 1+1 or unprotected nodes, but cannot be created on path protectionnodes.

Table 6-2 shows the circuit source and destination options for ONS 15310-CL VT circuits.

Table 6-2 CTC Circuit Source/Destination Options for ONS 15310-CL VT Circuits

Card	Port Type	Ports	Port Rate	VTs	VCAT Members
15310-CL-CTX	Optical	2	OC-12 or OC-3	28 per STS	—
	Broadband	3	DS-3 or EC-1	28 per STS	—
	Wide band	21	DS-1	1 per DS-1	—

Table 6-2 CTC Circuit Source/Destination Options for ONS 15310-CL VT Circuits (continued)

Card	Port Type	Ports	Port Rate	VTs	VCAT Members
CE-100T-8	Ethernet/POS	8	—	—	1–64 per port
ML-100T-8		8	—	—	1–3 per port

Table 6-3 shows the circuit source and destination options for ONS 15310-CL STS circuits.

Table 6-3 CTC Circuit Source/Destination Options for ONS 15310-CL STS Circuits

Card	Port Type	Ports	Port Rate	STSs	VCAT Members
15310-CL-CTX	Optical	2	OC-12	12	—
			OC-3	3	—
	Broadband	3	DS-3 or EC-1	3	—
	Wide band	21	DS1	1	—
CE-100T-8	Ethernet/POS	8	—	1–3 per port	1–3 per port
ML-100T-8		2	—	1 per port	1–2 per port

Table 6-4 shows the circuit source and destination options for ONS 15310-MA VT circuits.

Table 6-4 CTC Circuit Source/Destination Options for ONS 15310-MA VT Circuits

Card	Port Type	Ports	Port Rate	VTs	VCAT Members
CTX2500	Optical	2	OC-48	28 per STS	—
			OC-12	28 per STS	—
			OC-3	28 per STS	—
DS1-28/DS3-EC1-3	Broadband	3	DS-3 or EC-1	28 per STS	—
	Wide band	28	DS-1	1 per DS-1	—
DS1-84/DS3-EC1-3	Broadband	3	DS-3 or EC-1	28 per STS	—
	Wide band	84	DS-1	1 per DS-1	—
CE-100T-8	Ethernet/POS	8	—	—	1–64 per port
ML-100T-8		8	—	—	1–3 per port

Table 6-5 shows the circuit source and destination options for ONS 15310-MA STS circuits.

Table 6-5 CTC Circuit Source/Destination Options for ONS 15310-MA STS Circuits

Card	Port Type	Ports	Port Rate	STSs	VCAT Members
CTX2500	Optical	2	OC-48	48	—
			OC-12	12	—
			OC-3	3	—
DS1-28/DS3-EC1-3	Broadband	3	DS-3 or EC-1	1	—
	Wide band	28	DS-1	28	—
DS1-84/DS3-EC1-3	Broadband	3	DS-3 or EC-1	3	—
	Wide band	84	DS-1	84	—
CE-100T-8	Ethernet/POS	8	—	1–3 per port	1–3 per port
ML-100T-8		2	—	1 per port	1–2 per port

NTP-C36 Verify Network Turn-Up

Purpose	This procedure verifies that the ONS network is ready for circuit provisioning.
Tools/Equipment	None
Prerequisite Procedures	Chapter 5, "Turn Up a Network"
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44. If you are already logged in, continue with Step 2.

Step 2 From the View menu, choose **Go to Network View**. Wait for all the nodes that are part of the network to appear on the network map. (Large networks might take several minutes to display all the nodes.)

Note If this is the first time your computer has connected to this ONS network, the node icons will be stacked on the left side of the graphic area, possibly out of view. Use the scroll bar below the network map to display the icons. To separate the icons, drag and drop an icon to a new location. Repeat until all the nodes are visible on the graphic area.

Step 3 Verify node accessibility. In the network view, all node icons must be either green, yellow, orange, or red.

If all network nodes do not appear after a few minutes, or if a node icon is gray with "Unknown" under it, do not continue. Look at the Net box in the lower right corner of the window. If it is gray, log in again, making sure not to check the Disable Network check box in the CTC Login dialog box. If problems persist, see Chapter 5, "Turn Up a Network" to review the network turn-up procedure appropriate for your network topology, or refer to the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Troubleshooting Guide*.

Step 4 Verify DCC connectivity. All nodes must be connected by green lines. If lines are missing or gray in color, do not continue. See Chapter 5, "Turn Up a Network" and follow the network turn-up procedure appropriate for your network topology. Verify that all nodes have DCC connectivity before continuing.

Step 5 Click the **Alarms** tab.

a. Verify that the alarm filter is not on. See the "DLP-C88 Disable Alarm Filtering" task on page 17-109 as necessary.

b. Verify that no unexplained alarms appear on the network. If alarms are present, investigate and resolve them before continuing. Refer to the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Troubleshooting Guide* if necessary.

Step 6 From the View menu, choose **Go to Home View**. Verify that the node is provisioned according to your site or engineering plan:

a. View the cards on the shelf map. Verify that the cards appear in the specified slots.

b. Click the **Provisioning > General** tabs. Verify that the node name, contacts, date, time, and Network Time Protocol/Simple Network Time Protocol (NTP/SNTP) server IP address (if used) are correctly provisioned. If needed, make corrections using the "NTP-C78 Change Node Management Information" procedure on page 11-2.

c. Click the **Network** tab. Verify that the IP address, subnet mask, default router, SOCKS proxy server, and gateway settings are correctly provisioned. If not, make corrections using the "NTP-C79 Change CTC Network Access" procedure on page 11-2.

d. Click the **Protection** tab. Verify that protection groups are created as specified in your site plan. If the protection groups are not created, complete the "NTP-C141 Create Optical Protection Groups for the ONS 15310-CL" procedure on page 4-12.

e. Click the **Security** tab. Verify that the users and access levels are provisioned as specified. If not, see the "NTP-C19 Create Users and Assign Security" procedure on page 4-4 to correct the information.

f. If Simple Network Management Protocol (SNMP) is used, click the **SNMP** tab and verify the trap and destination information. If the information is not correct, see the "NTP-C84 Change SNMP Settings" procedure on page 11-7 to correct the information.

g. Click the **Comm Channels** tab. Verify that Section DCCs (SDCCs) or Line DCCs (LDCCs) were created on the applicable OC-N ports. If DCCs were not created, see Chapter 5, "Turn Up a Network" and complete the turn-up procedure appropriate for your network topology.

h. Click the **Timing** tab. Verify that timing is provisioned as specified. If not, use the "NTP-C82 Change Node Timing" procedure on page 11-6 to make the changes.

i. Click the **Alarm Profiles** tab. If you provisioned optional alarm profiles, verify that the alarms are provisioned as specified. If not, see the "NTP-C60 Create, Download, and Assign Alarm Severity Profiles" procedure on page 9-6 to change the information.

j. Verify that the network element (NE) defaults file listed in the status area of the node view window is correct. Refer to the "Network Element Defaults" appendix in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual* document for more information about NE defaults.

Step 7 Repeat Step 6 for each node in the network.

Step 8 As appropriate, complete the circuit creation procedure listed in the "Before You Begin" section on page 6-1.

Stop. You have completed this procedure.

NTP-C37 Create an Automatically Routed DS-1 Circuit

Purpose	This procedure creates an automatically routed DS-1 circuit, meaning that CTC chooses the circuit route based on the parameters you specify and on the software version.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the circuit source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, complete the following fields:

- Circuit Type—Choose **STS** or **VT**. STS or VT cross-connects will carry the DS-1 circuit across the ONS network.
- Number of Circuits—Enter the number of DS-1 circuits that you want to create. The default is 1. If you are creating multiple circuits with the same slot and sequential port numbers, you can use autoranging to create the circuits automatically.
- Auto-ranged—This check box is automatically selected if you enter more than 1 in the Number of Circuits field. Autoranging creates identical (same source and destination), sequential circuits automatically. Uncheck this check box if you do not want CTC to create sequential circuits automatically.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-1 on page 6-7):

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters, (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—If you are creating an STS circuit, choose **STS-1**. If you are creating a VT circuit, Size displays VT1.5 and cannot be changed.
- Bidirectional—Leave the default unchanged (checked) for this circuit.
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- Diagnostic—Leave unchecked.
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the In-Service and Normal (IS-NR) service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the Out-of-Service and Management, Disabled (OOS-MA,DSBLD) service state. Traffic is not passed on the circuit.

- **IS,AINS**—Puts the circuit cross-connects in the Out-of-Service and Autonomous, Automatic In-Service (OOS-AU,AINS) service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
- **OOS,MT**—Puts the circuit cross-connects in the Out-of-Service and Management, Maintenance (OOS-MA,MT) service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

Note If VT circuit source and destination ports are in an OOS-AU,AINS; OOS-MA,MT; or IS-NR service state, VT circuits in OOS-AU,AINS change to IS-NR even if a physical signal is not present.

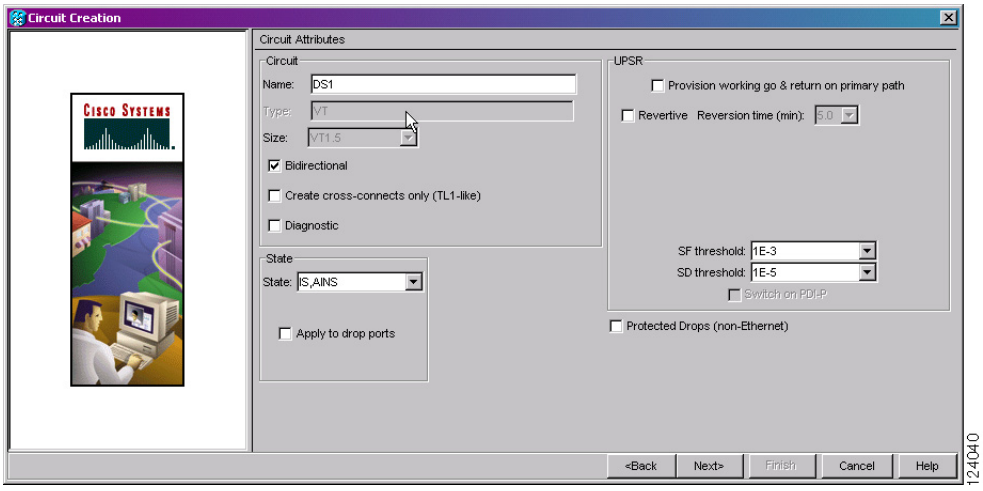
For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Protected Drops—Check this check box if you want the circuit routed on protected drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected cards and ports as source and destination choices.

Figure 6-1 Setting Circuit Attributes for a DS-1 Circuit



Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-C57 Provision Path Protection Selectors During Circuit Creation" task on page 17-75. Otherwise, continue with the next step.

Step 9 Click **Next**.

Step 10 Complete the "DLP-C58 Provision a DS-1 Circuit Source and Destination" task on page 17-76.

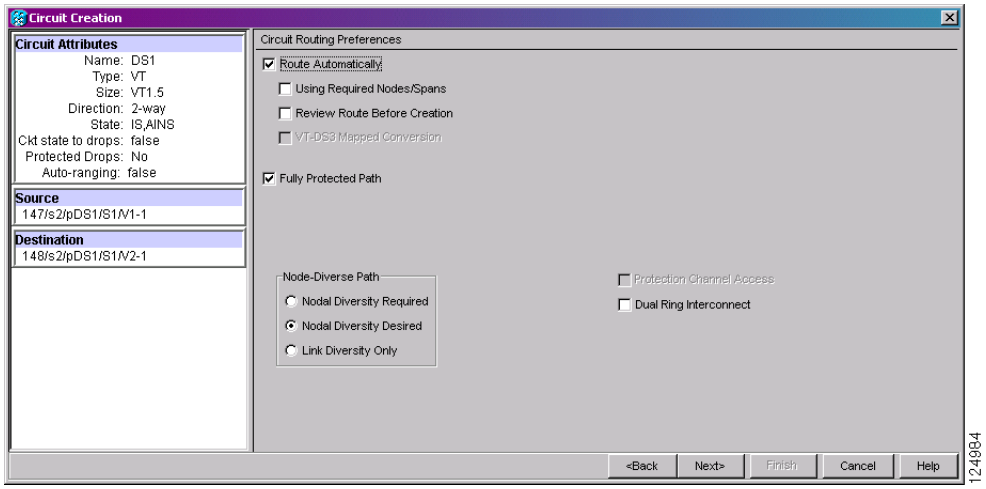
Step 11 In the Circuit Routing Preferences area (Figure 6-2), click **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

- Using Required Nodes/Spans—Check this check box if you want to specify nodes and spans to include or exclude in the CTC-generated circuit route.

  Including nodes and spans for a circuit ensures that those nodes and spans are in the working path of the circuit (but not the protect path). Excluding nodes and spans ensures that the nodes and spans are not in the working or protect path of the circuit.

- Review Route Before Creation—Check this check box if you want to review and edit the circuit route before the circuit is created.

Figure 6-2 Setting Circuit Routing Preferences for a DS-1 Circuit



Step 12 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 13. CTC creates a fully protected circuit route based on the path diversity option you choose. Fully protected paths might or might not have path protection path segments (with primary and alternate paths), and the path diversity options apply only to path protection path segments, if any exist.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

Step 13 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection configuration, choose one of the following:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.

- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Step 14 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection dual-ring interconnect (DRI), check the **Dual Ring Interconnect** check box.

Step 15 If you selected Using Required Nodes/Spans in Step 11, complete the following substeps. If not, continue with Step 17.

a. Click **Next**.

b. In the Circuit Route Constraints area, click a node or span on the circuit map.

c. Click **Include** to include the node or span in the circuit. Click **Exclude** to exclude the node or span from the circuit. The order in which you choose included nodes and spans is the order in which the circuit will be routed. Click spans twice to change the circuit direction.

d. Repeat Step c for each node or span you want to include or exclude.

e. Review the circuit route. To change the circuit routing order, choose a node from the Required Nodes/Lines or Excluded Nodes Links lists and click the **Up** or **Down** buttons to change the circuit routing order. Click **Remove** to remove a node or span.

