Juniper Networks | Engineering Simplicity

MX2008 Universal Routing Platform

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MX2008 Quick Start Description

This Quick Start contains information to help you quickly install and configure the MX2008 Universal Routing Platform. For complete installation instructions, see the MX2008 Universal Routing Platform Hardware Guide at https://www.juniper.net/documentation/.

WARNING: This Quick Start contains a summary of safety warnings in "Safety Warnings" on page 70. For a complete list of warnings for this router, including translations, see the MX2008 Universal Routing Platform Hardware Guide at https://www.juniper.net/documentation/.

The MX2008 Universal Routing Platform is shipped in a wooden crate. A wooden pallet forms the base of the crate. The MX2008 chassis is bolted to this pallet. The shipping crate also contains a large rack mount tray, electromagnetic interference (EMI) cover, a cardboard accessory box, and a Quick Start (this document).

NOTE: The shipping container and router (fully populated) weighs approximately 1343 lb (609.17 kg), depending on your configuration.

The MX2008 Universal Routing Platform with standard cable managers and EMI cover measures 42 in. (106.68 cm) high, 19 in. (48.26 cm) wide, and 30.90 in. (78.49 cm) deep (from the front-mounting flanges to the rear of the chassis). An extended cable manager extends the total depth to 36.82 in. (93.53 cm).

One router can be installed in a 24-U or taller open-frame or four-post rack if the rack can support the combined weight, which can be greater than 664.8 lb (301.55 kg).

NOTE:

- The dimensions also include the cable managers and EMI cover.
- If you are installing the MX2008 router into a network cabinet, make sure that no hardware, device, rack, or cabinet components obstruct the 24-U rack space from access during installation.

The MX2008 router is 24 rack units (U) tall. One router can be installed in an open-frame rack, four-post rack, or cabinet. The MX2008 router has 10 dedicated line-card slots, which means a maximum of 10 Modular Port Concentrators (MPCs) including Adapter cards and Modular Interface Cards (MICs) can be installed on MX2008. ADCs provide housing to MPCs. The MPCs attach to the adapter cards, which in

turn connect to the backplane. Up to 2 MICs can be installed in each MPC. Fully populated, the MX2008 router supports up to 20 MICs. The MX2008 host subsystem consists of two Routing and Control Boards (RCBs). The RCB is an integrated board and a single FRU that provides Routing Engine and Control Board functionality and supports virtualization. The router contains 8 SFBs that provide 7+1 redundancy.

For a list of the supported MPCs and MICs, see the *MX Series Interface Module Reference*.

Step 1: Prepare the Site for Installation

IN THIS SECTION

- Rack-Mounting Requirements | 2
- Moving Requirements and Guidelines for Using a Router Transport Kit | 5
- Tools Required to Unpack and Prepare the Router for Installation | 8

Rack-Mounting Requirements

- You can install the router in an open-frame rack, a four-post rack, or a cabinet.

  NOTE: The shipping and installation site must be an electrostatic discharge (ESD)-approved area.

- The rack rails must be spaced widely enough to accommodate the chassis's external dimensions: 42 in. (106.68 cm) high, 19 in. (48.26 cm) wide, and 30.90 in. (78.49 cm) deep (measured from the front of cable manager to the rear of the chassis). An extended cable manager extends the total depth to 36.82 in. (93.53 cm) (measured from the front of cable manager to the rear of the chassis). See Figure 1 on page 4 and Figure 2 on page 5.

  In an open-frame rack, center-mounting is required to provide an even distribution of weight for greater stability. For center-mounting, use the mounting brackets attached to the center of the chassis for rack mounting.

- The rack must be strong enough to support the weight of the fully configured router, up to 742.2 lb (336.66 kg) for AC chassis, and 664.8 lb (301.55 kg) for DC chassis.
- For the cooling system to function properly, the airflow around the chassis must be unrestricted. Allow at least 36 in. (91.44 cm) of clearance between front-to-rear-cooled routers. Allow 2.8 in. (7 cm) between the side of the chassis and any non-heat-producing surface such as a wall.
- For service personnel to remove and install hardware components, there must be adequate space at the front and back of the router. Allow at least 36 in. (91.44 cm) in front of the router and 36 in. (91.44 cm) behind the router.
- The rack or cabinet must have an adequate supply of cooling air.
- Ensure that the cabinet allows the hot exhaust air of the chassis to exit from the cabinet without recirculating into the router.
- The router must have the shipping covers installed to help move the router into the rack or cabinet.
- The router must be installed into a rack or cabinet that is secured to the building structure.
- The cabinet must be clear of any hardware, device, rack, or cabinet component that obstructs the 24-U rack space from being accessed during installation.

Figure 1: MX2008 Rack Clearance and Router Dimensions for Four-Post Rack Installation

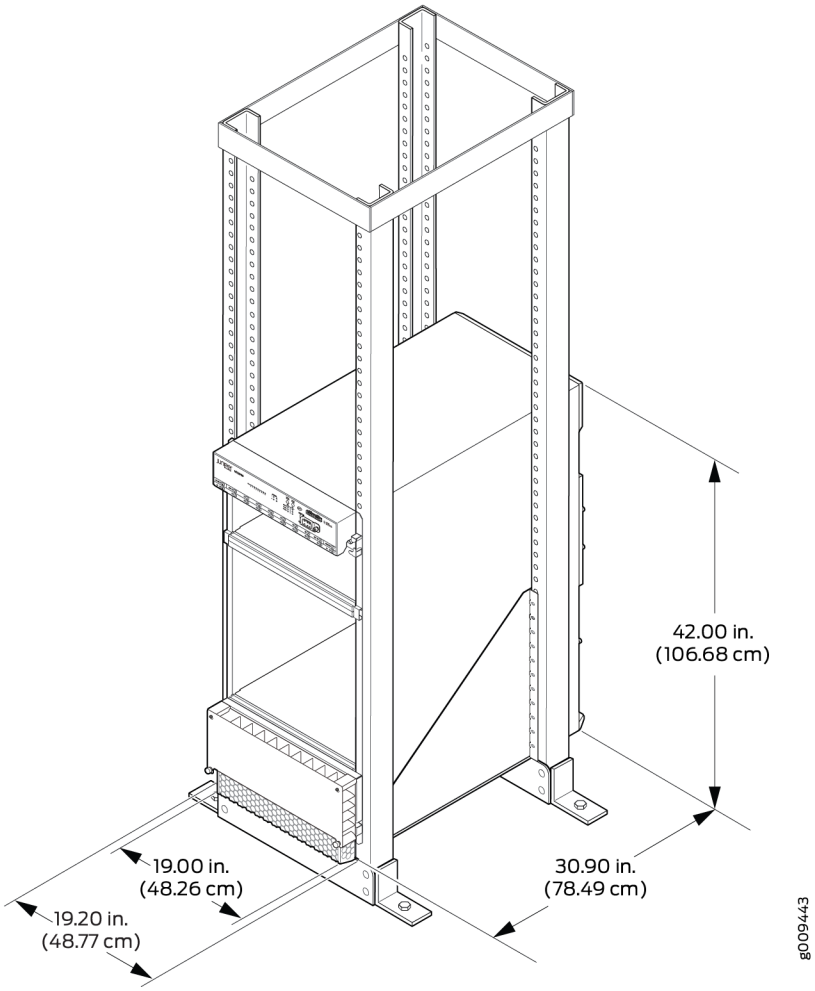
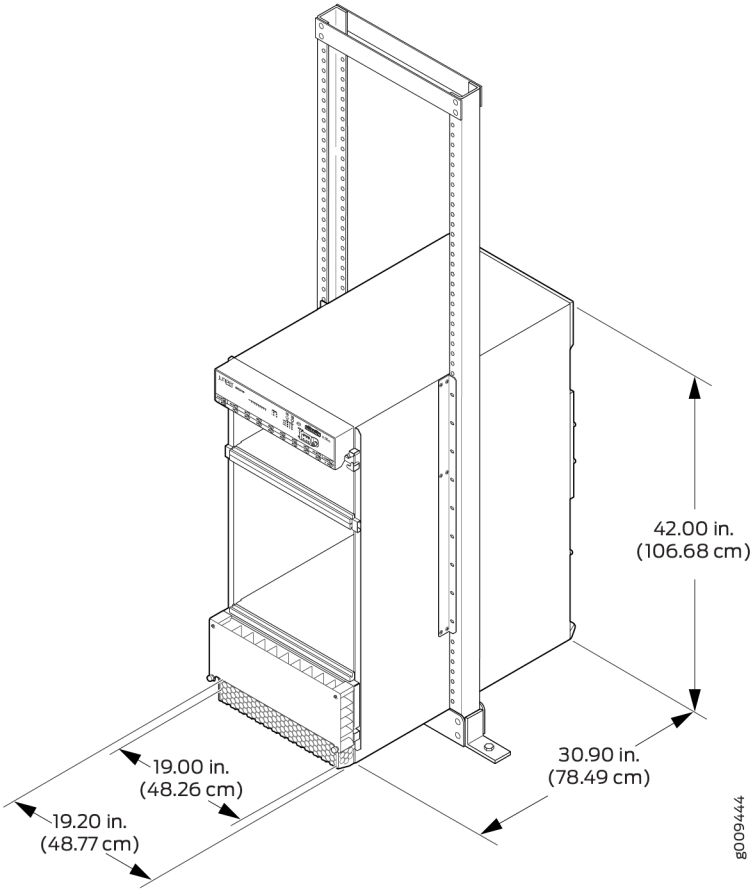


Figure 2: MX2008 Rack Clearance and Router Dimensions for Open-Frame Rack Installation

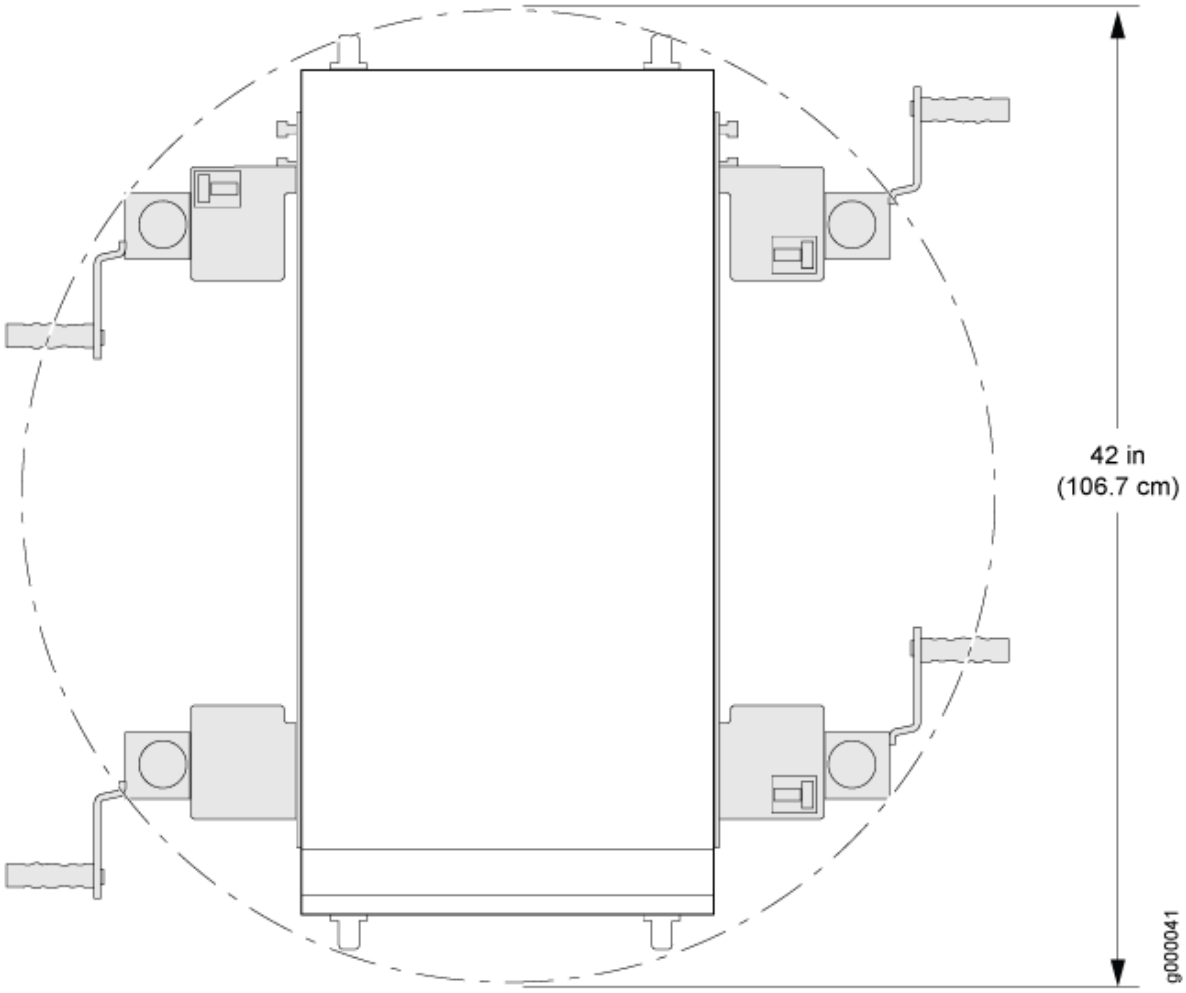


Moving Requirements and Guidelines for Using a Router Transport Kit

The router requires a minimum 42 in. (106.7 cm) diameter of space to turn the chassis on the router transport kit (see Figure 3 on page 6).

NOTE: The router transport kit handles can be removed to accommodate aisle width.

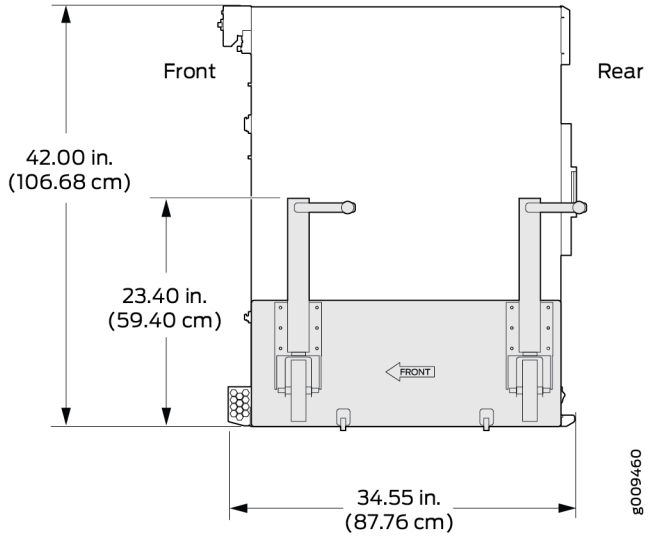
Figure 3: Turning Diameter of the Router Transport Kit



The weight of the router transport kit is 138.5 lb (63 kg). The maximum recommended height the router should be lifted from the floor by using the router transport kit is 1.5 in. (3.8 cm).

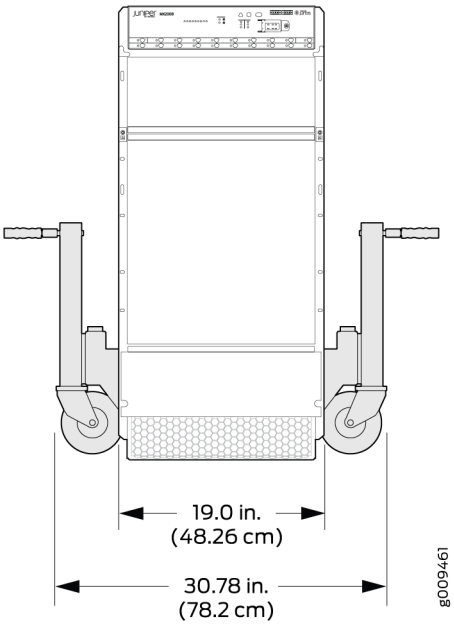
Viewed from the side, the router with the router transport kit installed measures 42 in. (106.7 cm) high and 36.20 in. (91.95 cm) wide, with the transport kit measuring 23.40 in. (59.4 cm) high (see Figure 4 on page 7).

Figure 4: Measurements of the Router Transport Kit Installed on the MX2008 (Side View)



Viewed from the front, the router with the router transport kit installed measures 30.78 in. (78.2 cm) wide (see Figure 5 on page 7).

Figure 5: Measurements of the Router Transport Kit Installed on the MX2008 (Front View)



Tools Required to Unpack and Prepare the Router for Installation

To unpack the router and prepare for installation, you need the following tools and equipment:

NOTE: We recommend that you install the MX2008 by using a pallet jack with attachment or a router transport kit.

- Router transport kit (model number MX2K-TRNSPRT-KIT)
- Standard pallet jack—48 in. (121.92 cm) deep x 27 in. (68.58 cm) wide.
- Pallet jack attachment (model number MX2000-PLLT-JCK-ADPTR)
- Front component shipping cover
- Rear component shipping cover
- Phillips (+) screwdrivers, numbers 1, 2, and 3
- 1/2-in. (12.7 mm) drive ratchet
- 1/4-in. (6.35 mm) torque-controlled driver or socket wrench to tighten the nuts on the router transport kit
- 1-1/8-in. (28.57 mm) torque-controlled driver or socket wrench to tighten the router transport kit winch mechanism
- 9/16-in. or 14-mm open-end or socket wrench with extension to remove the bracket bolts from the shipping pallet
- Electrostatic discharge wrist strap
- Antistatic mat

Step 2: Install the Mounting Hardware

A mounting shelf is required for installing the router in a four-post rack or cabinet. The shelf is not required for installing the router in an open-frame rack.

1. Slide the large shelf between the rack rails, resting the bottom of the shelf on the rack supports. The large shelf installs on the rear rack rails, extending toward the front of the rack.

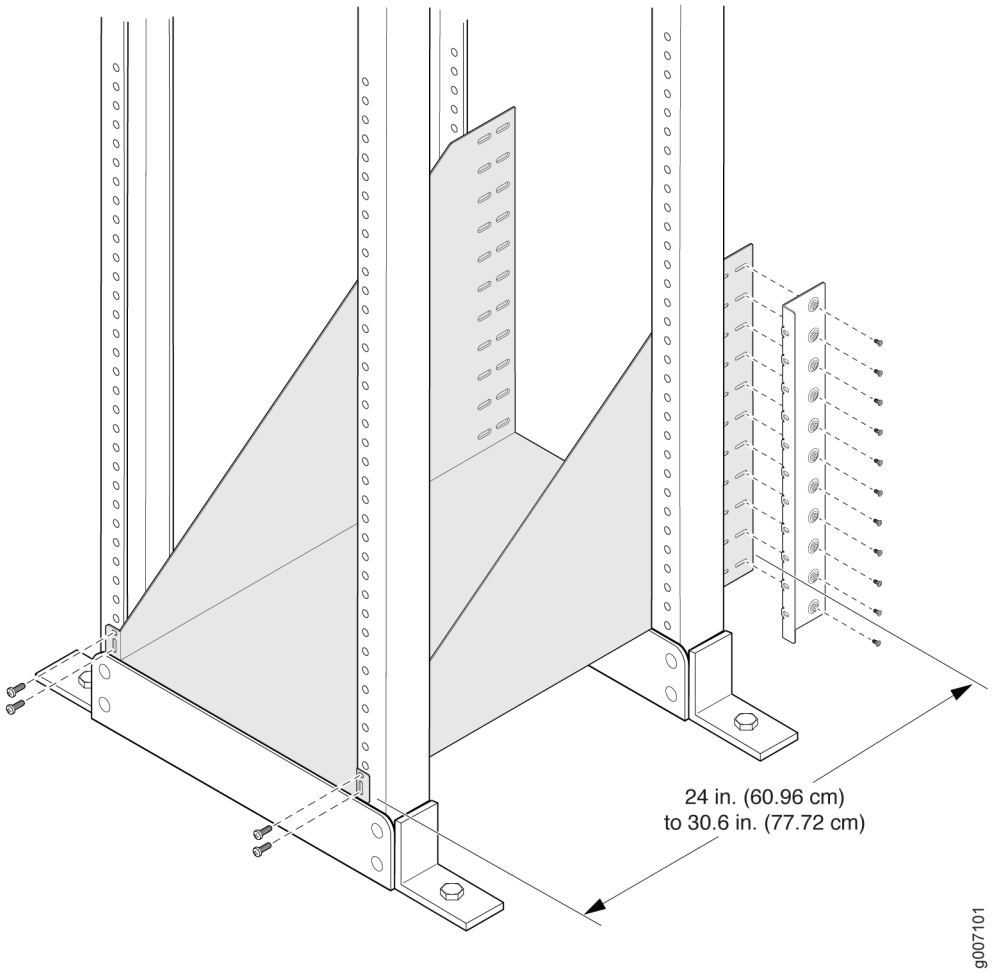
NOTE: There must be a minimum of 24-U unobstructed front-to-back usable rack space when installing the MX2008 router into a four-post rack or cabinet.

