



Hardware

This chapter describes fabric card, line card, and CPT 50 panel.

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Introduction to Carrier Packet Transport Cards

This topic describes the Carrier Packet Transport (CPT) cards. There are two cards in the CPT system:

- Fabric Card
- Line Card

The CPT 50 panel is a standalone unit and can be connected to the CPT system. The CPT 50 panel enables the number of ports to be scaled on the CPT system.

These cards are supported on the CPT 200 and CPT 600 platforms. The CPT system complies with RoHS-6 standards.

The following system configuration is recommended on the CPT 200 shelf:

- Standalone fabric card
- Standalone TNC/TSC card
- One or more CPT 50 panels

The following system configuration is recommended on the CPT 600 shelf:

- Redundant fabric cards
- One line card
- Redundant TNC/TSC cards
- One or more CPT 50 panels

Fabric Card

(CPT 200 and CPT 600 only)

The fabric card is a single slot card with two 10GE SFP+ ports and two 10GE XFP ports. The XFP ports on the fabric card support the Optical Transport Network (OTN) protocol. The SFP+ ports on the fabric card can serve as normal ports or InterConnect (IC) ports. When the SFP+ ports are used as IC ports, these ports are used to connect with the SFP+ ports on the CPT 50 panel.

The fabric card runs the route processor version of IOS. The fabric card manages the line card and the CPT 50 panel through the backplane GE management channel.

When fabric and line cards are installed on the shelf, a bidirectional 2 * 16G connection is set up between each fabric and line card and also between two fabric cards.

In chassis AC type, two fabric and two line cards are supported. In chassis DC type, there is no limit on the cards that are supported.

Circuit creation is possible only at XFP ports of the fabric card. Only OCHTRAIL creation is supported. Before creating the OCHTRAIL, create a provisionable patchcord (PPC) between the XFP port of the fabric card and the OCH port.

Slot Compatibility

On the CPT 600 shelf, install the redundant fabric cards in slots 4 and 5. There can be up to 2 fabric cards on the CPT 600 shelf. The two fabric cards on the CPT 600 shelf can both be in active mode with both cards carrying the traffic.

On the CPT 200 shelf, install the fabric card in slot 2 or 3.

Faceplate and Block Diagram

Figure 1: Fabric Card Faceplate, on page 3 illustrates the faceplate of the fabric card.

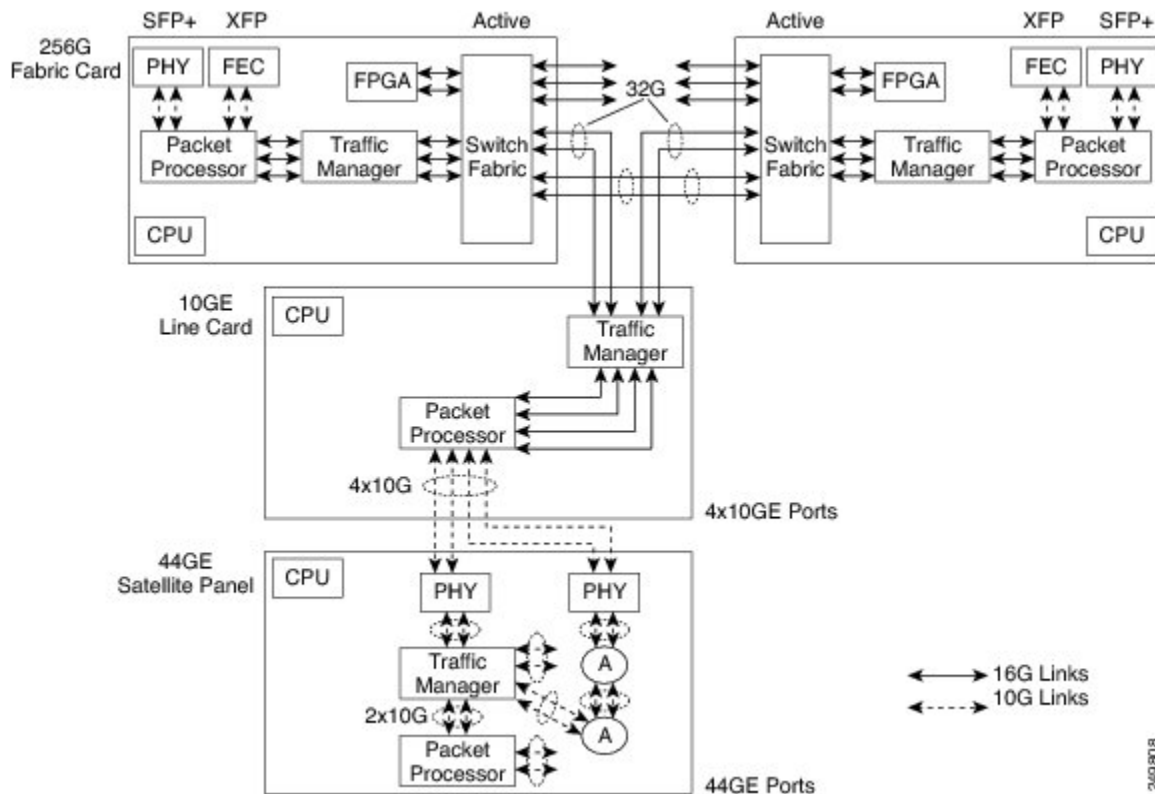
The FPGA on the fabric card processes the traffic packets. The console port on the faceplate is used for debugging.

Figure 1: Fabric Card Faceplate



Figure 2: CPT System Block Diagram, on page 3 illustrates the CPT system block diagram.

Figure 2: CPT System Block Diagram



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Card-Level Indicators

Table 1: Card-Level Indicators

Card-Level LED	Description
Red FAIL LED	The red FAIL LED indicates that the processor of the card is not ready. This LED is on during the reset. The FAIL LED flashes during the boot process. Replace the card if the red FAIL LED persists.
Green ACT LED	If the ACT LED is green, the card is operational (one or more ports active) and ready to carry the traffic.
Amber SF LED	The amber SF LED indicates that a signal failure or condition such as LOS, LOF, or high BERs is present in one or more of the ports of the card. The amber SF LED is also on if the transmit and receive fibers are incorrectly connected. If the fibers are properly connected and the link is working, the light turns off.

Port-Level Indicators

A port status LED is provided for each SFP+ port and XFP port on the fabric card. The XFP ports on the fabric card have only Link LEDs and no ACT LEDs.

Table 2: Port-Level Indicators

Port-Level LED	Description
Link LED	<p>Green—The port is either in-service and receiving a recognized signal (that is, no signal fail), or out-of-service and maintenance (OOS, MT or locked, maintenance) in which case the signal fail and alarms are ignored.</p> <p>Red—The port is in-service but is receiving a signal fail (LOS).</p> <p>Amber—The port is provisioned and is in a standby state.</p>
ACT LED	Indicates data reception. The LED blinks on packet flow.

Line Card

(CPT 200 and CPT 600 only)

The line card has four 10GE SFP+ ports. The SFP+ ports on the line card serve as normal ports or InterConnect (IC) ports. When the SFP+ ports are used as IC ports, these ports are used to connect with the SFP+ ports on the CPT 50 panel. The line card runs the line card version of IOS.

When fabric and line cards are installed on the shelf, a bidirectional 2 * 16G connection is set up between each fabric card and each line card and also between two fabric cards.

Slot Compatibility

On the CPT 600 shelf, install the line cards in slots 2, 3, 6, and 7. There can be up to four line cards on the CPT 600 shelf. However, the line card is not required to be present on the CPT 600 shelf.

On the CPT 200 shelf, install the line card in slot 2 or 3. There can be a single line card on the CPT 200 shelf. However, the line card is not required to be present on the CPT 200 shelf.

Line Card States

The line card could be in one of the following states:

- Empty slot
- Card pre-provisioned
- Card plugged-in
- Image downloading
- Application initialization
- Ready

Faceplate

[Figure 3: Line Card Faceplate](#), on page 5 illustrates the faceplate for the line card. The console port on the faceplate is used for debugging.

Figure 3: Line Card Faceplate



Card-Level Indicators

[Table 1: Card-Level Indicators](#), on page 4 provides information on card-level indicators.

Port-Level Indicators

A port status LED is provided for each SFP+ port on the line card.

[Table 2: Port-Level Indicators](#), on page 4 provides information on port-level indicators.

CPT 50 Panel

(CPT 200 and CPT 600 only)

The CPT 50 panel enables the number of ports to be scaled on the CPT system. The CPT 50 panel has 4 10GE SFP+ ports and 44 GE SFP ports. The CPT 50 panel runs the line card version of IOS.

**Note**

The CPT 50 panel is not placed in the CPT 200 or CPT 600 shelf.

**Note**

The CPT 50 panel should be of REV 5 hardware. To check the hardware, run the following command: **show version**.

The CPT 50 panel cannot operate independently. After connecting the CPT 50 panel to the fabric card or the line card, the CPT 50 panel is automatically discovered and registered. The discovery operation is performed using the Satellite Discovery Protocol (SDP) and the registration operation is performed using the Satellite Registration Protocol (SRP).

The four SFP+ ports on the CPT 50 panel can be connected to the SFP+ ports on the fabric card or the line card. The four SFP+ ports on the CPT 50 panel can be connected to only one card (fabric or line card) at a time.

CPT 50 shelf supports ONE-GE and FE for 1 to 44 ports. CPT 50 shelf supports TEN-GE for 45 to 48 ports. By default, the 45 to 48 ports are in IC mode and cannot be changed.

The CPT 50 panel has redundant DC feeds. The CPT 50 panel DC power supply can handle 48 V and 24 V. The 48 V power supply has both ANSI and ETSI versions.

The CPT 50 panel has a removable fan tray and a local console port for onsite access and debugging.

TDM SFP on a CPT 50 panel is supported even if the other end of the static pseudowire is connected to a Cisco ASR 9000 Series Router or a Cisco 7600 Series Router.

Faceplate

There are four variations of the CPT 50 panel faceplate:

- CPT 50 panel with AC power. See [Figure 4: CPT 50 panel with AC Power Faceplate, on page 7](#).
- CPT 50 panel with DC ETSI 48 V. See [Figure 5: CPT 50 panel with DC ETSI 48 V Faceplate, on page 7](#).
- CPT 50 panel with DC ANSI 48 V. See [Figure 6: CPT 50 panel with DC ANSI 48 V Faceplate, on page 7](#).

- CPT 50 panel with DC ANSI 24 V. See [Figure 7: CPT 50 panel with DC ANSI 24 V Faceplate](#), on [page 7](#).

Figure 4: CPT 50 panel with AC Power Faceplate



Figure 5: CPT 50 panel with DC ETSI 48 V Faceplate



Figure 6: CPT 50 panel with DC ANSI 48 V Faceplate

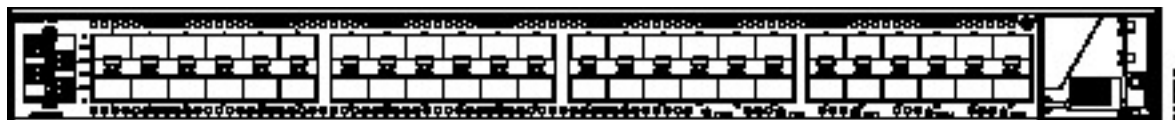


Figure 7: CPT 50 panel with DC ANSI 24 V Faceplate



Card-Level Indicators

Table 3: CPT 50 Panel Card-Level Indicators

Card-Level LED	Description
PWR	Indicates the status of the power to the card. If there is a power failure, this LED turns red.
FAN	Indicates the status of the fan to the card. If there is a fan failure, this LED turns red.
CRIT	Indicates the critical alarms in the network at the local terminal.
MAJ	Indicates the major alarms in the network at the local terminal.
MIN	Indicates the minor alarms in the network at the local terminal.

Supported CPT 50 Panels on the CPT System

- The CPT system supports up to 20 CPT 50 panels or 880 GE ports on the CPT 600 shelf.
- The CPT system supports up to 6 CPT 50 panels or 264 GE ports on the CPT 200 shelf.

The limit on the number of ports is not enforced by CTC.

CPT 50 Panel States

The following states are defined for a CPT 50 panel that is configured in the CPT system:

- Pre-provisioned—When the 10GE ports on the fabric or the line card are configured as IC ports and when these IC ports are associated with a Fan-Out-Group (FOG).
- Loading—When the CPT 50 panel has booted up with the IOS image and when the line card version of IOS is being downloaded from the fabric card.
- Active—When the CPT 50 panel boots up with the line card image and the application initialization is completed.

CPT 50 Panel Connectivity to the Fabric or Line Card

If the CPT 50 shelf loses connectivity to the fabric or line card due to interconnect (IC) link down events, the CPT 50 shelf reloads after the last IC link in the FOG (Fan-Out-Group) fails. This reload occurs after the configured carrier time delay. If there is a connection loss due to remote failures, the CPT 50 shelf reloads after detecting the failure time-out period (5 seconds) for the last link that was active. When the reload is complete, the CPT 50 shelf tries to reestablish the connection to the fabric or line card by performing the discovery operation. If the discovery operation is not successful within 5 minutes, the CPT 50 shelf reloads again. This cycle is repeated thrice with a reduction in the time-out period (30 seconds), until the discovery operation is successful. In the event of successful discovery, the CPT 50 shelf reestablishes the connection to the fabric or line card, else the CPT 50 shelf transits to the idle state and then attempts to connect to the fabric or line card.

Interlink Protection

If one of the links in the FOG is down, the traffic sent on that link is switched and distributed to the remaining active links in the FOG.

Hardware Restrictions

At any given time, only 12 TDM SFP modules can be connected to a CPT 50 panel. With these modules, 15 SFP modules and 2 SFP+ modules can also be connected. For information about SFP and SFP+ modules, see the [Pluggables compatible with Cisco CPT 50](#). These SFP and SFP+ modules can be connected to only selected ports of the CPT 50 panel. See

Figure 8: TDM SFP Configuration

DS1 and DS3 SFP configuration (15 TDM SFP), OC3 and OC12 SFP configuration (10 SFP) & 2 SFP+												TDM SFP (1.55W each)						STM1/STM3 SFP (2 W each)							
Power Supply	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	SFP+	SFP+	FAN Tray
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	SFP+	SFP+	

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Only the ports highlighted in green can be used to connect TDM SFP modules or any other SFP modules. The ports highlighted in purple can be used only to connect SFP+ modules.

**Note**

Ensure to close the remaining ports with cage caps. The Cisco part number for a cage cap is 51-2870-01.

Software Restrictions

The following software restrictions apply to the CPT 50 panel:

- The CPT system supports up to 880 GE ports on the CPT 600 shelf and these ports are distributed among 1 to 20 CPT 50 panels.
- The CPT system supports up to 264 GE ports on the CPT 200 shelf and these ports are distributed among 1 to 6 CPT 50 panels.

The limit on the number of ports is not enforced by CTC.

- Each CPT 50 panel can be connected to only one fabric or line card at a time.
- Only one FOG can be created for each CPT 50 panel.

Pre-provisioning

The following can be pre-provisioned through CTC:

- Fabric card
- Line card
- FOG
- TEN-GE PPMs
- Port states
- OTN parameters

The ONE-GE and FE PPMs are not pre-provisioned by default.

NTP-J19 Install the Fabric and Line Cards

Purpose	<p>(CPT 200 and CPT 600 only) This procedure installs the fabric and line cards on the CPT 200 and CPT 600 shelves.</p> <p>On the CPT 600 shelf, install the redundant fabric cards in slots 4 and 5. On the CPT 200 shelf, install the fabric card in slots 2 or 3.</p> <p>On the CPT 600 shelf, install the line cards in slots 2, 3, 6, and 7. On the CPT 200 shelf, install the line card in slots 2 or 3.</p>
Tools/Equipment	Fabric and line cards.

Prerequisite Procedures	DLP-G604 Install the TNC or TSC Card in <i>Cisco ONS 15454 DWDM Configuration Guide</i>
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**Warning**

During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94

**Warning**

Class 1 laser product. Statement 1008

**Warning**

Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. Statement 1056

**Warning**

Class 1 laser product. Statement 1008

**Caution**

Always use the supplied ESD wristband when working with a CPT 200 and CPT 600 shelf. For detailed instructions on how to wear the ESD wristband, refer to the *Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms*.

**Note**

If protective clips are installed on the backplane connectors of the cards, remove the clips before installing the cards.

**Note**

If you install a card incorrectly, the FAIL LED flashes continuously.

Procedure

- Step 1** Navigate to the Cisco Transport Planner shelf layout for the node where you will install the fabric or line card.
- Step 2** Remove the card from its packaging, then remove the protective clips from the backplane connectors.
- Step 3** Open the card ejectors.
- Step 4** Hold the card firmly and align it to the guard rails and slide it inside the slot until the card plugs into the receptacle at the back of the slot designated by the Cisco Transport Planner shelf layout.
- Step 5** Verify that the card is inserted correctly and simultaneously close the ejectors on the card.
- Note** It is possible to close ejectors when the card is not completely plugged into the backplane. Ensure that you cannot insert the card any further.
- Note** If you install the card in the wrong slot, CTC will raise a MEA (EQPT) alarm. To clear this alarm, open the ejectors, slide the card out, then insert it in the correct slot.
- After you install the card, the FAIL, ACT, and SF LEDs will go through a sequence of activities. They will turn on, turn off, and blink at different points. After approximately 2 to 3 minutes, the ACT or ACT/STBY LED turns on. The SF LED might persist until all card ports connect to their far-end counterparts and a signal is present.
- Note** Until a card is provisioned, the card is in the standby condition and the ACT/STBY LED remains amber in color.
- Step 6** If the card does not boot up properly or the LEDs do not progress through the activities described in step 5, check the following:
- When a physical card type does not match the type of card provisioned for that slot in CTC, the card might not boot and CTC will show a MEA (EQPT) alarm. If the card does not boot, open CTC and ensure that the slot is not provisioned for a different card type before assuming that the card is faulty.
 - If the red FAIL LED does not turn on, check the power.
 - If you insert a card into a slot provisioned for a different card, all LEDs turn off.
 - If the red FAIL LED is on continuously or the LEDs behave erratically, the card is not installed properly.

If any of these conditions are present, remove the card and repeat steps 3 to 5. If the card does not boot up properly the second time, contact your next level of support.

Note Until a card is provisioned, the card is in the standby condition and the ACT/STBY LED remains amber in color.

Stop. You have completed this procedure.

NTP-J72 Create a Fan-Out-Group Using CTC

Purpose	This procedure creates a Fan-Out-Group (FOG) using CTC.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed

Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

By default, the SFP+ ports on the fabric or line cards are configured as 10GE ports. These ports need to be configured as IC ports and associated to a FOG to connect these ports to the CPT 50 panel. FOG is a logical channel that consists of a bundle of 10GE IC ports.

The CPT 50 panel can be connected to the fabric card using two IC ports. The CPT 50 panel can be connected to the line card using four IC ports.

The 4 SFP+ ports that are displayed as 1+ 2+ 3+ 4+ on the faceplate of the CPT 50 panel are displayed as 45, 46, 47, 48 in CTC. This includes the display in Alarms and Performance Monitoring.



Note You can create only one FOG for each CPT 50 panel.

Procedure

- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to configure the SFP+ ports as IC ports.
 - Step 2** From the View menu, choose **Go to Home View**.
 - Step 3** Right-click the fabric or line card and choose **Open Packet Transport System View**. The Packet Transport System View dialog box appears.
 - Step 4** Click the **Fan-Out Groups** tab.
 - Step 5** Click **Create**. The Create/Edit Fan-Out Group dialog box appears.
 - Step 6** From the Fan-Out Group ID drop-down list, choose a FOG ID. FOG ID is the virtual slot ID of the CPT 50 panel and takes values from FOG 36 to FOG 55.
 - Step 7** From the Card Slot drop-down list, choose a slot.
 - Step 8** From the Available Fan-Out Ports area, choose the required ports that you want to configure as IC ports and move these ports to the Available Fan-Out Group Member Ports area.
 - Step 9** Click **Apply** to create a FOG that consists of the selected ports.
- Note** The CPT 50 panel comes up only when the SFP+ port of the card from where it is connected is not in OOS,DSBLD administrative state.
- Stop. You have completed this procedure.**

NTP-J72 Create a Fan-Out-Group Using CTC

Purpose	This procedure creates a Fan-Out-Group (FOG) using CTC.
Tools/Equipment	None
Prerequisite Procedures	None

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

By default, the SFP+ ports on the fabric or line cards are configured as 10GE ports. These ports need to be configured as IC ports and associated to a FOG to connect these ports to the CPT 50 panel. FOG is a logical channel that consists of a bundle of 10GE IC ports.

The CPT 50 panel can be connected to the fabric card using two IC ports. The CPT 50 panel can be connected to the line card using four IC ports.

The 4 SFP+ ports that are displayed as 1+ 2+ 3+ 4+ on the faceplate of the CPT 50 panel are displayed as 45, 46, 47, 48 in CTC. This includes the display in Alarms and Performance Monitoring.

**Note**

You can create only one FOG for each CPT 50 panel.

Procedure

- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to configure the SFP+ ports as IC ports.
 - Step 2** From the View menu, choose **Go to Home View**.
 - Step 3** Right-click the fabric or line card and choose **Open Packet Transport System View**. The Packet Transport System View dialog box appears.
 - Step 4** Click the **Fan-Out Groups** tab.
 - Step 5** Click **Create**. The Create/Edit Fan-Out Group dialog box appears.
 - Step 6** From the Fan-Out Group ID drop-down list, choose a FOG ID. FOG ID is the virtual slot ID of the CPT 50 panel and takes values from FOG 36 to FOG 55.
 - Step 7** From the Card Slot drop-down list, choose a slot.
 - Step 8** From the Available Fan-Out Ports area, choose the required ports that you want to configure as IC ports and move these ports to the Available Fan-Out Group Member Ports area.
 - Step 9** Click **Apply** to create a FOG that consists of the selected ports.
- Note** The CPT 50 panel comes up only when the SFP+ port of the card from where it is connected is not in OOS,DSBLD administrative state.
- Stop. You have completed this procedure.**

Understanding Rings

The Carrier Packet Transport (CPT) system provides the ability to operate CPT 50 in a physical ring homed back to a single CPT 600 or CPT 200 chassis. This feature provides the flexibility of connecting CPT 50 in a closed-ended ring or an open-ended ring. As a result, the failure of a line or uplink card does not impact the traffic in a ring. CPT 50 in a ring works like a route processor and each CPT 50 interacts with Transport Node Controller (TNC) directly.

These sections describe more about the rings feature in CPT:

- [Common Terms in Rings](#), on page 14
- [Ring Types](#), on page 15
- [Supported Traffic Patterns](#), on page 16
- [Supported CPT 50 Rings Deployment Scenario](#), on page 17
- [Limitations and Restrictions](#), on page 18

Common Terms in Rings

This section describes the common terms in rings.