Step 16 If you are creating an STS circuit, skip this step and continue with Step 17. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 17 If you selected Review Route Before Creation in Step 11, complete the following substeps. If not, continue with Step 18.

a. Click **Next**.

b. Review the circuit route. To add or delete a circuit span, choose a node on the circuit route. Blue arrows show the circuit route. Green arrows indicate spans that you can add. Click a span arrowhead, then click **Include** to include the span or **Remove** to remove the span.

c. If the provisioned circuit does not reflect the routing and configuration you want, click **Back** to verify and change the circuit information. If the circuit needs to be routed to a different path, see the "NTP-C38 Create a Manually Routed DS-1 Circuit" procedure on page 6-10.

Step 18 Click **Finish**. One of the following results occurs, depending on the circuit properties you chose in the Circuit Creation dialog box:

- If you entered 1 in the Number of Circuits field, CTC creates the circuit.
- If you entered more than 1 in the Number of Circuits field and selected Auto-ranged, CTC automatically creates the number of circuits entered in the Number of Circuits field. If autoranging cannot complete all the circuits, for example, because sequential ports are unavailable at the source or destination, a dialog box appears. Set the new source or destination for the remaining circuits, then click **Finish** to continue autoranging. After completing the circuits, the Circuits window appears.
- If you entered more than 1 in the Number of Circuits field and did not choose Auto-ranged, the Circuit Creation dialog box appears for you to create the remaining circuits. Repeat Steps 5 through 17 for each additional circuit. After completing the circuits, the Circuits window appears.

Step 19 In the Circuits window, verify that the new circuits appear in the circuits list.

Step 20 Complete the "NTP-C46 Test Electrical Circuits" procedure on page 6-26. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C38 Create a Manually Routed DS-1 Circuit

Purpose	This procedure creates a DS-1 circuit and provisions its circuit route.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the circuit source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3. CTC assigns a circuit name automatically based on circuit type, node name, and sequence number.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, complete the following fields:

- Circuit Type—Choose **STS** or **VT**. STS or VT cross-connects will carry the DS-1 circuit across the ONS network.
- Number of Circuits—Enter the number of DS-1 circuits that you want to create. The default is 1.
- Auto-ranged—Applies to automatically routed circuits only. If you entered more than 1 in Number of Circuits, uncheck this check box. (The check box is unavailable if only one circuit is entered in Number of Circuits.)

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-1 on page 6-7):

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—If you are creating an STS circuit, choose **STS-1**. If you are creating a VT circuit, Size displays VT1.5 and cannot be changed.
- Bidirectional—Leave the default unchanged (checked) for this circuit.
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.

- **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
- **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

Note If VT circuit source and destination ports are in an OOS-AU,AINS; OOS-MA,MT; or IS-NR service state, VT circuits in OOS-AU,AINS change to IS-NR even if a physical signal is not present.

For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Protected Drops—Check this check box if you want the circuit routed on protected drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected cards and ports as source and destination choices.

Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-C57 Provision Path Protection Selectors During Circuit Creation" task on page 17-75. Otherwise, continue with the next step.

Step 9 Click **Next**.

Step 10 Complete the "DLP-C58 Provision a DS-1 Circuit Source and Destination" task on page 17-76.

Step 11 In the Circuit Routing Preferences area (Figure 6-2 on page 6-8), uncheck **Route Automatically**.

Step 12 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 13. Fully protected paths might or might not have path protection path segments (with primary and alternate paths), and the path diversity options apply only to path protection path segments, if any exist.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 16.

Step 13 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection configuration, choose a Node-Diverse Path option:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within the path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.

- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Step 14 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection DRI, check the **Dual Ring Interconnect** check box.

Step 15 If you are creating an STS circuit, skip this step and continue with Step 16. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 16 Click **Next**. In the Route Review and Edit area, node icons appear for you to route the circuit. The circuit source node is selected. Green arrows pointing from the source node to other network nodes indicate spans that are available for routing the circuit.

Step 17 Complete the "DLP-C60 Provision a DS-1, DS-3, or EC-1 Circuit Route" task on page 17-78 for the DS-1 circuit that you are creating.

Step 18 Click **Finish**.

CTC compares your manually provisioned circuit route with the specified path diversity option you chose in Step 13. If the path does not meet the specified path diversity requirement, CTC displays an error message and allows you to change the circuit path.

Step 19 If you entered more than 1 in the Number of Circuits field, the Circuit Creation dialog box appears for you to create the remaining circuits. Repeat Steps 5 through 18 for each additional circuit.

Step 20 When all the circuits are created, the main Circuits window appears. Verify that the circuits you created are correct.

Step 21 Complete the "NTP-C46 Test Electrical Circuits" procedure on page 6-26. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C39 Create a Unidirectional DS-1 Circuit with Multiple Drops

Purpose	This procedure creates a unidirectional DS-1 circuit with multiple drops (destinations).
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the circuit source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, complete the following fields:

- Circuit Type—Choose **STS** or **VT**.
- Number of Circuits—Leave the default (1) unchanged.
- Auto-ranged—Unavailable when the Number of Circuits field is 1.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-3 on page 6-14):

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—If you are creating an STS circuit, choose **STS-1**. If you are creating a VT circuit, Size displays VT1.5 and cannot be changed.
- Bidirectional—Uncheck for this circuit.
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. If this check box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- Diagnostic—Leave the default (unchecked) unchanged.
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
  - **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

Note If VT circuit source and destination ports are in an OOS-AU,AINS; OOS-MA,MT; or IS-NR service state, VT circuits in OOS-AU,AINS change to IS-NR even if a physical signal is not present.

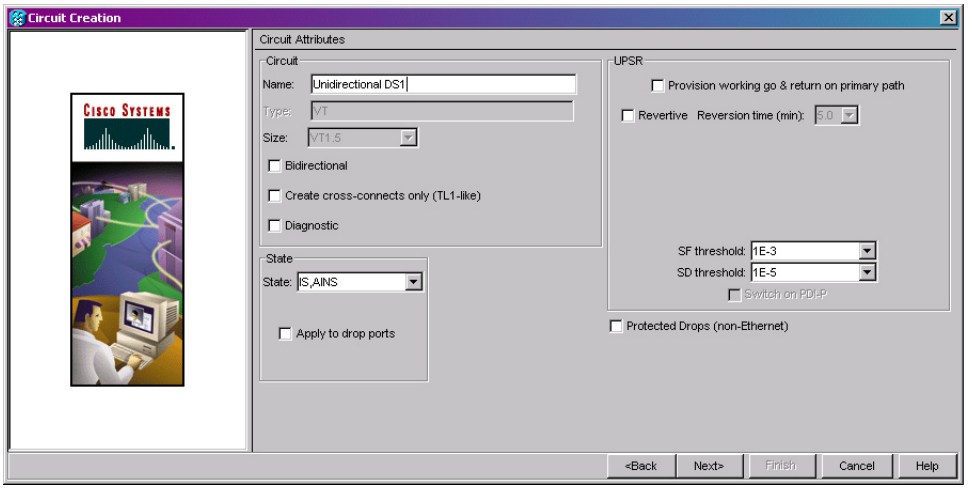
For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Protected Drops—Check this check box if you want the circuit routed to protect drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected ports as source and destination choices.

Figure 6-3 Setting Circuit Attributes for a Unidirectional DS-1 Circuit



Step 8 Click **Next**.

Step 9 Complete the "DLP-C58 Provision a DS-1 Circuit Source and Destination" task on page 17-76.

Step 10 In the Circuit Routing Preferences area, uncheck **Route Automatically**. When Route Automatically is not checked, the Using Required Nodes/Spans and Review Route Before Circuit Creation check boxes are unavailable.

Step 11 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 12. Fully protected paths might or might not have path protection path segments (with primary and alternate paths), and the path diversity options apply only to path protection path segments, if any exist.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 14.

Step 12 If you selected Fully Protected Path in Step 11 and the circuit will be routed on a path protection configuration, choose one of the following:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within the path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.
- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Step 13 If you selected Fully Protected Path in Step 11 and the circuit will be routed on a path protection DRI, check the **Dual Ring Interconnect** check box.

Step 14 If you are creating an STS circuit, skip this step and continue with Step 15. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 15 Click **Next**. In the Route Review and Edit area, node icons appear for you to route the circuit manually. The circuit source node is selected. Green arrows pointing from the source node to other network nodes indicate spans that are available for routing the circuit.

Step 16 Complete the "DLP-C60 Provision a DS-1, DS-3, or EC-1 Circuit Route" task on page 17-78 for the DS-1 circuit that you are creating.

Step 17 Click **Finish**. CTC completes the circuit. The Circuits window appears.

Step 18 In the Circuits window, click the circuit that you want to route to multiple drops. The Delete, Edit, and Search buttons become active.

Step 19 Click **Edit** (or double-click the circuit row). The Edit Circuit window appears with the General tab selected.

All nodes in the DCC network appear on the network map. Circuit source and destination information appears under the source and destination nodes. To display a detailed view of the circuit, click **Show Detailed Map**. To rearrange a node icon, select the node, press **Ctrl**, then drag and drop the icon to the new location.

Step 20 In the Edit Circuit dialog box, click the **Drops** tab. A list of existing drops appears.

Step 21 Click **Create**.

Step 22 In the Define New Drop dialog box, create the new drop:

- **a.** Node—Choose the target node for the circuit drop.
- **b.** Slot—Choose the target card and slot.
- **c.** Port, STS, VT, or DS1—Choose the port, STS, VT, or DS-1 from the Port, STS, VT, or DS-1 drop-down lists. The card selected in Step b determines the fields that appear. See Table 6-2 on page 6-3 for a list of options.
- **d.** The routing preferences for the new drop will match those of the original circuit. If the original circuit was routed on a protected path, you can change the nodal diversity options: Nodal Diversity Required, Nodal Diversity Desired, or Link Diversity Only. See Step 12 for option descriptions.
- **e.** If you want to change the circuit state, choose the circuit state from the Target Circuit State drop-down list. The state chosen applies to the entire circuit.
- **f.** Check **Apply to drop ports** if you want to apply the state chosen in the Target Circuit State to the circuit source and destination drops.
- **g.** Click **Finish**. The new drop appears in the Drops list.

Step 23 If you need to create additional drops for the circuit, repeat Steps 21 and 22 to create the additional drops.

Step 24 Click **Close**. The Circuits window appears.

Step 25 Verify that the new drops appear in the Destination column for the circuit you edited. If they do not appear repeat Steps 5 through 24, making sure all options are provisioned correctly.

Step 26 Complete the "NTP-C46 Test Electrical Circuits" procedure on page 6-26. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C40 Create an Automatically Routed DS-3 or EC-1 Circuit

Purpose	This procedure creates an automatically routed DS-3 or EC-1 circuit. CTC routes the circuit automatically based on circuit creation parameters and the software version.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the circuit source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, complete the following fields:

- Circuit Type—Choose **STS (both DS-3 and EC-1)** or **VT (EC-1 only)**.
- Number of Circuits—Enter the number of DS-3 or EC-1 circuits that you want to create. The default is 1. If you are creating multiple circuits with sequential source and destination ports, you can use autoranging to create the circuits automatically.
- Auto-ranged—This check box is automatically selected if you enter more than 1 in the Number of Circuits field. Leave selected if you are creating multiple DS-3 or EC-1 circuits with the same source and destination and you want CTC to create the circuits automatically. Uncheck this check box if you do not want CTC to create sequential circuits automatically.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-4 on page 6-17):

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—If you are creating an STS circuit, choose **STS-1**. If you are creating a VT circuit, Size displays VT1.5 and cannot be changed.
- Bidirectional—Leave the default (checked) for this circuit.
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- Diagnostic—Leave the default (unchecked).
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.

- **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
- **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

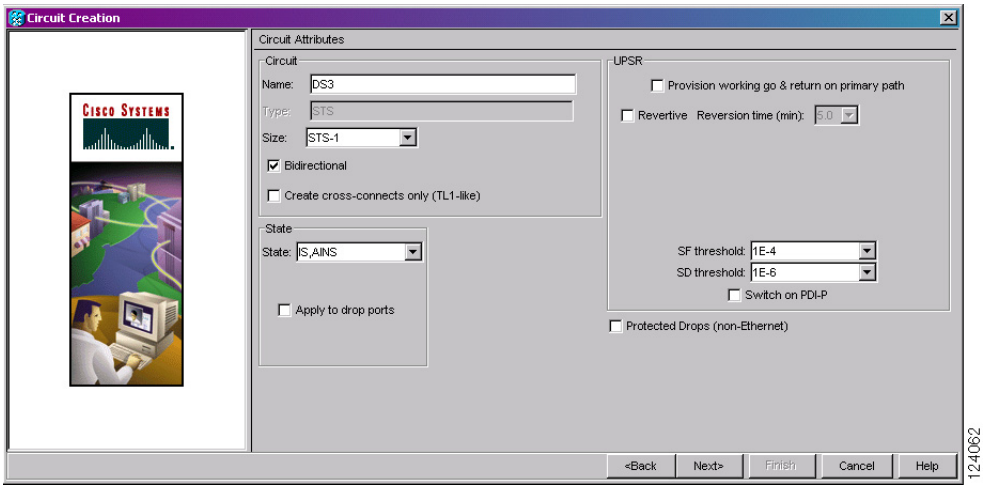
For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Protected Drops—Check this check box if you want the circuit routed on protected drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected cards and ports as source and destination choices.

Figure 6-4 Setting Circuit Attributes for a DS-3 or EC-1



Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-C57 Provision Path Protection Selectors During Circuit Creation" task on page 17-75.

