Hewlett Packard Enterprise

HPE FlexNetwork MSR3000 Routers

Installation Guide

Part number: 5998-8797a
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Acknowledgments

Contents

Preparing for installation

The MSR3000 Routers include the models in Table 1.

Table 1 HPE MSR3000 Routers models

Router model	Product code	HPE description	RMN
MSR3064	JG404A	HPE MSR3064 Router	BJNGA-BB0006
MSR3044	JG405A	HPE MSR3044 Router	BJNGA-BB0011
MSR3024	JG406A	HPE MSR3024 AC Router	BJNGA-BB0007
MSR3024	JG407A	HPE MSR3024 DC Router	BJNGA-BB0007
MSR3024	JG408A	HPE MSR3024 PoE Router	BJNGA-BB0007
MSR3012	JG409A	HPE MSR3012 AC Router	BJNGA-BB0008
MSR3012	JG409B	HPE MSR3012 AC Router	BJNGA-BB0008
MSR3012	JG410A	HPE MSR3012 DC Router	BJNGA-BB0008

IMPORTANT:

For regulatory identification purposes, every MSR3000 router is assigned a regulatory model number (RMN). These regulatory model numbers should not be confused with the marketing name HPE MSR30XX or the product codes.

Safety recommendations

Safety symbols

When reading this document, note the following symbols:

WARNING means an alert that calls attention to important information that if not understood or followed can result in personal injury.

CAUTION means an alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.

General safety recommendations

- Keep the chassis and installation tools away from walk areas.
- Make sure the ground is dry and flat and anti-slip measures are in place.
- Remove all the external cables (including power cords) before moving the chassis.

Electricity safety

- Locate the emergency power-off switch in the room before installation. Shut the power off at once in case accident occurs. Disconnect the power cord of the router if necessary.
- Make sure the router is correctly grounded.
- Do not open or close the chassis cover when the router is powered on.

- Correctly connect the interface cables of the router.
- Use an uninterrupted power supply (UPS).
- If two power inputs are available, disconnect the two power inputs to power off the router.
- Do not work alone when the router has power.
- Always make sure the power has been disconnected during the installation and replacement procedures.

Laser safety

- Do not stare into any fiber port when the router has power. The laser light emitted from the optical fiber may hurt your eyes.
- Install the dust cover if the fiber port is not connected to a fiber connector to prevent damage to the fiber port.

Examining the installation site

The routers can only be used indoors. To make sure the router operates correctly and to prolong its service lifetime, the installation site must meet the following requirements.

Temperature and humidity

Maintain temperature and humidity in the equipment room as described in Table 2.

- Lasting high relative humidity can cause poor insulation, electricity leakage, mechanical property change of materials, and metal corrosion.
- Lasting low relative humidity can cause washer contraction and ESD and cause problems including loose mounting screws and circuit failure.
- High temperature can accelerate the aging of insulation materials and significantly lower the reliability and lifespan of the router.

Table 2 Temperature and humidity requirements

Temperature	Humidity
0°C to 45°C (32°F to 113°F)	5% to 90% (noncondensing)

Cleanliness

Dust buildup on the chassis might result in electrostatic adsorption, which causes poor contact of metal components and contact points, especially when indoor relative humidity is low. In the worst case, electrostatic adsorption can cause communication failure.

Table 3 Dust concentration limit in the equipment room

Substance	Concentration limit (particles/m^3)
Dust particles	≤ 3 x 10^4 (No visible dust on desk in three days)
NOTE: Dust particle diameter ≥ 5 μm	

The equipment room must also meet strict limits on salts, acids, and sulfides to eliminate corrosion and premature aging of components, as shown in Table 4.

Table 4 Harmful gas limits in the equipment room

Gas	Max. (mg/m^3)
SO_2	0.2
H_2S	0.006
NH_3	0.05
Cl_2	0.01

Cooling system

The MSR3012/3024 router uses left to right airflow for heat dissipation, and the MSR3044/3064 router uses left to rear airflow for heat dissipation.

Figure 1 Airflow through the MSR3012/3024 chassis

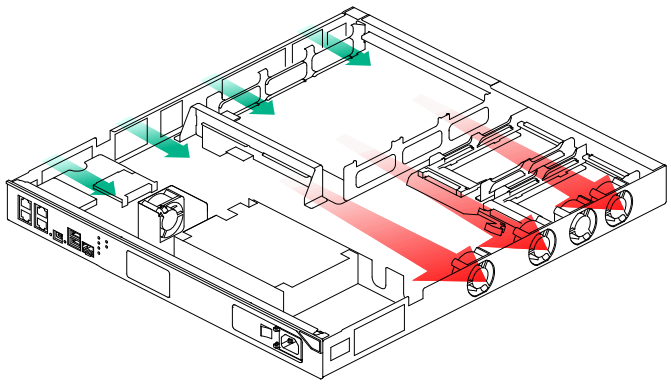
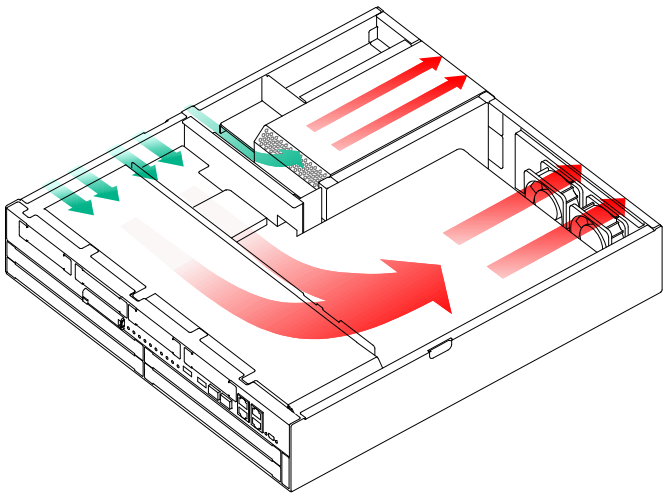


Figure 2 Airflow through the MSR3044/3064 chassis



To ensure good ventilation, the following requirements must be met:

- The air inlet and outlet vents are not blocked, and leave at least 10 cm (3.94 in) of clearance.
- The installation site has a good cooling system.

ESD prevention

CAUTION:

Check the resistance of the ESD wrist strap for safety. The resistance reading should be in the range of 1 to 10 megohm (Mohm) between human body and the ground.

To prevent electrostatic discharge (ESD), follow these guidelines:

- Make sure the router and the floor are well grounded.
- Take dust-proof measures for the equipment room.
- Maintain the humidity and temperature at a proper level.
- Always wear an ESD wrist strap and ESD cloth when touching a circuit board or transceiver module.

  An MSR3000 router does not supply an ESD wrist wrap. Prepare an ESD wrist wrap yourself.
- Place the removed memory module, CF card, or interface module on an antistatic workbench, with the face upward, or put it into an antistatic bag.
- Touch only the edges, instead of electronic components when you observe or move a removed memory module, CF card, or interface module.

To attach an ESD wrist strap:

1. Wear the wrist strap on your wrist.
2. Lock the wrist strap tight around your wrist to keep good contact with the skin.
3. Insert the ESD plug into the ESD socket.
4. Make sure the rack is well grounded.

EMI

All electromagnetic interference (EMI) sources, from outside or inside of the switch and application system, adversely affect the switch in the following ways:

- A conduction pattern of capacitance coupling.
- Inductance coupling.
- Electromagnetic wave radiation.
- Common impedance (including the grounding system) coupling.

To prevent EMI, use the following guidelines:

- If AC power is used, use a single-phase three-wire power receptacle with protection earth (PE) to filter interference from the power grid.
- Keep the switch far away from radio transmitting stations, radar stations, and high-frequency devices.
- Use electromagnetic shielding, for example, shielded interface cables, when necessary.

Lightning protection

To better protect the router from lightning, do as follows:

- Make sure the grounding cable of the chassis is well grounded.
- Make sure the grounding terminal of the AC power receptacle is well grounded.
- Install a lightning arrester at the input end of the power supply to enhance the lightning protection capability of the power supply.

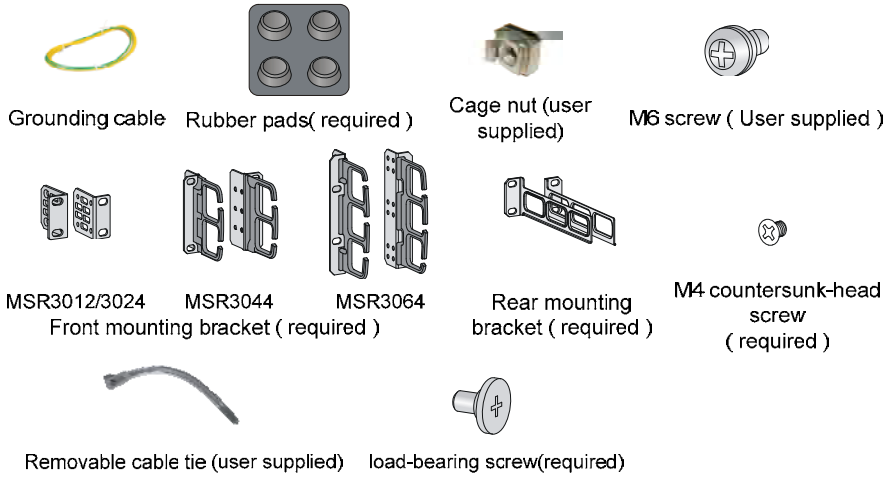
- Install a special lightning arrester at the input end of outdoor signal lines (for example, E1/T1 line) to which interface modules of the router are connected to enhance the lightning protection capability.

Rack-mounting

Before mounting the router to a rack, adhere to the following requirements:

- The rack is equipped with a good ventilation system.
- The rack is sturdy enough to support the router and its accessories.
- For heat dissipation and device maintenance, make sure the front and rear of the rack are at least 0.8 m (2.62 ft) away from walls or other devices, and the headroom in the equipment room is no less than 3 m (9.84 ft).

Installation accessories



Checklist before installation

Table 5 Checklist before installation

Item		Requirements	Result
Installation site	Ventilation	• There is a minimum clearance of 10 cm (3.94 in) around the inlet and outlet vents for heat dissipation of the router chassis. • A good ventilation system is available at the installation site.	

Item		Requirements	Result
	Temperature	0°C to 45°C (32°F to 113°F).	
	Relative humidity	5% to 90% (noncondensing).	
	Cleanness	• Dust concentration ≤ 3×10^4 particles/m^3. • No visible dust on desk within three days.	
	ESD prevention	• The equipment and floor are reliably grounded. • The equipment room is dust-proof. • The humidity and temperature are at a proper level, respectively. • Wear an ESD wrist strap and uniform when touching a circuit board. • Place the removed memory module, CF card, or interface module on an antistatic workbench, with the face upward, or put it into an antistatic bag. • Touch only the edges, instead of electronic components when observing or moving a removed memory module, CF card, or interface module.	
	EMI prevention	• Take effective measures to protect the power system from the power grid system. • Separate the protection ground of the router from the grounding device or lightning protection grounding device as far as possible. • Keep the router far away from radio stations, radar and high-frequency devices working in high current. • Use electromagnetic shielding when necessary.	
	Lightning protection	• The grounding cable of the chassis is well grounded. • The grounding terminal of the AC power receptacle is well grounded. • A port lightning arrester is installed. (Optional.) • A power lightning arrester is installed. (Optional.) • A signal lightning arrester is installed at the input end of an external signal cable. (Optional.)	
	Electricity safety	• Equip an uninterrupted power supply (UPS). • In case of emergency during operation, switch off the external power switch.	
	Workbench	• The workbench is stable enough. • The workbench is well grounded.	
	Rack-mounting requirements	• The rack is equipped with a good ventilation system. • The rack is sturdy enough to support the weight of the router and installation accessories. • The size of the rack is appropriate for the router. • The front and rear of the rack are at least 0.8 m (2.62 ft) away from walls or other devices.	
Safety precautions		• The router is far away from any moist area and heat source. • The emergency power switch in the equipment room is located.	
Tools		• Installation accessories supplied with the router. • User supplied tools.	
Reference		• Documents shipped with the router. • Online documents.	

Installing the router

WARNING!

To avoid injury, do not touch bare wires, terminals, or parts with high-voltage hazard signs.

IMPORTANT:

- The barcode on the router chassis contains product information that must be provided to local sales agent before you return a faulty router for service.
- Keep the tamper-proof seal on a mounting screw on the chassis cover intact, and if you want to open the chassis, contact Hewlett Packard Enterprise for permission. Otherwise, Hewlett Packard Enterprise shall not be liable for any consequence.

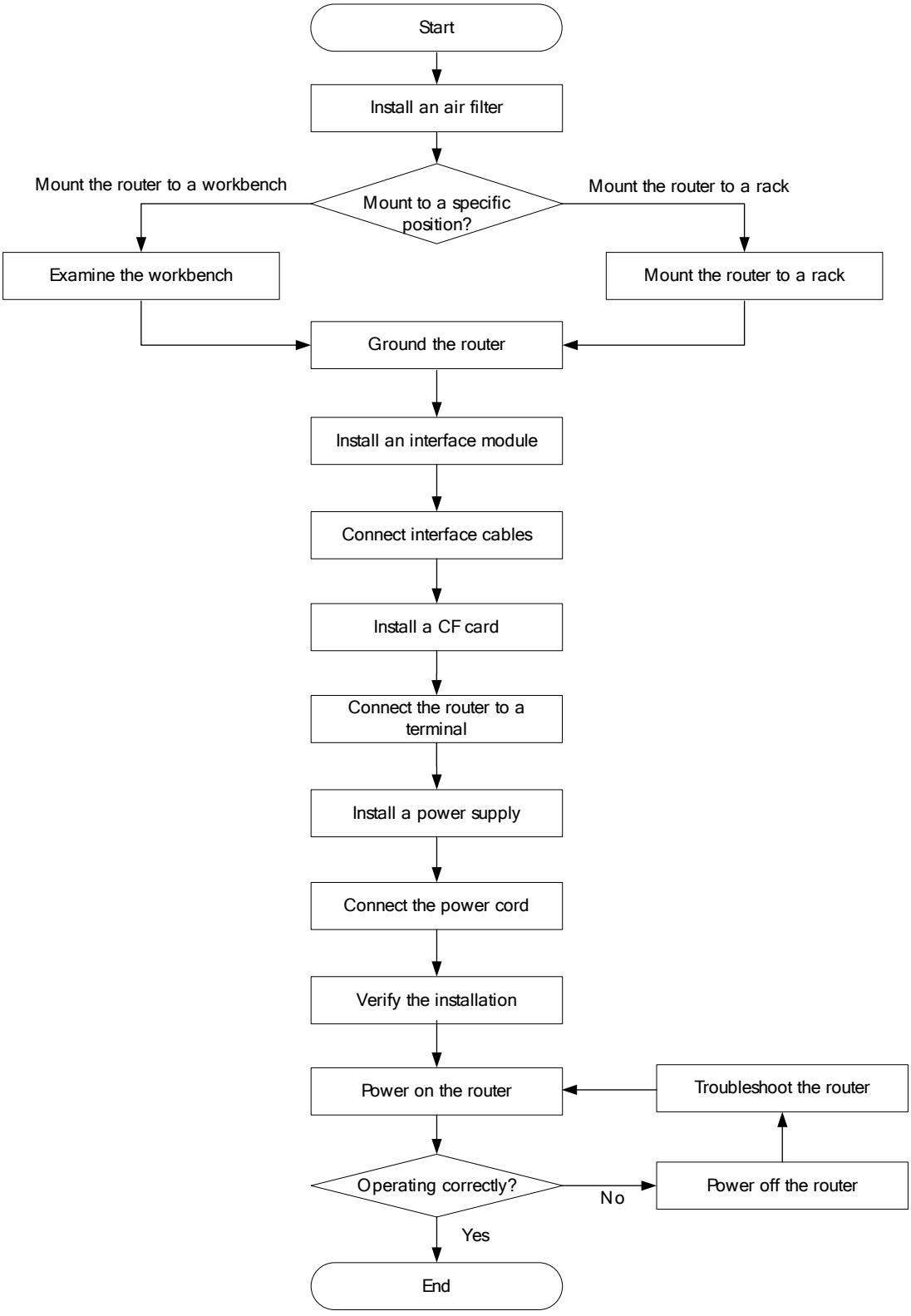
Installation prerequisites

- You have read "Preparing for installation" carefully.
- All requirements in "Preparing for installation" are met.