2. Partially insert screws into the open holes in the rear flanges of the four-post mounting shelf (see Figure 6 on page 9).

NOTE: Depending on the type of rack or cabinet you have, cage nuts might be required.

3. On the front of each front rack rail, partially insert a mounting screw into the holes in each ear of the four-post mounting shelf (see Figure 6 on page 9).
4. Tighten all the screws completely.

Figure 6: Mounting Hardware for a Four-Post Rack or Cabinet



NOTE:

- Because of the short lift capability of the pallet jack, we recommend that you install the router on the bottom of the rack.
- The two rear flanges on the four-post mounting shelf are adjustable from 24 in. (60.96 cm) through 30 in. (76.2 cm) to accommodate different types of racks rails.
- If you are installing the MX2008 router into a network cabinet, make sure that no hardware, device, rack, or cabinet component obstructs the 24-U rack space from access during installation.

Step 3: Install the Router

IN THIS SECTION

- Unpack the Router | **11**
- Remove Components | **13**
- Install the Router by Using a Pallet Jack with Attachment | **18**
- Install the Router Using a Router Transport Kit | **24**

- "Unpack the Router" on page 11
- "Remove Components" on page 13
- Install the router using one of the following procedures:
  - "Install the Router by Using a Pallet Jack with Attachment" on page 18
  - "Install the Router Using a Router Transport Kit" on page 24

Unpack the Router

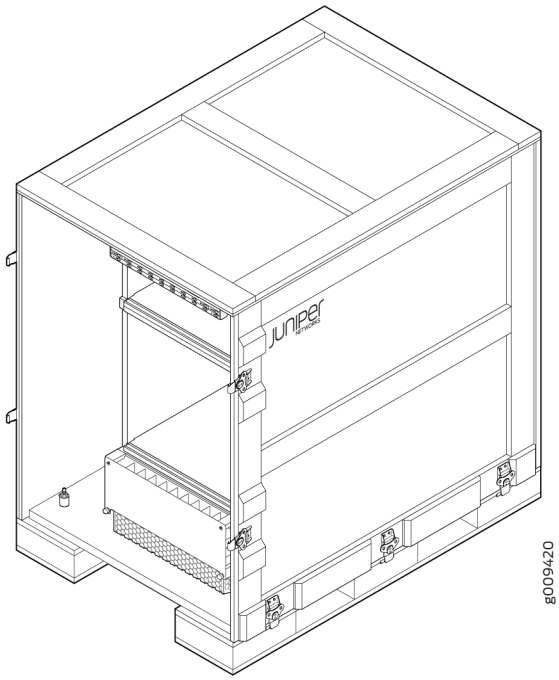
The router is shipped in a wooden crate. A wooden pallet forms the base of the crate. The router chassis is bolted to this pallet. A large rack mount tray, a pallet jack attachment, EMI covers, and a cardboard accessory box are also included in the shipping crate.

Before removing the router from the shipping crate, you must remove all components (see "Remove Components" on page 13).

Because of the router's size and weight—up to 742.2 lb (336.66 kg) for AC chassis and 664.8 lb (301.55 kg) for DC chassis depending on configuration—we strongly recommend that you install the router by using a router transport kit or a pallet jack with pallet jack attachment.

NOTE: The router is maximally protected inside the shipping crate (see Figure 7 on page 11). Do not unpack it until you are ready to begin installation.

Figure 7: MX2008 Shipping Crate Door



To unpack the router:

1. Move the shipping crate to a staging area as close to the installation site as possible, where you have enough room to remove the components from the chassis. While the chassis is bolted to the shipping pallet, you can use a forklift or pallet jack to move it.

   NOTE: The staging and installation area must be ESD-approved.

2. Position the shipping crate with the arrows pointing up.
3. Open all the latches on the shipping crate.
4. Remove the front door of the shipping crate and set it aside.
5. Using a two-person team, slide the remainder of the shipping crate off the pallet.
6. Remove the foam covering the top of the router.
7. Remove the pallet jack attachment, if ordered.

   NOTE: If you ordered a router transport kit, see "Unpack the Router Transport Kit" on page 24 for instructions on how to unpack and install the router transport kit.

8. Remove the large mounting tray.
9. Remove the accessory box.
10. Verify the parts received against the lists.
11. Remove the vapor corrosion inhibitor (VCI) packs attached to the pallet, being careful not to break the VCI packs open.
12. To remove the brackets holding the chassis to the pallet, use a 1/2-in. socket wrench; and a number 2 Phillips screwdriver to remove the bolts and screws from the brackets.
13. Set the shipping brackets aside for later use to secure the router to the pallet jack attachment.

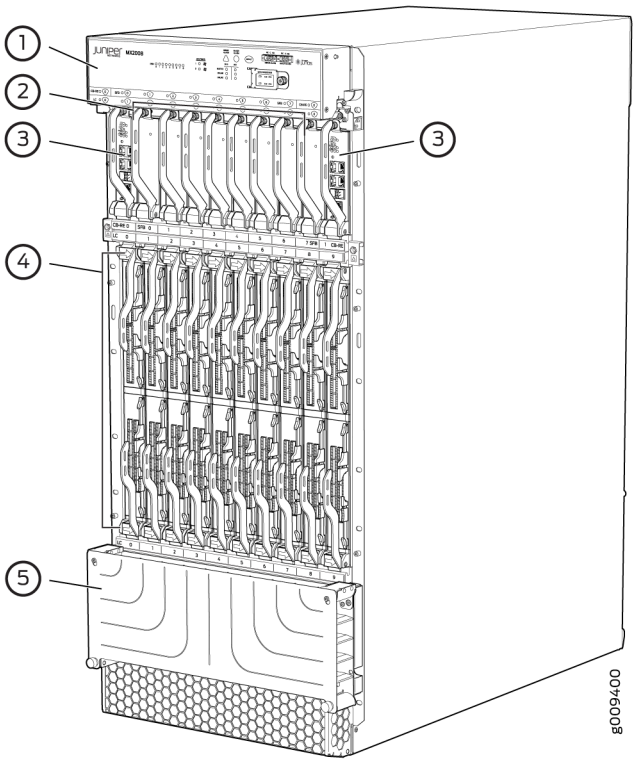
    NOTE: If you ordered a router transport kit, see "Unpack the Router Transport Kit" on page 24 for instructions on how to unpack and install the router transport kit.

14. Save the shipping crate cover and packing materials in case you need to move or ship the router at a later time.

Remove Components

The router might have field replacement units (FRUs) installed. Remove these FRUs from the MX2008 router before installing the router into a rack or cabinet (see Figure 8 on page 13, Figure 9 on page 14, and Figure 10 on page 16).

Figure 8: Components to Remove from the Front of the MX2008 Router



Remove field replacement units (FRUs) from the front of the MX2008 router before you install the router. See Table 1 on page 13 for information about MX2008 router components.

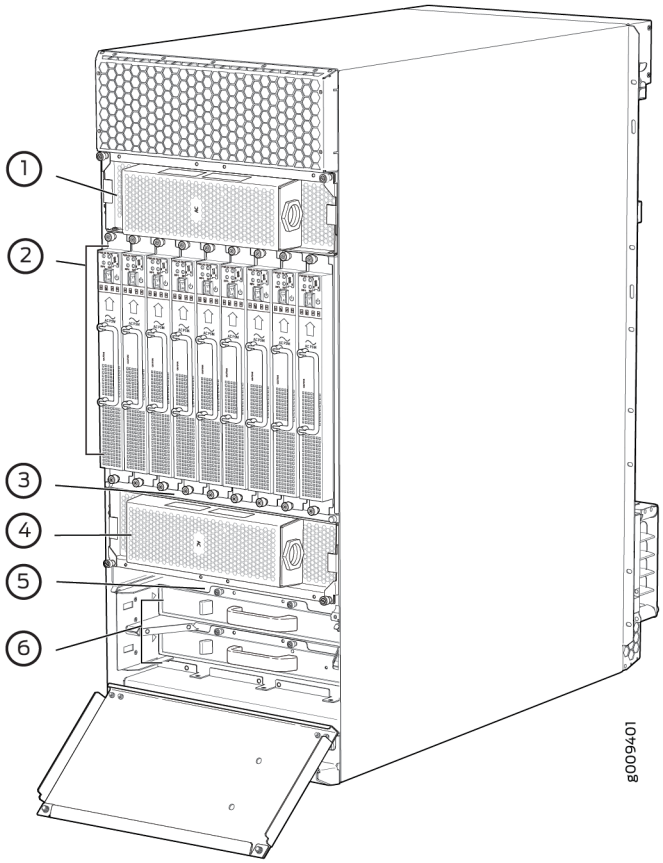
Table 1: Components to Remove from the Front of the MX2008 Router

Component No.	Component Description	Slots	Number of FRUs
1	Craft interface	–	1
2	Switch Fabric Boards (SFBs)	0 through 7	8

Table 1: Components to Remove from the Front of the MX2008 Router *(Continued)*

Component No.	Component Description	Slots	Number of FRUs
3	Routing and Control Boards (RCB)	0 and 1	2
4	MPCs and MICs	0 through 9	10
5	Cable Manager	–	1

Figure 9: Components to Remove from the Rear of an AC-Powered MX2008 Router

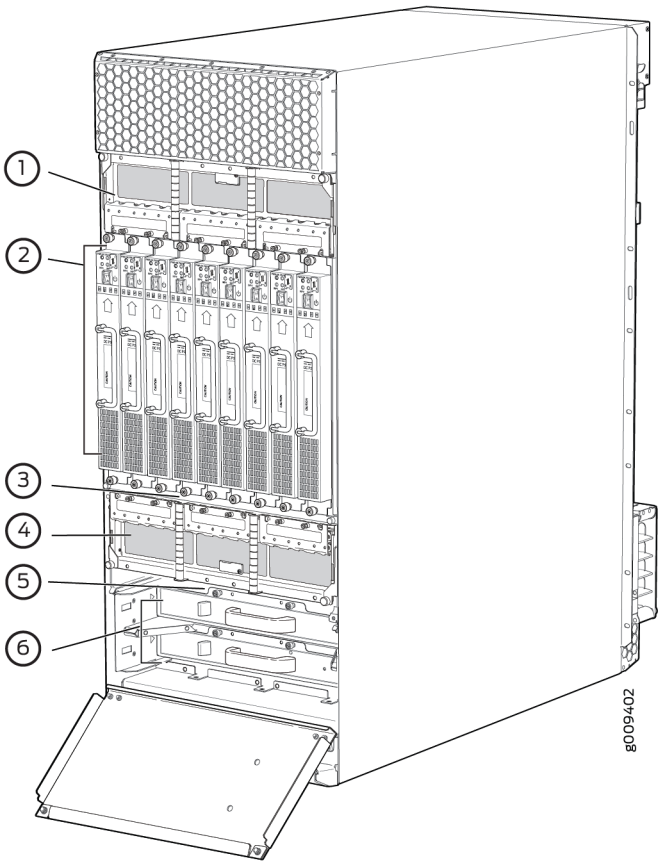


Remove field replacement units (FRUs) from the rear of an AC-powered MX2008 router before you install the router. See Table 2 on page 15 for information about MX2008 router components.

Table 2: Components to Remove from the Rear of an AC-Powered MX2008 Router

Component No.	Component Description	Slots	Number of FRUs
1	AC power distribution module (PDM)—Three-phase delta or wye, or a single-phase AC PDM	PDM1/Input1	1
2	AC power supply module (PSM)	0 through 8	9
3	PSM air filter	–	1
4	AC PDM—Three-phase delta or wye, or a single-phase AC PDM	PDM0/Input0	1
5	Fan tray air filter	–	1
6	Fan trays (two)	Fan tray 0 and fan tray 1 (behind access door)	2

Figure 10: Components to Remove from the Rear of a DC-Powered MX2008 Router



Remove field replacement units (FRUs) from the rear of a DC-powered MX2008 router before you install the router. See Table 3 on page 16 for information about MX2008 router components.

Table 3: Components to Remove from the Rear of a DC-Powered MX2008 Router

Component No.	Component Description	Slots	Number of FRUs
1	DC PDM	PDM1/Input1	1
2	DC PSM	0 through 8	9
3	PSM air filter	–	1
4	DC PDM	PDM0/Input0	1

Table 3: Components to Remove from the Rear of a DC-Powered MX2008 Router *(Continued)*

Component No.	Component Description	Slots	Number of FRUs
5	Fan tray air filter	–	1
6	Fan trays (two)	Fan tray 0 and fan tray 1 (behind access door)	2

To remove the components from the router:

1. Slide each component out of the chassis evenly so that it does not become stuck or damaged.
2. Label each component as you remove it so you can reinstall it in the correct location.

> **NOTE**: The MX2008 PSMs can be installed in any order in the chassis.

3. Immediately store each removed component in an electrostatic bag.
4. Do not stack removed components. Lay each one on a flat surface.

To remove the lower fan tray (see Figure 11 on page 18):

> **NOTE**: The fan trays are interchangeable and are hot-insertable and hot-removable.

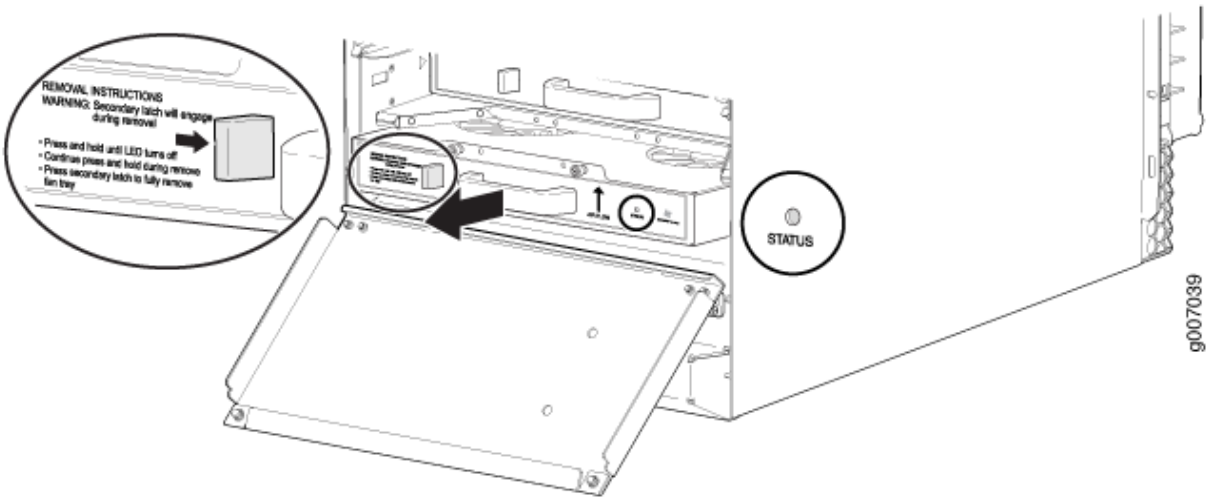
1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to an approved site ESD grounding point. See the instructions for your site.
2. Loosen and open the two captive screws on each side of the fan tray access panel.
3. Loosen and open the two captive screws on the fan tray faceplate.
4. Press and hold the latch while simultaneously pulling the fan tray out approximately 1 to 3 in. Place one hand under the fan tray for support, while pulling the fan tray completely out of the router.

> **NOTE**: The double latch system is a safety mechanism, so you cannot pull the fan tray out in one motion.

5. Place each component on an antistatic mat resting on a stable, flat surface.

CAUTION: Do not stack fan trays on one another after you remove them.

Figure 11: Removing Lower Fan Trays



WARNING: Before removing a fan tray, make sure that the fan blades have stopped completely.

NOTE: For complete instructions on removing router components, see the MX2008 Universal Routing Platform Hardware Guide.

Install the Router by Using a Pallet Jack with Attachment

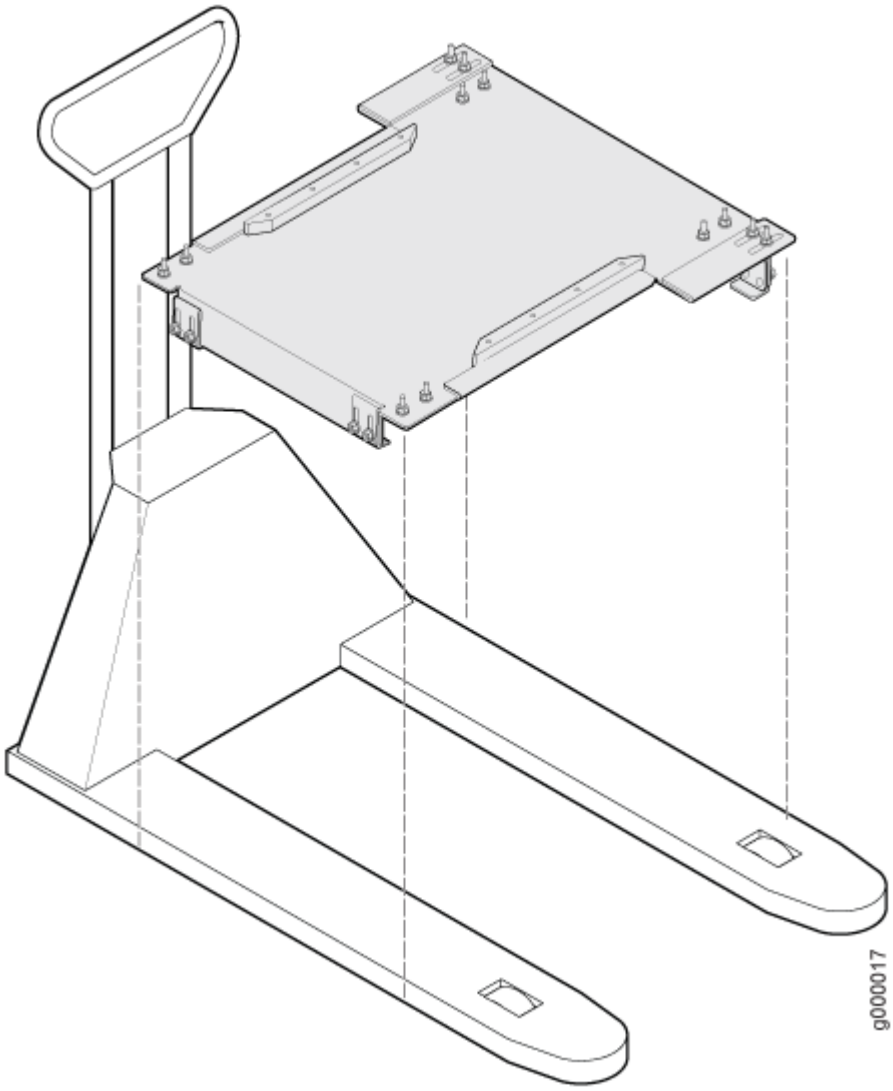
IN THIS SECTION

- Install the Pallet Jack Attachment | 19
- Use the Pallet Jack with Attachment to Install the Router | 20

Install the Pallet Jack Attachment

1. Remove the pallet jack attachment from the shipping crate.
2. Place the pallet jack attachment across both pallet jack legs.
3. Using a 9/16-in. (14 mm) socket wrench, loosen and remove the eight torque fasteners for bracket support that are located on the top of the pallet jack attachment platform.
4. Using a 9/16-in. (14 mm) socket wrench, loosen the torque fasteners that are located on the four adjustable pallet jack attachment brackets.
5. Adjust the four pallet jack attachment brackets until they fit under the pallet jack legs.
6. Tighten the torque fasteners using a 9/16-in. (14 mm) socket wrench to secure the brackets on the pallet jack attachment to the pallet jack (see Figure 12 on page 20).