Step 9 Click **Next**.

Step 10 Complete the "DLP-C61 Provision a DS-3 or EC-1 Circuit Source and Destination" task on page 17-79.

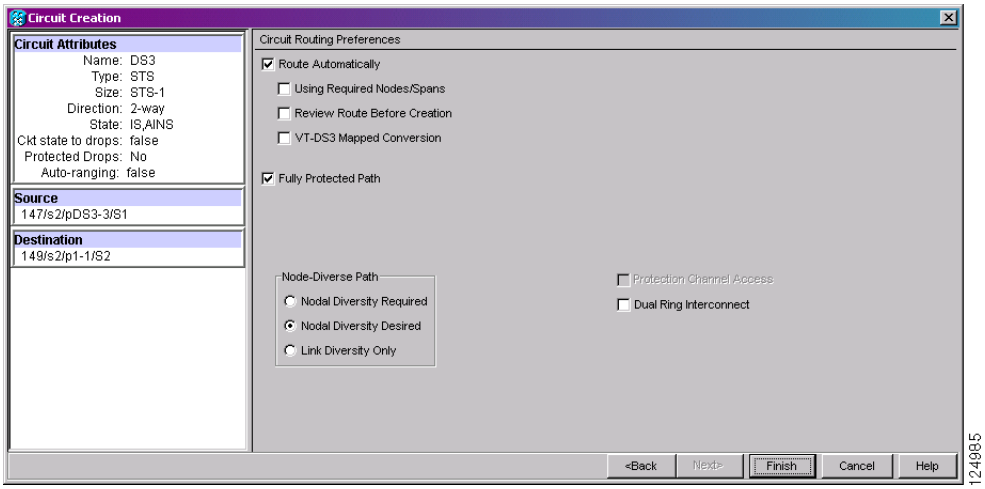
Step 11 In the Circuit Routing Preferences area (Figure 6-5), choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences:

- Using Required Nodes/Spans—Check this check box to specify nodes and spans to include or exclude in the CTC-generated circuit route.

  Including nodes and spans for a circuit ensures that those nodes and spans are in the working path of the circuit (but not the protect path). Excluding nodes and spans ensures that the nodes and spans are not in the working or protect path of the circuit.

- Review Route Before Creation—Check this check box to review and edit the circuit route before the circuit is created.

Figure 6-5 Setting Circuit Routing Preferences for a DS-3 or EC-1 Circuit



Step 12 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 13. CTC creates a fully protected circuit route based on the path diversity option you choose. Fully protected paths might or might not have path protection path segments (with primary and alternate paths), and the path diversity options apply only to path protection path segments, if any exist.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

Step 13 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection configuration, choose one of the following:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.
- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Step 14 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection DRI, check the **Dual Ring Interconnect** check box.

Step 15 If you selected Using Required Nodes/Spans in Step 11, complete the following substeps; otherwise, continue with Step 17:

a. Click **Next**.

b. In the Circuit Route Constraints area, click a node or span on the circuit map.

c. Click **Include** to include the node or span in the circuit. Click **Exclude** to exclude the node or span from the circuit. The order in which you choose included nodes and spans determines the circuit sequence. Click spans twice to change the circuit direction.

d. Repeat Step c for each node or span you want to include or exclude.

e. Review the circuit route. To change the circuit routing order, choose a node from the Required Nodes/Lines or Excluded Nodes Links lists, then click the **Up** or **Down** buttons to change the circuit routing order. Click **Remove** to remove a node or span.

Note If a node or span stays gray, that node or span is required.

Step 16 If you are creating an STS circuit, skip this step and continue with Step 17. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 17 If you selected Review Route Before Creation in Step 11, complete the following substeps; otherwise, continue with Step 18.

a. Click **Next**.

b. Review the circuit route. To add or delete a circuit span, choose a node on the circuit route. Blue arrows show the circuit route. Green arrows indicate spans that you can add. Click a span arrowhead, then click **Include** to include the span or **Remove** to remove the span.

c. If the provisioned circuit does not reflect the routing and configuration you want, click **Back** to verify and change the circuit information. If the circuit needs to be routed to a different path, see the "NTP-C41 Create a Manually Routed DS-3 or EC-1 Circuit" procedure on page 6-20.

Step 18 Click **Finish**. One of the following actions occurs based on the circuit properties you selected:

- If you entered 1 in the Number of Circuits field, CTC creates the circuit.
- If you entered more than 1 in the Number of Circuits field and chose Auto-ranged, CTC automatically creates the number of circuits entered in the Number of Circuits field. If autoranging cannot complete all the circuits, for example, because sequential ports are unavailable at the source or destination, a dialog box appears. Set the new source or destination for the remaining circuits, then click **Finish** to continue autoranging. After completing the circuits, the Circuits window appears.
- If you entered more than 1 in the Number of Circuits field and did not choose Auto-ranged, the Circuit Creation dialog box appears for you to create the remaining circuits. Repeat Steps 5 through 17 for each additional circuit. After completing the circuits, the Circuits window appears.

Step 19 In the Circuits window, verify that the circuits you just created appear in the circuits list.

Step 20 Complete the "NTP-C46 Test Electrical Circuits" procedure on page 6-26. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C41 Create a Manually Routed DS-3 or EC-1 Circuit

Purpose	This procedure creates a DS-3 or EC-1 circuit and allows you to choose the circuit route.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the circuit source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, complete the following fields:

- Circuit Type—Choose **STS (both DS-3 and EC-1)** or **VT (EC-1 only)**.
- Number of Circuits—Enter the number of DS-3 or EC-1 circuits that you want to create. The default is 1.
- Auto-ranged—Applies to automatically routed circuits only. If you entered more than 1 in Number of Circuits, uncheck this check box. (The check box is unavailable if only one circuit is entered in Number of Circuits.)

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-4 on page 6-17):

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave this field blank, CTC assigns a default name to the circuit.
- Size—If you are creating an STS circuit, choose **STS-1**. If you are creating a VT circuit, Size displays VT1.5 and cannot be changed.
- Bidirectional—Leave the default (checked).
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- Diagnostic—Leave the default (unchecked).
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.

– **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Protected Drops—Check this check box if you want the circuit routed to protect drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected cards as source and destination choices.

Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-C57 Provision Path Protection Selectors During Circuit Creation" task on page 17-75.

Step 9 Click **Next**.

Step 10 Complete the "DLP-C61 Provision a DS-3 or EC-1 Circuit Source and Destination" task on page 17-79.

Step 11 In the Circuit Routing Preferences area (Figure 6-5 on page 6-18), uncheck **Route Automatically**.

Step 12 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 13. Fully protected paths might or might not have path protection path segments (with primary and alternate paths), and the path diversity options apply only to path protection path segments, if any exist.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

Step 13 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection configuration, choose one of the following:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within the path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.
- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Step 14 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection DRI, check the **Dual Ring Interconnect** check box.

Step 15 If you are creating an STS circuit, skip this step and continue with Step 16. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 16 Click **Next**. In the Route Review and Edit area, node icons appear for you to route the circuit manually. The green arrows pointing from the selected node to other network nodes indicate spans that are available for routing the circuit.

Step 17 Complete the "DLP-C60 Provision a DS-1, DS-3, or EC-1 Circuit Route" task on page 17-78 for the DS-3 or EC-1 circuit that you are creating.

Step 18 Click **Finish**.

Step 19 If you entered more than 1 in the Number of Circuits field, the Circuit Creation dialog box appears for you to create the remaining circuits. Repeat Steps 5 through 17 for each additional circuit.

Step 20 When all the circuits are created, the main Circuits window appears. Verify that the circuits you created appear in the window.

Step 21 Complete the "NTP-C46 Test Electrical Circuits" procedure on page 6-26. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C42 Create a Unidirectional DS-3 or EC-1 Circuit with Multiple Drops

Purpose	This procedure creates a unidirectional DS-3 or EC-1 circuit with multiple drops.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the circuit source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, complete the following fields:

- Circuit Type—Choose **STS (both DS-3 and EC-1)** or **VT (EC-1 only)**.
- Number of Circuits—Leave the default unchanged (1).
- Auto-ranged—Unavailable when the Number of Circuits is 1.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-6 on page 6-24):

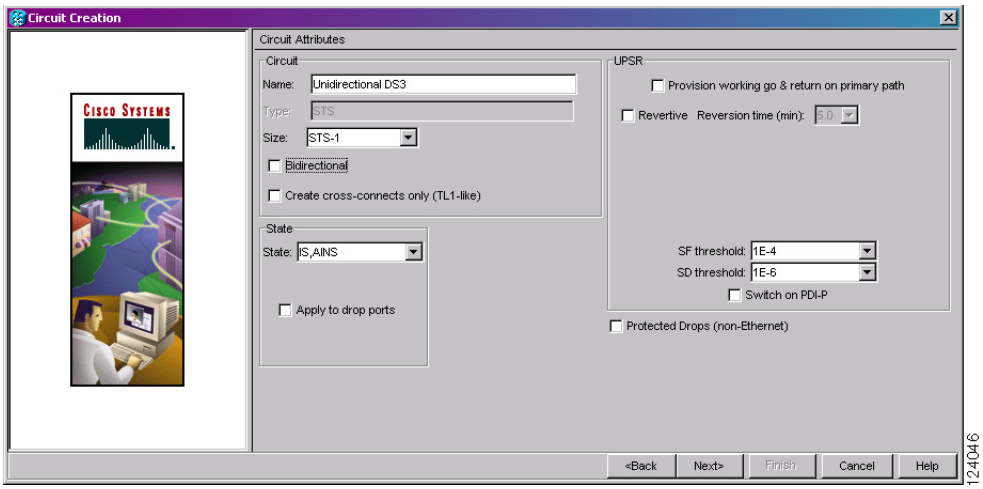
- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—If you are creating an STS circuit, choose **STS-1**. If you are creating a VT circuit, Size displays VT1.5 and cannot be changed.
- Bidirectional—Uncheck for this circuit.
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- Diagnostic—Leave the default (unchecked).
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
  - **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

  For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual.*
- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

  Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Protected Drops—Check this check box if you want the circuit routed to protect drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected cards as source and destination choices.

Figure 6-6 Setting Circuit Attributes for a Unidirectional DS-3 or EC-1 Circuit



Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-C57 Provision Path Protection Selectors During Circuit Creation" task on page 17-75.

Step 9 Click **Next**.

Step 10 Complete the "DLP-C61 Provision a DS-3 or EC-1 Circuit Source and Destination" task on page 17-79.

Step 11 Uncheck **Route Automatically**. When Route Automatically is not checked, Using Required Nodes/Spans and Review Route Before Circuit Creation are unavailable.

Step 12 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 13. Fully protected paths might or might not have path protection path segments (with primary and alternate paths), and the path diversity options apply only to path protection path segments, if any exist.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

Step 13 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection configuration, choose one of the following:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within the path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.
- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Step 14 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection DRI, check the **Dual Ring Interconnect** check box.

Step 15 If you are creating an STS circuit, skip this step and continue with Step 16. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 16 Click **Next**. In the Route Review and Edit area, node icons appear for you to route the circuit manually. The circuit source node is selected. Green arrows pointing from the source node to other network nodes indicate spans that are available for routing the circuit.

Step 17 Complete the "DLP-C60 Provision a DS-1, DS-3, or EC-1 Circuit Route" task on page 17-78 for the DS-3 or EC-1 you are creating.

Step 18 Click **Finish**. After completing the circuit, the Circuits window appears.

Step 19 In the Circuits window, click the circuit that you want to route to multiple drops. The Delete, Edit, and Search radio buttons become active.

Step 20 Click **Edit**. The Edit Circuit window appears with the General tab selected. All nodes in the DCC network appear on the network map. Circuit source and destination information appears under the source and destination nodes. To display a detailed view of the circuit, click **Show Detailed Map**. You can rearrange the node icons by selecting the node with the left mouse button while simultaneously pressing **Ctrl** then dragging the icon to the new location.

Step 21 In the Edit Circuit dialog box, click the **Drops** tab. A list of existing drops appears.

Step 22 Click **Create**.

Step 23 In the Define New Drop dialog box, define the new drop:

- **a.** Node—Choose the target node for the circuit drop.
- **b.** Slot—Choose the target card and slot.
- **c.** Port, STS—Choose the port and/or STS from the Port and STS drop-down lists. The card selected in Step b determines whether port, STS, or both lists display. See Table 6-2 on page 6-3 for a list of options.
- **d.** VT—If applicable, choose the VT from the VT drop-down list.
- **e.** The routing preferences for the new drop will match those of the original circuit. If the original circuit was routed on a protected path, you can change the nodal diversity options: Nodal Diversity Required, Nodal Diversity Desired, or Link Diversity Only. See Step 13 for option descriptions.
- **f.** If you want to change the circuit state, choose the circuit state from the Target Circuit State drop-down list. The state chosen applies to the entire circuit.
- **g.** Check **Apply to drop ports** if you want to apply the state chosen in the Target Circuit State to the circuit source and destination drops.
- **h.** Click **Finish**. The new drop appears in the Drops list.

Step 24 If you need to create additional drops for the circuit, repeat Steps 22 and 23 to create the additional drops.

Step 25 Click **Close**. The Circuits window appears.

Step 26 Verify that the new drops appear in the Destination column for the circuit you edited. If they do not appear, repeat this procedure, making sure all options are provisioned correctly.

