MX960 3D Universal Edge Router

Quick Start

This document describes how to install the Juniper Networks® MX960 3D Universal Edge Router.

Contents

MX960 Quick Start Description .................................................... 3
Step 1: Prepare the Site for MX960 Installation ............................ 4
  Rack-Mounting Requirements ............................................... 4
  Tools Required to Unpack and Prepare the MX960 Router for
  Installation ............................................................................ 5
Step 2: Install the Mounting Hardware ....................................... 6
  Install the Mounting Hardware in a Four-Post Rack or Cabinet .... 6
  Install the Mounting Hardware in an Open-Frame Rack ............ 7
Step 3: Install the Router .......................................................... 9
  Remove Components ................................................................ 9
  Install the Router Using a Lift ............................................ 10
  Reinstall Components .......................................................... 12
Step 4: Connect the Grounding Cable ......................................... 13
Step 5: Connect External Devices and Line Card Cables ............. 14
  Connect to a Network for Out-of-Band Management .............. 14
  Connect a Management Console .......................................... 14
  Connect the Line Card Cables ............................................. 15
Step 6: Connect Power Cables .................................................... 16
  Connect Power to an AC Router with Normal-Capacity Power Supplies 16
  Connect Power to an AC Router with High-Capacity Power Supplies 16
  Connect Power to a DC Router with Normal-Capacity Power Supplies 20
  Connect Power to a DC Router with High-Capacity Power Supplies 21
Step 7: Perform Initial Software Configuration ............................ 26
  Enter Configuration Mode .................................................. 26
  Configure User Accounts and Passwords ................................. 26
  Configure System Attributes .............................................. 27
  Commit the Configuration .................................................. 27
Safety Warnings ........................................................................ 29
Compliance Statements for NEBS ............................................... 30
Compliance Statements for EMC Requirements .......................... 31
  Canada .................................................................................. 31
  European Community .............................................................. 31
  Israel .................................................................................... 31
  Japan .................................................................................... 31
  United States ......................................................................... 31
Junos Documentation and Release Notes ................................... 33
Requesting Technical Support .................................................... 33
  Self-Help Online Tools and Resources .................................... 33
  Opening a Case with JTAC ....................................................... 34
Revision History ....................................................................... 34
MX960 Quick Start Description

This Quick Start contains information you need to install and configure the router quickly. For complete installation instructions, see the MX960 3D Universal Edge Router Hardware Guide at http://www.juniper.net/techpubs/.

WARNING: This Quick Start contains a summary of safety warnings in “Safety Warnings” on page 29. For a complete list of warnings for this router, including translations, see the MX960 3D Universal Edge Router Hardware Guide at http://www.juniper.net/techpubs/.

The MX960 3D Universal Edge Router with the standard cable manager is 16 rack units (U) tall, or 21 U with the extended cable manager. Three routers with the standard cable manager, or two routers with the extended cable manager, can be stacked in a single floor-to-ceiling rack, for increased port density per unit of floor space.

The router provides 14 slots that can be populated with up to 12 Dense Port Concentrators (DPCs) or Modular Port Concentrators (MPCs), six Flexible PIC Concentrators (FPCs), and two Switch Control Boards (SCBs) in nonredundant fabric configurations.

Several types of DPCs are available. Each DPC includes either two or four Packet Forwarding Engines. Each Packet Forwarding Engine enables a throughput of 10 Gbps.

Up to two PICs can be installed in each FPC. Fully populated, the MX960 router supports up to 12 PICs.

Up to two Modular Interface Cards (MICs) can be installed in each MPC. Fully populated, the MX960 router supports up to 24 MICs.

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

The router is shipped in a cardboard box strapped securely to a wooden pallet. Plastic straps secure the top and bottom in place. The router chassis is bolted to this pallet. Quick Start installation instructions and a cardboard accessory box are also included in the shipping container.
Step 1: Prepare the Site for MX960 Installation

- Rack-Mounting Requirements on page 4
- Tools Required to Unpack and Prepare the MX960 Router for Installation on page 5