Figure 12: Installing MX2008 Pallet Jack Attachment



Use the Pallet Jack with Attachment to Install the Router

Before installing the router, you must remove all components (see "Remove Components" on page 13). To install the router using a pallet jack with attachment:

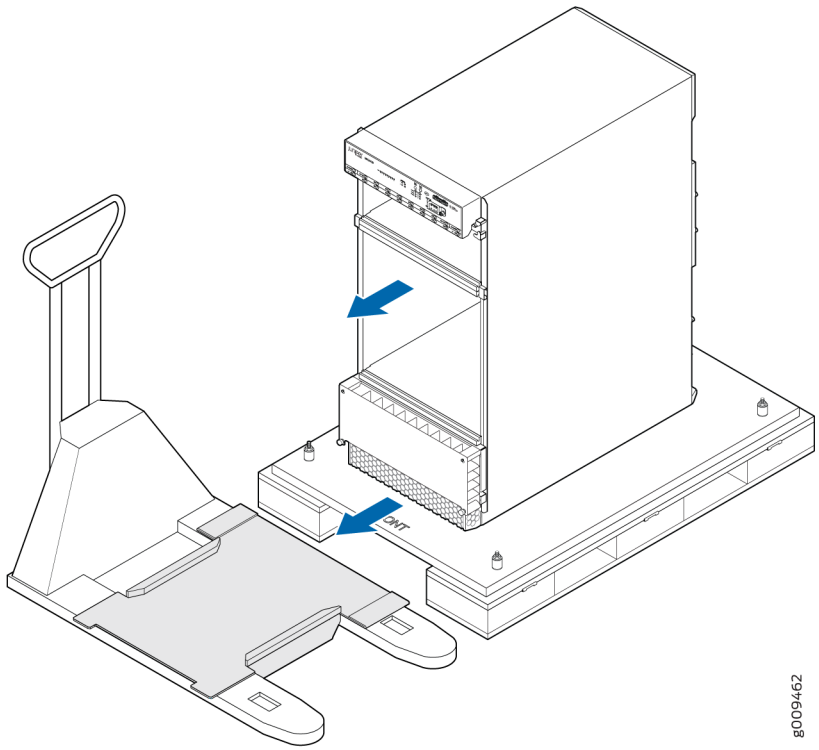
1. Ensure that the rack or cabinet is in its permanent location and is secured to the building. Ensure that the installation site allows adequate clearance for both airflow and maintenance. For details, see the MX2008 Universal Routing Platform Hardware Guide.
2. Reattach the front and rear shipping covers to the chassis to help move the router. The handles on the shipping covers are used to guide the chassis during installation.

CAUTION: Do not lift the router by using the handles on the shipping covers. Use these handles only to help position the router.

3. Place the pallet jack attachment across both legs and secure the attachment to the pallet jack.
4. Using a four-person team, load the router onto the pallet jack, making sure it rests securely on the pallet jack attachment platform (see Figure 13 on page 21).

WARNING: Applying force to any other parts of the chassis other than the shipping covers can damage the chassis.

Figure 13: Loading the MX2008 Router onto the Pallet Jack



5. Attach the shipping brackets to the pallet jack attachment by using the existing bracket screws.
6. On each of the shipping brackets, partially insert screws into the holes to secure the brackets to the chassis. Tighten all screws. These brackets help prevent the chassis from tilting.
7. Lower the pallet jack before moving the chassis. Doing this helps distribute the weight evenly and reduces the risk of tilting or damage to the chassis.

NOTE: An empty MX2008 router weighs approximately 261 lb (118.39 kg).

8. Using the pallet jack, position the router in front of the rack or cabinet, centering it in front of the rack.

NOTE: If you are installing the MX2008 router into a network cabinet, make sure that no hardware, device, rack, or cabinet component obstructs the 24-U rack space from access during installation.

9. Using the pallet jack, lift the chassis approximately 0.75 in. (1.9 cm) above the surface of the mounting shelf (four-post rack) or bottom opening of the rack (open-frame rack), and position it as close as possible.

NOTE: Because of the short lift capability of the pallet jack, we recommend that you install the router on the bottom of the rack.

10. Remove the shipping brackets that are attached to the pallet jack attachment and chassis, and set them aside.
11. Grasp the handles on the shipping covers and carefully slide the router into the rack. If you are installing the router into a four-post rack, continue sliding the router onto the mounting shelf so that the bottom of the chassis and the mounting shelf overlap by approximately 2 in. (5.0 cm).
12. With four people pushing on the front-mounting flanges, slide the router until the center-mounting brackets (open-frame racks) or front-mounting flanges (four-post racks) contact the rack rails. In a four-post rack, the mounting shelf ensures that the holes in the front-mounting flanges of the chassis align with the holes in the rack rails (see and Figure 14 on page 23 and Figure 15 on page 24).
13. Move the pallet jack away from the rack.
14. Insert twelve mounting screws (six on each side) into the mounting holes to secure the router to the rack.
15. 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 should be aligned with the mounting screws on the opposite side, and the router should be level.

Figure 14: Loading the MX2008 Router into a Four-Post Rack

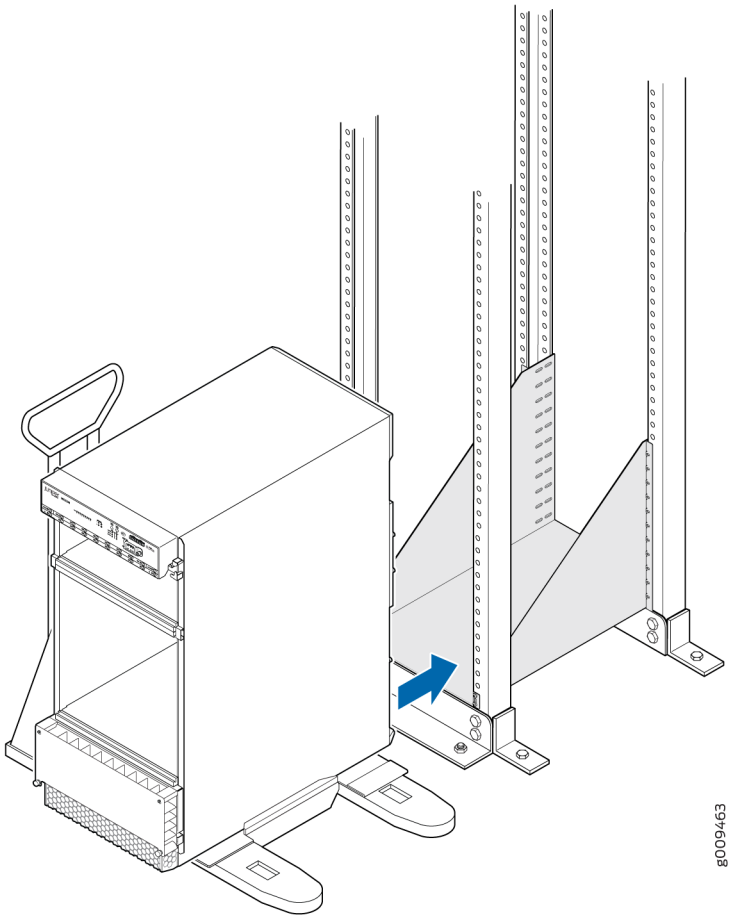
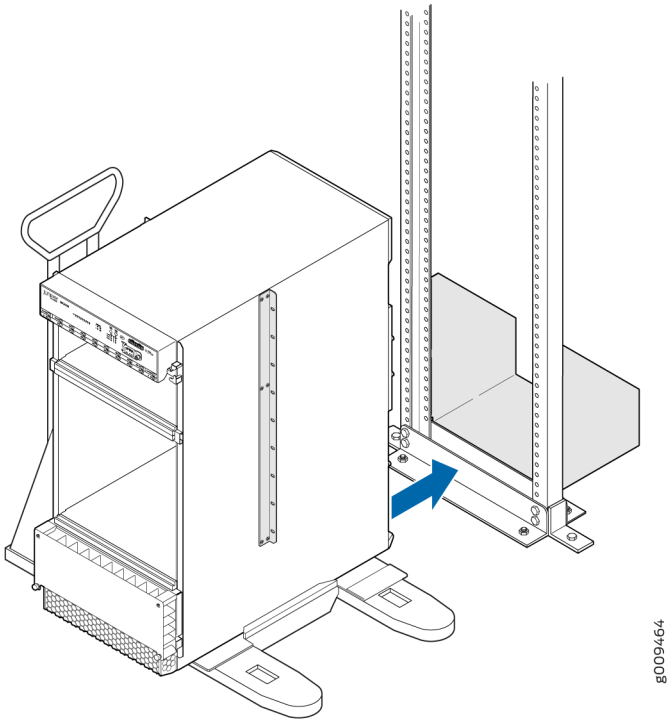


Figure 15: Loading the MX2008 Router into an Open-Frame Rack



Install the Router Using a Router Transport Kit

IN THIS SECTION

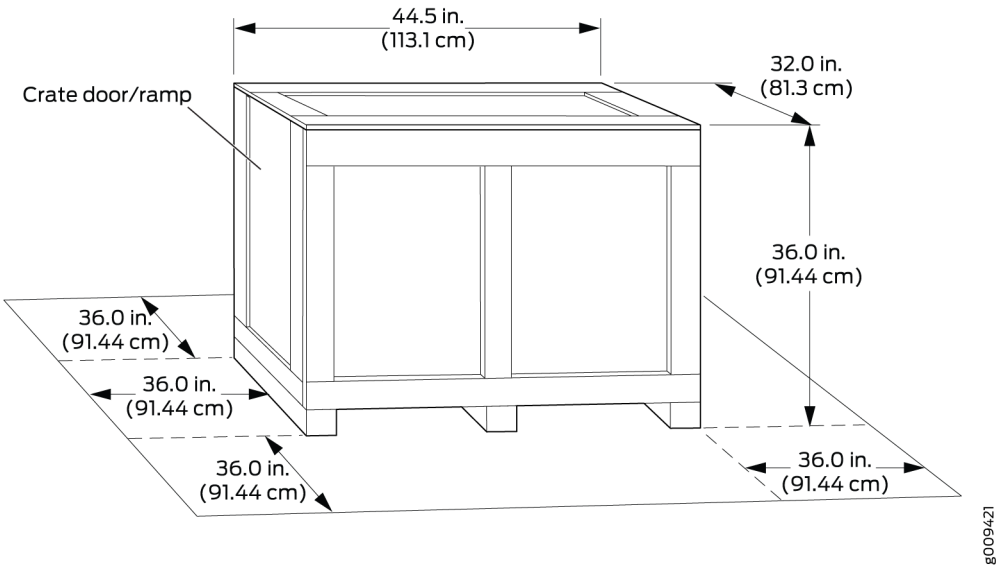
- Unpack the Router Transport Kit | **24**
- Install the Router Transport Kit onto the Router | **28**
- Secure the Router to the Transport Platform | **30**
- Use the Router Transport Kit to Install the Router in a Four-Post Rack | **33**
- Use the Router Transport Kit to Install the Router in an Open-Frame Rack | **39**

Unpack the Router Transport Kit

The router transport kit is shipped in a wooden crate. A wooden pallet forms the base of the crate. Metal clips secure the top and front of the crate in place.

The router transport kit shipping container measures 36 in. (91.4 cm) high, 32 in. (81.3 cm) wide, and 44.5 in. (113 cm) deep (see Figure 16 on page 25). The total weight of the container containing the router transport kit is 200 lb (90.71 kg).

Figure 16: Router Transport Kit Crate Dimensions

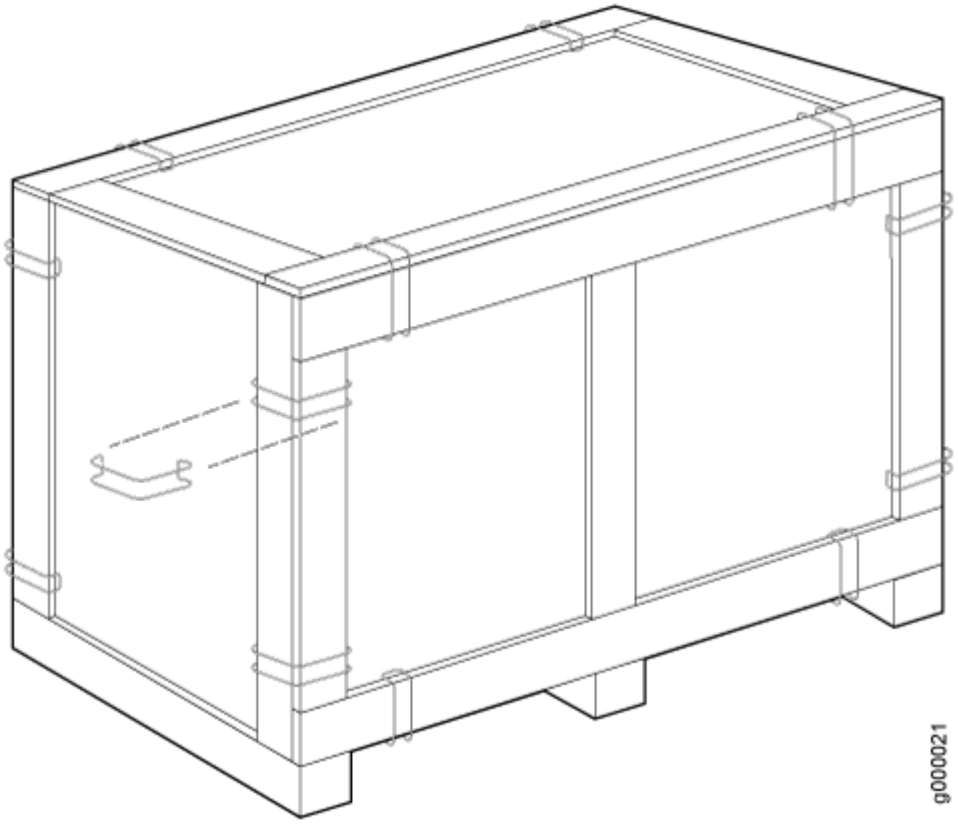


NOTE: The router transport kit is maximally protected inside the shipping crate. Do not unpack it until you are ready to begin installation.

To unpack the router transport kit:

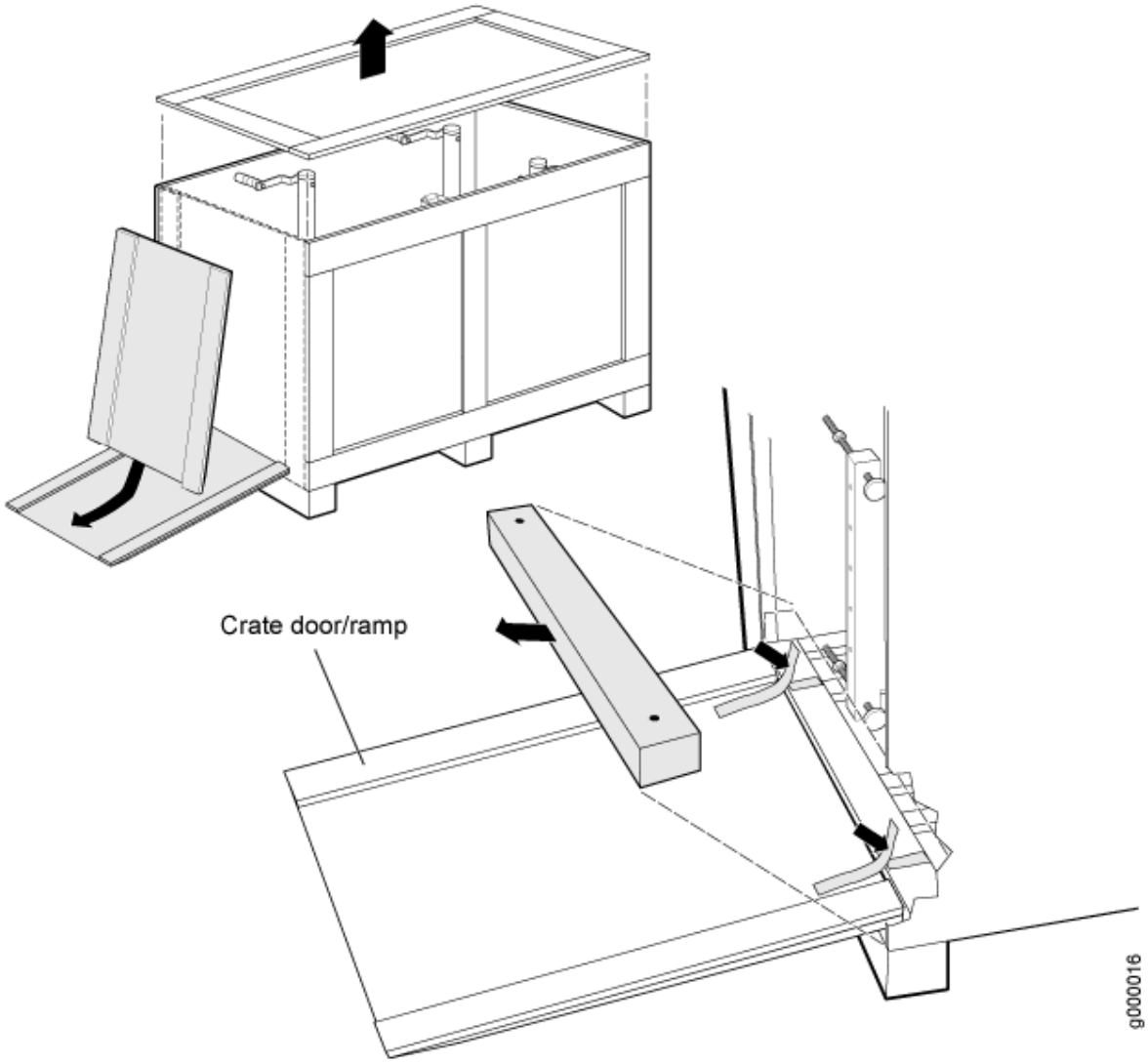
1. Move the router transport kit shipping crate to an ESD-approved staging area, where you have enough room to remove the kit for assembly.
2. Position the shipping crate with the arrows pointing up.
3. Remove the metal clips on the shipping crate that secure the top and front to the crate (see Figure 17 on page 26).

Figure 17: Open Router Transport Kit Shipping Crate



4. Remove the top and front of the shipping crate, and set them aside.
5. Remove the two wing nuts that secure the wooden brace to the shipping crate platform, and set them aside.
6. Align the crate door with the shipping crate platform, and secure the door to the platform by using the attached velcro straps (see Figure 18 on page 27).