Step 27 Complete the "NTP-C46 Test Electrical Circuits" procedure on page 6-26. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C46 Test Electrical Circuits

Purpose	This procedure tests DS-1, DS-3, and EC-1 circuits.
Tools/Equipment	A test set and all appropriate cables
Prerequisite Procedures	This procedure assumes you completed a facility loopback tests on the fibers and cables from the source and destination nodes to the DSX and that you created a circuit using one of the following procedures: NTP-C37 Create an Automatically Routed DS-1 Circuit, page 6-6 NTP-C38 Create a Manually Routed DS-1 Circuit, page 6-10 NTP-C39 Create a Unidirectional DS-1 Circuit with Multiple Drops, page 6-12 NTP-C40 Create an Automatically Routed DS-3 or EC-1 Circuit, page 6-16 NTP-C41 Create a Manually Routed DS-3 or EC-1 Circuit, page 6-20 NTP-C42 Create a Unidirectional DS-3 or EC-1 Circuit with Multiple Drops, page 6-22
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you created the circuits. If you are already logged in, continue with Step 2.

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

Step 3 Click the **Circuits** tab.

Step 4 Complete the "DLP-C111 Change a Circuit Service State" task on page 18-17 to set the circuit and circuit ports to the OOS-MA,MT service state. Note the original state because you will change it back at the end of the procedure.

Step 5 Set the source and destination DS-1 port line length:

- **a.** In network view, double-click the source node.
- **b.** Double-click the circuit source card and click the **Provisioning > Line** tabs.
- **c.** From the circuit source port Line Length drop-down list, choose the line length for the distance (in feet) between the DSX (if used) or circuit termination point and the source node.
- **d.** Click **Apply**.
- **e.** From the View menu, choose **Go to Network View**.
- **f.** Repeat Steps a through e for the destination port line length.

Step 6 Attach loopback cables to the circuit destination card:

- **a.** Verify the integrity of the loopback cable by looping the test set transmit (Tx) connector to the test set receive (Rx) connector. If the test set does not run error-free, check the cable for damage and check the test set to make sure it is set up correctly before going to Step b.
- **b.** Attach the loopback cable to the port you are testing. Connect the Tx connector to the Rx connector of the port being tested.

Step 7 Attach loopback cables to the circuit source node:

a. Test the loopback cable by connecting one end to the test set Tx port and the other end to the test set Rx port. 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.

b. Attach the loopback cable to the port you are testing. Connect the test set to the circuit source port. Connect the Tx port of the test set to the circuit Rx port, and the test set Rx port to the circuit Tx port.

Step 8 Configure the test set for the card that is the source of the circuit you are testing:

- DS-1—If you are testing an unmultiplexed DS-1, you must have a DSX-1 panel or use the high-density DS-1 interface through the LFH-96 connector. Set the test set for DS-1. For information about configuring your test set, consult your test set user guide.
- DS-3/EC-1—If you are testing a clear channel DS-3 or EC-1, you must have a direct DS-3/EC-1 interface into the node through the broadband electrical (BBE) ports on the CTX card. Set the test set for clear channel DS-3. For information about configuring your test set, consult your test set user guide.

Step 9 Verify that the test set displays a clean signal. If a clean signal does not appear, repeat Steps 2 through 8 to make sure the test set and cabling is configured correctly.

Step 10 Inject errors from the test set. Verify that the errors display at the source and destination nodes.

Step 11 Clear the performance monitoring (PM) counts for the ports that you tested. See the "DLP-C95 Clear Selected PM Counts" task on page 17-114 for instructions.

Step 12 Complete the "DLP-C111 Change a Circuit Service State" task on page 18-17 to set the circuit and circuit ports to their original service state.

Step 13 As needed, complete the "DLP-C55 Path Protection Switching Test" task on page 17-73.

Step 14 Perform a bit error rate test (BERT) for 12 hours or follow your site requirements for length of time. For information about configuring your test set for BERT, see your test set user guide.

Step 15 After the BERT is complete, print the results or save them to a disk for future reference. For information about printing or saving test results, see your test set user guide.

Stop. You have completed this procedure.

NTP-C43 Create an Automatically Routed VT Tunnel

Purpose	This procedure creates an automatically routed VT tunnel from source to destination nodes.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note VT tunnels allow VT circuits to pass through intermediary ONS nodes without consuming VT matrix resources on the 15310-CL-CTX or CTX2500 card. VT tunnels can carry 28 VT1.5 circuits. In general, creating VT tunnels is a good idea if you are creating many VT circuits from the same source and destination. Refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual* for more information.

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the tunnel source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, choose **VT Tunnel** from the Circuit Type list.

Step 6 Click **Next**.

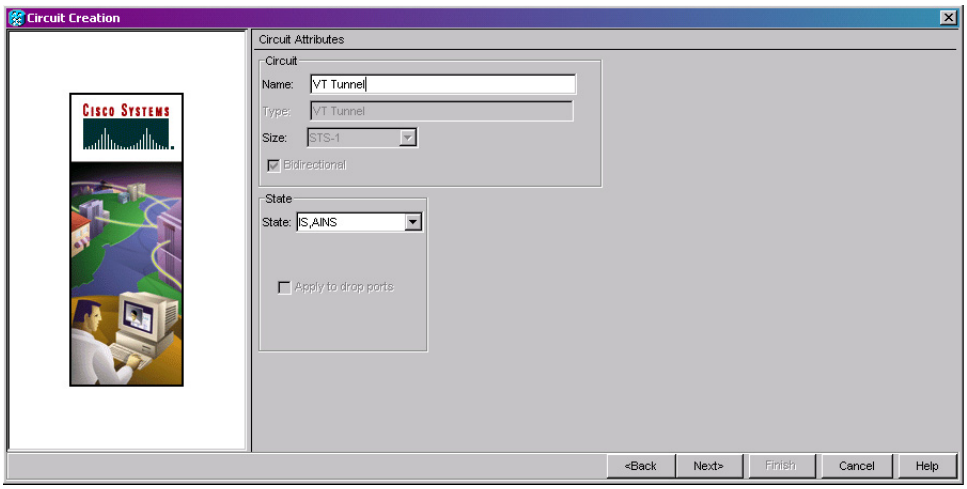
Step 7 Define the circuit attributes (Figure 6-7 on page 6-29):

- Name—Assign a name to the VT tunnel. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the tunnel.
- Size—Unavailable for VT tunnels.
- Bidirectional—Unavailable for VT tunnels.
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
  - **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

  Note A VT tunnel automatically transitions into the IS service state after a VT circuit is created.

  For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual.*
- Apply to drop ports—Unavailable for VT tunnels.

Figure 6-7 Setting Attributes for a VT Tunnel



Step 8 Click **Next**.

Step 9 In the Circuit Source area, choose the node where the VT tunnel will originate from the Node drop-down list.

Step 10 Click **Next**.

Step 11 In the Circuit Destination area, choose the node where the VT tunnel will terminate from the Node drop-down list.

Step 12 Click **Next**.

Step 13 In the Circuit Routing Preferences area, choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

- Using Required Nodes/Spans—Check this check box to specify nodes and spans to include or exclude in the CTC-generated tunnel route.

  Including nodes and spans for a circuit ensures that those nodes and spans are in the working path of the circuit (but not the protect path). Excluding nodes and spans ensures that the nodes and spans are not in the working or protect path of the circuit.

- Review Route Before Creation—Check this check box to review and edit the VT tunnel route before the circuit is created.

Step 14 If you selected Using Required Nodes/Spans in Step 13:

a. Click **Next**.

b. In the Circuit Route Constraints area, click a span on the VT tunnel map.

c. Click **Include** to include the node or span in the VT tunnel. Click **Exclude** to exclude the node or span from the VT tunnel. The order in which you choose included nodes and spans sets the VT tunnel sequence. Click spans twice to change the circuit direction.

d. Repeat Step c for each node or span you want to include or exclude.

e. Review the VT tunnel route. To change the tunnel routing order, choose a node in the Required Nodes/Lines or Excluded Nodes Links lists, then click the **Up** or **Down** buttons to change the tunnel routing order. Click **Remove** to remove a node or span.

Step 15 If you selected Review Route Before Creation in Step 13:

a. Click **Next**.

b. Review the tunnel route. To add or delete a tunnel span, choose a node on the tunnel route. Blue arrows show the tunnel route. Green arrows indicate spans that you can add. Click a span arrowhead, then click **Include** to include the span or **Remove** to remove the span.

c. If the provisioned tunnel does not reflect the routing and configuration you want, click **Back** to verify and change tunnel information.

Step 16 Click **Finish**. The Circuits window appears.

Step 17 Verify that the tunnel you just created appears in the circuits list. VT tunnels are identified by VTT in the Type column.

Stop. You have completed this procedure.

NTP-C44 Create a Manually Routed VT Tunnel

Purpose	This procedure creates a manually routed VT tunnel from source to destination nodes.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note VT tunnels allow VT circuits to pass through intermediary ONS nodes without consuming VT matrix resources on the 15310-CL-CTX or CTX2500 card. VT tunnels can carry 28 VT1.5 circuits. In general, creating VT tunnels is a good idea if you are creating many VT circuits from the same source and destination. Refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual* for more information.

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the tunnel source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, choose **VT Tunnel** from the Circuit Type list.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-7 on page 6-29):

- Name—Assign a name to the VT tunnel. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the tunnel.
- Size—Unavailable for VT tunnels.
- Bidirectional—Unavailable for VT tunnels.

- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
  - **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

Note A VT tunnel automatically transitions into the IS service state after a VT circuit is created.

For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

Step 8 Click **Next**.

Step 9 In the Circuit Source area, choose the node where the VT tunnel will originate from the Node drop-down list.

Step 10 Click **Next**.

Step 11 In the Circuit Destination area, choose the node where the VT tunnel will terminate from the Node drop-down list.

Step 12 Click **Next**.

Step 13 In the Circuit Routing Preferences area, uncheck **Route Automatically**.

Step 14 Click **Next**. In the Route Review and Edit area, node icons appear for you to route the tunnel. The circuit source node is selected. Green arrows pointing from the source node to other network nodes indicate spans that are available for routing the tunnel.

Step 15 Complete the "DLP-C62 Provision a VT Tunnel Route" task on page 17-80 for the tunnel you are creating. The Circuits window appears.

Step 16 Verify that the tunnel you just created appears in the circuits list. VT tunnels are identified by VTT in the Type column.

Stop. You have completed this procedure.

NTP-C45 Create a VT Aggregation Point

Purpose	This procedure creates a VT aggregation point (VAP). VAPs allow multiple DS-1 (VT1.5) circuits to be aggregated on a single STS on an OC-N port. VAPs allow multiple VT1.5 circuits to pass through the 15310-CL-CTX or CTX2500 card without utilizing resources on the 15310-CL-CTX or CTX2500 card VT matrix.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note The maximum number of VAPs that you can create depends on the node protection topology and number of VT1.5 circuits that terminate on the node. Assuming no other VT1.5 circuits terminate at the node, the maximum number of VAPs that can terminate at one node is five for the ONS 15310-CL and ten for the ONS 15310-MA.

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the tunnel source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, choose **VT Aggregation Point** from the Circuit Type list.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-8 on page 6-33):

- Name—Assign a name to the VT aggregation point. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the VAP.
- Size—(Display only) Displays STS-1.
- Bidirectional—(Display only) The check box is checked.
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.

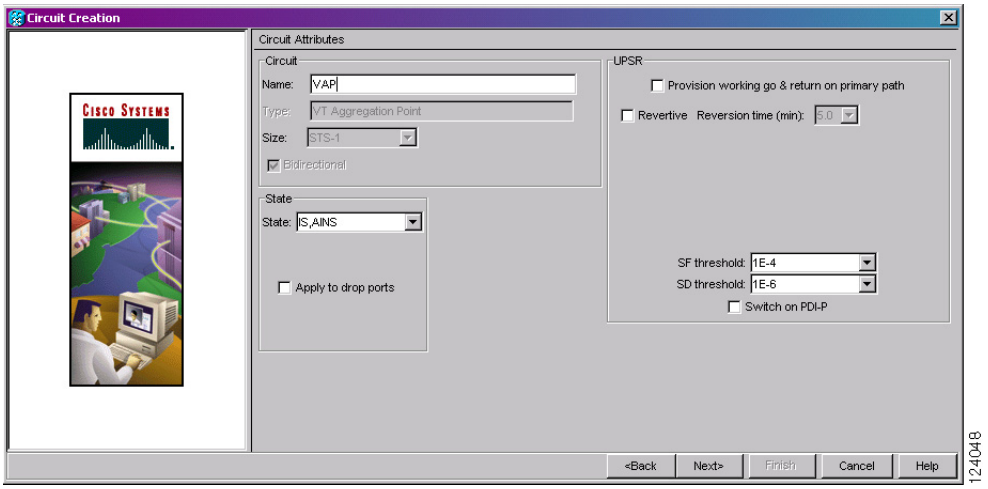
– **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

Note A VAP automatically transitions into the IS service state after a VT circuit is created.

For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

- Apply to drop ports—Uncheck this check box.

Figure 6-8 Setting Attributes for a VT Aggregation Point



Step 8 Click **Next**.

Step 9 In the Circuit Source area, choose the source node, slot, port, and STS for the VAP. The VAP source is where the DS-1 (VT1.5) circuits will be aggregated into a single STS. The VAP destination is where the DS-1 circuits originate.

a. From the Node drop-down list, choose the node where the VAP will originate.

b. From the Slot drop-down list, choose the slot containing the OC-N port where the VAP will originate.

c. From the Port drop-down list, choose the desired port.

d. From the STS drop-down list, choose the source STS.

Step 10 Click **Next**.

Step 11 In the Circuit Destination area, choose the node where the VT circuits aggregated by the VAP will terminate from the Node drop-down list.

Step 12 Click **Next**.

Step 13 In the Circuit Routing Preferences area, choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

- Using Required Nodes/Spans—Check this check box to specify nodes and spans to include or exclude in the VAP route.

Including nodes and spans for a circuit ensures that those nodes and spans are in the working path of the circuit (but not the protect path). Excluding nodes and spans ensures that the nodes and spans are not in the working or protect path of the circuit.

- Review Route Before Creation—Check this check box to review and edit the VAP route before the circuit is created.