Rack-Mounting Requirements

- You can install the router in a four-post rack or cabinet or an open-frame rack.
- The rack rails must be spaced widely enough to accommodate the router chassis's external dimensions: 27.75 in. (70.49 cm) high, 23.0 in. (58.42 cm) deep, and 17.37 in. (44.11 cm) wide. The outer edges of the mounting brackets extend the width to 19 in. (48.3 cm).
- The rack must be strong enough to support the weight of the fully configured router, up to 350 lb (158.76 kg). If you stack three fully configured routers in one rack, it must be capable of supporting about 1,050 lb (476.3 kg).
- 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 30 in. (76.2 cm) in front of the router and 24 in. (61 cm) behind the router.
- The rack or cabinet must have an adequate supply of cooling air.
- Ensure that the cabinet allows the chassis hot exhaust air to exit from the cabinet without recirculating into the router.
- The router must be installed into a rack that is secured to the building structure.
- Mount the router at the bottom of the rack if it is the only unit in the rack.
- When mounting the router in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
Tools Required to Unpack and Prepare the MX960 Router for Installation

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

• A mechanical lift—recommended
• Phillips (+) screwdrivers, numbers 1 and 2
• 2.5 mm flat-blade (–) screwdriver
• 7/16-in. (11 mm) torque-controlled driver or socket wrench
• 1/2-in. or 13-mm open-end or socket wrench to remove bracket bolts from the shipping pallet
• Electrostatic discharge wrist strap
• Antistatic mat

Proceed to "Step 2: Install the Mounting Hardware" on page 6.
Step 2: Install the Mounting Hardware

- Install the Mounting Hardware in a Four-Post Rack or Cabinet on page 6
- Install the Mounting Hardware in an Open-Frame Rack on page 7

Install the Mounting Hardware in a Four-Post Rack or Cabinet

1. On the front rack rails, install cage nuts in the holes specified in the MX960 3D Universal Edge Router Hardware Guide for the large shelf and the spacer bars.
2. On the front of each front rack rail, partially insert a mounting screw into the hole containing the lowest cage nut.
3. Install the large shelf on the front rack rails. Rest the bottom slot of each ear on a mounting screw.
4. Partially insert a mounting screw into the top hole in each ear of the large shelf.
5. Tighten all the screws completely.
6. On the rear rack rails, install cage nuts in the holes specified in the MX960 3D Universal Edge Router Hardware Guide for the small shelf.
7. On the back of each rear rack rail, partially insert a mounting screw into the hole containing the lowest cage nut.
8. Install the small shelf on the back rack rails. Rest the bottom slot of each ear on a mounting screw. The small shelf installs on the back of the rear rails, extending toward the center of the rack. The bottom of the small shelf should align with the bottom of the large shelf.
9. Partially insert screws into the open holes in the ears of the small shelf.
10. Tighten all the screws completely.
Install the Mounting Hardware in an Open-Frame Rack

1. On the rear of each rack rail, partially insert a mounting screw into the highest hole specified in the MX960 3D Universal Edge Router Hardware Guide for the large shelf.

2. Install the large shelf on the rack. Hang the shelf over the mounting screws using the keyhole slots located near the top of the large shelf flanges.

3. Partially insert screws into the open holes in the ears of the large shelf.

4. Tighten all the screws completely.
Figure 3: Mount Hardware for an Open-Frame Rack
Step 3: Install the Router

- Remove Components on page 9
- Install the Router Using a Lift on page 10
- Reinstall Components on page 12

Remove Components

Figure 4: Components to Remove from the Front of the MX960 Router

Figure 5: Components to Remove from the Rear of the MX960 Router
Before installing the router, you must remove the following components:

- Power supplies
- Switch Control Boards (SCBs)
- Cable management system
- Routing Engines
- Air filter
- Fan trays
- Line cards:
  - Dense Port Concentrators (DPCs)
  - Flexible PIC Concentrators (FPCs)
  - Physical Interface Cards (PICs)
  - Modular Port Concentrators (MPCs)
  - Modular Interface Cards (MICs)

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

**NOTE:** For complete instructions on removing router components, see the *MX960 3D Universal Edge Router Hardware Guide*.

**Install the Router Using a Lift**

Before installing the router, you must remove all components (see “Remove Components” on page 9). To install the router using a lift:

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 both airflow and maintenance. For details, see the *MX960 3D Universal Edge Router Hardware Guide*.
2. Load the router onto the lift, making sure it rests securely on the lift platform (see Figure 6 on page 11).
3. Using the lift, position the router in front of the rack or cabinet, centering it in front of the mounting shelves.

4. Lift the chassis approximately 0.75 in. above the surface of the mounting shelves, and position it as close as possible to the shelves.