Figure 18: Router Transport Kit Shipping Crate Door



7. Remove the router transport kit from the shipping container.
8. Remove the vapor corrosion inhibitor (VCI) packs attached to the pallet, being careful not to break the VCI packs open.
9. Save the shipping crate cover, pallet, and packing materials in case you need to move or ship the router transport kit at a later time.

Install the Router Transport Kit onto the Router

NOTE: The router transport kit can be purchased from Juniper Networks.

The router transport kit includes the following components:

- Router transport platform
- Router transport left and right mounting plates with adjustable wheel assembly
- Router winch mount with winch strap plate

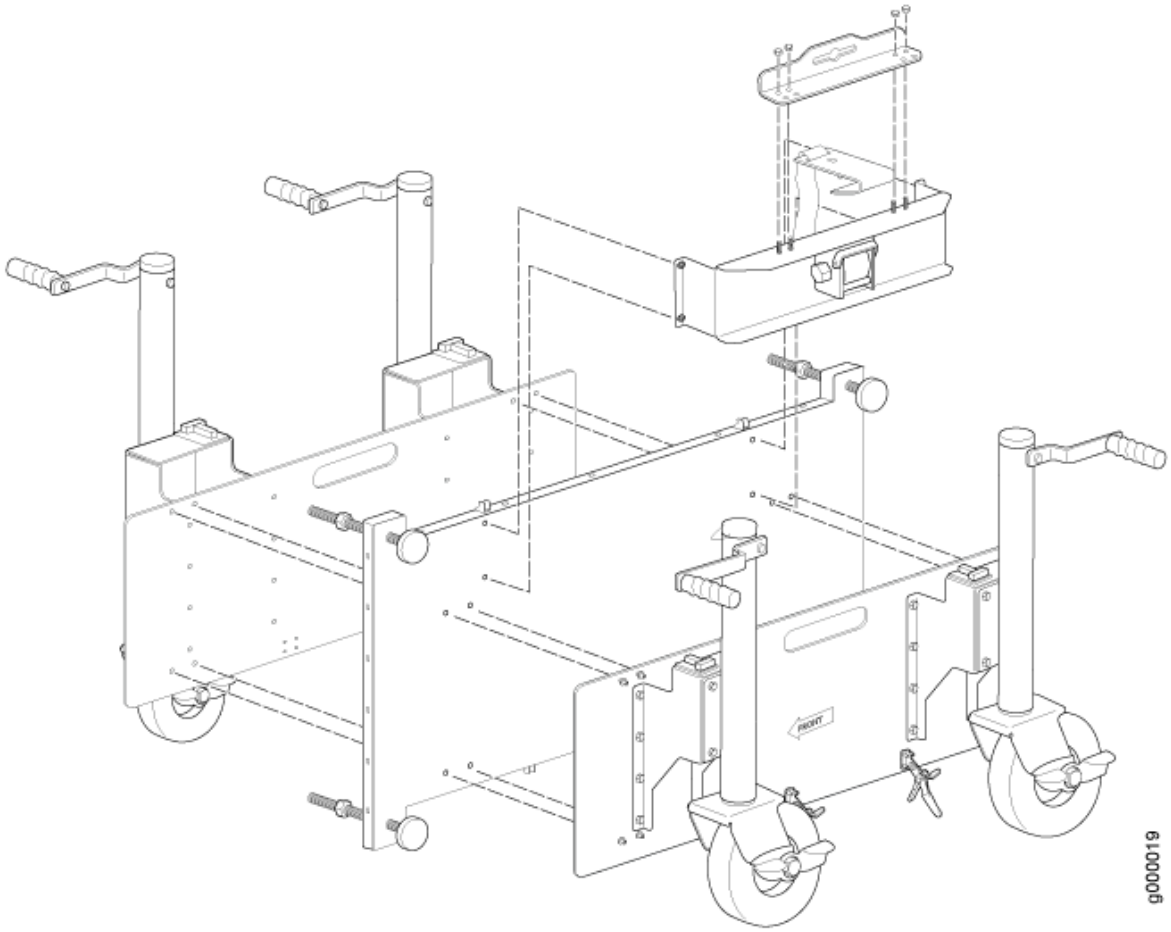
To install the router transport kit:

1. Remove the router transport kit from the shipping crate (see "Unpack the Router Transport Kit" on page 24).

   NOTE: The router transport kit weighs approximately 138.5 lb (62.82 kg).

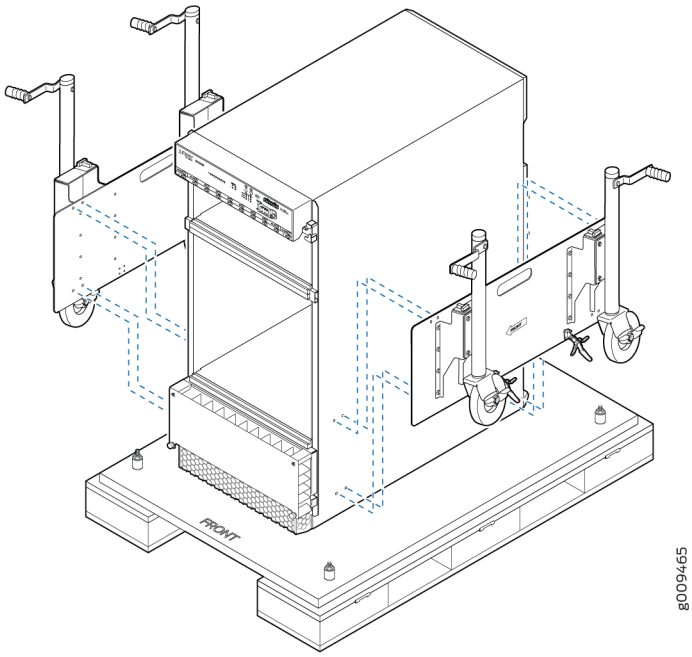
2. Remove the winch strap plate that is secured to the winch mount by using a 9/16-in. (14 mm) socket wrench, and set the plate aside.
3. Using a number 3 Phillips screwdriver, loosen the captive screws that secure the winch mount to the router transport kit, and set the mount aside.
4. Using a number 3 Phillips screwdriver, loosen the captive screws that secure the router transport mounting plate and wheel assembly (left and right) to the router transport platform, and set them aside (see Figure 19 on page 29).

Figure 19: Preparing the Router Transport Kit for Installation



5. Remove the four shipping brackets that secure the router to the shipping crate platform by using a 9/16-in. (14 mm) socket wrench and a number 2 Phillips screwdriver, and set the brackets aside.
6. Align the left router transport mounting plate and wheel assembly (indicated by left arrow shown on the assembly) with the holes on the left side of the chassis (see Figure 20 on page 30).
7. Using a number 3 Phillips screwdriver, tighten the captive screws to secure the router transport mounting plate and wheel assembly to the chassis.
8. Align the right router transport mounting plate and wheel assembly (indicated by right arrow shown on the assembly) with the holes on the right side of the chassis (see Figure 20 on page 30).
9. Using a number 3 Phillips screwdriver, tighten the captive screws to secure the router transport mounting plate and wheel assembly to the chassis.

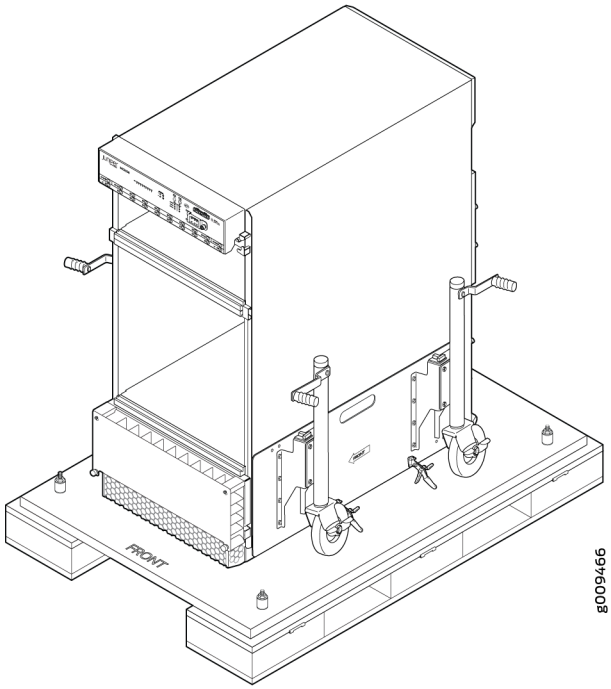
Figure 20: Installing the Router Transport Kit onto the MX2008 Router



Secure the Router to the Transport Platform

1. Ensure that the rack is in its permanent location and is secured to the building. Ensure that the installation site allows adequate clearance for router transport kit turn ratios, airflow, and maintenance.
2. Secure the door of the crate platform by using the two metal latches (see Figure 21 on page 31).

Figure 21: Securing the Crate Door to the Shipping Crate Platform



NOTE: An empty MX2008 weighs approximately 261 lb (118.39 kg).

3. Using a two-person team on either side of the chassis, turn the handles on the router transport kit 4–5 times until the chassis is raised approximately 1 in. (2.54 cm), making sure that the chassis is level.

NOTE: The router transport kit is equipped with four T-shaped levels on top of each of the four router transport mounting brackets. Make sure the bubbles within the T-shaped levels are between the lines, indicating the chassis is level.

CAUTION: Do not raise the chassis above 1 in. (2.54 cm). This will ensure that the router will not tilt when transporting, which can result in injury or damage to the router.

4. Turn the four wheels on the router transport kit toward the rear of the chassis.
5. Grasping the handles on the shipping covers, carefully guide the chassis down the crate to the rack location.

WARNING: Do not push or pull the router fast while transporting. Using excessive speed can cause the wheels to turn abruptly and tilt the router over.

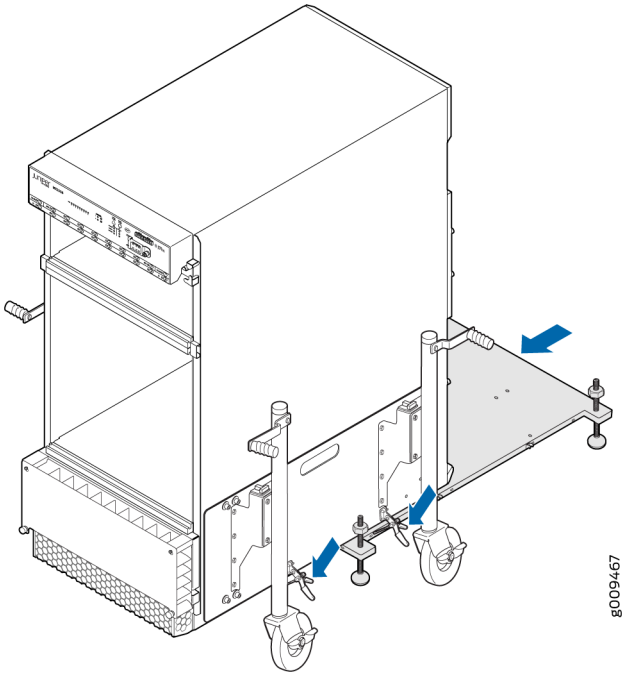
CAUTION: Do not lift the router by using the handles on the shipping covers. Use these handles only to help position the router.

6. Position the router transport platform directly under the router, aligning the router transport platform with the bottom of the chassis by adjusting the four leveling mounts.

NOTE: The router transport platform height can be adjusted from 0.25 in. (0.6 cm) to a maximum of 4 in. (10.16 cm).

7. Secure the router transport platform to the router transport mounting plates by using the four latch locks (see Figure 22 on page 32).

Figure 22: Securing the Router Transport Platform



Use the Router Transport Kit to Install the Router in a Four-Post Rack

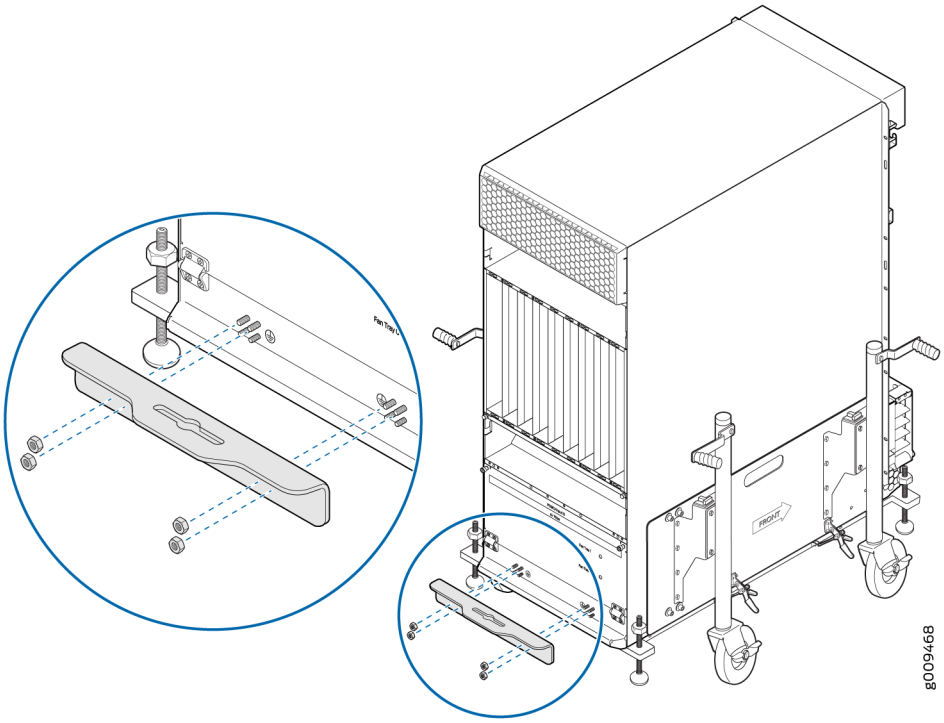
Because of the router's size and weight—up to 742.2 lb (336.66 kg) for AC chassis and 664.8 lb (301.55 kg) for DC chassis depending on the configuration—we recommend that you use a router transport kit to install the router.

NOTE: Four people are needed to install the router into a rack.

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

1. Install the winch strap plate to the rear of the router by tightening the four captive screws (see Figure 23 on page 33).

Figure 23: Installing the Winch Strap Plate (Four-Post Rack)



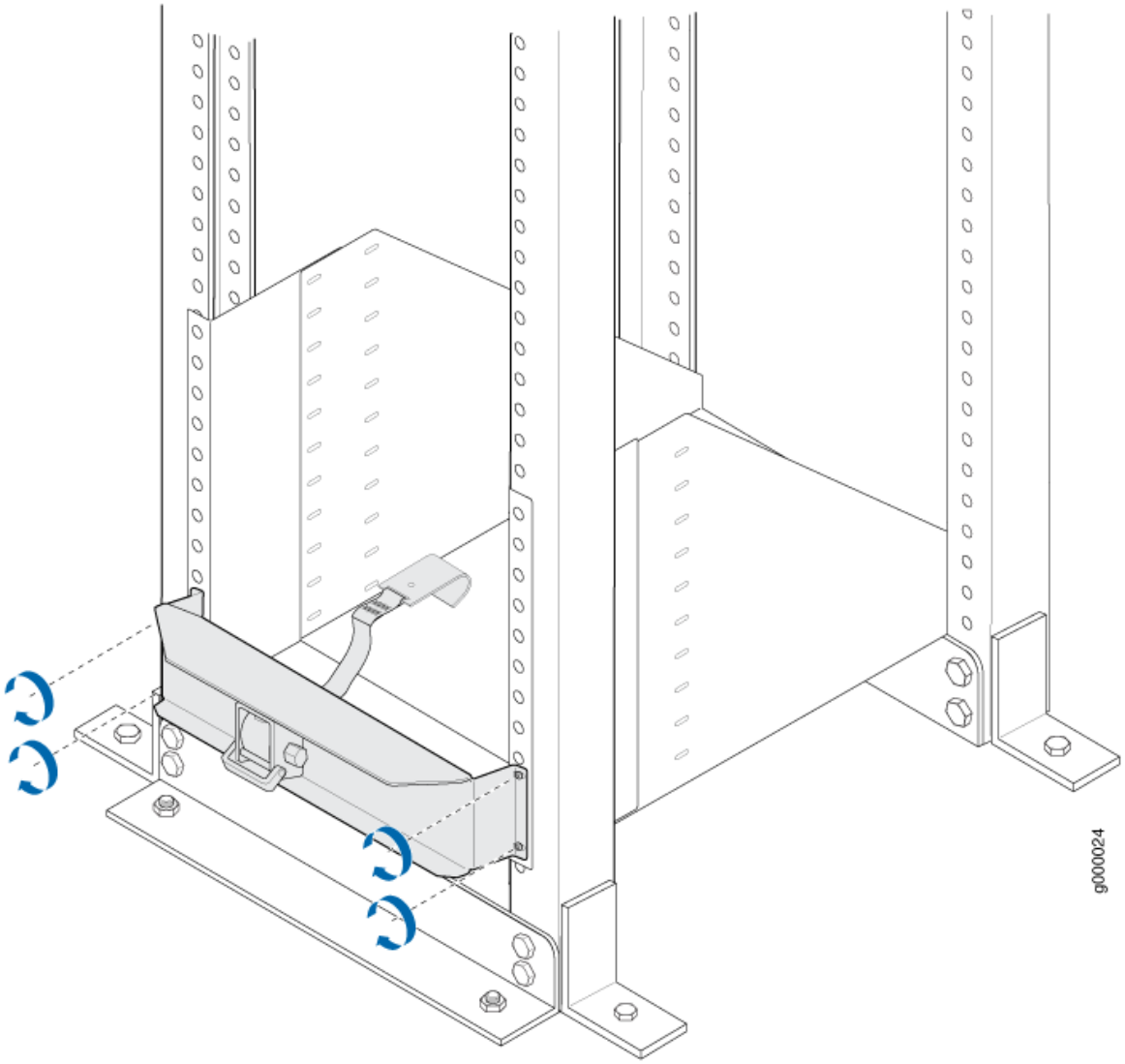
2. Using a four-person team, transport the router to the rack installation location and center it in front of the mounting shelf.

NOTE:

- A minimum of 38 in. (96.5 cm) of clearance is required to roll the chassis sideways.
- A minimum of 42 in. (106.7 cm) of circular space is required to rotate the chassis.
- The router transport kit handles can be removed to accommodate aisle width.

3. Install the winch mount bracket to the rear rack rails by using the six captive screws, and tighten the screws (see Figure 24 on page 34).