Installation flowchart

You can install the router on a workbench or in a rack. Select an installation method according to the installation environment, and follow the installation flowchart shown in Figure 3.

Figure 3 Installation flowchart



Installing the router

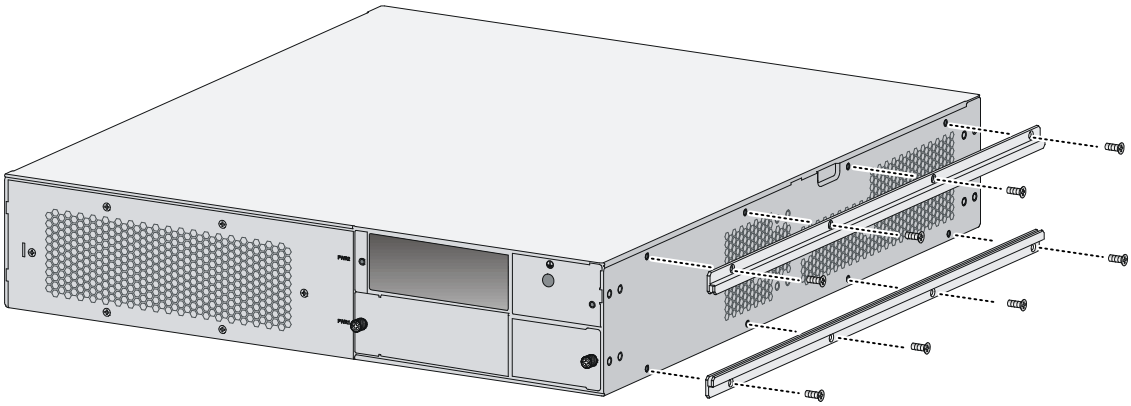
Installing an air filter

No air filter is provided with the router. Purchase one yourself. Only the MSR3044 and MSR3064 support air filters.

To install an air filter:

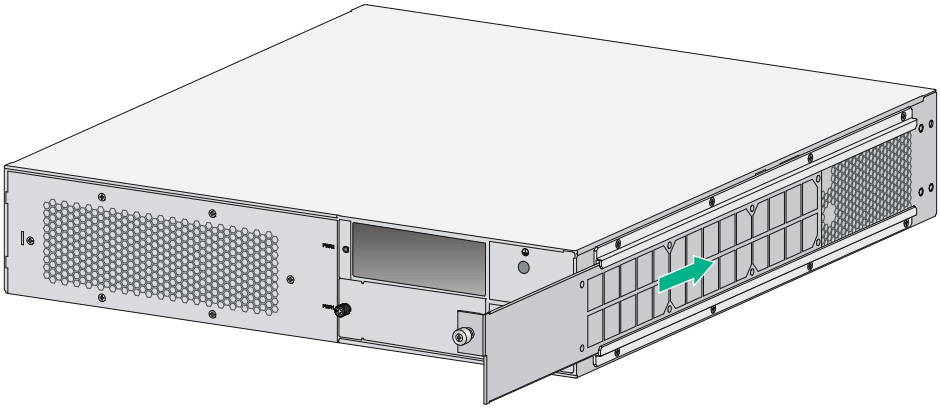
1. Face the left side (side of the inlet vents) of the router.
2. Install the upper and lower guide rails of the air filter to the chassis. See Figure 4.
3. Fasten the fastening screws on the guide rails with a Phillips screwdriver.

Figure 4 Installing the upper and lower guide rails



4. Push the air filter along the slide rails from the rear side of the chassis to the front.
5. Fasten the captive screws on the air filter.

Figure 5 Pushing the air filter along the guide rails



Mounting the router on a workbench

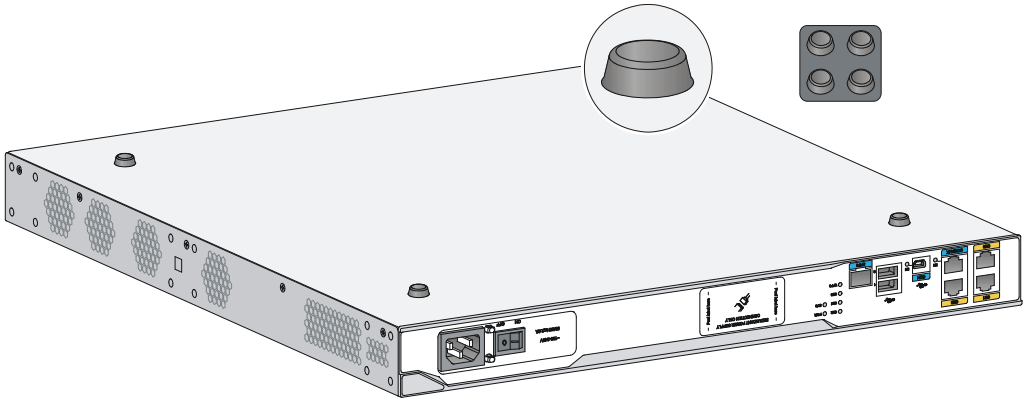
IMPORTANT:

- Ensure good ventilation and 10 cm (3.94 in) of clearance around the chassis for heat dissipation.
- Avoid placing heavy objects on the router.

To mount the router on a workbench:

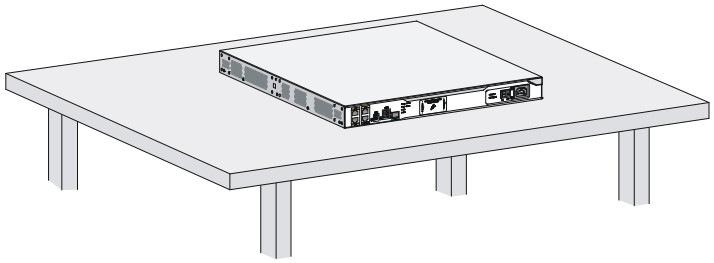
1. Make sure the workbench is clean, stable, and reliably grounded.
2. Place the router upside down on the workbench and attach the rubber feet to the four round holes in the chassis bottom.

Figure 6 Attaching the rubber feet



3. Place the router on the workbench with the upside up.

Figure 7 Mounting the router on a workbench



Installing the router in a rack

Mounting brackets

The MSR3000 routers require different types of front mounting brackets, as shown in Figure 8.

Figure 8 Front mounting brackets

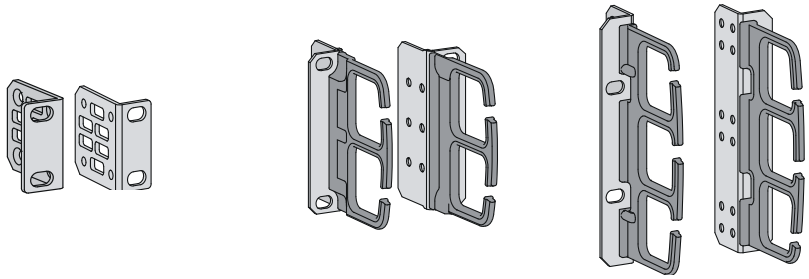
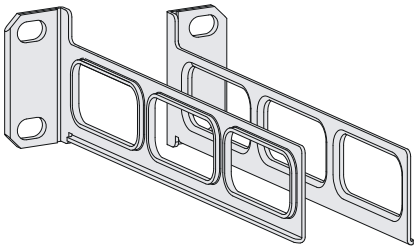


Figure 9 Rear mounting brackets



Rack-mounting clearance requirements

Figure 10 Rack-mounting clearances for the MSR3012/3024

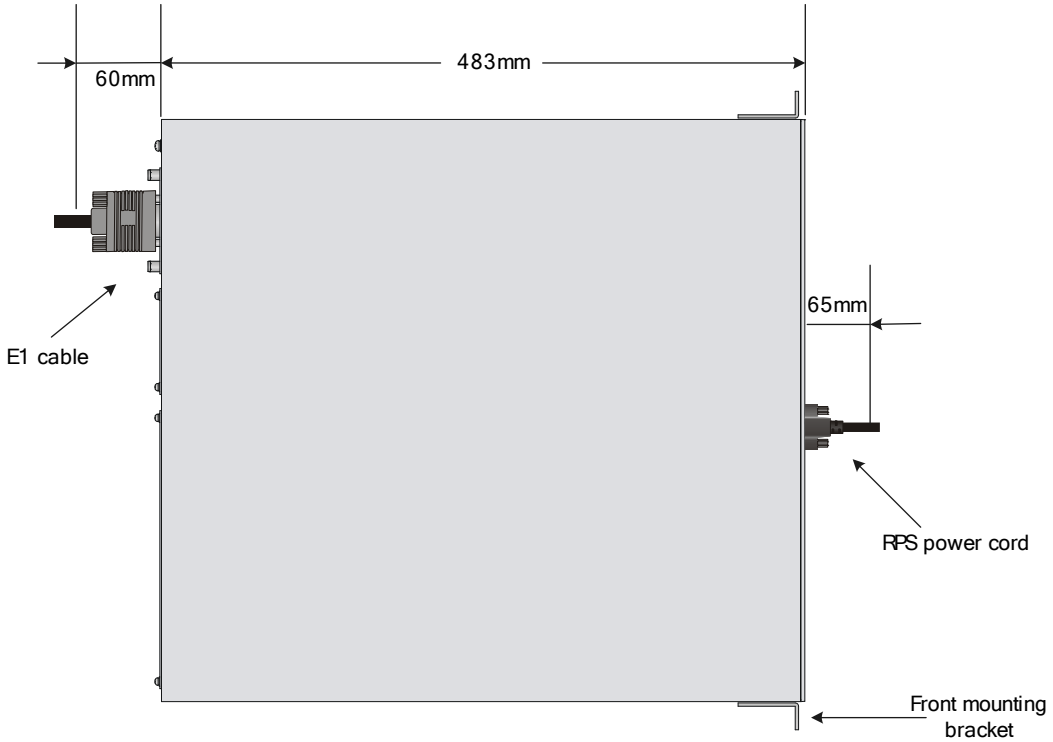


Figure 11 Rack-mounting clearances for the MSR3044/3064

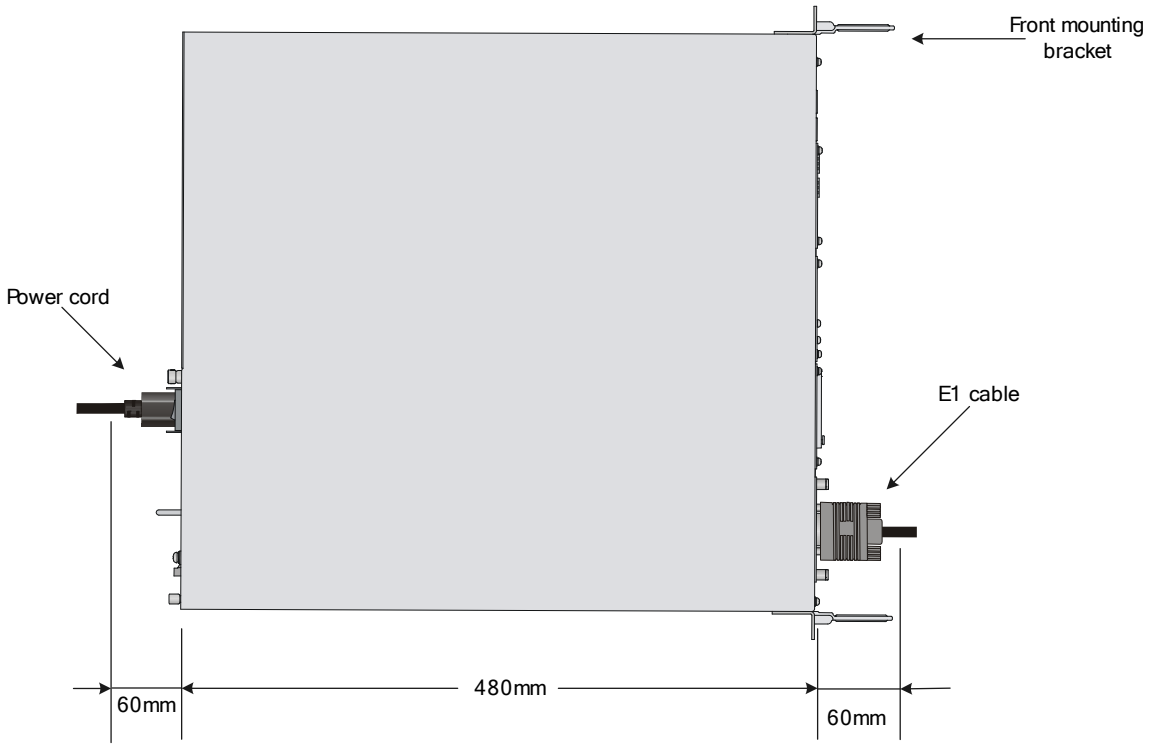


Table 6 Rack-mounting clearance requirements

Model	Router dimensions	Rack clearance requirements

3012/3024	• **Width**—440 mm (17.32 in)
	• **Height**—44.2 mm (1.74 in) (1 RU)
	• **Total depth**—608 mm (23.94 in)
	  ○ 483 mm (19.02 in) for the chassis
	  ○ 65 mm (2.56 in) for connecting an RPS power cord at the front of the chassis
	  ○ 60 mm (2.36 in) for connecting an E1 cable at the rear of the chassis
		The rack must meet all the following requirements:
		• A minimum of 80 mm (3.15 in) between the front rack post and the front door.
		• A minimum of 550 mm (21.65 in) between the front rack post and the rear door.
		• 290 mm (11.42 in) to 430 mm (16.93 in) between the front and rear rack posts, with a clearance of 160 mm (6.30 in) between the rear rack post and the rear door, or 450 mm (17.72 in) to 610 mm (24.02 in) between the front and rear rack posts.

3044	• **Width**—440 mm (17.32 in)
	• **Height**—88.2 mm (3.47 in) (2 RU)
	• **Total depth**—600 mm (23.62 in)
	  ○ 480 mm (18.90 in) for the chassis
	  ○ 60 mm (2.36 in) for connecting an RPS power cord at the front of the chassis
	  ○ 60 mm (2.36 in) for connecting an E1 cable at the rear of the chassis
		The rack must meet all the following requirements:
		• A minimum of 80 mm (3.15 in) between the front rack post and the front door.
		• A minimum of 550 mm (21.65 in) between the front rack post and the rear door.
		• 310 mm (12.20 in) to 440 mm (17.32 in) between the front and rear rack posts, with a clearance of 160 mm (6.30 in) between the rear rack post and the rear door, or 465 mm (18.31 in) to 595 mm (23.43 in) between the front and rear rack posts.

