JUNIPER NETWORKS | Engineering Simplicity

Quick Start Guide

PTX10008 Packet Transport Router

IN THIS GUIDE

PTX10008 System Overview

NOTE: The PTX10008 Quick Start is designed to get your new router up and running in short order. For a full description of all the components, the specifications, and unabridged installation instructions, see the *PTX10008 Packet Transport Router Hardware Guide*.

The Juniper Networks PTX10008 Packet Transport Router enables cloud and data center operators to smoothly transition from 10-Gigabit and 40-Gigabit Ethernet networks to 100-Gigabit and 400-Gigabit Ethernet high-performance networks. This flexible, 13 rack unit (13-U) modular chassis has eight line card slots that can support a maximum of 1152 10-Gigabit

Ethernet ports, 288 25-Gigabit Ethernet ports, 288 40-Gigabit Ethernet ports, 288 50-Gigabit Ethernet ports, 1152 100-Gigabit Ethernet ports, 576 200-Gigabit Ethernet ports, and 288 400-Gigabit Ethernet ports.

Step 1–Prepare the Site

IN THIS SECTION

Before you install the PTX10008, make sure the site meets all of the rack, power, cooling, and clearance requirements.

Rack-Mount Requirements

The PTX10008 router chassis is designed to be installed in standard 19-in. wide four-post racks that are spaced at 1 U (1.75 in. or 4.45 cm) increments.

You can stack a maximum of three PTX10008 chassis in a four-post rack if:

- The rack is 42 U or greater.
- The rack meets the strength requirements to support the weight of the chassis and the cabling. A single PTX10008 chassis without optics and cabling can range from 145.2 lb (65.86 kg) to 421.25 lb (191.07 kg).
- The facility has adequate cooling and power to support additional systems.

Power Requirements

The PTX10008 router is available in AC, DC, high voltage AC (HVAC) and high voltage DC (HVDC) power configurations. Each configuration has different power supplies, power cables, and cooling requirements. The power configuration and the number of line cards you are installing determine your power requirements for the system. A procedure to determine these power requirements is available in the *PTX10008 Packet Transport Hardware Guide*.

Cooling and Maintenance Requirements

For the cooling system to operate properly, you must allow sufficient clearance around the installed chassis for cooling and maintenance (see Figure 1 and Figure 2 for a top view of clearance for the PTX10008. The cooling system in a PTX10008 chassis consists of dual fan trays and dual fan tray controllers. Systems with 14.4 Tbps line cards require addition air volume and use the JNP10008-FAN2 and JNP10008-FTC2 fans and fan tray controllers.

Figure 1: Clearance Requirements for Airflow and Hardware Maintenance for a PTX10008 Chassis with JNP10008-FAN

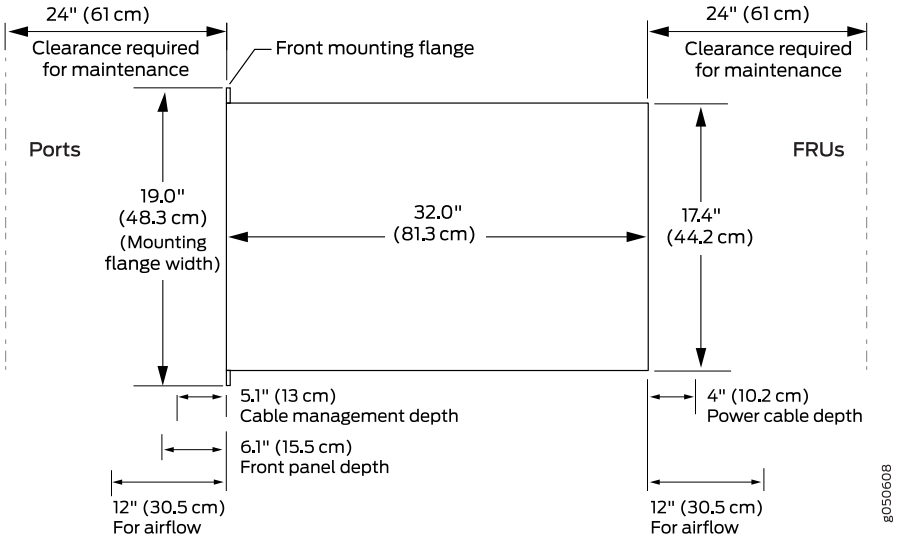
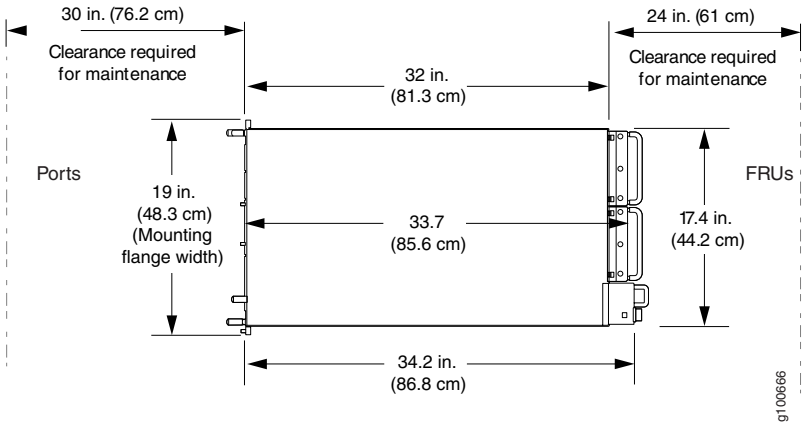


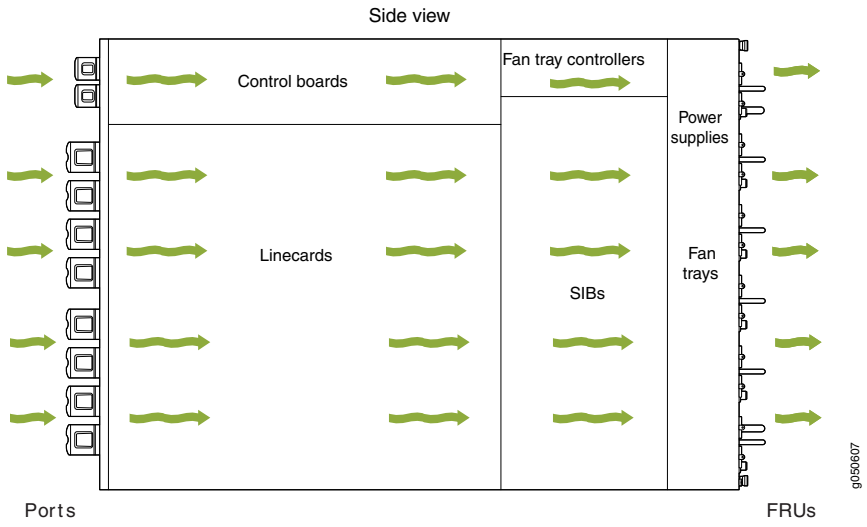
Figure 2: Clearance Requirements for Airflow and Hardware Maintenance for a PTX10008 with JNP10008-FAN2



If you are mounting a PTX10008 in a rack with other equipment, ensure that the exhaust from other equipment does not blow into the intake vents of the chassis.

The air intake to cool the chassis is located in the vents of the line cards and Routing and Control Boards (RCBs). Air flows passes from the line cards and RCBs, through the switch interface boards (SIBs), and exists from the fans trays and the power supplies. This airflow is called port-to-FRU cooling or airflow out (AFO). See Figure 3.

Figure 3: Top View of Airflow Through a PTX10008



Step 2–Unpacking the PTX10008

> **NOTE:** The chassis is maximally protected inside the shipping box. Do not unpack it until you are ready to begin installation.

Ensure that you have the following parts and tools available to unpack the PTX10008:

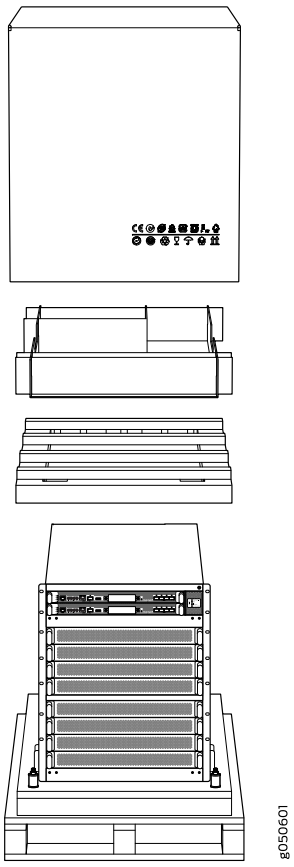
- A 13/32 in. (10 mm) open-end or socket wrench to remove the bracket bolts from the shipping pallet
- A box cutter or packing knife to slice open the nylon straps and tape that seal the crate and boxes

The chassis ships in a cardboard box that has a two-layer wooden pallet base with foam cushioning between the layers. The router chassis is bolted to the pallet base.

The shipper has the option to either ship the front panel separately or to ship along with the chassis. If the front panel arrives with the chassis, set aside the front panel box until you are ready to verify the contents of the order.

To unpack the chassis (see Figure 4):

Figure 4: Shipping Crate and Accessory Box



1. Move the shipping box to a staging area as close to the installation site as possible. While the chassis is bolted to the pallet, you can use a forklift or pallet jack to move it. Make sure there is enough space to remove components from the chassis.

2. Position the shipping box with the arrows pointing up.

3. Slice the nylon straps with the box cutter that hold the shipping boxes to the pallet.

4. Lift the shipping box off the chassis.

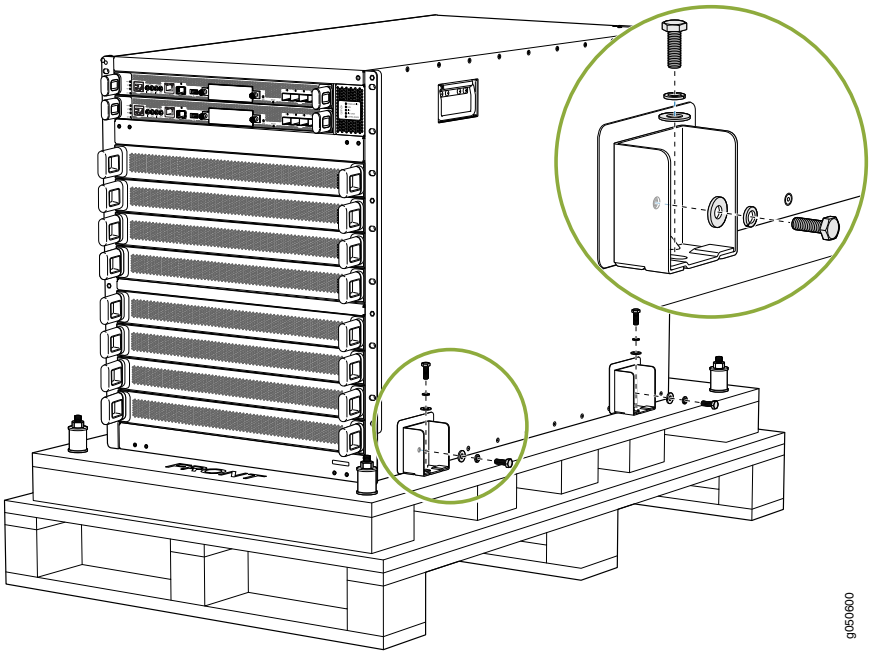
5. Remove the cardboard accessory box.

6. Remove the foam padding from the top of the box.

7. Remove the plastic cover from the router chassis.

8. Use a 13/32 in. (10 mm) open-end or socket wrench to remove the four sets of bracket bolts that secure the chassis to the shipping pallet (see Figure 5).

