Create Circuits and VT Tunnels

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

This chapter explains how to create Cisco ONS 15454 electrical circuits, VT tunnels, optical circuits, and Ethernet circuits. For additional information about ONS 15454 circuits, refer to the Circuits and Tunnels chapter in the *Cisco ONS 15454 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 15454 Troubleshooting Guide* as necessary.

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

1. NTP-A127 Verify Network Turn Up, page 6-4—Complete this procedure before you create any circuits.

2. NTP-A181 Create an Automatically Routed DS-1 Circuit, page 6-6—Complete as needed.

3. NTP-A182 Create a Manually Routed DS-1 Circuit, page 6-10—Complete as needed.

4. NTP-A183 Create a Unidirectional DS-1 Circuit with Multiple Drops, page 6-13—Complete as needed.

5. NTP-A184 Create an Automatically Routed DS-3 Circuit, page 6-20—Complete as needed.

6. NTP-A185 Create a Manually Routed DS-3 Circuit, page 6-24—Complete as needed.

7. NTP-A186 Create a Unidirectional DS-3 Circuit with Multiple Drops, page 6-26—Complete as needed.

8. NTP-A133 Create an Automatically Routed VT Tunnel, page 6-32—Complete as needed.

9. NTP-A134 Create a Manually Routed VT Tunnel, page 6-35—Complete as needed.

10. NTP-A187 Create a VT Aggregation Point, page 6-38—Complete as needed.

11. NTP-A135 Test Electrical Circuits, page 6-41—Complete this procedure after you create an electrical circuit.

12. NTP-A188 Create an Automatically Routed Optical Circuit, page 6-43—Complete as needed.

13. NTP-A189 Create a Manually Routed Optical Circuit, page 6-47—Complete as needed.

14. NTP-A190 Create a Unidirectional Optical Circuit with Multiple Drops, page 6-49—Complete as needed.

15. NTP-A62 Test Optical Circuits, page 6-55—Complete this procedure after you create an optical circuit.

16. NTP-A139 Create a Half Circuit on a BLSR or 1+1 Node, page 6-57—Complete this procedure as needed to create a half circuit using an OC-N as a destination in a BLSR or 1+1 topology.

17. NTP-A140 Create a Half Circuit on a Path Protection configuration Node, page 6-59—Complete as needed to create a half circuit using an OC-N as a destination in a path protection configuration.

18. NTP-A191 Create an E-Series EtherSwitch Circuit (Multicard or Single-Card Mode), page 6-63—Complete as needed.

19. NTP-A192 Create a Circuit for an E-Series Card in Port-Mapped Mode, page 6-65—Complete as needed to create a circuit for an E-Series in port-mapped mode.

20. NTP-A142 Create an E-Series Shared Packet Ring Ethernet Circuit, page 6-67—Complete as needed.

21. NTP-A143 Create an E-Series Hub and Spoke Ethernet Configuration, page 6-70—Complete as needed.

22. NTP-A144 Create an E-Series Single-Card EtherSwitch Manual Cross-Connect, page 6-72—Complete as needed.

23. NTP-A145 Create an E-Series Multicard EtherSwitch Manual Cross-Connect, page 6-75—Complete as needed.

24. NTP-A146 Test E-Series Circuits, page 6-82—Complete after creating E-Series SONET circuits.

25. NTP-A147 Create a G-Series Circuit, page 6-83—Complete as needed.

26. NTP-A148 Create a Manual Cross-Connect for a G-Series or an E-Series in Port-Mapped Mode, page 6-85—Complete as needed.

27. NTP-A149 Test G-Series or ML-Series Circuits, page 6-88—Complete after creating G-Series SONET circuits.

28. NTP-A193 Create an ML-Series Circuit, page 6-89—Complete as needed.

Table 6-1 defines ONS 15454 circuit creation terms and options.

Table 6-1   ONS 15454 Circuit Options

Circuit Option	Description
Source	The circuit source is where the circuit enters the ONS 15454 network.
Destination	The circuit destination is where the circuit exits an ONS 15454 network.
Automatic circuit routing	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 STS or VT for each circuit segment and create circuits from work orders prepared by an operations support system (OSS) like the Telcordia TIRKS system.

Table 6-1   ONS 15454 Circuit Options

Circuit Option	Description
VT tunnel	VT tunnels allow VT1.5 circuits to pass through an ONS 15454 without utilizing cross-connect card (XC, XCVT, XC10G) resources. VT circuits using VT tunnels will 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 to reduce VT matrix resource utilization. The STS grooming end of the VAP requires an OC-N, EC-1, or DS3XM-6 card. VT aggregation points can be created BLSR, 1+1, or unprotected nodes, but cannot be created on path protection configuration nodes.

ONS 15454 circuits are either VT or STS circuits. Table 6-2 shows the circuit source and destination options that display for VT circuits.

Table 6-2   CTC Circuit Source and Destination Options for VT Circuits

Card	Ports	STSs	VTs	DS1s
DS1-14, DS1N-14	–	–	–	14
DS3-12, DS3N-12, DS3-12E, DS3N-12E	–	–	–	–
DS3XM-6	6	–	–	28 per port
EC1-12	12	–	28 per port	–
OC3 IR 4/STM1	4	3 per port	28 per STS	–
OC3-8	8	3 per port	28 per STS	–
OC12 IR/STM4 OC12 LR/STM4	–	12	28 per STS	–
OC12 IR 4/STM4 OC12 LR 4/STM4	4	12 per port	28 per STS	–
All OC-48 cards	–	48	28 per STS	–
OC-192	–	192	28 per STS	–

Table 6-3 shows the options that display for STS circuits.

Table 6-3   CTC Circuit Source and Destination Options for STS Circuits

Card	Ports	STSs
DS1-14, DS1N-14[1]	–	–
DS3-12, DS3N-12, DS3-12E, DS3N-12E	12	–
DS3XM-6	6	–
EC1-12	12	–
OC3 IR 4/STM1	4	3 per port
OC3-8	8	3 per port

Table 6-3   *CTC Circuit Source and Destination Options for STS Circuits*

Card	Ports	STSs
OC12 IR/STM4 OC12 LR/STM4	–	12
OC12 IR 4/STM4 OC12 LR 4/STM4	4	12 per port
All OC-48 cards	–	48
OC-192	–	192

1. You can route one STS circuit on a DS-1 card to carry all 14 ports within the STS. However, 14 VT1.5s are not utilized.

NTP-A127 Verify Network Turn Up

Purpose	This procedure verifies that the ONS 15454 network is ready for circuit provisioning.
Tools/Equipment	None
Prerequisite Procedures	Chapter 5, "Turn Up Network"
Required/As Needed	Required
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into an ONS 15454 on the network where you will create circuits. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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 display on the network map. (Large networks may take several minutes to display all the nodes.)

✎ **Note**   If this is the first time your computer has connected to this ONS 15454 network, the node icons will be stacked on the left side of the graphic area, possibly out of view. Use the scroll bar under the network map to display the icons. To separate the icons press **Ctrl** and drag and drop the icon to the 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 display after a few minutes, or if a node icon is grey with an IP address under it, do not continue. Look at the Net box in the lower right corner of the window. If it is grey, log in again, making sure not to check the Disable Network check box on the CTC Login dialog box. If problems persist, see Chapter 5, "Turn Up Network" to review the network turn-up procedure appropriate for your network topology, or refer to the *Cisco ONS 15454 Troubleshooting Guide* for troubleshooting procedures.

Step 4   Verify DCC connectivity. All nodes must be connected by green lines. If lines are missing or grey in color, do not continue. See Chapter 5, "Turn Up 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 to view alarm descriptions. Investigate and resolve, if necessary, all critical (red node icon) or major (orange node icon) alarms. Refer to the *Cisco ONS 15454 Troubleshooting Guide* to resolve alarms before continuing.

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 displayed in the shelf map. Verify that the ONS 15454 cards appear in the specified slots.

    b.   Click the **Provisioning > General** tabs. Verify that the node name, contacts, date, time, and NTP/SNTP server IP address (if used) are correctly provisioned. If needed, make corrections using the "NTP-A25 Set Up Name, Date, Time, and Contact Information" procedure on page 4-6.

    c.   Click the **Network** tab. Verify that the IP address, Subnet Mask, Default Router, Prevent LCD IP Config, and Gateway Settings are correctly provisioned. If not, make corrections using the "NTP-A169 Set Up CTC Network Access" procedure on page 4-8.

    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-A170 Create Protection Groups" procedure on page 4-25.

    e.   If the node is in a BLSR, click the **BLSR** tab. (If the node is not in a BLSR, continue with Step f.) Verify that the following items are provisioned as specified in your site plan:

        •   BLSR type (2-Fiber or 4-Fiber)

        •   BLSR ring ID and node IDs

        •   Ring reversion time

        •   East and west card assignments

        •   4-fiber BLSRs: span reversion and east/west protect card assignments

    If you need to make corrections, see the "NTP-A40 Provision BLSR Nodes" procedure on page 5-15 for instructions.

    f.   Click the **Security** tab. Verify that the users and access levels are provisioned as specified. If not, see the "NTP-A30 Create Users and Assign Security" procedure on page 4-4 to correct the information.

    g.   If SNMP is used, click the **SNMP** tab and verify the trap and destination information. If the information is not correct, see the "NTP-A87 Change SNMP Settings" procedure on page 10-27 to correct the information.

    h.   Click the **DCC/GCC** tab. Verify that DCCs were created to the applicable OC-N slots and ports. If DCCs were not created for the appropriate OC-N slots and ports, see Chapter 5, "Turn Up Network" and complete the turn-up procedure appropriate for your network topology.

    i.   Click the **Timing** tab. Verify that timing is provisioned as specified. If not, use the "NTP-A85 Change Node Timing" procedure on page 10-19 to make the changes.

    j.   Click the **Alarm Behavior** tab. If you provisioned optional alarm profiles, verify that the alarms are provisioned as specified. If not, see the "NTP-A71 Create, Download, and Assign Alarm Severity Profiles" procedure on page 7-17 to change the information.

    k.   Verify that the network element defaults listed in the status area of the node view window is correct.

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

Step 8   As appropriate, complete the circuit creation procedure listed on page 6-1.

Stop. You have completed this procedure.

NTP-A181 Create an Automatically Routed DS-1 Circuit

Purpose	This procedure creates an automatically routed DS-1 circuit, meaning CTC chooses the circuit route based on the parameters you specify and on the software version.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (Figure 6-1), complete the following fields:

- 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—Choose VT. VT cross-connects will carry the DS-1 circuit across the ONS 15454 network.

- Size—VT1.5 is the default. You cannot change it.

- Bidirectional—Leave checked for this circuit (default).

- Number of circuits—Type the number of DS-1 circuits 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 Auto-ranged 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. Auto-ranging creates identical (same source and destination) sequential circuits automatically. Deselect the box if you do not want CTC to create sequential circuits automatically.

- State—Choose a service state to apply to the circuit:
  - IS—The circuit is in service.
  - OOS—The circuit is out of service. Traffic is not passed on the circuit.
  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

– OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

Note   If VT circuit source and destination ports are in an OOS_AINS, OOS_MT, or IS state, VT circuits in OOS_AINS will change to IS even if a physical signal is not present. Refer to the *Cisco ONS 15454 Reference Manual* for more information.

- Apply to drop ports—Select if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

Note   Loss of Signal alarms are generated if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Select this check box if you want the circuit routed on protected drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you select 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 6   If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29. Otherwise, continue with the next step.
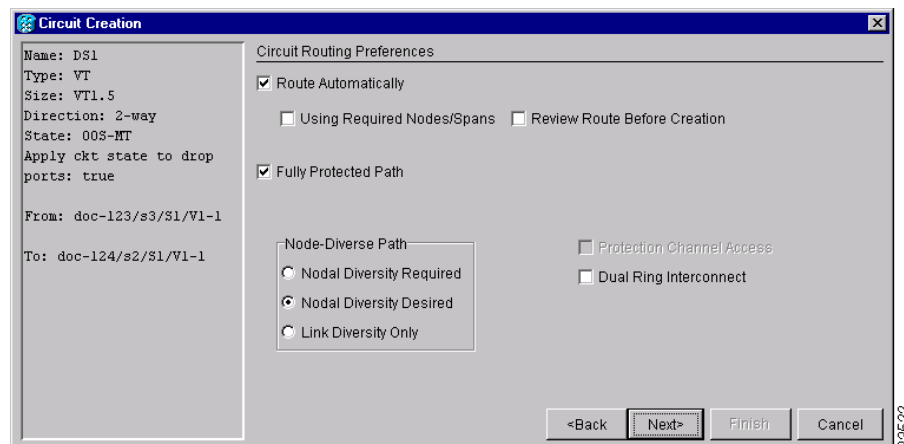
Step 7   Click **Next**.

Step 8   Complete the "DLP-A95 Provision a DS-1 Circuit Source and Destination" task on page 6-18.

Step 9   Under Circuit Routing Preferences (Figure 6-2 on page 6-8), choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

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

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

Step 10   Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 11. CTC creates a fully-protected circuit route based on the path diversity option you choose. Fully-protected paths may or may not have path protection configuration path segments (with primary and alternate paths), and the path diversity options apply only to path protection configuration path segments, if any exist.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 13.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path**, check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 13.

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Caution   Circuits routed on BLSR protection channels are not protected. They are preempted during BLSR switches.

Step 11   If you selected Fully Protected Path in Step 10, choose one of the following:

- Nodal Diversity Required—Ensures that the primary and alternate paths within path protection configuration 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 configuration portion of the complete circuit path.

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

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

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

Step 13   If you selected Using Required Nodes/Spans in Step 9, complete the following substeps. If not, continue with Step 16.

   a.   Click **Next**.

   b.   Under Circuit Route Constraints, 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 wish to include or exclude.

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

Step 14   Click **Next**. On the VT Circuit panel under Create, choose one of the following:

   • VT Tunnel on Transit Nodes—This option is available if the DS-1 circuit passes through a node that does not have a VT tunnel, or if an existing VT tunnel is full. VT tunnels allow VT circuits to pass through ONS 15454s without consuming cross-connect card resources. 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 *Cisco ONS 15454 Reference Manual* for more information.

   • VT Aggregation Point—This option is available if you are creating a DS-1 circuit to an EC-1, DS3XM-6, or OC-N port on a BLSR, 1+1, or unprotected node. A VT aggregation point (VAP) allows VT1.5 circuits to be routed through a node using one STS connection on the cross-connect card matrix rather than multiple connections on the VT1.5 matrix. If available, choose one of the following:

      – Use source as the STS grooming end—Creates the VAP on the DS-1 circuit source node. This option is available only if the DS-1 circuit originates on an EC-1, DS3XM-6, or OC-N card.

      – Use destination as the STS grooming end—Creates the VAP on the DS-1 circuit destination node. This option is available only if the DS-1 circuit terminates on an EC-1, DS3XM-6, or OC-N card.

   • None—Choose this option if you do not want to create a VT tunnel or a VAP. This will be the only available option if CTC cannot create a VT tunnel or VAP.

Step 15   If you chose VT Aggregation Point, complete the following substeps. If not, continue with Step 16.

   a.   Click **Next**.

   b.   On the VT Aggregation Point Destination panel, click the node that you want to be the VAP destination, then click **Add Destination**.

Step 16   If you selected Review Route Before Creation in Step 9, complete the following substeps. If not, continue with Step 17.

   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 circuit information. If the circuit needs to be routed to a different path, see the "NTP-A182 Create a Manually Routed DS-1 Circuit" procedure on page 6-10.

Step 17 Click **Finish**. One of the following results occurs, depending on the circuit properties you chose in the Circuit Creation dialog box:

- 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 auto ranging cannot complete all the circuits, for example, because sequential ports are unavailable at the source or destination, a dialog box is displayed. Set the new source or destination for the remaining circuits, then click **Finish** to continue auto ranging.

- If you entered more than 1 in the Number of Circuits field and did not choose Auto-ranged, the Circuit Creation dialog box is displayed so you can create the remaining circuits. Repeat this procedure for each additional circuit.

- After completing the circuit(s), CTC displays the Circuits window.

Step 18 On the Circuits window, verify that the new circuit(s) appear in the circuits list.

Step 19 Complete the "NTP-A135 Test Electrical Circuits" procedure on page 6-41. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-A182 Create a Manually Routed DS-1 Circuit

Purpose	This procedure creates a DS-1 circuit and allows you to provision the circuit route.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (see Figure 6-1 on page 6-7), complete the following fields:

- 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—Choose VT. VT cross-connects will carry the DS-1 circuit across the ONS 15454 network.

- Size—VT1.5 is the default. You cannot change it.

- Bidirectional—Leave checked for this circuit (default).

- Number of circuits—Type the number of DS-1 circuits 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, deselect this box. (The box is unavailable if only one circuit is entered in Number of Circuits.)

- State—Choose a service state to apply to the circuit:

    – IS—The circuit is in service.

    – OOS—The circuit is out of service. Traffic is not passed on the circuit.

    – OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

    – OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

Note   If VT circuit source and destination ports are in an OOS_AINS, OOS_MT, or IS state, VT circuits in OOS_AINS will change to IS even if a physical signal is not present. Refer to the *Cisco ONS 15454 Reference Manual* for more information.

- Apply to drop ports—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

Note   Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Check this box if you want the circuit routed on protected drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you select this check box, CTC displays only protected cards and ports as source and destination choices.

Step 6   If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29. Otherwise, continue with the next step.

Step 7   Click **Next**.

Step 8   Complete the "DLP-A95 Provision a DS-1 Circuit Source and Destination" task on page 6-18.

Step 9   Under Circuit Routing Preferences (see Figure 6-2 on page 6-8), deselect **Route Automatically**.

Step 10   Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 11. Fully-protected paths may or may not have path protection configuration path segments (with primary and alternate paths), and the path diversity options apply only to path protection configuration path segments, if any exist.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path,** check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 15.

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Caution   Circuits routed on BLSR protection channels are not protected and are preempted during BLSR switches.

Step 11   If you selected Fully Protected Path, choose a Node-Diverse Path option:

- Nodal Diversity Required—Ensures that the primary and alternate paths within the path protection configuration 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 configuration portion of the complete circuit path.