Model	Router dimensions	Rack clearance requirements

3064	• **Width**—440 mm (17.32 in)
	• **Height**—130.5 mm (5.14 in) (3 RU)
	• **Total depth**—600 mm (23.62 in)
	  ○ 480 mm (18.90 in) for the chassis
	  ○ 60 mm (2.36 in) for connecting an RPS power cord at the front of the chassis
	  ○ 60 mm (2.36 in) for connecting an E1 cable at the rear of the chassis
		The rack must meet all the following requirements:
		• A minimum of 80 mm (3.15 in) between the front rack post and the front door.
		• A minimum of 550 mm (21.65 in) between the front rack post and the rear door.
		• 310 mm (12.20 in) to 440 mm (17.32 in) between the front and rear rack posts, with a clearance of 160 mm (6.30 in) between the rear rack post and the rear door, or 465 mm (18.31 in) to 595 mm (23.43 in) between the front and rear rack posts.

IMPORTANT:

- For the MSR3012/3024 router, use a rack with a depth of more than 0.68 m (2.23 ft) as a best practice.
- For the MSR3044/3064 router, use a rack shelf and a rack with a depth of more than 0.68 m (2.23 ft) as a best practice.

Mounting the router in the rack

WARNING!

The mounting brackets can only support the weight of the router. To avoid damage to the router, do not place any objects on the router.

To mount the router in a rack:

1. Use a front mounting bracket to mark the positions of cage nuts, making sure they are at the same level.
2. Use a rear mounting bracket to mark the positions of cage nuts, making sure the front and rear mounting brackets are at the same level.

Figure 12 Marking the positions of cage nuts for the front mounting brackets

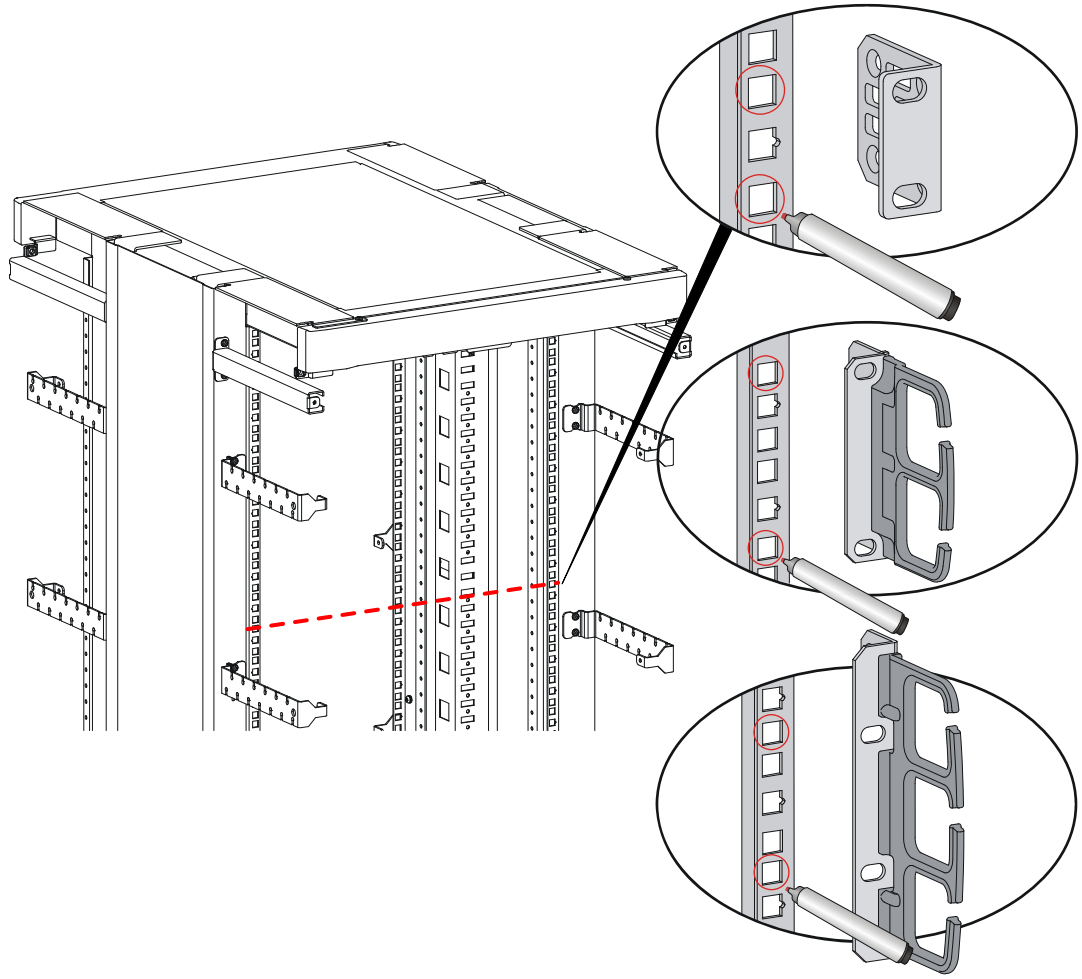
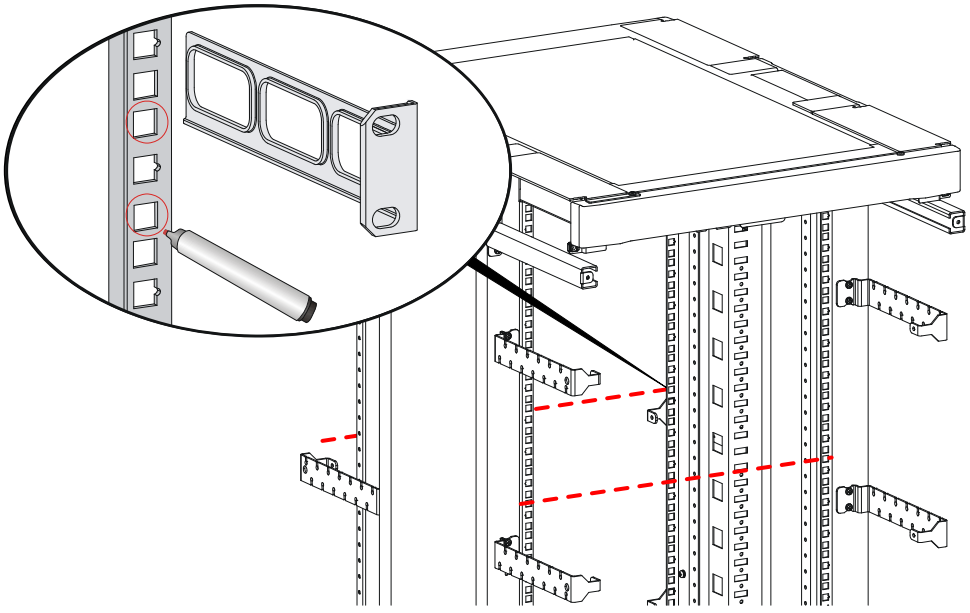
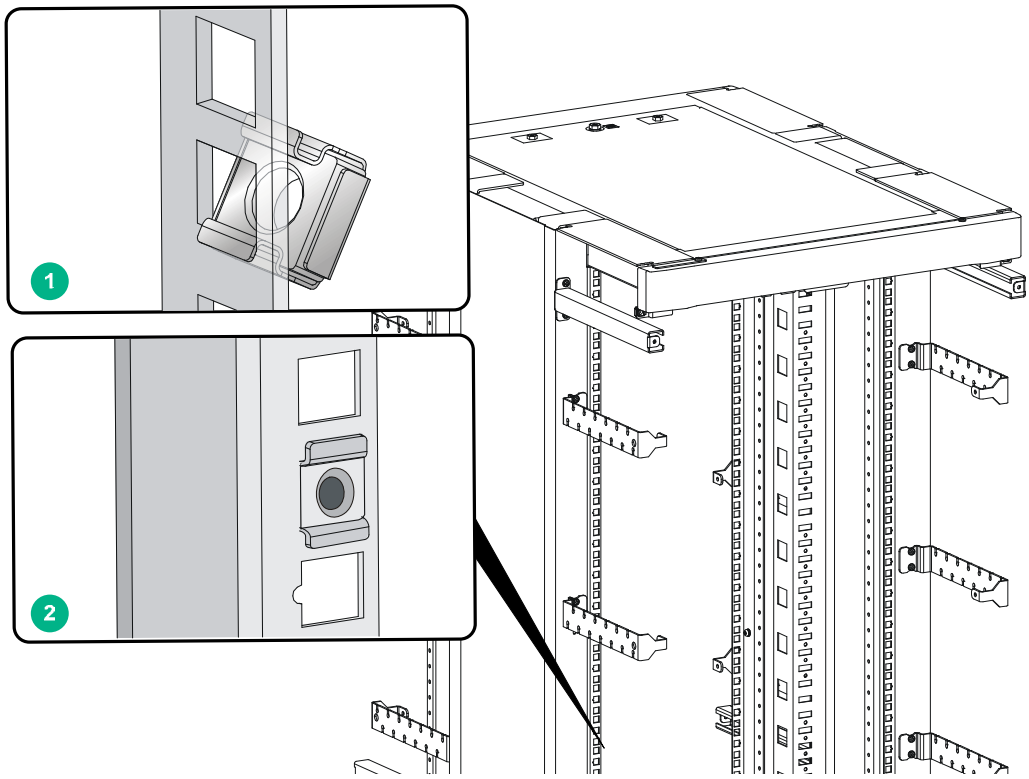


Figure 13 Marking the positions of cage nuts for the rear mounting brackets



3. Insert one edge of a cage nut into the hole. Use a flat-blade screwdriver to compress the other edge of the cage nut, and then push the cage nut fully into the hole.
4. Repeat step 3 to install other cage nuts to all the marked positions on the rack posts.

Figure 14 Installing a cage nut



5. Attach the rear mounting brackets to the rack and fasten the screws.

   The depth of the router might be greater or smaller than the depth of the rack, depending on the rack model. If the depth of the router is greater than the depth of the rack, follow Figure 15 to attach the rear mounting brackets. If smaller, follow Figure 16 to attach the rear mounting brackets.

Figure 15 Attaching the rear mounting brackets (router depth greater than rack depth)

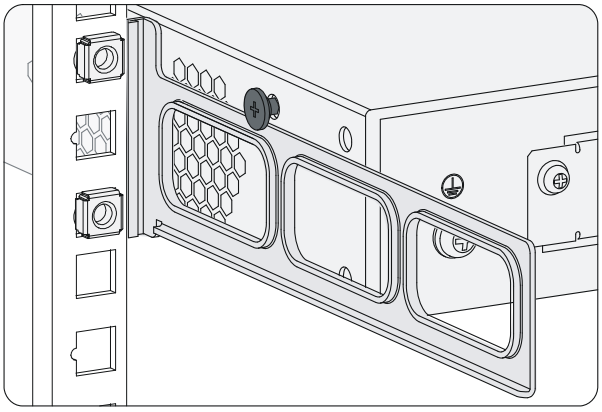
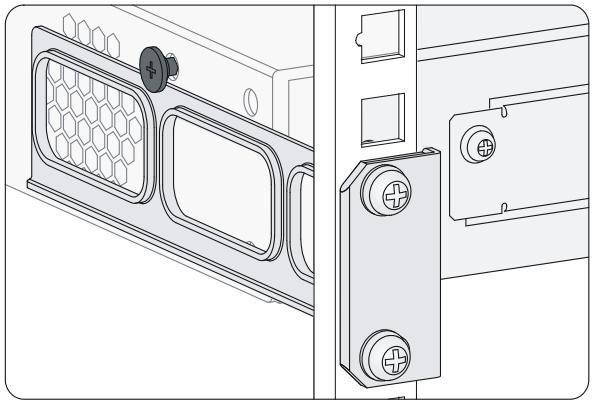


Figure 16 Attaching the rear mounting brackets (router depth smaller than rack depth)



6. Attach the front mounting brackets to the chassis and fasten the screws.
7. Attach load-bearing screws to the rear of the chassis.

Figure 17 Attaching the front mounting brackets and load-bearing screws to the MSR3012/3024

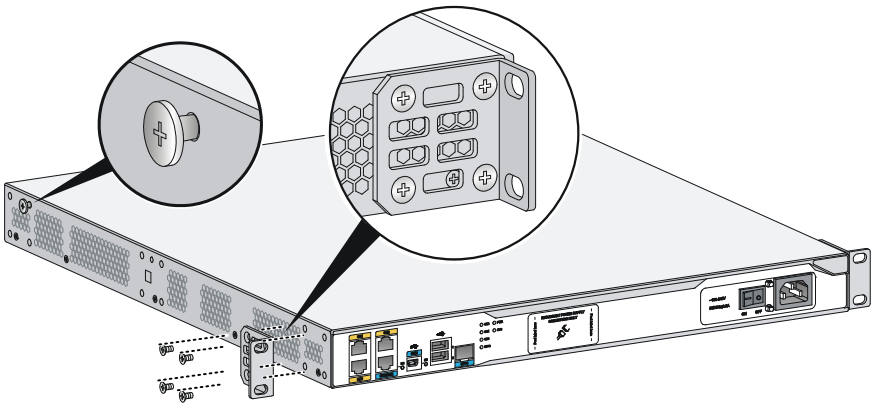


Figure 18 Attaching the front mounting brackets and load-bearing screws to the MSR3044