Step 14 If you selected Using Required Nodes/Spans in Step 13, complete the following steps:

a. Click **Next**.

b. In the Circuit Route Constraints area, click a span on the VAP map.

c. Click **Include** to include the node or span in the VAP. Click **Exclude** to exclude the node or span from the VAP. The sequence in which you choose the nodes and spans sets the VAP sequence. Click spans twice to change the circuit direction.

d. Repeat Step c for each node or span you want to include or exclude.

e. Review the VAP route. To change the tunnel routing order, choose a node in the Required Nodes/Lines or Excluded Nodes Links lists, then click the **Up** or **Down** buttons to change the tunnel routing order. Click **Remove** to remove a node or span.

Step 15 If you selected Review Route Before Creation in Step 13, complete the following steps:

a. Click **Next**.

b. Review the tunnel route. To add or delete a tunnel span, choose a node on the tunnel route. Blue arrows show the tunnel route. Green arrows indicate spans that you can add. Click a span arrowhead, then click **Include** to include the span or **Remove** to remove the span.

c. If the provisioned tunnel does not reflect the routing and configuration you want, click **Back** to verify and change tunnel information.

Step 16 Click **Finish**. The Circuits window appears.

Step 17 Verify that the VAP you just created appears in the circuits list. VAPs are identified in the Type column. The VAP tunnel automatically transitions into the IS-NR service state.

Stop. You have completed this procedure.

NTP-C47 Create an Automatically Routed Optical Circuit

Purpose	This procedure creates an automatically routed optical circuit.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4 NTP-C130 Manage Pluggable Port Modules, page 10-3 (as needed)
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the circuit source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 Complete the following as necessary (you can provision Ethernet or packet-over-SONET (POS) ports before or after the STS circuit is created):

- To provision Ethernet ports for CE-100T-8 circuits, complete the "DLP-C190 Provision CE-100T-8 Card Ethernet Ports" task on page 18-89.
- To provision POS ports for CE-100T-8 circuits, complete the "DLP-C191 Provision CE-100T-8 Card POS Ports" task on page 18-91.
- To provision link integrity soak timer for Ethernet card, complete the "DLP-C278 Configure Link Integrity Timer" task on page 19-93.

Step 4 From the View menu, choose **Go to Network View**.

Step 5 Click the **Circuits** tab, then click **Create**.

- Circuit Type—Choose **STS** or **VT**.
- Number of Circuits—Enter the number of optical circuits that you want to create. The default is 1. If you are creating multiple circuits with the same source and destination, you can use autoranging to create the circuits automatically.
- Auto-ranged—This check box is automatically checked when you enter more than 1 in the Number of Circuits field. Leave checked if you are creating multiple optical circuits with the same source and destination and you want CTC to create the circuits automatically. Uncheck this check box if you do not want CTC to create the circuits automatically.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-9 on page 6-36):

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—Choose the optical circuit size. If you are creating an STS circuit, the choices are STS-1, STS-3c, STS-6c, STS-9c, or STS-12c. If you are creating a VT circuit, the Size displays VT1.5. You cannot change it.
- Bidirectional—Leave the default (checked) for this circuit.
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- Diagnostic—Leave the default (unchecked).
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.

– **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

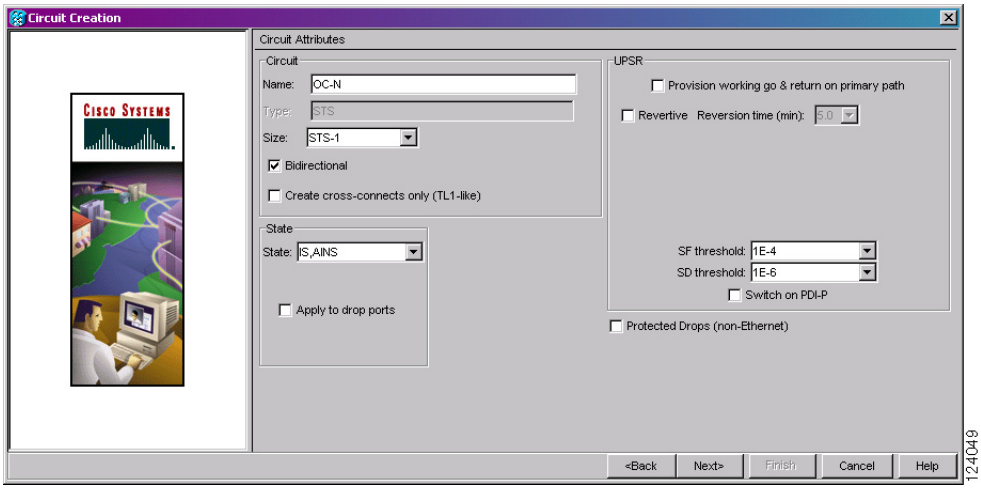
For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Protected Drops—Check this check box if you want the circuit routed to protected drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected cards as source and destination choices.

Figure 6-9 Setting Circuit Attributes for an Optical Circuit



Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-C57 Provision Path Protection Selectors During Circuit Creation" task on page 17-75.

Step 9 Click **Next**.

Step 10 Complete the "DLP-C63 Provision an OC-N Circuit Source and Destination" task on page 17-80 for the optical circuit that you are creating.

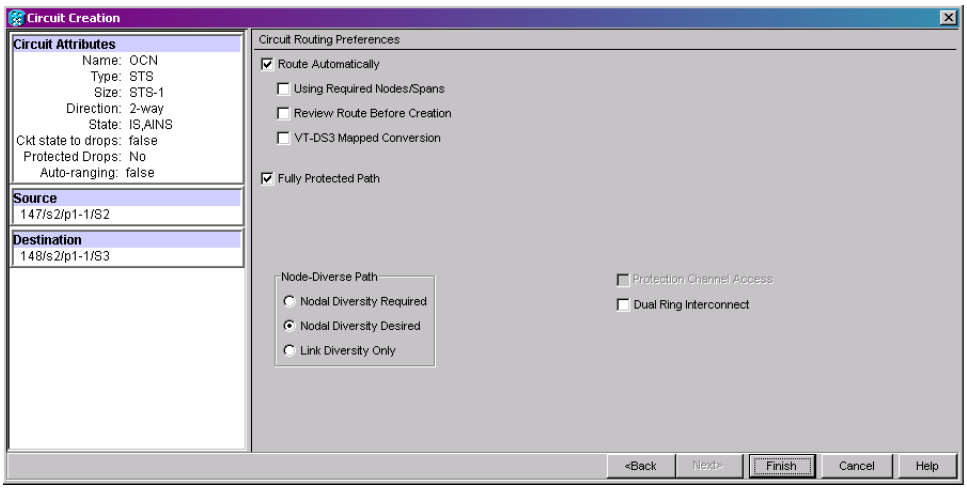
Step 11 In the Circuit Routing Preferences area (Figure 6-10), choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

- Using Required Nodes/Spans—Check this check box to specify nodes and spans to include or exclude in the CTC-generated circuit route.

Including nodes and spans for a circuit ensures that those nodes and spans are in the working path of the circuit (but not the protect path). Excluding nodes and spans ensures that the nodes and spans are not in the working or protect path of the circuit.

- Review Route Before Creation—Check this check box to review and edit the circuit route before the circuit is created.

Figure 6-10 Setting Circuit Routing Preferences for an Optical Circuit



Step 12 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 13. CTC creates a fully protected circuit route based on the path diversity option you choose. Fully protected paths might or might not have path protection path segments (with primary and alternate paths), and the path diversity options apply only to path protection path segments, if any exist.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

Step 13 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection configuration, choose one of the following:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.
- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Step 14 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection DRI, check the **Dual Ring Interconnect** check box.

Step 15 If you selected Using Required Nodes/Spans in Step 11, complete the following substeps. If not, continue with Step 17:

a. Click **Next**.

b. In the Circuit Route Constraints area, click a node or span on the circuit map.

c. Click **Include** to include the node or span in the circuit, or click **Exclude** to exclude the node or span from the circuit. The order in which you choose included nodes and spans is the order in which the circuit will be routed. Click spans twice to change the circuit direction.

d. Repeat Step c for each node or span you want to include or exclude.

e. Review the circuit route. To change the circuit routing order, choose a node in the Required Nodes/Lines or Excluded Nodes Links lists, then click the **Up** or **Down** buttons to change the circuit routing order. Click **Remove** to remove a node or span.

Step 16 If you are creating an STS circuit, skip this step and continue with Step 17. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 17 If you selected Review Route Before Creation in Step 11, complete the following substeps; otherwise, continue with Step 18:

a. Click **Next**.

b. Review the circuit route. To add or delete a circuit span, choose a node on the circuit route. Blue arrows show the circuit route. Green arrows indicate spans that you can add. Click a span arrowhead, then click **Include** to include the span or **Remove** to remove the span.

c. If the provisioned circuit does not reflect the routing and configuration you want, click **Back** to verify and change the circuit information. If the circuit needs to be routed to a different path, see the "NTP-C48 Create a Manually Routed Optical Circuit" procedure on page 6-39 to assign the circuit route yourself.

Step 18 Click **Finish**. One of the following results occurs, based on the circuit properties you provisioned in the Circuit Creation dialog box:

- If you entered 1 in the Number of Circuits field, CTC creates the circuit.
- If you entered more than 1 in Number of Circuits and chose Auto-ranged, CTC automatically creates the number of circuits entered in Number of Circuits. If autoranging cannot complete all the circuits, for example, because sequential ports are unavailable on the source or destination, a dialog box appears. Set the new source or destination for the remaining circuits, then click **Finish** to continue autoranging. After completing the circuits, the Circuits window appears.
- If you entered more than 1 in Number of Circuits and did not choose Auto-ranged, the Circuit Creation dialog box appears for you to create the remaining circuits. Repeat Steps 7 through 17 for each additional circuit. After completing the circuits, the Circuits window appears.

Step 19 In the Circuits window, verify that the circuits you created appear in the circuits list.

Step 20 Complete the "NTP-C50 Test Optical Circuits" procedure on page 6-44. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C48 Create a Manually Routed Optical Circuit

Purpose	This procedure creates a manually routed optical circuit.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4 NTP-C130 Manage Pluggable Port Modules, page 10-3 (as needed)
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the tunnel source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 Complete the following as necessary (you can provision Ethernet or POS ports before or after the STS circuit is created):

- To provision Ethernet ports for CE-100T-8 circuits, complete the "DLP-C190 Provision CE-100T-8 Card Ethernet Ports" task on page 18-89.
- To provision POS ports for CE-100T-8 circuits, complete the "DLP-C191 Provision CE-100T-8 Card POS Ports" task on page 18-91.
- To provision link integrity soak timer for Ethernet card, complete the "DLP-C278 Configure Link Integrity Timer" task on page 19-93.

Step 4 From the View menu, choose **Go to Network View**.

Step 5 In the Circuit Creation dialog box, complete the following fields:

- Circuit Type—Choose **STS** or **VT**.
- Number of Circuits—Enter the number of optical circuits that you want to create. The default is 1.
- Auto-ranged—Applies to automatically routed circuits only. If you entered more than 1 in the Number of Circuits field, uncheck this box. (The box is unavailable if only one circuit is entered in Number of Circuits.)

Step 6 Click **Next**.

Step 7 Define the circuit attributes:

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—Choose the optical circuit size. If you are creating an STS circuit, the choices are STS-1, STS-3c, STS-6c, STS-9c, or STS-12c. If you are creating a VT circuit, Size displays VT1.5. You cannot change it.
- Bidirectional—Leave the default (checked) for this circuit.
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- Diagnostic—Leave the default (unchecked).

- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
  - **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

  For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.
- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

  Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.
- Protected Drops—Check this check box if you want the circuit routed to protect drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected cards as source and destination choices.

Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-C57 Provision Path Protection Selectors During Circuit Creation" task on page 17-75.

Step 9 Click **Next**.

Step 10 Complete the "DLP-C63 Provision an OC-N Circuit Source and Destination" task on page 17-80 for the optical circuit that you are creating.

Step 11 In the Circuit Routing Preferences area (Figure 6-10 on page 6-37), uncheck **Route Automatically**.

Step 12 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 13.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

Step 13 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection configuration, choose one of the following:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within the path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.

- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Step 14 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection DRI, check the **Dual Ring Interconnect** check box.

Step 15 If you are creating an STS circuit, skip this step and continue with Step 16. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 16 Click **Next**. In the Route Review and Edit area, node icons appear for you to route the circuit manually.

Step 17 Complete the "DLP-C64 Provision an OC-N Circuit Route" task on page 17-81.

Step 18 Click **Finish**. If the path does not meet the specified path diversity requirement, CTC displays an error message and allows you to change the circuit path. If you entered more than 1 in Number of Circuits, the Circuit Creation dialog box appears after the circuit is created for you to create the remaining circuits. Repeat Steps 5 through 17 for each additional circuit.

Step 19 When all the circuits are created, the main Circuits window appears. Verify that the circuits you created appear in the window.

Step 20 Complete the "NTP-C50 Test Optical Circuits" procedure on page 6-44. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C49 Create a Unidirectional Optical Circuit with Multiple Drops

Purpose	This procedure creates a unidirectional optical circuit with multiple traffic drops (circuit destinations).
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4 NTP-C130 Manage Pluggable Port Modules, page 10-3 (as needed)
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the tunnel source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, complete the following fields:

- Circuit Type—Choose **STS** or **VT**.

- Number of Circuits—Leave the default unchanged (1).
- Auto-ranged—Unavailable when the Number of Circuits field is 1.

Step 6 Click **Next**.