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

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

Step 13   Click **Next**. On the VT Circuit panel under Create, choose one of the following:

- VT Tunnel on Transit Nodes—This option is available if the DS-1 circuit passes through a node that does not have a VT tunnel, or if an existing VT tunnel is full. VT tunnels allow VT circuits to pass through ONS 15454s without consuming cross-connect card resources. 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 *Cisco ONS 15454 Reference Manual* for more information.

- VT Aggregation Point—This option is available if you are creating a DS-1 circuit to an EC-1, DS3XM-6, or OC-N port on a BLSR, 1+1, or unprotected node. A VT aggregation point (VAP) allows VT1.5 circuits to be routed through a node using one STS connection on the cross-connect card matrix rather than multiple connections on the VT1.5 matrix. If available, choose one of the following:

  – Use source as the STS grooming end—Creates the VAP on the DS-1 circuit source node. This option is available only if the DS-1 circuit originates on an EC-1, DS3XM-6, or OC-N card.

  – Use destination as the STS grooming end—Creates the VAP on the DS-1 circuit destination node. This option is available only if the DS-1 circuit terminates on an EC-1, DS3XM-6, or OC-N card.

- None—Choose this option if you do not want to create a VT tunnel or a VAP. This will be the only available option if CTC cannot create a VT tunnel or VAP.

Step 14   If you chose VT Aggregation Point, complete the following substeps. If not, continue with Step 16.

  a.   Click **Next**.

  b.   On the VT Aggregation Point Destination panel, click the node that you want to be the VAP destination, then click **Add Destination**.

Step 15   Click **Next**. Under Route Review and Edit, node icons are displayed 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 16   Complete the "DLP-A96 Provision a DS-1 or DS-3 Circuit Route" task on page 6-31 for the DS-1 circuit you are creating.

Step 17   Click **Finish**. CTC will compare your manually-provisioned circuit route with the specified path diversity option you chose in Step 11. 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 the Number of Circuits field, the Circuit Creation dialog box is displayed so you can create the remaining circuits. Repeat this procedure for each additional circuit.

Step 18   When all the circuits are created, CTC displays the main Circuits window. Verify that the circuit(s) you created are correct.

Step 19   Complete the "NTP-A135 Test Electrical Circuits" procedure on page 6-41. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-A183 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-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (Figure 6-3 on page 6-15), complete the following fields:

- 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—Choose VT.

- Size—VT1.5 is the default. You cannot change it.

- Bidirectional—Deselect for this circuit.

- Number of circuits—Leave the default unchanged (1).

- Auto-ranged—Unavailable when the Number of Circuits field is 1.

- State—Choose a service state to apply to the circuit:

    - IS—The circuit is in service.

    - OOS—The circuit is out of service. Traffic is not passed on the circuit.

    - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

    - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

    Note   If VT circuit source and destination ports are in an OOS_AINS, OOS_MT, or IS state, VT circuits in OOS_AINS will change to IS even if a physical signal is not present. Refer to the *Cisco ONS 15454 Reference Manual* for more information.

- Apply to drop ports—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

    Note   Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Check this box if you want the circuit routed to protect drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you check this box, CTC displays only protected cards as source and destination choices.

Figure 6-3   Setting Circuit Attributes for a Unidirectional DS-1 Circuit
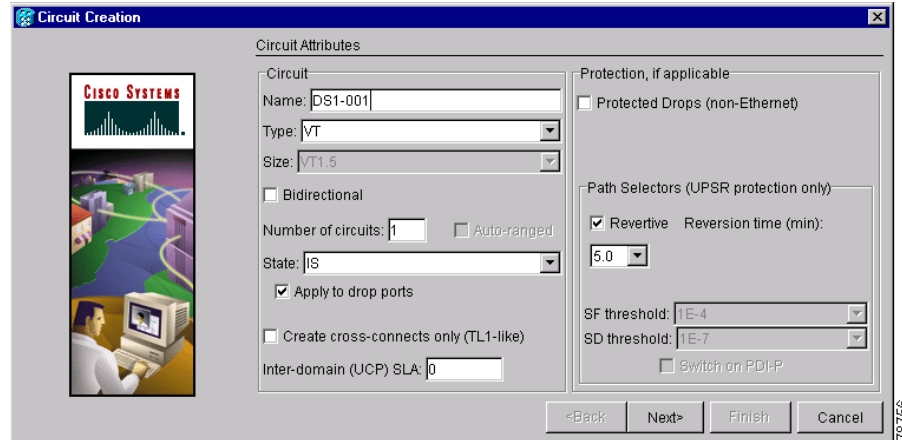
Step 6   Click **Next**.

Step 7   Complete the "DLP-A95 Provision a DS-1 Circuit Source and Destination" task on page 6-18.

Step 8   Under Circuit Routing Preferences, deselect **Route Automatically**. When Route Automatically is not selected, Using Required Nodes/Spans and Review Route Before Circuit Creation are unavailable.

Step 9   Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 11. Fully-protected paths may or may not have path protection configuration path segments (with primary and alternate paths), and the path diversity options apply only to path protection configuration path segments, if any exist.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 15.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path**, check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 15.

⚠
Caution   Circuits routed on BLSR protection channels are not protected and are preempted during BLSR switches.

Step 10   If you selected Fully Protected Path, choose one of the following:

- Nodal Diversity Required—Ensures that the primary and alternate paths within the path protection configuration 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 configuration portion of the complete circuit path.

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

Step 11   If you selected Fully Protected Path and the circuit will be routed on a path protection configuration dual ring interconnect (DRI), click the **Dual Ring Interconnect** check box.

Step 12   Click **Next**. On the VT Circuit panel under Create, choose one of the following:

- VT Tunnel on Transit Nodes—This option is available if the DS-1 circuit passes through a node that does not have a VT tunnel, or if an existing VT tunnel is full. VT tunnels allow VT circuits to pass through ONS 15454s without consuming cross-connect card resources. 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 *Cisco ONS 15454 Reference Manual* for more information.

- VT Aggregation Point—This option is available if you are creating a DS-1 circuit to an EC-1, DS3XM-6, or OC-N port on a BLSR, 1+1, or unprotected node. A VT aggregation point (VAP) allows VT1.5 circuits to be routed through a node using one STS connection on the cross-connect card matrix rather than multiple connections on the VT1.5 matrix. If available, choose one of the following:

  - Use source as the STS grooming end—Creates the VAP on the DS-1 circuit source node. This option is available only if the DS-1 circuit originates on an EC-1, DS3XM-6, or OC-N card.

  - Use destination as the STS grooming end—Creates the VAP on the DS-1 circuit destination node. This option is available only if the DS-1 circuit terminates on an EC-1, DS3XM-6, or OC-N card.

- None—Choose this option if you do not want to create a VT tunnel or a VAP. This will be the only available option if CTC cannot create a VT tunnel or VAP.

Step 13 If you chose VT Aggregation Point, complete the following substeps. If not, continue with Step 16.

    a. Click **Next**.

    b. On the VT Aggregation Point Destination panel, click the node that you want to be the VAP destination, then click **Add Destination**.

Step 14 Click **Next**. Under Route Review and Edit, node icons are displayed so you can 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 15 Complete the "DLP-A96 Provision a DS-1 or DS-3 Circuit Route" task on page 6-31 for the DS-1 circuit you are creating.

Step 16 Click **Finish**. CTC completes the circuit and displays the Circuits window.

Step 17 On the Circuits window, click the circuit that you want to route to multiple drops. The Delete, Edit, and Search buttons become active.

Step 18 Click **Edit** (or double-click the circuit row). The Edit Circuit window is displayed with the General tab selected.

All nodes in the DCC network are displayed 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**. To rearrange a node icon, select the node, press **Ctrl**, then drag and drop the icon to the new location.

Step 19 On the Edit Circuit dialog box, click the **Drops** tab. A list of existing drops is displayed.

Step 20 Click **Create**.

Step 21 On 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 DS1 from the Port, STS, VT or DS1 pull-down menus. The card selected in Step b determines the fields that display. 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. However, you can modify the following:

- If the original circuit was routed on a protected path, you can change the nodal diversity options: Required, Desired, Don't Care; Link Diverse only. See Step 10 for options descriptions.

- If the original circuit was not routed on a protected path, the Protection Channel Access options is available. See Step 10 for a description of the PCA option.

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

Step 22   If you need to create additional drops for the circuit, repeat Steps 20 and 21 to create the additional drops.

Step 23   Click **Close**. The Circuits window is displayed.

Step 24   Verify that the new drops are displayed under the Destination column for the circuit you edited. If they do not appear repeat Steps 5 through 22, making sure all options are provisioned correctly.

Step 25   Complete the "NTP-A135 Test Electrical Circuits" procedure on page 6-41. Skip this step if you built a test circuit.

     Stop. You have completed this procedure.

DLP-A314 Assign a Name to a Port

Purpose	Use this task to assign a name to a port on any ONS 15454 card.
Tools/Equipment	None
Prerequisite Procedures	NTP-A24 Verify Card Installation, page 4-2
Required/As Needed	As needed.
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into the node where you want to assign a port name for a card or cards. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions.

Step 2   Double-click the card that has the port you want to provision.

Step 3   Click the **Provisioning** tab.

Step 4   Click the **Port Name** column for the port number you are assigning a name to and enter the desired port name.

     The port name can be up to 32 alphanumeric/special characters and is blank by default.

Step 5   Click **Apply**.

Step 6   Return to your originating procedure (NTP).

DLP-A95 Provision a DS-1 Circuit Source and Destination

Purpose	This task provisions an electrical circuit source and destination for a DS-1 circuit.
Tools/Equipment	None
Prerequisite Procedures	You perform this task during one of the following procedures:
	NTP-A181 Create an Automatically Routed DS-1 Circuit, page 6-6, or
	NTP-A182 Create a Manually Routed DS-1 Circuit, page 6-10, or
	NTP-A183 Create a Unidirectional DS-1 Circuit with Multiple Drops, page 6-13
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note After you have selected the circuit properties in the Circuit Source dialog box according to the specific circuit creation procedure, you are ready to provision the circuit source.

Step 1 From the Node pull-down menu, choose the node where the source will originate.

Step 2 From the Slot pull-down menu, choose the slot containing the DS1-14, DS1N-14 (Figure 6-4), or DS3XM-6 card (Figure 6-5) where the circuit will originate.

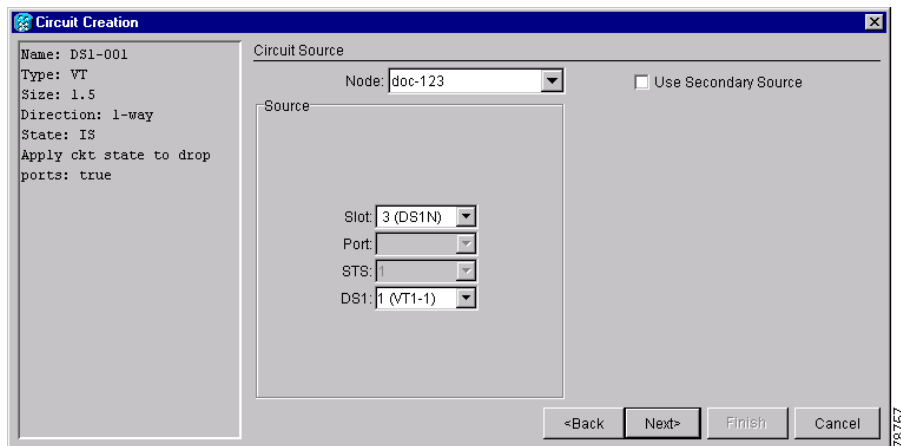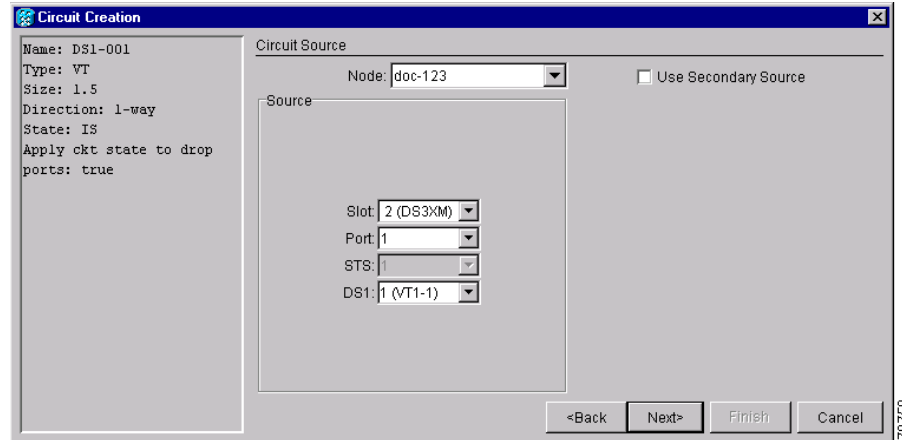*Figure 6-4   Defining the Circuit Source on a DS-1 Card*

Figure 6-5   Defining the Circuit Source on a DS3XM-6 Card

Step 3 Only if you chose DS3XM-6 as the card, choose the port from the Port pull-down menu.

Step 4 From the DS-1 pull-down menu, choose the source DS-1.

Step 5 If you need to create a secondary source, for example, a path protection configuration bridge/selector circuit entry point in a multivendor path protection configuration, click **Use Secondary Source** and repeat Steps 1 through 4 to define the secondary source. If you do not need to create a secondary source, continue with Step 6.

Step 6 Click **Next**.

Step 7 From the Node pull-down menu, choose the destination (termination) node.

Step 8 From the Slot pull-down menu, choose the slot containing the destination card. The destination is typically a DS-1 card. You can also choose an OC-N card to map the DS-1 to a VT1.5 for optical transport.

Step 9 Depending on the destination card, choose the destination port, STS, VT, or DS1 from the sub-menus that display based on the card selected in Step 8. See Table 6-2 on page 6-3 for a list of valid options. CTC does not display ports, STSs, VTs, or DS1s already used by other circuits. If you and a user working on the same network choose the same port, STS, VT, port, or DS1 simultaneously, one of you will receive a Path in Use error and be unable to complete the circuit. The user with the incomplete circuit needs to choose new destination parameters.

Step 10 If you need to create a secondary destination, for example, a path protection configuration bridge/selector circuit exit point in a multivendor path protection configuration, click **Use Secondary Destination** and repeat Steps 7 through 9 to define the secondary destination.

Step 11 Click **Next**.

Step 12 Return to your originating procedure (NTP).

NTP-A184 Create an Automatically Routed DS-3 Circuit

Purpose	This procedure creates an automatically routed DS-3 circuit. CTC routes the circuit automatically based on circuit creation parameters and the software version.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (Figure 6-6 on page 6-21), complete the following fields:

- 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—Choose STS. STS cross-connects will carry the DS-3 circuit across the ONS 15454 network.

- Size—Choose STS-1.

- Bidirectional—Leave checked for this circuit (default).

- Number of circuits—Type the number of DS-3 circuits you want to create. The default is 1. If you are creating multiple circuits with sequential source and destination ports, you can use Auto-ranged to create the circuits automatically.

- Auto-ranged—This 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 circuits with the same source and destination and you want CTC to create the circuits automatically. Deselect the box if you do not want CTC to create sequential circuits automatically.

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

  - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

> **Note**   Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Check this box if you want the circuit routed on protected drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you check this box, CTC displays only protected cards and ports as source and destination choices.

Figure 6-6   Setting Circuit Attributes for a DS-3 Circuit
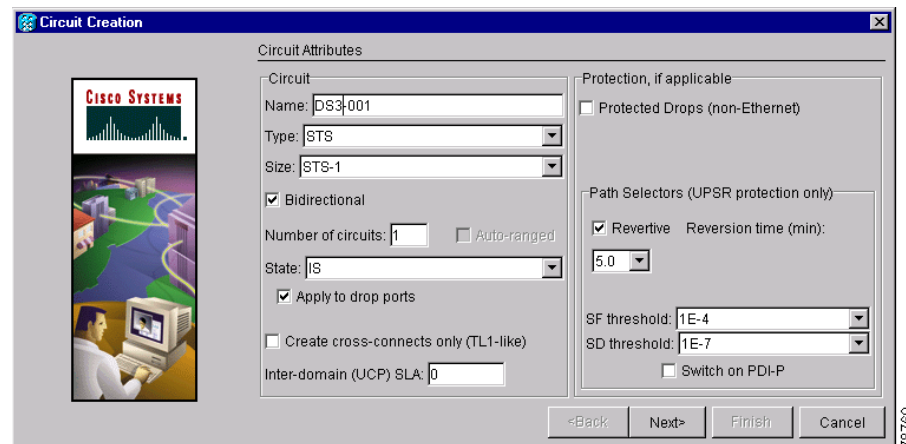
Step 6   If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 7   Click **Next**.

Step 8   Complete the "DLP-A208 Provision a DS-3 Circuit Source and Destination" task on page 6-30.

Step 9   Under Circuit Routing Preferences (Figure 6-7 on page 6-22), choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences:

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

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

Step 10   Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 14. CTC creates a fully-protected circuit route based on the path diversity option you choose. Fully-protected paths may or may not have path protection configuration path segments (with primary and alternate paths), and the path diversity options apply only to path protection configuration path segments, if any exist.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 13.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path**, check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 13.

⚠

**Caution**   Circuits routed on BLSR protection channels are not protected and are preempted during BLSR switches.

Step 11   If you selected Fully Protected Path in Step 10, choose one of the following:

- Nodal Diversity Required—Ensures that the primary and alternate paths within path protection configuration 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 configuration portion of the complete circuit path.