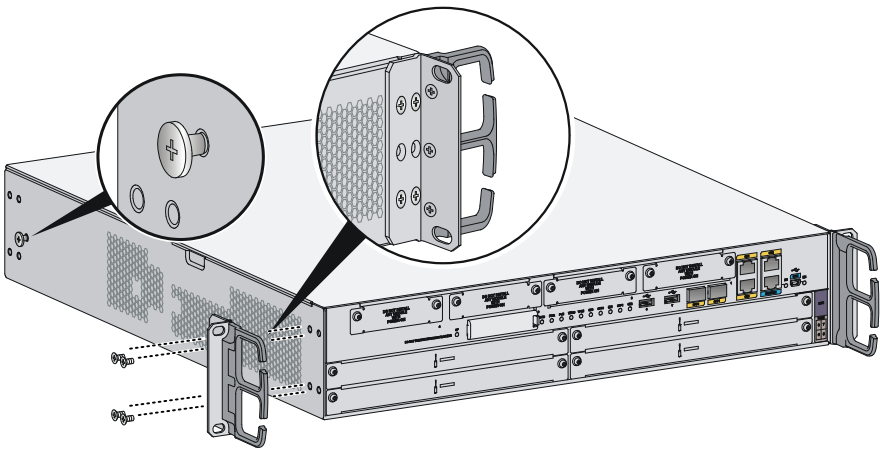
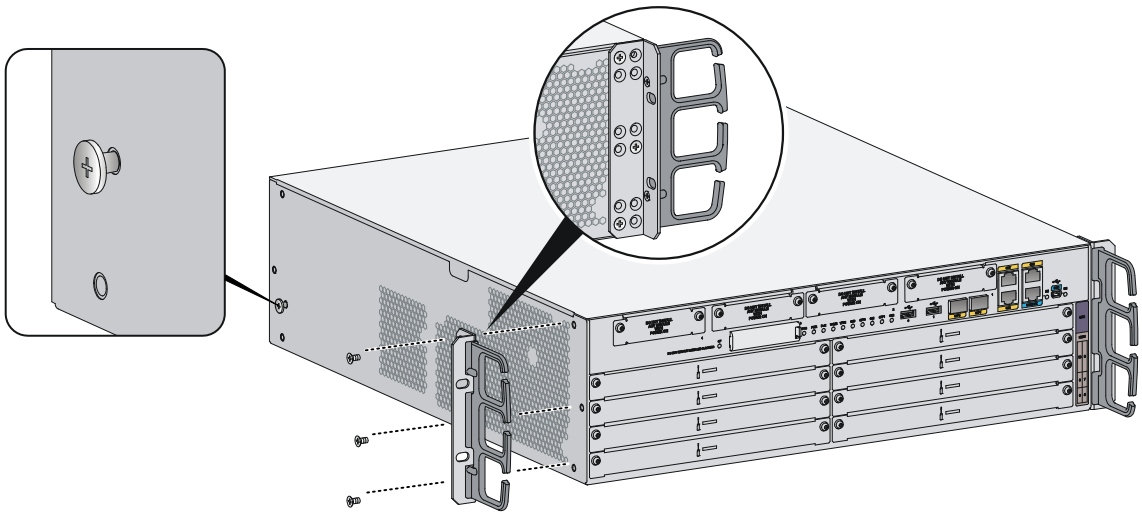
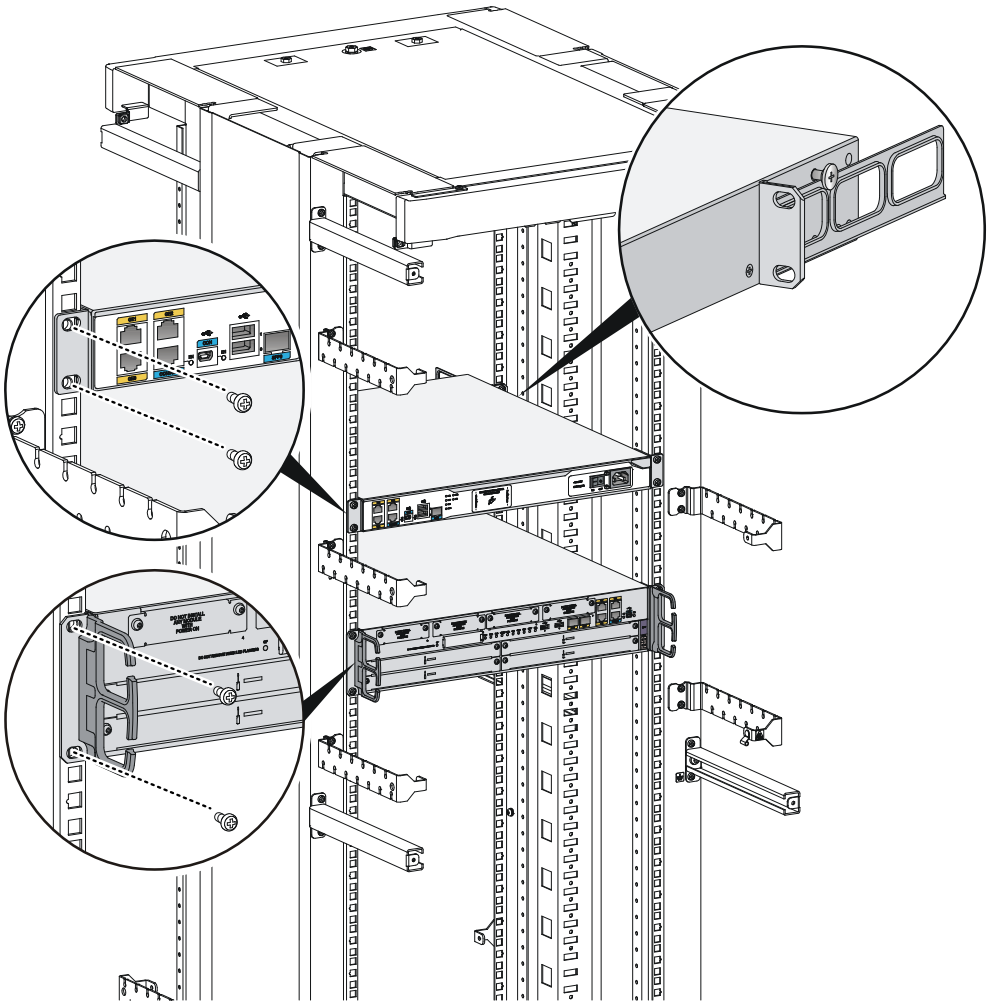


Figure 19 Attaching the front mounting brackets and load-bearing screws to the MSR3064



8. Place the router on the rack, making sure the load-bearing screws hang on the rear mounting brackets. Secure the chassis in the rack by attaching the front mounting brackets with proper pan head screws onto the back.

Figure 20 Mounting the router in the rack



Grounding the router

WARNING!

Correctly connecting the router grounding cable is crucial to lightning protection and EMI protection.

IMPORTANT:

The resistance reading should be smaller than 5 ohms between the chassis and the ground.

Grounding the router through the grounding terminal on the rack

IMPORTANT:

Make sure the rack is reliably grounded before grounding the router.

To connect the grounding cable:

1. Remove the two grounding screws from the rear panel of the chassis.
2. Attach the grounding screw to the ring terminal of the grounding cable. See Figure 21.
3. Use a Phillips screwdriver to fasten the grounding screw into the grounding screw hole.
4. Remove the grounding screw from the grounding point on the rack.
5. Use a needle-nose pliers to bend a hook at the other end of the grounding cable, attach it to the grounding point, and secure it with a screw. See Figure 22.

Figure 21 Connecting the grounding cable to the grounding hole of the router

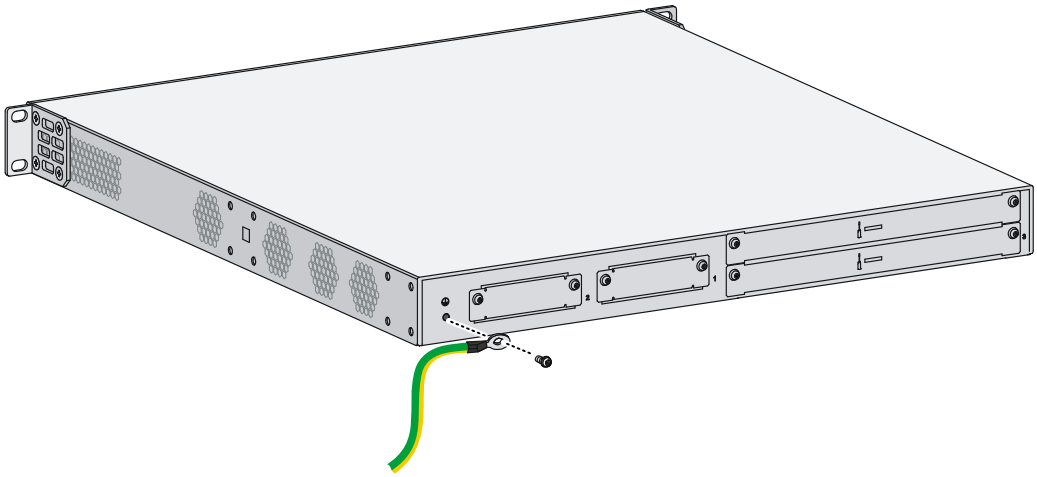
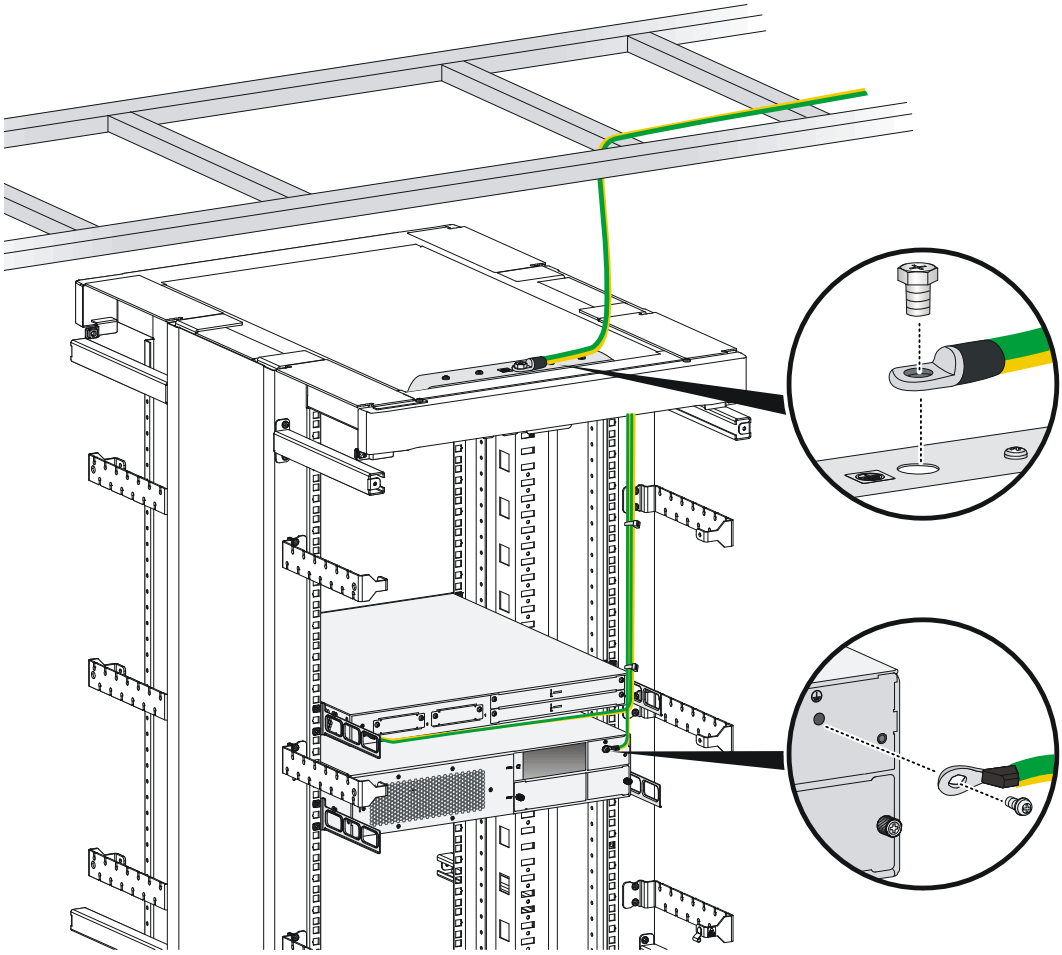
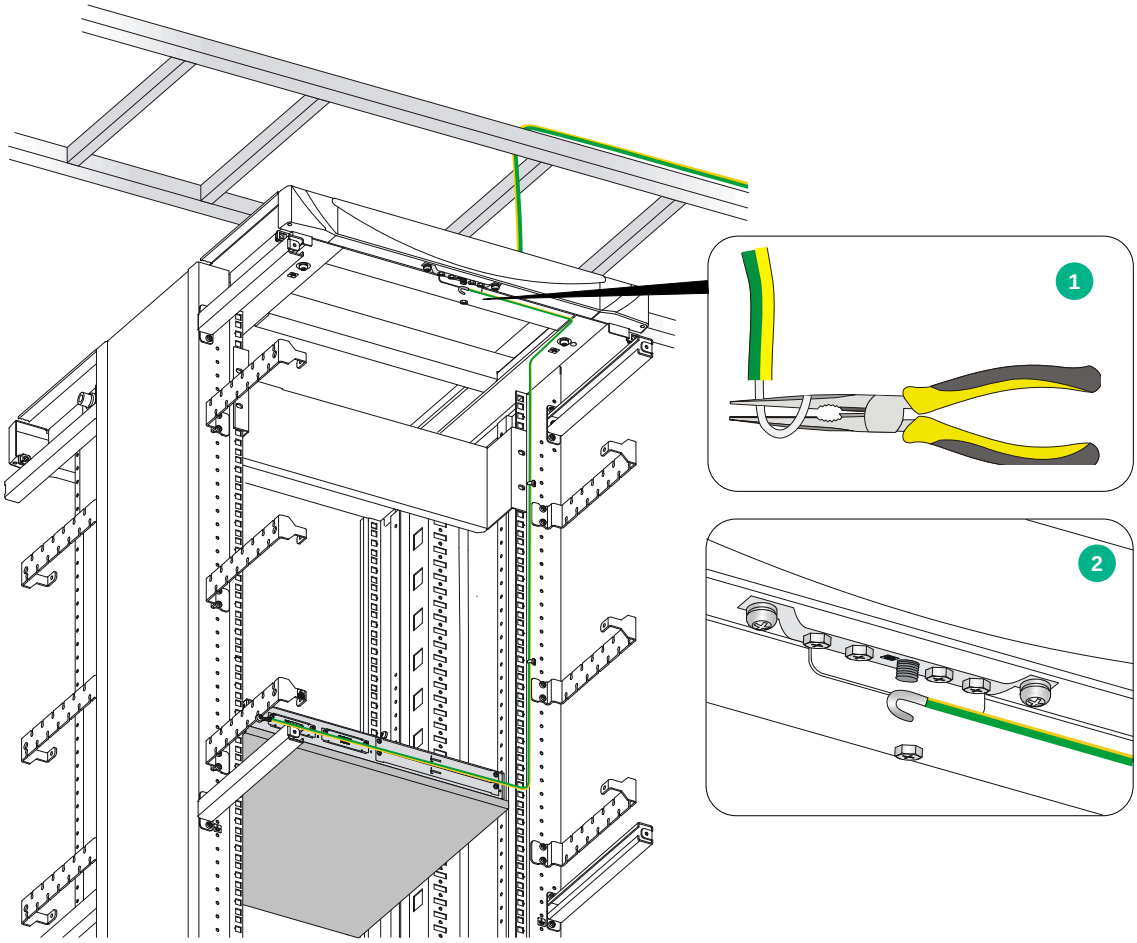


Figure 22 Grounding the router through the grounding terminal on the rack



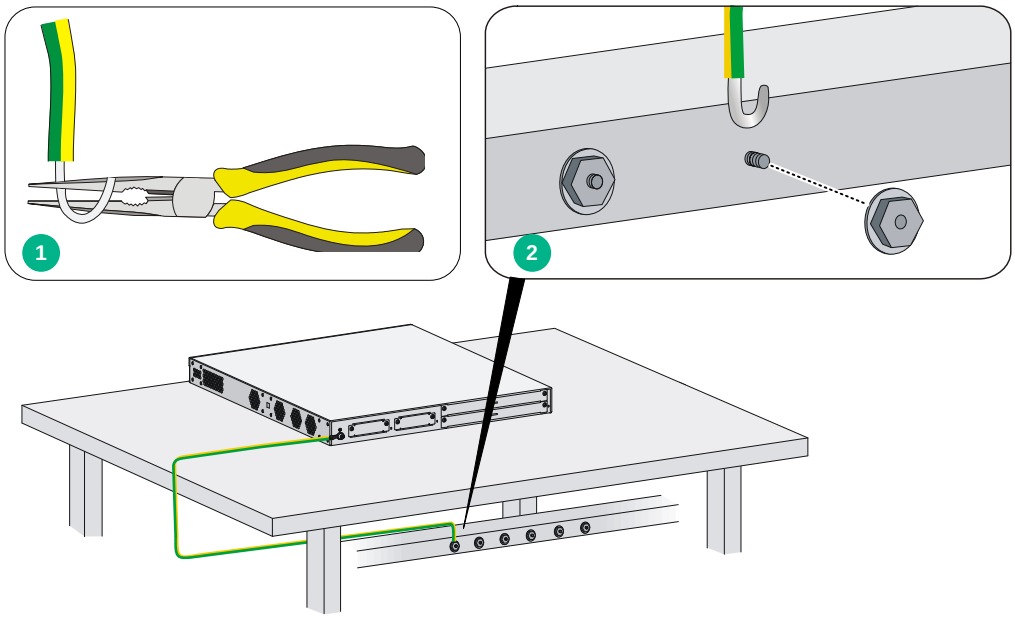


Grounding the router with a grounding strip

If a grounding strip is available at the installation site, connect the grounding cable to the grounding strip.