Step 7 Define circuit attributes:

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Size—Choose the circuit size. If you are creating an STS circuit, the choices are STS-1, STS-3c, STS-6c, STS-9c, or STS-12c. If you are creating a VT circuit, Size displays VT1.5. You cannot change it.
- Bidirectional—Uncheck this check box for this circuit.
- Create cross-connects only (TL1-like)—Check this check box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits. Also, VT tunnels and Ethergroup sources and destinations are unavailable.
- Diagnostic—Leave the default (unchecked).
- State—Choose the administrative state to apply to all of the cross-connects in a circuit:
  - **IS**—Puts the circuit cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the circuit cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the circuit cross-connects in the OOS-AU,AINS service state and suppresses alarms and conditions. When the connections receive a valid signal, the service state automatically changes to IS-NR.
  - **OOS,MT**—Puts the circuit cross-connects in the OOS-MA,MT service state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the circuit. Use OOS,MT for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; IS,AINS; or OOS,DSBLD when testing is complete. See the "DLP-C111 Change a Circuit Service State" task on page 18-17.

  For additional information about circuit service states, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.
- Apply to drop ports—Check this check box to apply the administrative state chosen in the State field to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

  Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Protected Drops—Check this check box if you want the circuit routed to protect drops only, that is, to ports that are in 1+1 protection. If you check this check box, CTC displays only protected cards as source and destination choices.

Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-C57 Provision Path Protection Selectors During Circuit Creation" task on page 17-75.

Step 9 Click **Next**.

Step 10 Complete the "DLP-C63 Provision an OC-N Circuit Source and Destination" task on page 17-80 for the circuit that you are creating.

Step 11 Uncheck **Route Automatically**. When Route Automatically is not checked, Using Required Nodes/Spans and Review Route Before Circuit Creation are unavailable.

Step 12 To set the circuit path protection, complete one of the following:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 13. Fully protected paths might or might not have path protection path segments (with primary and alternate paths), and the path diversity options apply only to path protection path segments, if any exist.
- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

Step 13 If you selected Fully Protected Path in Step 12, choose one of the following:

- **Nodal Diversity Required**—Ensures that the primary and alternate paths within the path protection portions of the complete circuit path are nodally diverse.
- **Nodal Diversity Desired**—Specifies that node diversity is preferred, but if node diversity is not possible, CTC creates fiber-diverse paths for the path protection portion of the complete circuit path.
- **Link Diversity Only**—Specifies that only fiber-diverse primary and alternate paths for path protection portions of the complete circuit path are needed. The paths might be node-diverse, but CTC does not check for node diversity.

Note For manually routed circuits, CTC checks your manually provisioned path against the path diversity option you choose. If the path does not meet the path diversity requirement that is specified, CTC displays an error message.

Step 14 If you selected Fully Protected Path in Step 12 and the circuit will be routed on a path protection DRI, check the **Dual Ring Interconnect** check box.

Step 15 If you are creating an STS circuit, skip this step and continue with Step 16. If you are creating a VT circuit, click **Next** and complete the "DLP-C59 Provision STS and VT Grooming Nodes" task on page 17-77.

Step 16 Click **Next**. In the Route Review and Edit area, node icons appear for you to route the circuit manually. The green arrows pointing from the selected node to other network nodes indicate spans that are available for routing the circuit.

Step 17 Complete the "DLP-C64 Provision an OC-N Circuit Route" task on page 17-81.

Step 18 Click **Finish**. After completing the circuit, the Circuits window appears.

Step 19 In the Circuits window, click the circuit that you want to route to multiple drops. The Delete, Edit, and Search buttons become active.

Step 20 Click **Edit**. The Edit Circuit window appears with the General tab selected. All nodes in the DCC network appear on the network. Circuit source and destination information appears under the source and destination nodes. To display a detailed view of the circuit, click **Show Detailed Map**. You can rearrange the node icons by selecting the node with the left mouse button, pressing **Ctrl** and dragging the icon to the new location.

Step 21 In the Edit Circuit dialog box, click the **Drops** tab. A list of existing drops appears.

Step 22 Click **Create**.

Step 23 In the Define New Drop dialog box, define the new drop:

a. Node—Choose the target node for the circuit drop.

b. Slot—Choose the target card and slot.

c. Port, STS—Choose the port and/or STS from the Port and STS drop-down lists. The choice in these menus depends on the card selected in Step b. See Table 6-2 on page 6-3 for a list of options.

d. The routing preferences for the new drop will match those of the original circuit. If the original circuit was routed on a protected path, you can change the nodal diversity options: Nodal Diversity Required, Nodal Diversity Desired, or Link Diversity Only. See Step 13 for options descriptions.

e. Click **OK**. The new drop appears in the Drops list.

Step 24 If you need to create additional drops on the circuit, repeat Steps 21 through 23.

Step 25 Click **Close**. The Circuits window appears.

Step 26 Verify that the new drops appear in the Destination column for the circuit you edited. If they do not appear, repeat Steps 5 through 25 making sure all options are provisioned correctly.

Step 27 Complete the "NTP-C50 Test Optical Circuits" procedure on page 6-44. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-C50 Test Optical Circuits

Purpose	This procedure tests an optical circuit.
Tools/Equipment	Test set capable of optical speeds, appropriate fibers, and attenuators
Prerequisite Procedures	This procedure assumes you completed facility loopback tests to test the fibers and cables from the source and destination ONS 15310-CLs or ONS 15310-MAs to the fiber distribution panel or the DSX and one of following circuit procedures: NTP-C47 Create an Automatically Routed Optical Circuit, page 6-34 NTP-C48 Create a Manually Routed Optical Circuit, page 6-39 NTP-C49 Create a Unidirectional Optical Circuit with Multiple Drops, page 6-41
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you created the circuits. If you are already logged in, continue with Step 2.

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

Step 3 Click the **Circuits** tab.

Step 4 Complete the "DLP-C111 Change a Circuit Service State" task on page 18-17 to set the circuit and circuit ports to the OOS-MA,MT service state. Note the original state because you will change it back at the end of the procedure.

Step 5 Set up the patch cable at the destination node:

a. Test the patch cable by connecting one end to the test set Tx port and the other end to the test set Rx port. 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.

b. Install the loopback cable on the port you are testing. Connect the Tx connector to the Rx connector of the port being tested.

Step 6 Set up the loopback cable at the source node:

a. Test the loopback cable by connecting one end to the test set Tx port and the other end to the test set Rx port. 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.

b. At the source node, attach the loopback cable to the port you are testing. Connect the test set to the circuit source port. Connect the Tx port of the test set to the circuit Rx port, and the test set Rx port to the circuit Tx port.

Step 7 Configure the test set for the source port:

- OC-3 ports—You will test either an OC-3c or a multiplexed OC-3. If you are testing an OC-3c, configure the test set for an OC-3c. If you are testing a multiplexed OC-3, configure the test set for a multiplexed OC-3 and choose the DS-3 and/or DS-1 you will test. For information about configuring your test set, consult your test set user guide.
- OC-12 ports—You will test either an OC-12c or a multiplexed OC-12. If you are testing an OC-12c, configure the test set for an OC-12c. If you are testing a multiplexed OC-12, configure the test set for a multiplexed OC-12 and choose the DS-3 and/or DS-1 you will test. For information about configuring your test set, consult your test set user guide.

Step 8 Verify that the test set displays a clean signal. If a clean signal does not appear, repeat Steps 2 through 7 to make sure that you have configured the test set and cabling correctly.

Step 9 Inject errors from the test set. Verify that the errors display at the source and destination nodes.

Step 10 Clear the PM counts for the ports that you tested. See the "DLP-C95 Clear Selected PM Counts" task on page 17-114 for instructions.

Step 11 Complete the "DLP-C55 Path Protection Switching Test" task on page 17-73.

Step 12 Perform a BERT for 12 hours or a duration dictated by local testing custom. For information about configuring your test set for BERT, see your test set user guide.

Step 13 After the BERT is complete, print the results or save them to a disk for future reference. For information about printing or saving test results see your test set user guide.

Step 14 Complete the "DLP-C111 Change a Circuit Service State" task on page 18-17 to return the circuit and circuit ports to their original service state.

Stop. You have completed this procedure.

NTP-C51 Create an Automatically Routed VCAT Circuit

Purpose	This procedure creates an automatically routed VCAT circuit. For more information about VCAT circuits, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.
Tools/Equipment	ML-100T-8 or CE-100T-8 cards must be installed at the nodes used in the VCAT circuit. For information about the ML-100T-8 or CE-100T-8 cards, refer to the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Ethernet Card Software Feature and Configuration Guide*.
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at the node where you will create the VCAT circuit. If you are already logged in, continue with Step 2.

Step 2 Complete the following as necessary (you can provision Ethernet or POS ports before or after the VCAT circuit is created):

- To provision Ethernet ports for CE-100T-8 circuits, complete the "DLP-C190 Provision CE-100T-8 Card Ethernet Ports" task on page 18-89.
- To provision POS ports for CE-100T-8 circuits, complete the "DLP-C191 Provision CE-100T-8 Card POS Ports" task on page 18-91.
- To provision a VCAT circuit that traverses through a third-party network, complete the "NTP-C140 Create a Server Trail" procedure on page 6-56.
- To provision link integrity soak timer for Ethernet card, complete the "DLP-C278 Configure Link Integrity Timer" task on page 19-93.

Step 3 From the View menu, choose **Go to Network View**.

Step 4 Click the **Circuits** tab, then click **Create**.

Step 5 In the Circuit Creation dialog box, choose **STS-V** or **VT-V** from the Circuit Type drop-down list.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-11 on page 6-48):

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Type—Displays the circuit type you chose in Step 5. You cannot change it.
- Bidirectional—Checked is the default. You cannot change it.
- Create cross-connects only (TL1-like)—Check this box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits.
- State—Choose the administrative state to apply to all of the member cross-connects in a VCAT circuit:
  - **IS**—Puts the member cross-connects in the IS-NR service state.

  - **OOS,DSBLD**—Puts the member cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the member cross-connects in the Out-of-Service and Autonomous, Automatic In-Service (OOS-AU,AINS) service state. When the connections receive a valid signal, the cross-connect service states automatically change to IS-NR.
  - **OOS,MT**—Puts the member cross-connects in the OOS-MA,MT service state. This service state does not interrupt traffic flow and allows loopbacks to be performed on the circuit, but suppresses alarms and conditions. Use the OOS,MT administrative state for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; OOS; or IS,AINS when testing is complete.
  - **OOS,OOG**—(LCAS only) Puts VCAT member cross-connects in the Out-of-Service and Management, Out-of-Group (OOS-MA,OOG) service state. This administrative state is used to put a member circuit out of the group and to stop sending traffic. OOS-MA,OOG applies only to the cross-connects on an end node where VCAT resides. The cross-connects on intermediate nodes are in the OOS-MA,MT service state.

- Apply to drop ports—Check this check box to apply the IS administrative state to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.

Note If ports managed into the IS administrative state are not receiving signals, loss of signal alarms are generated and the port service state transitions to OOS-AU,FLT.

- Symmetric—Checked is the default. You cannot change it.
- Member size—Choose the member size. For information about the member size supported for each card, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.
- Num. of members—Choose the number of members. For information about the number of members supported for each card, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

Note When creating open-ended VCAT circuits the number of members must be the same on each side of the virtual concatenated group (VCG). The configuration with different number of members on each side of circuit is not supported. This is applicable to circuits created on CE-Series and ML-Series cards.

- Mode—Choose the protection mode for the VCAT circuit:
  - None—Provides no protection. A failure on one member causes the entire VCAT circuit to fail. For CE-100T-8 card, you can add or delete members after creating a VCAT circuit with no protection. During the time it takes to add or delete members (from seconds to minutes), the entire VCAT circuit will be unable to carry traffic. For ML-100T-8 cards, you cannot add or delete members if the protection mode is None.

– SW-LCAS—(Software Link Capacity Adjustment Scheme [LCAS]) Allows the VCAT circuit to adapt to member failures and keep traffic flowing after failures at a reduced bandwidth. SW-LCAS provides interoperability with the ONS 15454 ML-Series cards. SW-LCAS uses legacy SONET failure indicators like AIS-P and RDI-P to detect member failure. You cannot add or delete members from a VCAT circuit with SW-LCAS protection.

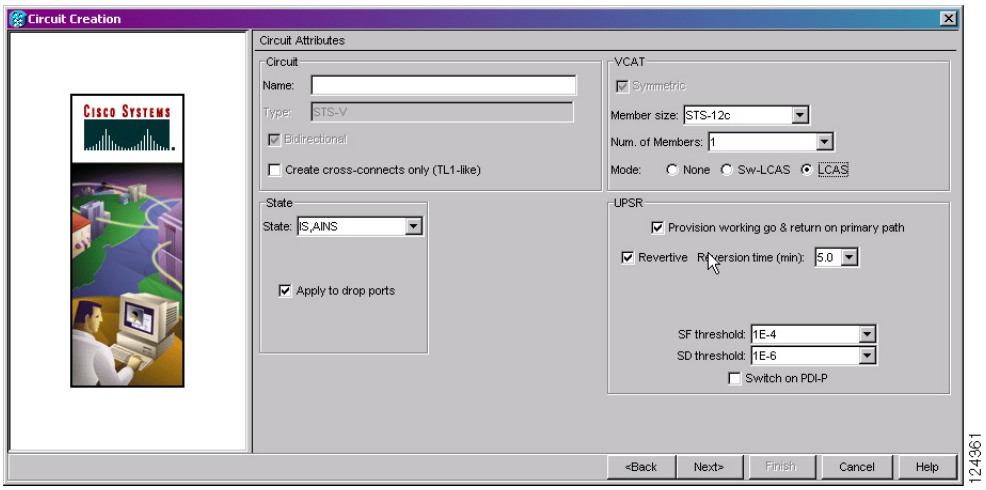
Note While deleting SW-LCAS circuit members change the administrative state of the members to OOS,DSBLD. This is applicable to circuits created on CE-Series and ML-Series cards.

– LCAS—Sets the VCAT circuit to use LCAS. With LCAS, you can add or delete members without interrupting the operation of noninvolved members, and if a member fails, LCAS temporarily removes the failed member from the VCAT circuit. The remaining members carry the traffic until the failure clears.