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

Figure 6-7   Setting Circuit Routing Preferences for a DS-3 Circuit
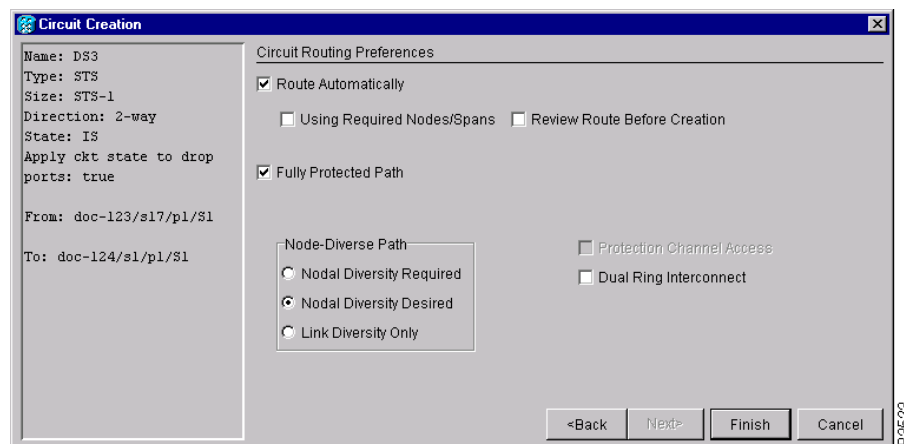
Step 12   If you selected Fully Protected Path and the circuit will be routed on a path protection configuration dual ring interconnect (DRI), click the **Dual Ring Interconnect** check box.

Step 13   If you selected Using Required Nodes/Spans in Step 9, complete the following substeps; otherwise, continue with Step 14:

    a.   Click **Next**.

    b.   Under Circuit Route Constraints, 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 wish 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 Notes 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 grey, that node or span is required.

Step 14 If you selected Review Route Before Creation, complete the following substeps; otherwise, continue with Step 15.

    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 circuit information. If the circuit needs to be routed to a different path, see the "NTP-A185 Create a Manually Routed DS-3 Circuit" procedure on page 6-24.

Step 15 Click **Finish**. One of the following actions occurs based on the circuit properties you selected:

- 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 auto ranging cannot complete all the circuits, for example, because sequential ports are unavailable at the source or destination, a dialog box is displayed. Set the new source or destination for the remaining circuits, then click **Finish** to continue auto ranging.

- If you entered more than 1 in the Number of Circuits field and did not choose Auto-ranged, the Circuit Creation dialog box is displayed so you can create the remaining circuits. Repeat Steps 8 through 15 for each additional circuit.

- After completing the circuit(s), CTC displays the Circuits window.

Step 16 On the Circuits window, verify that the circuit(s) you just created appear in the circuits list.

Step 17 Complete the "NTP-A135 Test Electrical Circuits" procedure on page 6-41. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-A185 Create a Manually Routed DS-3 Circuit

Purpose	This procedure creates a DS-3 circuit and allows you to provision the circuit route.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into the node where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. If you are already logged in, continue with Step 3.

Step 2 If you want to assign a name to the circuit source and destination ports before you create the circuit, complete the "DLP-A314 Assign a Name to a Port" task on page 6-17. If not, continue with Step 4.

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 (Figure 6-3 on page 6-15), complete the following fields:

- 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 will assign a default name to the circuit.

- Type—Choose STS. STS cross-connects will carry the DS-3 circuit across the ONS 15454 network.

- Size—Choose STS-1.

- Bidirectional—Leave this field checked (default).

- Number of circuits—Type the number of DS-3 circuits 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, deselect this box. (The box is unavailable if only one circuit is entered in Number of Circuits.)

- State—Choose a service state to apply to the circuit:
  - IS—The circuit is in service.
  - OOS—The circuit is out of service. Traffic is not passed on the circuit.
  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).
  - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

✎

Note   Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Select this check box if you want the circuit routed to protect drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you select this check box, CTC displays only protected cards as source and destination choices.

Step 6   If the circuit will be routed on a path protection configuration, set the path protection configuration path selectors. See the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 7   Click **Next**.

Step 8   Complete the "DLP-A208 Provision a DS-3 Circuit Source and Destination" task on page 6-30.

Step 9   Under Circuit Routing Preferences (Figure 6-7 on page 6-22), deselect **Route Automatically**.

Step 10   Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 11. Fully-protected paths may or may not have path protection configuration path segments (with primary and alternate paths), and the path diversity options apply only to path protection configuration path segments, if any exist.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 13.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path**, check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 13.

⚠

Caution   Circuits routed on BLSR protection channels are not protected and are preempted during BLSR switches.

Step 11   If you selected Fully Protected Path, choose one of the following:

- Nodal Diversity Required—Ensures that the primary and alternate paths within the path protection configuration 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 configuration portion of the complete circuit path.

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

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

Step 13   Click **Next**. Under Route Review and Edit, node icons are displayed so you can 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 14   Complete the "DLP-A96 Provision a DS-1 or DS-3 Circuit Route" task on page 6-31 for the DS-3 you are creating.

Step 15   Click **Finish**. If you entered more than 1 in the Number of Circuits field, the Circuit Creation dialog box is displayed so you can create the remaining circuits. Repeat this procedure for each additional circuit.

Step 16   When all the circuits are created, CTC displays the main Circuits window. Verify that the circuit(s) you created appear in the window.

Step 17   Complete the "NTP-A135 Test Electrical Circuits" procedure on page 6-41. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-A186 Create a Unidirectional DS-3 Circuit with Multiple Drops

Purpose	This procedure creates a unidirectional DS-3 circuit with multiple drops.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (Figure 6-8 on page 6-27), complete the following fields:

- 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—Choose STS.

- Size—Choose STS-1.

- Bidirectional—Deselect for this circuit.

- Number of circuits—Leave the default unchanged (1).

- Auto-ranged—Unavailable when the Number of Circuits field is 1.

- State—Choose a service state to apply to the circuit:

    - IS—The circuit is in service.

    - OOS—The circuit is out of service. Traffic is not passed on the circuit.

- OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

- OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

> **Note**   Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Select this check box if you want the circuit routed to protect drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you select this check box, CTC displays only protected cards as source and destination choices.

Figure 6-8   Setting Circuit Attributes for a Unidirectional DS-3 Circuit

Step 6   If the circuit will be routed on a path protection configuration, set the path protection configuration path selectors. See the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 7   Click **Next**.

Step 8   Complete the "DLP-A208 Provision a DS-3 Circuit Source and Destination" task on page 6-30.

Step 9 Deselect **Route Automatically**. When Route Automatically is not selected, Using Required Nodes/Spans and Review Route Before Circuit Creation are unavailable.

Step 10 Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 11. Fully-protected paths may or may not have path protection configuration path segments (with primary and alternate paths), and the path diversity options apply only to path protection configuration path segments, if any exist.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 13.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path**, check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 13.

⚠️

Caution Circuits routed on BLSR protection channels are not protected and are preempted during BLSR switches.

Step 11 If you selected Fully Protected Path, choose one of the following:

- Nodal Diversity Required—Ensures that the primary and alternate paths within the path protection configuration 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 configuration portion of the complete circuit path.

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

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

Step 13 Click **Next**. Under Route Review and Edit, node icons are displayed so you can 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 14 Complete the "DLP-A96 Provision a DS-1 or DS-3 Circuit Route" task on page 6-31 for the DS-3 you are creating.

Step 15 Click **Finish**. After completing the circuit, CTC displays the Circuits window.

Step 16 On the Circuits window, click the circuit that you want to route to multiple drops. The Delete, Edit, and Search radio buttons become active.

Step 17 Click **Edit**. The Edit Circuit window is displayed with the General tab selected. All nodes in the DCC network are displayed 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 18 On the Edit Circuit dialog box, click the **Drops** tab. A list of existing drops is displayed.

Step 19 Click **Create**.

Step 20 On 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 pull-down menus. The card selected in Step b determines whether port, STS, or both display. 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. However, you can modify the following:

- If the original circuit was routed on a protected path, you can change the nodal diversity options: Required, Desired, Don't Care; Link Diverse only. See Step 11 for options descriptions.

- If the original circuit was not routed on a protected path, the Protection Channel Access options is available. See Step 10 for a description of the PCA option.

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

Step 21   If you need to create additional drops for the circuit, repeat Steps 19 and 20 to create the additional drops.

Step 22   Click **Close**. The Circuits window displays.

Step 23   Verify that the new drops are displayed under the Destination column for the circuit you edited. If they do not appear, repeat this procedure, making sure all options are provisioned correctly.

Step 24   Complete the "NTP-A135 Test Electrical Circuits" procedure on page 6-41. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation

Purpose	This task provisions path protection configuration selectors during circuit creation. Use this task only if the circuit will be routed on a path protection configuration.
Tools/Equipment	None
Prerequisite Procedures	You must have the Circuit Creation wizard displayed.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   On the Circuit Attributes panel of the Circuit Creation wizard, set the path protection configuration path selectors:

- Revertive—Check this box if you want traffic to revert to the working path when the conditions that diverted it to the protect path are repaired. If you do not choose Revertive, traffic remains on the protect path after the switch.

- Reversion time—If Revertive is checked, click the Reversion time field and choose a reversion time from the pull-down menu. The range is 0.5 to 12.0 minutes. The default is 5.0 minutes. This is the amount of time that will elapse before the traffic reverts to the working path. Traffic can revert when conditions causing the switch are cleared.

- SF threshold—For STS circuits, set the path protection configuration path-level signal failure bit error rate (BER) thresholds. Unavailable for VT circuits.

- SD threshold—For STS circuits, set the path protection configuration path-level signal degrade BER thresholds. Unavailable for VT circuits.

- Switch on PDI-P—For STS circuits, check this box if you want traffic to switch when an STS payload defect indicator is received. Unavailable for VT circuits.

Step 2 Return to your originating procedure (NTP).

DLP-A208 Provision a DS-3 Circuit Source and Destination

Purpose	This task provisions an electrical circuit source and destination for a DS-3 circuit.
Tools/Equipment	None
Prerequisite Procedures	You perform this task during one of the following procedures:
	NTP-A184 Create an Automatically Routed DS-3 Circuit, page 6-20, or
	NTP-A185 Create a Manually Routed DS-3 Circuit, page 6-24, or
	NTP-A186 Create a Unidirectional DS-3 Circuit with Multiple Drops, page 6-26
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note After you have selected the circuit properties in the Circuit Source dialog box according to the specific circuit creation procedure, you are ready to provision the circuit source.

Step 1 From the Node pull-down menu, choose the node where the source will originate.

Step 2 From the Slot pull-down menu, choose the slot containing the DS-3 card where the circuit will originate If you are configuring a DS-3 circuit with a transmux card, choose the DS3XM-6 card.

Step 3 From the Port pull-down menu, choose the source DS-3 or DS3XM-6 card as appropriate.

Step 4 If you need to create a secondary source, for example, a path protection configuration bridge/selector circuit entry point in a multivendor path protection configuration, click **Use Secondary Source** and repeat Steps 1 through 3 to define the secondary source. If you do not need to create a secondary source, continue with Step 6.

Step 5 Click **Next**.

Step 6 From the Node pull-down menu, choose the destination (termination) node.

Step 7 From the Slot pull-down menu, choose the slot containing the destination card. The destination is typically a DS3XM-6 or DS-3 card. You can also choose an OC-N card to the map DS-3 circuit to an STS.

Step 8 Depending on the destination card, choose the destination port or STS from the sub-menus that display based on the card selected in Step 2. See Table 6-2 on page 6-3 for a list of valid options. CTC does not display ports, STSs, VTs, or DS1s if they are already in use by other circuits. If you and a user working

on the same network choose the same port, STS, VT, port, or DS1 simultaneously, one of you will receive a Path in Use error and be unable to complete the circuit. The user with the incomplete circuit needs to choose new destination parameters.

Step 9   If you need to create a secondary destination, for example, a path protection configuration bridge/selector circuit exit point in a multivendor path protection configuration, click **Use Secondary Destination** and repeat Steps 7 and 8 to define the secondary destination.

Step 10   Click **Next**.

Step 11   Return to your originating procedure (NTP).

DLP-A96 Provision a DS-1 or DS-3 Circuit Route

Purpose	This task provisions the circuit route for manually-routed DS-1 or DS-3 circuits.
Tools/Equipment	None
Prerequisite Procedures	You perform this task during one of the following procedures:
	NTP-A182 Create a Manually Routed DS-1 Circuit, page 6-10, or
	NTP-A183 Create a Unidirectional DS-1 Circuit with Multiple Drops, page 6-13, or
	NTP-A185 Create a Manually Routed DS-3 Circuit, page 6-24, or
	NTP-A186 Create a Unidirectional DS-3 Circuit with Multiple Drops, page 6-26
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   On the Circuit Creation wizard under Route Review and Edit, click the source node icon if it is not already selected.

Step 2   Starting with a span on the source node, click the arrow of the span you want the circuit to travel. The arrow turns white. Under Selected Span, the From and To fields display span information. The source STS and VT (DS-1 circuit only) are displayed. Figure 6-9 shows a DS-1 circuit example.

Figure 6-9   Manually Routing a DS-1 Circuit
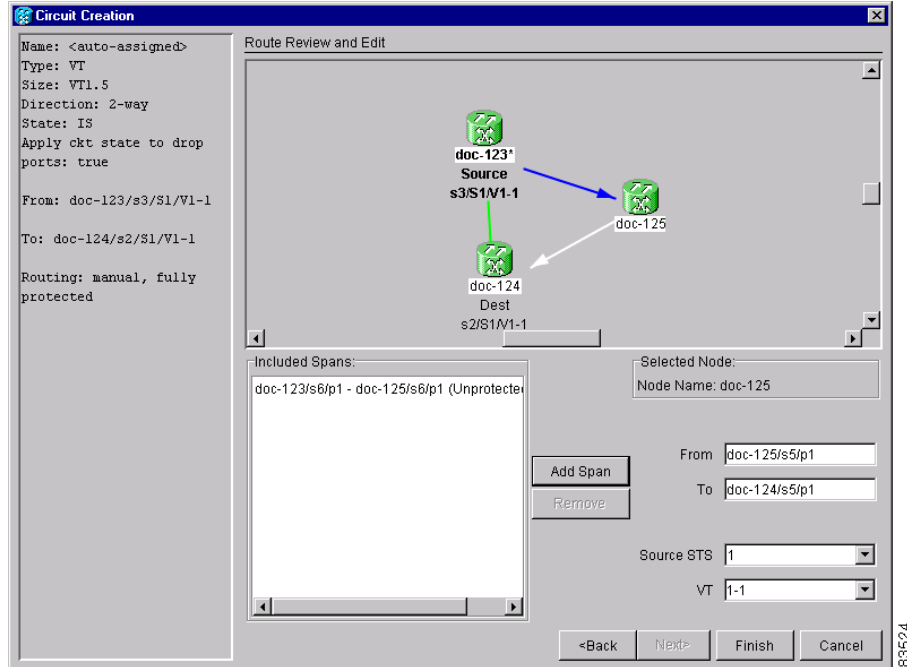
Step 3   If you want to change the source STS, adjust the Source STS field; otherwise, continue with Step 4.

Step 4   If you want to change the source VT for DS-1 circuits, adjust the Source VT field; otherwise, continue with Step 5.

✎

Note   VT is grey (unavailable) for DS-3 circuits.

Step 5   Click **Add Span**.The span is added to the Included Spans list and the span arrow turns blue.

Step 6   Repeat Steps 2 through 5 until the circuit is provisioned from the source to the destination node through all intermediary nodes. If the Fully Protect Path check box is checked on the Circuit Routing Preferences panel, you must:

- Add two spans for all path protection configuration or unprotected portions of the circuit route from the source to the destination

- Add one span for all BLSR or 1+1 portions of route from the source to the destination

Step 7   Return to your originating procedure (NTP).

NTP-A133 Create an Automatically Routed VT Tunnel

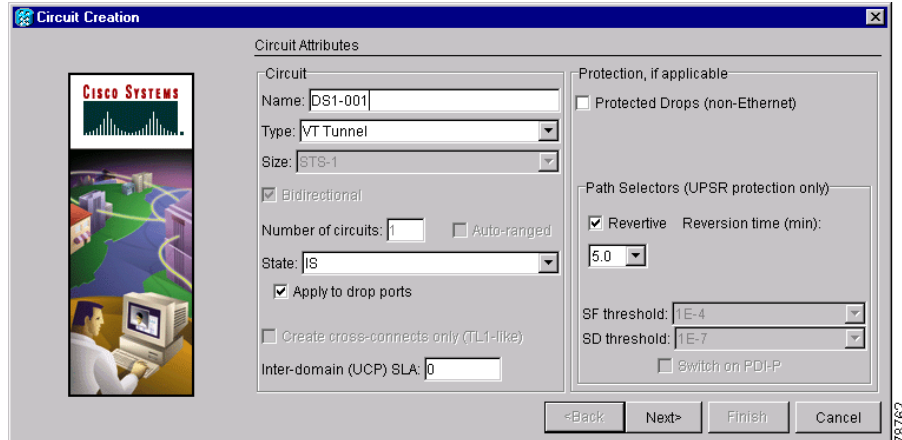|	
Purpose	This procedure creates an automatically routed VT tunnel from source to destination nodes.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4

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 15454s without consuming VT matrix resources on the cross-connect 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 15454 Reference Manual* for more information.

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (Figure 6-10 on page 6-34), complete the following fields:

- 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.

- Type—Choose VT Tunnel. The Bidirectional, Number of Circuits, Field Size, and Create cross-connects fields in the dialog box become unavailable.

- Size—Unavailable for VT tunnels.

- Bidirectional—Unavailable for VT tunnels.

- Number of circuits—Unavailable for VT tunnels.

- Auto-ranged—Unavailable for VT tunnels.

- State—Choose a service state to apply to the VT tunnel:

   – IS—The VT tunnel is in service.

   – OOS—The VT tunnel is out of service. Traffic is not passed on the circuit.

   – OOS-AINS—The VT tunnel is in service when it receives a valid signal; until then, the tunnel is out of service.

   – OOS-MT—The VT tunnel is in a maintenance state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the tunnel. Use OOS-MT for circuit testing or to suppress circuit alarms temporarily. Change the state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Uncheck this box.

- Inter-domain (UCP) SLA—If the tunnel will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

Figure 6-10   Setting Attributes for a VT Tunnel

Step 6   Click **Next**.

Step 7   Under Circuit Source, choose the node where the VT tunnel will originate from the Node pull-down menu.

Step 8   Click **Next**.

Step 9   Under Circuit Destination, choose the node where the VT tunnel will terminate from the Node pull-down menu.

Step 10   Click **Next**.

Step 11   Under Circuit Routing Preferences, choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

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

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

Step 12   If you selected Using Required Nodes/Spans:

a. Click **Next**.

b. Under Circuit Route Constraints, 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 wish to include or exclude.