Follow the same procedures in "Grounding the router through the grounding terminal on the rack" to connect the grounding cable.

Figure 23 Grounding the router with a grounding strip



Grounding the router with a grounding conductor buried in the earth ground

If the installation site has no grounding strips, but earth ground is available, hammer a 0.5 m (1.64 ft) or longer angle iron or steel tube into the earth ground to serve as a grounding conductor. The steel tube must be zinc-coated. Weld the yellow-green grounding cable to the angel iron or steel tube and treat the joint for corrosion protection.

Installing an interface module

Installing a SIC

CAUTION:

SIC interface modules are not hot swappable. Make sure the router is powered off before installing a SIC.

To install a SIC:

1. Remove the fastening screws with a Phillips screwdriver to remove the filler panel.

   Keep the removed filler panel for future use.
2. Push the SIC slowly along the slide rails into the slot until it makes close contact with the backplane of the router.
3. Use a Phillips screwdriver to fasten the captive screws on the SIC.

Figure 24 Removing the filler panel

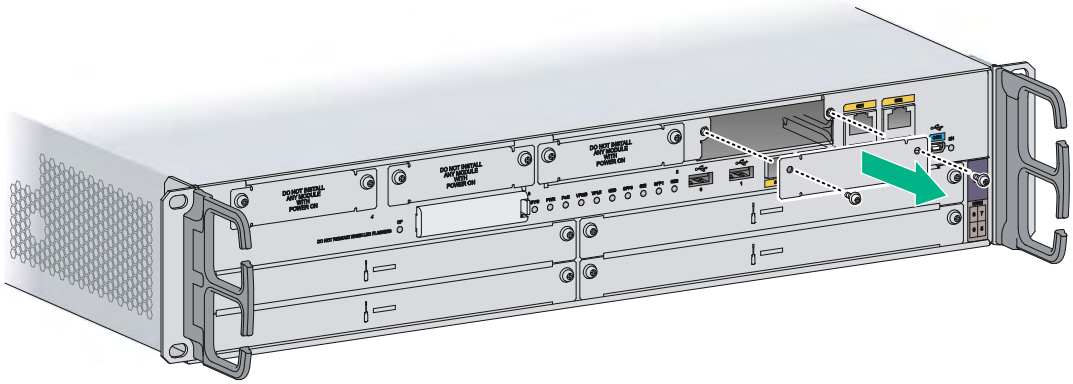
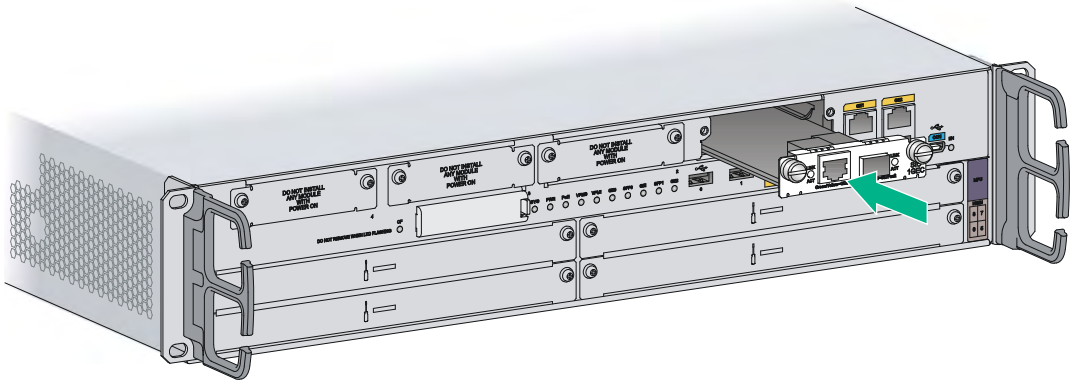


Figure 25 Installing the SIC



Installing a DSIC

CAUTION:

DSIC interface modules are not hot swappable. Make sure the router is powered off before installing a DSIC.

To install a DSIC:

1. Remove the screws on the filler panel on a SIC slot of an MSR3024, MSR3044, or MSR3064 to remove the filler panel.

   For an MSR3024, MSR3044, or MSR3064, a DSIC can be installed after you remove the slot divider between slot 1 and slot 2, or between slot 3 and slot 4.

2. Loosen the captive screws on the slot divider and pull out the slot divider.

   You can install a DSIC to an MSR3024, MSR3044, or MSR3064 after you remove the slot divider.

Figure 26 Removing the filler panel

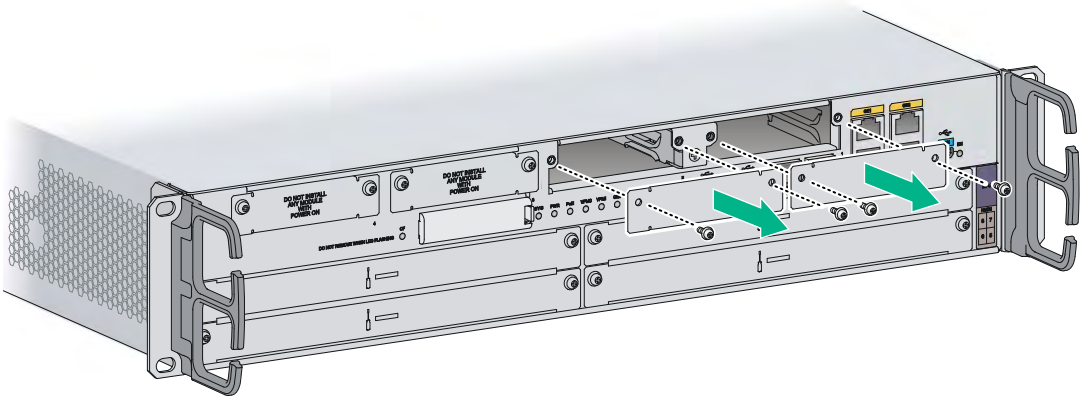
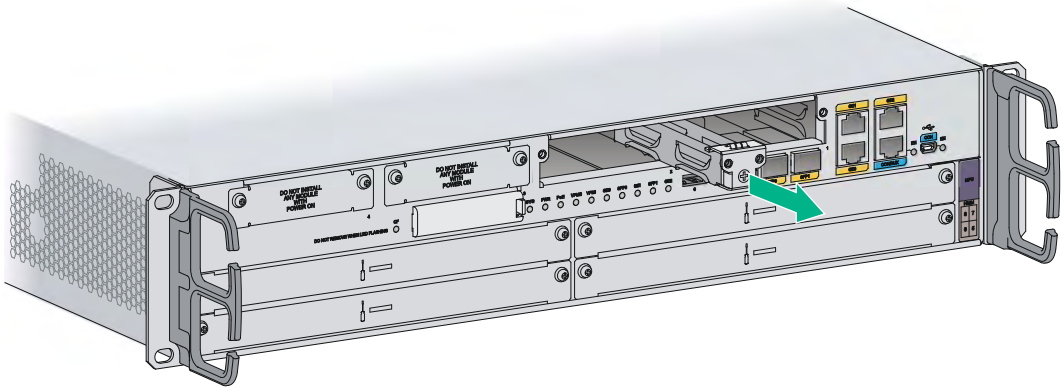
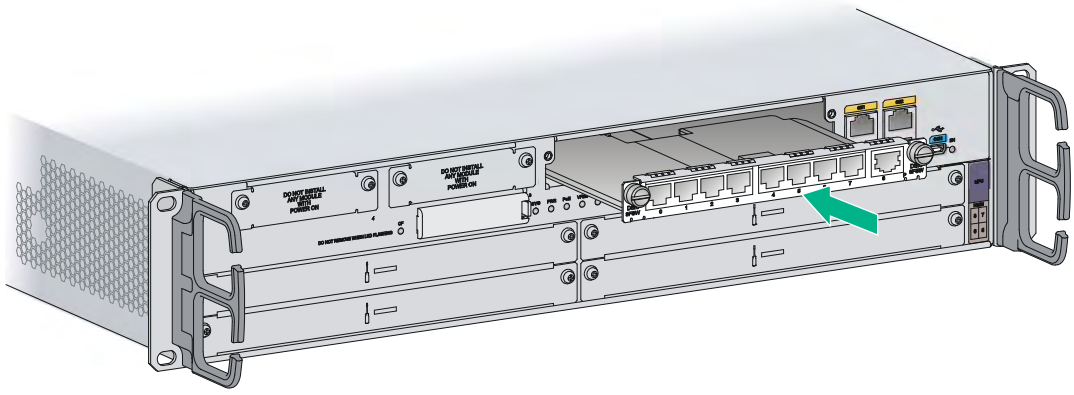


Figure 27 Removing the slot divider



3. Insert the DSIC into the slot and push it along the slide rails until it makes close contact with the backplane of the router.

Figure 28 Installing a DSIC



4. Fasten the captive screws to secure the DSIC.

Installing an HMIM

IMPORTANT:

- You can install an HMIM when the router is powered on. However, before replacing an HMIM when the router is powered on, you must execute the **remove hmimslot** *slotnumber* command.
- An HMIM interface module can be 1U or 0.5U. This section takes a 0.5U interface module for example. When you install a 1U interface module to an MSR router, remove the filler panels of the target slot and the neighboring slot above.
- If you install HMIMs on both of the HMIM slots on an MSR3024, when you insert an HMIM to the upper slot, slightly press down the HMIM, and then push it into the slot.

To install an HMIM:

1. Remove the fastening screws with a Phillips screwdriver to remove the filler panel.

   Keep the removed filler panel for future use.
2. Push the HMIM slowly along the slide rails into the slot until it makes close contact with the backplane of the router.

Figure 29 Removing the filler panel

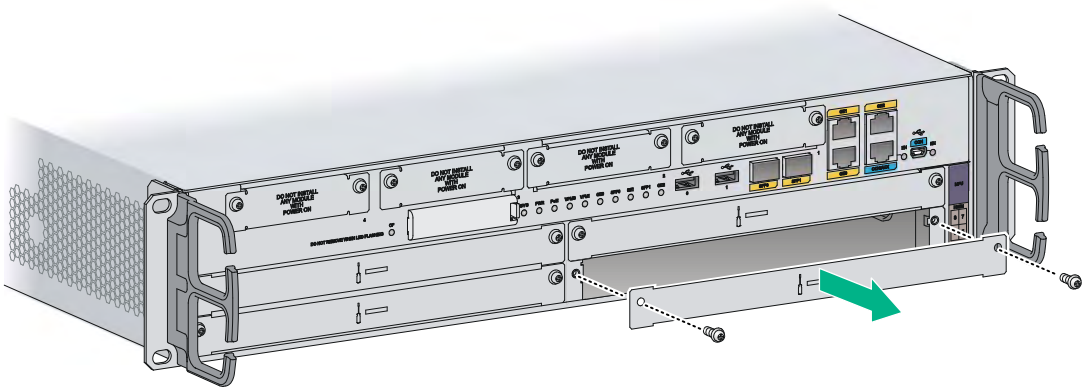
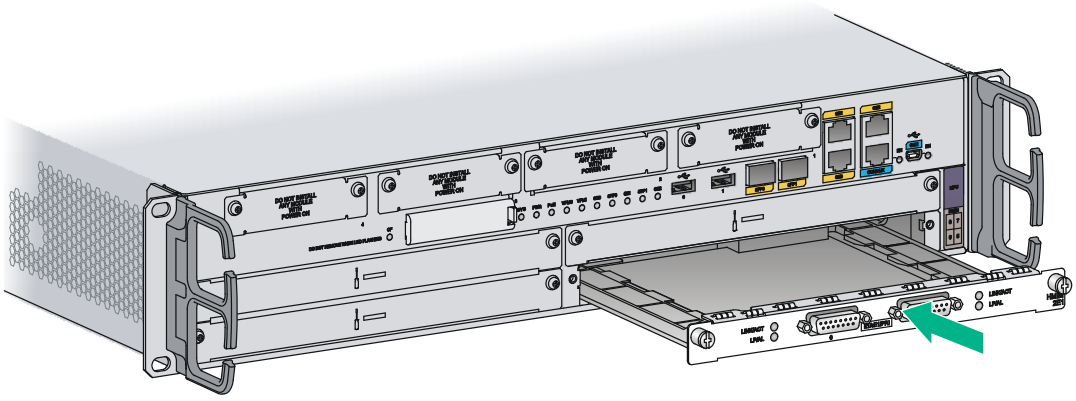


Figure 30 Installing an HMIM



3. Fasten the captive screws on the HMIM to secure it to the router.

Installing a MIM

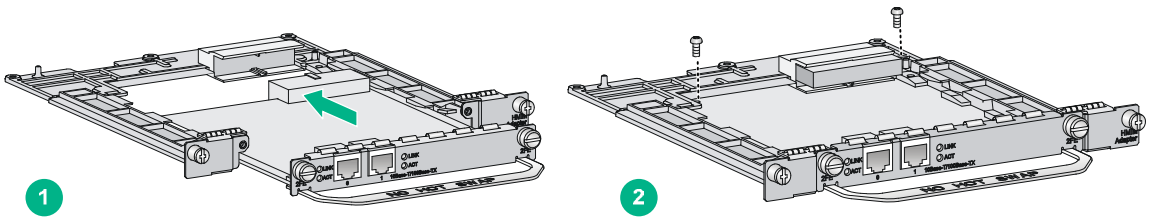
IMPORTANT:

- To install a MIM, install it to the HMIM adapter and then insert it into the HMIM slot.
- You can install a MIM when the router is powered on. However, before replacing a MIM when the router is powered on, you must execute the **remove hmimslot** *slotnumber* command.
- A MIM interface module can be 1U or 0.5U. This section takes a 0.5U interface module for example. When you install a 1U interface module to an MSR router, remove the filler panels of the target slot and the neighboring slot above, and use the 1U HMIM adapter.
- If you install MIMs on both of the HMIM slots on an MSR3024, when you insert a MIM to the upper slot, slightly press down the MIM, and then push it into the slot.

To install a MIM:

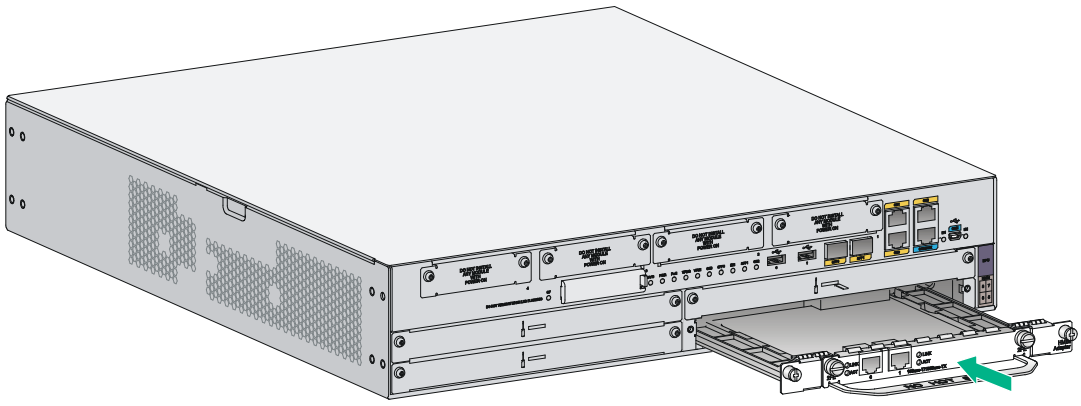
1. Remove the fastening screws with a Phillips screwdriver to remove the filler panel.
2. Push the MIM slowly along the slide rails until it makes close contact with the backplane of the HMIM adapter.
3. Fasten the fastening screws.
4. Fasten the captive screws on the MIM to secure it to the HMIM adapter.