5. Carefully slide the router onto the mounting shelves so that the bottom of the chassis and the mounting shelves overlap by approximately 2 inches.

6. Slide the router onto the mounting shelves until the mounting brackets or front-mounting flanges contact the rack rails. The shelves ensure that the holes in the mounting brackets and the front-mounting flanges of the chassis align with the holes in the rack rails.

7. Move the lift away from the rack.

8. To install the router in an open-frame rack, install a mounting screw into each of the open mounting holes aligned with the rack, starting from the bottom.

9. 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.
Reinstall Components

To reinstall the components in the router:

1. Slide each component into the chassis evenly so that it does not become stuck or damaged.

2. Tighten the captive screws for each component.

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

Proceed to "Step 4: Connect the Grounding Cable" on page 13.
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 grounding connections are made.

5. 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 MX960 3D Universal Edge Router Hardware Guide.

6. Place the grounding cable lug over the grounding points. The left pair is sized for M6 bolts, and the right pair is sized for UNC 1/4-20 bolts.

7. Secure the grounding cable lug to the grounding points, first with the washers, then with the screws.

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.

Proceed to “Step 5: Connect External Devices and Line Card Cables” on page 14.
Step 5: Connect External Devices and Line Card Cables

Figure 7: Connect External Devices and DPC Cables

- Connect to a Network for Out-of-Band Management on page 14
- Connect a Management Console on page 14
- Connect the Line Card Cables on page 15

Connect to a Network for Out-of-Band Management

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

Connect a Management Console

1. Turn off the power to the management device.
2. Plug one end of the RJ-45 Ethernet cable into the CONSOLE or AUX port on the Routing Engine.
3. Plug the female DB-9 end into the device's serial port.
Connect the Line Card Cables

1. Have ready a length of the type of cable used by the DPCs, MPCs, MICs, or PICs. 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.

   **WARNING:** Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. 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 management 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 management 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.

Proceed to “Step 6: Connect Power Cables” on page 16.
Step 6: Connect Power Cables

Depending on your configuration, your router uses either AC or DC power supplies. Perform the appropriate procedures for each power supply in your router.

- Connect Power to an AC Router with Normal-Capacity Power Supplies on page 16
- Connect Power to an AC Router with High-Capacity Power Supplies on page 16
- Connect Power to a DC Router with Normal-Capacity Power Supplies on page 20
- Connect Power to a DC Router with High-Capacity Power Supplies on page 21

Connect Power to an AC Router with Normal-Capacity Power Supplies

1. Locate the power cords shipped with the router, which should have a plug appropriate for your geographical location (see the MX960 3D Universal Edge Router Hardware Guide).

2. 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 For more information about ESD, see the MX960 3D Universal Edge Router Hardware Guide..

3. Move the power switch on the power supply faceplate to the standby position.

4. Insert the appliance coupler end of the power cord into the appliance inlet on the power supply.

5. Insert the power cord plug into an external AC power source receptacle.

   ![NOTE: Each power supply must be connected to a dedicated AC power feed and a dedicated customer site circuit breaker. We recommend that you use a 15 A (250 VAC) minimum, or as permitted by local code.]

6. Dress the power cord appropriately. Verify that the power cord does not block the air exhaust and access to router components, or drape where people could trip on it.

7. Repeat Step 1 through Step 6 for the remaining power supplies.

Connect Power to an AC Router with High-Capacity Power Supplies

   ![NOTE: A minimum of two AC nominal 220 VAC 20 amp power cords are required for this procedure.]

To install an MX960 high-capacity AC power supply, use the following procedure (see Figure 8 on page 17).

1. Verify that the power switch on the power supply is in the off (O) position.

2. Ensure that the release lever below the empty power supply slot is locked in the counterclockwise position (see Figure 8 on page 17).
If necessary, pull the spring-loaded locking pin in the release lever away from the chassis and turn the release lever counterclockwise until it stops. Let go of the locking pin in the release lever. Ensure that the pin is seated inside the corresponding hole in the chassis.

3. On the power supply, rotate the metal cover away from the input mode switch to expose the switch.

4. Move the input mode switch to position 0 for one feed or position 1 for two feeds (see Figure 9 on page 18).
CAUTION: Do not use a pencil, because fragments can break off and cause damage to the power supply.