Figure 5: Bracket Bolt Removal



9. Unpack any items that shipped separately, such as an RCB, SIB, or line cards.
10. Unpack the accessory box and lay out the contents so that they are ready for use.
11. Verify that your order includes all appropriate parts.
12. Store the brackets and bolts inside the accessory box.
13. Save the shipping box and packing materials in case you need to move or ship the router at a later time.

Step 3–Mount the Chassis in the Rack

Install the Mounting Hardware

To install the chassis, first install the mounting hardware in the rack and then mount the PTX10008 in the rack.

The router can be installed in a four-post closed frame rack or a four-post open frame rack. Install the mounting hardware on the rack before installing the router.

To mount the chassis on a four-post rack, you must first install the mounting hardware in the rack. The PTX10008 router comes with a four-piece set of brackets that supports the chassis in the rack.

> **NOTE:** Two-post installation racks are not supported.

The main pieces of the rack mount kit are:

- One left base bracket. The bracket is labeled **LEFT FRONT** on the side of the bracket that faces the interior of the rack, near the holes for attaching the bracket to the rack.
- One right base bracket. The bracket is labeled **RIGHT FRONT** on the side of the bracket that faces the interior of the rack, near the holes for attaching the bracket to the rack.
- Two rear brackets. These brackets are labeled **REAR** on the side of the bracket that faces the interior of the rack, near the holes for attaching the bracket to the rack. The rear brackets are interchangeable; you can use either of the rear brackets with the right or left base bracket.

Ensure that you have the following parts and tools available to install the mounting hardware:

- A Phillips (+) screwdriver, number 1, 2, or 3, depending on the size of your rack screws
- A Phillips (+) screwdriver, number 2, to install the screws that connect the rear and base brackets
- 12 Phillips flat-head screws (provided)
- 14 rack screws appropriate for your rack to attach the mounting hardware to the rack (not provided)

When you install the base and rear brackets, the adjustable portion of the brackets overlap. Use the overlap area to adjust the total bracket length to fit any of the four standard rack sizes: 19 in. (483 mm), 23.62 in. (600 mm), 30 in. (762 mm), or 31.5 in. (800 mm).

To install the mounting hardware in a four-post rack:

1. Remove the mounting brackets from the rack mount kit box.

2. Decide where to place the chassis in the rack. If the rack is empty, mount the router in the lowest possible location.

3. Position the left base bracket at the desired position in the left side of the rack and line up its front screw holes with the holes in the rack. Use four mounting screws appropriate for your rack to attach the left base bracket to the rack.

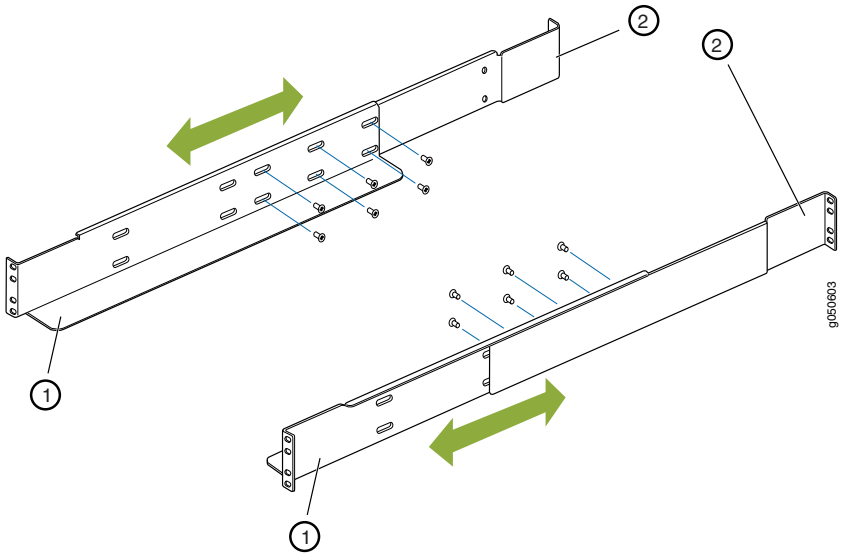
4. Position one of the rear brackets at the left rear of the rack on the same level as the left base bracket, so that the rear bracket overlaps with the left bracket. The screw holes for connecting the base and rear brackets should overlap. Use four mounting screws appropriate for your rack to attach the rear bracket to the rack.

5. Connect left base bracket and rear brackets (see Figure 6):

   a. Insert six of the flat-head screws provided with the mounting brackets into the overlapping bracket holes.

   b. Tighten the screws fully (to 12–16 in.-lb torque) using a number 2 Phillips screwdriver.

Figure 6: Mounting Brackets for Four-Post Rack Installation



1—Right and left base brackets	2—Rear brackets

6. Position the right base bracket at the desired position in the right side of the rack opposite the installed left base bracket, so that it is on the same rack level as the left base bracket. If the right and left base brackets are not on the same level, the chassis will rest at an angle in the rack instead of resting flat and level. Line up the right base bracket's front screw holes with the holes in the rack. Use four mounting screws appropriate for your rack to attach the right base bracket to front of the rack.

7. Position the other rear bracket at the right rear of the rack on the same level as the right base bracket, so that the rear bracket overlaps with the right base bracket. The screw holes for connecting the base and rear brackets should overlap. Use four mounting screws appropriate for your rack to attach the rear bracket to the rack.

8. Connect the right base and rear brackets (see Figure 6):

   a. Insert six of the screws provided with the mounting brackets into the overlapping bracket holes.

   b. Hand-tighten the screws fully (to 12–16 in.-lb torque) using a number 2 Phillips screwdriver.

Mount the PTX10008 in a 4-Post Rack Using a Mechanical Lift

Because of the router's size and weight, we strongly recommend using a mechanical lift to install the PTX10008. If you do not have a mechanical lift available, see the alternative instructions for manual mounting in the *PTX10008 Packet Routing Hardware Guide*.

> **CAUTION:** Do not install line cards in the chassis until after you mount the chassis securely on a rack or cabinet.

> **CAUTION:** Before front-mounting the router on a rack or cabinet, have a qualified technician verify that the rack or cabinet is strong enough to support the router's weight and is adequately supported at the installation site.

Ensure that you have the following parts and tools available to install the router:

- A mechanical lift rated for 500 lb (226.8 kg)
- 14 mounting screws appropriate for your rack
- A Phillips (+) screwdriver, number 2 or number 3, depending on the size of your rack-mounting screws

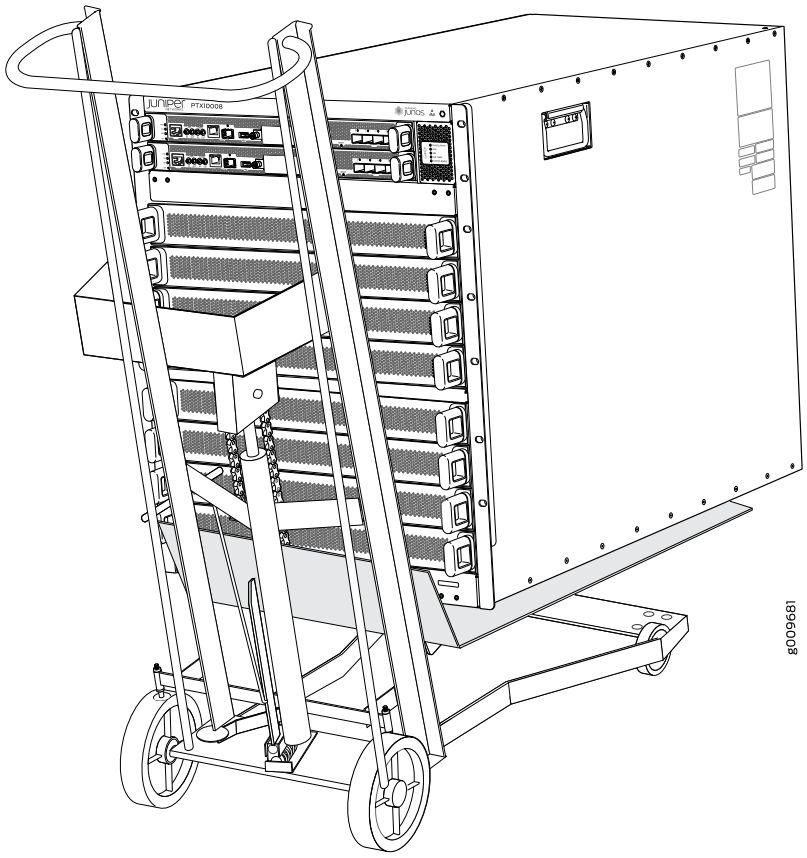
> **CAUTION:** If you are installing more than one router in a rack or cabinet, install the first router at the bottom of the rack.

To install the router using a mechanical lift (see Figure 7):

1. Ensure that the rack or cabinet is placed in its permanent location and is secured to the building. Ensure that the installation site allows adequate clearance for both airflow and maintenance. For details, see .

2. Load the router onto the lift, making sure it rests securely on the lift platform.

Figure 7: Loading the PTX10008 into a Rack Using a Mechanical Lift

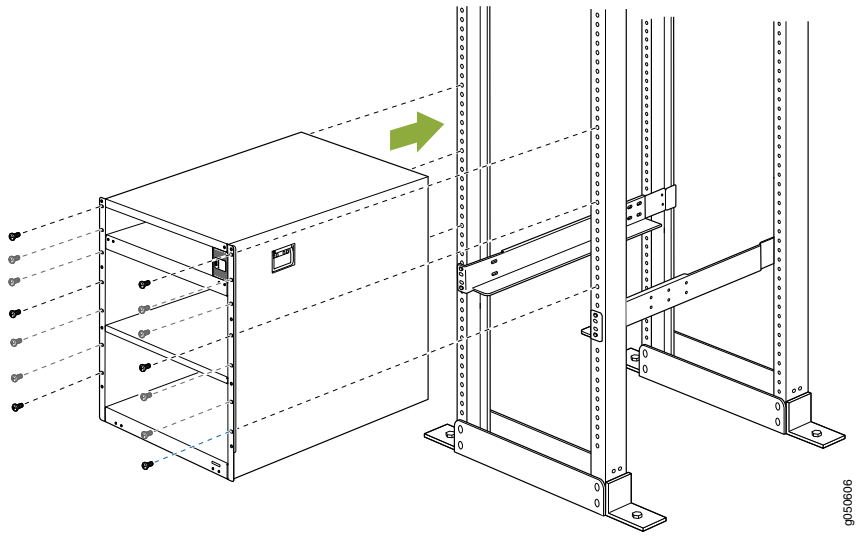


3. Using the lift, align the router in front of the rack, centering it in front of the base brackets.

4. Lift the chassis approximately 0.75 in. (1.9 cm) above the surface of the base brackets. Align the chassis as close as possible to the base brackets.

5. Carefully slide the chassis onto the adjustable base and rear mounting brackets until the chassis flanges contact the rack rails. The mounting brackets ensure that the holes in the flanges align with the holes in the rack rails. See Figure 8.

Figure 8: Attaching the Chassis Flanges to the Rack



6. Move the lift away from the rack.

7. Attach the chassis to the rack by installing a mounting screw through the open flange holes and rack, starting from the bottom.

8. Visually inspect the alignment of the router. If the router is installed properly in the rack, all the mounting screws on one side of the rack are aligned with the mounting screws on the opposite side and the router is level.

9. After ensuring that the router is aligned properly, tighten the screws.

10. After you install the mounting screws and securely bolt the chassis to the rack, reinstall the components in the chassis.