Figure 31 Attaching a MIM to an HMIM adapter



5. Push the MIM into the slot along the slide rails until it makes close contact with the backplane of the router.
6. Fasten the captive screws to secure the MIM to the router.

Figure 32 Installing the MIM to the router



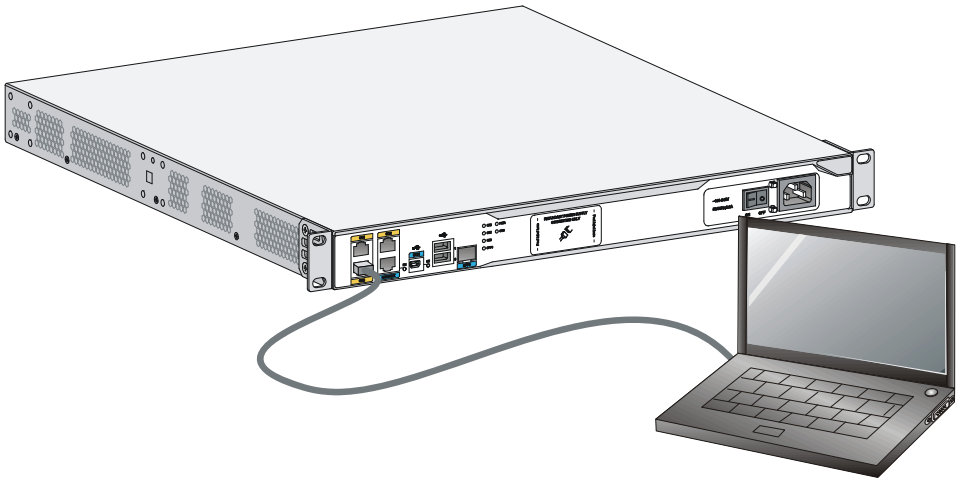
Connecting the router to the network

Connect the router to the network before powering on the router. This section describes how to connect the router to the network through Ethernet cables.

Connecting an Ethernet cable

1. Plug one end of an Ethernet twisted pair cable into the copper Ethernet port (RJ-45 port) to be connected on the router.
2. Plug the other end of the cable into the RJ-45 port of the peer device.

Figure 33 Connecting the router to a PC



Connecting an optical fiber

WARNING!

Do not stare into any fiber port when you connect an optical fiber. The laser light emitted from the optical fiber may hurt your eyes.

Follow these guidelines when you connect a fiber cable:

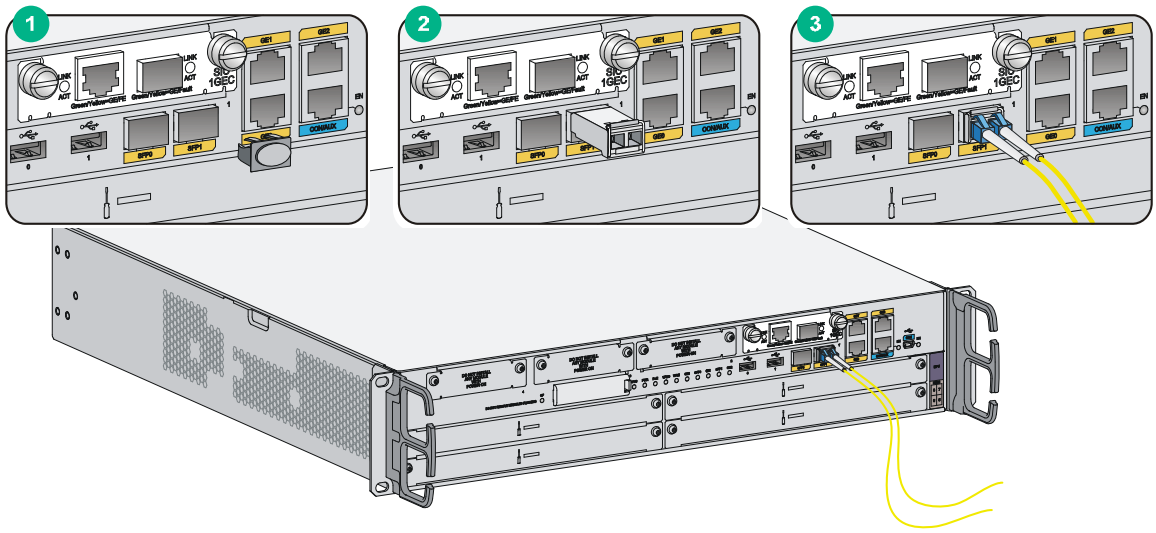
- Never bend or curve a fiber when connecting it.
- Make sure the Tx and Rx ends are properly connected.
- Keep the fiber end clean.
- Be sure to install the dust cover if the fiber port is not connected to a fiber connector.

To connect an optical fiber:

1. Remove the dust plug from a fiber port of the router.
2. Remove the dust cover from the transceiver module, and plug the end without a pull latch into the fiber port.
3. Remove the dust cover from the fiber connector.
4. Identify the Rx and Tx ports. Plug the LC connector at one end of one fiber cable into the Rx port of the router and the LC connector at the other end into the Tx port of the peer device. Plug the LC connector at one end of another fiber cable into the Tx port of the router and the LC connector at the other end to the Rx port of the peer device.

5. Examine the Ethernet port LED after connection. For more information, see "Appendix B LEDs."

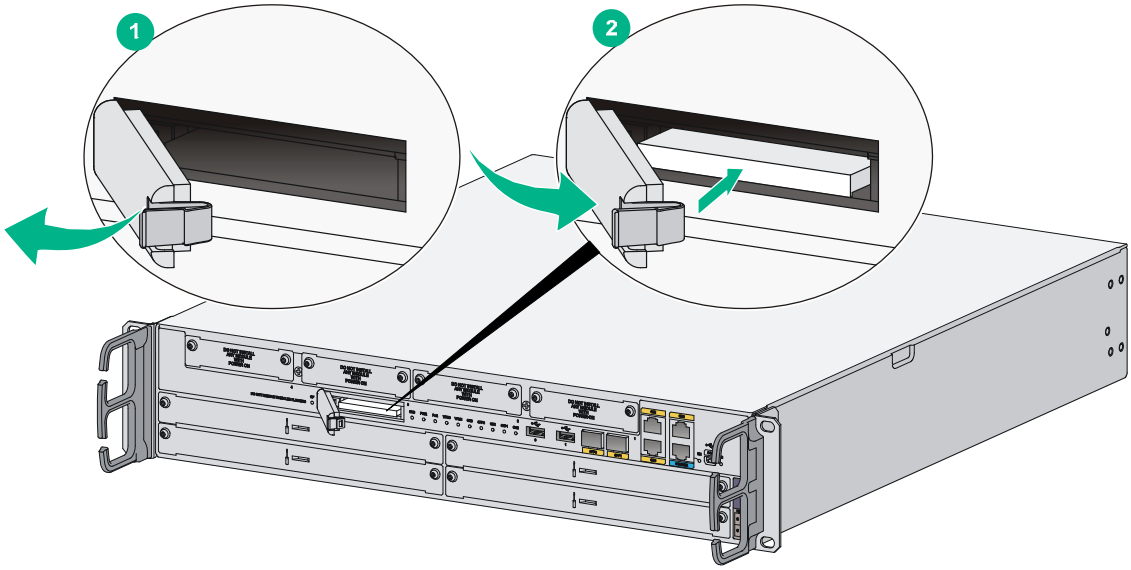
Figure 34 Connecting an optical fiber



Installing a CF card

1. Open the CF card cover by pressing the spring clip.
2. Push the CF card eject button all the way into the slot, and make sure the button does not project from the panel.
3. Insert the CF card into the slot following the direction shown in Figure 35, and make sure it does not project from the slot.
4. Close the CF card cover.

Figure 35 Installing a CF card



Logging in through the console port

Connecting a console cable

You can log in only through the console port by using a console or USB console cable the first time you log in to your router.

IMPORTANT:

When you connect a PC to a powered-on router, connect the RJ-45 connector to the router after connecting the DB-9 connector of the console cable to the PC.

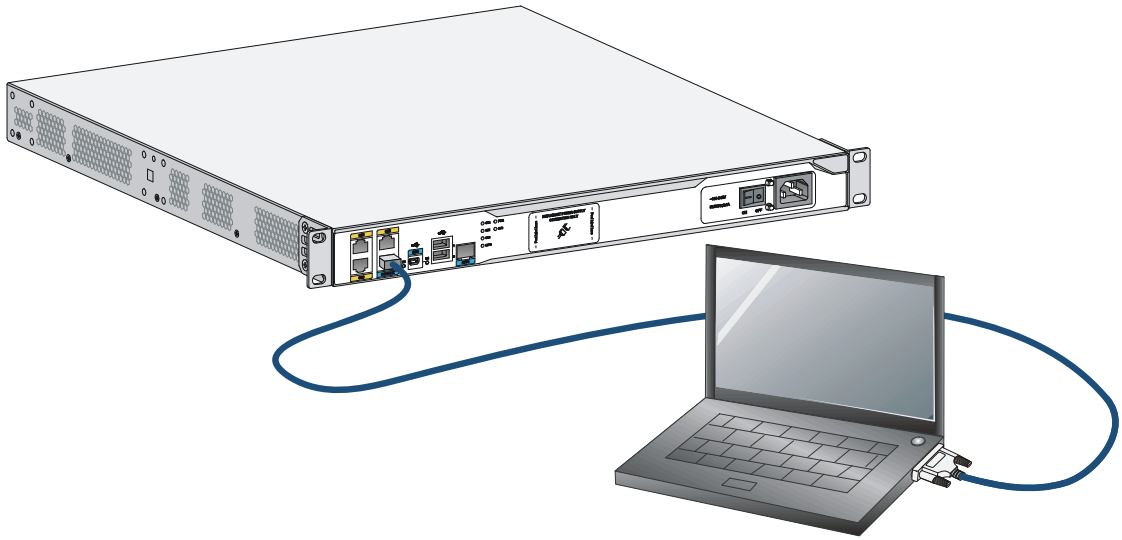
To connect a console cable:

1. Plug the DB-9 female connector to the serial port of the configuration terminal.
2. Connect the RJ-45 connector to the console port of the router.

NOTE:

If the configuration terminal does not have an RS-232 serial port, a serial adapter is required to connect the console cable to a USB port on the terminal.

Figure 36 Connecting the console cable



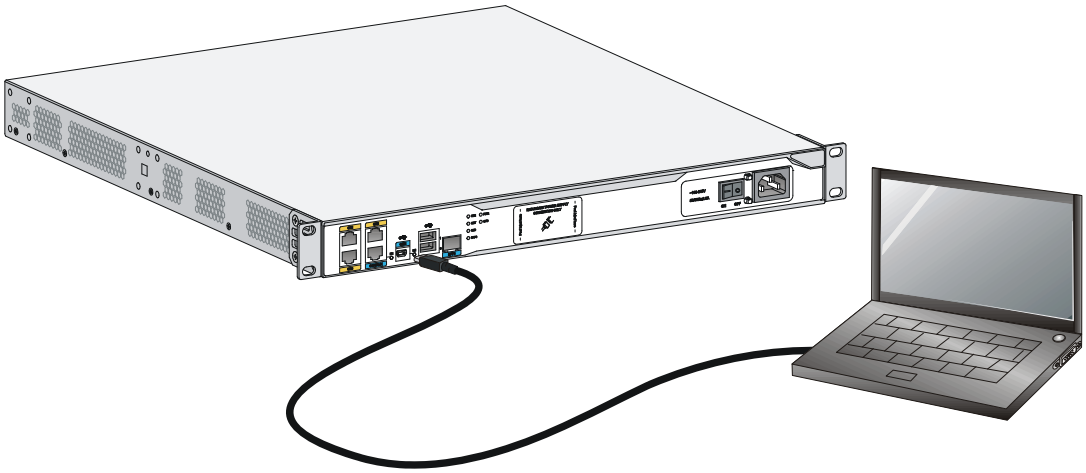
IMPORTANT:

Download and install the USB console driver program before configuring the device when you connect the device through a USB console cable.

To connect a USB cable:

1. Connect the USB port to the PC.
2. Connect the other end to the USB console port of the router.

Figure 37 Connecting the USB cable



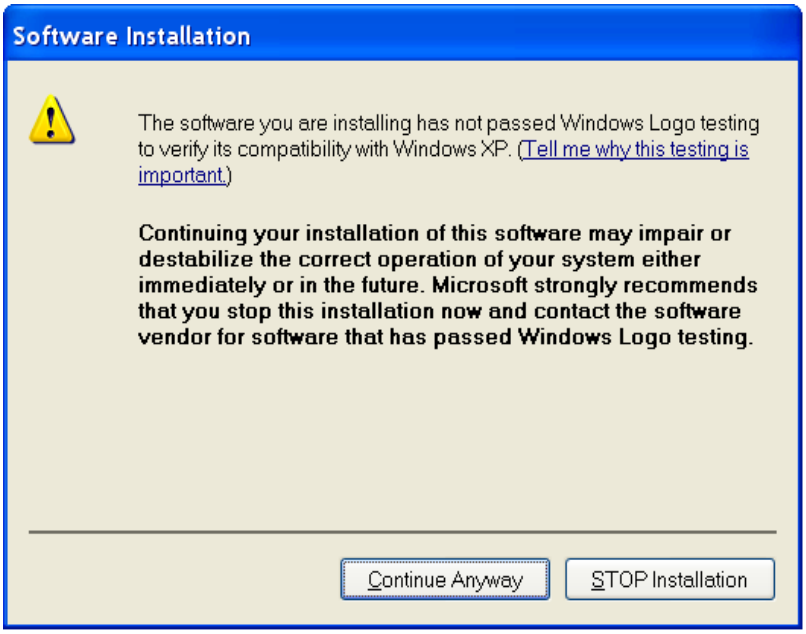
3. Click the following link, or copy it to the address bar on the browser to log in to download page of the USB console driver, and download the driver.

4. Select a driver program according to the operating system you use:
   - **XR21V1410_XR21B1411_Windows_Ver1840_x86_Installer.EXE**—Applicable to 32-bit operating systems.
   - **XR21V1410_XR21B1411_Windows_Ver1840_x64_Installer.EXE**—Applicable to 64-bit operating systems.
5. Click **Next** on the installation wizard.