Note Cisco recommends using LCAS mode for CE-100T-8 and ML-100T-8 cards that do not need to interoperate with the ONS 15454 ML-Series cards.

Note While deleting HW-LCAS circuit members change the administrative state of the members to OOS,OOG. This is applicable to circuits created on CE-Series and ML-Series cards.

Figure 6-11 Setting VCAT Circuit Attributes



Step 8 Click **Next**.

Step 9 Complete the "DLP-C65 Provision a VCAT Circuit Source and Destination" task on page 17-82 for the VCAT circuit that you are creating.

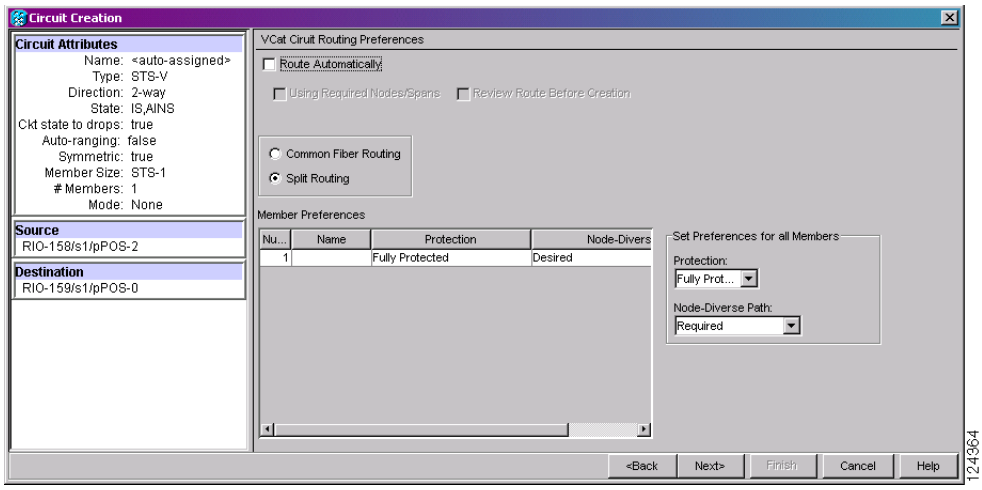
Step 10 In the VCAT Circuit Routing Preferences area (Figure 6-12), check **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

- Using Required Nodes/Spans—Check this check box to specify nodes and spans to include or exclude in the CTC-generated circuit route.

Including nodes and spans for a circuit ensures that those nodes and spans are in the working path of the circuit (but not the protect path). Excluding nodes and spans ensures that the nodes and spans are not in the working or protect path of the circuit.

- Review Route Before Creation—Check this check box to review and edit the circuit route before the circuit is created.

Figure 6-12 Automatically Routing a VCAT Circuit



Step 11 Choose one of the following routing types:

- Common Routing—Routes the members on the same fiber.
- Split Routing—Allows the individual members to be routed on different fibers or each member to have different routing constraints. Split routing is required when creating circuits over a path protection configuration.

Step 12 If you want to set preferences for individual members, complete the following in the Member Preferences area. To set identical preferences for all members, skip this step and continue with Step 13.

- Number—Choose a number from the drop-down list to identify the member.
- Name—Type a unique name to identify the member. The name can be alphanumeric and up to 48 characters (including spaces). If you leave the field blank, CTC assigns a default name to the circuit.
- Protection—Choose the member protection type:
  - Fully Protected—Routes the circuit on a protected path.
  - Unprotected—Creates an unprotected circuit.
  - PCA—(Future use) Routes the member on a bidirectional line switched ring (BLSR) protection channel.

  Note Although ONS 15310-CLs and ONS 15310-MAs do not support BLSR, you can route an LCAS VCAT circuit over a BLSR network of ONS 15600s or ONS 15454s.

  - DRI—(Split routing only) Routes the member on a DRI circuit.
- Node-Diverse Path—(Split routing only) Available for each member when Fully Protected is chosen.

Step 13 To set preferences for all members, complete the following in the Set Preferences for All Members area:

- Protection—Choose the member protection type:
  - Fully Protected—Routes the circuit on a protected path.
  - Unprotected—Creates an unprotected circuit.
  - PCA—(Future use) Routes the member on a BLSR protection channel.
  - DRI—(Split routing only) Routes the member on a DRI circuit.
- Node-Diverse Path—(Split routing only) Available when Fully Protected is chosen.

Step 14 Click **Next**. If you chose Fully Protected, click **OK** in the confirmation dialog box to continue. If not, continue with Step 15.

Step 15 If you selected Using Required Nodes/Spans in Step 10, complete the following substeps. If not, continue with Step 16:

a. In the Circuit Route Constraints area, choose the member that you want to route from the Route Member number drop-down list (Figure 6-13).

b. Click a node or span on the circuit map.

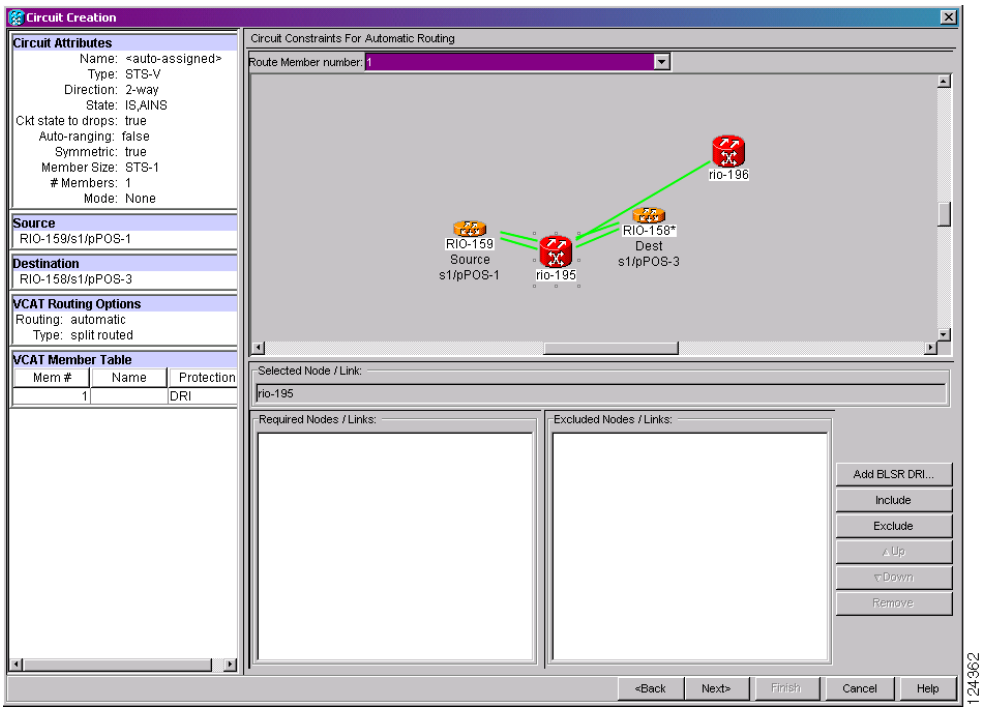
c. Click **Include** to include the node or span in the circuit, or click **Exclude** to exclude the node or span from the circuit. The order in which you choose included nodes and spans is the order in which the circuit is routed. Click spans twice to change the circuit direction.

d. Repeat Steps b and c for each node or span you want to include or exclude.

e. Review the circuit route. To change the circuit routing order, choose a node in the Required Nodes/Lines or Excluded Nodes Links lists, then click the **Up** or **Down** buttons to change the circuit routing order. Click **Remove** to remove a node or span.

f. Repeat Steps a through e for each member.

Figure 6-13 VCAT Circuit Route Constraints



Step 16 If you selected Review Route Before Creation in Step 10, complete the following substeps; otherwise, continue with Step 17:

- **a.** In the Route Review/Edit area, choose the member that you want to route from the Route Member number drop-down list.
- **b.** Click a node or span on the circuit map.
- **c.** Review the circuit route. To add or delete a circuit span, choose a node on the circuit route. Blue arrows show the circuit route. Green arrows indicate spans that you can add. Click a span arrowhead, then click **Include** to include the span or **Remove** to remove the span.
- **d.** If the provisioned circuit does not reflect the routing and configuration you want, click **Back** to verify and change the circuit information. If the circuit needs to be routed to a different path, see the "NTP-C52 Create a Manually Routed VCAT Circuit" procedure on page 6-52 to assign the circuit route yourself.
- **e.** Repeat Steps a through d for each member.

Step 17 Click **Finish**. The Circuits window appears.

Note Depending on the complexity of the network and number of members, the VCAT circuit creation process might take several minutes.

Step 18 In the Circuits window, verify that the circuits you created appear in the circuits list.

Step 19 As needed, complete the "DLP-C190 Provision CE-100T-8 Card Ethernet Ports" task on page 18-89 and/or the "DLP-C191 Provision CE-100T-8 Card POS Ports" task on page 18-91.

Stop. You have completed this procedure.

NTP-C52 Create a Manually Routed VCAT Circuit

Purpose	This procedure creates a manually routed VCAT circuit. For more information about VCAT circuits, refer to the "Circuits and Tunnels" chapter of the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.
Tools/Equipment	ML-100T-8 or CE-100T-8 cards must be installed at the nodes used in the VCAT circuit. For information about the ML-100T-8 and CE-100T-8 cards, refer to the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Ethernet Card Software Feature and Configuration Guide*.
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at the node where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 If you want to assign a name to the tunnel source and destination ports before you create the circuit, complete the "DLP-C56 Assign a Name to a Port" task on page 17-75. If not, continue with Step 3.

Step 3 Complete the following as necessary (you can provision Ethernet or POS ports before or after the VCAT circuit is created):

- To provision Ethernet ports for CE-100T-8 circuits, complete the "DLP-C190 Provision CE-100T-8 Card Ethernet Ports" task on page 18-89.
- To provision POS ports for CE-100T-8 circuits, complete the "DLP-C191 Provision CE-100T-8 Card POS Ports" task on page 18-91.
- To provision link integrity soak timer for Ethernet card, complete the "DLP-C278 Configure Link Integrity Timer" task on page 19-93.
- To provision a VCAT circuit that traverses through a third-party network, complete the "NTP-C140 Create a Server Trail" procedure on page 6-56.

Step 4 From the View menu, choose **Go to Network View**.

Step 5 In the Circuit Creation dialog box, choose **STS-V** or **VT-V** from the Circuit Type drop-down list.

Step 6 Click **Next**.

Step 7 Define the circuit attributes (Figure 6-11 on page 6-48):

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Type—Displays the circuit type you chose in Step 5. You cannot change it.
- Bidirectional—Checked is the default. You cannot change it.
- Create cross-connects only (TL1-like)—Check this box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits.
- State—Choose the administrative state to apply to all of the member cross-connects in a VCAT circuit:
  - **IS**—Puts the member cross-connects in the IS-NR service state.

  - **OOS,DSBLD**—Puts the member cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the member cross-connects in the Out-of-Service and Autonomous, Automatic In-Service (OOS-AU,AINS) service state. When the connections receive a valid signal, the cross-connect service states automatically change to IS-NR.
  - **OOS,MT**—Puts the member cross-connects in the OOS-MA,MT service state. This service state does not interrupt traffic flow and allows loopbacks to be performed on the circuit, but suppresses alarms and conditions. Use the OOS,MT administrative state for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; OOS; or IS,AINS when testing is complete.
  - **OOS,OOG**—(LCAS only) Puts VCAT member cross-connects in the Out-of-Service and Management, Out-of-Group (OOS-MA,OOG) service state. This administrative state is used to put a member circuit out of the group and to stop sending traffic. OOS-MA,OOG applies only to the cross-connects on an end node where VCAT resides. The cross-connects on intermediate nodes are in the OOS-MA,MT service state.

- Apply to drop ports—Check this check box to apply the IS administrative state to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.
- Symmetric—Checked is the default. You cannot change it.
- Member size—Choose the member size. For information about the member size supported for each card, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.
- Num. of members—Choose the number of members from the drop-down list. For information about the number of members supported for each card, refer to the "Circuits and Tunnels" chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

Note When creating open-ended VCAT circuits the number of members must be the same on each side of the virtual concatenated group (VCG). The configuration with different number of members on each side of circuit is not supported. This is applicable to circuits created on CE-Series and ML-Series cards.

- Mode—Choose the protection mode for the VCAT circuit:
  - None—Provides no protection. A failure on one member causes the entire VCAT circuit to fail. For CE-100T-8 you can add or delete members after creating a VCAT circuit with no protection. During the time it takes to add or delete members (from seconds to minutes), the entire VCAT circuit will be unable to carry traffic. For ML-100T-8 cards, you cannot add or delete members if the protection mode is None.
  - SW-LCAS—Allows the VCAT circuit to adapt to member failures and keep traffic flowing after failures at a reduced bandwidth. SW-LCAS provides interoperability with the ONS 15454 ML-Series cards. SW-LCAS uses legacy SONET failure indicators like AIS-P and RDI-P to detect member failure. You cannot add or delete members from a VCAT circuit with SW-LCAS protection.

Note While deleting SW-LCAS circuit members change the administrative state of the members to OOS,DSBLD. This is applicable to circuits created on CE-Series and ML-Series cards.

- LCAS—Sets the VCAT circuit to use LCAS. With LCAS, you can add or delete members without interrupting the operation of noninvolved members, and if a member fails, LCAS temporarily removes the failed member from the VCAT circuit. The remaining members carry the traffic until the failure clears.

Note Cisco recommends using LCAS for CE-100T-8 and ML-100T-8 cards that do not need to interoperate with the ONS 15454 ML-Series cards.

Note While deleting HW-LCAS circuit members change the administrative state of the members to OOS, OOG. This is applicable to circuits created on CE-Series and ML-Series cards.

Step 8 Click **Next**.