Step 4–Install the Line Cards

The line cards fall into two categories: line cards that mate with switch fabric JNP10008-SF and those that mate with switch fabric for 14.4 Tbps line cards, JNP10008-SF3. The two types of line cards are designed to only work with the matching type of switch fabricthat has the mating connector. You can’t mix the two types of line cards in the same chassis. See Table 1.

Table 1: Line Cards and Matching SIBs

Line Cards Using JNP10008-SF	Line Cards Using JNP10008-SF3
PTX10K-LC1101 PTX10K-LC1102 PTX10K-LC1104 PTX10K-LC1105 QFX10000-60S-6Q	PTX10K-LC201

You can remove a fan tray on unpowered systems, or use the **show chassis hardware models** CLI command on running systems to determine which type of switch fabric is installed.

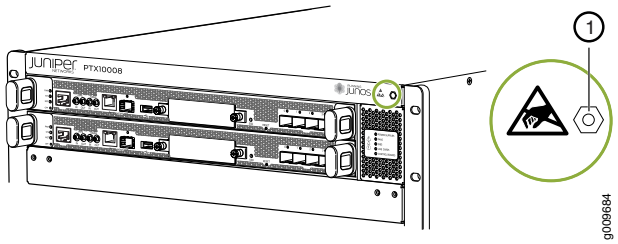
Before you install a line card in the router chassis:

- Ensure that you have the following parts and tools available to install a line card in the router:
  - ESD grounding strap
  - Phillips (+) screwdriver, number 2

To install a line card in the router chassis:

1. Attach the ESD grounding strap to your bare wrist and connect the strap to the ESD point on the router chassis. The ESD point is located above the status LED panel on the front of the router chassis. See Figure 9.

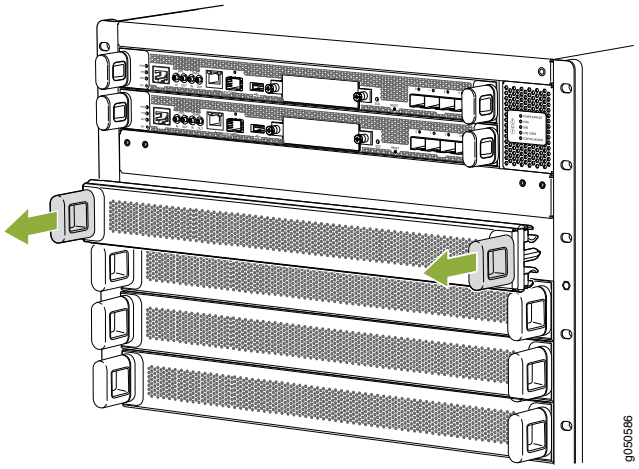
Figure 9: ESD Point on PTX10008 Chassis Front



1—ESD point	

2. Remove the line card cover by grasping the handles and pulling straight out to expose the slot for the line card. See Figure 10.

Figure 10: Removing the Cover Panel for a Line Card



CAUTION: Do not lift the line card by holding the edge connectors or the handles on the faceplate. Neither the handles or the edge connectors can support the weight of the line card. Lifting the line card by the handles or edge connectors might bend them, which would prevent the line cards from being properly seated in the chassis. See Figure 11 and Figure 12.

Figure 11: Line Card Connectors on 14.4 Tbps Line Cards

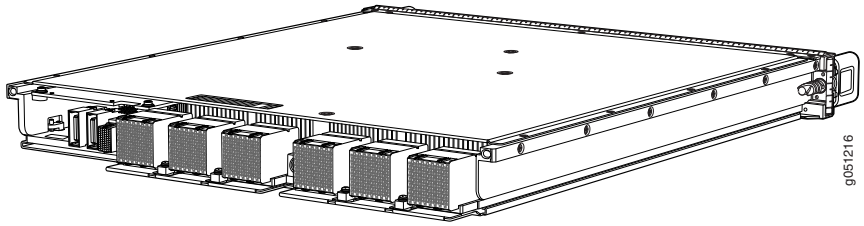
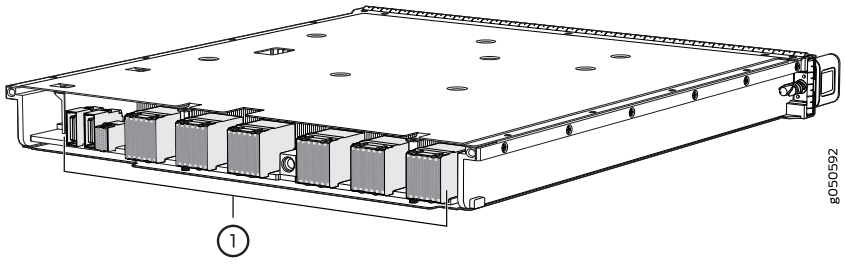


Figure 12: Line Card Connectors on Non-400 Gbps Line Cards



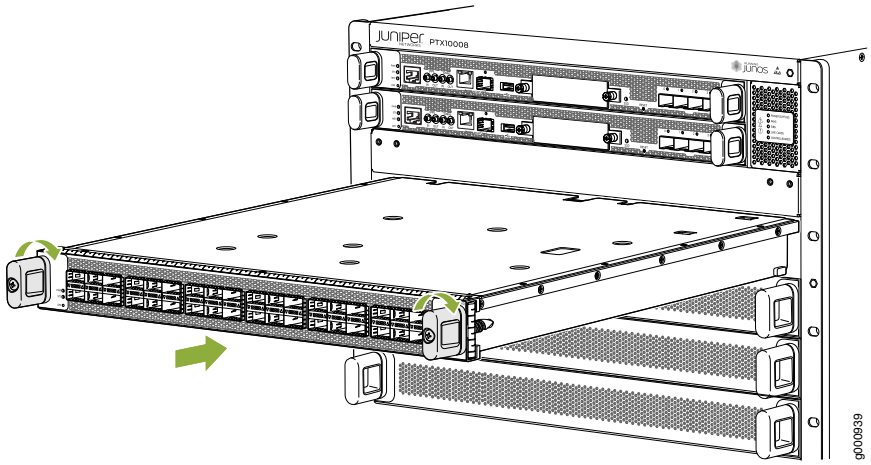
1–Connectors

3. Remove the line card from the electrostatic bag and inspect it for any damage before installing it into the chassis.

4. Grasp and lift the line card by the sides.

5. Slide the line card all the way into the slot until the handle holes align. See Figure 13.

Figure 13: Inserting a Line Card into the Slot and Rotating the Handles



6. Screw the line card into the chassis by rotating the handles simultaneously until the card is fully seated and the handles are vertical.

7. The line card automatically comes online when power is applied to the system.

You can install the optional cable management kit after the card is installed.

Step 5–Install the Front Panel

The front panel is required on the PTX10008 router to protect fiber optic cabling and to provide additional protection from electromagnetic interference (EMI). The front panel can be installed with or without the optional cable management system.

Ensure you have the following tools and parts before you begin:

- A Phillips (+) screwdriver, number 2
- Front panel (provided with the router chassis)
- Right base bracket (provided)
- Left base bracket (provided)
- 2 interchangeable latch brackets (provided)
- 8 Phillips flat-head mounting screws (provided)

To install the front panel:

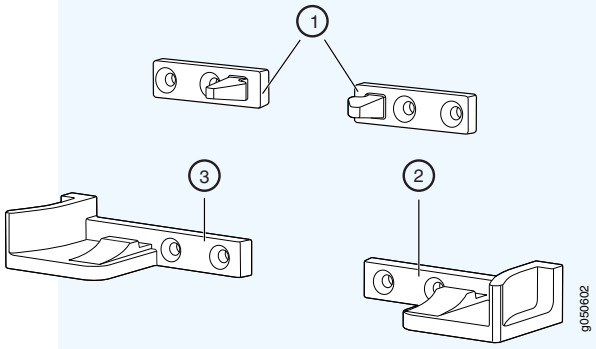
1. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.

2. Remove the plastic bag that is taped to the front panel, which holds the brackets and screws.

3. Use the Phillips screwdriver to attach two mounting screws to the left base bracket at the bottom left side of the chassis frame. The base brackets are larger than the latch brackets.

NOTE: The right and left base bracket cannot be interchanged (see Figure 14).

Figure 14: Front Panel Mounting Hardware

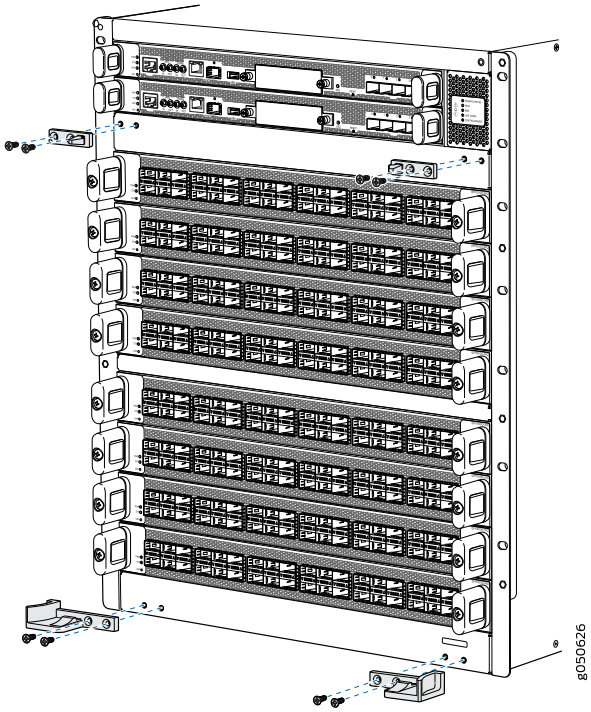


1–Latch brackets	3–Left base bracket
2–Right base bracket	

4. Use the Phillips screwdriver to attach two mounting screws to the right base bracket at the bottom right side of the chassis frame.

5. Use the Phillips screwdriver to attach two mounting screws to the latch bracket at the top left of the chassis frame (see Figure 15).

Figure 15: Attaching Front Panel Brackets on a PTX10008



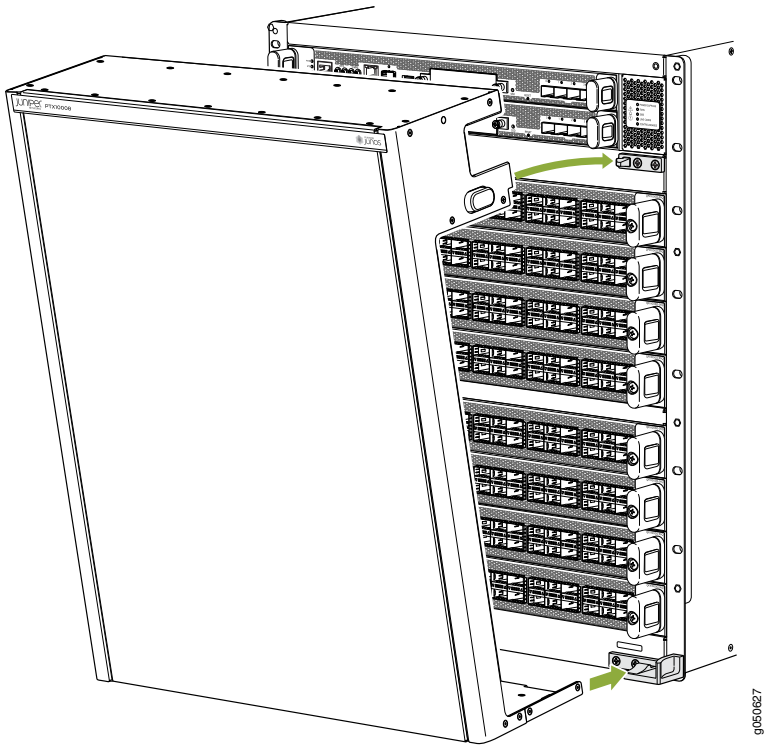
6. Use the final two mounting screws to attach a latch bracket to the top right of the chassis frame so there are brackets on all four corners of the front of the chassis.