Figure 24: Installing the Winch Mount Bracket to Rack Rails

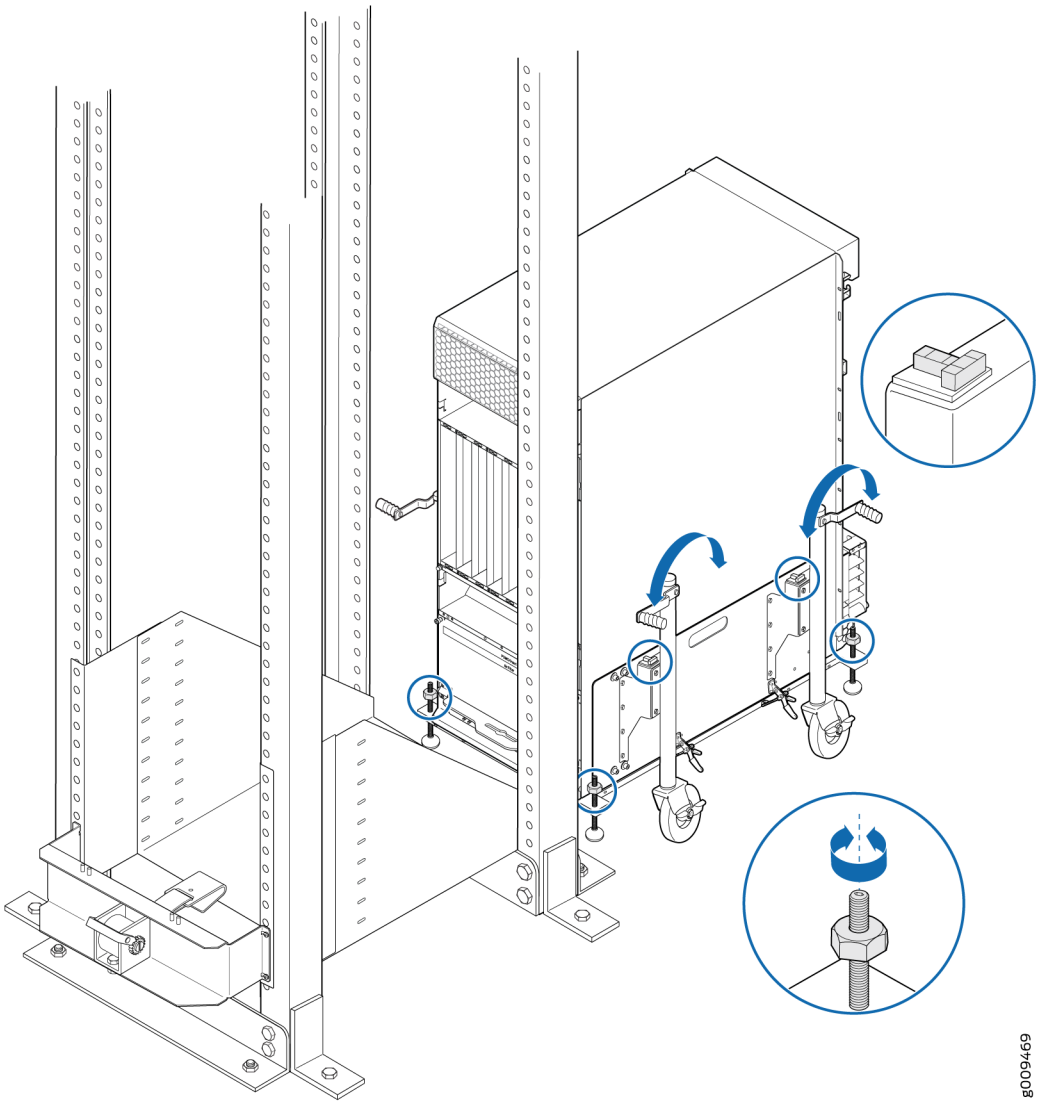


4. Adjust the height of the router by turning the handles clockwise until the router transport platform is aligned with the surface of the mounting shelf and slightly higher than the mounting shelf (see Figure 25 on page 35).

> **NOTE**: Make sure the bubbles within the T-shaped levels are between the lines, indicating that the router is level.

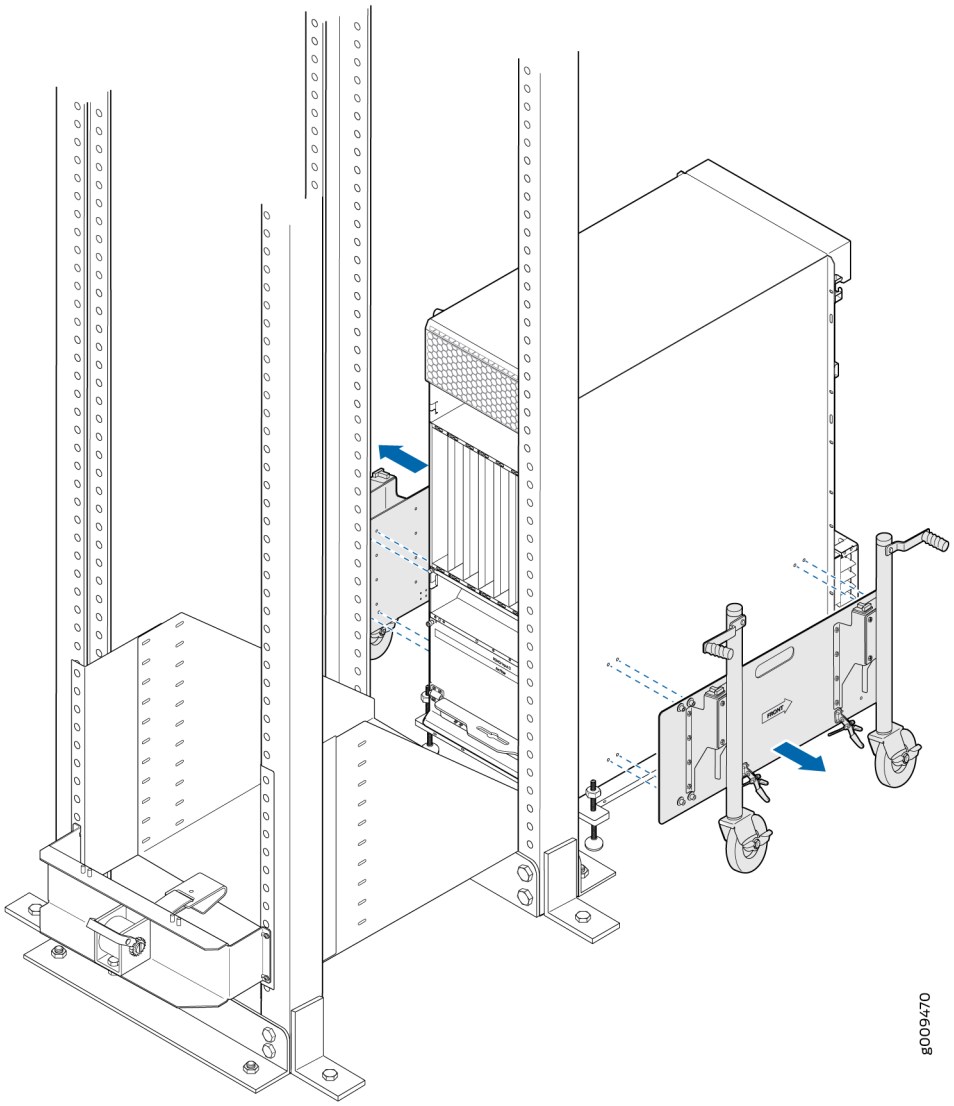
5. Adjust the four leveling mounts on the router transport platform until all four leveling mounts rest firmly on the ground (see Figure 25 on page 35).

Figure 25: Aligning the MX2008 Router with the Rack Mounting Shelf



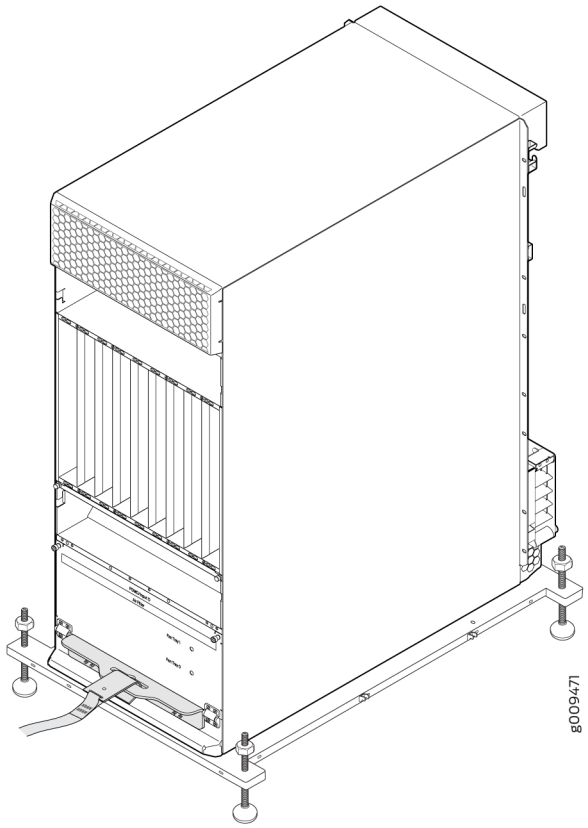
6. Unlock the four toggle latches that secure the router transport platform to the router transport mounting plate and wheel assembly.
7. Lift the wheels up by turning the handles counterclockwise so that the weight of the router is on the router transport platform.
8. Using a number 3 Phillips screwdriver, loosen the captive screws that secure the router transport mounting plates and wheel assembly to the chassis, and set them aside (see Figure 26 on page 36).

Figure 26: Removing the Router Transport Mounting Plate and Wheel Assembly



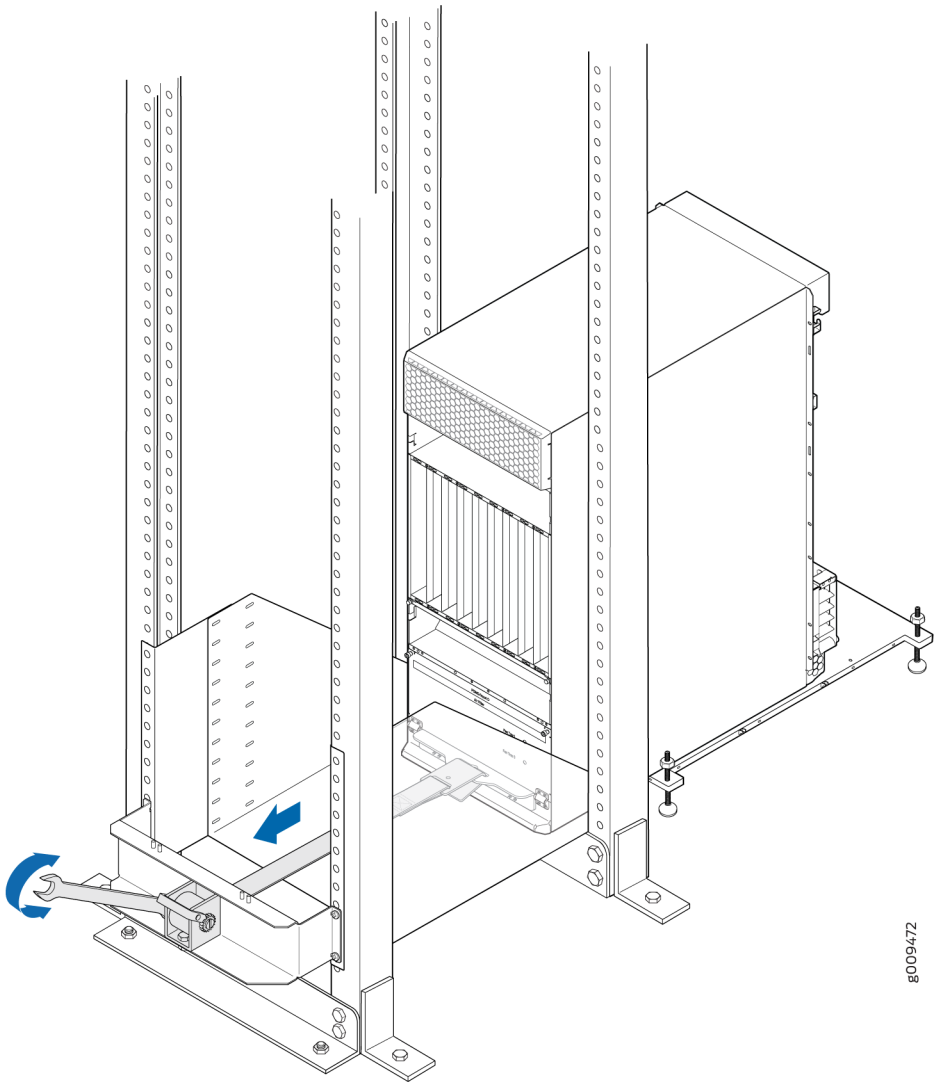
9. Attach the winch strap to the winch strap plate at the rear of the router (see Figure 27 on page 37).

Figure 27: Attaching the Winch Strap to the Winch Strap Plate



10. Attach a 1-1/8 in. (28.57 mm) torque-controlled driver or socket wrench to the winch mechanism and turn clockwise to start pulling the chassis into the rack (see Figure 28 on page 38).

Figure 28: Pulling the MX2008 into the Rack



NOTE:

- A four-person team is needed to carefully guide the router into the rack while operating the winch.
- If the router is not pulled all the way into the rack by the winch mechanism, grasp the handles on the shipping covers and carefully slide the router onto the mounting shelf until the front-mounting flanges contact the rack rails. You must remove the winch bracket to perform this procedure.

- There must be a minimum of 24-U of usable rack space when installing the MX2008 into a 24-U rack.

11. Remove the router transport platform, and set the platform aside.
12. Remove the winch mount and winch strap plate, and set them aside.
13. Insert twelve mounting screws (six on each side) into the mounting holes to secure the router to the rack.
14. Visually inspect the alignment of the router. To verify that the router is installed properly in the rack, see that 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.
15. Reassemble the router transport kit, and set it aside for future use.

Use the Router Transport Kit to Install the Router in an Open-Frame Rack

NOTE: Four persons are needed to install the router into a rack.

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

To install the MX2008 in an open-frame rack by using a router transport kit:

1. Using the router transport platform, position the router in front of the rack or cabinet, centering it in front of the rack.
2. Using a four-person team, transport the router to the rack installation location and center it in front of the rack.

   NOTE:

   - A minimum of 38 in. (96.5 cm) of clearance is required to roll the chassis sideways.
   - A minimum of 42 in. (106.7 cm) of circular space is required to rotate the chassis.
   - The router transport kit handles can be removed to accommodate aisle width.

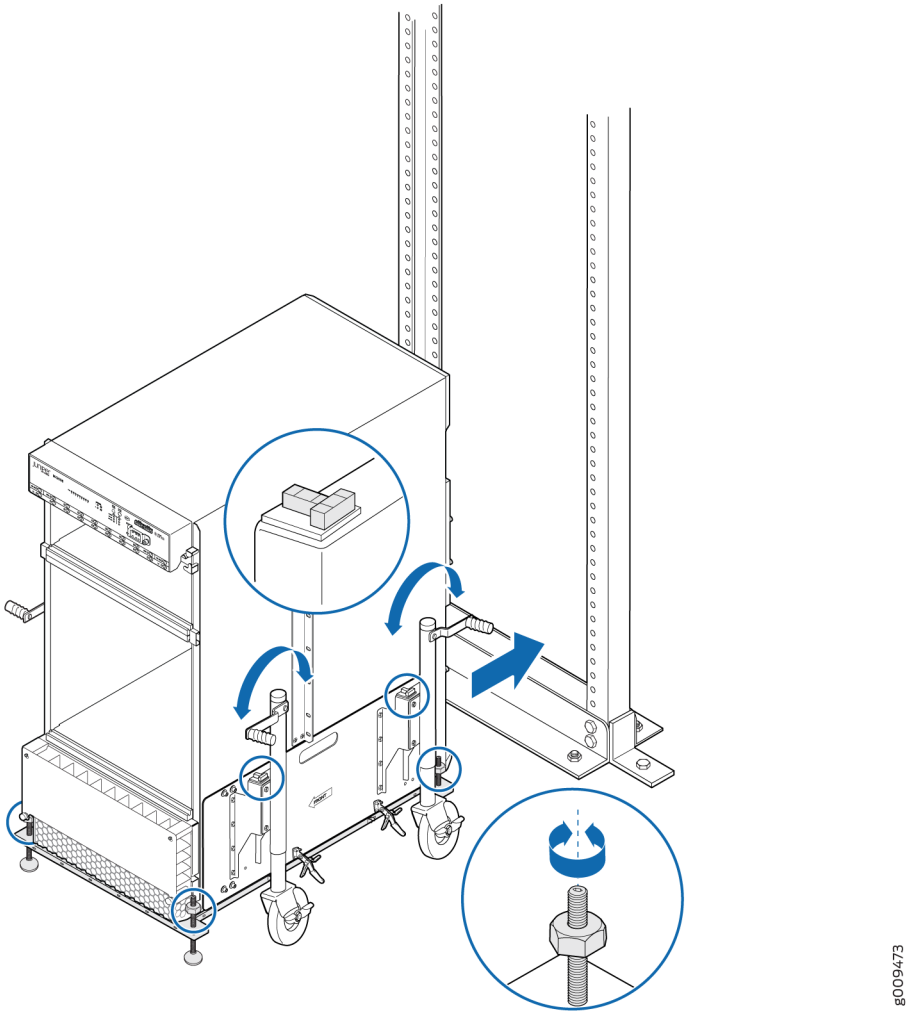
3. Adjust the height of the router by turning the handles clockwise until the router transport platform is approximately 0.75 in. (1.9 cm) above the bottom of the rack opening (see Figure 25 on page 35).

NOTE:

- Because of the short lift capability of the router transport kit, we recommend that you install the router on the bottom of the rack.
- Make sure that the bubbles within the T-shaped levels are between the lines, indicating that the router is level.

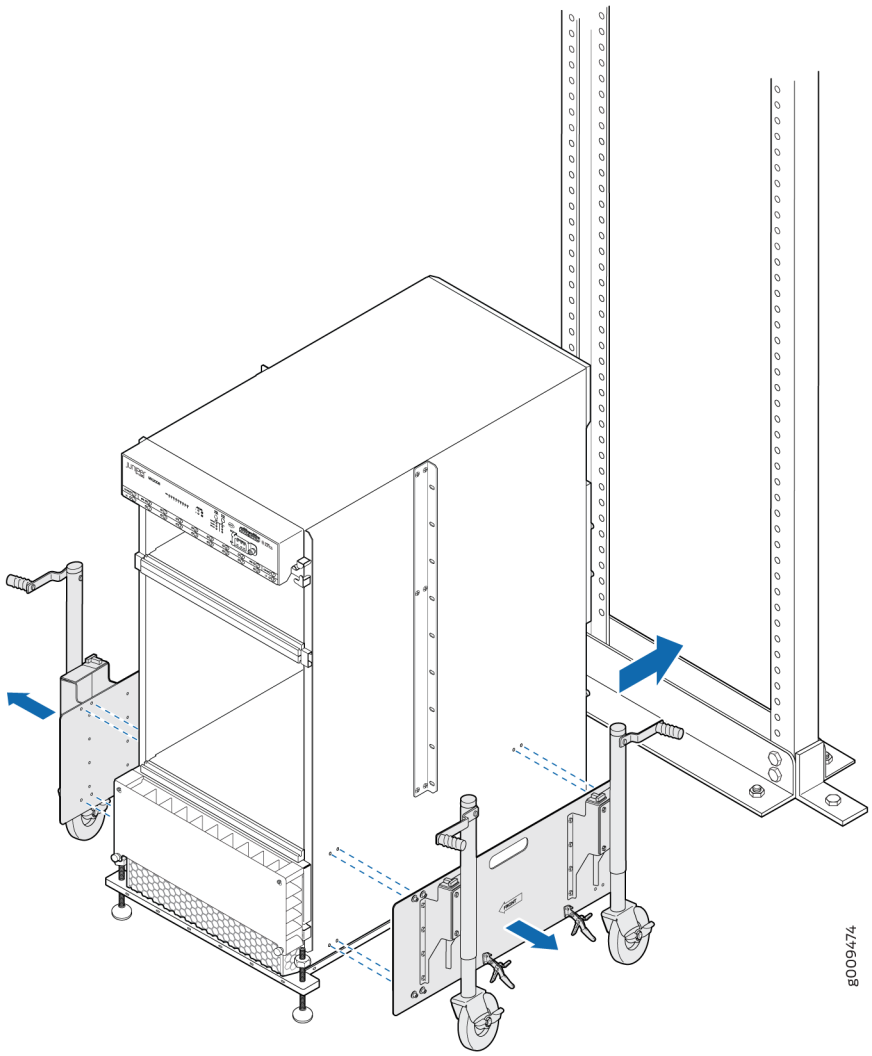
4. Adjust the four leveling mounts on the router transport platform until all four leveling mounts rest firmly on the ground (see Figure 29 on page 40).