- **Topology discovery** - This refers to the functionality that discovers nodes in a CPT 50 ring using REP and report it to the topology management functions residing on TNC.
- **CPT 50 in a ring** - This is an instance of CPT 50 that is loaded with the CPT 50 rings software and deployed in a ring subtended from CPT 600 or CPT 200.
- **Ring Controller** - For a provisioned ring, this refers to the following:
 - CPT 600 or 200 network element settings from which the provisioned ring is subtended.
 - TNC card from which the nodes are managed.
- **Open-ended ring** - This is a type of ring that is connected to CPT 600 or CPT 200 through only one interface and does not terminate on the headend. Hence, only one unprotected path gets available to the traffic on the ring.
- **Closed-ended ring** - This is a type of ring that is provisioned to connect to CPT 600 or CPT 200 through two interfaces on CPT 600 or 200. Hence, a protected path gets available to the traffic either through the east or west interface on the ring.
- **Working Ring Controller (WRC)** - For a provisioned dual-homed ring, this refers to other CPT 600 or CPT 200 network element from which the provisioned ring is subtended.
- **Protect Ring Controller (PRC)** - For a provisioned dual-homed ring, this refers to the other CPT 600 or 200 network element that provide node protection to WRC.
- **Ring island** - This indicates a ring of the CPT 50s that has lost the connectivity to CPT 600 or CPT 200. In open-ended ring, ring islands are caused by a single link failure from the east port of the ring controller. This can also be caused by a failure of one of the CPT 50s in the ring.
In closed-ended ring, ring islands are caused by two link failures between the east and the west port of the ring controller.
In dual homed ring, ring islands are caused by two link failures between the ring ports of the ring controller. This can also be caused by a failure of one of the CPT 50s in the ring.
- **Golden image** - This is an image stored on the CPT 50 panel that runs a software to establish control connection between the CPT 50 and CPT 600 or CPT 200 and downloads the kernel image from it.
- **Kernel image** - This refers to the CPT 50 application image that is downloaded by the golden image.
- **Boot Up** - This is a boot-up sequence for CPT 50 that comprises the following steps:

- Download kernel image, and allow the Boot VLAN transit traffic.
- Boot to kernel image, and allow boot VLAN and control VLAN transit traffic based on the REP convergence.
- Discover a unique identifier (ID) for CPT 50 and IP address from TNC.
- Discover active TNC, and establish a connectivity with TNC.
- Download database from TNC, and restore equipment and service configurations.

Ring Types

CPT supports the following types of ring:

Single-Homed Ring

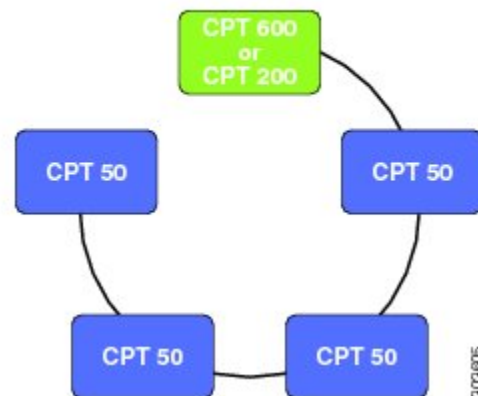
A Single-homed ring is the ring that is subtending from a single CPT-600 or CPT 200 in a linear or close-ended form. Following are the types of single-homed ring:

Open-Ended Ring

An Open-ended ring is the ring that is connected to a CPT 200 or CPT 600 through one port. It follows the linear topology. To create this type of ring, only the east port is required.

Figure 9: Open-Ended Ring

Open-Ended Ring

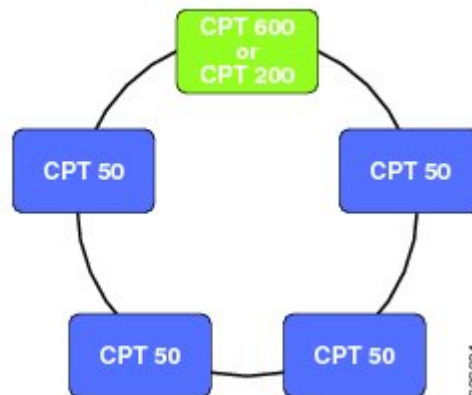


Closed-Ended Ring

A Closed-ended ring is the ring that is connected to a CPT 200 or CPT 600 through two interfaces. It follows the ring topology. To create this type of ring, both the east and west ports are required. It provides protection to the circuits and the control traffic.

Figure 10: Closed-Ended Ring

Closed-Ended Ring

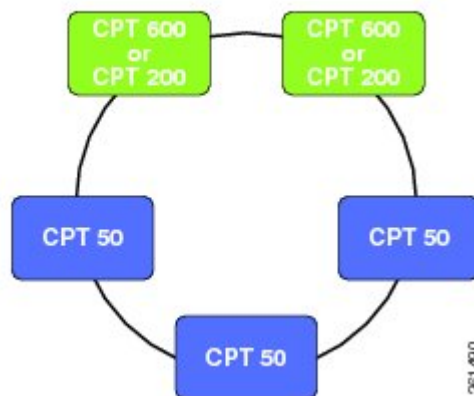


Dual-Homed Ring

A Dual-homed ring is the ring whose east port exists on one CPT 200 or CPT 600 (WRC) and west port exists on another CPT 200 or CPT 600 (PRC). If WRC fails, this type of ring provides access to all the CPT 50s in the ring by switching the traffic to the other controller.

Figure 11: Dual-Homed Ring

Dual-Homed Ring



Supported Traffic Patterns

The following MPLS-TP tunnel traffic is supported over a ring:

- Protected or unprotected MPLS-TP tunnel traffic from CPT 50 to the headend (CPT 600 or CPT 200).

- Protected or unprotected MPLS-TP tunnel traffic from CPT 50 to another CPT 50 in the same ring controller.
- Protected or unprotected MPLS-TP tunnel traffic from CPT 50 to another CPT 50 in another ring on the same headend.
- Protected or unprotected MPLS-TP tunnel traffic from CPT 50 to another CPT600 or CPT 200 that is reachable through the ring controller.
- Protected or unprotected MPLS-TP tunnel traffic from CPT 50 to another CPT 50 (in a ring) in another CPT 600 or CPT 200 that is reachable through the ring controller.
- Protected or unprotected MPLS-TP tunnel traffic from CPT 50 to another CPT 50 (in a fan-out group) in another CPT 600 or CPT 200 that is reachable through the ring controller.

The following services are supported over a ring:

- Ethernet services from CPT 50 UNI (front ports) realized through VPWS or VPLS over MPLS-TP tunnels on the ring.
- MPLS traffic from CPT 50 front ports stitched to VPLS or VPWS services over MPLS-TP tunnels on the ring.
- MS-PWE3 traffic from the core stitched to VPLS or VPWS services over the MPLS-TP tunnels on the ring.
- Multipoint E-LAN services with local connect .

Supported CPT 50 Rings Deployment Scenario

The CPT 50 rings architecture is raised over the CPT 50 standalone framework. CPT 50 in a ring provides a ring-based protection to the data path and the control path.

A ring can be subtended from a single CPT 600 or CPT 200 in a linear or close-ended form and are termed as single-homed rings. It can also be subtended from two interconnected CPT 600 or CPT 200 and are termed as dual-homed rings. From a CPT 600, 20 open-ended and 10 closed-ended single-homed rings can be subtended and up to 10 dual-homed rings can be subtended. From a CPT 200, six open-ended and three closed-ended single-homed rings can be subtended and up to three dual-homed rings can be subtended.

The CPT-50 support MPLS-TP based transport over the single-homed and dual-homed rings.

E-Line is realized using VPWS across the rings. E-LAN is realized using VPLS across the rings and using local switching within a CPT-50. Carrier Ethernet is not supported across the ring. Carrier Ethernet services in this case indicate E-Line and E-LAN services realized through P2P and P2MP Ethernet switching .

CPT 50 in ring mode can be provisioned through CTC only. This section describes the scenarios in which a ring can be configured using CPT 50 and the supported software features.

MPLS-TP Tunnels in a Ring

MPLS-TP tunnels in a ring can be created manually using CTC or Cisco IOS mode. BFD-based fault detection for MPLS-TP tunnels is supported at 50ms granularity using software mechanisms. It is also possible to create unprotected MPLS-TP tunnels. Only MPLS-TP data path circuit is supported over a ring. Protected MPLS-TP tunnels cannot be created in an open-ended ring as there is no alternate path available in such a configuration.

In a dual-homed ring, it is possible to create protected MPLS-TP Tunnels to WRC or PRC across the dual-homed ring and the inter-RC link spans.

VPWS in a Closed-Ended Rings

The VPWS port-based pseudowires can be created through MPLS-TP tunnels that are created within a ring or across rings. You cannot create a pseudowire in a ring if the chassis on which the corresponding attachment circuit exists, is down

VPLS in a Closed-Ended Ring

CPT 50 in a closed-ended ring can participate in the open ring or hub-and-spoke models of VPLS.

Local Switching

CPT supports local switching in a ring. Local switching allows switching of Layer 2 data between two attachment circuits on the same CPT 50 in the ring. In local switching (also known as hairpin connection), frames from one interface are switched to another interface on the same CPT 50 in a ring.

VPWS and VPLS in a Dual-Homed Ring

In a dual-homed ring, CPT 50 can participate in VPWS and VPLS by using either unprotected or protected pseudowires, terminating either at WRC or PRC.

Limitations and Restrictions

These limitations and restrictions apply to the ring in CPT:

- A maximum of 20 open-ended, 10 closed-ended and 20 dual-homed rings can be provisioned with CPT 600 and a maximum of 6 open-ended, 3 closed-ended and 6 dual-homed rings can be provisioned with CPT 200.
- A maximum of 15 CPT 50 panels can be configured in a ring.
- A maximum of 40 CPT 50 panels can be configured across all the rings (single-homed or dual-homed), on a single CPT 600 or CPT 200.
- The Resilient Ethernet Protocol (REP) configurations are internally provisioned on the ring.
- A ring cannot be configured on the XFP port.
- A CPT 600 or CPT 200 chassis can only have one role at a given time. It can be WRC, PRC or Single home.
- The ports that already have Fan-Out-Group (FOG) configured, cannot be used for creating a ring.
- The east port cannot be same as the west port while creating a single-homed ring.
- Services must be configured on the WRC of the dual-homed ring only, in the CTC mode and it should be in up state. It can be configured on the PRC when the WRC is down, but it is not recommended.
- In a dual-homed ring, in case of span failure service provisioning can be done only on the CPT 50's connected through the WRC, up to the first span failure .
- If a CPT 600 or CPT 200 chassis is used in dual-homed ring, it cannot be used in the single-homed ring.
- Both the WRC and the PRC should be in up state to perform any ring related provisioning on the dual-homed ring.
- Layer 1 and Layer 2 configurations should not be done on the dual-homed ring when the WRC is down, through the CTC and IOS mode.
- Services must not be configured on the ring and the Interconnect (IC) link ports when the node is in the IOS mode.

- Ring segment ID and normal REP segment ID must be different.
- Alarm synching is not supported from WRC to PRC and vice versa.
- Do not remove or change the REP parameters on the ring interface as it causes data loss and separation of CPT50 from the ring.
- Normal REP must not be configured on the Interconnect (IC) link port of a dual-homed ring.

NTP-J126 Configure a Ring Using CTC

Purpose	This procedure configures a ring.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

Step 1 Perform any of the following procedures as needed to configure a single-homed ring:

- [DLP-J371 Set the Role of a Node Using CTC, on page 32](#)
- [DLP-J363 Create a Single-Homed Ring Using CTC, on page 20](#)
- [DLP-J364 Edit a Single-Homed Ring Using CTC, on page 21](#)
- [DLP-J365 Manage the Packet Transport System View of a CPT 50 in a Ring, on page 23](#)
- [DLP-J366 View Actual Topology of a Ring, on page 31](#)

Stop. You have completed this procedure.

Step 2 Perform the following procedures as needed to configure a dual-homed ring:

- [DLP-J370 Add a Node Using CTC, on page 31](#)
- [DLP-J371 Set the Role of a Node Using CTC, on page 32](#)
- [DLP-J377 Configure a GCC Link, on page 33](#)
- [DLP-J372 Create a Dual-Homed Ring Using CTC, on page 34](#)
- [DLP-J373 Edit a Dual-Homed Ring Using CTC, on page 35](#)
- [DLP-J378 Change the Status of the PRC using CTC, on page 37](#)
- [DLP-J376 Configure Management Virtual Forwarding Interface \(VFI\), on page 37](#)

Stop. You have completed this procedure.

DLP-J363 Create a Single-Homed Ring Using CTC

Purpose	This procedure allows you to do the following: <ul style="list-style-type: none"> • Create a single-homed ring • Add CPT 50 in the ring • Enable the service
Tools/Equipment	None
Prerequisite Procedures	DLP-J371 Set the Role of a Node Using CTC , on page 32
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to create a single-homed ring.
- Step 2** From the View menu, choose **Go to Home View**.
- Step 3** Right-click the fabric or line card and choose **Open Packet Transport System View**. The Packet Transport System View dialog box appears.
- Step 4** Click the **Rings** tab.
- Step 5** Click **Create**. The Ring Creation wizard appears.
- Step 6** In the Ring Attributes area, specify the ring attributes as follows:
- From the Topology Type drop-down list, choose **Linear** or **Ring**.
 - Enter the name of the ring that you want to create in the Ring Name field.
 - In the East Port area, complete the following steps:
 - From the Slot drop-down list, choose a slot.
 - From the Port drop-down list, choose a port.
 - In the West Port area, complete the following steps:

Note The West Port area is displayed only if you have selected **Ring** from the Topology Type drop-down list to create a closed-ended ring.

 - From the Slot drop-down list, choose a slot.

- From the Port drop-down list, choose a port.

e) Click **Save**.

Note REP is enabled on the east and west ports by default. For information about the default parameters of REP, see [Understanding REP in a Ring](#).

f) Click **Next**.

Step 7 To add a CPT 50 in the ring, complete the following steps:

- Right-click the link and click **Add**. The CPT 50 Attributes dialog box appears.
- Enter the device identification number and description of CPT 50.
- Click **Save**.
- To add multiple CPT 50 panels, repeat the previous steps.

Step 8 From the Service drop-down list, choose **Enable**.

Note You cannot configure services such as MPLS-TP on this ring unless the service is enabled.

Step 9 Return to your originating procedure (NTP).

DLP-J364 Edit a Single-Homed Ring Using CTC

Purpose	This procedure edits a ring using CTC.
Tools/Equipment	None
Prerequisite Procedures	DLP-J363 Create a Single-Homed Ring Using CTC , on page 20
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

Step 1 Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to edit a ring.

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

Step 3 Right-click the fabric or line card and choose **Open Packet Transport System View**. The Packet Transport System View dialog box appears.

Step 4 Click the **Rings** tab.

Step 5 From the list of rings, select a ring to edit.

Step 6 Click **Edit**. The Ring Preview screen appears.

Step 7 Right click the CPT 50 and perform any of the following:

- Click **Open Card** to view the card details of the CPT 50.

- Click **Open PTS View** to open the Packet Transport System view of the CPT 50. For more information, see [DLP-J365 Manage the Packet Transport System View of a CPT 50 in a Ring](#), on page 23.

- Click **Add After or Add Before** to add CPT 50 before or after already added CPT 50.

Note **Add Before** button will appear only if the topology type is Ring and a CPT 50 is already added in the ring.

- Click **Edit** to modify the device identification number and description of the CPT 50 through CTC.

Note After editing through CTC, run the following Cisco IOS commands on the CPT 50 console.

- 1 test deviceIdentifier set <new identifier>
- 2 test deviceDescription set <new description>

- Click **Delete** to delete the CPT 50.

Note To delete a CPT 50, service state should be disable.

Step 8 From the Service drop-down list, choose **Enable**.

Note If the service state of a ring is disabled and the admin state of the east port of that ring, is set as down, SINGLE-SPAN-FAILURE alarm will get raised.

Note You cannot configure services such as MPLS-TP on this ring unless the service is enabled.

Step 9 Return to your originating procedure (NTP).

DLP-J381 Replace an existing CPT 50 in a ring with another CPT 50

Purpose	This procedure allows you to replace an existing CPT 50 in a ring with another CPT 50.
Tools/Equipment	None
Prerequisite Procedures	NTP-J109 Upgrade the Cisco CPT Software
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Perform the following steps to replace an existing CPT 50 in a ring with another CPT 50.



Note

If the CPT-50 is already used in 9.7.0, please follow only steps 6 to 10.

Procedure

-
- Step 1** Physically add a new CPT 50 to the node. The port should not be a ring port
- Step 2** Create FOG on the newly added CPT 50 using CTC. After creating FOG, CPT 50 will be in LC-slot with LC image.
- Note** Make sure that only one IC link should be connected to the CPT 50 and the node.
- Step 3** Run the following command to check the golden image version: **show version**
- Note** If the golden image version is less than 408.0, wait for the CPT 50 to auto reboot with the latest golden image.
- Note** If the golden image version is less than 408.0, don't delete the FOG already created.
- Step 4** Set device identifier of the new CPT50 same as the existing CPT 50 using the following commands: **test deviceidentifier set <name>**
- Step 5** Set device description of the new CPT50 same as the existing CPT 50 using the following commands: **test devicedescription set <name>**
- Step 6** Run the following command to check whether the device identifier and description fields are set properly: **show version**
- Step 7** Run the following command to change the mode from FANOUT to ring: **test satMode ring**
- Step 8** Delete the FOG from the CTC. Now the new CPT 50 will reboot with the latest golden image.
- Step 9** Physically replace a new CPT 50 in the ring.
- Note** Perform this step only if the CPT 50 is already used in CPT version 9.7.0.
- Step 10** Make east and west port connections. Now new CPT 50 automatically downloads the application image and comes up with all the services configured on the replaced CPT 50.
- Step 11** Return to your originating procedure (NTP).
-

DLP-J365 Manage the Packet Transport System View of a CPT 50 in a Ring

Purpose	This procedure manages the Packet Transport System (PTS) view of a CPT 50 in a ring.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	None

Procedure

- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to manage the PTS view of a CPT 50 in a ring.
- Step 2** Right-click the fabric or line card and choose **Open Packet Transport System View** . The Packet Transport System View dialog box appears.
- Step 3** Click the **Rings** tab.
- Step 4** Choose a ring to edit and click **Edit**. The Ring Preview screen appears.
- Step 5** Right-click the CPT 50 and choose **Open PTS View**. The CPT50 PTS View dialog box appears.
- Step 6** The CPT50 PTS View dialog box consists following tabs:
- **Provisioning** tab
 - **Maintenance** tab
 - **Service Level Alarms** tab

The following table lists all the configurations that you can perform in the Provisioning tab.

Note The configuration procedures performed in the PTS view of a CPT 50 in a ring is same as those performed in the PTS view of a card. However, the navigation steps to the PTS views of a CPT 50 in a ring and a card are different. Ignore the first three steps in the following procedures and follow step 1 through step 5 mentioned in this procedure to navigate to the CPT50 PTS View dialog box.

Pane	Configuration Procedure
Port Configuration	<ul style="list-style-type: none"> • DLP-J224 Configure CDP Using CTC • DLP-J225 Configure CDP Using Cisco IOS Commands

Control plane	<ul style="list-style-type: none"> • DLP-J109 Create and Edit a Loopback Interface Using CTC • DLP-J108 Create a Loopback Interface Using Cisco IOS Commands • DLP-J111 Specify the IP Address for Interfaces That Participate in an MPLS Network Using CTC • DLP-J110 Specify the IP Address for Interfaces That Participate in an MPLS Network Using Cisco IOS Commands • DLP-J118 Enable or Disable MPLS LDP Autoconfiguration Using CTC • DLP-J115 Enable MPLS LDP Autoconfiguration Using Cisco IOS Commands • DLP-J116 Disable MPLS LDP Autoconfiguration Using Cisco IOS Commands • DLP-J113 Enable OSPF on Specific Interfaces Using CTC • DLP-J112 Enable OSPF Protocol on Specific Interfaces Using Cisco IOS Commands • DLP-J209 Configure NSF for OSPF Using CTC • DLP-J221 Configure Cisco NSF for OSPF Using Cisco IOS Commands • DLP-J222 Configure IETF NSF for OSPF Using Cisco IOS Commands • DLP-J122 Enable MPLS LDP-IGP Synchronization Using CTC • NTP-J44 Configure MPLS LDP-IGP Synchronization
LDP	<ul style="list-style-type: none"> • NTP-J46 Configure MPLS LDP Session Protection • DLP-J124 Configure MPLS LDP Backoff Using CTC • DLP-J123 Configure MPLS LDP Backoff Using Cisco IOS Commands • DLP-J127 Enable MPLS LDP Session Protection Using CTC • DLP-J130 Create Targeted LDP Sessions Using CTC • DLP-J131 Configure MPLS LDP Discovery Using CTC • DLP-J133 Enable Explicit Null Label Using CTC • DLP-J135 Configure MPLS LDP Graceful Restart Using CTC

MPLS TE	<ul style="list-style-type: none"> • DLP-J139 Enable OSPF-TE Protocol on Specific Interfaces Using CTC • DLP-J137 Enable MPLS-TE on a System and on Specific Interfaces Using CTC • DLP-J136 Configure MPLS and RSVP to Support Traffic Engineering Using Cisco IOS Commands • DLP-J141 Enable RSVP Graceful Restart on an Interface Using CTC • DLP-J140 Enable RSVP Graceful Restart on an Interface Using Cisco IOS Commands • DLP-J142 Configure MPLS-TE Parameters for Each Interface Using CTC • DLP-J144 Change the Periodic Flooding Timer Using CTC • DLP-J143 Change the Periodic Flooding Timer Using Cisco IOS Commands
MPLS TP	<ul style="list-style-type: none"> • NTP-J36 Configure Global Settings for Multiprotocol Label Switching Transport Profile • DLP-J96 Configure Global Settings for Multiprotocol Label Switching Transport Profile Using CTC • DLP-J98 Create and Configure BFD Templates Using CTC <ul style="list-style-type: none"> Note The following BFD templates are configured automatically for a ring: <ul style="list-style-type: none"> • fast_profile_BFD • slow_profile_BFD • DLP-J97 Create and Configure BFD Templates Using Cisco IOS Commands • DLP-J100 Configure an MPLS-TP Link Number Using CTC • DLP-J99 Configure an MPLS-TP Link Using Cisco IOS Commands • DLP-J102 Create a Static OAM Class Using CTC • DLP-J101 Create a Static OAM Class Using Cisco IOS Commands
Pseudowire Class	<ul style="list-style-type: none"> • DLP-J89 Create a Pseudowire Class Using CTC • DLP-J88 Create a Pseudowire Class Using Cisco IOS Commands

Label Range	<ul style="list-style-type: none"> • DLP-J104 Specify Static Label Range Using CTC • DLP-J103 Specify Static Label Range Using Cisco IOS Commands
QoS	<ul style="list-style-type: none"> • DLP-J193 Creating or Editing a Policy Map Using CTC • DLP-J194 Setting Policy Class Actions Using CTC • DLP-J191 Creating or Editing a Class Map Using CTC • DLP-J196 Attaching or Removing a Traffic Policy from the Target Using CTC • DLP-J195 Attaching or Removing a Traffic Policy from the Target Using Cisco IOS Commands • DLP-J198 Creating or Editing a Table Map Using CTC
CFM	<ul style="list-style-type: none"> • NTP-J106 Configure CFM Using Cisco IOS Commands • DLP-J299 Enable or Disable CFM on the CPT System Using CTC • DLP-J305 Enable or Disable CFM on the CPT System Using Cisco IOS Commands • DLP-J300 Enable or Disable CFM for Each Port or Channel Group Using CTC • DLP-J313 Enable Caching of CFM Data Using CTC • DLP-J312 Enable Caching of CFM Data Using Cisco IOS Commands • DLP-J301 Create and Modify a Maintenance Domain Profile Using CTC • DLP-J303 Create and Modify a Maintenance Association Profile Using CTC • DLP-J304 Delete a Maintenance Association Profile Using CTC

Y1731	<ul style="list-style-type: none"> • DLP-J350 Clear AIS Alarms Using CTC • DLP-J349 Configure ETH-AIS Parameters Using Cisco IOS Commands • DLP-J352 Lock an MEP or an Interface Using CTC • DLP-J351 Configure ETH-LCK Parameters Using Cisco IOS Commands • DLP-J353 Enable Y.1731 Fault Management Parameters Using CTC • DLP-J355 Configure and Schedule Two-Way Delay Measurement Using CTC
Channel Group	<ul style="list-style-type: none"> • DLP-J15 Create a Channel Group Using CTC • DLP-J12 Configure a Channel Group Without LACP Using Cisco IOS Commands • DLP-J16 Edit a Channel Group Using CTC • DLP-J18 Configure Manual Load Balancing Using CTC • DLP-J17 Configure Manual Load Balancing Using Cisco IOS Commands
LACP	<ul style="list-style-type: none"> • DLP-J9 Set LACP System Priority Using CTC • DLP-J8 Set LACP System Priority Using Cisco IOS Commands
REP	<ul style="list-style-type: none"> • DLP-J29 Configure REP Administrative VLAN Using Cisco IOS Commands • DLP-J34 Create a Segment Using CTC • DLP-J35 Edit a Segment Using CTC • DLP-J30 Configure REP Administrative VLAN Using CTC • DLP-J40 Activate VLAN Load Balancing Using CTC • DLP-J41 Deactivate VLAN Load Balancing Using CTC

EFM	<ul style="list-style-type: none"> • DLP-J314 Enable or Disable Ethernet Link OAM on a Port Using CTC • DLP-J315 Enable or Disable Link Monitoring Support on an Interface Using CTC • DLP-J319 Configure the Port for Remote Link Failure Indication Using CTC • DLP-J318 Enable Remote Loopback on an Interface Using CTC • NTP-J114 Configure EFM Using Cisco IOS Commands
Timing	<ul style="list-style-type: none"> • DLP-J326 Set Up Timing Parameters Using CTC • DLP-J327 Select Timing Reference Using CTCDLP-J330 Enable or Disable ESMC Using CTC Note For ring port, SynE is enabled by default. • DLP-J329 View Timing Status Report Using CTC
Span	<ul style="list-style-type: none"> • DLP-J357 Configure a Port or EFP Span Using CTC • DLP-J358 Restrict the Destination Ports for a Span Using CTC • NTP-J119 Configure a Span Using Cisco IOS Commands

The following table lists all the configurations that you can perform in the Maintenance tab.