7. Lift the front panel and rest it on the two bottom brackets.

8. Slide the panel back on the bracket glides until it engages on the two ramps.

9. Tilt the panel towards the chassis until it is vertical with the chassis. The blue release buttons on the side of the panel click into place (see Figure 16).

Figure 16: Front Panel Installation on a PTX10008

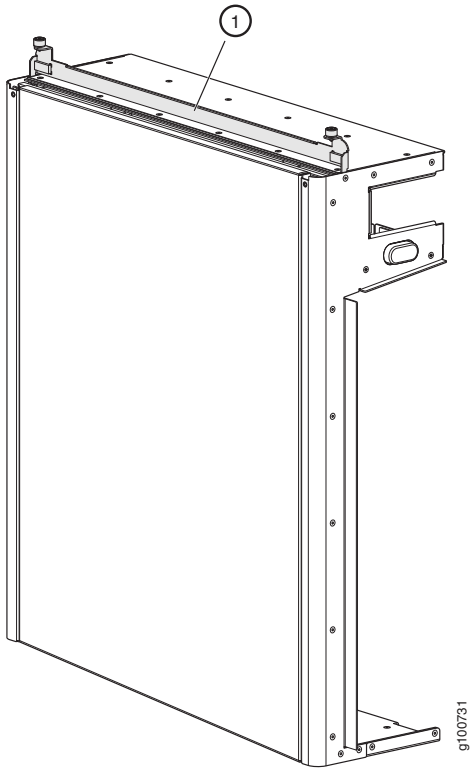


To install the (optional) air filter in the front panel:

1. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.

2. Turn the knob of the air filter frame anti-clockwise and move it over the top of the front panel. See Figure 17.

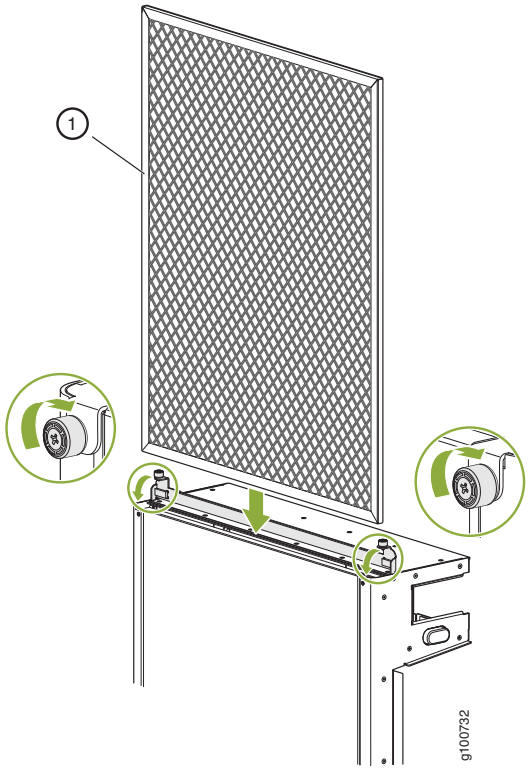
Figure 17: Air Filter Frame in a PTX10008 Front Panel



1—Air filter frame	

3. Hold the air filter with both hands and insert it into the front panel until it stops. See Figure 18.

Figure 18: Inserting the AIr Filter into a PTX10008 Front Panel



1–Air filter	

4. Move the air filter frame over the front panel and turn the knob on the air filter frame clockwise back in place.

> **NOTE:** You must replace the filter every 6 months.

Step 6–Connect Power to the Chassis

IN THIS SECTION

Before supplying power to the PTX10008, ground the chassis and install the power supplies appropriate to your system (AC, DC, and HVAC/HVDC)

Ground the PTX10008

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the chassis to earth ground before you connect it to power.

For installations that require a separate grounding conductor to the chassis, you must attach a protective earthing terminal bracket on the chassis. There are mounting holes for the terminal bracket on the left-rear side of the chassis to connect to the earth ground (see Figure 20).

> **NOTE:** A ground connection to the protective earthing terminal is not required for an AC-powered switch. The AC power cords provide adequate grounding when you connect the power supply in the switch to a grounded AC power outlet by using the AC power cord appropriate for your geographical location.

If an external ground connection is required, ensure that a licensed electrician has attached an appropriate grounding lug to the grounding cable you supply. Using a grounding cable with an incorrectly attached lug can damage the switch.

Ensure that you have the following parts and tools available:

- An electrostatic discharge (ESD) grounding strap (provided).
- Protective earthing terminal lug (provided).
- Grounding cable for your PTX10008 (not provided)—The grounding cable must be 6 AWG (13.3 mm^2), minimum 90° C wire, or as permitted by the local code.
- Grounding lug for your grounding cable (provided)—This bracket attaches to the lower left corner of the router chassis next to the bottom power supply, providing a protective earthing terminal for the router. The grounding lug required is a Panduit LCD6-10A-L or equivalent.
- A Phillips screwdriver to tighten the two screws that are mounted on the chassis.

An AC-powered PTX10008 gains additional grounding when you plug the power supply in the router into a grounded AC power outlet by using an AC power cord appropriate for your geographical location.

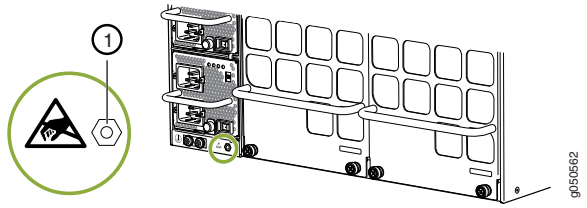
To connect earth ground to a PTX10008 chassis:

1. Verify that a licensed electrician has attached the cable lug (provided in the accessory kit) to the grounding cable.

2. Connect the other end of the grounding cable to a proper earth ground, such as the rack in which the router is mounted.

3. Attach an ESD grounding strap to your bare wrist, and connect the strap to the ESD grounding point next to the earthing posts (see Figure 19).

Figure 19: ESD Point for the PTX10008

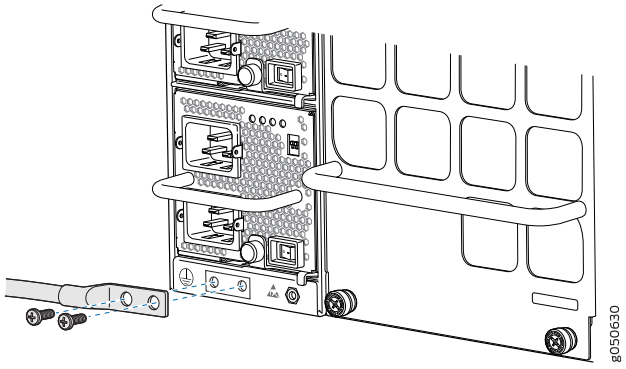


1—Grounding point

4. Remove the two screws on the chassis using a Phillips screwdriver.

5. Place the chassis grounding lug and cable over the PEM nuts with the cable connection pointing to the left. See Figure 20.

Figure 20: Connecting a Grounding Cable to the PTX10008



6. Place the two screws over the grounding lug and grounding cable.

7. Tighten the two 10-32 screws using a Phillips screwdriver and apply torque between of 30.1 in.-lb (3.4 N-m) and 42.04 in.-lb (4.75 N-m).

8. Dress the grounding cable and ensure that it does not touch or block access to other device components and that it does not drape where people can trip over it.

Install AC Power Supplies (JNP10K-PWR-AC)

The JNP10K-PWR-AC power supplies are 2700-W and support 200–240 VAC. The output is 12 VDC; the output power is 2700 W.

CAUTION: Use the same type of power supply in all slots. Do not mix power supply models in the same chassis.

NOTE: See the heat symbol 

. Wear heat-resistant hand gloves while accessing the fan tray and power supply.

Ensure that you have the following parts and tools available to install a JNP10K-PWR-AC power supply:

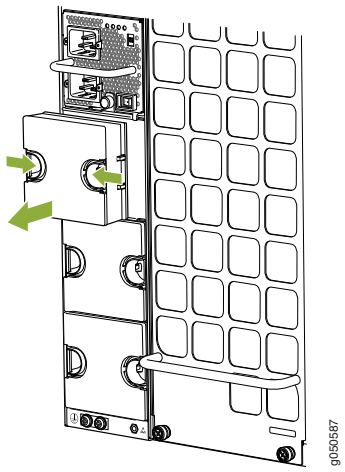
- Electrostatic discharge (ESD) grounding strap
- Phillips (+) screwdriver, number 1
- Power cords appropriate for your geographical location.
- Power cord retainer clips

To install an AC power supply in a PTX10008:

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis. There is an ESD point located next to the protective earthing terminal and below **PSU 5** on the PTX10008 rear panel (see Figure 19).

2. If the power supply slot has a cover panel on it, insert your thumb and forefinger into the finger holes, squeeze and pull the cover out of the slot. Save the cover for later use. See Figure 21 for removal on a PTX10008.

Figure 21: Removing the PSU Cover Panel on a PTX10008



3. Taking care not to touch power supply connections, remove the power supply from its bag.

4. Peel back and remove the protective plastic wrap that covers all four sides of the power supply.

5. Ensure the power switch is set to the standby (**O**) position. This switch turns off the output voltage; it does not interrupt AC supply.

6. Unscrew the captive screw in the counterclockwise direction by using the Phillips (+) screwdriver, number 1.

7. Rotate the captive screw away from the faceplate of the power supply to release the latch.

> **NOTE:** You can install the power supplies in any slot labeled **PSU 0** through **PSU 5** (top to bottom) on a PTX10008.

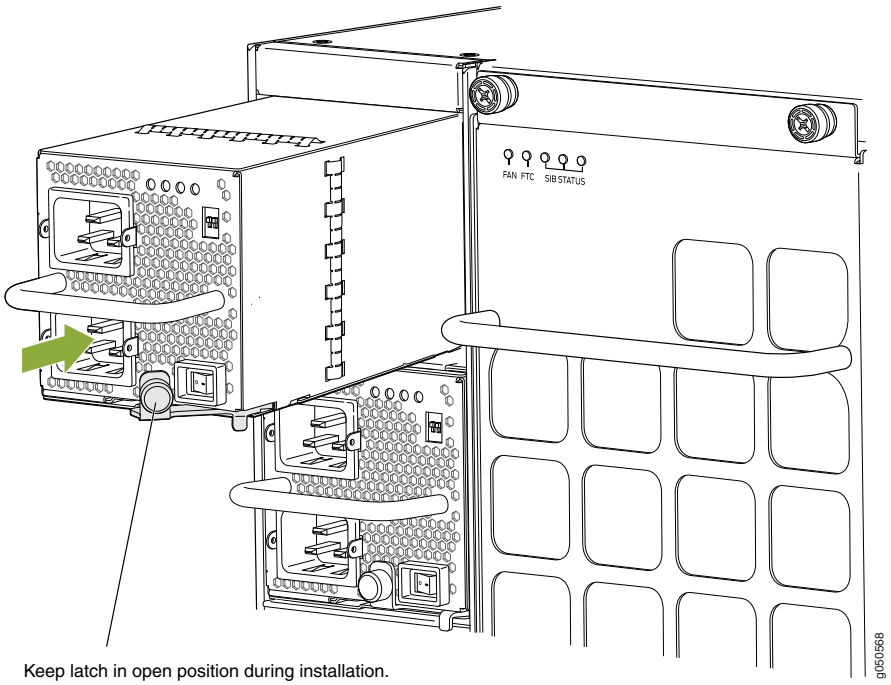
8. Using both hands, place the power supply in the power supply slot on the rear of the system.