5. Using both hands, slide the power supply straight into the chassis until the power supply is fully seated in the chassis slot. The power supply faceplate will protrude beyond the chassis.

The small tab on the metal housing that is controlled by the release lever must be inside of the corresponding slot at the bottom of the power supply (see Figure 9 on page 18). This tab is used to pull the power supply down in the chassis slot, prior to removing the power supply.

6. While firmly pushing the handle on the power supply faceplate with one hand, use your other hand to pull the spring-loaded locking pin in the release lever away from the chassis and turn the release lever clockwise until it stops.

7. Let go of the locking pin in the release lever. Ensure that the pin is seated inside the corresponding hole in the chassis.

8. Locate a power cord with the type of plug appropriate for your geographical location (see AC Power Cord Specifications for the MX960 Router).

9. Plug the power cord into the corresponding appliance inlet located in the chassis directly above the power supply. This is the recommend receptacle when using the power supply in one-feed mode. If using the power supply in two-feed mode, plug the second power cord into the receptacle on the power supply.

NOTE: Each power supply must be connected to a dedicated AC power feed and a dedicated customer site circuit breaker.
10. Dress the power cords appropriately. Verify that the power cord does not block the air exhaust and access to router components, and that they do not drape where people could trip on them.

11. Move the AC input switch above the power supply to the on (—) position. This is the only switch you have to turn on if you are using the power supply in one feed mode. If using the power supply in two-feed mode, move the power switch on the power supply to the on position. Remember to turn on both switches when operating the power supply in two-feed mode.

12. If the power supply is correctly installed and functioning normally, the AC1 OK, AC2 OK (two-feed mode only) DC OK LEDs light steadily, and the PS FAIL LED is not lit. See Table 1 on page 19.

Table 1: MX960 High-Capacity AC Power Supply LEDs

<table>
<thead>
<tr>
<th>Connected Inputs</th>
<th>DIP Switch Position</th>
<th>AC-1 OK</th>
<th>AC-2 OK</th>
<th>DC OK</th>
<th>PS FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDM connected, power supply</td>
<td>0 (1 input)</td>
<td>Green</td>
<td>Off</td>
<td>Green</td>
<td>Off</td>
</tr>
<tr>
<td>disconnected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDM disconnected, power supply</td>
<td>0 (1 input)</td>
<td>Off</td>
<td>Green</td>
<td>Green</td>
<td>Off</td>
</tr>
<tr>
<td>connected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDM connected, PS connected</td>
<td>0 (1 input)</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Off</td>
</tr>
<tr>
<td>PDM connected, PS disconnected</td>
<td>1 (2 inputs)</td>
<td>Green</td>
<td>Off</td>
<td>Off</td>
<td>Red</td>
</tr>
<tr>
<td>PDM disconnected, PS connected</td>
<td>1 (2 inputs)</td>
<td>Off</td>
<td>Green</td>
<td>Off</td>
<td>Red</td>
</tr>
</tbody>
</table>

Note: The corresponding appliance inlet located in the chassis directly above the power supply is the recommend receptacle when using the power supply in one feed mode. If using the power supply in two-feed mode, plug the second power cord into the receptacle on the power supply.

Note: PDM in the above table stands for Power Distribution Module.

13. Repeat steps 1-12 for installing power supplies in slots 1, 2, and 3, where required.
Connect Power to a DC Router with Normal-Capacity Power Supplies

1. 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.

2. Secure the power cable lugs to the terminal studs, first with the split washer, then with the nut. Apply between 23 lb-in. (2.6 Nm) and 25 lb-in. (2.8 Nm) of torque to each nut. 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 2: MX960 DC Power System Input Voltage

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC input voltage</td>
<td>Operating range: −40 to −72 VDC</td>
</tr>
</tbody>
</table>

Figure 10: Connect Ground and 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 improperly threaded may result in damage to the terminal stud.
Connect Power to a DC Router with High-Capacity Power Supplies

To install an MX960 DC high-capacity DC power supply:

1. Verify that the power switch on the power supply is in the off (O) position.
2. On the power supply, rotate the metal cover away from the input mode switch to expose the switch.
3. Move the input mode switch to position 0 for one feed or position 1 for two feeds (see Figure 11 on page 22).

CAUTION: The maximum torque rating of the terminal studs on the DC power supply is 58 lb-in. (6.5 Nm). The terminal studs may be damaged if excessive torque is applied. Use only a torque-controlled driver or socket wrench to tighten nuts on the DC power supply terminal studs.