Figure 29: Aligning the MX2008 Router with the Rack



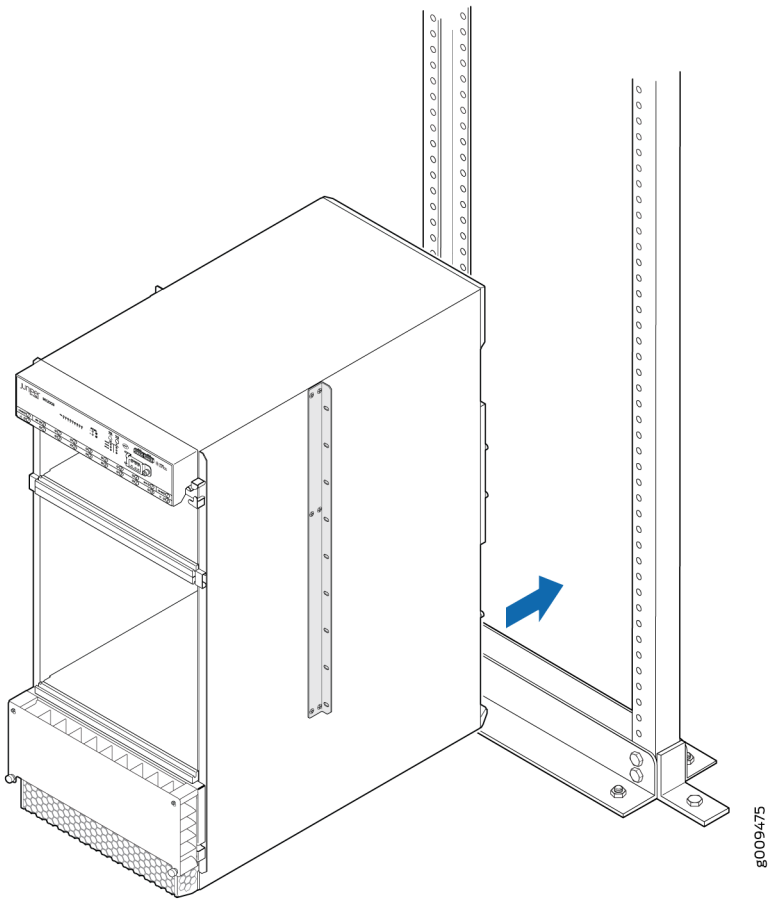
5. Unlock the four toggle latches that secure the router transport platform to the router transport mounting plate and wheel assembly.
6. Lift the wheels up by turning the handles counterclockwise so that the weight of the router is on the router transport platform.
7. Using a number 3 Phillips screwdriver, loosen the captive screws that secure the router transport mounting plates and wheel assembly to the chassis, and set them aside (see Figure 30 on page 41).

Figure 30: Removing the Router Transport Mounting Plate and Wheel Assembly



8. Grasping the handles on the shipping covers, carefully slide the router into the rack until the center-mounting brackets contact the rack rails (see Figure 31 on page 42).

Figure 31: Sliding the MX2008 into the Open-Frame Rack



NOTE: A four-person team is needed to carefully guide the router into the rack.

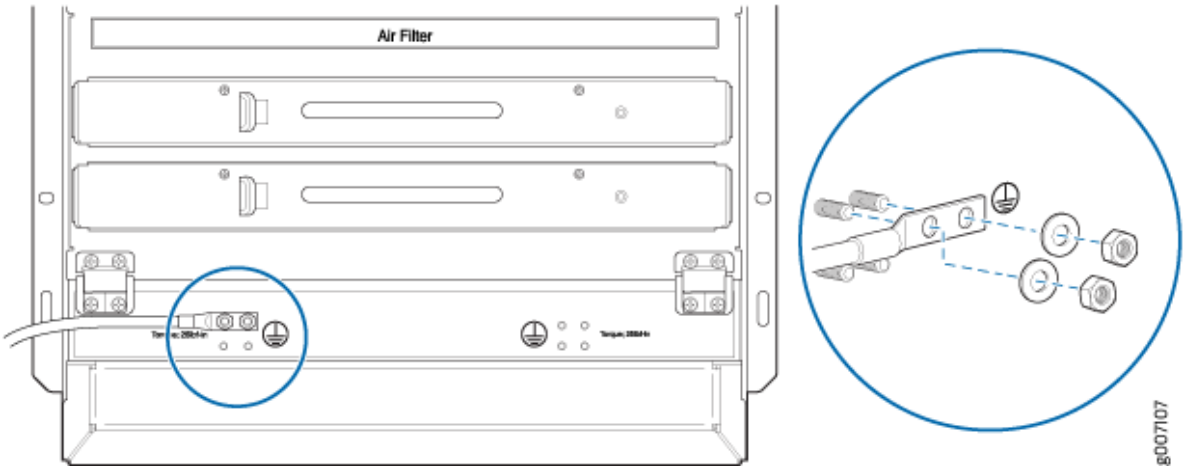
NOTE: There must be a minimum of 24-U of usable rack space when you install the MX2008 into a 24-U rack.

9. Remove the router transport platform, and set the platform aside.
10. Secure the router to the rack by using the mounting screws provided by the rack manufacturer.
11. Visually inspect the alignment of the router. To verify that the router is installed properly in the rack, see that 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.
12. Reassemble the router transport kit, and set it aside for future use.

Step 4: Connect the Grounding Cable

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to an approved site ESD grounding point. See the instructions for your site.
2. Connect the grounding cable to a proper earth ground.
3. Verify that a licensed electrician has attached the cable lug provided with the router to the grounding cable.
4. Make sure that grounding surfaces are clean and brought to a bright finish before you make grounding connections.
5. Attach an ESD grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis. For more information about ESD, see the MX2008 Universal Routing Platform Hardware Guide.
6. Place the grounding cable lug over the grounding points. The upper pair is sized for UNC 1/4-20 bolts, and the lower pair is sized for M6 bolts.
7. Secure the grounding cable lug to the grounding points, first with the washers, and then with the nuts (see Figure 32 on page 43).

Figure 32: Grounding Points on the MX2008 Router



8. Verify that the grounding cabling is correct, that the grounding cable does not touch or block access to router components, and that it does not drape where people could trip on it.

Step 5: Reinstall Components

To reinstall the components in the router:

1. Take each component out of its electrostatic bag, and identify the slot on the component where it will be connected.

   NOTE: Remove the shipping covers before installing router components.

2. Slide each component into the chassis evenly so that it does not become stuck or damaged.
3. Tighten the captive screws, and secure all levers for each component.

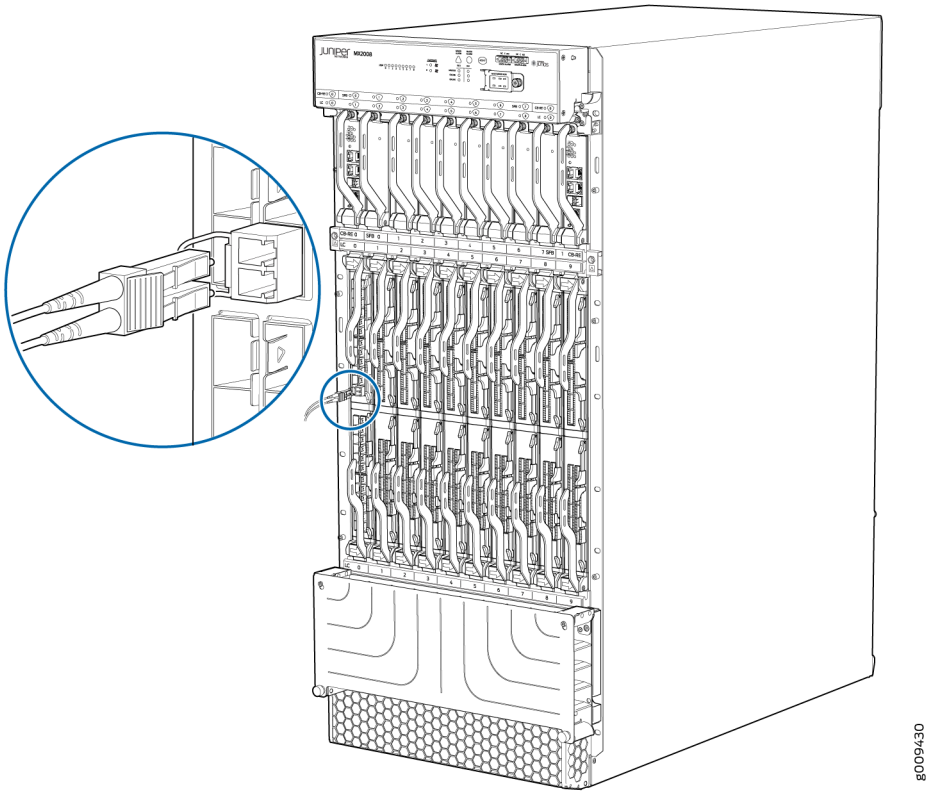
NOTE: Make sure that all empty slots are covered with a blank panel before operating the router.

Step 6: Connect External Devices and Line Card Cables

IN THIS SECTION

- Connect to a Network for Out-of-Band Management | 45
- Connect a Management Console | 45
- Connect the Line Card Cables | 46

Figure 33: Connecting External Devices and MPC Cables



Connect to a Network for Out-of-Band Management

1. Turn off the power to the management device.
2. Plug one end of an RJ-45 Ethernet cable into the **ETHERNET** port on the RCB.
3. Plug the other end of the cable into the network device.

CAUTION: You must use shielded cables for the following ports: console, management, auxiliary, USB, and clocking ports.

Connect a Management Console

1. Turn off the power to the management device.

2. Plug one end of an RJ-45 Ethernet cable into the **CONSOLE** or **AUX** port on the RCB.
3. Plug the female DB-9 adapter end of the cable into the device's serial port.

NOTE: We no longer include the RJ-45 console cable with the DB-9 adapter as part of the device package. If the console cable and adapter are not included in your device package, or if you need a different type of adapter, you can order the following separately:

- RJ-45 to DB-9 adapter (JNP-CBL-RJ45-DB9)
- RJ-45 to USB-A adapter (JNP-CBL-RJ45-USBA)
- RJ-45 to USB-C adapter (JNP-CBL-RJ45-USBC)

If you want to use RJ-45 to USB-A or RJ-45 to USB-C adapter you must have X64 (64-Bit) Virtual COM port (VCP) driver installed on your PC. See, https://ftdichip.com/drivers/vcp-drivers/ to download the driver.

CAUTION: You must use shielded cables for the following ports: console, management, auxiliary, USB, and clocking ports.

Connect the Line Card Cables

1. Have ready a length of the type of cable used by the MPCs or MICs. For cable specifications, see the *MX Series Interface Module Reference*.
2. If the cable connector port is covered by a rubber safety plug, remove the plug.

LASER WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cable. Fiber-optic transceivers and fiber-optic cable connected to a transceiver emit laser light that can damage your eyes.

CAUTION: Do not leave a fiber-optic transceiver uncovered except when inserting or removing cable. The safety cap keeps the port clean and prevents accidental exposure to laser light.

3. Insert the cable connector into the cable connector port on the faceplate.

4. Arrange the cable in the cable manager system to prevent it from dislodging or developing stress points. Secure the cable so that it is not supporting its own weight as it hangs to the floor. Place excess cable out of the way in a neatly coiled loop in the cable manager system. Placing fasteners on the loop helps to maintain its shape.

   CAUTION: Avoid bending fiber-optic cable beyond its minimum bend radius. An arc smaller than a few inches in diameter can damage the cable and cause problems that are difficult to diagnose.

   CAUTION: Do not let fiber-optic cable hang free from the connector. Do not allow fastened loops of cable to dangle, which stresses the cable at the fastening point.

Step 7: Connect Power Cables

IN THIS SECTION

- Connect Power to a Three-Phase Delta AC Power Distribution Module | 48
- Connect Power to a Three-Phase Wye AC Power Distribution Module | 52
- Connect AC Power Supply Modules | 56
- Connect Power to a DC Power Distribution Module | 59
- Connect DC Power Supply Modules | 62

Depending on your configuration, your router uses either AC or DC power distribution modules (PDMs). Perform the appropriate procedures for each PDM in your router. For more information about PDMs, see the MX2008 Universal Routing Platform Hardware Guide.

Connect Power to a Three-Phase Delta AC Power Distribution Module

To connect an AC power cord to an AC power source for the three-phase delta AC power distribution module (PDM):

CAUTION: Do not mix AC and DC power modules within the same router.

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to an approved site ESD grounding point. See the instructions for your site.
2. Switch off the dedicated customer-site circuit breakers. Ensure that the voltage across the AC power source cable leads is 0 V and that there is no chance that the cable leads might become active during installation.
3. Detach the ESD grounding strap from the approved site ESD grounding point, and connect the strap to one of the ESD points on the chassis.
4. Switch off (**O**) the AC power supply modules (PSMs) and disengage all AC PSMs.
5. Verify that the correct three-phase delta AC PDMs are installed and secured in the chassis before connecting power cables.

   NOTE: The power cables must be uninstalled and removed from the PDM before removal of the PDM from the chassis.

6. Using a number 2 Phillips (+) screwdriver, unscrew the four captive screws located on the either side of the metal AC wiring compartment (four screws total per PDM).
7. Remove the cover of the metal AC wiring compartment.
8. Unscrew the retaining nut from the AC power cord.
9. Insert the wires of the AC power cord through the hole of the retaining nut and rubber grommet.
10. Insert the wires of the AC power cord through the hole of the metal wiring compartment.
11. Connect the wires to the AC terminal block on the three-phase delta AC PDM (see Figure 34 on page 49). Loosen the input terminal or grounding point screw, insert each wire into the grounding point input terminal, and tighten the screw (see Table 4 on page 50 for approved AC wire gauge).

    NOTE: The terminal connections have either slotted screws or hex screws. Use a 1/4-in. slotted screwdriver for the slotted screws. Use a 5/32-in. (4-mm) Allen wrench for the 5/16-in. hex screws.

NOTE: The three-phase delta AC PDM must be installed and secured in the chassis before connecting the power input cables. If the PDM must be removed, both input power cables must be uninstalled and removed from the PDM before the PDM can be removed from the chassis. The MX2008 chassis is not sensitive to phase rotation sequence—either clockwise or counter clockwise will operate correctly.

To connect wires to the terminal block that serves six PSMs:

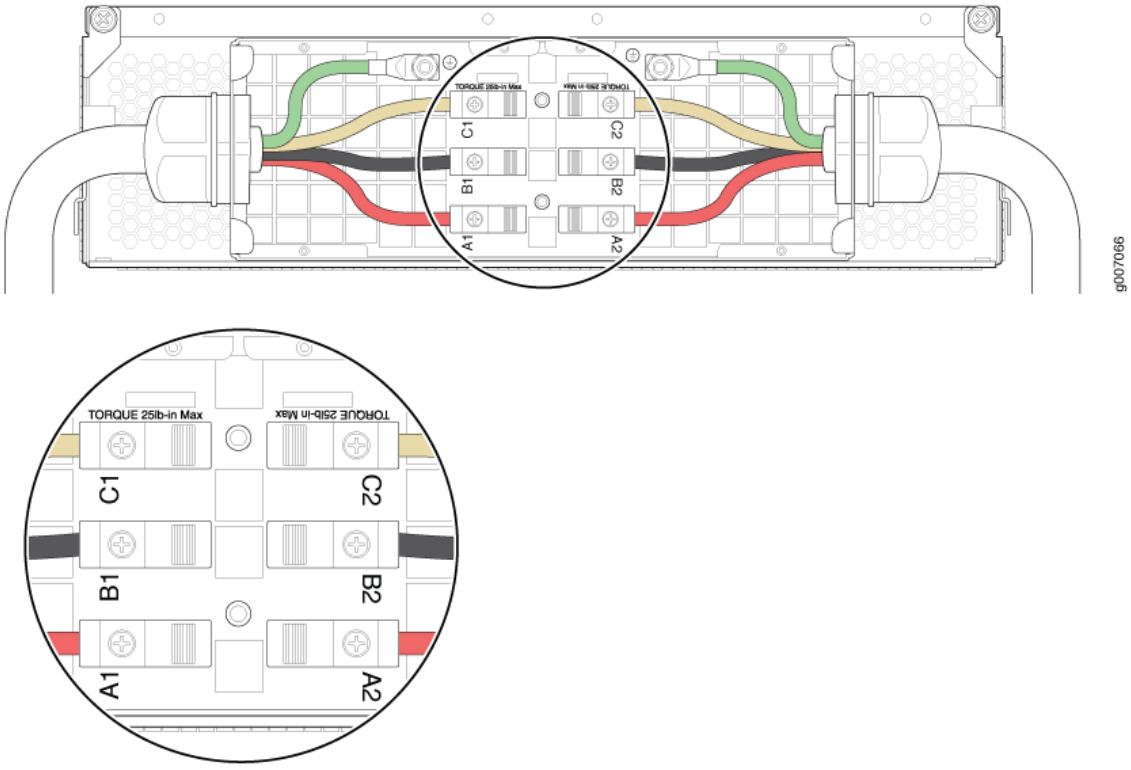
a. Insert the grounding wire into the grounding point labeled **GND**.

b. Insert the wire labeled **L1** into the input terminal labeled **A1**.

c. Insert the wire labeled **L2** into the input terminal labeled **B1**.

d. Insert the wire labeled **L3** into the input terminal labeled **C1**.

Figure 34: Connecting Power to a Three-Phase Delta AC Power Distribution Module



NOTE: The three-phase delta AC PDM terminal blocks will be flipped depending on which slot the PDM gets plugged into.

CAUTION: Wire label configuration is for Juniper Networks supplied cable only. If you are using your own cable, make sure you use the proper connections.

To connect wires to the terminal block that serves three PSMs:

a. Insert the grounding wire into the grounding point labeled **GND**.

b. Insert the wire labeled **L1** into the input terminal labeled **A2**.

c. Insert the wire labeled **L2** into the input terminal labeled **B2**.

d. Insert the wire labeled **L3** into the input terminal labeled **C2**.

WARNING: To protect power supplies from input voltage that might be caused by mis-wired PDMs, before reinstalling the metal cover to the wiring compartment, apply AC voltage to the PDM (with disengaged PSM) to make sure that two LEDs on the PDM are lit green and that the AC voltage between AC terminal blocks A1-B1, B1-C1, C1-A1, A2-B2, B2-C2, and C2-A2 for three-phase delta PDM is not more than 264 VAC when measured with a digital voltage meter (DVM). Then turn off the AC breaker, de-energizing the PDM, and install the metal cover and engage all AC PSMs.

NOTE: The color of each AC power wire might vary.

NOTE: Three-phase delta AC wire assembly kits can be purchased from Juniper Networks.