9. Slide the power supply straight into the chassis until the power supply is fully seated in the slot. Ensure the power supply faceplate is flush with any adjacent power supply faceplates or power supply cover panels (see Figure 22).

10. Push the captive screw into the power supply faceplate. Ensure that the screw is seated inside the corresponding hole on the faceplate.

11. Tighten the captive screw by turning it clockwise by using the Phillips (+) screwdriver, number 1. When the screw is completely tight, the latch locks into the router chassis.

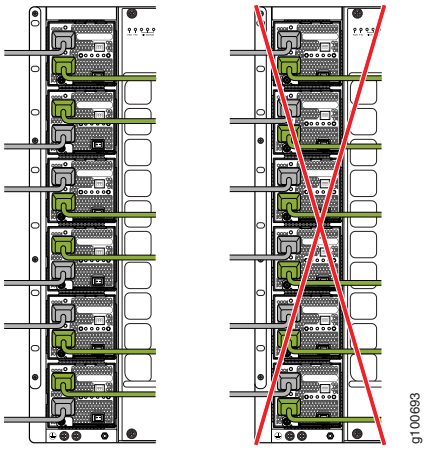
Figure 22: Installing a JNP10K-PWR-AC Power Supply in a PTX10008



NOTE: Ensure that the ejector is fully open to avoid scratching the chassis.

12. Manually load balance the power supplies as you attach each power cable to a dedicated AC power source outlet. To load balance, route the power cables to alternate between power sources. The JNP10K-PWR-AC does not share power; all power comes into INP1 (lower receptacle) and only uses INP2 (top receptacle) at fail over. See Figure 23.

Figure 23: Proper Load Balancing for JNP10K-PWR-AC Power Cables on PTX10008



WARNING: Ensure that the power cords do not block access to router components or drape where people can trip on them.

13. Squeeze the two sides of the power cord retainer clip and insert the ends of the clip into the holes in the bracket on each side of the AC appliance inlets on the AC power supply faceplate. See Figure 24.

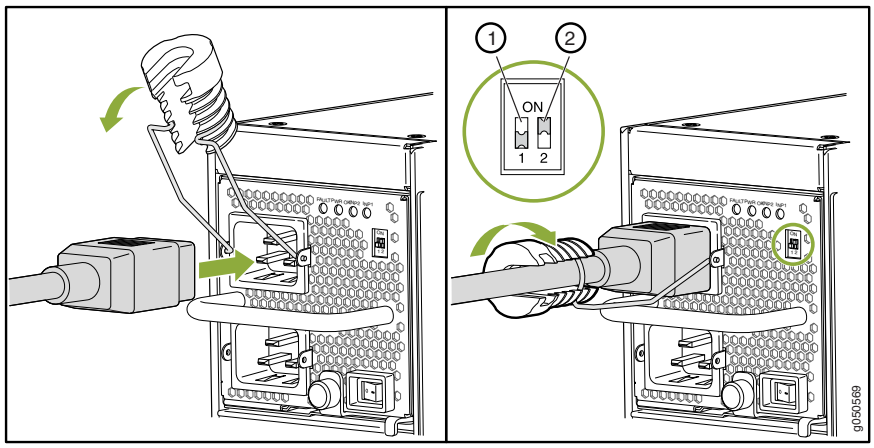
14. Locate two power cords shipped with the router; the cords have plugs appropriate for your geographical location.

15. Insert the power cord coupler into the power supply.

    Each AC power supply has two independent 16 A rated AC inlets on the faceplate. Each inlet must be connected to a dedicated AC power feed to achieve 2*n* source redundancy. If redundancy is not a requirement, use the default input **INP1** for a single connection.

16. Fasten the cord retainer by lowering the clip over the cord and pushing the cord into the adjustment nut of the cord retainer. Rotate the nut until it is tight against the base of the cord. See Figure 24.

Figure 24: Power Cord and Retainer Clip



1—Enable switch for **INP1** appears as INP0 in output.	2—Enable switch for **INP2** appears as INP1 in output.

WARNING: Ensure that the power cords do not block access to router components or drape where people can trip on them.

17. If the AC power source outlets have a power switch, set them to the on (|) position.

18. Move the enable switches for input 1 and input 2 to the **ON** position.

19. Verify that the **INP1** and **INP2** LEDs on the power supply faceplate are lit and are on steadily.

20. Press the power switch to the on (|) position.

Install AC/HVAC/HVDC Power Supplies (JNP10K-PWR-AC2)

The JNP10K-PWR-AC2 power supply is a high-capacity, high-line model that is designed to support either AC or DC systems in either a low power or high power mode. The power supply takes AC input and provides DC output of 12.3 VDC, 5000 W with a single feed and 5500 W with a dual feed. For AC systems, the operating input voltage is 180 to 305 VAC and for DC systems, the operating input voltage is 190 to 410 VDC.

CAUTION: Use the same type of power supply in all slots. Do not mix power supply models in the same chassis.

WARNING: Protect yourself from severe burns by wearing heat-protective gloves when removing a running JNP10K-PWR-AC2 power supply from the chassis. The power supply can reach 158°F (70°C).

Ensure that you have the following parts and tools available to install an JNP10K-PWR-AC2 power supply:

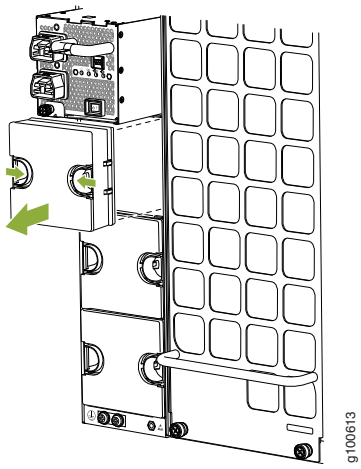
- Electrostatic discharge (ESD) grounding strap
- Phillips (+) screwdriver, number 1
- Power cables appropriate for your geographical location (for low-voltage installations) or input amperage (for high-voltage installations). HVAC and HVDC connectors and lugs must be installed by a qualified electrician before installation.

To install a JNP10K-PWR-AC2 power supply in a PTX10008 or a PTX10016:

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis. There is an ESD point located next to the protective earthing terminal and below **PSU5** on the PTX10008 rear panel (see Figure 19).

2. If the power supply slot has a cover on it, insert your thumb and forefinger into the finger holes, squeeze, and pull the cover out of the slot. Save the cover for later use. See Figure 25 for removal on a PTX10008 .

   Figure 25: Removing the Power Supply Cover on a PTX10008



3. Taking care not to touch power supply connections, remove the power supply from its bag.

4. Peel back and remove the protective plastic wrap that covers all four sides of the power supply.

5. Ensure the power switch is set to the standby (**O**) position. This switch turns off the output voltage; it does not interrupt input power.

6. Unscrew the captive screw in the counterclockwise direction by using the Phillips (+) screwdriver, number 1.

7. Rotate the captive screw away from the faceplate of the power supply to release the latch.

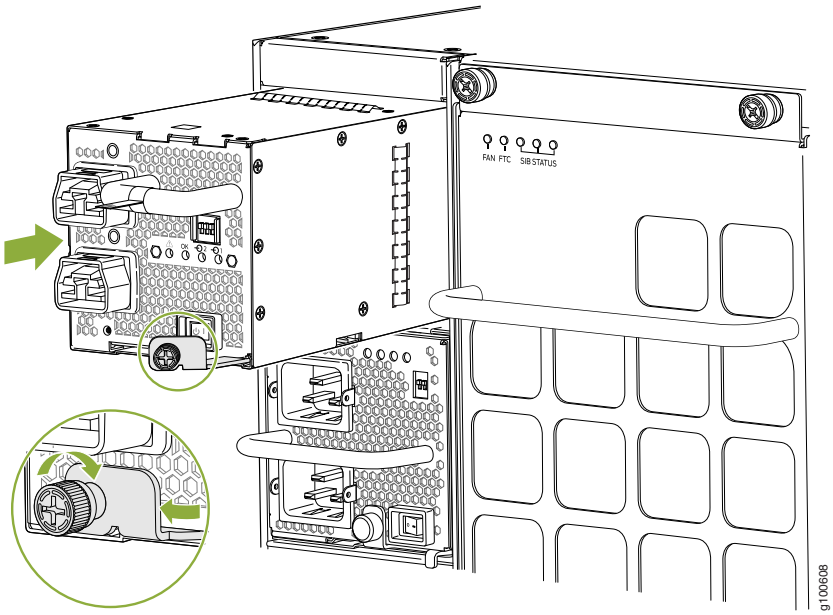
> **NOTE:** You can install the power supplies in any slot labeled **PSU 0** through **PSU 5** (top to bottom) on a PTX10008.

8. Using both hands, place the power supply in the power supply slot on the rear of the system. Slide the power supply straight into the chassis until the power supply is fully seated in the slot. Ensure the power supply faceplate is flush with any adjacent power supply faceplates or power supply covers (see Figure 26).

9. Push the captive screw into the power supply faceplate. Ensure that the screw is seated inside the corresponding hole on the faceplate.

10. Tighten the captive screw by turning it clockwise by using the Phillips (+) screwdriver, number 1. When the screw is completely tight, the latch locks into the router chassis.

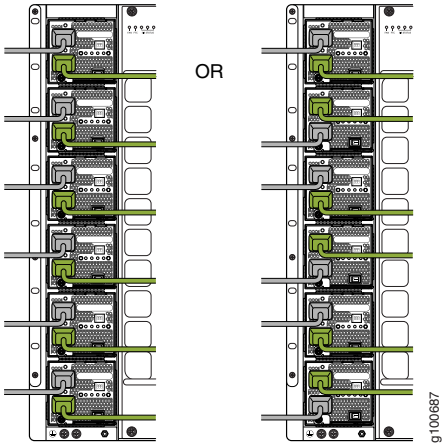
Figure 26: Installing a JNP10K-PWR-AC2 in a PTX10008



> **NOTE:** The power supply fans will start immediately when inserted into the chassis, even though a feed is not yet connected.

11. Attach each power cable to a dedicated power (A and B). The JNP10K-PWR-AC2 only requires that each power supply be connected to a separate source. See Figure 27 for some possible cabling combinations for PTX10008.

Figure 27: Proper Load Balancing for JNP10K-PWR-AC2 Power Cables on PTX10008



12. For each power cable, insert the end of the cable with the Anderson connector into the JNP10K-PWR-AC2 power supply module. The connector snaps and locks the cable into position.

> **WARNING:** Ensure that the power cords do not block access to router components or drape where people can trip on them.

13. If the AC or DC power source outlets have a power switch, set them to the on (|) position.

14. Set the three dip switches to set the inputs and whether the power supply is running at 3000 W, 5000 W, or 5500 W. See Table 2.

    Set both enable switches to the **on** position when using both source inputs. When not using source redundancy, set the unused source to the **O** (off) position. The LED turns red and indicates an error if a source input is not in use and the enable switch is **|** (on).