NOTE: For information about connecting to DC power sources, see the MX960 3D Universal Edge Router Hardware Guide.

3. Loosen the captive screw on the cable restraint on the lower edge of the power supply faceplate.

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

NOTE: For information about connecting to external DC power sources, see the MX960 3D Universal Edge Router Hardware Guide.

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

NOTE: For a fully redundant configuration in two-feed mode, eight feeds are required. For a nonredundant configuration, four feeds are required.
CAUTION: Do not use a pencil, because fragments can break off and cause damage to the power supply.

4. 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.

5. Ensure that the release lever below the empty power supply slot is locked in the counterclockwise position.

   If necessary, pull the spring-loaded locking pin in the release lever away from the chassis and turn the release lever counterclockwise until it stops. Let go of the locking pin in the release lever. Ensure that the pin is seated inside the corresponding hole in the chassis.

6. Using both hands, slide the power supply straight into the chassis until the power supply is fully seated in the chassis slot.
The small tab on the metal housing that is controlled by the release lever must be inside of the corresponding slot at the bottom of the power supply. This tab is used to pull the power supply down in the chassis slot, prior to removing the power supply.

7. While firmly pushing the handle on the power supply faceplate with one hand, use your other hand to pull the spring-loaded locking pin in the release lever away from the chassis and turn the release lever clockwise until it stops.

8. Let go of the locking pin in the release lever. Ensure that the pin is seated inside the corresponding hole in the chassis.

9. Remove the cover protecting the terminal studs on the faceplate.

10. Remove the nut and washer from each of the terminal studs.

11. Secure each power cable lug to the terminal studs, first with the split washer, then with the nut. Apply between 23 in-lb. (2.6 Nm) and 25 in-lb. (2.8 Nm) of torque to each nut. Do not overtighten the nut. (Use a 7/16-in. [11-mm] torque-controlled driver or socket wrench.)

   a. On INPUT 0, attach the positive (+) DC source power cable lug to the RTN (return) terminal as shown in Figure 11 on page 22. Repeat this step for INPUT 1 if using two feeds.

   b. On INPUT 0 attach the negative (–) DC source power cable lug to the −48V (input) terminal. Repeat this step for INPUT 1 if using two feeds.

   ![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 improperly threaded may result in damage to the terminal stud.]

   ![CAUTION: The maximum torque rating of the terminal studs on the DC power supply is 36 in-lb. (4.0 Nm). The terminal studs may be damaged if excessive torque is applied. Use only a torque-controlled driver or socket wrench to tighten nuts on the DC power supply terminal studs.]

   ![NOTE: The DC power supplies in slots PEM0 and PEM1 must be powered by dedicated power feeds derived from feed A, and the DC power supplies in PEM2 and PEM3 must be powered by dedicated power feeds derived from feed B. This configuration provides the commonly deployed A/B feed redundancy for the system. For information about connecting to DC power sources, see Electrical Specifications for the MX960 DC Power Supply.]

12. 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.
13. Replace the clear plastic cover over the terminal studs on the faceplate.


15. Verify that the **INPUT 0 OK** or **INPUT 1 OK** LEDs on the power supply are lit green steadily. If using two feeds, verify that both **INPUT 0 OK** and **INPUT 1 OK** LEDs on the power supply are lit steadily. The **INPUT OK** will be lit amber if that input’s voltage is in reverse polarity. Check the polarity of the power cables to fix the condition (see **Figure 12 on page 25** and **Table 3 on page 24**).

16. Move the switch to the on (1) position.

17. Verify that the **DC OK** LED is lit green steadily. See **Table 3 on page 24** for information on MX960 high-capacity DC LEDs.

### Table 3: MX960 High-Capacity DC Power Supply LEDs

<table>
<thead>
<tr>
<th>Connected Inputs</th>
<th>DIP Switch Position</th>
<th>LEDs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INP-0 OK</td>
<td>INP-1 OK</td>
</tr>
<tr>
<td>INP0 connected, INP1 disconnected</td>
<td>0 (1 input)</td>
<td>Green</td>
</tr>
<tr>
<td>INP0 disconnected, INP1 connected</td>
<td>Off</td>
<td>Green</td>
</tr>
<tr>
<td>INP0 connected, INP1 connected</td>
<td>Off</td>
<td>Green</td>
</tr>
<tr>
<td>INP0 connected, INP1 disconnected</td>
<td>1 (2 inputs)</td>
<td>Green</td>
</tr>
<tr>
<td>INP0 disconnected, INP1 connected</td>
<td>Off</td>
<td>Green</td>
</tr>
<tr>
<td>INP0 connected, INP1 connected</td>
<td>Off</td>
<td>Green</td>
</tr>
</tbody>
</table>

18. Repeat steps 1-17 for installing power supplies in slots 1, 2, and 3, where required.
19. Install a blank panel over the power distribution modules, if available.