Note The configuration procedures performed in the PTS view of a CPT 50 in a ring is same as those performed in the PTS view of a card. However, the navigation steps to the PTS views of a CPT 50 in a ring and a card are different. Ignore the first three steps in the following procedures and follow step 1 through step 5 mentioned in this procedure to navigate to the CPT50 PTS View dialog box.

Pane	Configuration Procedure
IOS	<ul style="list-style-type: none"> • NTP-J20 Change the CPT System Configuration Mode Using CTC • DLP-J56 Open the Cisco IOS Configuration Mode and View the Feature Configuration Details Using CTC

MAC Learning	<ul style="list-style-type: none"> • DLP-J22 Configure the MAC Address Limit on a Bridge Domain Using CTC • DLP-J21 Configure MAC Address Limit on a Bridge Domain Using Cisco IOS Commands • DLP-J20 Re-enable or Disable MAC Learning on a Bridge Domain Using CTC • DLP-J19 Re-enable or Disable MAC Learning on a Bridge Domain Using Cisco IOS Commands • DLP-J28 Display Information About the MAC Address Table Using CTC • DLP-J27 Display Information About the MAC Address Table Using Cisco IOS Commands • DLP-J24 Configure a Static MAC Address on a Service Instance Using CTC • DLP-J23 Configure a Static MAC Address on a Service Instance Using Cisco IOS Commands • DLP-J26 Remove a MAC Address Using CTC • DLP-J23 Configure a Static MAC Address on a Service Instance Using Cisco IOS Commands • DLP-J3 Edit an EVC Circuit Using CTC • DLP-J25 Remove a MAC Address Using Cisco IOS Commands • DLP-J1 Configure an Ethernet Service Instance Using Cisco IOS Commands • DLP-J336 Edit a VPLS Circuit Using CTC • NTP-J108 Configure a VPLS Circuit Using Cisco IOS Commands
OAM	NTP-J107 Perform ping and traceroute Operations on Services Using CTC

The following table lists all the configurations that you can perform in the Service Level Alarms tab.

Note The configuration procedures performed in the PTS view of a CPT 50 in a ring is same as those performed in the PTS view of a card. However, the navigation steps to the PTS views of a CPT 50 in a ring and a card are different. Ignore the first three steps in the following procedures and follow step 1 through step 5 mentioned in this procedure to navigate to the CPT50 PTS View dialog box.

Configuration Procedure
NTP-J73 Display Alarms that Affect Services Using CTC
NTP-J74 Display Alarms on Service Using CTC

- Step 7** Return to your originating procedure (NTP).

DLP-J366 View Actual Topology of a Ring

Purpose	This procedure provides a graphical representation of the actual ring topology in the field.
Tools/Equipment	None
Prerequisite Procedures	DLP-J363 Create a Single-Homed Ring Using CTC, on page 20
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to view the actual topology of a ring.
- Step 2** From the View menu, choose **Go to Home View**.
- Step 3** Right-click the fabric or line card and choose **Open Packet Transport System View**.
The Packet Transport System View dialog box appears.
- Step 4** Click the **Rings** tab.
- Step 5** Select a ring and click **Show Actual Topology**.
The Actual Topology dialog box appears containing the graphical representation of the actual ring topology in the field. The actual ring topology contains the physically connected CPT 50s. If there is a mismatch in the actual ring topology from the provisioned ring topology, corresponding alarms are generated.
- Note** The Show Actual Topology button is enabled only when the service state is enabled for a ring.
- Step 6** Return to your originating procedure (NTP).

DLP-J370 Add a Node Using CTC

Purpose	This procedure allows you to add a node.
Tools/Equipment	None
Prerequisite Procedures	None

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

Procedure

-
- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to create a dual-homed ring.
- Step 2** From the File menu, choose **Add Node** to add a new node in the network.
- Step 3** In the Add Node dialog box, enter the node name and click **Ok**.
- Step 4** Return to your originating procedure (NTP).
-

DLP-J371 Set the Role of a Node Using CTC

Purpose	This procedure sets the role of a node using CTC.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

-
- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to create a ring.
- Step 2** From the View menu, choose **Go to Home View**.
- Step 3** Right-click the fabric or line card and choose **Open Packet Transport System View**. The Packet Transport System View dialog box appears.
- Step 4** Click the **Node Role** tab.
- Step 5** In the Node Role Configuration pane, specify the dual-homed ring attributes as follows:
- From the Ring Mode drop-down list, choose Single Home or Dual Home.
Note To create a dual homed ring, two nodes are required with the node role as Dual Home.
 - From the Node Role drop-down list, choose WRC or PRC.
 - Enter the IP address of the peer node in the Peer Node IP field.
Note To create a single-homed ring, Peer Node IP field is disabled.

The Status field displays status of the node. The default status for WRC and single-homed ring is Active and for PRC is Stand by.

d) Enter the slot number to create interconnect (IC) link in the IC Slot field.

e) Enter the IP address to create interconnect (IC) link in the IC port field.

Note The IC Slot and IC port fields are disabled when creating a single-homed

Note Only one IC link can be created between WRC and PRC.

Step 6 Click **Apply**.

Step 7 Return to your originating procedure (NTP).

DLP-J377 Configure a GCC Link

Purpose	This procedure allows you to configure a generic communication channel (GCC) link.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

Step 1 Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to configure a GCC link.

Step 2 In the node view (single-shelf mode), click the **Provisioning > Comm Channels > GCC** tabs.

Step 3 Click **Create**. The Create GCC Terminations screen appears.

Step 4 Choose the port and slot to set the GCC termination point.

Step 5 From the GCC Rate drop-down list, choose the GCC rate.

Note For a dual-homed ring, configure the GCC link on both the nodes and make a physical connection between the PTF cards of both the nodes.

Step 6 Click **Finish**.

Note Verify the GCC link in CTC.

Step 7 Return to your originating procedure (NTP).

Note Enable the admin state of the port. [DLP-J78 Change the Port and Ethernet Settings Using CTC](#).

DLP-J372 Create a Dual-Homed Ring Using CTC

Purpose	This procedure allows you to create a dual-homed ring.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

-
- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to create a dual-homed ring.
- Step 2** From the View menu, choose **Go to Network View**.
- Step 3** Click the **Dual Home** tab.
- Step 4** Click **Create**. The Dual Home Ring Creation wizard appears.
- Step 5** In the Dual Home Attributes area, specify the dual-homed ring attributes as follows:
- Enter the name of the ring that you want to create in the Ring Name field.
 - From the Topology Type drop-down list, choose **Dual Home**.
 - Click **Next**.
- Step 6** In the Dual Home Origination screen of the wizard
- From the Node drop-down list, choose a WRC node.
 - From the Slot drop-down list, choose a slot.
 - From the Port drop-down list, choose a port.
 - Click **Next**.
- Step 7** In the Dual Home Termination screen of the wizard
- From the Node drop-down list, choose a PRC node.
 - From the Slot drop-down list, choose a slot.
 - From the Port drop-down list, choose a port.
 - Click **Finish**.
- Step 8** Click **Display Dual-Homed Ring** to view the ring.
- Note** You can configure different services on the dual-homed ring through CTC or Cisco IOS mode. Always run the write memory command after configuring services on the WRC, to synchronize the changes done on the WRC with the PRC.

Step 9 Return to your originating procedure (NTP).

DLP-J373 Edit a Dual-Homed Ring Using CTC

Purpose	This procedure edits a dual-homed ring and add CPT 50's in the dual-homed ring using CTC.
Tools/Equipment	None
Prerequisite Procedures	DLP-J372 Create a Dual-Homed Ring Using CTC, on page 34
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to edit a dual-homed ring.
- Step 2** From the View menu, choose **Go to Home View**.
- Step 3** Click the **Dual Home** tab.
- Step 4** From the list of rings, select a ring to edit.
- Step 5** Click **Edit**. The Dual Home Ring Preview screen appears.
- Step 6** In the Rings Attributes area, specify the ring attributes as follows:
- Modify the name of the ring in the **Ring Name** field.
 - From the Service Creation drop-down list, choose **Enable** or **Disable**.

Note If the service state of a ring is disabled and the admin state of a port at the WRC of that ring is set as down, no ring related alarm will get raised.

Note If the service is being configured through Cisco IOS mode then the option selected in this drop-down has no impact on the services configured for dual-homed ring.
- Step 7** To add a CPT 50 in the ring, complete the following steps:
- Right-click the ring and click **Add**. The CPT 50 Attribute dialog box appears.
 - Enter the device identification number and description of the CPT 50.
 - Click **Save**.
 - To add multiple CPT 50 panels, repeat the step 7 a) through step 7 c).
- Note** The CPT 50 will be get added between the source and the destination of the link, on which you have right clicked.
- Step 8** Click **Finish**.
- Step 9** Return to your originating procedure (NTP).
- Note** The CPT 50s must be provisioned using CTC in the same manner as they are physically connected. For example, ensure that the ports and equipment identifiers are same in the physical and provisioned configurations.

DLP-J381 Replace an existing CPT 50 in a ring with another CPT 50

Purpose	This procedure allows you to replace an existing CPT 50 in a ring with another CPT 50.
Tools/Equipment	None
Prerequisite Procedures	NTP-J109 Upgrade the Cisco CPT Software
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Perform the following steps to replace an existing CPT 50 in a ring with another CPT 50.


Note

If the CPT-50 is already used in 9.7.0, please follow only steps 6 to 10.

Procedure

- Step 1** Physically add a new CPT 50 to the node. The port should not be a ring port
- Step 2** Create FOG on the newly added CPT 50 using CTC. After creating FOG, CPT 50 will be in LC-slot with LC image.
 - Note** Make sure that only one IC link should be connected to the CPT 50 and the node.
- Step 3** Run the following command to check the golden image version: **show version**
 - Note** If the golden image version is less than 408.0, wait for the CPT 50 to auto reboot with the latest golden image.
 - Note** If the golden image version is less than 408.0, don't delete the FOG already created.
- Step 4** Set device identifier of the new CPT50 same as the existing CPT 50 using the following commands: **test deviceidentifier set <name>**
- Step 5** Set device description of the new CPT50 same as the existing CPT 50 using the following commands: **test devicedescription set <name>**
- Step 6** Run the following command to check whether the device identifier and description fields are set properly: **show version**
- Step 7** Run the following command to change the mode from FANOUT to ring: **test satMode ring**
- Step 8** Delete the FOG from the CTC. Now the new CPT 50 will reboot with the latest golden image.
- Step 9** Physically replace a new CPT 50 in the ring.
 - Note** Perform this step only if the CPT 50 is already used in CPT version 9.7.0.

- Step 10** Make east and west port connections. Now new CPT 50 automatically downloads the application image and comes up with all the services configured on the replaced CPT 50.
- Step 11** Return to your originating procedure (NTP).

DLP-J378 Change the Status of the PRC using CTC

Purpose	This procedure changes the status of the PRC using CTC.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed when the WRC is down.
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Procedure

- Step 1** Complete the [NTP-J22 Log into CTC](#) procedure at a node where you want to create a ring.
- Step 2** From the View menu, choose **Go to Home View**.
- Step 3** Right-click the fabric or line card and choose **Open Packet Transport System View**. The Packet Transport System View dialog box appears.
- Step 4** Click the **Node Role** tab.
- Step 5** In the Node Role Configuration pane, choose PRC in the Node Role drop-down list.
- Step 6** Click **GO ACTIVE** to make the status of the PRC as active.
Note The status of a node can be changed to active, if PROTNA alarm is not raised on that node.
- Step 7** Click **Apply**.
Note Change the status of the PRC only when the WRC is down.
- Step 8** Return to your originating procedure (NTP).

DLP-J376 Configure Management Virtual Forwarding Interface (VFI)

Purpose	This procedure allows you to configure Management Virtual Forwarding Interface (VFI).
Tools/Equipment	None
Prerequisite Procedures	None

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

Procedure

-
- Step 1** Create protected tunnels between both CPT 200 or CPT 600 and CPT 50s with pseudowire class as VPLS. [NTP-J41 Configure an MPLS-TP Tunnel](#)
- Step 2** Create Pseudowire Class. [NTP-J30 Create a Pseudowire Class](#)
- Step 3** Configure Mesh VPLS between WRC and PRC. [NTP-J107 Configure a VPLS Circuit Using CTC](#)
- Step 4** Configure Loopback. [DLP-J109 Create and Edit a Loopback Interface Using CTC](#)
- Step 5** Configure OSPF. [NTP-J65 Configure OSPF and OSPF-TE](#)
- Step 6** Configure H-VPLS from one of the 1GE ports of each CPT 50 to WRC as working and to PRC as standby hub node. [NTP-J107 Configure a VPLS Circuit Using CTC](#)
- Step 7** Assign IP address with similar network mask to another 1GE port.
- Step 8** Return to your originating procedure (NTP).
-

DLP-J380 Change CPT 50 in Ring Mode to Fan-Out-Group (FOG) Mode

Purpose	This procedure changes a CPT 50 in RIng mode to FOG mode
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

This procedure allows you to upgrade CPT 50's in ring mode to FOG mode.



Note

The CPT 600 or 200 must have CPT 9.7.0 or later version.

Procedure

-
- Step 1** Create a new ring on the CPT 600 or CPT 200.
- Step 2** Add the CPT 50s to the linear ring through CTC before physically connecting the CPT 50's in the ring.
- Step 3** Connect the port 45 of the CPT 50s to the east port of the newly created ring on the CPT 600 or CPT 200 and the west port to port 46 in case of closed single-homed or dual-homed ring.
- Note** In case of existing ring where services are already configured over the CPT 50's, follow the below three steps before proceeding to Step 4:
- 1 Delete the VPWS, VPLS or EVC services configured on the CPT 50's
 - 2 Now delete the MPLS-TP tunnels configured through the CPT 50's.
 - 3 Disable the service state.
- Step 4** Telnet the CPT 50s through CTC. **telnet <node ip> <2000 + ID of the CPT 50 in a ring>.**
- Step 5** Run the following command: **test satMode fanout**
- Step 6** Delete the ring and CPT 50s added to that ring using CTC.
- Step 7** Create the fan-out-group (FOG) using CTC.
- Step 8** Physically connect the CPT 50s in FANOUT mode.
- Step 9** Hard reset the CPT 50s.
- Step 10** Return to your originating procedure (NTP).
-

DLP-J374 Upgrade CPT 50 in Fan-Out-Group (FOG) Mode to Ring Mode

Purpose	This procedure allows you to upgrade CPT 50's in FOG mode to ring mode
Tools/Equipment	None
Prerequisite Procedures	NTP-J109 Upgrade the Cisco CPT Software
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

Perform the following steps to upgrade CPT 50 in FOG mode to ring mode.

Procedure

-
- Step 1** Physically connect a new CPT 50 to the node and create FOG on the newly added CPT 50 using CTC.
- Note** Make sure that only one IC link should be connected to the CPT 50 and the node.
- Step 2** Run the following command to check the golden image version: **show version**

Note If the golden image version is less than 408.0, don't delete the FOG already created.

**Warning**

Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

**Warning**

A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

**Note**

In this chapter, “shelf” refers to the steel enclosure that holds cards and connects power, and “node” refers to the entire hardware and software system.

**Note**

Unless otherwise specified, CPT 50 shelf refers to both ANSI and ETSI environments.

**Note**

The CPT 50 shelf is suitable for installation in network telecommunication facilities where the National Electric Code (NEC) applies.

Required Tools and Equipment

The following sections describe the tools and equipment you need to install and test the CPT 50 shelf.

Cisco Supplied Materials

The following materials are required and are shipped with the CPT 50 shelf (wrapped in plastic). The number in parentheses gives the quantity of the item included in the package.

- (Only ANSI) Pair of 19-inch mounting brackets (2)
- (Only ANSI) Pair of 23-inch mounting brackets (2)
- (Only ETSI) Pair of 21-inch mounting brackets (2)
- Cable guides (2)
- Rubber bumpers (4)
- M4 screws to fix brackets (8)
- M4 screws to fix ground lug (2)
- Ground lug (1)
- Power cable (1). A DC power cable is present in the kit if the customers have ordered for it.

**Attention**

Always use M4 screws to install a ground lug on a CPT 50 shelf. The Cisco part number for this screw is 48-0468-01. The recommended maximum length is 6 millimeters (mm). If you use a screw longer than 6 mm, it can lead to a short circuit in the CPT 50 shelf.

**Note**

If the customers have ordered a CPT-50-44GE-48E= or CPT-50-48E-LIC= shelf, a DC power cable is present in the accessory kit. If the customers have ordered a CPT-50-44GE-AC= or CPT-50-AC-LIC shelf, an AC power cable is present in the accessory kit.

**Caution**

Use only the power cables that are designed to be used with the CPT 50 shelf. These are sold separately.

User Supplied Materials

The following materials, tools, and equipment are required but are not supplied with the CPT 50 shelf.

- Equipment rack
- M4 Phillips screw driver
- Fuse panel
- Wire cutters
- Wire wrapper
- Voltmeter
- Ground cable #8 AWG stranded, specified for up to 90° Celsius (194° Fahrenheit)
- M3 Phillips screw driver only for CPT-50-44GE-48E= and CPT-50-48E-LIC= shelves to secure the DC power cable to the shelf.

**Caution**

Use only the power cables that are designed to be used with the CPT 50 shelf. These are sold separately.

NTP-J53 Unpack and Inspect the CPT 50 Shelf

Purpose	This procedure explains how to unpack the CPT 50 shelf and verify its contents.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite

Security Level	None
----------------	------

Procedure

-
- Step 1** Complete the [DLP-J171 Unpack and Verify the CPT 50 Shelf](#), on page 43.
- Step 2** Complete the [DLP-J172 Inspect the CPT 50 Shelf](#), on page 43.
Stop. You have completed this procedure.
-

DLP-J171 Unpack and Verify the CPT 50 Shelf

Purpose	This task describes how to remove the shelf from the package and verify the items.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

-
- Step 1** When you receive the CPT 50 shelf equipment at the installation site, open the top of the box. The Cisco Systems logo indicates the top of the box.
- Step 2** Remove the foam inserts from the box. The box contains the CPT 50 shelf (wrapped in plastic) and other items needed for installation.
- Step 3** To remove the shelf, grasp both rings of the shelf removal strap and slowly lift the shelf out of the box.
- Step 4** Verify that you have all items listed in the [Required Tools and Equipment](#), on page 41.
- Step 5** Return to your originating procedure (NTP).
-

DLP-J172 Inspect the CPT 50 Shelf

Purpose	This task explains how to verify that all parts of the shelf assembly are in good condition.
Tools/Equipment	None

Prerequisite Procedures	DLP-J171 Unpack and Verify the CPT 50 Shelf, on page 43
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

-
- Step 1** Verify the following:
- The CPT 50 shelf is not damaged.
 - The cable connectors, EOBC, timing connectors, and power connectors on the front panel of CPT 50 shelf are not damaged.
 - The SFP cages on the front panel of the CPT 50 shelf are not damaged.
- Step 2** If there is any damage, call your Cisco sales engineer for a replacement.
- Step 3** Return to your originating procedure (NTP).
-

ANSI Rack Installation

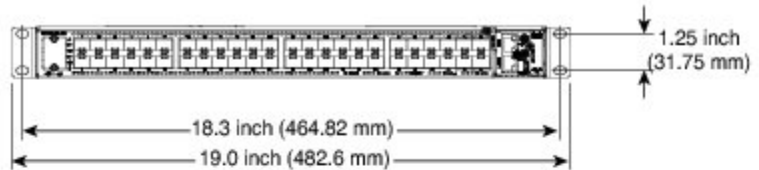
The CPT 50 shelf is mounted on a 19-inch (482.6-mm) or 23-inch (584.2-mm) equipment rack. If the shelf is mounted in the front position, then it projects 0.9 inches (22.86 mm) from the front of the rack. If the shelf assembly is mounted in the middle position, then it projects 4.3 inches (109.22 mm) from the front of the rack. The shelf mounts in both Electronic Industries Alliance (EIA) standard and Telcordia-standard racks. The shelf assembly is a total of 17.4 inches (442.4 mm) wide with no mounting ears attached. Ring runs are not provided by Cisco and might hinder side-by-side installation of shelves where space is limited.