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

Step 13   If you selected Review Route Before Creation:

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 14 Click **Finish**. The Circuits window displays.

Step 15 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-A134 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-A127 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 15454s without consuming VT matrix resources on the cross-connect 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 15454 Reference Manual* for more information.

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (Figure 6-10 on page 6-34), complete the following fields:

- 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.

- Type—Choose VT Tunnel. The Bidirectional, Number of Circuits, Field Size, and Create cross-connects fields in the dialog box become unavailable (greyed out).

- Size—Unavailable for VT tunnels.

- Bidirectional—Unavailable for VT tunnels.

- Number of circuits—Unavailable for VT tunnels.

- Auto-ranged—Unavailable for VT tunnels.

- State—Choose a service state to apply to the VT tunnel:

 - IS—The VT tunnel is in service.

- OOS—The VT tunnel is out of service. Traffic is not passed on the circuit.

- OOS-AINS—The VT tunnel is in service when it receives a valid signal; until then, the circuit is out of service.

- OOS-MT—The VT tunnel is in a maintenance state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed. Use OOS-MT for testing or to suppress circuit alarms temporarily. Change the state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Uncheck this box.

  - Inter-domain (UCP) SLA—If the tunnel will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

Step 6   Click **Next**.

Step 7   Under Circuit Source, choose the node where the VT tunnel will originate from the Node pull-down menu.

Step 8   Click **Next**.

Step 9   Under Circuit Destination, choose the node where the VT tunnel will terminate from the Node pull-down menu.

Step 10   Click **Next**.

Step 11   Under Circuit Routing Preferences, deselect **Route Automatically**.

Step 12   Click **Next**. Under Route Review and Edit, node icons are displayed 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 13   Complete the "DLP-A219 Provision a VT Tunnel Route" task on page 6-36 for the tunnel you are creating. The Circuits window displays.

Step 14   Verify that the tunnel you just created appears in the circuits list. VT tunnels are identified by VTT in the Type column.

Step 15   Return to your originating procedure.

DLP-A219 Provision a VT Tunnel Route

Purpose	This task provisions the route for a manually-routed VT tunnel.
Tools/Equipment	None
Prerequisite Procedures	Perform this task as part of the "NTP-A134 Create a Manually Routed VT Tunnel" procedure on page 6-35.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   On the Circuit Creation wizard under Route Review and Edit, click the source node icon if it is not already selected. Arrows indicate the available spans for routing the tunnel from the source node.

Step 2   Click the arrow of the span you want the VT tunnel to travel. The arrow turns white. Under Selected Span, the From and To fields display the slot and port that will carry the tunnel. The source STS is displayed. Figure 6-11 shows an example.

Figure 6-11   Manually Routing a VT Tunnel
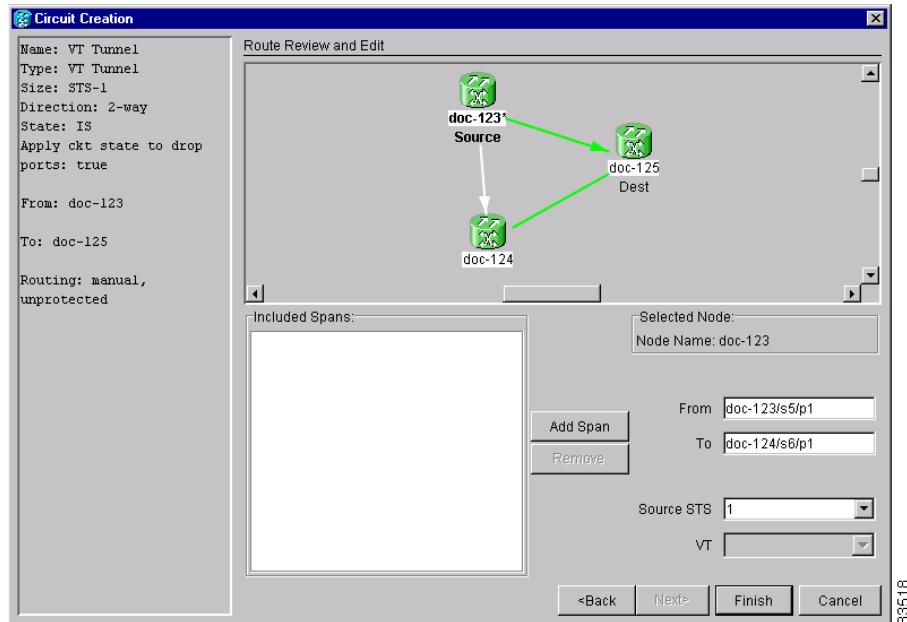
Step 3   If you want to change the source STS, change it in the Source STS field; otherwise, continue with the next step.

Step 4   Click **Add Span**.The span is added to the Included Spans list and the span arrow turns blue.

Step 5   Repeat Steps 3 and 4 until the tunnel is provisioned from the source to the destination node through all intermediary nodes.

Step 6   Return to the "NTP-A134 Create a Manually Routed VT Tunnel" procedure on page 6-35.

Stop. You have completed this procedure.

NTP-A187 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, EC-1, or DS3XM-6 card. VAPs allow multiple VT1.5 circuits to pass through cross-connect cards without utilizing resources on the cross-connect card VT matrix.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

> **Note**   VT aggregation points can be created for circuits on BLSR, 1+1, or unprotected nodes. They cannot be created for circuits on path protection configuration nodes.

> **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 you can terminate at one node is 8 for 1+1 and path protection configuration and 12 for BLSR protection.

Step 1   Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (Figure 6-12 on page 6-39), complete the following fields:

- 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.

- Type—Choose **VT Aggregation Point**. The Size, Bidirectional, Number of Circuits, and Create cross-connects fields in the dialog box become unavailable.

- Size—Unavailable for VAPs.

- Bidirectional—Unavailable for VAPs.

- Number of circuits—Unavailable for VAPs.

- Auto-ranged—Unavailable for VAPs.

- State—Choose a service state to apply to the VAP:

  - IS—The VAP is in service.

  - OOS—The VAP is out of service. Traffic is not passed on the circuit.

- OOS-AINS—The VAP is in service when it receives a valid signal; until then, the tunnel is out of service.

- OOS-MT—The VAP is in a maintenance state. The maintenance state does not interrupt traffic flow; it suppresses alarms and conditions and allows loopbacks to be performed on the VAP. Use OOS-MT for circuit testing or to suppress circuit alarms temporarily. Change the state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Uncheck this box.

- Inter-domain (UCP) SLA—If the VAP will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

Figure 6-12   Setting Attributes for a VT Aggregation Point
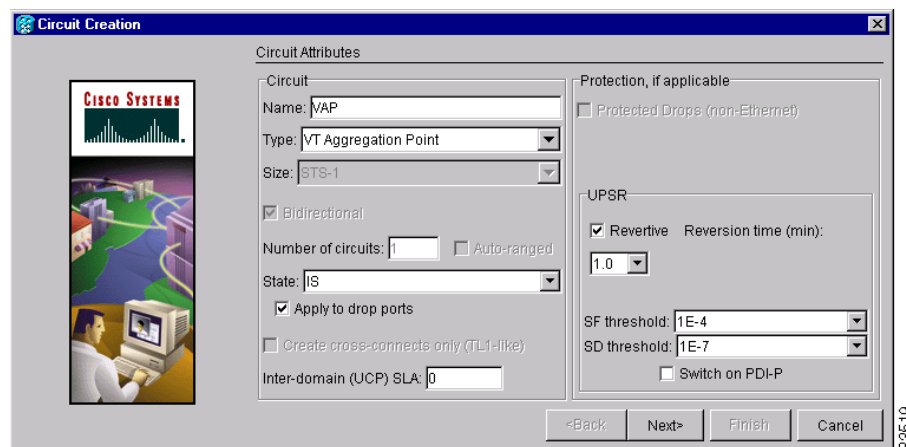
Step 6   Click **Next**.

Step 7   Under Circuit Source, 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 pull-down menu, choose the node where the VAP will originate.

    b.   From the Slot pull-down menu, choose the slot containing the OC-N, EC-1 or DS3XM-6 card where the VAP will originate.

    c.   Choose either the port or STS:

       - If you choose an EC-1 or DS3XM-6 card, from the Port pull-down menu, choose the source port.

       - If you choose an OC-N card, from the STS pull-down menu, choose the source STS.

Step 8   Click **Next**.

Step 9   Under Circuit Destination, choose the node where the VT circuits aggregated by the VAP will terminate from the Node pull-down menu.

Step 10   Click **Next**.

Step 11   Under Circuit Routing Preferences, choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

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

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

Step 12   If you selected Using Required Nodes/Spans:

    a.   Click **Next**.

    b.   Under Circuit Route Constraints, 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 wish to include or exclude.

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

Step 13   If you selected Review Route Before Creation:

    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 14   Click **Finish**. The Circuits window displays.

Step 15   Verify that the VAP you just created appears in the circuits list. VAPs are identified in the Type column.

Stop. You have completed this procedure.

NTP-A135 Test Electrical Circuits

Purpose	This procedures tests DS-1 and DS-3 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 ONS 15454s to the DSX, and that you created a circuit using one of the following procedures:
	NTP-A181 Create an Automatically Routed DS-1 Circuit, page 6-6
	NTP-A182 Create a Manually Routed DS-1 Circuit, page 6-10
	NTP-A183 Create a Unidirectional DS-1 Circuit with Multiple Drops, page 6-13
	NTP-A184 Create an Automatically Routed DS-3 Circuit, page 6-20
	NTP-A185 Create a Manually Routed DS-3 Circuit, page 6-24
	NTP-A186 Create a Unidirectional DS-3 Circuit with Multiple Drops, page 6-26
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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 **Circuit** tab.

Step 4 Set the circuit and circuit ports to the maintenance state (OOS-MT). Take note of the original state because you will return the circuit to that state later.

   a. Click the circuit you want to test then choose **Circuits > Set Circuit State** from the Tools menu.

   b. On the Set Circuit State dialog box, choose **OOS-MT** from the Target State pull-down menu.

   c. Check the **Apply to drop ports** check box.

   d. Click **Apply**.

Step 5 Set the source and destination DS-1 card 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 pull-down menu, choose the line length for the distance (in feet) between the DSX (if used) or circuit termination point and the source ONS 15454.

   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 transmit the (Tx) connector to the receive (Rx) connector of the port.

Step 7   Attach loopback cables to the circuit source node.

    a.   Verify the integrity of 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 test set to the circuit source port: (transmit (Tx) port of the test set to the circuit receive (Rx) port; test set receive (Rx) port to the circuit transmit (Tx) port.

Step 8   Configure the test set for the ONS 15454 card that is the source of the circuit you are testing:

- DS-1—If you are testing an unmuxed DS-1, you must have a DSX-1 panel or a direct DS-1 interface into the ONS 15454. Set the test set for DS-1. For information about configuring your test set, consult your test set user guide.

- DS-3—If you are testing a clear channel DS-3, you must have a DSX-3 panel or a direct DS-3 interface into the ONS 15454. Set the test set for clear channel DS-3. For information about configuring your test set, consult your test set user guide.

- DS3XM-6—If you are testing a DS-1 circuit on a DS3XM-6 card you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for a muxed DS3. After you choose muxed DS-3, choose the DS-1 to test on the muxed DS-3. For information about configuring your test set, consult your test set user guide.

- EC-1—If you are testing a DS-1 on an EC1 card, you must have a DSX-3 panel or a direct DS-3 interface to the ONS 15454. Set the test set for an STS-1. After you choose STS-1, choose the DS1 to test the STS-1. 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 is not displayed, repeat Steps 1 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 PMs for the ports that you tested. See the "DLP-A130 Clear Selected PM Counts" task on page 8-18 for instructions.

Step 12   Put the circuit and circuit ports back to the state they were in at the beginning of the test:

    a.   Click the circuit you want to test then choose **Circuits > Set Circuit State** from the Tools menu.

    b.   On the Set Circuit State dialog box, choose **IS** (in service), **OOS** (out of service) or **OOS-AINS** (auto in service) from the Target State pull-down menu.

    c.   Check the **Apply to drop ports** check box.

    d.   Click **Apply**.

Step 13   Perform the protection switch test appropriate to the SONET topology:

- For path protection configurations, complete the "DLP-A94 Path Protection Protection Switching Test" task on page 5-35

- For BLSRs complete the "DLP-A91 BLSR Switch Test" task on page 5-23.

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-A188 Create an Automatically Routed Optical Circuit

Purpose	This procedure creates an automatically-routed bidirectional or unidirectional optical circuit, including STS-1 and concatenated STS-3c, STS-6c, STS-9c, STS-12c, STS-24c, STS-48c, or STS-192c speeds.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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 (Figure 6-13 on page 6-44), complete the following fields:

- 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—Choose STS.

- Size—Choose the optical circuit size: STS-1, STS-3c, STS-6c, STS-9c, STS-12c, STS-24c, STS-48c, or STS-192c.

- Bidirectional—Leave checked for this circuit (default).

- Number of circuits—Type the number of optical circuits you want to create. The default is 1. If you are creating multiple circuits with the same source and destination, you can use auto-ranging to create the circuits automatically.

- Auto-ranged—This check box is automatically selected when you enter more than 1 in the Number of circuits field. Leave this check box selected if you are creating multiple optical circuits with the same source and destination and you want CTC to create the circuits automatically. Deselect the box if you do not want CTC to create the circuits automatically.

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

–   OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- **Apply to drop ports**—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

✎

Note   Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- **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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- **Inter-domain (UCP) SLA**—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- **Protected Drops**—Select this check box if you want the circuit routed to protected drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you select this check box, CTC displays only protected cards as source and destination choices.

Figure 6-13   Setting Circuit Attributes for an Optical Circuit

Step 6   If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 7   Click **Next**.

Step 8   Complete the "DLP-A97 Provision an Optical Circuit Source and Destination" task on page 6-52 for the optical circuit you are creating.

Step 9   Under Circuit Routing Preferences (Figure 6-14 on page 6-45), choose **Route Automatically**. Two options are available; choose either, both, or none based on your preferences.

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

- Review Route Before Creation—Choose this check box to review and edit the circuit route before the circuit is created.
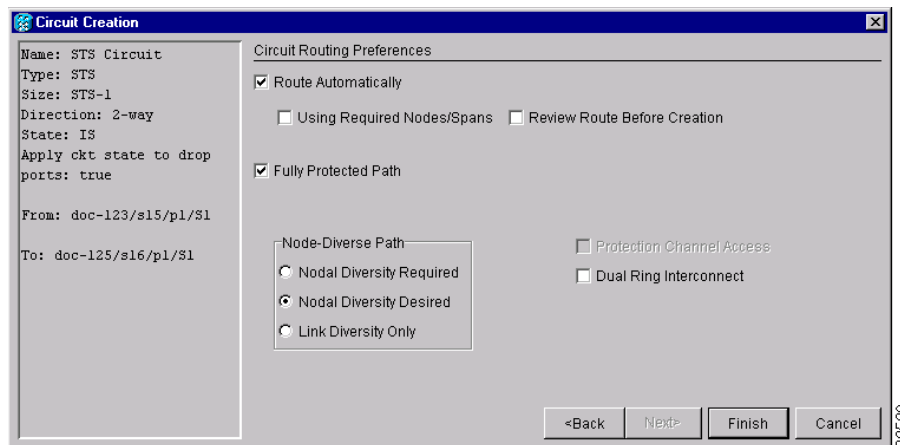
Step 10 Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 11. CTC creates a fully-protected circuit route based on the path diversity option you choose. Fully-protected paths may or may not have path protection configuration path segments (with primary and alternate paths), and the path diversity options apply only to path protection configuration path segments, if any exist.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 13.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path**, check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 13.

Step 11 If you selected Fully Protected Path, choose one of the following:

- Nodal Diversity Required—Ensures that the primary and alternate paths within path protection configuration 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 configuration portion of the complete circuit path.

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

Figure 6-14   Setting Circuit Routing Preferences for an Optical Circuit

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

Step 13 If you selected Using Required Nodes/Spans in Step 9, complete the following substeps. If not, continue with Step 14:

   a. Click **Next**.

   b. Under Circuit Route Constraints, 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 wish to include or exclude.

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

Step 14   If you selected Review Route Before Creation in Step 9, complete the following substeps; otherwise, continue with Step 15:

    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 circuit information. If the circuit needs to be routed to a different path, see the "NTP-A189 Create a Manually Routed Optical Circuit" procedure on page 6-47 to assign the circuit route yourself.

Step 15   Click **Finish**. One of the following occurs, based on the circuit properties you provisioned in the Circuit Creation dialog box:

- 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 Number of circuits. If auto ranging cannot complete all the circuits, for example, because sequential ports are unavailable on the source or destination, a dialog box is displayed. Set the new source or destination for the remaining circuits, then click **Finish** to continue auto ranging.

- If you entered more than 1 in the number of Circuits field and did not choose Auto-ranged, the Circuit Creation dialog box is displayed so you can create the remaining circuits. Repeat Steps Step 5 through 15 for each additional circuit.

- After completing the circuit(s), CTC displays the Circuits window.

Step 16   On the Circuits window, verify that the circuit(s) you created appear in the circuits list.

Step 17   Complete the "NTP-A62 Test Optical Circuits" procedure on page 6-55. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-A189 Create a Manually Routed Optical Circuit

Purpose	This procedure creates a manually routed, bidirectional or unidirectional optical circuit, including STS-1 and concatenated STS-3c, STS-6c, STS-9c, STS-12c, STS-24c, STS-48c, or STS-192c speeds.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. If not, continue with Step 3.

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

Step 4   In the Circuit Creation dialog box, complete the following fields:

- 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—Choose **STS**.

- Size—Choose the optical circuit size. Choices are STS-1, STS-3c, STS-6c, STS-9c, STS-12c, STS-24c, STS-48c, or STS-192c.

- Bidirectional—Leave checked for this circuit (default).

- Number of circuits—Type the number of optical circuits 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, deselect this box. (The box is unavailable if only one circuit is entered in Number of Circuits.)

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

  - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

✎
Note   Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Select this check box if you want the circuit routed to protect drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you select this check box, CTC displays only protected cards as source and destination choices.

Step 5   If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 6   Click **Next**.