Table 2: Setting the JNP10K-PWR-AC2 Dip Switches

Switch	State	Field
1	On	IP0 is present
	Off	IP0 is not present
2	On	IP1 is present
	Off	IP1 is not present
3	On	Enabled for 30 A feed; 5000-W for a single feed, 5500-W for dual feeds
	Off	Enabled for 20 A feed; power supply capacity is 3000-W

15. Verify that the **INP1** and **INP2** LEDs on the power supply faceplate are lit and are on steadily.

16. Press the power switch to the on (|) position.

Install DC Power Supplies (JNP10K-PWR-DC)

The JNP10K-PWR-DC power supply in a PTX10008 chassis is a hot-removable and hot-insertable field-replaceable unit (FRU). You can install up to 6 JNP10K-PWR-DC power supplies in a PTX10008 router chassis. All power supplies install in the rear of the chassis in the slots along the left side of the chassis.

Before you install a JNP10K-PWR-DC power supply in the chassis, ensure that you have followed all safety warnings and cautions:

CAUTION: Use the same type of power supply in all slots. Do not mix power supply models in the same chassis.

WARNING: Before performing DC power procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

CAUTION: Before you connect power to the router, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the router (for example, by causing a short circuit).

CAUTION: To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect PTX10000 routers to earth ground before you connect them to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the router chassis to connect to earth ground. For instructions on connecting a PTX10000 router to ground using a separate grounding conductor, see “Ground the PTX10008” on page 20.

NOTE: The battery returns of the JNP10K-PWR-DC power supply must be connected as an isolated DC return (DC-I).

- Ensure that you have the following parts and tools available to install a JNP10K-PWR-DC power supply:

- Electrostatic discharge (ESD) grounding strap
- DC power source cables (not provided) with the cable lugs (provided) attached

  The provided terminal lugs in a PTX10008 are sized for either4 AWG (21.1 mm^2) or 6 AWG (13.3 mm^2) power source cables. When running all JNP10K-PWR-DC power supply modules in the chassis, the DC power source cables that you provide must be 6 AWG (13.3 ^{2}) mm^2) stranded wire. We recommend that you install heat-shrink tubing insulation around the crimped section of the power cables and lugs.

> **NOTE:** See the heat symbol  . Wear heat-resistant gloves while accessing the fan tray and power supply.

- 13/32 in. (10 mm) nut driver or socket wrench
- Phillips (+) screwdrivers, numbers 1 and 2
- Multimeter

To install a JNP10K-PWR-DC power supply in a PTX10008 (see Figure 31):

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis. There is an ESD point located next to the protective earthing terminal and below **PSU 5** on the PTX10008 rear panel (see Figure 19)

2. Taking care not to touch power supply components, pins, leads, or solder connections, remove the power supply from its bag.

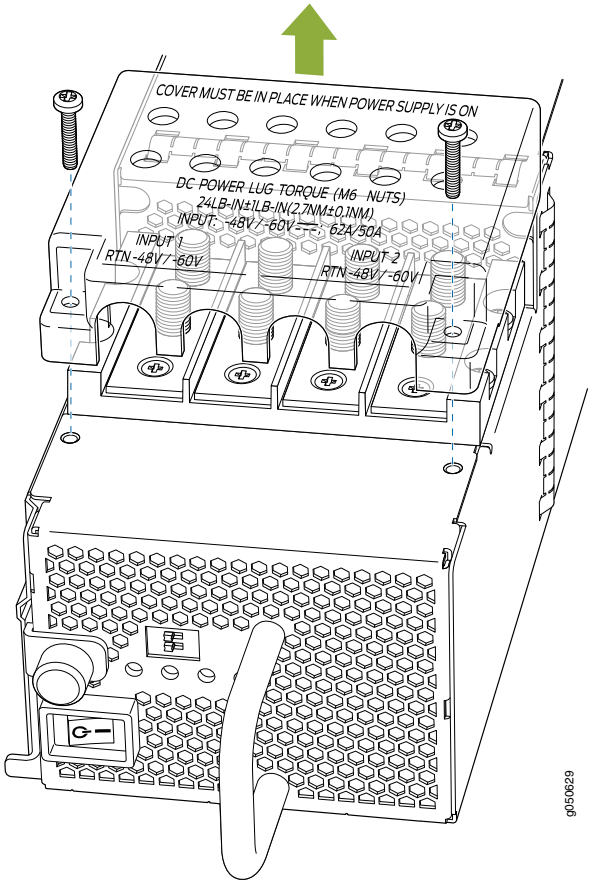
> **CAUTION:** See the heat symbol  . The power supply surfaces are hot. Allow a few minutes for the power supply to cool by pulling the power supply halfway out of the chassis, or wear heat-resistant gloves while removing the power supply.

3. Peel back and remove the protective plastic wrap that covers all four sides of the power supply.

4. Ensure the power switch is set to the standby (**O**) position. This switch turns off the output voltage; it does not interrupt DC.

5. Remove the plastic cable cover from the DC power input terminals by using the Phillips (+) screwdriver, number 2, to loosen the screws (see Figure 28).

Figure 28: Removing the Plastic Cable Cover on a JNP10K-PWR-DC Power Supply



6. Remove the nuts from each DC power input terminal, using the 13/32 in. (10 mm) nut driver or socket wrench to loosen the nuts.

7. Ensure that the power source circuit breaker is open so that the voltage across the DC power source cable leads is 0 V and that the cable leads do not become active while you are connecting DC power.

8. Install a power lug on each DC power cable. Ensure the lug meets the double hole standard lug terminal for 4 AWG wire. The lugs should be dual, 1/4 in. spaced 5/8 in. apart. The terminal must accommodate double hole standard lug terminal for 4 AWG or larger wire.

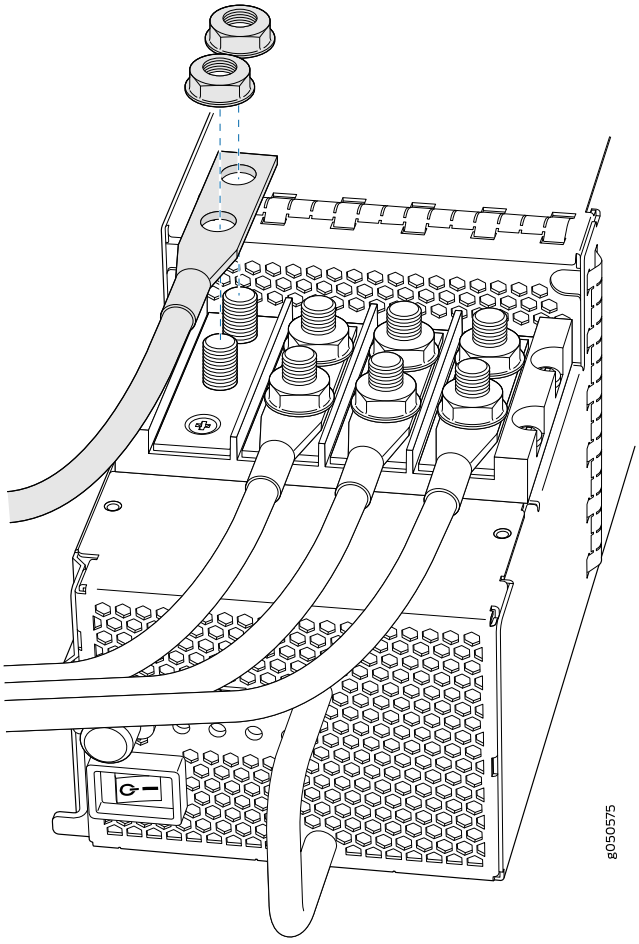
9. Verify that the DC power cables are correctly labeled before making connections to the power supply. In a typical power distribution scheme where the return is connected to chassis ground at the battery plant, you can use a multimeter to verify the resistance of the **–48V** and **RTN** DC cables to chassis ground:

   - The cable with very high resistance (indicating an open circuit) to chassis ground is negative (–) and will be installed on the **–48V** (input) DC power input terminal.
   - The cable with very low resistance (indicating a closed circuit) to chassis ground is positive (+) and will be installed on the **RTN** (return) DC power input terminal.

CAUTION: You must ensure that power connections maintain the proper polarity. The power source cables might be labeled **(+)** and **(–)** to indicate their polarity. There is no standard color coding for DC power cables.

10. Install each power cable lug on the DC power input terminal, securing it with the nut (see Figure 29). Apply between 24 in.-lb (2.7 Nm) and 25 in.-lb (2.8 Nm) of torque to each nut. (Use the 13/32 in. [10 mm] nut driver or socket wrench.)
    a. Secure each positive **(+)** DC source power cable lug to the **RTN** (return) DC power input terminal.
    b. Secure each negative **(–)** DC source power cable lug to the **–48V** (input) DC power input terminal.

Figure 29: Connecting the DC Power Supply Cables to a JNP10K-PWR-DC

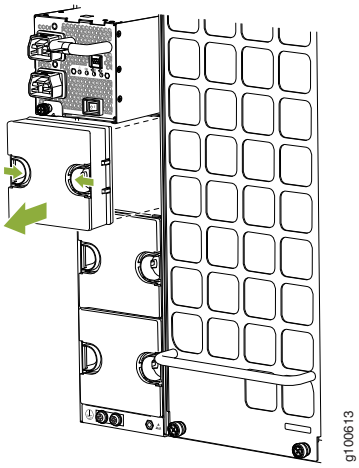


Each power supply has two independent sets of DC power input terminals (**INPUT 1: RTN –48V/–60V**: and **INPUT 2: : RTN –48V/–60V**). For feed redundancy, each power supply must be powered by dedicated power feeds derived from feed **INPUT 1** and feed **INPUT 2**. This configuration provides the commonly deployed INPUT 1 / INPUT 2 feed redundancy for the router. There is basic insulation between the inputs and the chassis ground. Also, there is basic insulation between RTN input feeds.

11. Install the plastic cable cover over each set of power cables by using the Phillips (+) screwdriver, number 2, to tighten the screw.

12. If the power supply slot on the chassis has a cover on it, insert your thumb and forefinger into the finger holes, squeeze, and pull the cover out of the slot. Save the cover for later use (see Figure 30 for PTX10008 installations).

Figure 30: Removing the PSU Cover on a PTX10008



13. Unscrew the captive screw in the counterclockwise direction by using the Phillips (+) screwdriver, number 1.

14. Pull the captive screw away from the faceplate of the power supply to release the latch.

> **NOTE:** You can install the power supplies in any slot labeled **PSU 0** through **PSU 5** (top to bottom) on a PTX10008.

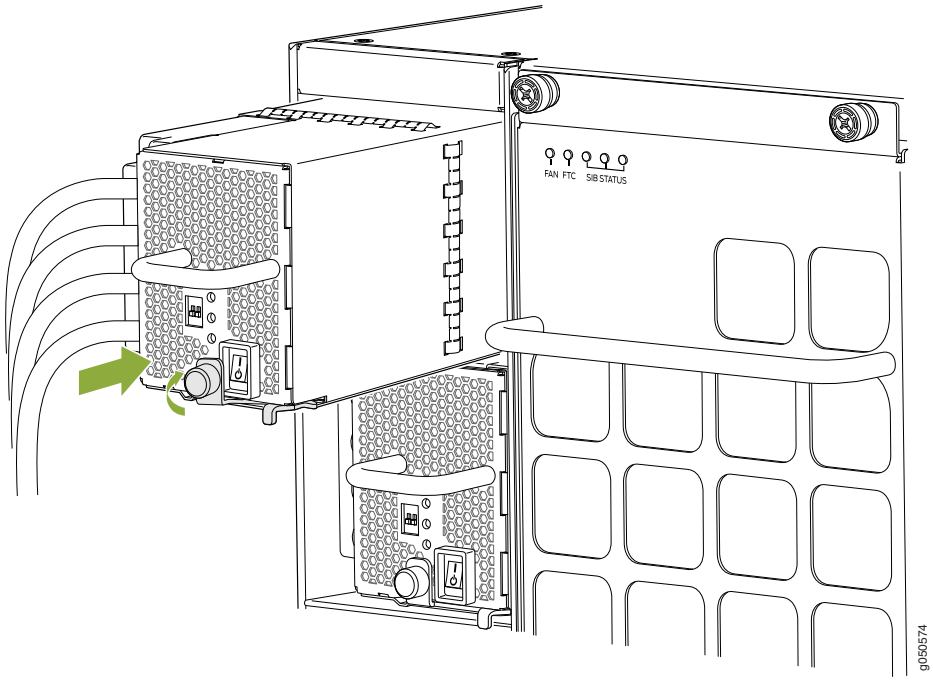
15. Using both hands, place the power supply in the power supply slot on the rear of the router.