The CPT 50 shelf measures 1.7 inches (43.1 mm) high, 19 or 23 inches (482.6 or 584.2 mm) wide (depending on which way the mounting ears are attached), and 9.1 inches (231.1 mm) deep.

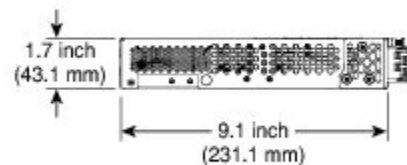
The following figure shows the dimensions of the CPT 50 shelf in a 19-inch ANSI rack configuration with brackets mounted in the front position.

Figure 12: CPT 50 Shelf Dimensions for a 19-inch ANSI Rack Configuration

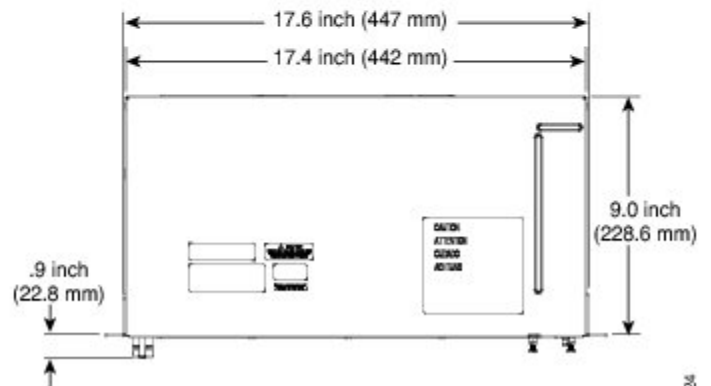
Front view



Side view



Top view



2819.24

Mounting Brackets



Caution

Use only the fastening hardware provided with the CPT 50 shelf to prevent loosening, deterioration, and electromechanical corrosion of the hardware and joined material.



Caution

When mounting the CPT 50 shelf in a frame with a nonconductive coating (such as paint, lacquer, or enamel) either use the thread-forming screws provided with the CPT 50 shelf shipping kit, or remove the coating from the threads to ensure electrical continuity.

The mounting brackets (19-inch or 23-inch) are used to mount the shelf on a 19-inch (482.6 mm) rack or a 23-inch (584.2 mm) rack.

Mounting a Single Node

Mounting the CPT 50 shelf on a rack requires a minimum of 1.75 inches (44.44 mm) of vertical rack space. To ensure the mounting is secure, use two #12-24 mounting screws for each side of the shelf assembly. For an ANSI rack, the brackets can be mounted in the front or middle position.

ETSI Rack Installation

The CPT 50 shelf is mounted on a 600 x 600-mm (23.6 x 23.6-inch) or 600 x 300-mm (23.6 x 11.8-inch) ETSI standard equipment rack. The shelf assembly is a total of 442 mm (17.4 inches) wide with no mounting ears attached. Cisco does not provide ring runs, which might hinder side-by-side installation of shelves where space is limited.

The CPT 50 shelf measures 43.1 mm (1.7 inches) high, 533.4 mm (21 inches) wide, and 231.1 mm (9.1 inches) deep.

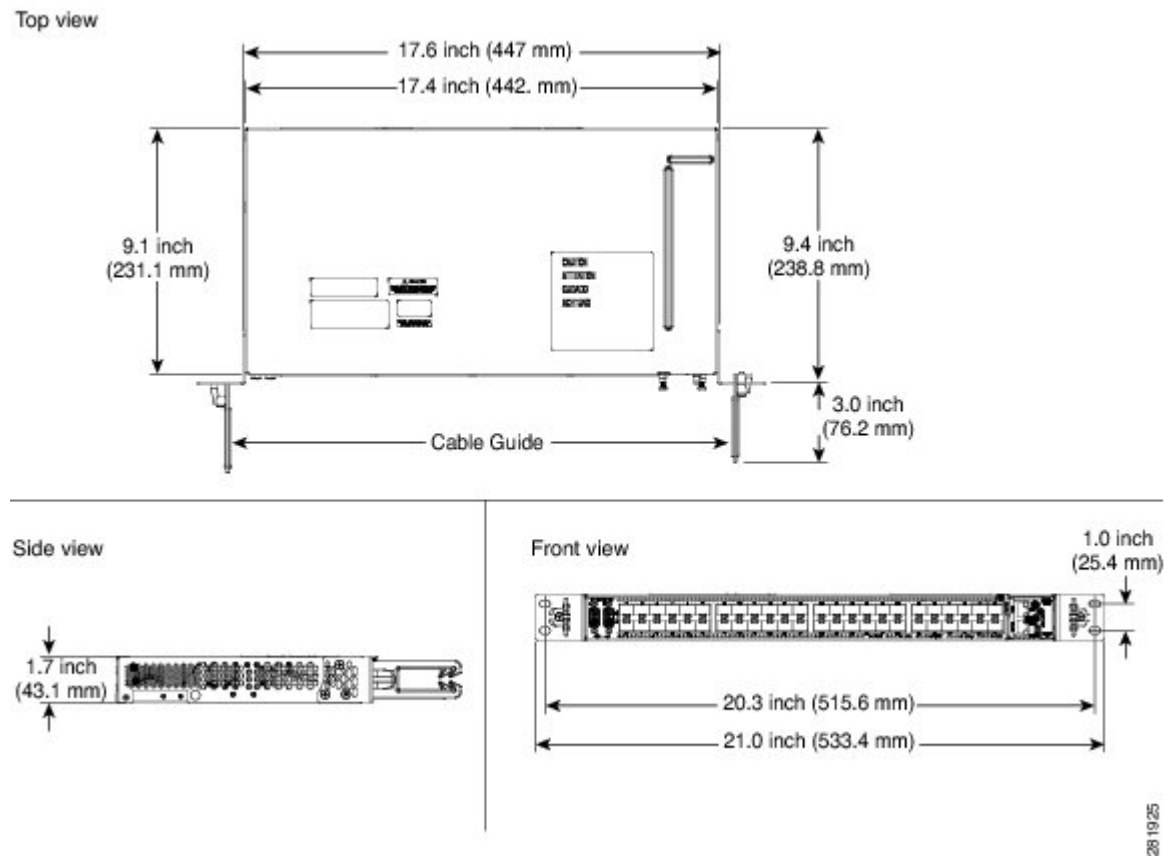
[Figure 13: CPT 50 Shelf Dimensions for an ETSI Rack Configuration](#), on page 46 provides the dimensions of the CPT 50 shelf installed on a 600 x 600-mm (23.6 x 23.6-inch) ETSI standard equipment rack. In this figure, the cable guides are attached to the mounting brackets.



Caution

When mounting a shelf in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack. If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Figure 13: CPT 50 Shelf Dimensions for an ETSI Rack Configuration



Mounting a Single Node

The CPT 50 shelf requires 1.75 inches (44.44 mm) minimum of vertical rack space. To ensure the mounting is secure, use two M6 mounting screws for each side of the shelf assembly. In an ETSI rack, the brackets can be mounted only in the front position.

Wall Mounting and Desktop Mounting the CPT 50 Shelf

This section provides information about mounting the CPT 50 shelf on the wall and the desktop.

Wall Mounting

The CPT 50 shelf can be mounted on the wall using the wall mount brackets. The type of screws used to mount the brackets on the wall depends on the wall-type; wall mount brackets are not provided by Cisco.

After the CPT 50 shelf is mounted on the wall, a fire protective tray is installed on the wall mount bracket to support the shelf assembly.

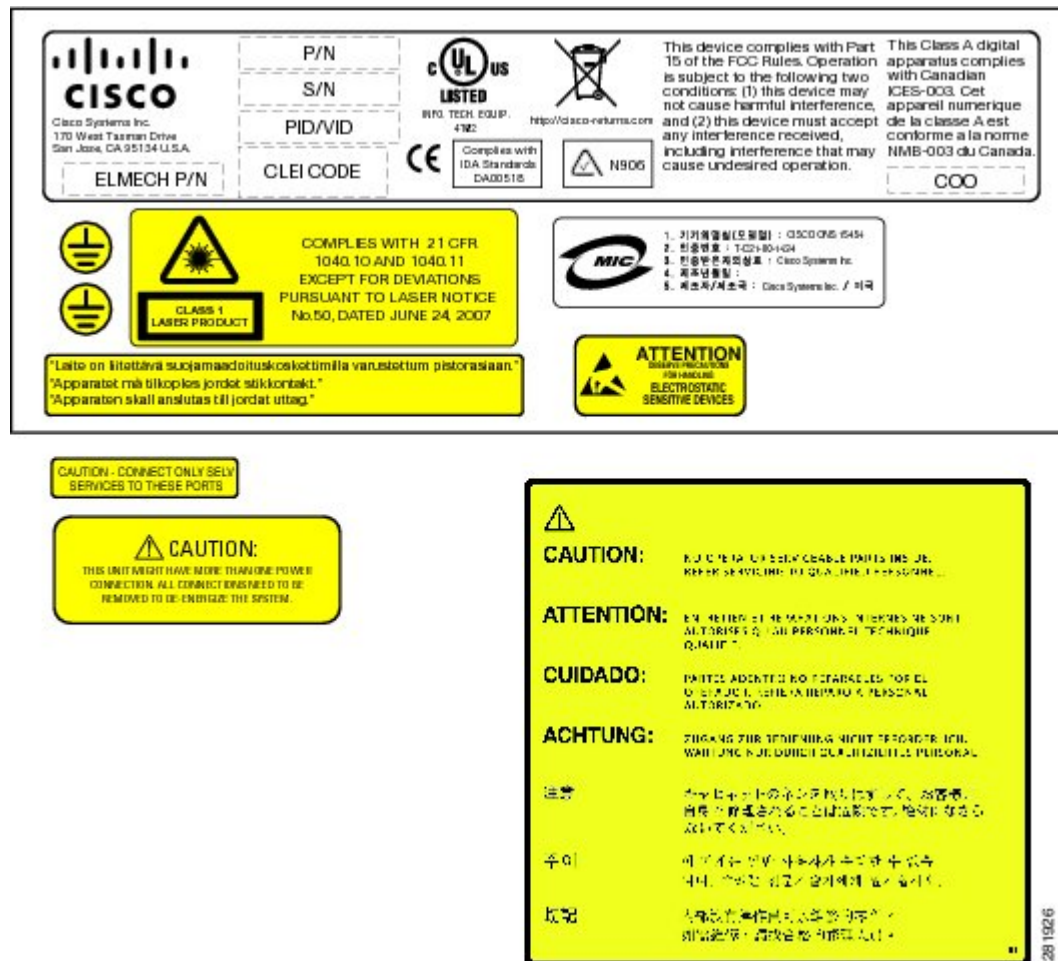
Desktop Mounting

The CPT 50 shelf can be mounted on the desktop for easy access.

Laser Warning

The laser warning label is placed on top of the chassis. The following figure shows the label placed on the CPT 50 shelf.

Figure 14: CPT 50 Shelf Label



NTP-J54 Install the CPT 50 Shelf

Purpose

This procedure describes how to install the shelf.

Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screwdriver • Screws
Prerequisite Procedures	NTP-J53 Unpack and Inspect the CPT 50 Shelf , on page 42
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**Note**

In a CO (Central Office) or CPE (Customer Premises Equipment) installation, if the CPT 600 and CPT 50 units are connected through copper SFP+, place the units less than 6 meters apart in the same lineup.

**Warning**

The intra-building ports of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring. Statement 7005

**Warning**

Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over. Statement 1048

**Warning**

This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045

**Warning**

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 10A for CPT 50 shelf with 48 VDC power supply; 15A for CPT 50 shelf with 24 VDC power supply. Statement 1005

**Warning**

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 10A-15A, 100-240VAC~. Statement 1005

**Warning**

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 131°F (55°C) for CPT 50 shelf with AC power module and 149°F (65°C) for CPT 50 shelf with DC power module. Statement 1047

**Warning**

Take care when connecting units to the supply circuit so that wiring is not overloaded. Statement 1018

**Warning**

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

**Warning**

To prevent airflow restriction, allow clearance around the ventilation openings to be at least: 1 inch (25.4 mm). Statement 1076

**Warning**

To pass Electrical Fast Transient/Burst (EFT/B) for GR-1089, the Westek UL C(UL) E171740 Type CM 24AWG 75degC EIA/TIA 568-B.2 STP CAT5e dual bantam to RJ45 shielded cable or an equivalent must be used with the DS1 pluggable 30-1462-01. The cable must have a grounded wire that is connected to the RJ45 shell as well as a shield of an aluminum foil.

**Note**

The CPT 50 installations are suitable for Network Telecommunication facilities and locations where NEC applies.

Procedure

Step 1 Complete the necessary task as applicable:

- [DLP-J173 Mounting the 19-inch Brackets on the CPT 50 Shelf for the ANSI Rack Configuration, on page 51](#)
- [DLP-J174 Mounting the 23-inch Brackets on the CPT 50 Shelf for the ANSI Rack Configuration, on page 52](#)
- [DLP-J175 Mounting the Brackets on the CPT 50 Shelf for the ETSI Rack Configuration, on page 54](#)

Step 2 Complete the necessary mounting task as applicable:

- [DLP-J176 Mount the CPT 50 Shelf on a Rack \(One Person\)](#), on page 56
- [DLP-J178 Mount the CPT 50 Shelf on the Desktop](#), on page 61
- [DLP-J177 Mount the CPT 50 Shelf on the Wall](#), on page 58

Step 3 Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the *Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms*.
Stop. You have completed this procedure.

DLP-J173 Mounting the 19-inch Brackets on the CPT 50 Shelf for the ANSI Rack Configuration

Purpose	This task describes how to install the 19-inch mounting brackets on the CPT 50 shelf for the ANSI rack configuration.
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screwdriver
Prerequisite Procedures	NTP-J53 Unpack and Inspect the CPT 50 Shelf , on page 42
Required/As Needed	As Needed
Onsite/Remote	Onsite
Security Level	None



Caution

Use only the fastening hardware provided with the CPT 50 shelf to prevent loosening, deterioration, and electromechanical corrosion of the hardware and joined material.



Caution

When mounting the CPT 50 shelf in a frame with a nonconductive coating (such as paint, lacquer, or enamel) either use the thread-forming screws provided with the CPT 50 ship kit, or remove the coating from the threads to ensure electrical continuity.



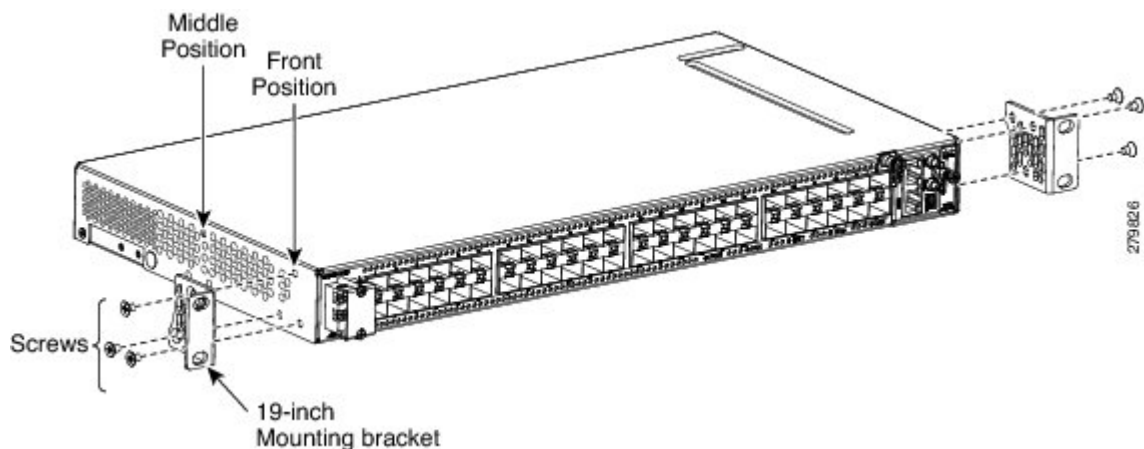
Note

The mounting brackets can be installed in the front or the middle position of the chassis.

Procedure

- Step 1** Place the wider side of the 19-inch mounting bracket flush against the CPT 50 shelf, as shown in [Figure 15: Mounting the Brackets on the CPT 50 Shelf for ANSI Rack Configuration, on page 52](#). The narrow side of the mounting bracket should be towards the front of the shelf.
- Step 2** Align the mounting bracket screw holes against the shelf assembly screw holes.
- Step 3** Insert the M4 flat screws and tighten them to a torque value of 11.5 in-lbs (1.3 N-m).
- Step 4** Repeat Step 1 to Step 3 to mount the bracket on the opposite side.

Figure 15: Mounting the Brackets on the CPT 50 Shelf for ANSI Rack Configuration



- Step 5** Return to your originating procedure (NTP).

DLP-J174 Mounting the 23-inch Brackets on the CPT 50 Shelf for the ANSI Rack Configuration

Purpose	This task describes how to install the 23-inch mounting brackets on the CPT 50 shelf for the ANSI rack configuration.
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screwdriver
Prerequisite Procedures	NTP-J53 Unpack and Inspect the CPT 50 Shelf, on page 42

Required/As Needed	As Needed
Onsite/Remote	Onsite
Security Level	None

**Caution**

Use only the fastening hardware provided with the CPT 50 shelf to prevent loosening, deterioration, and electromechanical corrosion of the hardware and joined material.

**Caution**

When mounting the CPT 50 shelf in a frame with a nonconductive coating (such as paint, lacquer, or enamel) either use the thread-forming screws provided with the CPT 50 ship kit, or remove the coating from the threads to ensure electrical continuity.

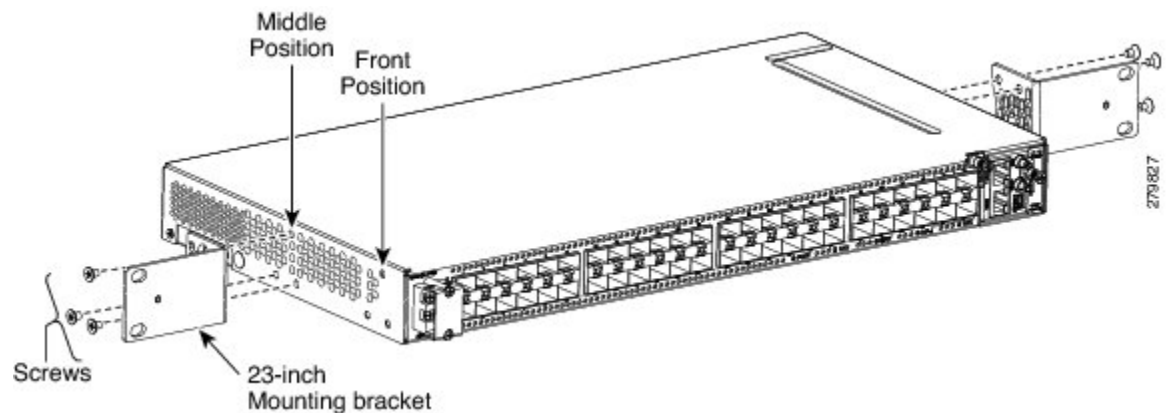
**Note**

The mounting brackets can be installed in the front or the middle position of the chassis.

Procedure

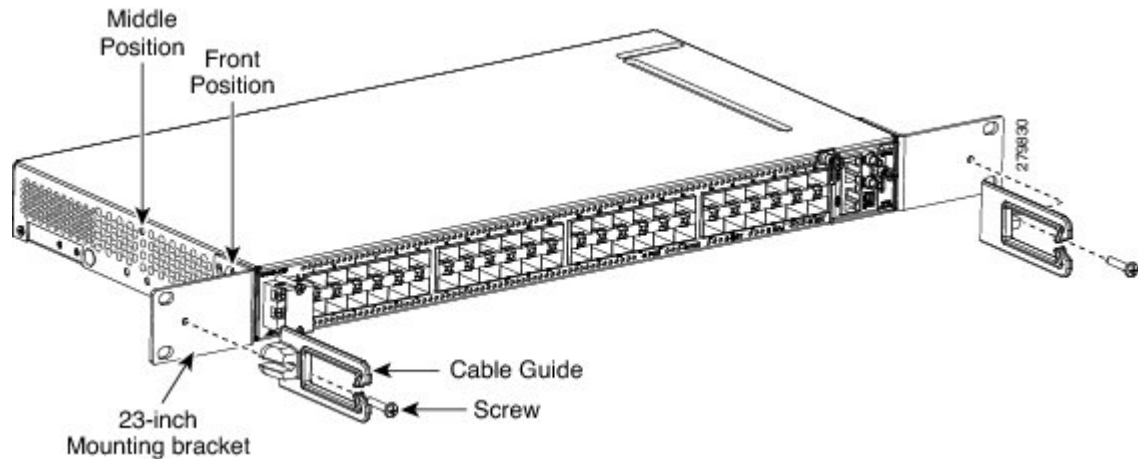
- Step 1** Place the narrow side of the 23-inch mounting bracket flush against the CPT 50 shelf, as shown in [Figure 16: Mounting the Brackets on the CPT 50 shelf for a 23-inch \(584.2-mm\) ANSI Configuration, on page 53](#). The wider side of the mounting bracket should be towards the front of the shelf.
- Step 2** Align the mounting bracket screw holes against the shelf assembly screw holes.
- Step 3** Insert the M4 flat screws and tighten them to a torque value of 11.5 in-lbs (1.3 N-m).
- Step 4** Repeat Step 1 to Step 3 to mount the bracket on the opposite side.

Figure 16: Mounting the Brackets on the CPT 50 shelf for a 23-inch (584.2-mm) ANSI Configuration



Step 5 Align the cable guide screw hole against the mount bracket screw hole, as shown in this figure.

Figure 17: Mounting the Cable Guide on the Bracket



Step 6 Insert the M4 screw and tighten it to a torque value of 6.5 in-lbs (0.75 N-m) .

Note The cable guide is made of plastic. Therefore a lower torque value should be applied to tighten the cable guide screws to avoid breakage.

Step 7 Repeat Step 5 and Step 6 to install the cable guide on the opposite side.

Step 8 Return to your originating procedure (NTP).

DLP-J175 Mounting the Brackets on the CPT 50 Shelf for the ETSI Rack Configuration

Purpose	This task describes how to install the mounting brackets on the CPT 50 shelf for the ETSI rack configuration.
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screwdriver
Prerequisite Procedures	NTP-J53 Unpack and Inspect the CPT 50 Shelf, on page 42
Required/As Needed	As Needed
Onsite/Remote	Onsite
Security Level	None

**Caution**

Use only the fastening hardware provided with the CPT 50 shelf to prevent loosening, deterioration, and electromechanical corrosion of the hardware and joined material.