Table 4: Supported Three-Phase Delta AC Wire Gauge

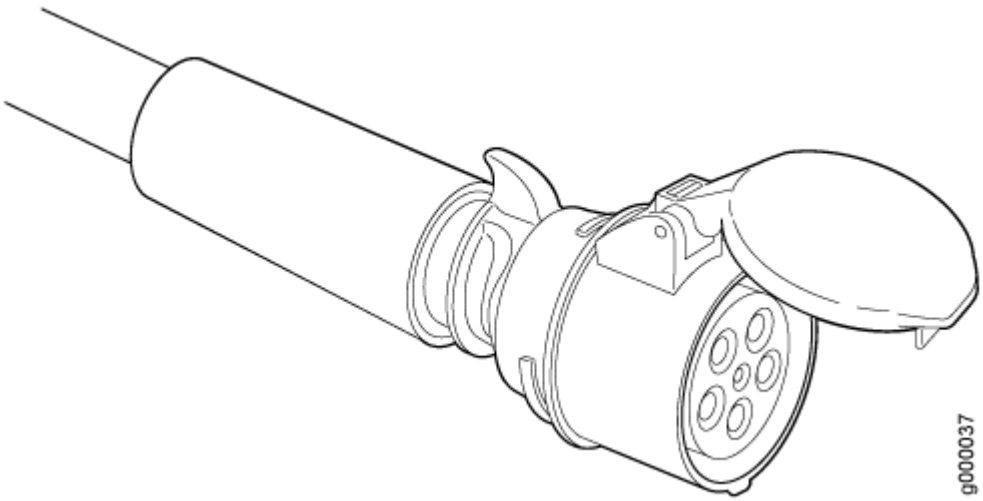
Wire Gauge	Description
4 x 6-AWG or equivalent	4 conductor wires, each wire is 6-AWG

NOTE: We recommend that you use the proper gauge wire in order for the cable clamps to hold the AC cables. Using smaller gauge wiring will result in the cable clamps not tightening properly.

WARNING: Power connections must be performed by a licensed electrician only.

12. Verify that the power cable connections are correct.
13. Screw the retaining nut onto the AC power cord to secure it to the metal wiring compartment.
14. Using a number 2 Phillips (+) screwdriver, tighten the two captive screws on the metal AC wiring compartment.
15. Use the provided plastic cable tie to fasten the AC power cord to the PDM.
16. Verify that the AC power cord does not touch or block access to router components, and that it does not drape where people could trip on it.
17. Repeat the procedure for the other three-phase delta AC PDMs.
18. Connect the three-phase delta AC power cord mating connector to the AC power cord connector (see Figure 35 on page 51). Table 5 on page 52 shows the approved three-phase delta AC power cord mating connector specifications.

Figure 35: Three-Phase Delta AC Power Cord Mating Connector



NOTE: The three-phase delta AC power cord mating connector is not supplied by Juniper Networks.

Table 5: Three-Phase Delta AC Power Cord Mating Cable Connector Specifications

Cable	Manufacturer Part Number	Description
Three-phase delta	460C9W	60-amp, 250 volt 3-phase, 3-pole, 4-wire, North American pin and sleeve connector, industrial grade, IP67, watertight (blue)

WARNING: Do not touch the power connectors on the PDM. They can contain dangerous voltages.

Connect Power to a Three-Phase Wye AC Power Distribution Module

CAUTION: Do not mix AC and DC power modules within the same router.

To connect an AC power cord to an AC power source for the three-phase wye AC PDM:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to an approved site ESD grounding point. See the instructions for your site.
2. Switch off the dedicated customer-site circuit breakers. Ensure that the voltage across the AC power source cable leads is 0 V and that there is no chance that the cable leads might become active during installation.
3. Detach the ESD grounding strap from the approved site ESD grounding point, and connect the strap to one of the ESD points on the chassis.
4. Switch off (**O**) the AC PSMs and disengage all AC PSMs.
5. Using a number 2 Phillips (+) screwdriver, unscrew the four captive screws located on the either side of the metal AC wiring compartment (four screws total per PDM).
6. Remove the cover of the metal AC wiring compartment.

7. Unscrew the retaining nut from the AC power cord.
8. Insert the wires of the AC power cord through the hole of the retaining nut and rubber grommet.
9. Insert the wires of the AC power cord through the hole of the metal wiring compartment.
10. Connect the wires to the AC terminal block on the three-phase wye AC PDM (see Figure 36 on page 54). Loosen the input terminal or grounding point screw, insert each wire into the grounding point or input terminal, and tighten the screw (see Table 6 on page 55 for approved AC wire gauge).

> **NOTE**: The terminal connections have either slotted screws or hex screws. Use a 1/4-in. slotted screwdriver for the slotted screws. Use a 5/32-in. (4-mm) Allen wrench for the 5/16-in. hex screws.

> **NOTE**: The three-phase wye AC PDM must be installed and secured in the chassis before connecting the power input cables. If the PDM must be removed, both input power cables must be uninstalled and removed from the PDM before the PDM can be removed from the chassis. The MX2008 chassis is not sensitive to phase rotation sequence—either clockwise or counter clockwise will operate correctly.

To connect wires to the terminal block that serves six PSMs:

a. Insert the grounding wire into the grounding point labeled **GND**.

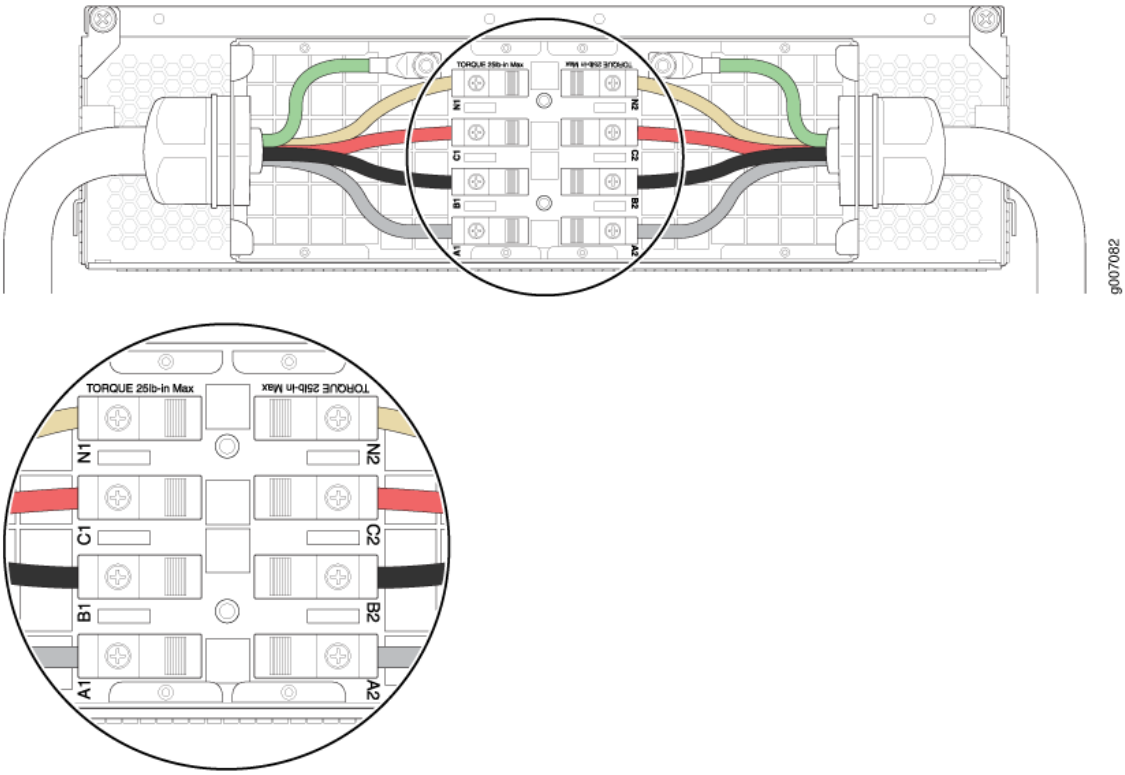
b. Insert the wire labeled **L1** into the input terminal labeled **A1**.

c. Insert the wire labeled **L2** into the input terminal labeled **B1**.

d. Insert the wire labeled **L3** into the input terminal labeled **C1**.

e. Insert the wire labeled **N** into the input terminal labeled **N1**.

Figure 36: Connecting Power to a Three-Phase Wye AC Power Distribution Module



CAUTION: Wire label configuration is for Juniper Networks supplied cable only. If you are using your own cable, make sure you use the proper connections.

To connect wires to the terminal block that serves three PSMs:

a. Insert the grounding wire into the grounding point labeled **GND**.

b. Insert the wire labeled **L1** into the input terminal labeled **A2**.

c. Insert the wire labeled **L2** into the input terminal labeled **B2**.

d. Insert the wire labeled **L3** into the input terminal labeled **C2**.

e. Insert the wire labeled **N** into the input terminal labeled **N2**.

WARNING: To protect power supplies from input voltage that might be caused by miswired PDMs, before reinstalling the metal cover to the wiring compartment, apply AC voltage to the PDM (with disengaged PSM) to make sure that two LEDs

on the PDM are lit green and that the AC voltage between AC terminal blocks A1-N1, B1-N1, C1-N1, A2-N2, B2-N2, and C2-N2 for three-phase wye PDM is not more than 264VAC when measured with a DVM. Then turn off the AC breaker, de-energizing the PDM, and install the metal cover and engage all AC PSMs.

NOTE: The color of each AC power wire might vary.

NOTE: Three-phase wye AC wire assembly kits can be purchased from Juniper Networks.

Table 6: Supported Three-Phase Wye AC Wire Gauge

Wire Gauge	Description
5 x 10-AWG or equivalent	5 conductor wires, each wire is 10-AWG

NOTE: We recommended that you use the proper gauge wire in order for the cable clamps to hold the AC cables. Using smaller gauge wiring will result in the cable clamps not tightening properly.

WARNING: Power connections must be performed by a licensed electrician only.

11. Verify that the power cable connections are correct.
12. Screw the retaining nut onto the AC power cord to secure it to the metal wiring compartment.
13. Reinstall the metal PDM wiring cover, and using a number 2 Phillips (+) screwdriver, tighten the four captive screws on the metal AC wiring compartment.
14. Use the provided plastic cable tie to fasten the AC power cord to the PDM.
15. Verify that the AC power cord does not touch or block access to router components, and that it does not drape where people could trip on it.
16. Repeat the procedure for the other three-phase wye AC PDMs.
17. Connect the three-phase wye AC power cord mating connector to the AC power cord connector (see Figure 37 on page 56). Table 7 on page 56 shows the approved three-phase wye AC power cord mating connector specifications.

Figure 37: Three-Phase Wye AC Power Cord Mating Connector

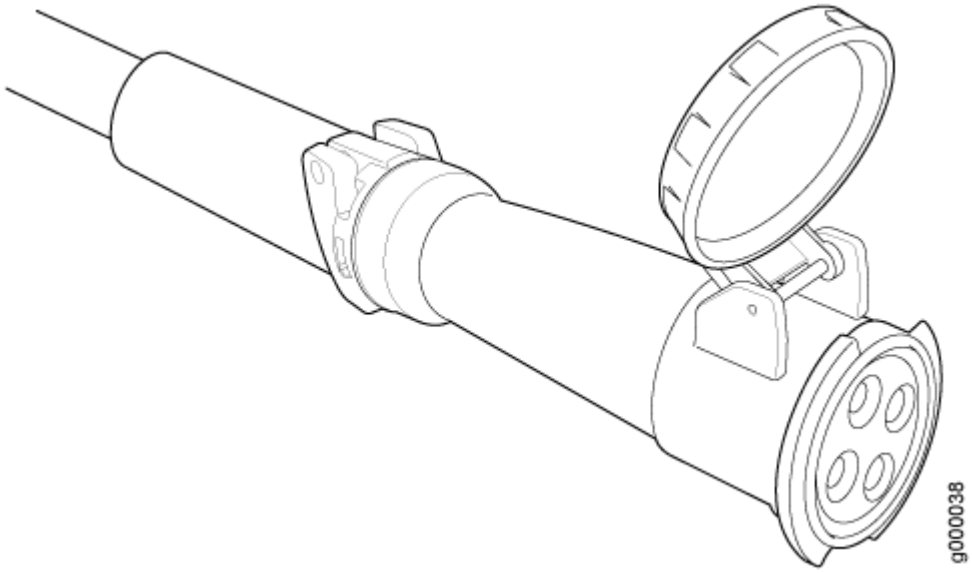


Table 7: Three-Phase Wye AC Power Cord Mating Cable Connector Specifications

Cable	Manufacturer Part Number	Description
Three-phase wye	PCE 225-6	32-amp, 400 volt IP44 3 pole, 5 wire with brass contacts (red)

NOTE: The three-phase wye AC power cord mating connector is not supplied by Juniper Networks.

WARNING: Do not touch the power connectors on the PDM. They can contain dangerous voltages.

Connect AC Power Supply Modules

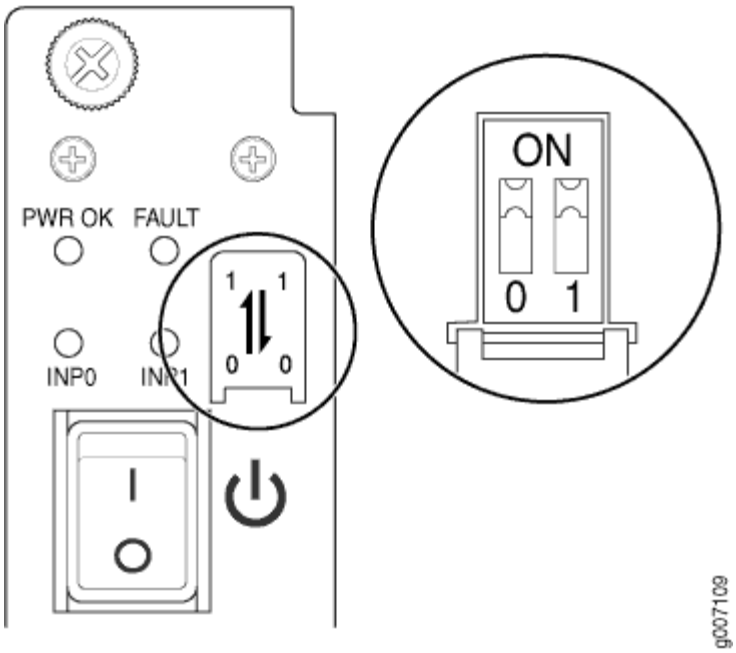
To install an MX2008 AC power supply module (PSM):

1. Verify that the power switch on the PSM is in the off (**O**) position (see Figure 38 on page 57).

2. Move the input mode DIP switch **0** (left switch) to the **ON** (top position) for the bottom feed **INP0** (expected to be connected), and DIP switch **1** (right switch) to the **ON** (top position) for the top feed **INP1** (expected to be connected). If both DIP switches **0** and **1** are turned to the **ON** position, then both top and bottom feeds are expected to be connected (see Figure 38 on page 57).

   The AC power system provides dual redundant feed. Each PSM takes in two AC feeds and uses one of the two. Only one of the two feeds is active during power operation. Each feed is a single-phase AC system 200–240 VAC derived from a three-phase delta or wye AC input system. In addition, a PSM failure triggers the alarm LED on the craft interface. Each PDM has an LED per feed indicating whether the feed is active or not, or whether the feed is connected properly.

Figure 38: Selecting AC Power Subsystem Feed Redundancy



3. Ensure that the voltage across the AC power source cable leads is 0 V and that there is no chance that the cable leads might become active during installation.
4. Using both hands, slide the PSM straight into the chassis until the PSM is fully seated in the chassis slot. Tighten the two captive screws to secure the PSM to the chassis.
5. Verify that the **INP0** or **INP1** LEDs on the PSM are lit green steadily. The **INP0** or **INP1** LEDs are lit yellow if that input's voltage is in reverse polarity. Check the polarity of the power cables to fix the condition (see Figure 39 on page 59 and Table 8 on page 58).
6. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis.
7. Move the switch to the on (|) position.
8. Verify that the **PWR OK** LED is lit green steadily. See Table 8 on page 58 for information about MX2008 AC PSM LEDs.

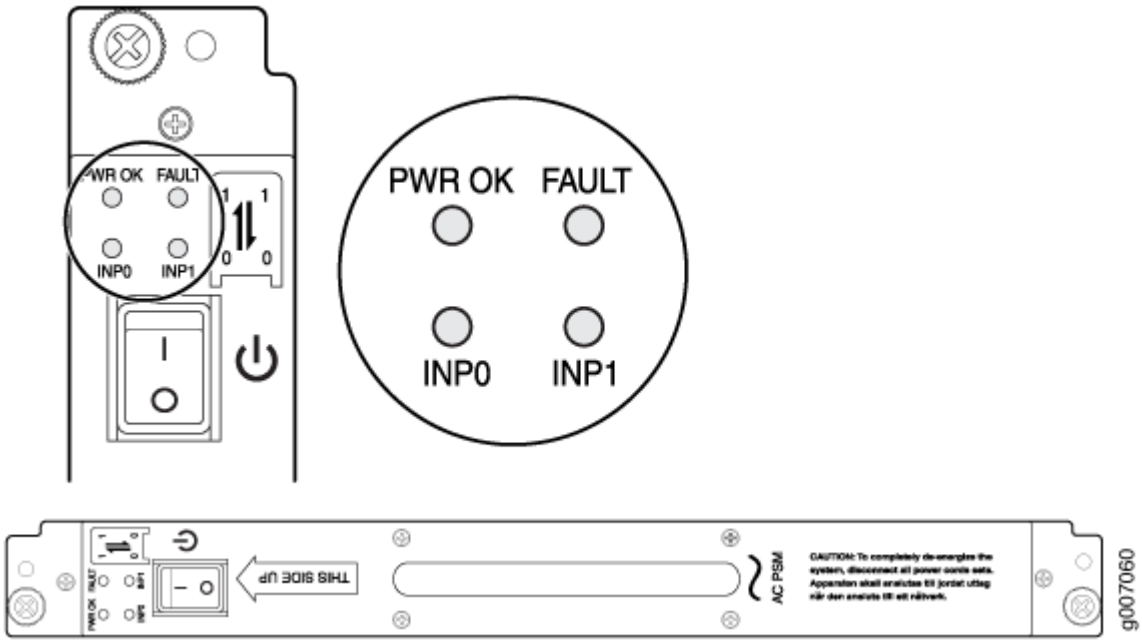
NOTE: The MX2008 systems configured for three-phase wye AC input power must use only three-phase wye AC PDMs and AC PSMs. Systems configured for three-phase delta AC input power must use three-phase delta AC PDMs and AC PSMs. AC and DC PSMs or PDMs must not be mixed within a single system.

Table 8: MX2008 AC Power Supply Module LEDs

Label	Color	State	Description
PWR OK	Green	On	Power is functioning normally with no alarms.
	Yellow	On	PSM controller is off with both **INP0** and **INP1** voltage out of range.
	–	Off	PSM is not functioning normally or the AC input voltage is out of range.
FAULT	Red	On	PSM is not functioning normally or the AC input voltage is out of range.
	–	Off	PSM is functioning normally.
INP0	Green	On	AC input is within the required voltage range and the DIP switch is set to on.
	Yellow	On	AC input is out of the required voltage range.
	–		
INP1	Green	On	AC input is within the required voltage range and the DIP switch is set to on.
	Yellow	On	AC input is out of the required voltage range.
	–	Off	AC input to the PSM is not present.

9. Repeat Steps 1 through 8 for installing PSMs in slots **0**, **1**, and **2**, where required.

Figure 39: MX2008 AC Power Supply Module Front View



NOTE: Each PSM slot not occupied by an AC PSM must be covered by a PSM blank panel.

Connect Power to a DC Power Distribution Module

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis. For more information about ESD, see the MX2008 Universal Routing Platform Hardware Guide.

   NOTE: If the DC PSMs are installed in the router, make sure that the power switch is turned to the off (**O**) position.

2. Ensure that the voltage across the DC power source cable leads is 0 V and that there is no chance that the cable leads might become active during installation.
3. Remove the DC PDM from the electrostatic bag.
4. Using both hands, slide the PDM part way into the chassis.
5. Open the two locking levers on either side of the PDM, and align them with the openings in the chassis.