16. Slide the power supply straight into the chassis until the power supply is fully seated in the slot. Ensure the power supply faceplate is flush with any adjacent power supply faceplates or power supply cover panels (see Figure 31).

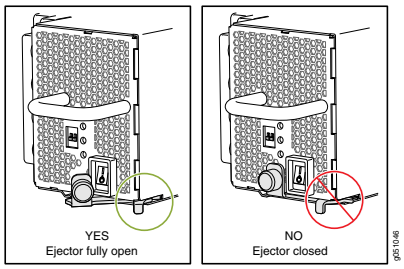
17. Push the captive screw into the power supply faceplate. Ensure that the screw is seated inside the corresponding hole on the faceplate.

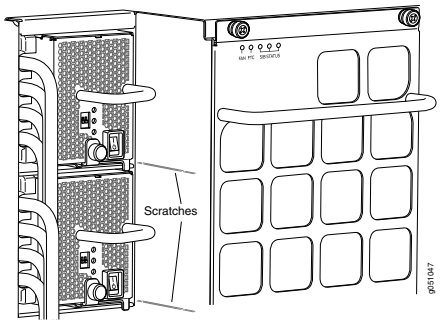
18. Tighten the captive screw by turning it clockwise by using the Phillips (+) screwdriver, number 1. When the screw is completely tight, the latch locks into the router chassis.

Figure 31: Installing a JNP10K-PWR-DC Power Supply in a PTX10008



NOTE: Ensure that the ejector is fully open to avoid scratching the chassis.





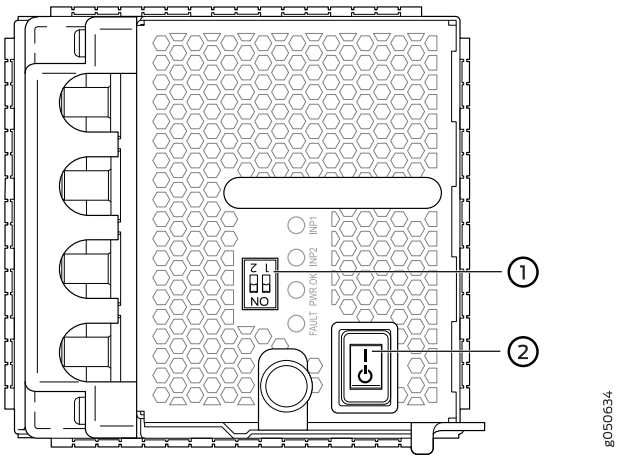
19. Route INP1 cables to a power source and INP2 to another power source. The JNP10K-PWR-DC shares power, so if power dips on one input, the power supply is able to load balance internally.

WARNING: Ensure that the power cords do not block access to router components or drape where people can trip on them.

20. Set the enable switches for input 1 and input 2 (see Figure 32).

Set both enable switches to the **|** (on) position when using both source inputs. When not using source redundancy, set the unused source to the off (**O**) position. The LED turns red and indicates an error if a source input is not in use and the enable switch is on (|).

Figure 32: Setting the Enable Switches for the Power Source



1—Dip switches for enabling input sources	2—Power switch, on (|) and standby (**o**)

21. Verify that the input 1 and 2 LEDs on the power supply faceplate are lit and are on steadily.

22. Press the power switch to the on (|) position.

Install Dual DC Power Supplies (JNP10K-PWR-DC2)

The JNP10K-PWR-DC2 power supply provides two power supplies in a single housing that accepts either 60 A or 80 A using four redundant input power feeds. PS_0 and PS_1 each have redundant input feeds: A0 and/or B0 for PS_0 and A1 and/or B1 for PS_1. The input is configured using a set of dip switches on the power supply faceplate. The output is dependant on the settings of these dip switches.

Before you install an JNP10K-PWR-DC2 power supply in the chassis, ensure that you have followed all safety warnings and cautions:

WARNING: Before performing DC power procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the off (**O**) position, and tape the switch handle of the circuit breaker in the off position.

WARNING: Protect yourself from severe burns by wearing heat-protective gloves when removing a working dual DC power supply from the chassis. Power supplies can reach 158°F(70°C).

CAUTION: Before you connect power to the router, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the router (for example, by causing a short circuit).

CAUTION: Use the same type of power supply in all slots. Do not mix power supply models in the same chassis.

NOTE: The battery returns of the JNP10K-PWR-DC2 power supply must be connected as an isolated DC return (DC-I).

- Ensure that you have the following parts and tools available to install a DC power supply:
  - Electrostatic discharge (ESD) grounding strap
  - Use high current cable assembly, CBL-PWR2-BARE (not provided) with the cable lugs (provided) attached

    The provided terminal lugs for the JNP10K-PWR-DC2 are Panduit LCD4-14A-L, or equivalent, and sized for 4 AWG (21.1 mm^2) power source cables. We recommend that you install heat-shrink tubing insulation around the crimped section of the power cables and lugs.
  - 13/32 in. (10 mm) nut driver or socket wrench
  - Phillips (+) screwdrivers, numbers 1 and 2
  - Multimeter

To install a JNP10K-PWR-DC2 power supply in a PTX10008:

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis. There is an ESD point located next to the protective earthing terminal and below **PSU 5** on the PTX10008 rear panel (see Figure 19).

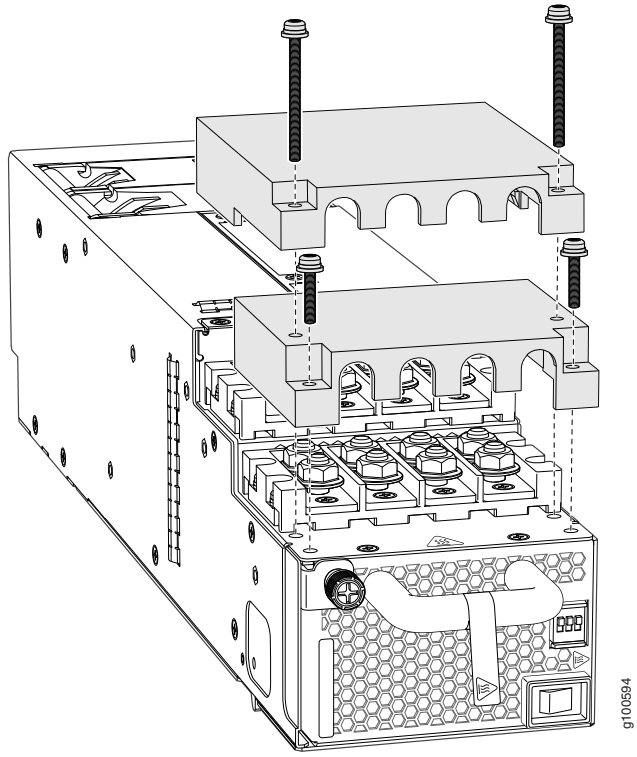
2. Taking care not to touch power supply components, pins, leads, or solder connections, remove the power supply from its bag.

3. Peel back and remove the protective plastic wrap that covers all four sides of the power supply.

4. Ensure the power switch is set to the standby (**O**) position. This switch turns off the output voltage; it does not interrupt DC.

5. Remove the plastic cable cover from the power input terminals by using the Phillips (+) screwdriver, number 2, to loosen the screws (see Figure 33).

Figure 33: Removing the Plastic Cable Cover on a JNP10K-PWR-DC2 Power Supply



6. Remove the nuts from each DC power input terminal, using the 13/32 in. (10 mm) nut driver or socket wrench to loosen the nuts.

7. Ensure that the power source circuit breaker is open so that the voltage across the DC power source cable leads is 0 V and that the cable leads do not become active while you are connecting DC power.

8. Verify that the DC power cables are correctly labeled before making connections to the power supply. In a typical power distribution scheme where the return is connected to chassis ground at the battery plant, you can use a multimeter to verify the resistance of the **–48V** and **RTN** DC cables to chassis ground:

   - The cable with very high resistance (indicating an open circuit) to chassis ground is negative (–) and will be installed on the **–48V** (input) DC power input terminal.
   - The cable with very low resistance (indicating a closed circuit) to chassis ground is positive (+) and will be installed on the **RTN** (return) DC power input terminal.

> **CAUTION:** You must ensure that power connections maintain the proper polarity. The power source cables might be labeled **(+)** and **(–)** to indicate their polarity. There is no standard color coding for DC power cables.

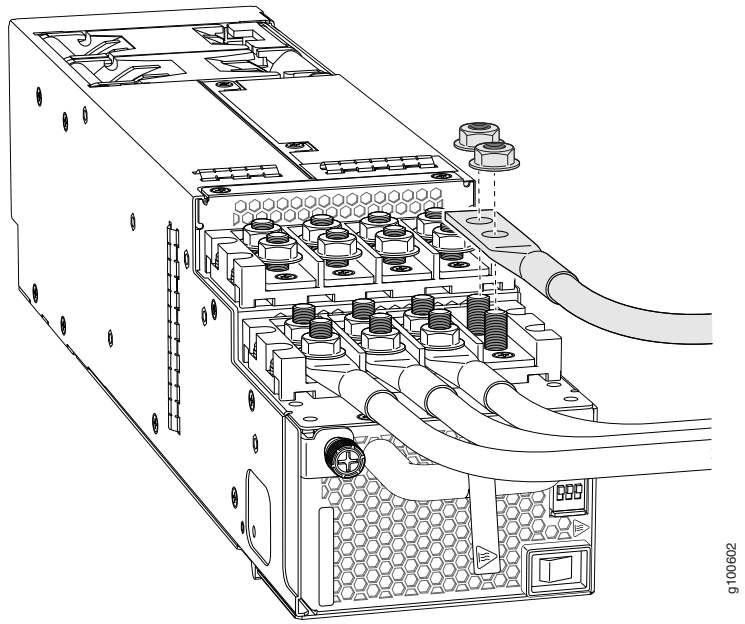
9. Install each power cable lug on the DC power input terminal, securing it with the nut (see Figure 34). Apply between 24 in.-lb (2.7 N-m) and 25 in.-lb (2.8 N-m) of torque to each nut. (Use the 13/32 in. [10 mm] nut driver or socket wrench.)

   a. Secure each positive **(+)** DC source power cable lug to the **RTN** (return) DC power input terminal.

   b. Secure each negative **(–)** DC source power cable lug to the **–48V** (input) DC power input terminal.

   Each power supply has two independent sets of DC power input terminals (**INPUT 1: RTN –48V/–60V**: and **INPUT 2: : RTN –48V/–60V**). For feed redundancy, each power supply must be powered by dedicated power feeds derived from feed **INPUT 1** and feed **INPUT 2**. This configuration provides the commonly deployed INPUT 1 / INPUT 2 feed redundancy for the router. There is basic insulation between the inputs and the chassis ground. Also, there is basic insulation between RTN input feeds.