**Caution**

When mounting the CPT 50 shelf in a frame with a nonconductive coating (such as paint, lacquer, or enamel) either use the thread-forming screws provided with the CPT-50 ship kit, or remove the coating from the threads to ensure electrical continuity.

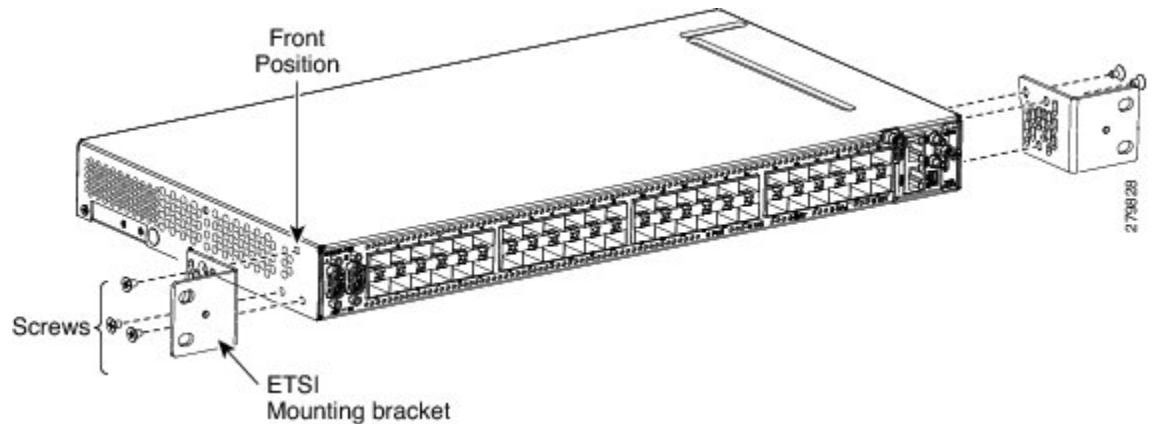
**Note**

The mounting brackets can be installed in the front or the middle position of the chassis.

Procedure

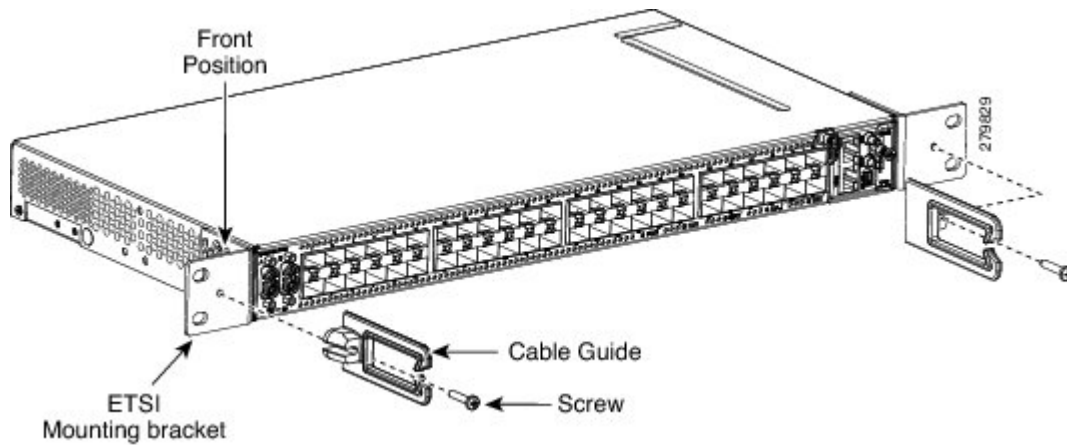
- Step 1** Place the mounting bracket flush against the CPT 50 shelf, as shown in this figure.

Figure 18: Mounting the Brackets on the CPT 50 Shelf for the ETSI Rack Configuration



- Step 2** Align the mounting bracket screw holes against the CPT 50 shelf screw holes.
- Step 3** Insert the M4 flat screws and tighten them to a torque value of 11.5 in-lbs (1.3 N-m).
- Step 4** Repeat Step 1 to Step 3 to mount the bracket on the opposite side.
- Step 5** Align the cable guide screw hole against the mount bracket screw hole, as shown in this figure.

Figure 19: Mounting the Cable Guide on the Bracket



- Step 6** Insert the M4 screw and tighten it to a torque value of 6.5 in-lbs (0.75 N-m) .
- Note** The cable guide is made of plastic. Therefore a lower torque value should be applied to tighten the cable guide screws to avoid breakage.
- Step 7** Repeat Step 5 and Step 6 to install the cable guide on the opposite side.
- Step 8** Return to your originating procedure (NTP).

DLP-J176 Mount the CPT 50 Shelf on a Rack (One Person)

Purpose	This task explains how one person can mount the shelf assembly in a rack.
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Four pan-head Phillips mounting screws
Prerequisite Procedures	NTP-J53 Unpack and Inspect the CPT 50 Shelf, on page 42
Required/As Needed	As Needed
Onsite/Remote	Onsite
Security Level	None

**Note**

The CPT 50 shelf requires a minimum of 1.75 inches (44.44 mm) of vertical rack space. To ensure that the mounting is secure, use two M6 mounting screws on each side of the shelf for ETSI rack installation, and two 12-24 x 3/4 pan-head Phillips mounting screws on each side of the shelf for ANSI rack installation. A shelf assembly should be mounted at the bottom of the rack if it is the only unit in the rack.

**Note**

In an ANSI rack, the chassis can be installed in the front or the middle position. In an ETSI rack, the chassis can be installed only in the front position.

Procedure

Step 1 Verify that the proper fuse panel has been installed in the top mounting space. If a fuse panel is not present, you must install one according to manufacturer instructions:

- For a 48 V DC power supply, the fuse rating must not exceed 10 A.
- For a 24 V DC power supply, the fuse rating must not exceed 15 A.
- For an AC power supply, the fuse rating must not exceed 10 A or 15 A, depending on the standards in various countries. The overcurrent and short circuit protection must be in accordance with local and national electrical codes.

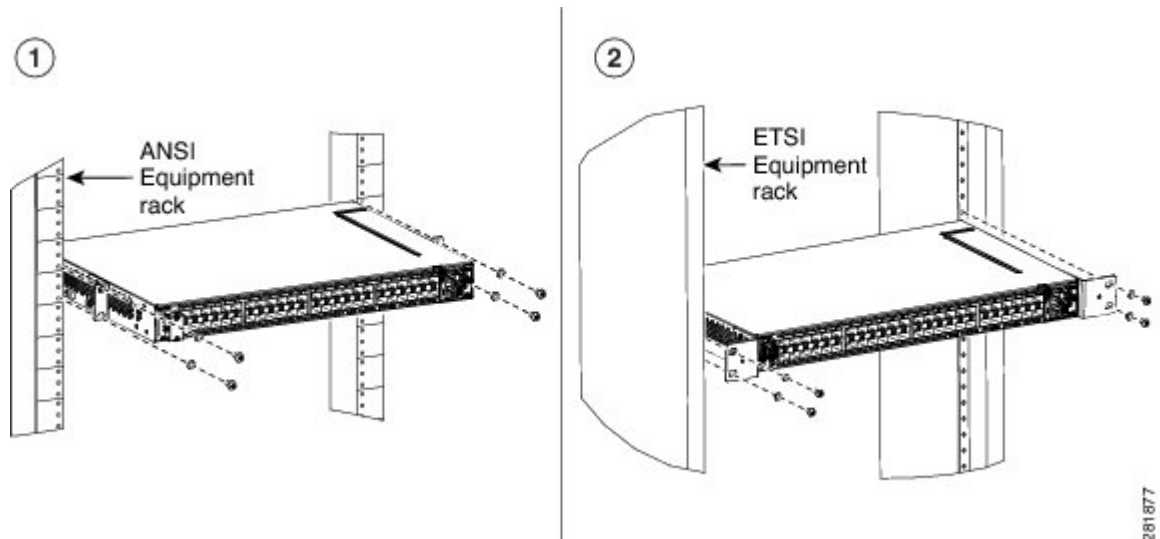
Step 2 Ensure that the shelf assembly is mounted on the appropriate rack equipment:

- 23 inches (584.2 mm) or 19 inches (482.6 mm) for ANSI racks
- 600 x 600-mm (23.6 x 23.6-inch) or 600 x 300-mm (23.6 x 11.8-inch) for ETSI racks.
- For an AC power supply, the fuse rating must not exceed 10 A or 15 A, depending on the standards in various countries. The overcurrent and short circuit protection must be in accordance with local and national electrical codes.

Diagram 1 of [Figure 20: Mounting an CPT 50 Shelf in a Rack, on page 58](#) shows the CPT 50 shelf mounted on an ANSI rack in the middle position using 19-inch mounting brackets.

Diagram 2 of [Figure 20: Mounting an CPT 50 Shelf in a Rack, on page 58](#) shows the CPT 50 shelf mounted on an ETSI rack in the front position using mounting brackets.

Figure 20: Mounting an CPT 50 Shelf in a Rack



- Step 3** Lift the shelf to the desired position in the rack.
- Step 4** Align the screw holes on the mounting brackets with the mounting holes in the rack.
- Step 5** Using the Phillips Dynamometric screwdriver, install one mounting screw in each side of the assembly:
- For an ANSI rack, use 12-24 x 3/4 pan-head Phillips mounting screws and tighten it to a torque value of 22 in-lbs (2.5 Nm)
 - For an ETSI rack, use M6 mounting screws and tighten it to a torque value of 22 in-lbs (2.5 Nm)
- Step 6** When the shelf assembly is secured to the rack, install the remaining two mounting screws on either sides of the shelf assembly.
- Step 7** Return to your originating procedure (NTP).

DLP-J177 Mount the CPT 50 Shelf on the Wall

Purpose	This task explains how to mount the CPT 50 shelf on the wall.
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver
Prerequisite Procedures	NTP-J53 Unpack and Inspect the CPT 50 Shelf, on page 42
Required/As Needed	As Needed
Onsite/Remote	Onsite
Security Level	None

**Note**

The CPT 50 shelf requires a minimum of 23.65 inches (600-mm) vertical length and a minimum of 15.75 inches (400-mm) horizontal width on the wall. Wall mount brackets are used to mount the CPT 50 shelf on the wall. The type of screws used to mount the brackets on the wall depends on the wall-type; wall mount brackets are not provided by Cisco. The screws used must be able to sustain an overall weight of at least 10 kg (22 lb).

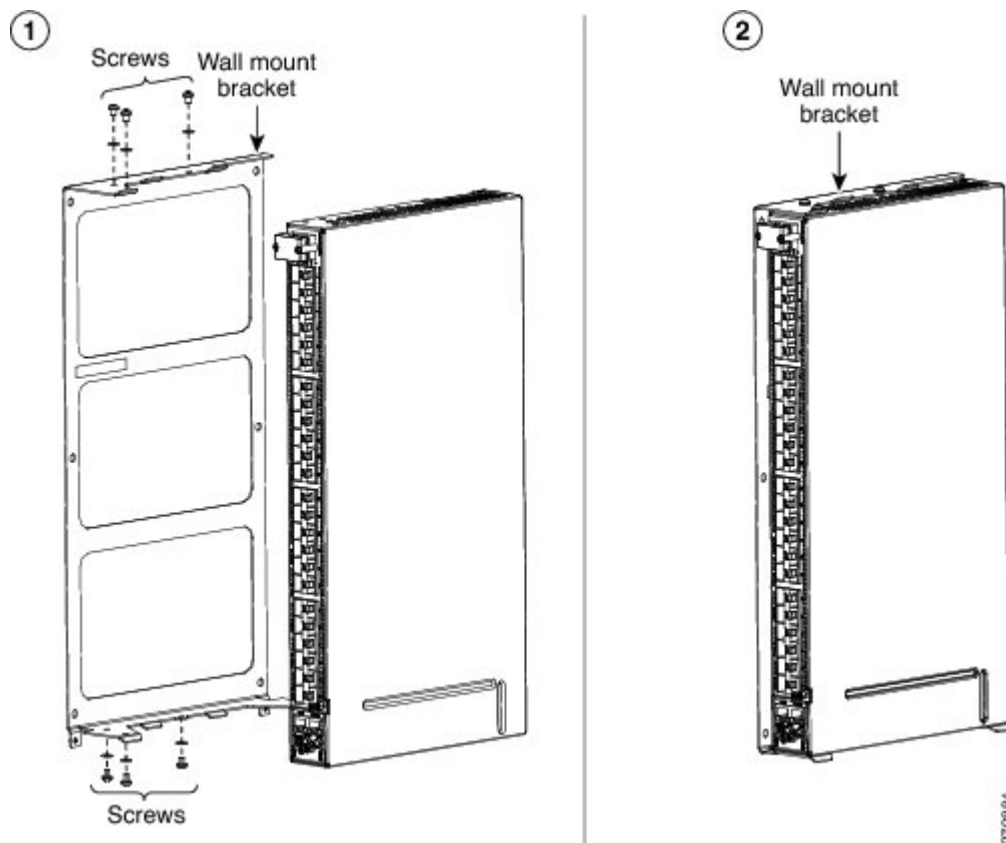
Procedure

- Step 1** Verify that the proper fuse panel has been installed in the top mounting space. If a fuse panel is not present, you must install one according to manufacturer instructions:
- For a 48 V DC power supply, the fuse rating must not exceed 10 A.
 - For a 24 V DC power supply, the fuse rating must not exceed 15 A.
 - For an AC power supply, the fuse rating must not exceed 10 A or 15 A, depending on the standards in various countries. The overcurrent and short circuit protection must be in accordance with local and national electrical codes.
- Step 2** Mount the bracket on the wall, as shown in [Figure 21: Wall Mounting of the CPT 50 Shelf](#), on page 60. To mount the bracket on a non-concrete wall, choose the bracket holes based on the wall structure. At least four

screws must be used to mount the bracket on the wall. Based on the wall material, apply the torque value provided by the screw vendor.

- Step 3** Align the mounting bracket screw holes against the shelf screw holes, as shown in diagram 1 of [Figure 21: Wall Mounting of the CPT 50 Shelf](#), on page 60.
- Step 4** Insert six M4 pan-head screws and tighten them to a torque value of 11.5 in-lbs (1.3 N-m), as shown in diagram 2 of [Figure 21: Wall Mounting of the CPT 50 Shelf](#), on page 60.

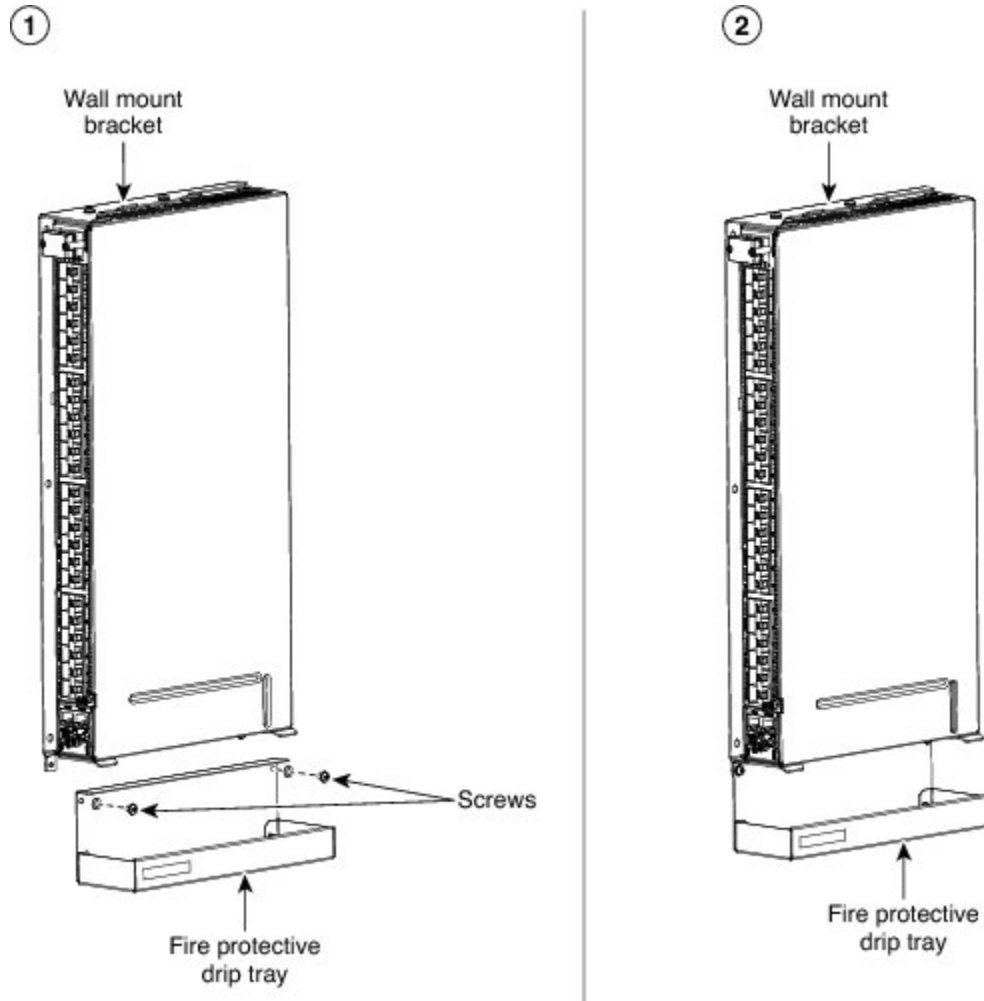
Figure 21: Wall Mounting of the CPT 50 Shelf



- Step 5** Align the fire protective drip tray screw holes against the wall mounting bracket screw holes, as shown in diagram 1 of [Figure 22: Mounting the Fire Protective Cover](#), on page 61. The fire protective drip tray is present in the wall mount accessory kit provided by Cisco. The part number of the fire protective drip tray is Cisco PN 700-31762-XX. The product identifier (PID) of the wall mount accessory kit is CPT-50-BRKTWM= and the part number is Cisco PN 53-3513-XX.

- Step 6** Insert two M4 pan-head screws and tighten them to a torque value of 11.5 in-lbs (1.3 N-m), as shown in diagram 2 of [Figure 22: Mounting the Fire Protective Cover](#), on page 61.

Figure 22: Mounting the Fire Protective Cover



- Step 7** Return to your originating procedure (NTP).

DLP-J178 Mount the CPT 50 Shelf on the Desktop

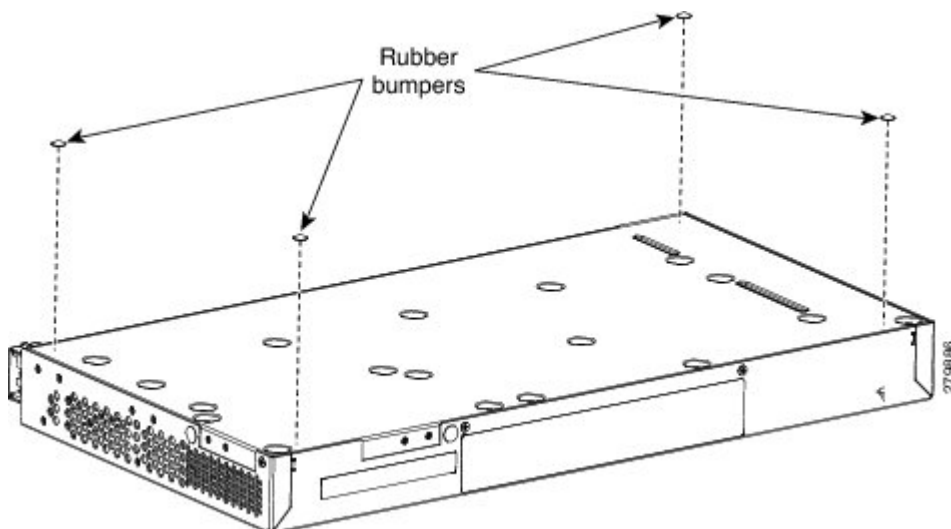
Purpose	This task explains how to mount the shelf on the desktop.
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver

Prerequisite Procedures	NTP-J53 Unpack and Inspect the CPT 50 Shelf, on page 42
Required/As Needed	As Needed
Onsite/Remote	Onsite
Security Level	None

Procedure

- Step 1** Verify that the proper fuse panel has been installed in the top mounting space. If a fuse panel is not present, you must install one according to manufacturer instructions:
- For a 48 V DC power supply, the fuse rating must not exceed 10 A.
 - For a 24 V DC power supply, the fuse rating must not exceed 15 A.
 - For an AC power supply, the fuse rating must not exceed 10 A or 15 A, depending on the standards in various countries. The overcurrent and short circuit protection must be in accordance with local and national electrical codes.
- Step 2** Locate the rubber bumpers provided in the accessory tool kit.
- Step 3** Place the CPT 50 shelf upside down on a smooth, flat surface.
- Step 4** Peel off the rubber bumpers from the adhesive strip and place it adhesive-side down onto all the four corners of the surface, as shown in this figure.

Figure 23: Desktop Mounting of the CPT 50 shelf



- Step 5** Place the CPT 50 shelf on a desktop, or other flat and secure surface.
- Step 6** Return to your originating procedure (NTP).

Power Module

The CPT 50 shelf is available in four variations based on the power module :

- CPT 50 shelf with an AC power module for ANSI and ETSI standards
- CPT 50 shelf with a DC power module (48 V) for ANSI standard
- CPT 50 shelf with a DC power module (48 V) for ETSI standard
- CPT 50 shelf with a DC power module (24 V) for ANSI standard

**Note**

Do not remove the top cover of the CPT 50 shelf.

CPT 50 Shelf with an AC Power Module

The AC power module converts the AC input current to DC output current. The AC power module has one AC single phase with 3- pole (line L, Neutral N, and Protective Earth PE) input connector.

CPT 50 Shelf with a DC Power Module

The CPT 50 shelf with a DC power module can be powered by redundant DC power lines, however a single power line can power the entire CPT 50 shelf.

The CPT 50 shelf with DC power module for ETSI standard has two input battery connectors (two poles)—
—48V, RET for power terminals A and B.

The CPT 50 shelf with DC power module for ANSI standard has single terminal block with four poles—
—48V, RET for power terminals A and B.

Fan-Tray Assembly

The fan-tray assembly is preinstalled on the right side of the CPT 50 shelf. The fan-tray assembly is removable and holds fans and fan-control circuitry for the CPT 50 shelf. The fan-tray assembly should be accessed only if a fan failure occurs.

The fan-tray assembly has the following ports:

- EOBC (Ethernet Out-of-Band Channel)—An RJ-45 port that supports high bandwidth external connectivity. If the CPT-50 shelf fails to boot up, the EOBC port also called as the disaster recovery port is used to log in to the CPT-50 shelf for troubleshooting.

**Note**

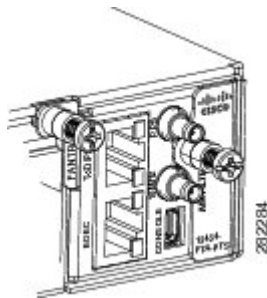
The EOBC port is meant only for TAC (Technical Assistance Center) usage.