Step 7   Complete the "DLP-A97 Provision an Optical Circuit Source and Destination" task on page 6-52 for the optical circuit you are creating.

Step 8   Under Circuit Routing Preferences (Figure 6-14 on page 6-45), deselect **Route Automatically**.

Step 9   Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 10.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 12.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path**, check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 12.

⚠
Caution   Circuits routed on BLSR protection channels are not protected and are preempted during BLSR switches.

Step 10   If you selected Fully Protected Path, choose one of the following:

- Nodal Diversity Required—Ensures that the primary and alternate paths within the path protection configuration 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 configuration portion of the complete circuit path.

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

Step 11   If you selected Fully Protected Path and the circuit will be routed on a path protection configuration dual ring interconnect (DRI), click the **Dual Ring Interconnect** check box.

Step 12   Click **Next**. Under Route Review and Edit, node icons are displayed so you can route the circuit manually.

Step 13 Complete the "DLP-A98 Provision an Optical Circuit Route" task on page 6-53.

Step 14 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 the number of Circuits field, the Circuit Creation dialog box is displayed after the circuit is created so you can create the remaining circuits. Repeat Steps 4 through 14 for each additional circuit.

Step 15 When all the circuits are created, CTC displays the main Circuits window. Verify that the circuit(s) you created appear in the window.

Step 16 Complete the "NTP-A62 Test Optical Circuits" procedure on page 6-55.

Stop. You have completed this procedure.

NTP-A190 Create a Unidirectional Optical Circuit with Multiple Drops

Purpose	This procedure creates a unidirectional OC-N circuit with multiple traffic drops (circuit destinations).
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into the node where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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:

- 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—Choose STS.

- Size—Choose the circuit size: STS-1, STS-3c, STS-6c, STS-9c, STS-12c, STS-24c, STS-48c, or STS-192c.

- Bidirectional—Deselect this check box for this circuit.

- Number of circuits—Leave the default unchanged (1).

- Auto-ranged—Unavailable when the Number of Circuits field is 1.

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

- OOS—The circuit is out of service. Traffic is not passed on the circuit.

- OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

- OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

> ✎
> **Note**   Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Select this check box if you want the circuit routed to protect drops only, that is, to ONS 15454 cards that are in 1:1, 1:N, or 1+1 protection. If you select this check box, CTC displays only protected cards as source and destination choices.

Step 6   If the circuit will be routed on a path protection configuration, set the path protection configuration path selectors. See the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 7   Click **Next**.

Step 8   Complete the "DLP-A97 Provision an Optical Circuit Source and Destination" task on page 6-52 for the circuit you are creating.

Step 9   Deselect **Route Automatically**. When Route Automatically is not selected, Using Required Nodes/Spans and Review Route Before Circuit Creation are unavailable.

Step 10   Set the circuit path protection:

- To route the circuit on a protected path, leave **Fully Protected Path** checked and continue with Step 11. Fully-protected paths may or may not have path protection configuration path segments (with primary and alternate paths), and the path diversity options apply only to path protection configuration path segments, if any exist.

- To create an unprotected circuit, uncheck **Fully Protected Path** and continue with Step 13.

- To route the circuit on a BLSR protection channel, if available, uncheck **Fully Protected Path**, check **Protection Channel Access**, click **Yes** on the Warning dialog box, then continue with Step 13.

⚠️

Caution   Circuits routed on BLSR protection channels are not protected and are preempted during BLSR switches.

Step 11   If you selected Fully Protected Path, choose one of the following:

- Nodal Diversity Required—Ensures that the primary and alternate paths within the path protection configuration 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 configuration portion of the complete circuit path.

- Link Diversity Only—Specifies that only fiber-diverse primary and alternate paths for path protection configuration portions of the complete circuit path are needed. The paths may 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 12   If you selected Fully Protected Path and the circuit will be routed on a path protection configuration dual ring interconnect (DRI), click the **Dual Ring Interconnect** check box.

Step 13   Click **Next**. Under Route Review and Edit, node icons are displayed so you can 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 14   Complete the "DLP-A98 Provision an Optical Circuit Route" task on page 6-53.

Step 15   Click **Finish**. After completing the circuit, CTC displays the Circuits window.

Step 16   On the Circuits window, click the circuit that you want to route to multiple drops. The Delete, Edit, and Search buttons become active.

Step 17   Click **Edit**. The Edit Circuit window is displayed with the General tab selected. All nodes in the DCC network are displayed. 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 pressing **Ctrl** while you drag and drop the icon to the new location.

Step 18   On the Edit Circuit dialog box, click the **Drops** tab. A list of existing drops is displayed.

Step 19   Click **Create**.

Step 20   On 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 pull-down menus. 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. However, you can modify the following:

    - If the original circuit was routed on a protected path, you can change the nodal diversity options: Required, Desired, Don't Care; Link Diverse only. See Step 11 for options descriptions.

    - If the original circuit was not routed on a protected path, the Protection Channel Access options is available. See Step 10 for a description of the PCA option.

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

Step 21 If you need to create additional drops on the circuit, repeat Steps 18 through 20.

Step 22 Click **Close**. The Circuits window appears.

Step 23 Verify that the new drops are displayed under the Destination column for the circuit you edited. If they do not appear, repeat Steps 19 through 22 making sure all options are provisioned correctly.

Step 24 Complete the "NTP-A62 Test Optical Circuits" procedure on page 6-55.

    Stop. You have completed this procedure.

DLP-A97 Provision an Optical Circuit Source and Destination

Purpose	This task provisions an optical circuit source and destination.
Tools/Equipment	None
Prerequisite Procedures	Perform this task during one of the following procedures:
	NTP-A188 Create an Automatically Routed Optical Circuit, page 6-43
	NTP-A189 Create a Manually Routed Optical Circuit, page 6-47
	NTP-A190 Create a Unidirectional Optical Circuit with Multiple Drops, page 6-49
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 From the Node pull-down menu, choose the node where the circuit will originate.

Step 2 From the Slot pull-down menu, choose the slot containing the optical card where the circuit originates. (If a card's capacity is fully utilized, it does not appear in the menu.)

Step 3 Depending on the circuit origination card, choose the source port and/or STS from the Port and STS menus. The Port menu is only available if the card has multiple ports. STSs are not displayed if they are already in use by other circuits.

    Note The STSs that display depend on the card, circuit size, and protection scheme. For example, if you create an STS-3c circuit on an OC-12 card in a path protection configuration, only four STSs are available. If you create an STS-3c circuit on an OC-12 card in a BLSR, two STSs are available because of the BLSR protection characteristics.

Step 4 If you need to create a secondary source, for example, a path protection configuration bridge/selector circuit entry point in a multivendor path protection configuration, click **Use Secondary Source** and repeat Steps 1 through 3 to define the secondary source.

Step 5 Click **Next**.

Step 6 From the Node pull-down menu, choose the destination node.

Step 7 From the Slot pull-down menu, choose the slot containing the optical card where the circuit will terminate (destination card). (If a card's capacity is fully utilized, the card does not appear in the menu.)

Step 8   Depending on the card selected in Step 2, choose the destination port and/or STS from the Port and STS sub-menus. The Port menu is available only if the card has multiple ports. The STSs that display depend on the card, circuit size, and protection scheme.

Step 9   If you need to create a secondary destination, for example, a path protection configuration bridge/selector circuit entry point in a multivendor path protection configuration, click **Use Secondary Destination** and repeat Steps 6 through 8 to define the secondary destination.

Step 10 Click **Next**.

Step 11 Return to your originating procedure (NTP).

DLP-A98 Provision an Optical Circuit Route

Purpose	This task provisions the circuit route for manually-routed optical circuits.
Tools/Equipment	None
Prerequisite Procedures	Perform this task during one of the following procedures:
	NTP-A188 Create an Automatically Routed Optical Circuit, page 6-43
	NTP-A189 Create a Manually Routed Optical Circuit, page 6-47
	NTP-A190 Create a Unidirectional Optical Circuit with Multiple Drops, page 6-49
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   On the Circuit Creation wizard under Route Review and Edit, click the source node icon if it is not already selected.

Step 2   Starting with a span on the source node, click the arrow of the span you want the circuit to travel. The arrow turns white. Under Selected Span, the From and To fields display span information. The source STS is displayed. Figure 6-15 shows an example.

Figure 6-15   Manually Routing an OC-N Circuit
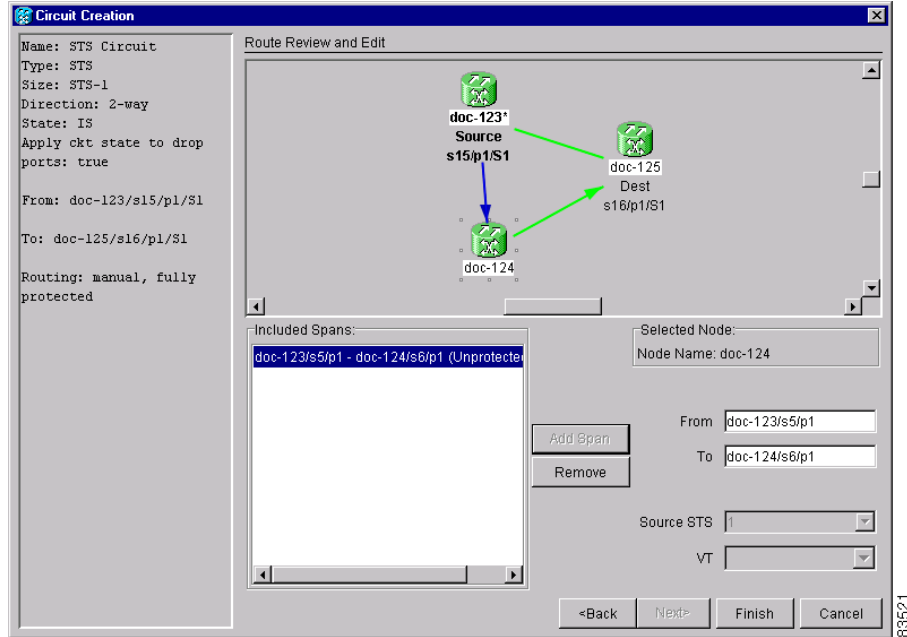
Step 3   If you want to change the source STS, adjust the Source STS field; otherwise, continue with Step 4.

> ✎
> **Note**   VT is grey for OC-N circuits.

Step 4   Click **Add Span**.The span is added to the Included Spans list and the span arrow turns blue.

Step 5   Repeat Steps 2 through 4 until the circuit is provisioned from the source to the destination node through all intermediary nodes. If Fully Protect Path is checked on the Circuit Routing Preferences panel, you must:

   •   Add two spans for all path protection configuration or unprotected portions of the circuit route from the source to the destination

   •   Add one span for all BLSR or 1+1 portions of route from the source to the destination

Step 6   Return to your originating procedure (NTP).

NTP-A62 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 15454s to the fiber distribution panel or the DSX and one of following circuit procedures:
	NTP-A188 Create an Automatically Routed Optical Circuit, page 6-43
	NTP-A189 Create a Manually Routed Optical Circuit, page 6-47
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Log into the node where you will create the circuit. See the for instructions.

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

Step 3 Click the **Circuits** tab.

Step 4 Set the circuit and circuit ports to Out of Service-Maintenance (OOS_MT):

   a. Click the circuit you want to test.

   b. From the Tools menu, choose **Circuits > Set Circuit State**.

   c. On the Set Circuit State dialog box, choose **OOS-MT** from the Target State pull-down menu.

   d. If unchecked, check the **Apply to drop ports** check box.

   e. Click **Apply**.

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

   a. Test the patch cable by connecting one end to the test set transmit (Tx) port and the other end to the test receive (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 transmit (Tx) connector to the receive (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 transmit (Tx) port and the other end to the test receive (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: transmit (Tx) port of the test set to the circuit receive (Rx) port; test set receive (Rx) port to the circuit transmit (Tx) port.

Step 7 Configure the test set for the source ONS 15454 card:

   • OC-3 cards—You will test either an OC-3c (the "c" denotes concatenated) or a muxed OC-3. If you are testing an OC-3c, configure the test set for an OC-3c. If you are testing a muxed OC-3, configure the test set for a muxed 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 cards—You will test either an OC-12c or a muxed OC-12. If you are testing an OC-12c, configure the test set for an OC-12c. If you are testing a muxed OC-12, configure the test set for a muxed OC12 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-48 cards—You will test either an OC-48c or a muxed OC-48. If you are testing an OC-48c configure the test set for an OC-48c. If you are testing a muxed OC-48, configure the test set for a muxed OC-48 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-192 cards—You will test an OC-192c or a muxed OC-192. If you are testing an OC-192c configure the test set for an OC-192c. If you are testing a muxed OC-192, configure the test set for a muxed OC-192 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 is not displayed, repeat Steps 1 through 7 to make sure 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 PMs for the ports that you tested. See the "DLP-A130 Clear Selected PM Counts" task on page 8-18 for instructions.

Step 11 Perform protection switch testing appropriate to SONET topology:

- For path protection configurations, see the "DLP-A94 Path Protection Protection Switching Test" task on page 5-35.

- For BLSRs see the "DLP-A91 BLSR Switch Test" task on page 5-23.

Step 12 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 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 Change the circuit and circuit ports from OOS_MT to their previous service states:

a. Click the circuit you want to test, then from the Tools menu choose **Circuits > Set Circuit State**.

b. On the Set Circuit State dialog box, choose **IS** (in service), **OOS** (out of service), or **OOS-AINS** (auto inservice) from the Target State pull-down menu.

c. If unchecked, check the **Apply to drop ports** check box.

d. Click **Apply**.

Stop. You have completed this procedure.

NTP-A139 Create a Half Circuit on a BLSR or 1+1 Node

Purpose	This procedure creates a DS-1, DS-3, or OC-N circuit from a drop card to an OC-N trunk card on the same node in a BLSR or 1+1 topology.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the half circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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:

- 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—For DS1 circuits, choose VT. VT cross-connects will carry the DS-1 circuit across the ONS 15454 network. For DS-3 or OC-N circuits, choose STS. STS cross-connects will carry the DS-3 circuit across the ONS 15454 network.

- Size—For DS-3 or OC-N circuits, choose STS-1. For DS-1 circuits, VT1.5 is the default. You cannot change it.

- Bidirectional—Leave checked for this circuit (default).

- Number of circuits—Type the number of circuits you want to create. The default is 1.

- Auto-ranged—This check box is automatically selected if you enter more than 1 in the Number of circuits field. Deselect the box.

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

  - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Select this check box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

✎
Note Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Deselect this box.

Step 6 Click **Next**.

Step 7 Complete the "DLP-A311 Provision a Half Circuit Source and Destination - BLSR and 1+1" task on page 6-61.

Step 8 Click **Finish**. One of the following results occurs, depending on the circuit properties you chose in the Circuit Creation dialog box:

- 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 Number of circuits. If auto ranging cannot complete all the circuits, for example, because sequential ports are unavailable at the source or destination, a dialog box is displayed. Set the new source or destination for the remaining circuits, then click **Finish** to continue auto ranging.

- If you entered more than 1 in the Number of Circuits field and did not choose Auto-ranged, the Circuit Creation dialog box is displayed so you can create the remaining circuits. Repeat this procedure for each additional circuit.

- After completing the circuit(s), CTC displays the Circuits window.

Step 9 On the Circuits window, verify that the new circuits appear in the circuits list.

Step 10 Complete the "NTP-A135 Test Electrical Circuits" procedure on page 6-41. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

NTP-A140 Create a Half Circuit on a Path Protection configuration Node

Purpose	This procedure creates a DS1, DS3, or OC-N circuit from a drop to an OC-N line card on the same path protection configuration node.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. 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:

- 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—For DS1 circuits, choose VT. VT cross-connects will carry the DS-1 circuit across the ONS 15454 network. For DS-3 or OC-N circuits, choose STS. STS cross-connects will carry the DS-3 circuit across the ONS 15454 network.

- Size—For DS-1 circuits, VT1.5 is the default. You cannot change it. For DS-3 or OC-N circuits, choose STS-1.

- Bidirectional—Leave checked for this circuit (default).

- Number of circuits—Type the number of circuits you want to create. The default is 1. I

- Auto-ranged—This check box is automatically selected if you enter more than 1 in the Number of circuits field. Deselect the box.

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

  - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Check this box if you want to apply the state chosen in the State field to the circuit source and destination ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

> ✎
> **Note** Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- 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. If this box is checked, you cannot assign a name to the circuit. Also, VT tunnels and Ethergroup sources and destinations are unavailable.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Leave this box unchecked.

Step 6 Set the path protection configuration path selectors. See the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 7 Click **Next**.

Step 8 Complete the "DLP-A312 Provision a Half Circuit Source and Destination - Path Protection configuration" task on page 6-62.

Step 9 Click **Use Secondary Destination** and repeat Steps 7 through 9 to define the secondary destination.

Step 10 Click **Finish**. One of the following results occurs, depending on the circuit properties you chose in the Circuit Creation dialog box:

- 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 Number of circuits. If auto ranging cannot complete all the circuits, for example, because sequential ports are unavailable at the source or destination, a dialog box is displayed. Set the new source or destination for the remaining circuits, then click Finish to continue auto ranging.

- If you entered more than 1 in the Number of Circuits field and did not choose Auto-ranged, the Circuit Creation dialog box is displayed so you can create the remaining circuits. Repeat this procedure for each additional circuit.

- After completing the circuit(s), CTC displays the Circuits window.

Step 11 On the Circuits window, verify that the new circuits appear in the circuits list.

Step 12 Complete the "NTP-A135 Test Electrical Circuits" procedure on page 6-41. Skip this step if you built a test circuit.

Stop. You have completed this procedure.

DLP-A311 Provision a Half Circuit Source and Destination - BLSR and 1+1

Purpose	This task provisions a half circuit source and destination.
Tools/Equipment	None
Prerequisite Procedures	You perform this task during the NTP-A139 Create a Half Circuit on a BLSR or 1+1 Node, page 6-57 procedure.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

⬥

Note   After you have selected the circuit properties in the Circuit Source dialog box according to the specific circuit creation procedure, you are ready to provision the circuit source.

Step 1   From the Node pull-down menu, choose the node that will contain the half circuit.

Step 2   From the Node pull-down menu, choose the node that will contain the circuit.