Figure 38 Device driver installation wizard

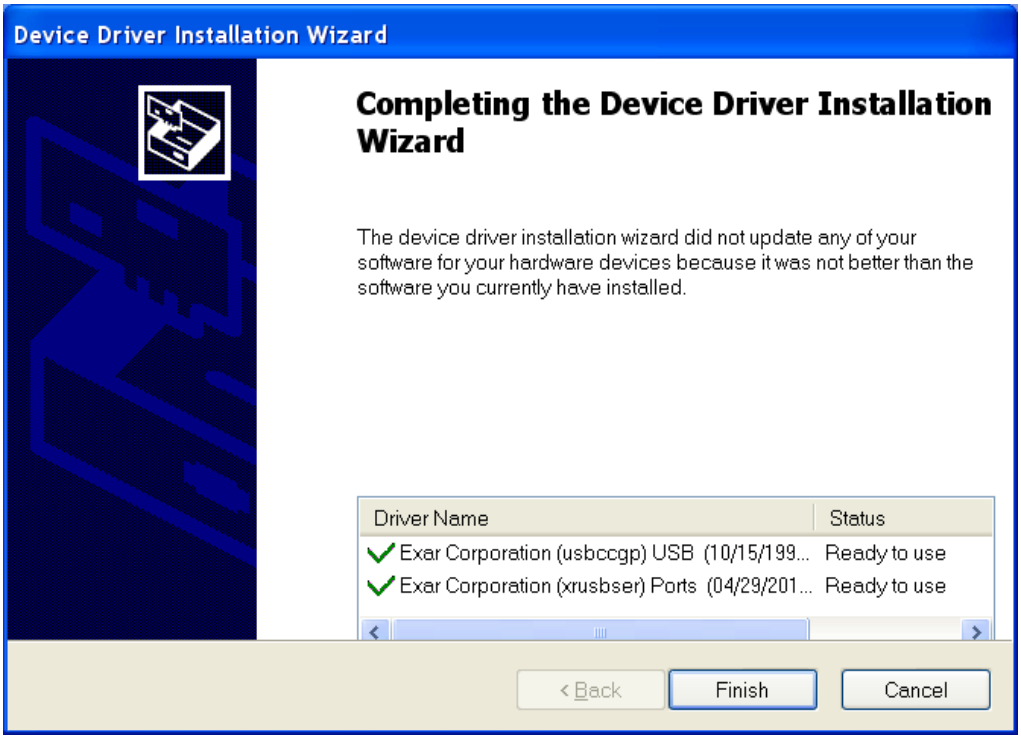
6. Click **Continue Anyway** if the following dialog box appears.

Figure 39 Software installation



7. Click **Finish**.

Figure 40 Completing the device driver installation wizard



Setting terminal parameters

To access the device through the console port, you must run a terminal emulator program (HyperTerminal, PuTTY, or Tera Term) on the configuration terminal. For information about using a terminal emulator program, see the program's user guide.

The following are the required terminal settings:

- **Baud rate**—9600.
- **Data bits**—8.
- **Stop bits**—1.
- **Parity**—none.
- **Flow control**—none.

Installing a power supply

IMPORTANT:

- Only the MSR3044 and MSR3064 support power supplies.
- To install multiple power supplies, make sure all power supplies are AC input or DC input.

Installing an AC/DC power supply

1. Face the front of the router and locate the slot to be used.
2. Loosen the captive screws with a Phillips screwdriver to remove the filler panel from the slot.

   Keep the removed filler panel for future use.

   Skip this step if the router is shipped with this slot empty.
3. Holding the handle of the power supply with one hand and supporting the bottom of the power supply with the other hand, insert the power supply slowly along the slide rails until it makes close contact with the backplane.
4. Use a Phillips screwdriver to fasten the captive screws on the two sides of the power supply.

Figure 41 Installing an AC power supply

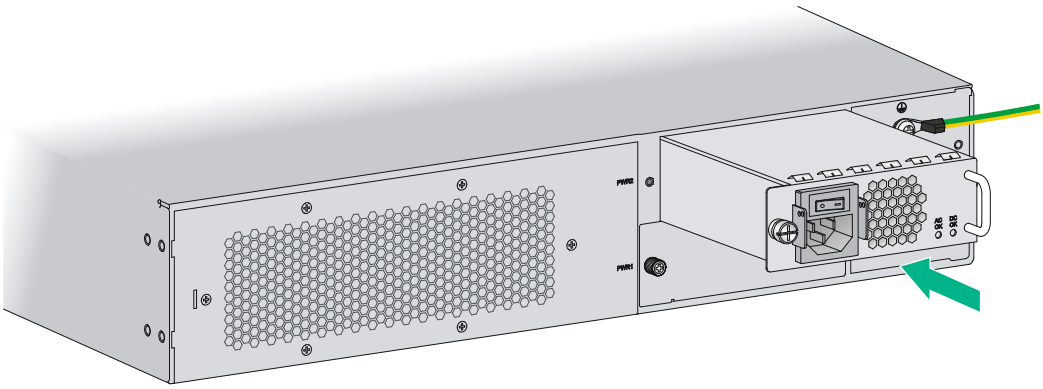
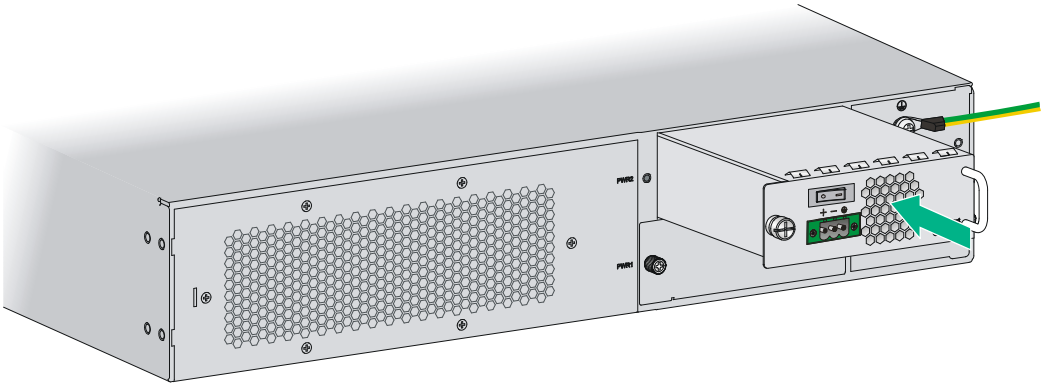


Figure 42 Installing a DC power supply



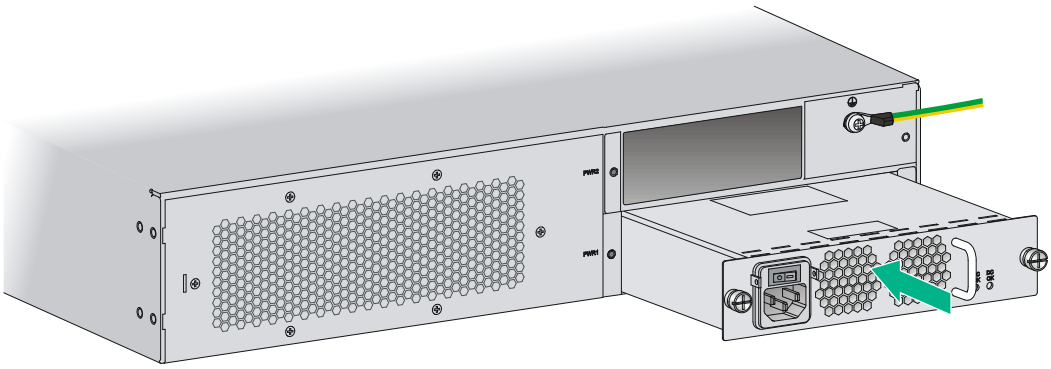
Installing a PoE power supply

1. Face the front of the router and locate the slot to be used.
2. Loosen the captive screws with a Phillips screwdriver to remove the filler panel from the slot.

   Keep the removed filler panel for future use.

   Skip this step if you install the power supply to the PWR1 slot.
3. Holding the handle of the power supply with one hand and supporting the bottom of the power supply with the other hand, insert the power supply slowly along the slide rails until it makes close contact with the backplane.
4. Use a Phillips screwdriver to fasten the captive screws on the two sides of the power supply.

Figure 43 Installing a PoE power supply



Connecting the power cord

The power cords in the figures of this section are only for illustration.

Connecting an AC power cord

1. Make sure the router is well grounded, and the power switch on the router is in the OFF position.
2. Connect one end of the AC power cord to the AC receptacle on the router, and use a cable tie to secure the power cord.
3. Connect the other end of the power cord to the AC power source.

Figure 44 Connecting an AC power cord to an MSR3012/3024 router

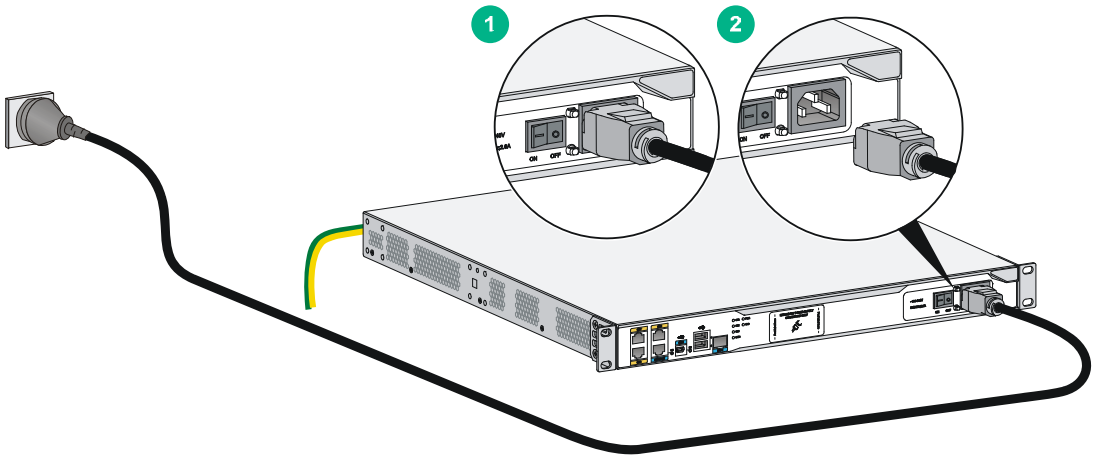
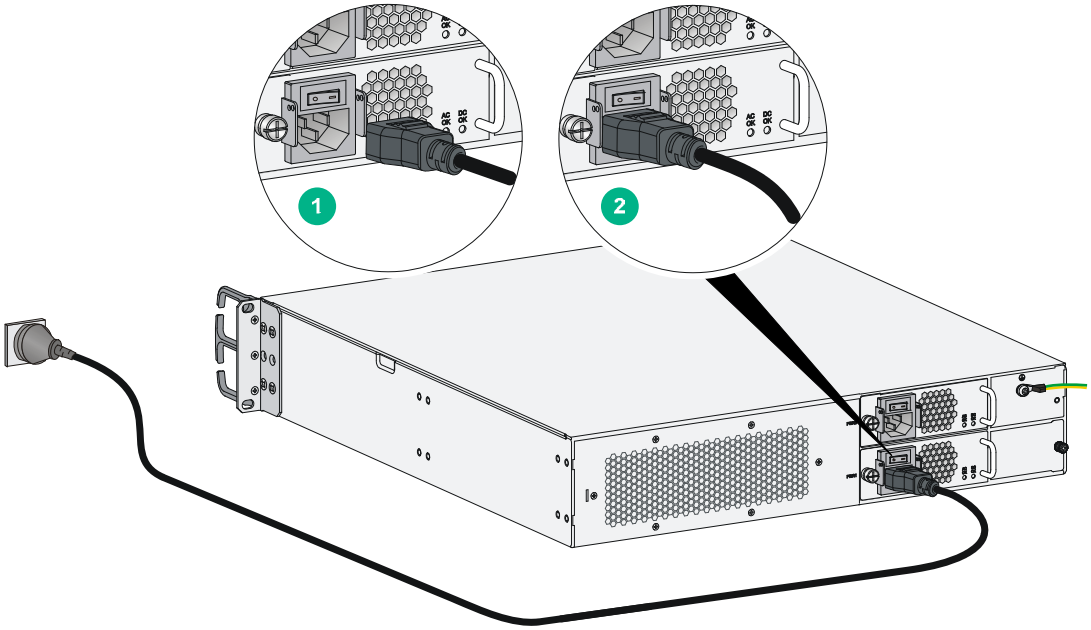


Figure 45 Connecting an AC power cord to an MSR3044/3064 router



Connecting a DC power cord

CAUTION:

The power cord color code scheme in this section is for illustration only. The cable delivered for your country or region might use a different color scheme. When you connect a power cord, always identify the polarity symbol on its wires.

The MSR3012/3024 and MSR3044/3064 use different DC connectors, but the power cord connection procedures are the same.

To connect DC power cords:

1. Make sure the router is well grounded, and the power switch on the router is in the OFF position.

2. Loosen the captive screws on the power supply with a Phillips screwdriver to remove the power supply connector.
3. Connect one end of the DC power cord supplied with the router to the DC receptacle on the router.
4. Connect the other ends of the wires to the DC power source wiring terminals, with the negative wire (**–** or **L–**) to the negative terminal (**–**) and the positive wire (**+** or **M/N**) to the positive terminal (**+**).

Figure 46 Connecting a DC power cord for an MSR3012/3024

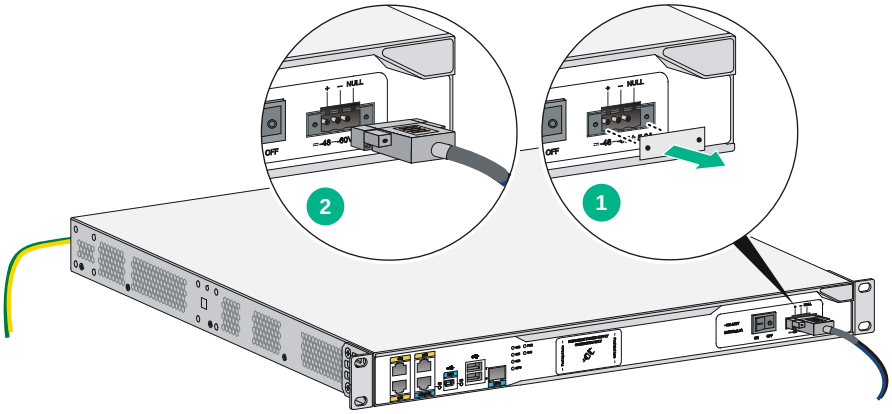
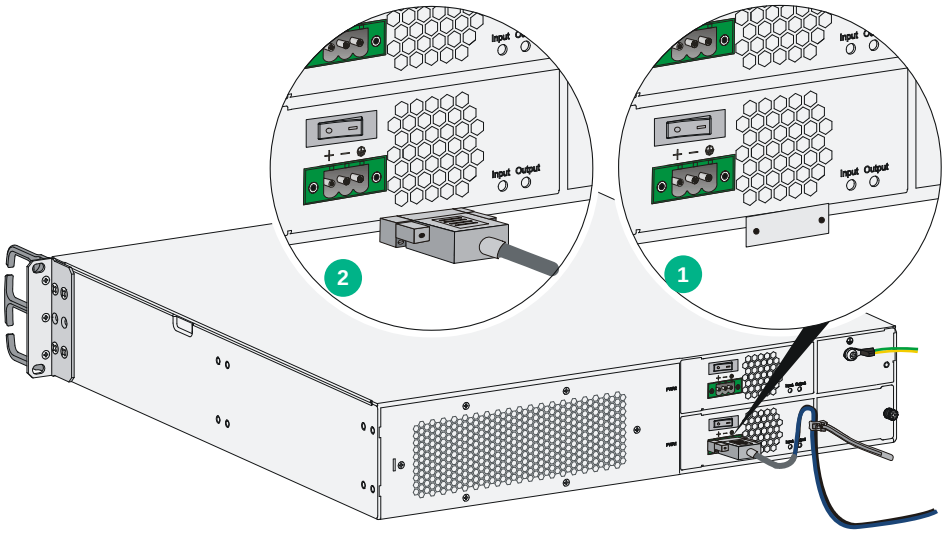


Figure 47 Connecting a DC power cord for an MSR3044/3064



Connecting an RPS power cord

The MSR3012 and MSR3024 offer remote power supply (RPS) support. As an external power supply, RPS can provide power supply for the device in case of power supply abnormality. It enhances the reliability of the device.