- PPS (Pulse Per Second)—A mini BNC output port that provides timing signals to an external equipment from the CPT 50 shelf .

- 10MH—A mini BNC output port that provides timing signals at a frequency of 10 MHz to an external equipment from the CPT 50 shelf and RET for power terminals A and B.
- ToD/PPS (Time of Day/Pulse Per Second)—An RJ-45 serial output port that provides time and day information and timing signals to an external equipment from the CPT 50 shelf.
- CONSOLE—A USB port that is used to connect a console terminal. The console terminal can be one of the following:
 - An ASCII terminal or a PC running terminal emulation software
 - A modem

The following figure shows the ports on the fan-tray assembly:

Figure 24: Ports on the Fan-Tray Assembly



Note The timing signals are compliant with the IEEE 1588 standard.

The console port provides access to the CPT 50 shelf either locally (using a console terminal), or remotely (using a modem). Console connections transmit at slower speeds than modems; therefore, the console connection is suited for use with console terminals.



Note An RJ-45 serial port is used for TOD/PPS functionality. The two RJ-45 pins 7 and 8 is used for TOD (Time Of Day) functionality and the other two RJ-45 pins 1 and 2 are used for PPS functionality. Even though an RJ-45 cable is used for TOD/PPS connection, a serial link is established. Two mini coax connectors with RG316 1.0/2.3 M/M cables (50 ohm) are used for PPS (Pulse Per Second) and for 10MHz sinusoidal signal. Cable for TOD/PPS and 10MHz shall be shielded.



Note For rules about provisioning timing references, see Telcordia SR-NWT-002224.

Fan Speed

Fan speed is controlled by the microprocessor present in the CPT 50 shelf. The sensors measure the critical component temperature of the CPT 50 shelf. Fan speed options are low, medium, and high.

Fan Failure

If one or more fans fail on the fan-tray assembly, replace the entire assembly. You cannot replace individual fans. The red Fan Fail LED on the front of the CPT 50 shelf illuminates when one or more fans fail. The red Fan Fail LED clears after you install a working fan-tray.

NTP-J55 Replace the Fan-Tray Assembly in the CPT 50 Shelf

Purpose	This procedure describes how to replace the fan-tray assembly in the CPT 50 shelf.
Tools/Equipment	#2 Phillips Dynamometric screwdriver
Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>.
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None


Caution

Do not operate an CPT 50 shelf without an air filter.


Note

The estimated time for a skilled technician to replace an equipment fan or fan tray is 2 minutes.


Note

The fan or the cooling unit can be replaced without service interruption.


Caution

Do not force a fan-tray module into place. Doing so can damage either the connectors on the fan tray or the connectors on the back panel of the shelf assembly, or both.

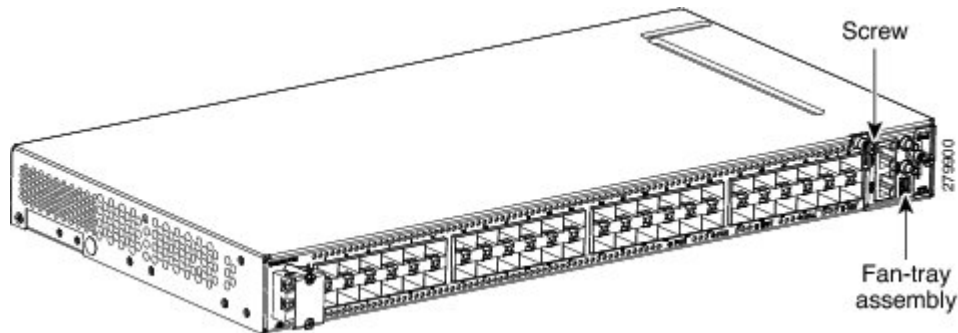

Note

Error messages appear on the TNC or TSC card, the fan-tray LED, and in Cisco Transport Controller (CTC) when the fan-tray module is removed from the shelf or when one fan is not working.

Procedure

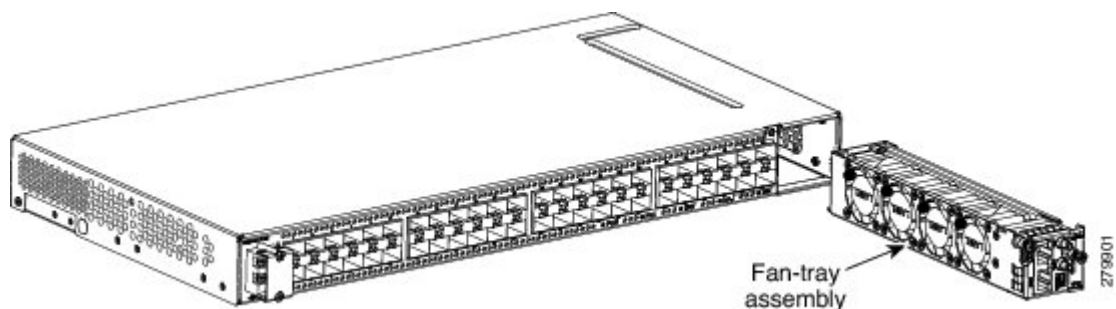
- Step 1** Loosen the screw on the fan-tray assembly, as shown in this figure.

Figure 25: Fan-Tray Assembly in the CPT-50 Shelf



- Step 2** Extract the fan-tray assembly partially (not more than 1 inch) to disconnect the backplane connector and wait until the fan stops.
- Step 3** When the fans have stopped, pull the fan-tray assembly completely out of the shelf, as shown this figure.

Figure 26: Fan-Tray Extracted



- Step 4** Slide the new fan-tray assembly into the shelf until the electrical plug at the rear of the tray plugs into the corresponding receptacle on the backplane.
- Step 5** Tighten the M3 screw to a torque value of 4 in-lbs (0.45 N-m) on the fan-tray assembly.
Stop. You have completed this procedure.

NTP-J56 Replace the Air Filter in the CPT 50 Shelf

Purpose	This procedure explains how to replace the air filter of the CPT 50 shelf.
Tools/Equipment	#2 Phillips Dynamometric screwdriver

Prerequisite Procedures	<ul style="list-style-type: none">• NTP-J54 Install the CPT 50 Shelf, on page 48• Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, refer to the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>.
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**Caution**

Do not operate a CPT 50 shelf without an air filter.

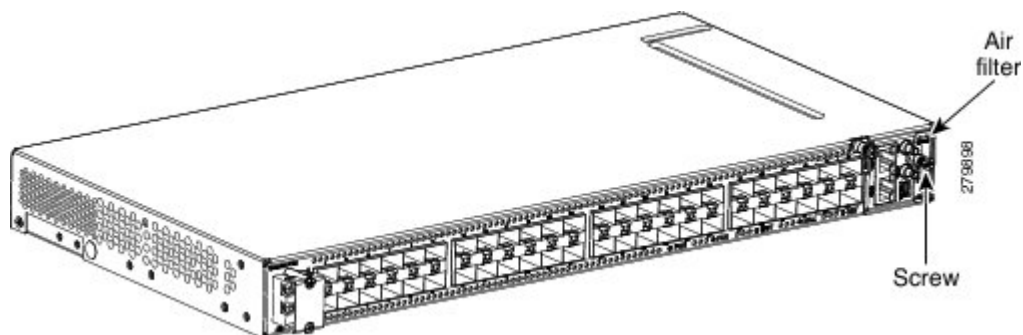
**Note**

Replacement or cleaning of an air filter is recommended every 60 days. Air filters are replaceable or reusable.

Procedure

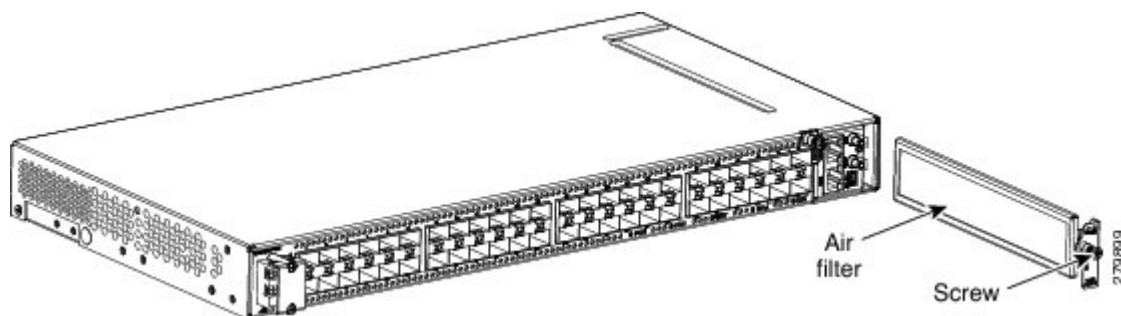
- Step 1** Loosen the screw on the air filter faceplate, as shown in this figure.

Figure 27: Removing the Air Filter



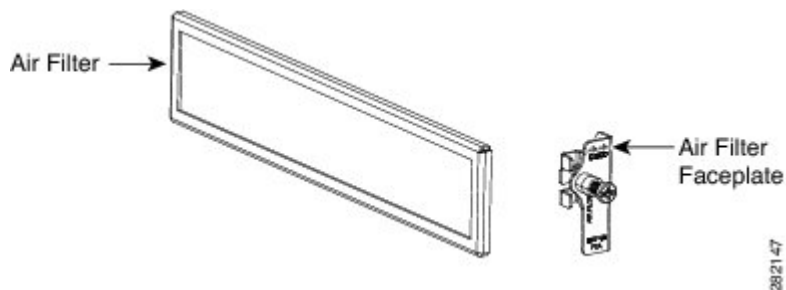
- Step 2** Extract the air filter from the shelf, as shown in this figure.

Figure 28: Replacing the Air Filter



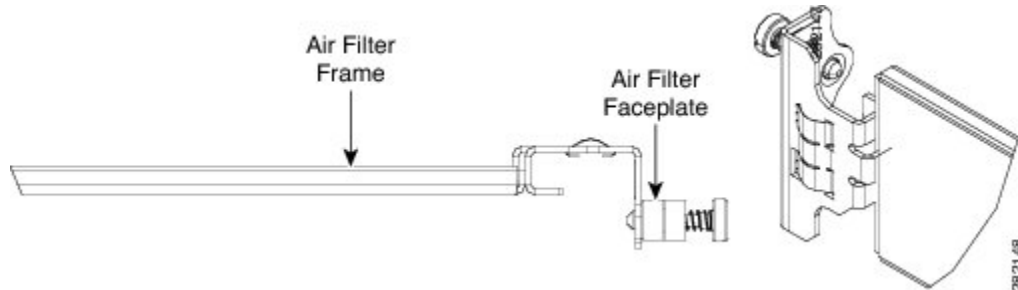
- Step 3** Remove the air filter faceplate from the air filter frame, as shown in this figure.

Figure 29: Removing Air filter from the Face Plate



- Step 4** Clean or replace the air filter.
- Step 5** Insert the air filter faceplate engaging the air filter frame, as shown in this figure.

Figure 30: Attach the Air Filter Faceplate to the Air Filter Frame



- Step 6** Insert the air filter into the shelf.
- Step 7** Tighten the M3 screw to a torque value of 4.0 in-lbs (0.45 N-m) on the air-filter.
Stop. You have completed this procedure.

Power and Ground Description

Ground the equipment according to Telcordia standards or local practices. The following sections describe how to power and ground the CPT 50 shelf.



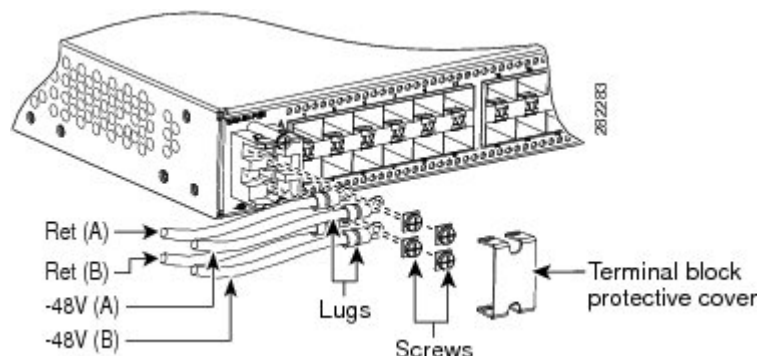
Note For detailed instructions on grounding the CPT 50 shelf, refer to the *Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms*.

ANSI Power and Ground

For AC power feed, use the power cable shipped with the CPT 50 shelf. For an AC power supply, the fuse rating must not exceed 10 A or 15 A, depending on the standards in various countries. The overcurrent and short circuit protection must be in accordance with local and national electrical codes. The voltage rating value for AC power ranges between 100 VAC to 240 VAC depending on the standards in various countries. This product is intended for use on the TN and TT power systems.

The CPT 50 shelf for 48 VDC power supply has redundant –48 VDC #14 single-hole lug power terminals. The terminals are labeled RET(A), RET(B), -48V(A), and -48V(B) on the power module. See the figure below:

Figure 31: CPT 50 Shelf for 48 VDC Power Supply



The CPT 50 shelf for 24 VDC power supply has redundant –24 VDC #14 single-hole lug power terminals. The terminals are labeled RET(A), RET(B), -24V(A), and -24V(B) on the power module.

To install redundant DC power feeds, use four power cables and one ground cable. For a single power feed, only two power cables (#14 AWG or larger, copper conductor, 194 degrees Fahrenheit [90 degrees Celsius] minimum) and one ground cable (#8 AWG or larger) are required. Use a conductor with low impedance to ensure circuit overcurrent protection. However, the conductor must have the capability to safely conduct any faulty current that might be imposed.

For a 24 VDC power supply, the fuse rating must not exceed 15 A. The voltages –20 VDC and –28.3 VDC are, respectively, the minimum and maximum voltages required to power the chassis. The nominal steady state voltage is -24 VDC.

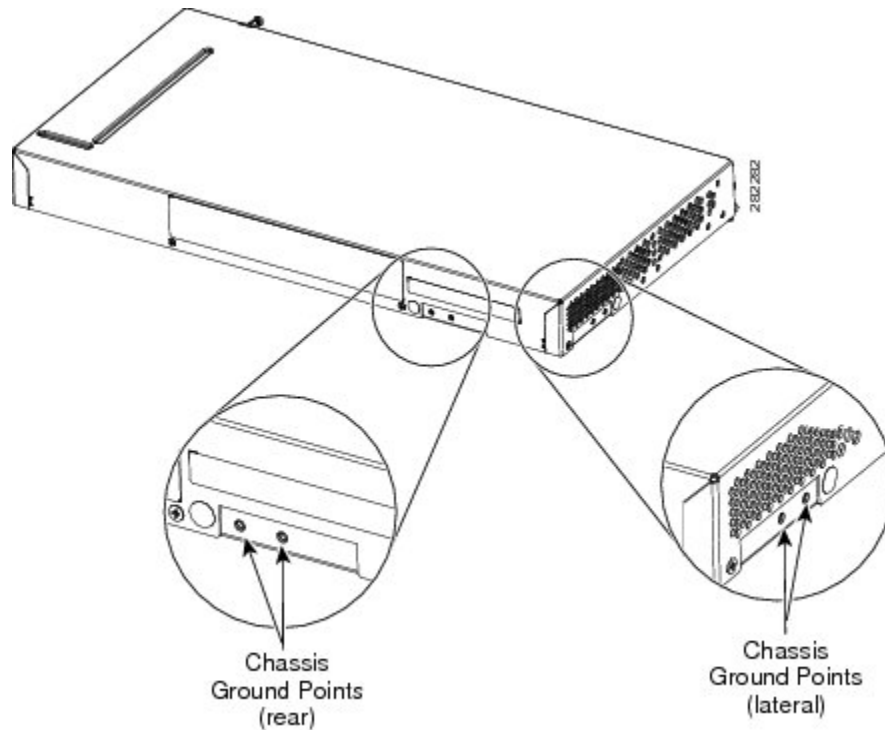
For a 48 VDC power supply, the fuse rating must not exceed 10 A. The voltages –40.5 VDC and –57.6 VDC are, respectively, the minimum and maximum voltages required to power the chassis. Functionality is guaranteed at -40 VDC input voltage, according to GR-1089. The nominal steady state voltage is -48 VDC.

We recommend the following wiring conventions, but customer conventions prevail:

- Red wire for battery connections (–48 VDC or -24 VDC).
- Black wire for battery return connections (RET).
- The battery return connection is treated as DC-I, as defined in Telcordia GR-1089-CORE.

The ground lug must be a dual-hole type, UL Listed, CSA certified, and rated to accept the #8 AWG cable. Two ground threaded holes with M4 screws are provided on the CPT 50 shelf to accommodate the dual-hole lug. See the figure below:

Figure 32: Ground Points on the CPT 50 Shelf



ETSI Power and Ground

The CPT 50 shelf for ETSI has redundant -48 VDC power connectors (DSUB for DC power module) on the DC power module. To install redundant power feeds, use the two power cables shipped with the CPT 50 shelf and one ground cable. For a DC power supply, the fuse rating must not exceed 10 A. The voltages -40.5 VDC and -57.6 VDC are, respectively, the minimum and maximum voltages required to power the chassis. The nominal steady state voltage is -48 VDC.

For AC power feed, use the power cable shipped with the CPT 50 shelf. For an AC power supply, the fuse rating must not exceed 10 A or 15 A, depending on the standards in various countries. The overcurrent and short circuit protection must be in accordance with local and national electrical codes. The voltage rating value for AC power ranges between 100 VAC to 240 VAC depending on the standards in various countries. This product is intended for use on the TN and TT power systems.



Caution

Use only the power cables shipped with the CPT 50 shelf. The part number of the cables is Cisco PN 72-4974-XX and the PID is CPT-DC-CBL-E=.

NTP-J57 Install the Power Feeds and Ground to the CPT 50 Shelf

Purpose	This procedure explains how to install power feeds and ground the CPT 50 shelf.
Tools/Equipment	<p>ANSI and ETSI:</p> <ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screwdriver • Screws • Ground cable 8.37-mm² (#8 AWG) stranded • Listed pressure dual-holes lugs suitable for #14 AWG or larger copper conductors • Wire cutters • Wire strippers • Crimp tool • Fuse panel • ETSI only: <ul style="list-style-type: none"> ◦ Power cable (from the fuse panel to the power modules), shipped with the CPT 50 shelf ◦ Two-hole grounding lug, shipped with the CPT 50 shelf • ANSI only: <ul style="list-style-type: none"> ◦ Power cable (from the fuse panel to the assembly), #14 AWG or larger copper conductors, 194°F [90°C])
Prerequisite Procedures	Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i> .
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**Warning**

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

**Warning**

To reduce the risk of electric shock, switch on the power only after the power cord is completely installed into the power module. Statement 390

**Warning**

When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations should be the appropriate size for the wires and should clamp both the insulation and conductor. Statement 1002

**Warning**

Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

**Warning**

Before working on a chassis or working near power supplies, unplug the power cord on AC units. Statement 246

**Warning**

This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use. Statement 39

**Warning**

Use copper conductors only. Statement 1025

**Warning**

Connect the unit only to DC power source that complies with the safety extra-low voltage (SELV) requirements in IEC 60950-1 based safety standards. Statement 1033

**Warning**

This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045

**Warning**

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 10A for CPT 50 shelf with 48 VDC power supply; 15A for CPT 50 shelf with 24 VDC power supply. Statement 1005

**Warning**

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 10A-15A, 100-240VAC~. Statement 1005

**Warning**

A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

**Warning**

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

**Caution**

Always use the supplied ESD wristband when working with a powered CPT 50 shelf. For detailed instructions on how to wear the ESD wristband, see the *Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms*.

Procedure

-
- Step 1** Verify that the correct fuse panel is installed in the top mounting space:
- For a 48 VDC power supply, the fuse rating must not exceed 10 A.
 - For a 24 VDC power supply, the fuse rating must not exceed 15 A.
 - For an AC power supply, the fuse rating must not exceed 10 A or 15 A, depending on the standards in various countries. The overcurrent and short circuit protection must be in accordance with local and national electrical codes.
- Step 2** Depending on the shelf and the power module installed, complete the necessary task:
- [DLP-J179 Connect Office Power \(AC\) to the CPT 50 Shelf](#), on page 75.
 - [DLP-J180 Connect Office Power \(DC\) to the CPT 50 Shelf \(ANSI Only\)](#), on page 78.
 - [DLP-J181 Connect Office Power \(DC\) to the CPT 50 Shelf \(ETSI Only\)](#), on page 82.
- Step 3** Connect the office ground to the CPT 50 shelf. For detailed instructions on grounding, refer to the *Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms*.
- Step 4** Complete the [DLP-J182 Turn On and Verify AC Office Power on the CPT 50 Shelf](#), on page 85 or [DLP-J183 Turn On and Verify DC Office Power on the CPT 50 Shelf](#), on page 86 as necessary.
- Stop. You have completed this procedure.**
-

DLP-J179 Connect Office Power (AC) to the CPT 50 Shelf

Purpose	This task explains how to connect AC power to the CPT 50 shelf.
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screwdriver • Wire wrapper • Wire cutters • Wire strippers • Crimp tool • Fuse panel • Ground cable 8.37-mm² (#8 AWG) stranded
Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>.
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None


Note

This product is intended for use on the TN and TT power systems.


Warning

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046


Warning

This equipment shall be connected to AC mains provided with a surge protective device (SPD) at the service equipment complying with NFPA 70, the National Electrical Code (NEC). Statement 7012

**Caution**

The CPT 50 shelf relies on the protective devices in the building installation to protect against short circuit, overcurrent, and ground faults. Ensure that the protective devices are properly rated and comply with national and local codes.

**Caution**

When terminating the frame ground, do not use soldering lug connectors, screwless (push-in) connectors, quick connect connectors, or other friction-fit connectors.

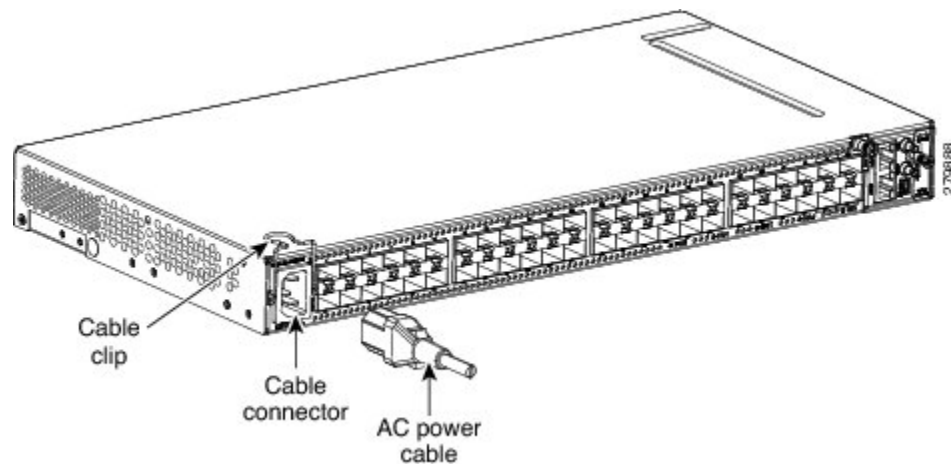
**Note**

If the CPT-50 shelf loses its connection to the line or fabric card, the CPT-50 shelf resets until the connection to the line or fabric card is re-established.