Step 9 Complete the "DLP-C65 Provision a VCAT Circuit Source and Destination" task on page 17-82 for the VCAT circuit that you are creating.

Step 10 In the Circuit Routing Preferences area (Figure 6-12 on page 6-49), uncheck **Route Automatically**.

Step 11 Choose one of the following routing types:

- Common Routing—Routes the members on the same fiber.
- Split Routing—Allows the individual members to be routed on different fibers or each member to have different routing constraints. Split routing is required when creating circuits over a path protection configuration.

Step 12 If you want to set preferences for individual members, complete the following in the Member Preferences area. To set identical preferences for all members, skip this step and continue with Step 13.

- Number—Choose a number from the drop-down list to identify the member.
- Name—Type a unique name to identify the member. The name can be alphanumeric and up to 48 characters (including spaces). If you leave the field blank, CTC assigns a default name to the circuit.
- Protection—Choose the member protection type:
  - Fully Protected—Routes the circuit on a protected path.
  - Unprotected—Creates an unprotected circuit.
  - PCA—(Future use) Routes the member on a BLSR protection channel.

    Note Although ONS 15310-CLs and ONS 15310-MAs do not support BLSR, you can route an LCAS VCAT circuit over a BLSR network of ONS 15600s or ONS 15454s.

  - DRI—(Split routing only) Routes the member on a DRI circuit.
- Node-Diverse Path—(Split routing only) Available for each member when Fully Protected is chosen.

Step 13 To set preferences for all members, complete the following in the Set Preferences for All Members area:

- Protection—Choose the member protection type:
  - Fully Protected—Routes the circuit on a protected path.
  - Unprotected—Creates an unprotected circuit.
  - PCA—(Future use) Routes the member on a BLSR protection channel.
  - DRI—(Split routing only) Routes the member on a DRI circuit.
- Node-Diverse Path—(Split routing only) Available when Fully Protected is chosen.

Step 14 Click **Next**. If you chose Fully Protected, click **OK** to continue. If not, continue with the next step.

Step 15 In the Route Review and Edit area, node icons appear so you can route the circuit manually.

Step 16 Complete the "DLP-C66 Provision a VCAT Circuit Route" task on page 17-83.

Step 17 Click **Finish**. If the path does not meet the specified path diversity requirement, CTC displays an error message and allows you to change the circuit path.

Note Depending on the complexity of the network and number of members, the VCAT circuit creation process might take several minutes.

Step 18 When all the circuits are created, the main Circuits window appears. Verify that the circuits you created appear in the window.

Step 19 As needed, complete the "DLP-C190 Provision CE-100T-8 Card Ethernet Ports" task on page 18-89 and/or the "DLP-C191 Provision CE-100T-8 Card POS Ports" task on page 18-91.

Stop. You have completed this procedure.

NTP-C55 Create Overhead Circuits

Purpose	This procedure creates overhead circuits on an ONS network. Overhead circuits include DCC tunnels, orderwire, UDC circuits, and IP tunnels.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note The ONS 15310-CL and ONS 15310-MA support pass-through orderwire circuits if the source and destination are on ONS 15454 node optical ports. For more information, refer to the *Cisco ONS 15454 Procedure Guide*.

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at a node on the network where you will create the overhead circuit. If you are already logged in, continue with Step 2.

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

Step 3 As needed, complete the "DLP-C67 Create a DCC Tunnel" task on page 17-84.

Step 4 As needed, complete the "DLP-C68 Create a User Data Channel Circuit" task on page 17-85.

Step 5 As needed, complete the "DLP-C228 Provision Orderwire" task on page 19-27.

Step 6 As needed, complete the "DLP-C69 Create an IP-Encapsulated Tunnel" task on page 17-86.

Stop. You have completed this procedure.

NTP-C140 Create a Server Trail

Purpose	This procedure creates a server trail, which provides a connection between ONS nodes through a third-party network. You can create server trails between any two optical ports.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note You cannot create server trails on ports with DCC links.

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at the node where you will create the circuit. If you are already logged in, continue with Step 2.

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

Step 3 Click the **Provisioning > Server Trails** tabs.

Step 4 Click **Create**.

Step 5 In the Server Trail Creation dialog box, complete the following fields:

- Type—Choose **VT** or **STS**.
- Size—Depending on the type selected, choose the server trail size. For VTs, choose VT1.5 or VT2; for STSs, choose STS1, STS-3c, STS-6c, STS-12c, STS-48c, or STS-192c.
- Protection Type—Choose one of the following protection types: Preemptible, Unprotected, or Fully Protected. The server trail protection sets the protection type for any circuit that traverses it.
  - Preemptible— PCA circuits will use server trails with the Preemptible attribute.
  - Unprotected—In Unprotected Server Trail, CTC assumes that the circuits going out from that specific port will not be protected by provider network and will look for a secondary path from source to destination if you are creating a protected circuit.
  - Fully Protected—In Fully Protected Server Trail, CTC assumes that the circuits going out from that specific port will be protected by provider network and will not look for a secondary path from source to destination.

- Number of Trails—Enter the number of server trails. Number of trails determine the number of circuits that can be created on server trail. You can create a maximum of 3744 server trails on a node. You can create multiple server trails from the same port. This is determined by how many circuits of a particular server trail size can be supported on the port (for example, you can create 12 STS-1 server trails from one OC-12 port or two STS3c and six STS-1 server trails from same port).
- SRLG—Enter a value for the Shared Resource Link Group (SRLG). SRLG is used by Cisco Transport Manager (CTM) to specify link diversity. The SRLG field has no restrictions. If you create multiple server trails from one port, you can assign the same SRLG value to all the links to indicate that they originate from the same port.

Step 6 Click **Next**.

Step 7 In the Source area, complete the following:

- From the Node drop-down list, choose the node where the server trail will originate.
- From the Slot drop-down list, choose the slot containing the card where the server trail originates. (If a card's capacity is fully utilized, the card does not appear in the list.)
- Depending on the origination card, choose the source port and/or STS or VT from the Port and STS or VT lists. The Port list is only available if the card has multiple ports. STSs and VTs do not appear if they are already in use by other circuits.

Step 8 Click **Next**.

Step 9 In the Destination area, complete the following:

- From the Node drop-down list, choose the destination node.
- From the Slot drop-down list, choose the slot containing the card where the server trail will terminate (destination card). (If a card's capacity is fully utilized, the card does not appear in the list.)
- Depending on the card selected, choose the destination port and/or STS or VT from the Port and STS or VT drop-down lists. The Port drop-down list is available only if the card has multiple ports. The STSs that appear depend on the card, circuit size, and protection scheme.

Step 10 Click **Finish**.

Stop. You have completed this procedure.

NTP-C186 Configure CCAT/VCAT Circuit in Manual Mode

Purpose	This procedure configures a CCAT/VCAT circuit in MANUAL mode.
Tools/Equipment	None
Prerequisite Procedures	NTP-C36 Verify Network Turn-Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Complete the "DLP-C29 Log into CTC" task on page 17-44 at the node where you will create the circuit. If you are already logged in, continue with Step 2.

Step 2 In the node view double-click the CE-MR-10 Card.

Step 3 Click the **Circuits** > **Circuits** tabs .

Step 4 Click **Create**.

Step 5 In the Circuit Creation dialog box, choose **STS-V** or **VT-V** from the Circuit Type drop-down list.

Step 6 Click **Next**.

Step 7 Define the circuit attributes:

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces). Circuit names should be 44 characters or less if you want the ability to create monitor circuits. If you leave the field blank, CTC assigns a default name to the circuit.
- Type—Displays the circuit type you chose in Step 5. You cannot change it.
- Bidirectional—Checked is the default. You cannot change it.
- Create cross-connects only (TL1-like)—Check this box if you want to create one or more cross-connects to complete a signal path for TL1-generated circuits.
- State—Choose the administrative state to apply to all of the member cross-connects in a VCAT circuit:
  - **IS**—Puts the member cross-connects in the IS-NR service state.
  - **OOS,DSBLD**—Puts the member cross-connects in the OOS-MA,DSBLD service state. Traffic is not passed on the circuit.
  - **IS,AINS**—Puts the member cross-connects in the Out-of-Service and Autonomous, Automatic In-Service (OOS-AU,AINS) service state. When the connections receive a valid signal, the cross-connect service states automatically change to IS-NR.
  - **OOS,MT**—Puts the member cross-connects in the OOS-MA,MT service state. This service state does not interrupt traffic flow and allows loopbacks to be performed on the circuit, but suppresses alarms and conditions. Use the OOS,MT administrative state for circuit testing or to suppress circuit alarms temporarily. Change the administrative state to IS; OOS; or IS,AINS when testing is complete.
  - **OOS,OOG**—(LCAS only) Puts VCAT member cross-connects in the Out-of-Service and Management, Out-of-Group (OOS-MA,OOG) service state. This administrative state is used to put a member circuit out of the group and to stop sending traffic. OOS-MA,OOG applies only to the cross-connects on an end node where VCAT resides. The cross-connects on intermediate nodes are in the OOS-MA,MT service state.
- Apply to drop ports—Check this check box to apply the IS administrative state to the circuit source and destination ports. CTC applies the administrative state to the ports only if the circuit bandwidth is the same as the port bandwidth or, if the port bandwidth is larger than the circuit, the circuit is the first circuit to use the port. If not, a Warning dialog box shows the ports where the administrative state could not be applied. If the check box is unchecked, CTC does not change the service state of the source and destination ports.
- Symmetric—Checked is the default. You cannot change it.
- Member size—Choose the member size. For information about the member size supported for each card, refer to the “Circuits and Tunnels” chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.
- Num. of members—Choose the number of members from the drop-down list. For information about the number of members supported for each card, refer to the “Circuits and Tunnels” chapter in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual*.

Note When creating open-ended VCAT circuits the number of members must be the same on each side of the virtual concatenated group (VCG). The configuration with different number of members on each side of circuit is not supported. This is applicable to circuits created on CE-Series and ML-Series cards.

- Mode—Choose the protection mode for the VCAT circuit:
  - None—Provides no protection. A failure on one member causes the entire VCAT circuit to fail. For CE-100T-8, you can add or delete members after creating a VCAT circuit with no protection. During the time it takes to add or delete members (from seconds to minutes), the entire VCAT circuit will be unable to carry traffic. For ML-100T-8 cards, you cannot add or delete members if the protection mode is None.
  - SW-LCAS—Allows the VCAT circuit to adapt to member failures and keep traffic flowing after failures at a reduced bandwidth. SW-LCAS provides interoperability with the ONS 15454 ML-Series cards. SW-LCAS uses legacy SONET failure indicators like AIS-P and RDI-P to detect member failure. You cannot add or delete members from a VCAT circuit with SW-LCAS protection.

Note While deleting SW-LCAS circuit members change the administrative state of the members to OOS,DSBLD. This is applicable to circuits created on CE-Series and ML-Series cards.

  - LCAS—Sets the VCAT circuit to use LCAS. With LCAS, you can add or delete members without interrupting the operation of noninvolved members, and if a member fails, LCAS temporarily removes the failed member from the VCAT circuit. The remaining members carry the traffic until the failure clears.

Note Cisco recommends using LCAS for CE-100T-8 and ML-100T-8 cards that do not need to interoperate with the ONS 15454 ML-Series cards.

Note While deleting HW-LCAS circuit members change the administrative state of the members to OOS, OOG. This is applicable to circuits created on CE-Series and ML-Series cards.

Step 8 Click **Next**.

Step 9 Complete the "DLP-C65 Provision a VCAT Circuit Source and Destination" task on page 17-82 for the VCAT circuit that you are creating.

Step 10 In the Circuit Routing Preferences area, uncheck **Route Automatically**.

Step 11 Choose one of the following routing types:

- Common Routing—Routes the members on the same fiber.
- Split Routing—Allows the individual members to be routed on different fibers or each member to have different routing constraints. Split routing is required when creating circuits over a path protection configuration.

Step 12 If you want to set preferences for individual members, complete the following in the Member Preferences area. To set identical preferences for all members, skip this step and continue with Step 13.

- Number—Choose a number from the drop-down list to identify the member.

- Name—Type a unique name to identify the member. The name can be alphanumeric and up to 48 characters (including spaces). If you leave the field blank, CTC assigns a default name to the circuit.
- Protection—Choose the member protection type:
  - Fully Protected—Routes the circuit on a protected path.
  - Unprotected—Creates an unprotected circuit.
  - PCA—(Future use) Routes the member on a BLSR protection channel.

  Note Although ONS 15310-CLs and ONS 15310-MAs do not support BLSR, you can route an LCAS VCAT circuit over a BLSR network of ONS 15600s or ONS 15454s.

  - DRI—(Split routing only) Routes the member on a DRI circuit.
- Node-Diverse Path—(Split routing only) Available for each member when Fully Protected is chosen.

Step 13 To set preferences for all members, complete the following in the Set Preferences for All Members area:

- Protection—Choose the member protection type:
  - Fully Protected—Routes the circuit on a protected path.
  - Unprotected—Creates an unprotected circuit.
  - PCA—(Future use) Routes the member on a BLSR protection channel.
  - DRI—(Split routing only) Routes the member on a DRI circuit.
- Node-Diverse Path—(Split routing only) Available when Fully Protected is chosen.

Step 14 Click **Next**. If you chose Fully Protected, click **OK** to continue. If not, continue with the next step.

Step 15 In the Route Review and Edit area, node icons appear so you can route the circuit manually.

Step 16 Complete the "DLP-C66 Provision a VCAT Circuit Route" task on page 17-83.

Step 17 Click **Finish**. If the path does not meet the specified path diversity requirement, CTC displays an error message and allows you to change the circuit path.

Note Depending on the complexity of the network and number of members, the VCAT circuit creation process might take several minutes.

Step 18 When all the circuits are created, the main Circuits window appears. Verify that the circuits you created appear in the window.

Stop. You have completed this procedure.