Step 3   From the Slot pull-down menu, choose the slot containing the card where the circuit will originate.

Step 4   From the Port pull-down menu, choose the port where the circuit will originate. This field will not be available if a DS-1 card is chosen in Step 3.

Step 5   If the circuit is a DS-1 circuit and you choose a DS-1 card as the source, choose the DS-1 where the traffic will originate From the DS1 pull-down menu.

Step 6   Click **Next**.

Step 7   From the Node pull-down menu, choose the node chosen in Step 1.

Step 8   From the Slot pull-down menu, choose the OC-N card to map the DS-1 to a VT1.5 for optical transport or to map the DS-3 or OC-N STS circuit to an STS.

Step 9   Choose the destination STS or VT from the sub-menus that display.

Step 10   Return to your originating procedure (NTP).

DLP-A312 Provision a Half Circuit Source and Destination - Path Protection configuration

Purpose	This task provisions a half circuit source and destination.
Tools/Equipment	None
Prerequisite Procedures	You perform this task during the NTP-A140 Create a Half Circuit on a Path Protection configuration Node, page 6-59 procedure.
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note After you have selected the circuit properties in the Circuit Source dialog box according to the specific circuit creation procedure, you are ready to provision the circuit source.

Step 1 From the Node pull-down menu, choose the node that will contain the half circuit.

Step 2 From the Node pull-down menu, choose the node that will contain the circuit.

Step 3 From the Slot pull-down menu, choose the slot containing the card where the circuit will originate.

Step 4 From the Port pull-down menu, choose the port where the circuit will originate. This field will not be available if a DS-1 card is chosen in Step 3

Step 5 If the circuit is a DS-1 circuit and you choose a DS-1 card as the source, choose the DS-1 where the traffic will originate From the DS1 pull-down menu.

Step 6 Click **Next**.

Step 7 From the Node pull-down menu, choose the node chosen in Step 1.

Step 8 From the Slot pull-down menu, choose the OC-N card to map the DS-1 to a VT1.5 for optical transport or to map the DS-3 or OC-N STS circuit to an STS.

Step 9 Choose the destination STS or VT from the sub-menus that display.

Step 10 Click Use Secondary Destination and repeat Steps 1 through 9

Step 11 Return to your originating procedure (NTP).

NTP-A191 Create an E-Series EtherSwitch Circuit (Multicard or Single-Card Mode)

Purpose	This procedure creates a multicard or single-card EtherSwitch circuit. It does not apply to E-Series cards in port-mapped mode. To create a port-mapped mode circuit, see NTP-A192 Create a Circuit for an E-Series Card in Port-Mapped Mode, page 6-65.
Tools/Equipment	E-Series Ethernet cards (E100T-12/E100T-G, E1000-2/E1000-2-G) must be installed at each end of the Ethernet circuit.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. If you are already logged in, continue with Step 2.

Step 2 If a high number of VLANs is already used by the network, complete the "DLP-A99 Determine Available VLANs" task on page 6-78 to verify that sufficient VLAN capacity is available (you will create a VLAN during each circuit creation task).

Step 3 Verify that the circuit source and destination Ethernet cards are provisioned for the mode of the circuit you will create, either multicard or single-card. See the "DLP-A246 Provision E-Series Ethernet Card Mode" task on page 6-79.

Step 4 Provision and enable the Ethernet ports. See "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

Step 5 From the View menu, choose **Go to Network View**.

Step 6 Click the **Circuits** tab, then click **Create**.

Step 7 In the Create Circuits dialog box, complete the following fields:

- 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—Choose STS.

- Size—Choose the circuit size. Valid circuit sizes for an Ethernet Multicard circuit are STS-1, STS-3c, and STS6c. Valid circuit sizes for an Ethernet Single-card circuit are STS-1, STS-3c, STS6c, and STS12c.

- Bidirectional—Leave the default unchanged (checked).

- Number of circuits—Leave the default unchanged (1).

- Auto-ranged—Unavailable.

- State—Choose **IS** (in service). Ethergroup circuits are stateless, and always in service.

- Apply to drop ports—Uncheck this box; states cannot be applied to E-Series Ethernet card ports.

- Create cross-connects only (TL1-like)—Uncheck this box; it does not apply to Ethernet circuits.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Leave the default unchanged (unchecked).

Step 8   If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 9   Click **Next**.

Step 10   Provision the circuit source:

  a.   From the Node pull-down menu, choose one of the EtherSwitch circuit endpoint nodes. (Either end node can be the EtherSwitch circuit source.)

  b.   From the Slot pull-down menu, choose one of the following:

   - If you are building a Multicard EtherSwitch circuit, choose **Ethergroup**.
   - If you are building a Single-card EtherSwitch circuit, choose the Ethernet card where you enabled the single-card EtherSwitch.

Step 11   Click **Next**.

Step 12   Provision the circuit destination:

  a.   From the Node pull-down menu, choose the second EtherSwitch circuit endpoint node.

  b.   From the Slot pull-down menu, choose one of the following:

   - If you are building a Multicard EtherSwitch circuit, choose **Ethergroup**.
   - If you are building a Single-card EtherSwitch circuit, choose the Ethernet card where you enabled the single-card EtherSwitch.

Step 13   Click **Next**.

Step 14   Under Circuit VLAN Selection, click **New VLAN**. If the desired VLAN already exists, continue with Step 17.

Step 15   In the New VLAN dialog box, complete the following:

   - VLAN Name—Assign an easily-identifiable name to your VLAN.
   - VLAN ID—Assign a VLAN ID. The VLAN ID should be the next available number between 2 and 4093 that is not already assigned to an existing VLAN. Each ONS 15454 network supports a maximum of 509 user-provisionable VLANs.

Step 16   Click **OK**.

Step 17   Under Circuit VLAN Selection, highlight the VLAN name and click the arrow button (**>>**) to move the available VLAN(s) to the Circuit VLANs column.

Step 18   If you are building a single-card EtherSwitch circuit and want to disable spanning tree protection on this circuit, uncheck the **Enable Spanning Tree** check box and click **OK** on the Disabling Spanning Tree dialog box. The Enable Spanning Tree box will remain checked or unchecked for the creation of the next single-card, point-to-point Ethernet circuit.

⚠
Caution   Disabling spanning tree protection increases the likelihood of logic loops on an Ethernet network.

⚠
Caution   Turning off spanning tree on a circuit-by-circuit basis means that the ONS 15454 is no longer protecting the Ethernet circuit and that the circuit must be protected by another mechanism in the Ethernet network.

> ⚠
> **Caution**   Multiple circuits with spanning tree protection enabled will incur blocking if the circuits traverse the same E-series card and use the same VLAN.

> ✎
> **Note**   You can disable or enable spanning tree protection on a circuit-by-circuit basis only for single-card, point-to-point Ethernet circuits. Other E-series Ethernet configurations disable or enable spanning tree on a port-by-port basis.

Step 19   Click **Next**.

Step 20   Confirm that the following information about the circuit is correct:

- Circuit name
- Circuit type
- Circuit size
- ONS 15454 circuit nodes

Step 21   Click **Finish**.

Step 22   Complete the "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

Step 23   Complete the "DLP-A221 Provision E-Series Ethernet Ports for VLAN Membership" task on page 6-80.

Stop. You have completed this procedure.

NTP-A192 Create a Circuit for an E-Series Card in Port-Mapped Mode

Purpose	This procedure creates an E-Series point-to-point SONET circuit with an E-Series card in port-mapped mode.
Tools/Equipment	An E-Series Ethernet card must be installed at each end of the circuit and configured in port-mapped mode.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. If you are already logged in, continue with Step 4.

Step 2   Provision the Ethernet cards that will carry the circuit for port-mapped mode. See the "DLP-A246 Provision E-Series Ethernet Card Mode" task on page 6-79.

Step 3   Provision and enable the Ethernet ports. See "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

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

Step 5 Click the **Circuits** tab and click **Create**.

Step 6 In the Create Circuits dialog box, complete the following fields:

- 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—Choose STS.

- Size—Choose the circuit size. Valid circuit sizes for an E-Series circuit are STS-1, STS-3c, STS6c, and STS-12c.

- Bidirectional—Leave the default unchanged (checked).

- Number of circuits—Leave the default unchanged (1).

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

  - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Select this checkbox if you want to apply the state chosen in the State field (IS or OOS-MT only) to the Ethernet circuit source and destination ports. You cannot apply OOS-AINS to E-Series Ethernet card ports. CTC will apply the circuit 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 must be the first circuit to use the drop port. If not, a Warning dialog box displays the ports where the circuit state could not be applied. If the box is unchecked, CTC will not change the state of the source and destination ports.

  Note Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- Create cross-connects only (TL1-like)—Uncheck this box.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Auto-ranged—Unavailable.

- Protected Drops—Leave the default unchanged (unchecked).

Step 7 If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 8 Click **Next**.

Step 9 Provision the circuit source:

  a. From the Node pull-down menu, choose the circuit source node. Either end node can be the point-to-point circuit source.

  b. From the Slot pull-down menu, choose the slot containing the E-Series card that you will use for one end of the point-to-point circuit.

c. From the Port pull-down menu, choose a port.

Step 10 Click **Next**.

Step 11 Provision the circuit destination:

a. From the Node pull-down menu, choose the circuit destination node.

b. From the Slot pull-down menu, choose the slot containing the E-Series card that you will use for other end of the point-to-point circuit.

c. From the Port pull-down menu, choose a port.

Step 12 Click **Next**. The Circuits window appears.

Step 13 Confirm that the following circuit information is correct:

- Circuit name
- Circuit type
- Circuit size
- ONS 15454 circuit nodes

Step 14 Click **Finish**.

Step 15 Complete the "NTP-A146 Test E-Series Circuits" procedure on page 6-82.

Stop. You have completed this procedure.

NTP-A142 Create an E-Series Shared Packet Ring Ethernet Circuit

Purpose	This procedure creates a shared packet ring Ethernet circuit. It does not apply to E-Series cards in port-mapped mode.
Tools/Equipment	E-Series Ethernet cards (E100T-12/E100T-G, E1000-2/E1000-2-G) must be installed at both Ethernet circuit endpoint nodes.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. If you are already logged in, continue with Step 2.

Step 2 If a high number of VLANs is already used by the network, complete the "DLP-A99 Determine Available VLANs" task on page 6-78 to verify that sufficient VLAN capacity is available (you will create a VLAN during each circuit creation task).

Step 3 Verify that the Ethernet cards that will carry the circuit are provisioned for Multi-card EtherSwitch Group. See the "DLP-A246 Provision E-Series Ethernet Card Mode" task on page 6-79.

Step 4 Provision and enable the Ethernet ports. See "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

Step 5 From the View menu, choose **Go to Network View**.

Step 6 Click the **Circuits** tab and click **Create**.

Step 7 In the Create Circuits dialog box, complete the following fields:

- 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—Choose STS.

- Size—Choose the circuit size. Valid shared packet ring circuit sizes are STS-1, STS-3c, and STS6c.

- Bidirectional—Leave the default unchanged (checked).

- Number of circuits—Leave the default unchanged (1).

- Auto-ranged—Unavailable.

- State—Choose **IS** (in service). Ethergroup circuits are always in service.

- Apply to drop ports—Uncheck this box; states cannot be applied to E-Series ports.

- Create cross-connects only (TL1-like)—Uncheck this box; it does not apply to Ethernet circuits.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Leave the default unchanged (unchecked).

Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 9 Click **Next**.

Step 10 Provision the circuit source:

a. From the Node pull-down menu, choose one of the shared packet ring circuit endpoint nodes. (Either end node can be the shared packet ring circuit source.)

b. From the Slot pull-down menu, choose **Ethergroup**.

Step 11 Click **Next**.

Step 12 Provision the circuit destination:

a. From the Node pull-down menu, choose the second shared packet ring circuit endpoint node.

b. From the Slot pull-down menu, choose **Ethergroup**.

Step 13 Click **Next**.

Step 14 Review the VLANs listed under Available VLANs. If the VLAN you want to use is displayed, continue with Step 15. If you need to create a new VLAN, complete the following steps:

a. Click the **New VLAN** button.

b. On the New VLAN dialog box, complete the following:

- VLAN Name—Assign an easily-identifiable name to your VLAN.

- VLAN ID—Assign a VLAN ID. The VLAN ID should be the next available number between 2 and 4093 that is not already assigned to an existing VLAN. Each ONS 15454 network supports a maximum of 509 user-provisionable VLANs.

c. Click **OK**.

Step 15 In the Available VLANs column, click the VLAN you want to use and click the arrow button (**>>**) to move the VLAN to the Circuit VLANs column.

> ✎ **Note**   Moving the VLAN from Available VLANs to Circuit VLANs forces all the VLAN traffic to use the shared packet ring you are creating.

Step 16   Click **Next**.

Step 17   Under Circuit Routing Preferences, uncheck the **Route Automatically** check box and click **Next**.

Step 18   Under Route Review and Edit, click the source node, then click a span (green arrow) leading away from the source node.

The span turns white.

Step 19   Click **Add Span**.

The span turns blue. CTC adds the span to the Included Spans list.

Step 20   Click the node at the end of the blue span.

Step 21   Click the green span joining the node selected in Step 20.

The span turns white.

Step 22   Click **Add Span**.

The span turns blue.

Step 23   Repeat Steps 19 through 22 for every node in the ring.

Step 24   Under Route Review and Edit, verify that the new circuit is correctly configured. If the circuit information is not correct, click the **Back** button and repeat the procedure with the correct information.

> ✎ **Note**   If the circuit is incorrect, you can also click **Finish**, delete the completed circuit, and begin the procedure again.

Step 25   Click **Finish**.

Step 26   Complete the "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79 for each node that carries the circuit.

Step 27   Complete the "DLP-A221 Provision E-Series Ethernet Ports for VLAN Membership" task on page 6-80 for each node that carries the circuit.

Step 28   Complete the "NTP-A146 Test E-Series Circuits" procedure on page 6-82.

Stop. You have completed this procedure.

NTP-A143 Create an E-Series Hub and Spoke Ethernet Configuration

Purpose	This procedure creates a hub and spoke Ethernet configuration, which is made up of multiple circuits that share a common endpoint. It does not apply to E-Series cards in port-mapped mode.
Tools/Equipment	E-Series Ethernet cards (E100T-12/E100T-G, E1000-2/E1000-2-G) must be installed at all Ethernet circuit endpoint nodes.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into the hub node (the common endpoint). See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. If you are already logged in, continue with Step 2.

Step 2 Complete the "DLP-A99 Determine Available VLANs" task on page 6-78 to verify that sufficient VLAN capacity is available (you will create a VLAN during each circuit creation task).

Step 3 Display the node view.

Step 4 Verify that the Ethernet card that will carry the hub and spoke circuit is provisioned for Singlecard EtherSwitch Group. See the "DLP-A246 Provision E-Series Ethernet Card Mode" task on page 6-79.

Step 5 Provision and enable the Ethernet ports. See "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

Step 6 Log into a spoke endpoint node and repeat Steps 3 and 4 for the destination Ethernet card. (You only need to verify that the hub node is provisioned for Singlecard EtherSwitch once.)

Step 7 Click the **Circuits** tab and click **Create**.

Step 8 In the Create Circuits dialog box, complete the following fields:

- 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—Choose STS.

- Size—Choose the circuit size.

- Bidirectional—Leave the default unchanged (checked).

- Number of circuits—Leave the default unchanged (1).

- Auto-ranged—Unavailable.

- State—Choose a service state to apply to the circuit:

    – IS—Ethergroup circuits are always in service.

- Apply to drop ports—Uncheck this box; states cannot be applied to E-Series ports.

- Create cross-connects only (TL1-like)—uncheck this box; it does not apply to Ethernet circuits.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Leave the default unchanged (unchecked).

Step 9   If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 10   Click **Next**.

Step 11   Provision the circuit source:

    a.   From the Node pull-down menu, choose the hub node.

    b.   From the Slot pull-down menu, choose the Ethernet card where you enabled the single-card EtherSwitch.

Step 12   Click **Next**.

Step 13   Provision the circuit destination:

    a.   From the Node pull-down menu, choose an EtherSwitch circuit endpoint node.

    b.   From the Slot pull-down menu, choose the Ethernet card where you enabled the single-card EtherSwitch.

Step 14   Click **Next**.

Step 15   Review the VLANs listed under Available VLANs. If the VLAN you want to use is displayed, continue with Step 17. If you need to create a new VLAN, complete the following steps:

    a.   Click the **New VLAN** button.

    b.   On the New VLAN dialog box, complete the following:

       •   VLAN Name—Assign an easily-identifiable name to your VLAN.

       •   VLAN ID—Assign a VLAN ID. The VLAN ID should be the next available number between 2 and 4093 that is not already assigned to an existing VLAN. Each ONS 15454 network supports a maximum of 509 user-provisionable VLANs.

    c.   Click **OK**.

Step 16   In the Available VLANs column, click the VLAN you want to use and click the arrow button (**>>**) to move the VLAN to the Circuit VLANs column.

> ✎
> **Note**   Moving the VLAN from Available VLANs to Circuit VLANs forces all the VLAN traffic to use the shared packet ring you are creating.

Step 17   Click **Next**.

Step 18   Confirm that the following information about the hub and spoke circuit is correct:

    •   Circuit name

    •   Circuit type

    •   Circuit size

    •   VLAN names

    •   ONS 15454 circuit nodes

If the circuit information is not correct, click the **Back** button and repeat the procedure with the correct information.

> ✎
> **Note**   You can also click **Finish**, delete the completed circuit, and start the procedure from the beginning.

Step 19   Click **Finish**.

Step 20   Complete the "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

Step 21   Complete the "DLP-A221 Provision E-Series Ethernet Ports for VLAN Membership" task on page 6-80.

Step 22   Complete the "NTP-A146 Test E-Series Circuits" procedure on page 6-82.

Step 23   To create additional circuits ("spokes"):

    a.   Complete the "DLP-A99 Determine Available VLANs" task on page 6-78 to verify that sufficient VLAN capacity is available for the circuit destination node.

    b.   Repeat Steps 3 through 22.

    Stop. You have completed this procedure.