Procedure

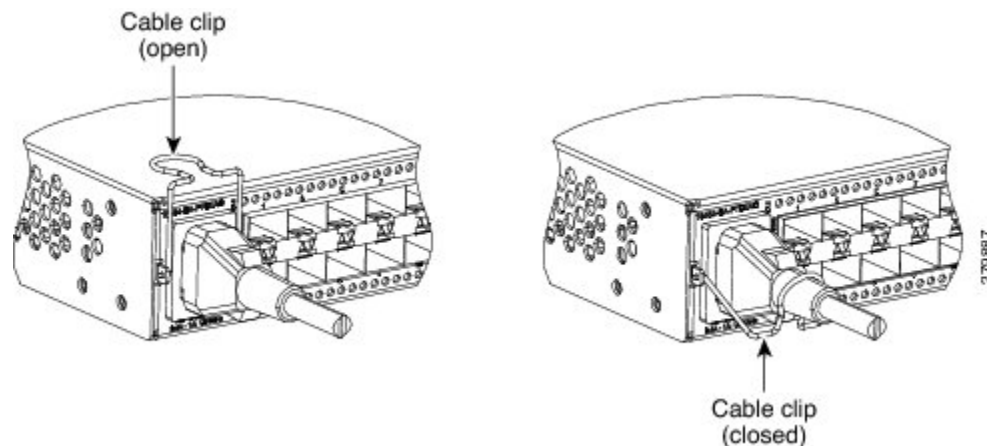
- Step 1** Attach the AC power cable to the cable connector in the AC power module, as shown in this figure.

Figure 33: Connecting Office Power—AC Power



- Step 2** Close the cable clip to secure the power cable, as shown in this figure.

Figure 34: Cable Clip to Secure the Power Cable



- Step 3** Connect the power cable to the fuse panel or power source.
Note The voltage rating value for AC power ranges between 100 VAC to 240 VAC depending on the standards in various countries.
- Step 4** Return to your originating procedure (NTP).

DLP-J180 Connect Office Power (DC) to the CPT 50 Shelf (ANSI Only)

Purpose	This task explains how to connect the DC power to the CPT 50 shelf (ANSI Only).
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screwdriver • Wire cutters • Wire strippers • Crimp tool • Fuse panel • Ground cable 8.37-mm² (#8 AWG) stranded • Power cable (from fuse panel to assembly), #14 AWG or larger copper conductors, 194°F [90°C] • Listed pressure dual-holes lugs suitable for #14 AWG or larger copper conductors
Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>.
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None


Warning

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046


Warning

Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place. Statement 1075

**Caution**

The CPT 50 shelf relies on the protective devices in the building installation to protect against short circuit, overcurrent, and ground faults. Ensure that the protective devices are properly rated and comply with national and local codes.

**Note**

The battery return connection is treated as DC-I, as defined in Telcordia GR-1089-CORE.

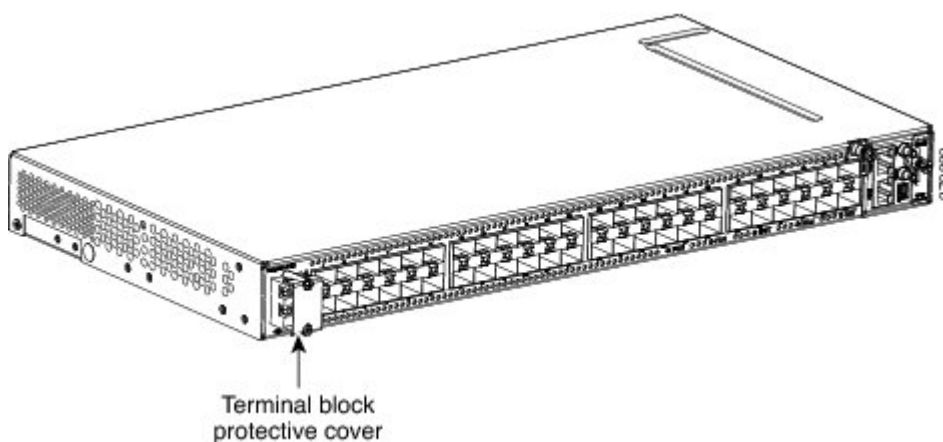
**Note**

If the CPT-50 shelf loses its connection to the line or fabric card, the CPT-50 shelf resets until the connection to the line or fabric card is re-established.

Procedure

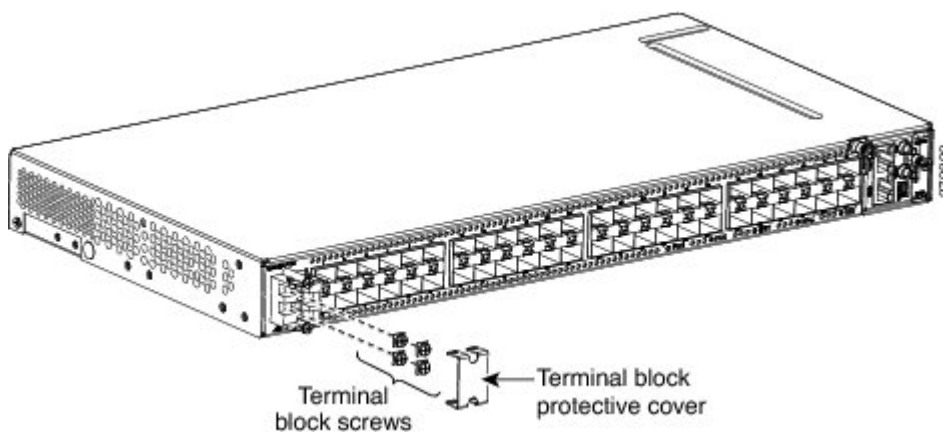
- Step 1** Connect the return cables of the power supply to the Earth ground located at the power supply side.
- Step 2** Connect the office power according to the fuse panel engineering specifications.
- Step 3** Measure and cut the cables as needed to reach the CPT 50 shelf from the fuse panel.
- Step 4** Dress the power according to local site practice.
- Step 5** Strip 1/2 inch (12.7 mm) of insulation from all power cables that you will use.
- Step 6** Crimp the lugs onto the ends of all the power leads.
- Step 7** Remove the terminal block protective cover, as shown in this figure.

Figure 35: Removing the Terminal Block Protective Cover



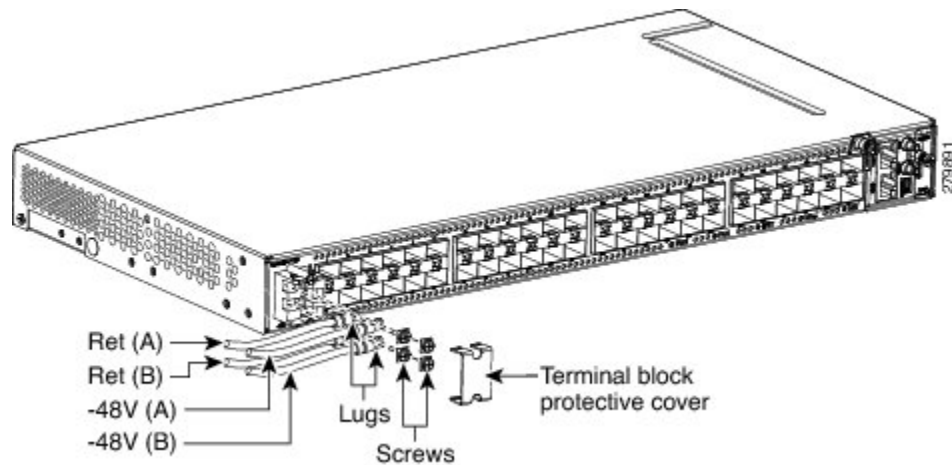
- Step 8** Untighten the terminal block screws, as shown in this figure.

Figure 36: Loosening the Terminal Block Screws



- Step 9** Insert the lugs, as shown in this figure.

Figure 37: Inserting the Lugs



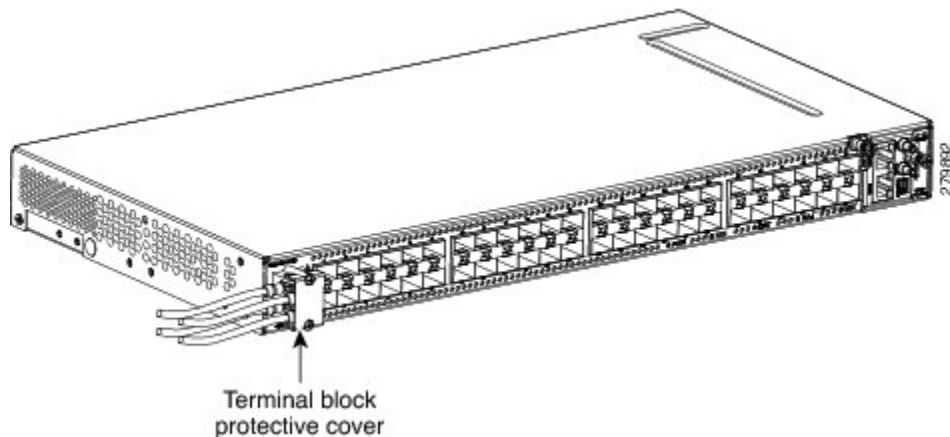
Note There are two DC power terminals—A and B. Each power terminal is connected with two cables—one for RET and the other for -48V.

Step 10 Tighten the M3.5 screws to a torque value of 7 in-lbs (0.79 N-m) to lock the lugs.

Step 11 Mount the terminal block protective cover on the CPT 50 shelf (see the following figure, "Connecting Office Power—DC Power Modules (ANSI Only)").

Note Use only pressure terminal connectors, such as ring and fork types, when terminating the battery, battery return, and frame ground conductors.

Figure 38: Replacing the Terminal Block Protective Cover



Caution Before you make any crimp connections, coat all bare conductors (battery, battery return, and frame ground) with an appropriate antioxidant compound. Bring all unplated connectors, braided strap, and bus bars to a bright finish, then coat with an antioxidant before you connect them. You do not need to prepare tinned, solder-plated, or silver-plated connectors and other plated connection surfaces, but always keep them clean and free of contaminants.

Caution When terminating the power, return (RET), and frame ground, do not use soldering lug, screwless (push-in) connectors, quick-connect, or other friction-fit connectors.

Step 12 Return to your originating procedure (NTP).

DLP-J181 Connect Office Power (DC) to the CPT 50 Shelf (ETSI Only)

Purpose	This task explains how to connect the DC power to the CPT 50 shelf (ETSI Only).
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screwdriver • Wire wrapper • Wire cutters • Wire strippers • Crimp tool • Fuse panel • Ground cable 8.37-mm² (#8 AWG) stranded
Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>.
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None


Warning

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046


Warning

Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place. Statement 1075


Note

The battery return connection is treated as DC-I, as defined in Telcordia GR-1089-CORE.

**Caution**

The CPT 50 shelf relies on the protective devices in the building installation to protect against short circuit, overcurrent, and ground faults. Ensure that the protective devices are properly rated and comply with national and local codes.

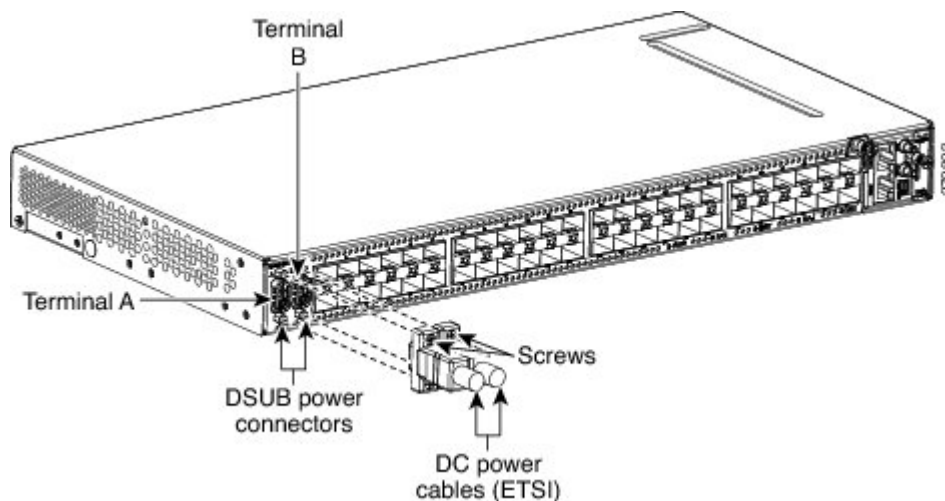
**Note**

If the CPT 50 shelf loses its connection to the line or fabric card, the CPT 50 shelf resets until the connection to the line or fabric card is re-established.

Procedure

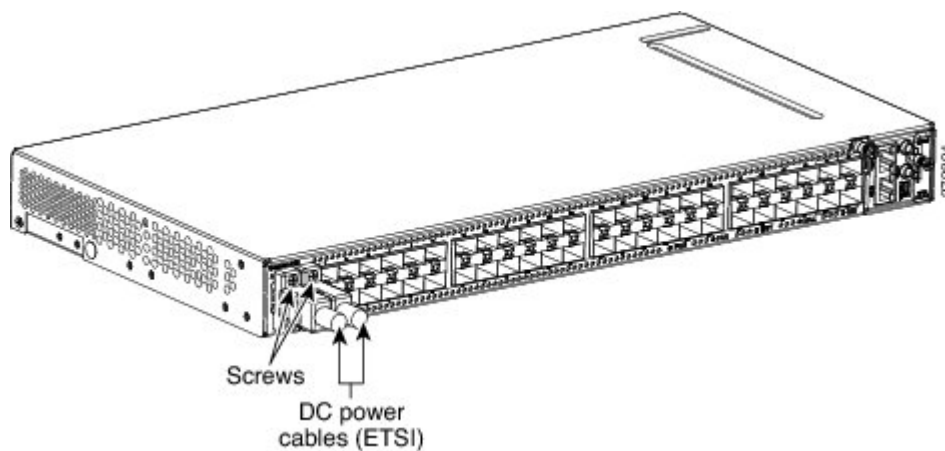
- Step 1** Connect the return cables of the power supply to the Earth ground located at the power supply side.
- Step 2** Attach the DC ETSI power cables to the DSUB power connectors of the DC power module, as shown in this figure.

Figure 39: Connecting DC ETSI Power Cables to the DSUB Power Connectors



- Step 3** Tighten the M3 pan-head screws to a torque value of 4 in-lbs (0.45 N-m) to secure the cable, as shown in this figure.

Figure 40: Securing the DC Power Cables



Note Use only pressure terminal connectors, such as ring and fork types, when terminating the battery, battery return, and frame ground conductors.

Caution Before you make any crimp connections, coat all bare conductors (battery, battery return, and frame ground) with an appropriate antioxidant compound. Bring all unplated connectors, braided strap, and bus bars to a bright finish, then coat with an antioxidant before you connect them. You do not need to prepare tinned, solder-plated, or silver-plated connectors and other plated connection surfaces, but always keep them clean and free of contaminants.

Caution When terminating power, return, and frame ground, do not use soldering lug, screwless (push-in) connectors, quick-connect, or other friction-fit connectors.

Step 4 Return to your originating procedure (NTP).

DLP-J182 Turn On and Verify AC Office Power on the CPT 50 Shelf

Purpose	This task explains how to measure the power to verify correct power and returns for the CPT 50 shelf.
Tools/Equipment	Voltmeter
Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>. • DLP-J179 Connect Office Power (AC) to the CPT 50 Shelf, on page 75
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None



Warning

To reduce the risk of electric shock, switch on the power only after the power cord is completely installed into the power module. Statement 390



Caution

Do not apply power to the shelf assembly until you complete all the installation steps.

Procedure

-
- Step 1** To power up the node, insert the fuse into the fuse position according to site practice. For an AC power supply, the fuse rating must not exceed 10 A or 15 A, depending on the standards in various countries.
- Step 2** If the CPT 50 shelf does not power up, check the voltage at the power source using a voltmeter. The voltage should be 100 VAC to 240 VAC +/-10 percent.
- Step 3** Return to your originating procedure (NTP).
-

DLP-J183 Turn On and Verify DC Office Power on the CPT 50 Shelf

Purpose	This task explains how to measure the power to verify correct power and returns for the CPT 50 shelf.
Tools/Equipment	Voltmeter
Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>. • DLP-J180 Connect Office Power (DC) to the CPT 50 Shelf (ANSI Only), on page 78 (or) • DLP-J181 Connect Office Power (DC) to the CPT 50 Shelf (ETSI Only), on page 82
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None



Warning

To reduce the risk of electric shock, switch on the power only after the power cord is completely installed into the power module. Statement 390



Caution

Do not apply power to the shelf assembly until you complete all the installation steps.

Procedure

- Step 1** Using a voltmeter, verify the office battery and ground at the following points on the fuse panel:
- To verify the power, place the black test lead of the voltmeter to the return (RET). Place the red test lead on the BAT-A connection and verify that:
 - For a 24 VDC power supply, the voltage is between –20 VDC and –28.3 VDC. Place the red test lead on the BAT-B connection and verify that it is between –20 VDC and –28.3 VDC.
Note The voltages –20 VDC and –28.3 VDC are, respectively, the minimum and maximum voltages required to power the CPT 50 shelf that has 24V DC power supply. The nominal steady state voltage is -24 VDC.
 - For a 48 VDC power supply, the voltage is between –40.5 VDC and –57.6 VDC. Place the red test lead on the BAT-B connection and verify that it is between –40.5 VDC and –57.6 VDC.
Note The voltages –40.5 VDC and –57.6 VDC are, respectively, the minimum and maximum voltages required to power the CPT 50 shelf that has 48V DC power supply. The nominal steady state voltage is -48 VDC.
 - To verify the ground, place the black test lead of the voltmeter to the frame ground. Place the red test lead on the BAT-A return ground and verify that no voltage is present, that is, meter reading must be 0 VDC. Place the red test lead on the BAT-B return ground and verify that no voltage is present, that is, meter reading must be 0 VDC.
- Step 2** To power up the node, insert the fuse into the fuse position according to site practice. For a 24 VDC power supply, the fuse rating must not exceed 15 A. For a 48V DC power supply, the fuse rating must not exceed 10 A.
- Step 3** Using a voltmeter, verify the CPT 50 shelf for –48 VDC or –24 VDC battery and return:
- To verify the BAT-A of the shelf, place the black lead of the voltmeter to the return. Place the red test lead to the –48V or –24V (BAT-A battery connection) red cable. For a 48 VDC power supply, verify that it reads between –40.5 VDC and –57.6 VDC. For a 24 VDC power supply, verify that the voltage reads between –20 VDC and –28.3 VDC. Then place the red test lead of the voltmeter to the RET1 (BAT-A return ground) black cable and verify that no voltage is present, that is, meter reading must be 0 VDC.
Note For a CPT 50 shelf that has 24 VDC power supply, the voltages –20 VDC and –28.3 VDC are, respectively, the minimum and maximum voltages required to power the CPT 50 shelf. The nominal steady state voltage is –24 VDC. To prevent damage to the CPT 50 shelf, the voltage must not exceed -30 VDC.
Note For a CPT 50 shelf that has 48 VDC power supply, the voltages –40.5 VDC and –57.6 VDC. are, respectively, the minimum and maximum voltages required to power the CPT 50 shelf. The nominal steady state voltage is –48 VDC.
 - To verify the BAT-B of the shelf, place the black test lead of the voltmeter to the return. Place the red test lead to the –48 V or –24 V (BAT-B battery connection) red cable. For a 48 VDC power supply, verify that it reads between –40.5 VDC and –57.6 VDC. For a 24 VDC power supply, verify that the voltage reads between –20 VDC and –28.3 VDC. Then place the red test lead of the voltmeter to the RET2 (BAT-B return ground) black cable and verify that no voltage is present, that is, meter reading must be 0 VDC.
 - To verify the ground, place the black test lead of the voltmeter to the frame ground. Place the red test lead on the BAT-A return ground and verify that no voltage is present, that is, meter reading must be 0 VDC.

Place the red test lead on the BAT-B return ground and verify that no voltage is present, that is, meter reading must be 0 VDC.

Step 4 Return to your originating procedure (NTP).

NTP-J58 Connecting Cables to the EOBC, Timing, and Console Ports

Purpose	This procedure describes how to connect cables to the EOBC, timing, and console ports in the CPT 50 shelf.
Tools/Equipment	<ul style="list-style-type: none"> • Mini-BNC cables (Cisco PN 72-5118-XX) • USB cable • CAT-5 Ethernet cable
Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, refer to the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>.
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Caution

Always use the supplied Electrostatic Discharge (ESD) wristband when working with a powered CPT 50 shelf. For detailed instructions on how to wear the ESD wristband, see the *Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms*.

Procedure

- Step 1** Complete the [DLP-J184 Connect the Timing Cables to the PPS, 10MHz, and ToD/PPS Ports](#), on page 89 to connect timing to an external equipment.
- Step 2** Complete the [DLP-J185 Install Cables to the EOBC or Console Port](#), on page 90 to install the cables to the EOBC or console port.
- Stop. You have completed this procedure.**

DLP-J184 Connect the Timing Cables to the PPS, 10MHz, and ToD/PPS Ports

Purpose	This procedure describes how to connect the timing cables to the PPS, 10 MHz, and ToD/PPS ports on the CPT 50 shelf.
Tools/Equipment	<ul style="list-style-type: none"> • Mini-BNC cables (Cisco PN 72-5118-XX) • CAT-5 Ethernet cable
Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, refer to the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>.
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Warning

The intra-building ports of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring. **Statement 7005**



Note

For rules about provisioning timing references, see ITU-T G.813.

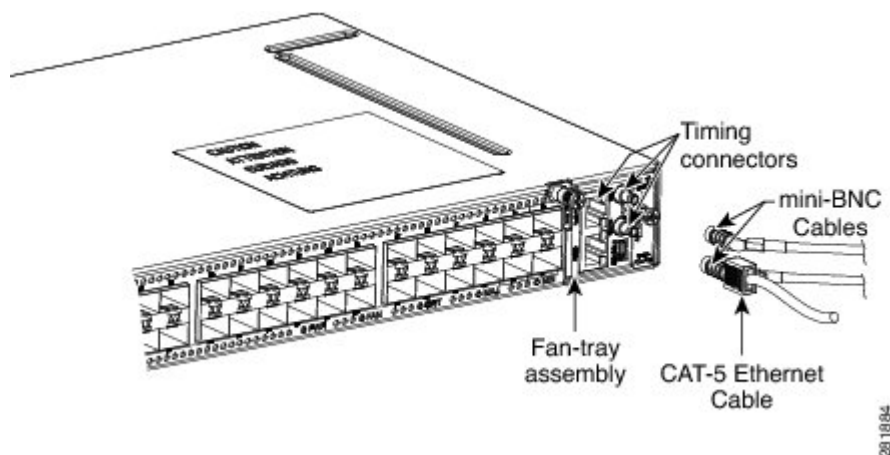


Note To unplug the RJ-45 cables connected to the ToD/PPS and EOBC ports on the fan-tray, use small pliers or a screwdriver.