6. Using both hands, push firmly on both spring-loaded levers until the PDM is fully seated in the chassis slot. The PDM faceplate should be flush. Tighten both captive screws.

   NOTE: Make sure that the DC circuit feed switch on the PDM faceplate matches the current rating amperage—**60 A** or **80 A**. This switch applies to all inputs of this PDM, and selecting 60 A reduces the available power output capacity of the PSMs supplied by this PDM.

7. Loosen the captive screws on the clear plastic cable restraint protecting the terminal studs on the faceplate of the PDM.
8. Secure each power cable lug to the terminal studs, first with the flat washer, then with the split washer, and finally with the nut. Apply between 23 lb-in. (2.6 Nm) and 25 lb-in. (2.8 Nm) torque to each nut (see Figure 40 on page 61). Do not overtighten the nut. (Use a 7/16-in. [11 mm] torque-controlled driver or socket wrench.)

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

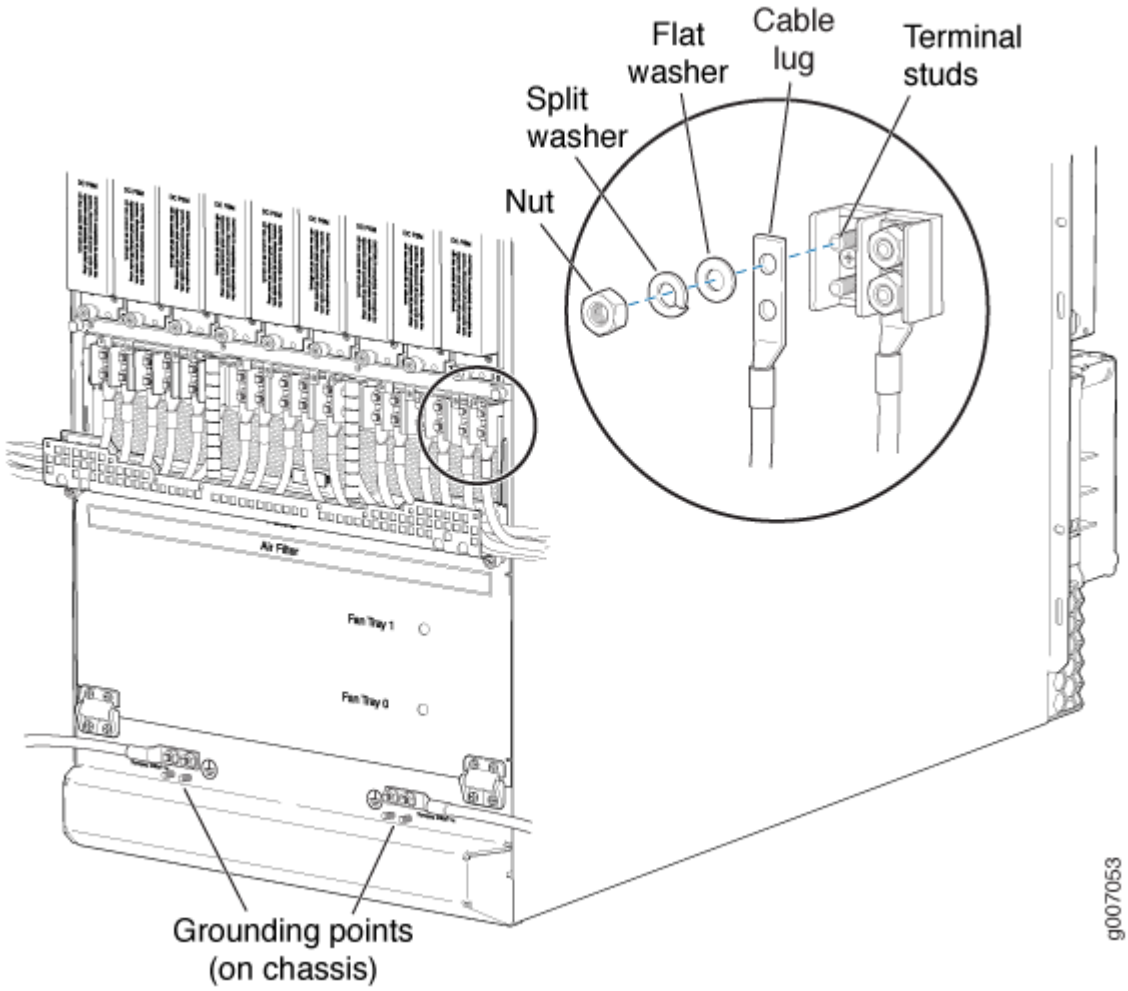
   b. Attach the negative (–) DC source power cable lug to the **–48V** (input) terminal.

   Table 9 on page 60 describes the DC operating range specifications.

Table 9: MX2008 DC Power System Input Voltage

Item	Specification
DC input voltage	Operating range: –40 through –72 VDC

Figure 40: Connecting Ground and DC Power Cables



CAUTION: Ensure that each power cable lug seats flush against the surface of the terminal block as you are tightening the nuts. Ensure that each nut is properly threaded onto the terminal stud. The nut should be able to spin freely with your fingers when it is first placed onto the terminal stud. Applying installation torque to the nut when the nut is improperly threaded might result in damage to the terminal stud.

CAUTION: The maximum torque rating of the terminal studs on the DC PDM is 25 lb-in. (33.89 Nm). The terminal studs might be damaged if excessive torque is

applied. Use only a torque-controlled driver or socket wrench to tighten nuts on the DC PDM terminal studs.

NOTE: For information about connecting to DC power sources, see the MX2008 Universal Routing Platform Hardware Guide.

9. Connect each DC power cable to the appropriate external DC power source.

NOTE: For information about connecting to external DC power sources, see the MX2008 Universal Routing Platform Hardware Guide.

10. Switch on the external circuit breakers to provide voltage to the DC power source cable leads.

NOTE: Each PDM must be connected to a dedicated **60 A** or **80 A** DC circuit breaker for the DC power source. The PDM has a switch to accommodate DC circuit breaker amperage.

11. Verify that the power cabling is correct, that the cables are not touching, and that they do not block access to router components or drape where people could trip on them.
12. Close the cable restraint cover over the terminal studs, and tighten the captive screws.

Connect DC Power Supply Modules

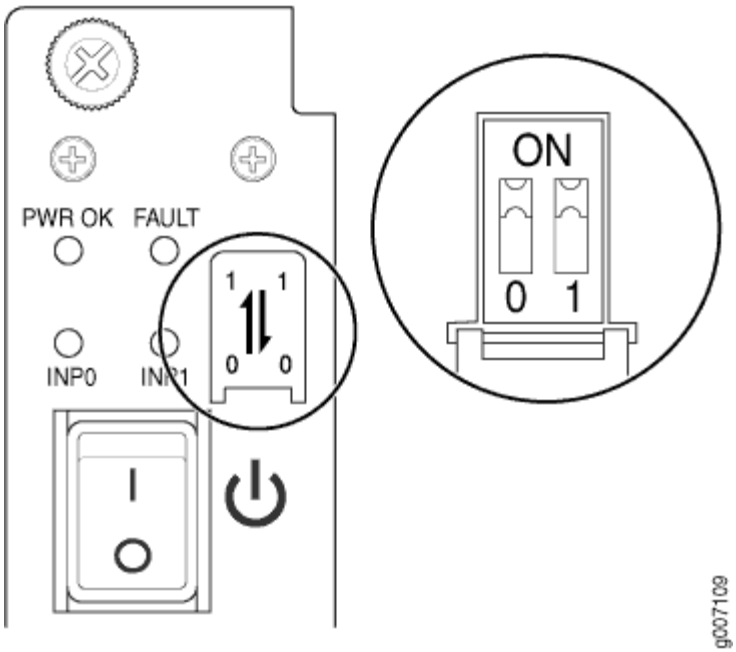
To install an MX2008 DC PSM:

1. Verify that the power switch on the PSM is in the off (**O**) position (see Figure 41 on page 63).
2. Move the input mode DIP switch **0** (left switch) to the **ON** (top position) for the bottom feed **INP0** (expected to be connected), and DIP switch **1** (right switch) to the **ON** (top position) for the top feed **INP1** (expected to be connected). If both DIP switches **0** and **1** are turned to the **ON** position, then both top and bottom feeds are expected to be connected, (see Figure 41 on page 63).

   The DC power subsystem is feed redundant. Each DC PSM can be connected to two separate feeds from different sources that are used to provide feed redundancy. If two feeds are connected, PSM input power is drawn from the feed with the higher voltage present. There are two PDMs per power subsystem capable of carrying nine feeds each. Connect feeds from one source to one PDM and feeds from the other source to the second PDM of the power subsystem. The primary input of the PSM is a dual redundant feed, labeled **INP0** and **INP1**. Both feeds are active during operation, but both feeds might or might not be providing current. In addition, a PSM failure triggers the alarm LED

on the craft interface. Each PDM has an LED per feed indicating whether the feed is active or not, or whether the feed is connected properly.

Figure 41: Selecting DC Power Subsystem Feed Redundancy



3. Ensure that the voltage across the DC power source cable leads is 0 V and that there is no chance that the cable leads might become active during installation.
4. Using both hands, slide the PSM straight into the chassis until the PSM is fully seated in the chassis slot. Tighten the two captive screws to secure the PSM to the chassis.

> **NOTE**: The MX2008 systems configured for DC input power must use only DC PDMs and DC PSMs. AC and DC PSMs or PDMs must not be mixed within a single system.

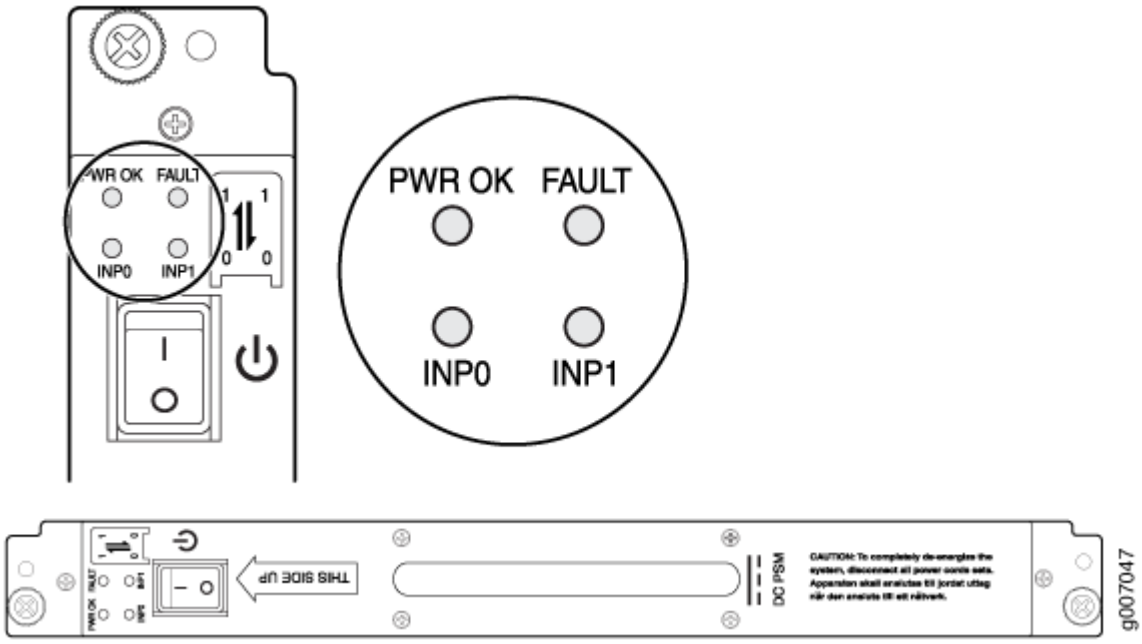
5. Verify that the **INP0** or **INP1** LED on the PSM is lit green steadily. The **INP0** or **INP1** LED is lit yellow if that input's voltage is in reverse polarity. Check the polarity of the power cables to fix the condition (see Figure 42 on page 65 and Table 10 on page 64).
6. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis.
7. Move the switch to the on (|) position.
8. Verify that the **PWR OK** LED is lit green steadily. See Table 10 on page 64 for information about MX2008 DC PSM LEDs.

Table 10: MX2008 DC Power Supply Module LEDs

Label	Color	State	Description
PWR OK	Green	On	PSM is functioning normally with no alarms.
	Yellow	On	PSM controller is off with both **INP0** and **INP1** voltage out of range.
	–	Off	PSM is not functioning normally or the PSM controller is off.
FAULT	Red	On	PSM is not functioning normally or the DC input voltage of one or more feeds is out of range.
	–	Off	PSM is functioning normally or both DIP switches are set to off.
INP0	Green	On	DC input is within required voltage range and the DIP switch is set to on.
	Yellow	On	DC input is detected but voltage is out of range.
	–	Off	DC input to the PSM is not present.
INP1	Green	On	DC input is within required voltage range and the DIP switch is set to on.
	Yellow	On	DC input is detected but voltage is out of range.
	–	Off	DC input to the PSM is not present.

9. Repeat Steps 1 through 8 for installing PSMs in slots **0**, **1**, and **2**, where required.

Figure 42: MX2008 DC Power Supply Module Front View



NOTE: Each PSM slot not occupied by a DC PSM must be covered by a PSM blank panel.

Step 8: Perform Initial Software Configuration

IN THIS SECTION

- Enter Configuration Mode | 66
- Configure User Accounts and Passwords | 66
- Configure System Attributes | 67
- Commit the Configuration | 68

This procedure connects the router to the network but does not enable it to forward traffic. For complete information about configuring the router to forward traffic, including examples, see the Junos OS configuration guides.

Check the LEDs on the craft interface to verify the hardware status after reinstalling or powering on the MX2008 router.

For a list of system status verification commands, see the MX2008 Universal Routing Platform Hardware Guide at https://www.juniper.net/documentation/.

To configure the software:

Enter Configuration Mode

1. Verify that the network device is powered on.
2. Log in as the “root” user. There is no password.
3. Start the CLI.

```
root@% cli
root>
```

4. Enter configuration mode.

```
root> configure
Entering configuration mode.
[edit]
root#
```

Configure User Accounts and Passwords

For information about using an encrypted password or an SSH public key string (DSA or RSA), see authentication.

1. Add a password to the root administration user account. Enter a clear-text password.

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

2. Create a management console user account.

```
[edit]
root# set system login user user-name authentication plain-text-password
New Password: password
Retype new password: password
```

3. Set the user account class to `super-user`.

```
[edit]
root@# set system login user user-name class super-user
```

Configure System Attributes

For more information about configuring the backup routing and static routes, see the Junos OS Administration Library.

1. 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
```

> **NOTE**: The DNS server does not use the hostname to resolve to the correct IP address. This hostname is used to display the name of the Routing Engine in the CLI. For example, the configured values for the *user-name* and *host-name* variables appear on the command prompt in the following format when the user is logged in to the CLI:
>
> *user-name@host-name>*

2. Configure the IP address of the DNS server.

```
[edit]
root# set system name-server address
```

3. Configure the router's domain name.

```
[edit]
root# set system domain-name domain-name
```

4. Configure the IP address and prefix length for the router's management Ethernet interface.

```
[edit]
root # set interfaces fxp0 unit 0 family inet address address/prefix-length
```

5. Configure the IP address of a backup Routing Engine. The backup Routing Engine is used while the local router is booting and if the routing process fails to start. After the routing process starts, the backup Routing Engine address is removed from the local routing and forwarding tables.

```
[edit]
root# set system backup-router address
```

6. (Optional) Configure the static routes to remote subnets with access to the management Ethernet port. Access to the management Ethernet port is limited to the local subnet. To access the management Ethernet port from a remote subnet, you must add a static route to that subnet within the routing table.

```
[edit]
root# set routing-options static route remote-subnet next-hop destination-IP retain no-
readvertise
```

7. Configure the Telnet service at the `[edit system services]` hierarchy level.

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

Commit the Configuration

1. Display the configuration to verify that it is correct.

```
[edit]
root@# show
system {
    host-name host-name;
    domain-name domain-name;
    backup-router address;
    root-authentication {
        authentication-method (password | public-key);
    }
    name-server {
        address;
    }
}
interfaces {
    fxp0 {
        unit 0 {
            family inet {
                address address/prefix-length;
            }
        }
    }
}
```

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

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

3. Optionally, configure additional properties by adding the necessary configuration statements. Then commit the changes to activate them on the router.

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

4. When you have finished configuring the router, exit configuration mode.

```
[edit]
root@host# exit
root@host>
```

Safety Warnings

WARNING: See installation instructions before connecting the router. This is a summary of safety warnings. For a complete list of warnings for this router, including translations, see the MX2008 Universal Routing Platform Hardware Guide. Other services should be performed by authorized service personnel only.

WARNING: The intrabuilding port(s) of the router is suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding port(s) of the router MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

CAUTION: To comply with intrabuilding lightning and surge requirements, intrabuilding wiring must be shielded, and the shield for the wiring must be grounded at both ends.

CAUTION: Before removing or installing components of a router, attach an ESD strap to an ESD point and place the other end of the strap around your bare wrist. Failure to use an ESD strap could result in damage to the router.

CAUTION: Use an external surge protective device (SPD) at the AC input of the router.

- Only trained and qualified personnel should install or replace the router.

- Perform only the procedures described in this Quick Start or in the MX2008 Universal Routing Platform Hardware Guide. Other services should be performed by authorized service personnel only.
- Read the installation instructions before you connect the router to a power source.
- Before installing the router, read the guidelines for site preparation in the MX2008 Universal Routing Platform Hardware Guide to make sure that the site meets power, environmental, and clearance requirements for the router.
- For the cooling system to function properly, the airflow around the chassis must be unrestricted. Allow at least 36 in. (91.44 cm) of clearance between front to rear-cooled routers. Allow 2.8 in. (7 cm) between the side of the chassis and any non-heat-producing surface such as a wall.
- Four people are required to move the MX2008 router.
- Always remove the front and rear shipping covers before removing the components.
- Always remove all components before moving the router. The empty router weighs 261 lb (118.39 kg).
- When installing the router, do not incline the chassis more than 10 degrees.
- Measure the shipping container to make sure there is adequate clearance through doorways and passages to accommodate the dimensions.

  NOTE: The shipping container (wooden crate) is 66.25 in. (168.27 cm) high, 48 in. (121.92 cm) deep, and 42 in. (106.68 cm) wide.

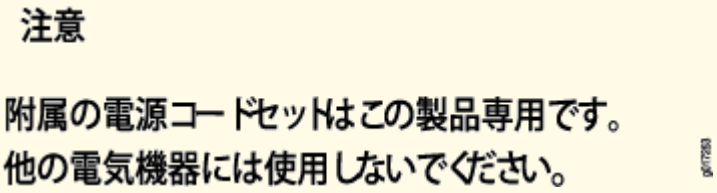
- Always reinstall the front and rear shipping covers to help move the router.

  WARNING: The shipping covers help prevent damage to the card cage and backplanes during rack installation.

- When installing components into the router, load the chassis from the bottom to the top.
- After installing components, install the EMI cover over the line cards.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the router in the rack.
- When removing or installing an electrical component, always place it component-side up on a flat antistatic surface or in an electrostatic bag.
- When you install the router, always make the ground connection first and disconnect it last.

- Wire the DC PDMs by using the appropriate lugs. When you connect power, the proper wiring sequence is ground to ground, +RTN to +RTN, then –48 V to –48 V. When you disconnect power, the proper wiring sequence is –48 V to –48 V, +RTN to +RTN, then ground to ground. Always connect the ground wire first and disconnect it last.
- Do not work on the system 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.
- Failure to observe these safety warnings can result in serious physical injury.
- AC power cable warning (Japan):

WARNING: The attached power cable is only for this product. Do not use the cable for another product.



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