Step 7: Perform Initial Software Configuration

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.

To configure the software:

- Enter Configuration Mode on page 26
- Configure User Accounts and Passwords on page 26
- Configure System Attributes on page 27
- Commit the Configuration on page 27

Enter Configuration Mode

1. Log in as the “root” user. There is no password.
2. Start the CLI.
   
   root# cli
   root@
3. Enter configuration mode.
   
   cli> configure
   [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

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

2. Configure the router’s domain name.

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

3. Configure the IP address and prefix length for the router’s Ethernet interface.

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

4. Configure the IP address of a backup router, which is used only while the routing protocol is not running.

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

5. Configure the IP address of a DNS server.

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

Commit the Configuration

1. Optionally, 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.
3. (Optional) 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 MX960 3D Universal Edge Router Hardware Guide at http://www.juniper.net/techpubs/.

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: 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 the MX960 3D Universal Edge Router 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 MX960 3D Universal Edge Router 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 6 in. (15.2 cm) of clearance between side-cooled routers. Allow 2.8 in. (7 cm) between the side of the chassis and any non-heat-producing surface such as a wall.
- When installing the router, do not use a ramp inclined more than 10 degrees.
- Mount the router at the bottom of the rack if it is the only unit in the rack.
• When mounting the router in a partially filled rack, load the rack from the bottom to
the top with the heaviest component at the bottom of the rack.

• If the rack is provided with stabilizing devices, install the stabilizers before mounting
or servicing the 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 power supply using the appropriate lugs. When connecting power, the
proper wiring sequence is ground to ground, +RTN to +RTN, then −48 V to −48 V. When
disconnecting 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.

 Compliance Statements for NEBS

• The equipment is suitable for installation as part of the Common Bonding Network
(CBN).

• The equipment is suitable for installation in locations where the National Electrical
Code (NEC) applies.

• The battery return connection is to be treated as an isolated DC return (i.e. DC-I), as
defined in GR-1089-CORE.

• For Juniper systems with AC power supplies, an external surge protective device (SPD)
must be used at the AC power source.
Compliance Statements for EMC Requirements

- Canada on page 31
- European Community on page 31
- Israel on page 31
- Japan on page 31
- United States on page 31

Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

European Community

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Israel

Translation from Hebrew—Warning: This product is Class A. In residential environments, the product may cause radio interference, and in such a situation, the user may be required to take adequate measures.

Japan

Translation from Japanese—This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. VCCI-A

United States

The hardware equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual,
may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Junos Documentation and Release Notes

For a list of related Junos documentation, see http://www.juniper.net/techpubs/software/junos/.

If the information in the latest release notes differs from the information in the documentation, follow the Junos Release Notes.

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at http://www.juniper.net/techpubs/.

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need postsales technical support, you can access our tools and resources online or open a case with JTAC.


- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/.

- JTAC Hours of Operation — The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: http://www.juniper.net/customers/support/

- Find product documentation: http://www.juniper.net/techpubs/

- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/

- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/

- Search technical bulletins for relevant hardware and software notifications: http://kb.juniper.net/InfoCenter/

- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/

- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/
To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://tools.juniper.net/SerialNumberEntitlementSearch/

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at http://www.juniper.net/cm/.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, visit us at http://www.juniper.net/support/requesting-support.html

Revision History


April 2011—Added high-capacity power information.


August 2010—530-036124. Revision 1. Updated information about MPCs and MICs.


July 2009—530-031139. Revision 1. Updated procedure for connecting DC power. Updated information about FPCs and PICs.

April 2008—Removed automatic shutdown note. Updated procedures to connect power and ground. Minor updates.

April 2007—530-021108. Revision 1. Added additional safety information and DC input voltages. Updated the connect DC power procedure.

March 2007—530-017574. Revision 1. Initial release.