Procedure

- Step 1** Locate the timing connectors (PPS, 10 MHz, or ToD/PPS) on the fan-tray assembly of the CPT 50 shelf, as shown in this figure.

Figure 41: Timing Connectors (PPS, 10 MHz, or ToD/PPS) on the Fan-Tray Assembly



- Step 2** To connect the PPS or 10 MHz port:
- Connect one end of the mini-BNC cable to the PPS or 10 MHz mini-BNC output port.
 - Connect the other end of the mini-BNC cable to an external equipment to provide timing signals.
- Step 3** To connect the ToD/PPS RJ-45 output port:
- Connect one end of a standard CAT-5 Ethernet cable to the ToD/PPS RJ-45 output port.
 - Connect the other end of the CAT-5 Ethernet cable to an external equipment to provide timing signals.
- Step 4** Return to your originating procedure (NTP).

DLP-J185 Install Cables to the EOBC or Console Port

Purpose	This procedure explains how to connect cables to the EOBC or console port on the CPT 50 shelf.
Tools/Equipment	<ul style="list-style-type: none"> • USB cable • CAT-5 Ethernet cable

Prerequisite Procedures	<ul style="list-style-type: none"> • NTP-J54 Install the CPT 50 Shelf, on page 48 • Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, refer to the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i>.
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

**Warning**

The intra-building ports of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly must not be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring. **Statement 7005.**

**Note**

The console port is used for the setup and maintenance of the CPT 50 shelf and the EOBC port is used for disaster recovery, that is, to log in to the CPT 50 shelf for troubleshooting when the connection between the CPT 50 shelf and CPT 600 shelf is lost.

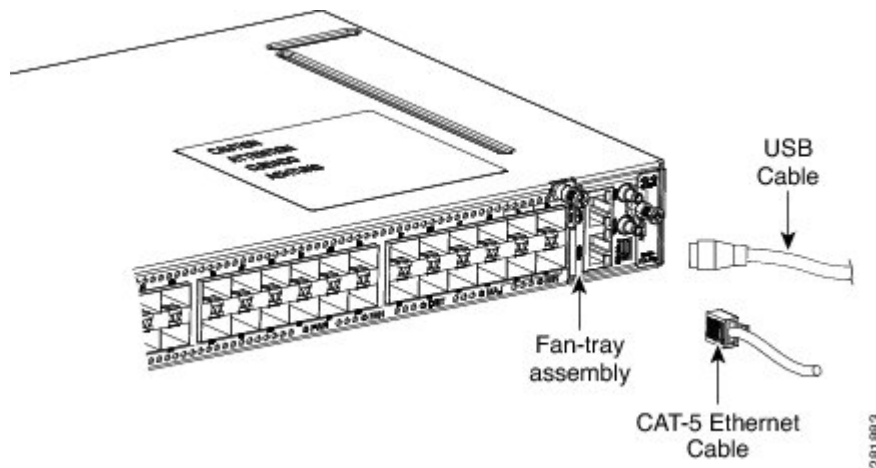
**Note**

To unplug the RJ-45 cables connected to the ToD/PPS and EOBC ports on the fan-tray, use small pliers or a screwdriver.

Procedure

- Step 1** Locate the EOBC port or the console port on the fan tray assembly of the CPT 50 shelf, as shown in this figure.

Figure 42: EOBC or Console Port on the Fan-Tray Assembly



- Step 2** To connect the EOBC port:
- Connect one end of a standard CAT-5 Ethernet cable to the EOBC port.
 - Connect the other end of the CAT-5 Ethernet cable to establish external connectivity.
- Step 3** To connect the console port:
- Connect one end of the USB cable to the console port.
 - Connect the other end of the USB cable to the console terminal or a modem that connects to the console terminal.
- Step 4** Return to your originating procedure (NTP).

NTP-J59 Install and Route Fiber-Optic Cables

Purpose	This task describes how to install and route fiber-optic cables.
Tools/Equipment	<ul style="list-style-type: none"> • Cables • Tie-wrap
Prerequisite Procedures	None
Required/As Needed	Required

Onsite/Remote	Onsite
Security Level	None

**Warning**

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

**Caution**

When connecting an optical fiber patch cord between the CPT 50 shelf and the optical card ports in the Cisco ONS 15454 M6 or Cisco ONS 15454 M2, use the electrostatic discharge wristband supplied with the Cisco ONS 15454 M6 or M2.

**Note**

Always clean all the fiber connectors thoroughly before making the connection with the mating adapter. Very small particles can permanently damage the end of the mating fiber inside the CPT 50 shelf, which makes regular cleaning imperative. For cleaning instructions, see [NTP-J60 Clean Fiber Connectors](#), on page 95.

**Note**

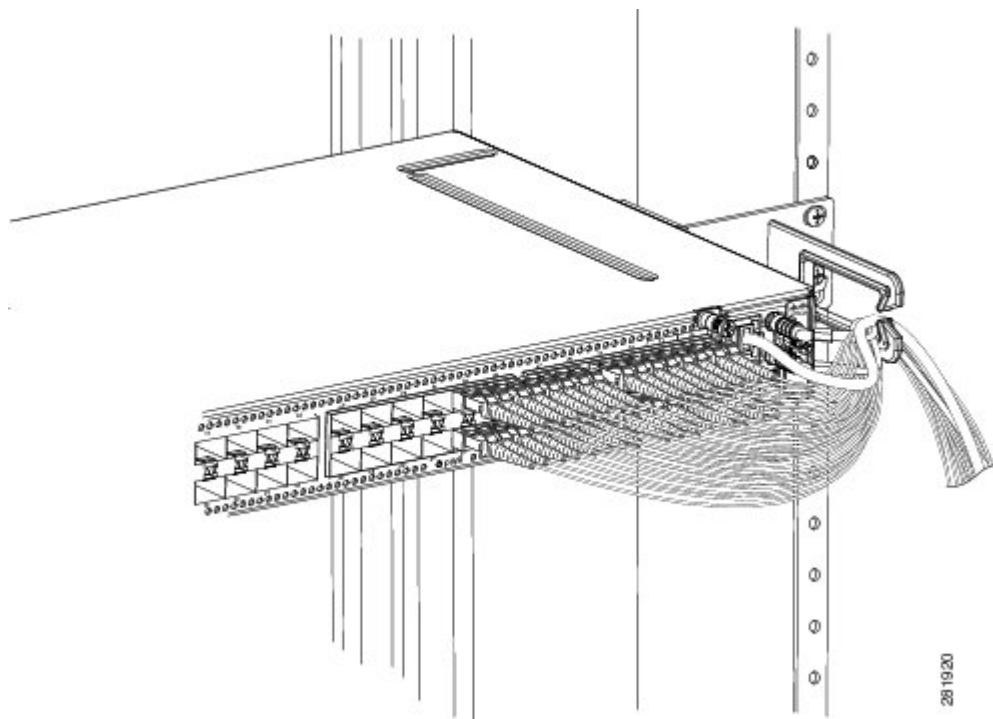
The CPT 50 shelf features LC/UPC bulkhead adapters. Always use fiber-optic cables equipped with the corresponding (LC/UPC) connector type. Using any other type of connector results in damage to the connector or adapter, or both.

Procedure

- Step 1** Place the LC/UPC cable connector in front of the corresponding bulkhead adapter on the front panel of the CPT 50 shelf.
- Step 2** Align the keyed ridge of the cable connector with the slot in the receiving adapter.
- Step 3** Gently push the cable connector into the adapter until you hear a click, which indicates that the latching system is engaged.
- Step 4** Route the fiber cables through the cable guide (left and right side). A tie-wrap is tied around the fiber and cables through the cable guide.

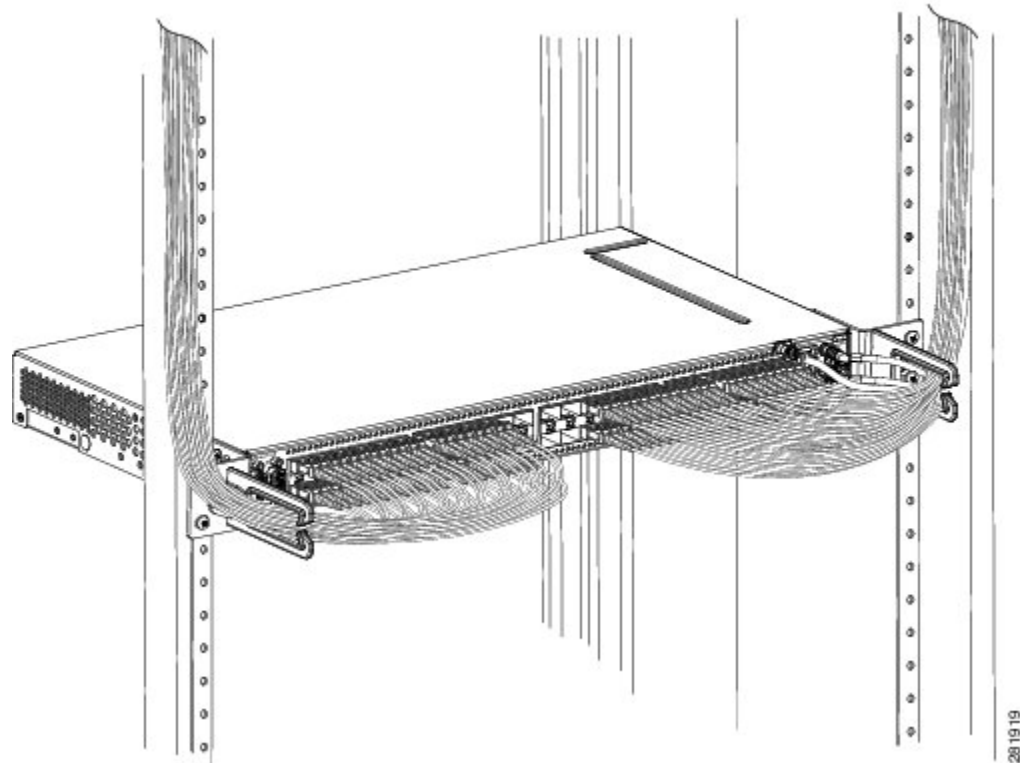
The cables are routed through the cable guide in an ANSI (23-inch) rack configuration, as shown in this figure.

Figure 43: Cable Management in an ANSI Rack Configuration



The cables are routed through the cable guide in an ETSI rack configuration, as shown in this figure.

Figure 44: Cable Management in an ETSI Rack Configuration



Note If no cable guide is installed, bind the cables and fibers using the tie-wrap.

NTP-J60 Clean Fiber Connectors

Purpose	This procedure explains how to clean the fiber connectors.
Tools/Equipment	<ul style="list-style-type: none"> • Type A Fiber-Optic Connector Cleaner (CLETOP reel) • Inspection microscope • Optical swab • Optical receiver cleaning stick
Prerequisite Procedures	None

Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

-
- Step 1** Using an inspection microscope, inspect each fiber connector for dirt, cracks, or scratches.
- Step 2** Replace any damaged fiber connectors.
- Note** Replace all dust caps whenever the equipment is unused for 30 minutes or more.
- Step 3** Complete the [DLP-J186 Clean Fiber Connectors with CLETOP](#), on page 96 as necessary.
- Step 4** Complete the [DLP-J187 Clean the Fiber Adapters](#), on page 97 as necessary.
- Step 5** Stop. You have completed this procedure.
-

DLP-J186 Clean Fiber Connectors with CLETOP

Purpose	This task explains how to clean the fiber connectors with CLETOP.
Tools/Equipment	<ul style="list-style-type: none"> • Type A Fiber-Optic Connector Cleaner (CLETOP reel) • Optical receiver cleaning stick
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

-
- Step 1** Remove the dust cap from the fiber connector.
- Step 2** Press the lever up to open the shutter door. Each time you press the lever, you expose a clean wiping surface.
- Step 3** Insert the connector into the CLETOP cleaning cassette slot, rotate one quarter turn, and gently swipe downwards.
- Step 4** Use an inspection microscope to inspect each fiber connector for dirt, cracks, or scratches. If the connector is not clean, repeat Step 1 to Step 3.
- Step 5** Insert the fiber connector into the applicable adapter or attach a dust cap to the fiber connector.
- Step 6** Return to your originating procedure (NTP).
-

DLP-J187 Clean the Fiber Adapters

Purpose	This task explains how to clean the fiber adapters.
Tools/Equipment	CLETOP stick swab
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

-
- Step 1** Remove the dust plug from the fiber adapter.
- Step 2** Insert a CLETOP stick swab (14100400) into the adapter opening and rotate the swab.
- Step 3** Place dust plugs on the fiber adapters when not in use.
- Step 4** Return to your originating procedure (NTP).
-

NTP-J61 Perform the CPT 50 Shelf Installation Acceptance Test

Purpose	This procedure describes how to perform a shelf installation acceptance test for the CPT 50 shelf.
Tools/Equipment	Voltmeter
Prerequisite Procedures	Applicable procedures in this chapter

Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

Step 1 If you installed a CPT 50 shelf, verify that each applicable procedure listed in the below table was completed.

Table 4: CPT 50 Shelf Installation Task Summary

Description	Completed
NTP-J53 Unpack and Inspect the CPT 50 Shelf, on page 42	
NTP-J54 Install the CPT 50 Shelf, on page 48	
Connect the chassis to the office ground. For detailed instructions on how to ground the chassis, see the <i>Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms</i> .	
NTP-J57 Install the Power Feeds and Ground to the CPT 50 Shelf, on page 72	
NTP-J58 Connecting Cables to the EOBC, Timing, and Console Ports, on page 88	
NTP-J59 Install and Route Fiber-Optic Cables, on page 92	

Step 2 [DLP-J188 Inspect the CPT 50 Shelf Installation and Connections , on page 98.](#)

Step 3 [DLP-J189 Measure DC Voltage on the CPT 50 shelf, on page 99.](#)

Step 4 Continue with [NTP-J21 Set Up the Computer for CTC](#) and [NTP-J22 Log into CTC](#).
Stop. You have completed this procedure.

DLP-J188 Inspect the CPT 50 Shelf Installation and Connections

Purpose	This task describes how to inspect the shelf installation and connections and verify that everything is installed and connected properly.
Tools/Equipment	None

Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

- Step 1** Make sure that all external wiring connections (that is, power, ground, alarms, and so on) are secure. If a wire or cable is loose, return to the appropriate procedure in this chapter to correct it.
- Step 2** Return to your originating procedure (NTP).

DLP-J189 Measure DC Voltage on the CPT 50 shelf

Purpose	This task describes how to measure the power to verify correct power and returns.
Tools/Equipment	Voltmeter
Prerequisite Procedures	Before installing the DC power, check the voltage
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None



Warning

To reduce the risk of electric shock, switch on the power only after the power cord is completely installed into the power module. Statement 390



Caution

Do not apply power to the shelf assembly until you complete all the installation steps.

Procedure

- Step 1** Using a voltmeter, verify the office ground and power:
- Place the black lead (positive) on the return (RET). Hold it there while completing Step b.
 - Place the red lead (negative) on the fuse power points on the third-party power distribution panel to verify that they read between:

- –40.5 VDC and –57.6 VDC (power) and 0 (return ground) for a 48 V power source.
- –20 VDC and –28.3 VDC (power) and 0 (return ground) for a 24 V power source

Step 2 Using a voltmeter, verify the shelf ground and power wiring:
Place the black lead (positive) on the RET1(A) and the red lead on the –48 V (A) or –24 V (A) point.

- For the CPT 50 shelf with 48 V power supply, verify a reading between –40.5 VDC and –57.6 VDC.
- For the CPT 50 shelf with 24 V power supply, verify a reading between –20 VDC and –28.3 VDC.

If there is no voltage, check the following and correct if necessary:

- Battery and ground are reversed to the shelf.
- Battery is open or missing.
- Return is open or missing.

Step 3 Repeat Step 1 and Step 2 for the RET2 (B) and –48 V (B) or –24 V (B) of the redundant power supply input.

Step 4 Return to your originating procedure (NTP).

Hardware Specifications

This chapter contains product names and hardware specifications for CPT 50 shelf, fabric card, and line card.

Product Names

The product names for the CPT 50 shelf, fabric, and line cards are listed in this table.

Card / Shelf	Product Name
Fabric Card	CPT-PTF256-10GX4=
Line Card	CPT-PTM-10GX4=
CPT 50 Shelf with 48 V AC power module	CPT-50-44GE-AC=
CPT 50 Shelf with 48 V DC power module for ANSI standard	CPT-50-44GE-48A
CPT 50 Shelf with 48 V DC power module for ETSI standard	CPT-50-44GE-48E=
CPT 50 Shelf with 24 DC power module for ANSI standard	CPT-50-44GE-24A=



Caution

In order to ensure system reliability, the CPT 600 or CPT 200 shelf must have all their slots equipped with either cards or fillers.

**Note**

The fabric and line cards are inserted in a CPT 600 or CPT 200 shelf. The line card filler (15454-M-FILLER) must be installed in unused and empty slots to ensure proper air flow and electromagnetic interference (EMI) requirements during the CPT 200 or CPT 600 operation. In the CPT 200 shelf, the line card filler can be installed in Slot 2 and Slot 3. In the CPT 600 shelf, the line card filler can be installed in slots 2, 3, 4, 5, 6, and 7. The line card fillers have no card-level LED indicators. CTC does not detect filler cards. This support may be added in later releases.

CPT Specifications

This section provides the specifications for timing, power, and environmental specifications, card and shelf dimensions.

GPS (Global Positioning System) Interface (1PPS and 10Mhz) of CPT 50 Shelf

	10 MHz Specification	1 PPS Specification
Waveform	Sine wave	Pulse
Frequency	10 MHz	1 PPS
Amplitude	>1 V LVTTTL Compatible	>1 V LVTTTL Compatible
Impedance	50 Ω	50 Ω

TOD/1PPS RS422 Interface— RJ45 Pinout of CPT 50

The pinout of the TOD (Time of Day) RJ45 port is listed in this table.

Pin	Signal Name	Description
1	1PPS_N	1PPS RS422 output signal
2	1PPS_P	1PPS RS422 output signal
3	NC	No Connect
4	GND	—
5	GND	—
6	NC	No Connect
7	TOD_P	Time of Day RS422 output
8	TOD_N	Time of Day RS422 output

System Power for CPT 50 Shelf

The power specifications for the CPT 50 shelf is listed in this table.

Shelf	Input Voltage	Power Consumption	Power Terminals	Fuse Rating
CPT 50 shelf with AC power module for ANSI and ETSI standards	100V - 240V AC depending on the standards in various countries	100 VAC 2.4 A ; 240 VAC 1A	One AC single phase with 3-pole (line L, Neutral N, and Protective Earth PE) input connector.	Must not exceed 10 A or 15 A, depending on the standards in various countries.
CPT 50 shelf with 48 V DC power module for ANSI standard	Voltages –40.5 VDC and –57.6 VDC are, respectively, the minimum and maximum voltages required to power the chassis. The nominal steady state voltage is -48 VDC. Functionality is guaranteed at -40 VDC input voltage, according to GR-1089.	48 V DC 5 A	Single terminal block with four poles— –48V, RET for power terminals A and B.	Must not exceed 10 A
CPT 50 shelf with 48 V DC power module for ETSI standard	Voltages –40.5 VDC and –57.6 VDC are, respectively, the minimum and maximum voltages required to power the chassis. The nominal steady state voltage is -48 VDC.	48 VDC 5 A	DSUB 2 poles	Must not exceed 10 A
CPT 50 shelf with 24 V DC power module for ANSI standard	Voltages –20 VDC and –28.3 VDC are, respectively, the minimum and maximum voltages required to power the chassis. The nominal steady state voltage is -24 VDC.	24VDC 10 A	Single terminal block with four poles— –24V, RET for power terminals A and B.	Must not exceed 15 A.

Fan Tray

The following table lists power requirements for the fan-tray assembly.

Table 5: Fan-Tray Power Requirements

Fan Tray	Watts	Amps
12 V supplied by CPT 50 shelf	36	3

Fabric Card and Line Card Power Specifications

This section provides power specifications for fabric and line cards.

Card	Maximum Power in Watts	Typical Power in Watts	Amperes at -48 V (Maximum)
Fabric Card	200	150	4.1
Line Card	150	100	2.1

CPT 50 Shelf, Fabric, and Line Card Dimensions

Card / Shelf	Physical Dimensions							
	Measurement in inches				Measurement in mm			
	Height	Width	Depth	Weight in Kg	Height	Width	Depth	Weight in Kg
Fabric and Line Card (Single Slot)	12.650	0.921	9.000	<ul style="list-style-type: none"> • Fabric—1.2 • Line—1.04 	321.3	23.4	228.6	<ul style="list-style-type: none"> • Fabric—1.22 • Line—1.04

Card / Shelf	Physical Dimensions							
	Measurement in inches				Measurement in mm			
CPT 50 Shelf	1.7	<ul style="list-style-type: none"> • 19 or 23 inches with mounting ears attached for ANSI rack configuration • 21 inches with mounting ears attached for ETSI rack configuration 	9.1	<ul style="list-style-type: none"> • CPT with AC power module—4.06 kg • CPT with DC power module—4.22 kg 	43.1	<ul style="list-style-type: none"> • 482.6 or 584.2 mm with mounting ears attached for ANSI rack configuration • 533.4 mm with mounting ears attached for ETSI rack configuration 	231.1	<ul style="list-style-type: none"> • CPT with AC power module—4.06 kg • CPT with DC power module—4.22 kg

CPT 50 Shelf, Fabric, and Line Card Environmental Specifications

The operating temperature and humidity for CPT 50 shelf, fabric, and line cards are as follows:

- Operating Temperature— 32 to 131 degrees Fahrenheit, 0 to +55 degrees Celsius)
- Operating Humidity— 5 to 85%, noncondensing; functionality is guaranteed up to 5 to 95%, noncondensing.

Other Specifications

Card / Shelf	Interface	Switching Capacity
Fabric Card	<ul style="list-style-type: none"> • Two 10GE XFP ports (OTN enabled) • Two 10GE SFP+ ports • Mini USB port (local craft access RS232 for CTC software) 	256 G

Card / Shelf	Interface	Switching Capacity
Line Card	<ul style="list-style-type: none">• Four 10GE SFP+ ports• Mini USB port (local craft access RS232 for CTC software)	40 G
CPT 50 Shelf	<ul style="list-style-type: none">• 44 GE 10/100/1000Mbps SFP ports• Four 10GE SFP+ ports	44 G

SFP, SFP+, and XFP Modules

SFP, SFP+, and 10-Gbps SFP (XFP) modules are integrated fiber optic transceivers that provide high-speed serial links from a port or slot to the network. For more information on SFP/SFP+/XFP modules and for a list of SFP/SFP+/XFP modules supported by the CPT, see [Installing the SFP, SFP+, and XFP Modules in Cisco CPT](#). In CTC, SFP, SFP+, and XFP modules are called pluggable port modules (PPMs).