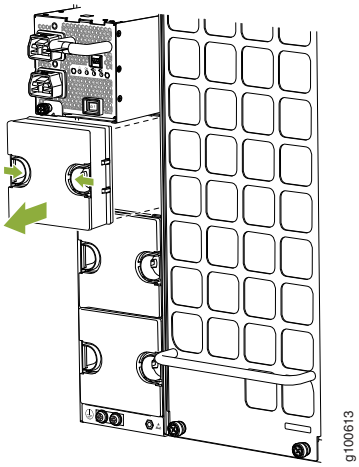
Figure 34: Connecting the DC Power Supply Cables to a JNP10K-PWR-DC2



10. Install the plastic cable cover over each set of power cables by using the Phillips (+) screwdriver, number 2, to tighten the screw.

11. If the power supply slot on the chassis has a cover on it, insert your thumb and forefinger into the finger holes, squeeze, and pull the cover out of the slot. Save the cover for later use (see Figure 35).

Figure 35: Removing the Power Supply Cover on a PTX10008



12. Unscrew the captive screw in the counterclockwise direction by using the Phillips (+) screwdriver, number 1.

13. Rotate the captive screw away from the faceplate of the power supply to release the latch.

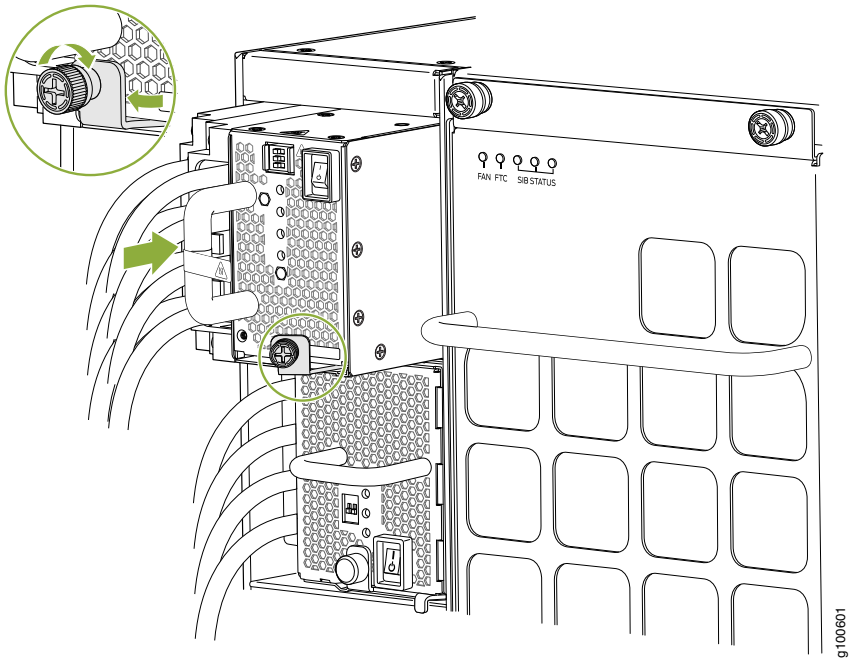
14. Using both hands, place the power supply in the power supply slot on the rear of the router. Slide the power supply straight into the chassis until the power supply is fully seated in the slot. The power supply will protrude from the chassis about 2 in. (5 cm) (see Figure 36).

    NOTE: The power supply fans will start immediately when inserted into the chassis.

15. Push the captive screw into the power supply faceplate. Ensure that the screw is seated inside the corresponding hole on the faceplate.

16. Tighten the captive screw by turning it clockwise by using the Phillips (+) screwdriver, number 1. When the screw is completely tight, the latch locks into the router chassis.

Figure 36: Installing a JNP10K-PWR-DC2 in PTX10008



17. Route INP1 cables to a power source and INP2 to another power source. The JNP10K-PWR-DC shares power, so if power dips on one input, the power supply is able to load balance internally.

> **WARNING:** Ensure that the power cords do not block access to router components or drape where people can trip on them.

18. Set the three dip switches to set the inputs and whether the power supply is running at 3000 W, 5000 W, or 5500 W. See Table 3 and Figure 37.

    Set both enable switches to the **on** position when using both source inputs. When not using source redundancy, set the unused source to the **O** (off) position. The LED turns red and indicates an error if a source input is not in use and the enable switch is **|** (on).

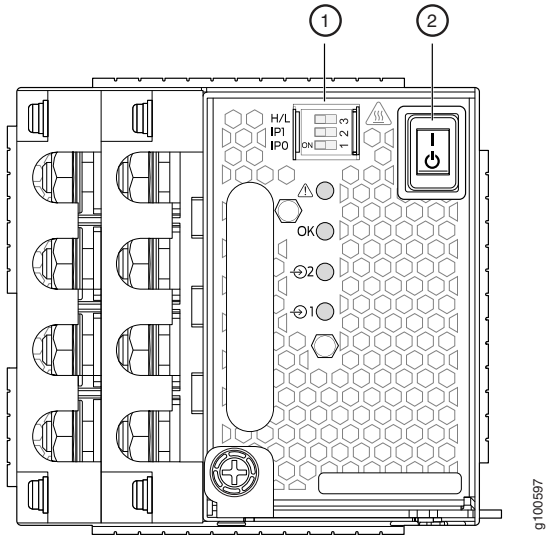
Table 3: Setting the JNP10K-PWR-DC2 Dip Switches

Switch	State	Field
1	On	IP0 is present
	Off	IP0 is not present
2	On	IP1 is present
	Off	IP1 is not present

Table 3: Setting the JNP10K-PWR-DC2 Dip Switches *(continued)*

Switch	State	Field
3	On	Enabled for 80 A feed; 5000-W for a single feed, 5500-W for dual feeds
	Off	Enabled for 60 A feed; power supply capacity is 3000-W

Figure 37: Setting the Enable Switches for the Power Source



1–Dip switches	2–Power switch, on (|) and standby (**O**)

19. Verify that the input 1 and 2 LEDs on the power supply faceplate are lit and are on steadily.

20. Press the power switch to the on (|) position.

Step 7–Connecting to the Network

You can configure and manage the PTX10008 by using a dedicated console. Every control board has a console port with an RJ-45 connector. Use the console port to connect the device to the management console or to a console server. The console port accepts a cable with an RJ-45 connector.

Ensure that you have an Ethernet cable with an RJ-45 connector available. An RJ-45 cable and an RJ-45 to DB-9 serial port adapter are supplied with the device.

NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to the device, use a combination of the RJ-45 to DB-9 female adapter supplied with the device and a USB to DB-9 male adapter. You must provide the USB to DB-9 male adapter.

To connect the PTX10008 to the network using the console port:

1. Connect one end of the Ethernet cable into the console port labeled **CON**on the control board.

2. Connect the other end of the Ethernet cable into the console server.

Step 8–Perform the Initial Configuration

You must perform the initial configuration of the PTX10008 through the console port using the CLI or through Zero Touch Provisioning (ZTP). In order to use ZTP to provision the device, you must have access to a Dynamic Host Control Protocol (DHCP) server, and a File Transfer Protocol (anonymous FTP), Hypertext Transfer Protocol (HTTP), or Trivial File Transfer Protocol (TFTP) server on which the software image and configuration files are stored. For more information about using ZTP for provisioning the device, see Understanding Zero Touch Provisioning in the *Installation and Upgrade Guide*.

Before you begin connecting and configuring the router, set the following parameter values on the console server or PC:

- Baud Rate—9600
- Flow Control—None
- Data—8
- Parity—None
- Stop Bits—1
- DCD State—Disregard

To connect and configure the router from the console:

1. Connect the console port to a laptop or PC using the supplied RJ-45 cable and RJ-45 to DB-9 adapter. The console (**CON**) port is located on the port panel of the router.

2. Log in as **root**. There is no password. If the software booted before you connected to the console port, you might need to press the Enter key for the prompt to appear.

   ```
   login: root
   ```

3. Start the CLI.

   ```
   root@% cli
   ```

4. Enter configuration mode.

   ```
   root> configure
   ```

5. Add a password to the root administration user account.

   ```
   [edit]
   root@# set system root-authentication plain-text-password
   New password: password
   Retype new password: password
   ```

6. (Optional) Configure the name of the router. If the name includes spaces, enclose the name in quotation marks (“ ”).

   ```
   [edit]
   root@# set system host-name host-name
   ```

7. Configure the default gateway.

   - For standard Junos OS systems:

     ```
     [edit]
     root@# set routing-options static route default next-hop address
     ```

   - For Junos OS Evolved system:

     ```
     [edit]
     root@# set system management-instance
     root@# set routing-instances mgmt_junos routing-optins static route prefix/prefix-length next-hop
     default-gateway-ip-address
     ```

8. Configure the IP address and prefix length for the router management interface.

   - For standard Junos OS systems:

     ```
     [edit]
     root@# set interfaces em0 unit 0 family inet address ip-address/prefix-length
     ```

   - For Junos OS Evolved systems:

     ```
     [edit]
     root@# set interfaces re0:mgmt-0 unit 0 family inet address ip-address/prefix-length
     ```

     CAUTION: Although the CLI permits you to configure two management Ethernet interfaces within the same subnet, only one interface is usable and supported.

> **NOTE:** The management ports, **em0** or **re0:mgmt-0** (**MGMT** for RJ-45 connections) and **em1** (also labeled **MGMT** for fiber connections), are found on the front of the RCBs of the PTX10008 router.

9. (Optional) Configure the static routes to remote prefixes with access to the management port.

```
[edit]
root@# set routing-options static route remote-prefix next-hop destination-ip retain no-readvertise
```

10. Enable services such as SSH and Telnet.

> **NOTE:** You will not be able to log in to the router as the **root** user through Telnet. Root login is allowed only through SSH.

```
[edit]
root@# set system services telnet
```

11. Commit the configuration to activate it on the router.

```
[edit]
root@# commit
```

Safety Warnings Summary

This is a summary of safety warnings. For a complete list of warnings, including translations, see *PTX10008 Hardware Guide* at https://www.juniper.net/documentation/.

> **WARNING:** Failure to observe these safety warnings can result in personal injury or death.

- Permit only trained and qualified personnel to install or replace router components.
- Perform only the procedures described in this quick start and the PTX10008 router documentation. Other services must be performed only by authorized service personnel.
- Before installing the router, read the planning instructions in the PTX10008 router documentation to make sure that the site meets power, environmental, and clearance requirements for the router.
- Before connecting the router to a power source, read the installation instructions in the PTX10008 router documentation.

- The weight of a chassis varies by the configuration. A chassis spare is the lightest at 273 lb (123.8 kg) and the weight goes up to 421 lb (191 kg) on the PTX10008-PREM3. Installing the PTX10008 router in a rack or cabinet requires either a mechanical lift or three people to lift the router and another person to secure it to the rack. To prevent injury, keep your back straight and lift with your legs, not your back.
- If the rack or cabinet has stabilizing devices, install them in the rack before mounting or servicing the router in the rack or cabinet.
- Before installing or after removing an electrical component, always place it component-side up on a flat antistatic mat or in an electrostatic bag.
- Do not work on the router or connect or disconnect cables during electrical storms.
- Before working on equipment that is connected to power lines, remove jewelry, including rings, necklaces, and watches. Metal objects heat up when connected to power and ground and can cause serious burns or become welded to the terminals.

CAUTION: Do not place a copper transceiver in an access port directly above or below another copper transceiver. Damage to the access ports will occur.

Power Cable Warning (Japanese)

The attached power cable is only for this product. Do not use this cable for another product. Contacting Juniper Networks For technical support, see *https://www.juniper.net/support/requesting-support.html*.

注意

附属の電源コードセットはこの製品専用です。
他の電気機器には使用しないでください。

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