NTP-A144 Create an E-Series Single-Card EtherSwitch Manual Cross-Connect

Purpose	This procedure manually creates a Single-Card EtherSwitch cross-connect between E-Series Ethernet cards and OC-N cards connected to non-ONS equipment.
Tools/Equipment	E-Series Ethernet cards (E100T-12/E100T-G, E1000-2/E1000-2-G) must be installed at the circuit source node.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

> **Note**   In this procedure, cross-connect refers to a circuit connection created within the same node between the Ethernet card and an OC-N card connected to third-party equipment. You create cross-connects at the source and destination nodes so an Ethernet circuit can be routed from source to destination across third-party equipment.

Step 1   Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A314 Assign a Name to a Port" task on page 6-17. If not, continue with Step 3.

Step 3   If a high number of VLANs is already used by the network, complete the "DLP-A99 Determine Available VLANs" task on page 6-78 to verify that sufficient VLAN capacity is available (you will create a VLAN during each circuit creation task).

Step 4   On the node view, double-click the Ethernet card that will carry the cross-connect.

Step 5   Verify that the Ethernet cards that will carry the circuit are provisioned for Singlecard EtherSwitch . See the "DLP-A246 Provision E-Series Ethernet Card Mode" task on page 6-79.

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

Step 7   Click the **Circuits** tab and click **Create**.

Step 8   In the Create Circuits dialog box, complete the following fields:

- Name—Assign a name to the cross-connect. 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 cross-connect.

- Type—Choose STS.

- Size—Choose the cross-connect size. For single-card EtherSwitch, the available sizes are STS-1, STS-3c, STS-6c, and STS-12c.

- Bidirectional—Leave the default unchanged (checked).

- Number of circuits—Leave the default unchanged (1).

- Auto-ranged—Unavailable.

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

  - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Uncheck this box.

- Create cross-connects only (TL1-like)—Uncheck this box.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Leave the default unchanged (unchecked).

Step 9   If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 10   Click **Next**.

Step 11   Provision the circuit source:

    a. From the Node pull-down menu, choose the cross-connect source node.

    b. From the Slot pull-down menu, choose the Ethernet card where you enabled the single-card EtherSwitch in Step 5.

Step 12   Click **Next**.

Step 13   Provision the circuit destination:

    a. From the Node pull-down menu, choose the cross-connect circuit source node selected in Step 11. (For Ethernet cross-connects, the source and destination nodes are the same.)

    b. From the Slot pull-down menu, choose the OC-N card that is connected to the non-ONS equipment.

    c. Depending on the OC-N card, choose the port and/or STS from the Port and STS pull-down menus.

Step 14   Click **Next**.

Step 15 Review the VLANs listed under Available VLANs. If the VLAN you want to use is displayed, continue with Step 16. If you need to create a new VLAN, complete the following steps:

  a. Click the **New VLAN** button.

  b. On the New VLAN dialog box, complete the following:

- VLAN Name—Assign an easily-identifiable name to your VLAN.
- VLAN ID—Assign a VLAN ID. The VLAN ID should be the next available number between 2 and 4093 that is not already assigned to an existing VLAN. Each ONS 15454 network supports a maximum of 509 user-provisionable VLANs.

  c. Click **OK**.

Step 16 Click the VLAN you want to use on the Available VLANs column, then click the arrow **>>** button to move the VLAN to the Circuit VLANs column.

Step 17 Click **Next**. The Circuit Creation (Circuit Routing Preferences) dialog box opens.

Step 18 Confirm that the following information about the single-card EtherSwitch manual cross-connect is correct (in this task, "circuit" refers to the Ethernet cross-connect):

- Circuit name
- Circuit type
- Circuit size
- VLAN names
- ONS 15454 nodes

If the information is not correct, click the **Back** button and repeat the procedure with the correct information.

Step 19 Click **Finish**.

Step 20 Complete the "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

Step 21 Complete the "DLP-A221 Provision E-Series Ethernet Ports for VLAN Membership" task on page 6-80.

Stop. You have completed this procedure.

NTP-A145 Create an E-Series Multicard EtherSwitch Manual Cross-Connect

Purpose	This procedure manually creates Multicard EtherSwitch cross-connects between E-Series Ethernet cards and an OC-N cards connected to non-ONS equipment.
Tools/Equipment	E-Series Ethernet cards (E100T-12/E100T-G, E1000-2/E1000-2-G) must be installed at the circuit source node.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

> **Note**   In this procedure, cross-connect refers to a circuit connection created within the same node between the Ethernet card and an OC-N card connected to third-party equipment. You create cross-connects at the source and destination nodes so an Ethernet circuit can be routed from source to destination across third-party equipment.

Step 1   Log into a circuit endpoint. See "DLP-A60 Log into CTC" task on page 3-23 for instructions. If you are already logged in, continue with Step 2.

Step 2   Complete the "DLP-A99 Determine Available VLANs" task on page 6-78 to verify that sufficient VLAN capacity is available (you will create a VLAN during each circuit creation task).

Step 3   Verify that the Ethernet card that will carry the circuit is provisioned for Multicard EtherSwitch Group. See the "DLP-A246 Provision E-Series Ethernet Card Mode" task on page 6-79.

Step 4   Provision and enable the Ethernet ports. See "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

Step 5   From the View menu, choose **Go to Network View**.

Step 6   Click the **Circuits** tab and click **Create**.

Step 7   In the Create Circuits dialog box, complete the following fields:

- Name—Assign a name to the source cross-connect. 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 source cross-connect.

- Type—Choose STS.

- Size—Choose the size of the circuit that will be carried by the cross-connect. For Multicard EtherSwitch circuits, the available sizes are STS-1, STS-3c, and STS-6c.

- Bidirectional—Leave checked (default).

- Number of circuits—Leave the default unchanged (1).

- Auto-ranged—Unavailable.

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

- OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

- OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Uncheck this box.

- Create cross-connects only (TL1-like)—Uncheck this box.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Leave the default unchanged (unchecked).

Step 8 If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 9 Click **Next**.

Step 10 Provision the cross-connect source:

   a. From the Node pull-down menu, choose the cross-connect source node.

   b. From the Slot pull-down menu, choose **Ethergroup**.

Step 11 Click **Next**.

Step 12 From the Node pull-down menu under Destination, choose the circuit source node selected in Step 10. For Ethernet cross-connects, the source and destination nodes are the same.

   The Slot field is provisioned automatically for Ethergroup.

Step 13 Click **Next**.

Step 14 Review the VLANs listed under Available VLANs. If the VLAN you want to use is displayed, continue with Step 16. If you need to create a new VLAN, complete the following steps:

   a. Click the **New VLAN** button.

   b. On the New VLAN dialog box, complete the following:

   - VLAN Name—Assign an easily-identifiable name to your VLAN.

   - VLAN ID—Assign a VLAN ID. The VLAN ID should be the next available number between 2 and 4093 that is not already assigned to an existing VLAN. Each ONS 15454 network supports a maximum of 509 user-provisionable VLANs.

   c. Click **OK**.

Step 15 In the Available VLANs column, click the VLAN you want to use and click the arrow button (>>) to move the VLAN to the Circuit VLANs column.

Step 16 Click **Next**.

   The Circuit Creation (Circuit Routing Preferences) dialog box opens.

Step 17 Verify the cross-connect information (in this step, "circuit" refers to the Ethernet cross-connect):

- Circuit name

- Circuit type

- Circuit size

- VLANs

- ONS 15454 nodes

If the information is not correct, click the **Back** button and repeat the procedure with the correct information.

Step 18   Click **Finish**.

Step 19   Complete the "DLP-A220 Provision E-Series Ethernet Ports" task on page 6-79.

Step 20   Complete the "DLP-A221 Provision E-Series Ethernet Ports for VLAN Membership" task on page 6-80.

Step 21   From the View menu, choose **Go to Home View**.

Step 22   Click the **Circuits** tab.

Step 23   Highlight the circuit and click **Edit**.

The Edit Circuit dialog box opens.

Step 24   Click **Drops** and click **Create**.

The Define New Drop dialog box opens.

Step 25   From the **Slot** menu, choose the OC-N card that links the ONS 15454 to the non-ONS 15454 equipment.

Step 26   From the **Port** menu, choose the appropriate port.

Step 27   From the STS menu, choose the STS that matches the STS of the connecting non-ONS 15454 equipment.

Step 28   Click **OK**.

Step 29   Confirm the circuit information that displays in the Edit Circuit dialog box and click **Close**.

Step 30   Repeat Steps 2 through 29 at the second Ethernet manual cross-connect endpoint.

The first and second Ethernet manual cross-connect endpoints will be bridged by the OC-N STS cross-connect circuit.

Note   The appropriate STS circuit must exist in the non-ONS equipment to connect the two Ethernet manual cross-connect endpoints.

Caution   If a CARLOSS alarm repeatedly appears and clears on an Ethernet manual cross-connect, the two Ethernet circuits might have a circuit-size mismatch. For example, a circuit size of STS-3c was configured on the first ONS 15454 and circuit size of STS-12c was configured on the second ONS 15454. Refer to the *Cisco ONS 15454 Troubleshooting Guide* if the alarm persists.

Step 31   Complete the "NTP-A146 Test E-Series Circuits" procedure on page 6-82.

Stop. You have completed this procedure.

DLP-A99 Determine Available VLANs

Purpose	This task verifies that the network has the capacity to support the additional new VLANs required for the creation E-Series circuits. It does not apply to E-Series cards in port-mapped mode.
Tools/Equipment	E-Series Ethernet cards (E100T-12/E100T-G, E1000-2/E1000-2-G) must be installed at each end of the Ethernet circuit.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 At any CTC view, click the **Circuits** tab.

Step 2 Click any existing Ethernet circuit to highlight that row.

Step 3 Click **Edit**, then click the **VLANs** tab.

The Edit Circuit dialog displays the number of VLANs used by circuits and the total number of VLANs available for use.

Step 4 Determine that number of available VLANs listed is sufficient for the number of E-series Ethernet circuits that you will create.

⚠

Caution Multiple E-series Ethernet circuits with spanning tree enabled will block each other if the circuits traverse the same E-series Ethernet card and use the same VLAN.

Step 5 Return to the originating procedure (NTP).

DLP-A246 Provision E-Series Ethernet Card Mode

Purpose	This task provisions an E-Series Ethernet card for multicard EtherSwitch Group, single-card EtherSwitch, or port-mapped mode.
Tools/Equipment	E-Series Ethernet cards (E100T-12/E100T-G, E1000-2/E1000-2-G) must be installed.
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

⚠️
Caution   You cannot change the mode while the Ethernet card is carrying circuits. If you want change the card mode, delete any circuits that it carries first. See the "NTP-A152 Delete Circuits" procedure on page 9-16.

Step 1   In the network view, double-click the node containing the E-Series Ethernet card you want to provision, then double-click the Ethernet card.

Step 2   Click the **Provisioning > Ether Card** tabs.

Step 3   Under Card Mode, choose one of the following:

- For multicard EtherSwitch circuit groups, choose **Multicard EtherSwitch Group**. Click **Apply**.

- For single-card EtherSwitch circuits, choose **Single-card EtherSwitch**. Click **Apply**.

- For port-mapped circuits, choose **Port-mapped**. Click **Apply**.

Step 4   Multicard EtherSwitch circuits only: repeat Steps 2 and 3 for all other Ethernet cards in the node that will carry the multicard EtherSwitch circuits.

Step 5   Repeat Steps 1 through 4 for other nodes as necesarry.

Step 6   Return to your originating procedure (NTP).

DLP-A220 Provision E-Series Ethernet Ports

Purpose	This task enables ports for the E100T-12, E100T-G, E1000-2, and E1000-2-G cards.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	Required to enable E-Series Ethernet traffic
Onsite/Remote	Onsite or remote
Security	Provisioning or higher

Step 1   Display the node view.

Step 2   Double-click the Ethernet card that you want to provision.

Step 3   Click the **Provisioning > Ether Port** tabs.

Step 4   For each Ethernet port, provision the following parameters:

- Port Name—If you want to label the port, type a port name.

- Mode—Choose the appropriate mode for the Ethernet port:

  - Valid choices for the E100T-12/E100T-G card are Auto, 10 Half, 10 Full, 100 Half, or 100 Full.

  - Valid choices for the E1000-2/E1000-2-G card are 1000 Full or Auto.

> **Note**   Both 1000 Full and Auto mode set the E1000-2 port to the 1000 Mbps and Full duplex operating mode; however, flow control is disabled when 1000 Full is selected. Choosing Auto mode enables the E1000-2 card to auto-negotiate flow control. Flow control is a mechanism that prevents network congestion by ensuring that transmitting devices do not overwhelm receiving devices with data. The E1000-2 port handshakes with the connected network device to determine if that device supports flow control.

- Enabled—Click this check box to activate the corresponding Ethernet port.

- Priority—Choose a queuing priority for the port. Options range from 0 (Low) to 7 (High). Priority queuing (IEEE 802.1Q) reduces the impact of network congestion by mapping Ethernet traffic to different priority levels. Refer to the priority queuing information in the *Cisco ONS 15454 Reference Manual*. This parameter does not apply to an E-Series card in port-mapped mode.

- Stp Enabled—Click this check box to enable the spanning tree protocol (STP) on the port. This parameter does not apply to an E-Series card in port-mapped mode. Refer to the spanning tree information in the *Cisco ONS 15454 Reference Manual*.

Step 5   Click **Apply**.

Step 6   Repeat Steps 1 through 5 for all other cards in the VLAN, or if the E-Series card is in port-mapped mode, repeat Steps 1 through 5 for the other card in a point-to-point circuit.

Step 7   Your Ethernet ports are provisioned and ready to be configured for VLAN membership. See the "DLP-A221 Provision E-Series Ethernet Ports for VLAN Membership" task on page 6-80 for instructions.

Step 8   Return to your originating procedure (NTP).

DLP-A221 Provision E-Series Ethernet Ports for VLAN Membership

Purpose	This task provisions E-Series card ports for VLAN membership. It does not apply to E-Series cards in port-mapped mode.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	Required to enable Ethernet traffic on E-Series Ethernet cards
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Display the node view.

Step 2   Double-click the E-Series card graphic to open the card.

Step 3   Click the **Provisioning** > **Ether VLAN** tabs.

Step 4   To put a port in a VLAN:

   a.   Click the port and choose either Tagged or Untag.

   b.   If a port is a member of only one VLAN, choose **Untag** from the Port column in the VLAN's row. Choose **--** for all the other VLAN rows in that Port column.

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> **Note**   The VLAN with **Untag** selected can connect to the port, but other VLANs cannot access that port.

   c.   Choose **Tagged** at all VLAN rows that need to be trunked. Choose **Untag** at VLAN rows that do not need to be trunked, for example, the default VLAN.

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> **Note**   Each Ethernet port must be attached to at least one untagged VLAN. A trunk port connects multiple VLANs to an external device, such as a switch, which also supports trunking. A trunk port must have tagging (802.1Q) enabled for all the VLANs that connect to that external device.

Step 5   After each port is in the appropriate VLAN, click **Apply**.

Table 6-4   VLAN Settings

Setting	Description
--	A port marked with this symbol does not belong to the VLAN.
Untag	The ONS 15454 will tag ingress frames and strip tags from egress frames.
Tagged	The ONS 15454 will process ingress frames according to the VLAN ID; egress frames will not have their tags removed.

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> **Note**   If Tagged is chosen, the attached external Ethernet devices must recognize IEEE 802.1Q VLANs.

> ✎
>
> **Note**   Both ports on an E1000-2/E1000-2-G card cannot be members of the same VLAN.

Step 6   Return to your originating procedure (NTP).

NTP-A146 Test E-Series Circuits

Purpose	This procedure tests circuits created on E-Series Ethernet cards provisioned for multicard EtherSwitch, single-card EtherSwitch, or port-mapped mode.
Tools/Equipment	Ethernet test set and appropriate fibers
Prerequisite Procedures	This procedure assumes you completed facility loopback tests to test the fibers and cables from the source and destination ONS 15454s to the fiber distribution panel or the DSX, and one of the following:
	NTP-A191 Create an E-Series EtherSwitch Circuit (Multicard or Single-Card Mode), page 6-63
	NTP-A142 Create an E-Series Shared Packet Ring Ethernet Circuit, page 6-67
	NTP-A143 Create an E-Series Hub and Spoke Ethernet Configuration, page 6-70
Required/As Needed	As needed
Onsite/Remote	Onsite
Security	Provisioning or higher

Step 1 Log into the ONS 15454 source Ethernet node. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions.

Step 2 On the shelf graphic, double-click the circuit source card.

Step 3 Click the **Provisioning > Ether Port** tabs.

Step 4 Verify the following settings:

- Mode— Auto, 10 Half, 10 Full, 100 Half, or 100 Full.

- Enabled—Checked

- Priority—Set to the priority level indicated by the circuit or site plan. Priority does not apply to E-Series cards in port-mapped mode.

- Stp—Checked if Spanning Tree Protocol is enabled for the circuit. STP does not apply to E-Series cards in port-mapped mode.

Step 5 Click the **Ether VLAN** tab. If the E-Series cards is not in port-mapped mode, verify that the source port is on the same VLAN as the destination port.

Step 6 Repeat Steps 1 through 5 for the destination node.

Step 7 At the destination node connect the Ethernet test set to the destination port and configure the test set to send and receive the appropriate Ethernet traffic.

> **Note** At this point, you will not be able to send and receive Ethernet traffic.

Step 8 At the source node connect an Ethernet test set to the source port and configure the test set to send and receive the appropriate Ethernet traffic.

Step 9 Transmit Ethernet frames between both test sets. If you cannot transmit and receive Ethernet traffic between the nodes, repeat Steps 1 through 8 to make sure you configured the Ethernet ports and test set correctly.

Step 10 Perform protection switch testing appropriate to the SONET topology:

- For path protection configurations, see the "DLP-A94 Path Protection Protection Switching Test" task on page 5-35

- For BLSRs see the "DLP-A91 BLSR Switch Test" task on page 5-23.

Configure your test set according to local site practice. For information about configuring your test set, see your test set user guide.

Step 11 After the Ethernet test 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-A147 Create a G-Series Circuit

Purpose	This procedure creates a G-Series circuit.
Tools/Equipment	A G-Series Ethernet card must be installed at each end of the circuit.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1 Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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 and click **Create**.

Step 4 In the Create Circuits dialog box, complete the following fields:

- 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—Choose STS.

- Size—Choose the circuit size. Valid circuit sizes for a G-Series circuit are STS-1, STS-3c, STS6c, STS-9c, STS-12c, STS-24c, and STS-48c.

Note Restrictions apply to provisioning multiple circuits on a G-Series card when one of the circuit sizes provisioned is STS-24c. Refer to the *Cisco ONS 15454 Reference Manual* for complete information.

- Bidirectional—Leave the default unchanged (checked).

- Number of circuits—Leave the default unchanged (1).

- State—Choose a service state to apply to the circuit:

  - IS—The circuit is in service.

  - OOS—The circuit is out of service. Traffic is not passed on the circuit.

- OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

- OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Leave this box at the default (unchecked).

> **Note** Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- Create cross-connects only (TL1-like)—Uncheck this box.

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Auto-ranged—Unavailable.

- Protected Drops—Leave the default unchanged (unchecked).

Step 5 If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 6 Click **Next**.

Step 7 Provision the circuit source:

a. From the Node pull-down menu, choose the circuit source node. Either end node can be the point-to-point circuit source.

b. From the Slot pull-down menu, choose the slot containing the G-Series card that you will use for one end of the point-to-point circuit.

c. From the Port pull-down menu, choose a port.

Step 8 Click **Next**.

Step 9 Provision the circuit destination:

a. From the Node pull-down menu, choose the circuit destination node.

b. From the Slot pull-down menu, choose the slot containing the G-Series card that you will use for other end of the point-to-point circuit.

c. From the Port pull-down menu, choose a port.

Step 10 Click **Next**. The Circuits window appears.

Step 11 Confirm that the following circuit information is correct:

- Circuit name

- Circuit type

- Circuit size

- ONS 15454 circuit nodes

Step 12 Click **Finish**.

> **Note** To change the capacity of a G-Series circuit, you must delete the original circuit and reprovision a new larger circuit.

Step 13 Complete the "NTP-A149 Test G-Series or ML-Series Circuits" procedure on page 6-88.

Stop. You have completed this procedure.

NTP-A148 Create a Manual Cross-Connect for a G-Series or an E-Series in Port-Mapped Mode

Purpose	This procedure creates a manual cross-connect between a G-Series Ethernet card or an E-Series in port-mapped mode and an OC-N card connected to non-ONS equipment.
Tools/Equipment	A G-Series or E-Series card must be installed at the circuit source node.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note In this procedure, cross-connect refers to a circuit connection created within the same node between the Ethernet card and an OC-N card connected to third-party equipment. You create cross-connects at the source and destination nodes so an Ethernet circuit can be routed from source to destination across third-party equipment.

Step 1 Log into a node where you will create the cross-connect. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. If you are already logged in, continue with Step 2.

Step 2 If you are provisioning an E-Series card, verify that the Ethernet card that will carry the circuit is provisioned for port-mapped mode. See the "DLP-A246 Provision E-Series Ethernet Card Mode" task on page 6-79.

Step 3 Click the **Circuits** tab and click **Create**.

Step 4 In the Create Circuits dialog box, complete the following fields:

- Name—Assign a name to the source cross-connect. 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 source cross-connect.
- Type—Choose STS.
- Size—Choose the size of the circuit that will be carried by the cross-connect. Valid sizes for a G-Series circuit are STS-1, STS-3c, STS-6c, STS-9c, STS-12c, STS-24c, and STS-48c. For an E-Series in port-mapped mode, valid sizes are STS-1, STS-3c, STS-6c, and STS-12c.
- Bidirectional—Leave the default unchanged (checked).
- Number of circuits—Leave the default unchanged (1).
- Auto-ranged—Unavailable.
- State—Choose a service state to apply to the circuit after it is created:
  - IS—The circuit is in service.

- OOS—The circuit is out of service. Traffic is not passed on the circuit.

- OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).

- OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.

- Apply to drop ports—Uncheck this box.

- Create cross-connects only (TL1-like)—Uncheck this box

- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.

- Protected Drops—Leave the default unchanged (unchecked).

Step 5 If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 6 Click **Next**.

Step 7 Provision the circuit source:

a. From the Node pull-down menu, choose the circuit source node.

b. From the Slot pull-down menu, choose the Ethernet card that will be the cross-connect source.

c. From the Port pull-down menu, choose the cross-connect source port.

Step 8 Click **Next**.

Step 9 Provision the circuit destination:

a. From the Node pull-down menu, choose the cross-connect source node selected in Step 9. (For Ethernet cross-connects, the source and destination nodes are the same.)

b. From the Slot pull-down menu, choose the OC-N card that connects to the non-ONS equipment.

c. Depending on the OC-N card, choose the port and STS from the Port and STS pull-down menus.

Step 10 Click **Next**.

Step 11 Verify the cross-connect information (in this step, "circuit" refers to the cross-connect):

- Circuit name

- Circuit type

- Circuit size

- ONS 15454 circuit nodes

If the information is not correct, click the **Back** button and repeat the procedure with the correct information.

Step 12 Click **Finish**.

Stop. You have completed this procedure.

DLP-A222 Provision G-Series Ethernet Ports

Purpose	This task provisions G-Series Ethernet ports.
Tools/Equipment	None
Prerequisite Procedures	DLP-A60 Log into CTC, page 3-23
Required/As Needed	Required to enable Ethernet traffic on the G-Series
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   In the node view, double-click the G-Series card graphic to open the card.

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

Step 3   For each G-Series port, provision the following parameters:

- Port Name—If you want to label the port, type the port name.

- State—Choose **IS** to put the port in service.

- Flow Control Neg—Click this check box to enable flow control negotiation on the port (default). If you do not want to enable flow control, uncheck the box.

Note   To activate flow control, the Ethernet device attached to the G-Series card must be set to auto-negotiation. If flow control is enabled but the negotiation status indicates no flow control, check the auto-negotiation settings on the attached Ethernet device.

- Max Size—To permit the acceptance of jumbo size Ethernet frames, choose **Jumbo** (default). If you do not want to permit jumbo size Ethernet frames, choose **1548**.

Note   The maximum frame size of 1548 bytes enables the port to accept valid Ethernet frames that use protocols, such as ISL. ISL adds 30 bytes of overhead and may cause the frame size to exceed the traditional 1518 byte maximum.

Step 4   Click **Apply**.

Step 5   Refresh the Ethernet statistics:

a.   Click the **Performance > Statistics** tabs.

b.   Click the **Refresh** button.

Note   Reprovisioning an Ethernet port on the G-Series card does not reset the Ethernet statistics for that port.

Step 6   Return to your originating procedure (NTP).

NTP-A149 Test G-Series or ML-Series Circuits

Purpose	This procedure tests circuits created on G-Series or ML-Series cards.
Tools/Equipment	Ethernet test set and appropriate fibers
Prerequisite Procedures	This procedure assumes you completed facility loopback tests to test the fibers and cables from the source and destination ONS 15454s to the fiber distribution panel or the DSX.
	NTP-A147 Create a G-Series Circuit, page 6-83 or
	NTP-A148 Create a Manual Cross-Connect for a G-Series or an E-Series in Port-Mapped Mode, page 6-85
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Step 1 Log into the ONS 15454 source Ethernet node. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions.

Step 2 Change the circuit and circuit ports to an OOS-MT service state:

   a. Click the **Circuits** tab.

   b. Click the circuit you want to test.

   c. From the Tools menu, choose **Circuits > Change Circuit State**.

   d. On the Change Circuit State dialog box, choose **OOS_MT** from the Target Circuit State pull-down menu.

   e. Check the **Apply to circuit drops** check box.

   f. Click **OK**.

Step 3 On the shelf graphic, double-click the circuit source card.

Step 4 Click the **Provisioning > Port** tabs.

Step 5 Verify the following settings:

- State—OOS_MT

- Flow Control Neg—Checked or unchecked as indicated by the circuit or site plan

- Max Size—Check or unchecked as indicated by the circuit or site plan

- Media Type— SX, LX, or ZX on G-Series or SX or LX on ML-Series

Step 6 Repeat Steps 1 through 5 for the destination node.

Step 7 At the destination node connect the Ethernet test to the destination port and configure the test set to send and receive the appropriate Ethernet traffic.

   ✎

   Note At this point, you will not be able to send and receive Ethernet traffic.

Step 8 At the source node connect an Ethernet test set to the source port and configure the test set to send and receive the appropriate Ethernet traffic.

Step 9   Transmit Ethernet frames between both test sets. If you cannot transmit and receive Ethernet traffic between the nodes, repeat Steps 1 through 6 to make sure you configured the Ethernet ports and test set correctly.

Step 10   Perform protection switch testing appropriate to the SONET topology:

- For path protection configurations, see the "DLP-A94 Path Protection Protection Switching Test" task on page 5-35.

- For BLSRs see the "DLP-A91 BLSR Switch Test" task on page 5-23.

Configure your test set according to local site practice. For information about configuring your test set, see your test set user guide.

Step 11   Change the circuit and circuit ports to the IS service state:

a.   Click the **Circuits** tab.

b.   Choose the circuit you want to test.

c.   From the Tools menu, choose **Circuits > Change Circuit State**.

d.   On the Change Circuit State dialog box, choose **IS** from the Target Circuit State pull-down menu.

e.   Check the **Apply to circuit drops** check box.

f.   Click **OK**.

Step 12   After the circuit test 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-A193 Create an ML-Series Circuit

Purpose	This procedure creates an ML-Series point-to-point SONET circuit. Refer to the *Cisco ONS 15454 ML-Series Multilayer Ethernet Card Software Feature and Configuration Guide* for more ML-Series information.
Tools/Equipment	An ML-Series Ethernet card must be installed at each end of the circuit.
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into a node on the network where you will create the circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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 and click **Create**.

Step 4   In the Create Circuits dialog box, complete the following fields:

- 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—Choose STS.
- Size—Choose the circuit size. Valid circuit sizes for an ML-Series circuit are STS-1, STS-3c, STS6c, STS-9c, STS-12c and STS-24c.
- Bidirectional—Leave the default unchanged (checked).
- Number of circuits—Leave the default unchanged (1).
- State—Choose a service state to apply to the circuit:
  - IS—The circuit is in service.
  - OOS—The circuit is out of service. Traffic is not passed on the circuit.
  - OOS-AINS—The circuit is out of service until it receives a valid signal, at which time the circuit state automatically changes to in service (IS).
  - OOS-MT—The circuit is in a maintenance 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 state to IS, OOS, or OOS-AINS when testing is complete. See the "DLP-A230 Change a Circuit State" task on page 9-9.
- Apply to drop ports—Uncheck this box.

✎ **Note** Loss of Signal alarms display if in service (IS) ports are not receiving signals.

- Create cross-connects only (TL1-like)—Uncheck this box.
- Inter-domain (UCP) SLA—If the circuit will travel on a unified control plane (UCP) channel, enter the service level agreement number. Otherwise, leave the field set to zero.
- Auto-ranged—Unavailable.
- Protected Drops—Leave the default unchanged (unchecked).

Step 5 If the circuit will be routed on a path protection configuration, complete the "DLP-A218 Provision Path Protection configuration Selectors During Circuit Creation" task on page 6-29.

Step 6 Click **Next**.

Step 7 Provision the circuit source:
  a. From the Node pull-down menu, choose the circuit source node. Either end node can be the point-to-point circuit source.
  b. From the Slot pull-down menu, choose the slot containing the ML-Series card that you will use for one end of the point-to-point circuit.
  c. From the Port pull-down menu, choose a port.

Step 8 Click **Next**.

Step 9 Provision the circuit destination:
  a. From the Node pull-down menu, choose the circuit destination node.
  b. From the Slot pull-down menu, choose the slot containing the ML-Series card that you will use for the other end of the point-to-point circuit.
  c. From the Port pull-down menu, choose a port.

Step 10 Click **Next**. The Circuits window appears.

Step 11 Confirm that the following circuit information is correct:

- Circuit name
- Circuit type
- Circuit size
- ONS 15454 circuit nodes

Step 12   Click **Finish**.

> ✎
>
> **Note**   To change the capacity of a ML-Series circuit, you must delete the original circuit and reprovision a new larger circuit.

Step 13   Complete the "NTP-A149 Test G-Series or ML-Series Circuits" task on page 6-88

Stop. You have completed this procedure.

NTP-A194 Create Overhead Circuits

Purpose	This procedure creates overhead circuits on an ONS 15454 network. Overhead circuits include DCC tunnels, the AIC and AIC-I card orderwire, and the AIC-I card user data channel.
Tools/Equipment	None
Prerequisite Procedures	NTP-A127 Verify Network Turn Up, page 6-4
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   Log into a node on the network where you will create the overhead circuit. See the "DLP-A60 Log into CTC" task on page 3-23 for instructions. 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-A313 Create a DCC Tunnel" task on page 6-92.

Step 4   As needed, complete the "DLP-A83 Provision Orderwire" task on page 6-93.

Step 5   As needed, complete the "DLP-A212 Create a User Data Channel Circuit" task on page 6-94.

Stop. You have completed this procedure.

DLP-A313 Create a DCC Tunnel

|	
Purpose	This task creates a DCC tunnel to transport traffic from third-party SONET equipment across ONS 15454 networks. Tunnels can be created on the Section DCC channel (D1-D3) (if not used by the ONS 15454 as a terminated DCC), or any Line DCC channel (D4-D6, D7-D9, or D10-D12).
Tools/Equipment	None
Prerequisite Procedures	NTP-A35 Verify Node Turn Up, page 5-2
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Note Each ONS 15454 can have up to 32 DCC tunnel connections. Terminated Section DCCs used by the ONS 15454 cannot be used as a DCC tunnel endpoint, and a Section DCC that is used as an DCC tunnel endpoint cannot be terminated. All DCC tunnel connections are bidirectional.

Step 1 In network view, click the **Provisioning > Overhead Circuits** tabs.

Step 2 Click **Create**.

Step 3 In the Circuit Creation dialog box (Figure 6-16), provision the DCC tunnel:

- Name—Type the tunnel name.
- Type—Choose one:
    - DCC Tunnel-D1-D3—Allows you to choose either the Section DCC (D1-D3) or a Line DCC (D4-D6, D7-D9, or D10-D12) as the source or destination endpoints.
    - DCC Tunnel-D4-D12—Provisions the full Line DCC as a tunnel.
- Source Node—Choose the source node.
- Slot—Choose the source slot.
- Port—If displayed, select the source port.
- Channel—Displayed if you chose DCC Tunnel-D1-D3 as the tunnel type. Choose one of the following:
    - DCC1 (D1-D3)—is the Section DCC
    - DCC2 (D4-D6)—is Line DCC 1
    - DCC3 (D7-D9)—is Line DCC 2
    - DCC4 (D10-D12)—is Line DCC 3

  DCC options are not displayed if they are used by the ONS 15454 (DCC1) or other tunnels.

Figure 6-16 Provisioning a DCC Tunnel
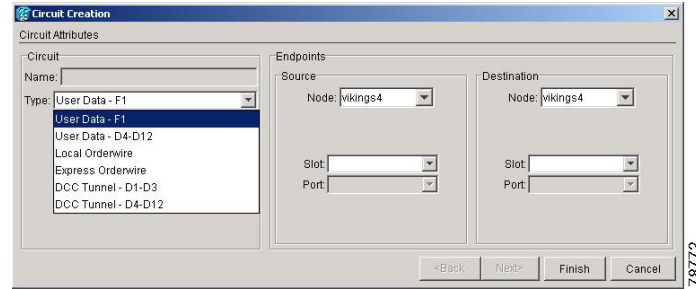
Step 4   Click **OK**.

Step 5   Put the ports that are hosting the DCC tunnel in service. See the "DLP-A214 Change the Service State for a Port" task on page 5-6 for instructions.

Step 6   Return to your originating procedure (NTP).

DLP-A83 Provision Orderwire

Purpose	This task provisions orderwire on the AIC or the AIC-I card.
Tools/Equipment	An AIC or AIC-I card must be installed in Slot 9.
Prerequisite Procedures	NTP-A24 Verify Card Installation, page 4-2
	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   In the network view, click the **Provisioning > Overhead Circuits** tabs.

Step 2   Click **Create**.

Step 3   In the Circuit Creation dialog box, complete the following fields:

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces).

- Type—Choose either LOW (local orderwire) or EOW (express orderwire) appropriate to the orderwire path that you want to create. If regenerators are not used between ONS 15454 nodes, you can use either local or express orderwire channels. If regenerators exist, use the express orderwire channel. You can provision up to four ONS 15454 OC-N ports for each orderwire path.

- PCM—Choose either MU_LAW or A_LAW.

Figure 6-17 shows the Local Orderwire subtab.The provisioning procedures are the same for both types of orderwire.

⚠

Caution   When provisioning orderwire for ONS 15454s residing in a ring, do not provision a complete orderwire loop. For example, a four-node ring typically has east and west ports provisioned at all four nodes. However, to prevent orderwire loops, provision two orderwire ports (east and west) at all but one of the ring nodes.

Figure 6-17   Provisioning Local Orderwire

Step 4   Under Endpoints, choose the source and destination nodes and source and destination optical ports and slots from the pull-down menus.

Step 5   Click **Finish**.

Step 6   Return to your originating procedure (NTP).

DLP-A212 Create a User Data Channel Circuit

Purpose	This task creates a user data channel (UDC) circuit on the ONS 15454. A UDC circuit allows you to create a dedicated data channel between nodes.
Tools/Equipment	None
Prerequisite Procedures	NTP-A24 Verify Card Installation, page 4-2
	DLP-A60 Log into CTC, page 3-23
Required/As Needed	As needed.
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Step 1   In network view, click the **Provisioning > Overhead Circuits** tabs.

Step 2   Click **Create**.

Step 3   In the Circuit Creation dialog box, complete the following fields:

- Name—Assign a name to the circuit. The name can be alphanumeric and up to 48 characters (including spaces).

- Type—Choose either User Data-F1 or User Data D-4-D-12 from the pull-down menu.

Step 4   Under Endpoints, choose the source and destination nodes and source and destination optical ports and slots from the pull-down menus.

Step 5   Click **Finish**.

Step 6   Return to your originating procedure (NTP).