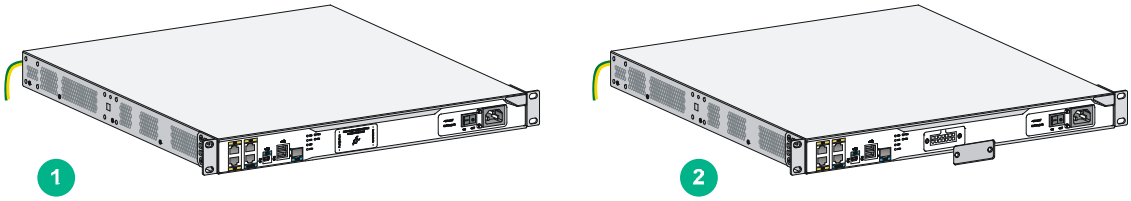
The router has a sticky label and a protective cover when shipped to protect the RPS receptacle.

To connect an RPS power cord:

1. Remove the sticky label.

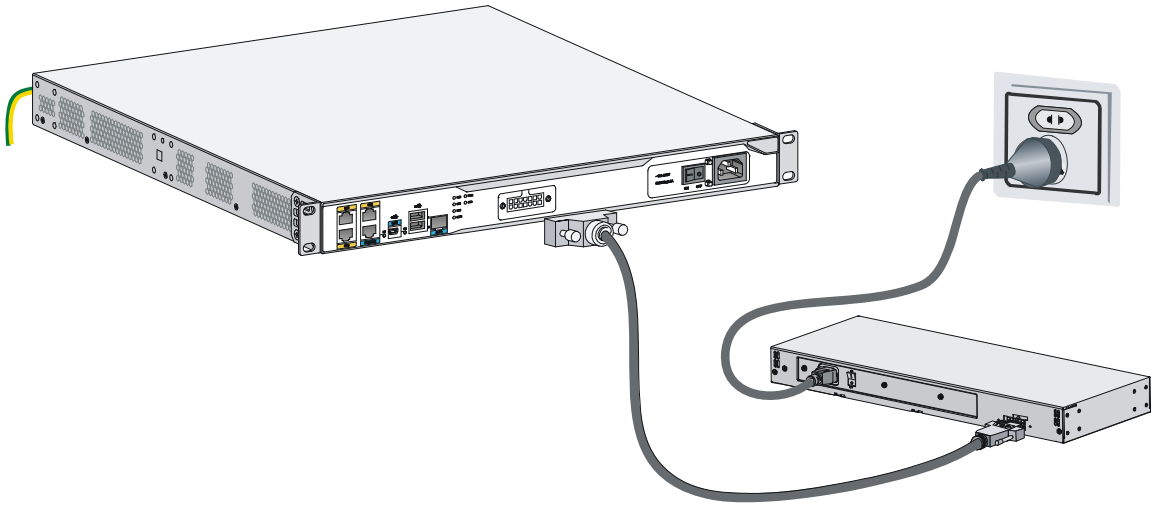
2. Remove the screws on the protective cover with a screw driver to remove the protective cover, as shown in the following figure:

Figure 48 Removing the sticky label and protective cover



3. Insert one end of the RPS power cord to the RPS receptacle on the router and fasten the screws on the RPS power cord plug.
4. Make sure the RPS power is OFF and connect the other end of the power cord to the RPS power source.

Figure 49 Connecting the RPS power cord



Verifying the installation

After you complete the installation, verify the following information:

- There is enough space for heat dissipation around the router, and the rack or workbench is stable.
- USB devices and interface modules are properly installed.
- The router, rack, and power cords are reliably grounded.
- The correct power source is used.

Powering on the router

Verifying before power-on

Before powering on the router, verify the following items:

- The power supplies are correctly installed.
- The power cord and grounding cable are properly connected.

- The power source voltage meets the requirement of the router.
- The console cable is properly connected, the terminal or PC used for configuration has started, and the configuration parameters have been set.
- If a CF card is used, verify that the CF card is in position.
- Make sure the installed HMIMs/MIMs are in position.

Powering on the router

1. Turn on the switch of the power supply system for the router.
2. Turn on the switch of the AC or DC power supplies.

Displaying boot information

Power on the router, and you can see the following information:

```
System is starting...
Press Ctrl+D to access BASIC-BOOTWARE MENU...
Booting Normal Extended BootWare........
The Extended BootWare is self-decompressing....Done.

********************************************************************************
*                                                                              *
*                   HPE MSR3064 BootWare, Version 1.60                          *
*                                                                              *
********************************************************************************
Copyright (c) 2010-2015 Hewlett Packard Enterprise Development LP

Compiled Date       : Dec 17 2015
CPU ID              : 0x4
Memory Type         : DDR3 SDRAM
Memory Size         : 2048MB
BootWare Size       : 1024KB
Flash Size          : 8MB
cfa0 Size           : 247MB
CPLD Version        : 2.0
PCB Version         : 2.0


BootWare Validating...
Press Ctrl+B to access EXTENDED-BOOTWARE MENU...
Loading the main image files...
Loading file cfa0:/msr3000-cmw710-system-e000603.bin.......................
...............................Done.
Loading file cfa0:/msr3000-cmw710-security-e000603.bin.........Done.
Loading file cfa0:/msr3000-cmw710-voice-e000603.bin...........Done.
Loading file cfa0:/msr3000-cmw710-data-e000603.bin............Done.
Loading file cfa0:/msr3000-cmw710-boot-e000603.bin.......................
Done.
```

```
Image file cfa0:/msr3000-cmw710-boot-e000603.bin is self-decompressing......
.........Done.
System image is starting...
Line aux0 is available.


Press ENTER to get started.
```

Press **Enter**, and the following prompt appears:

```
<HPE>
```

You can now configure the router.

NOTE:

To access the CLI when the device boots with empty configuration, press Ctrl+D.

Examining the router after power-on

After the router is powered on, verify that:

- The LEDs on the front panel are operating correctly:

LED	Status	Description
PWR	Steady green	The power supply is supplying power correctly.
SYS	Slow flashing green	The router is operating correctly.

- The configuration terminal displays information properly. For local configuration, the configuration terminal displays the boot information (see "Displaying boot information").
- If you press **Enter** as prompted after system bootup, the router is ready to configure.

Configuring basic settings for the router

After the router is powered on for the first time, configure the basic settings for the router. For more information, see *HPE MSR Routers Fundamentals Configuration Guide (V7)* and *HPE MSR Routers Fundamentals Command Reference (V7)*.

Replacement procedure

IMPORTANT:

- The barcode on the router chassis contains product information that must be provided to local sales agent before you return a faulty router for service.
- Keep the tamper-proof seal on a mounting screw on the chassis cover intact, and if you want to open the chassis, contact Hewlett Packard Enterprise for permission. Otherwise, Hewlett Packard Enterprise shall not be liable for any consequence.

Replacing a power supply

Power supplies are hot swappable.

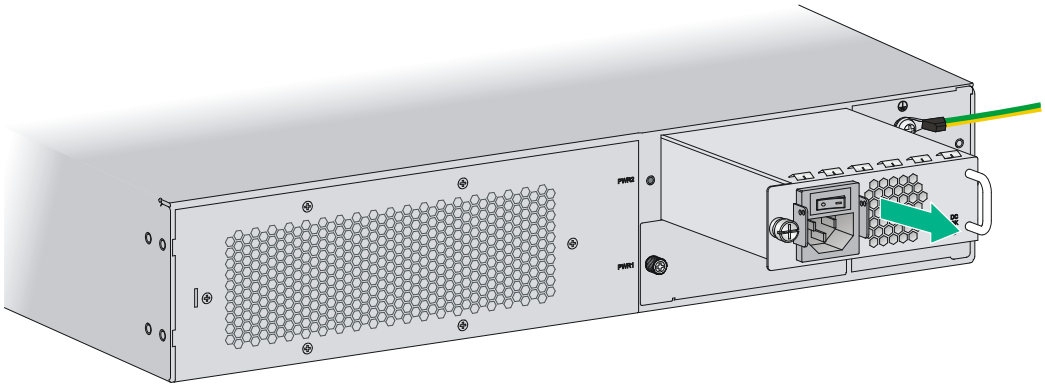
The replacement procedure of an AC power supply is the same as a DC power supply. This section uses an AC power supply as an example.

To replace a power supply:

1. Locate the power supply to be removed and use a Phillips screwdriver to completely loosen the captive screws on the power supply.
2. Holding the handle of the power supply with one hand and supporting the bottom of the power supply with the other hand, gently pull the power supply out of the slot along the slide rails.

   Put the removed power supply on an antistatic workbench or into an antistatic bag.

Figure 50 Pulling a power supply out of the slot



3. Install a new power supply. For the installation procedure, see "Installing the router."

   Install a filler panel if you do not install a new power supply.

Locating internal modules

Removing chassis covers

WARNING!

- To avoid bodily injury and equipment damage, make sure all power supplies connected to the router are powered off, all power cords and interface cables are removed before you maintain the hardware.
- Wear an ESD wrist strap and make sure it makes good skin contact and is reliably grounded.
- After you maintain the hardware, reinstall the chassis cover.

Removing the chassis cover from the MSR3012/MSR3024

1. Place the router on a flat ground and have the rear panel face you.
2. Use a Phillips screwdriver to remove the screws on the rear panel and the screws on the left and right sides of the chassis.
3. Rotate a flat-blade screwdriver to separate the chassis and the cover as shown in Figure 52.
4. Raise the chassis cover until its front edge is separated from the chassis bottom completely.
5. Pull the chassis cover towards you until the tab on the back edge is disengaged from the front panel, and put away the cover.

Figure 51 Removing chassis cover screws

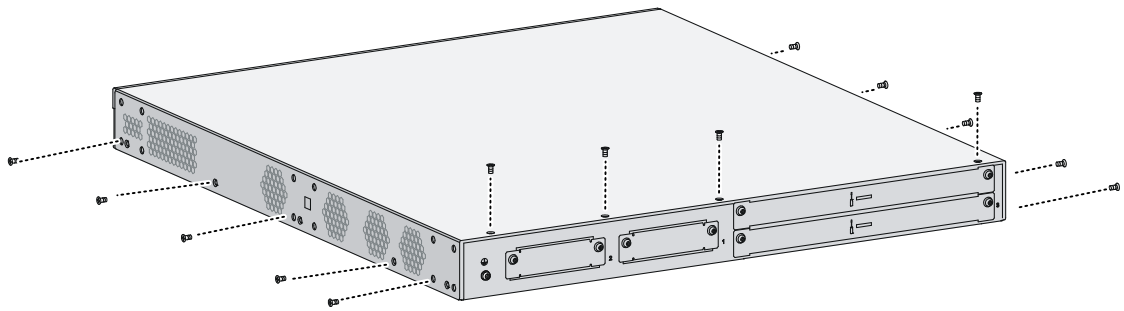


Figure 52 Rotating the flat-blade screwdriver

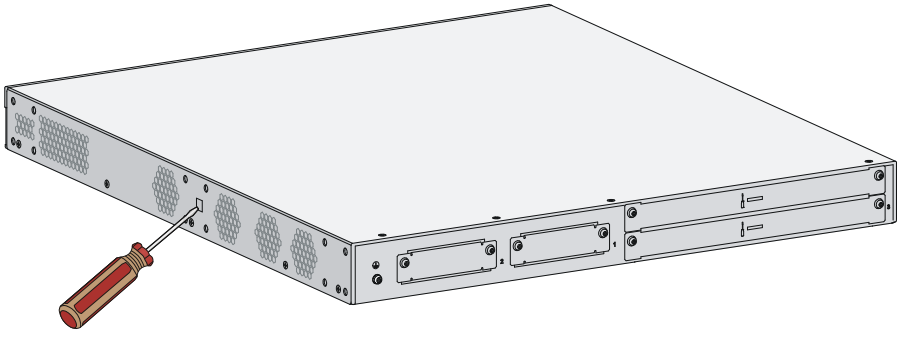
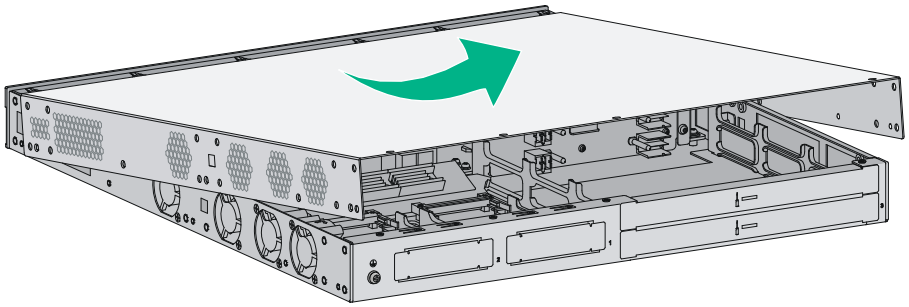


Figure 53 Lifting the chassis cover



Removing the chassis cover from the MSR3044/MSR3064

1. Place the router on a flat ground.
2. Use a Phillips screwdriver to remove the fastening screws at the top of the router from chassis cover.
3. Lift the chassis cover and put it away.

Figure 54 Removing chassis cover screws

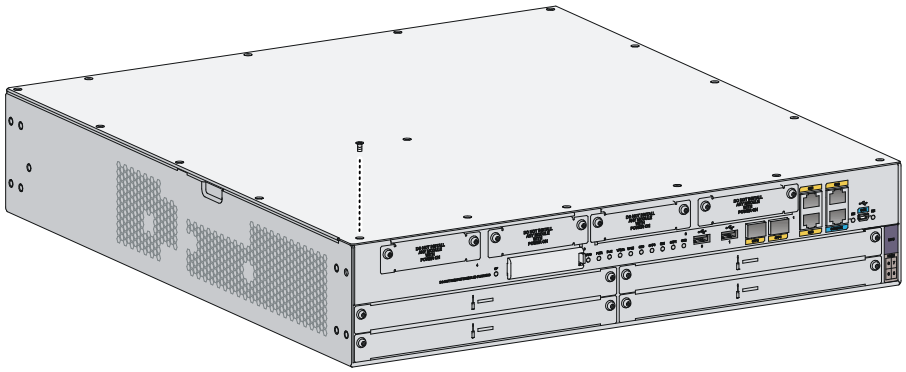
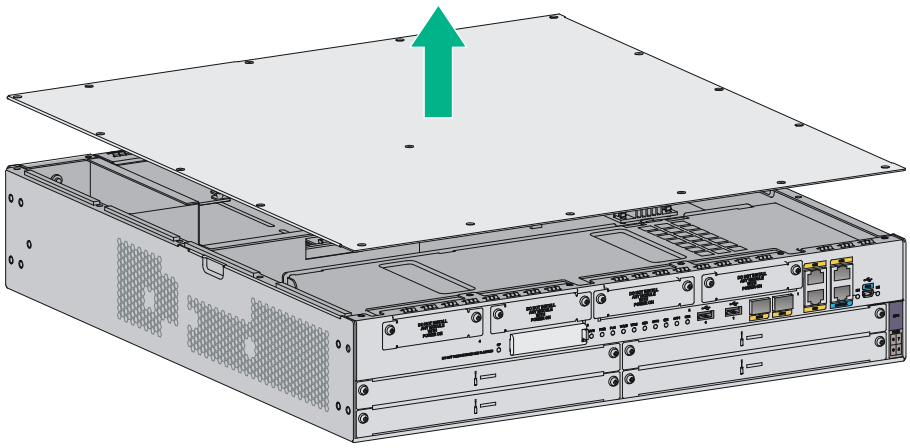
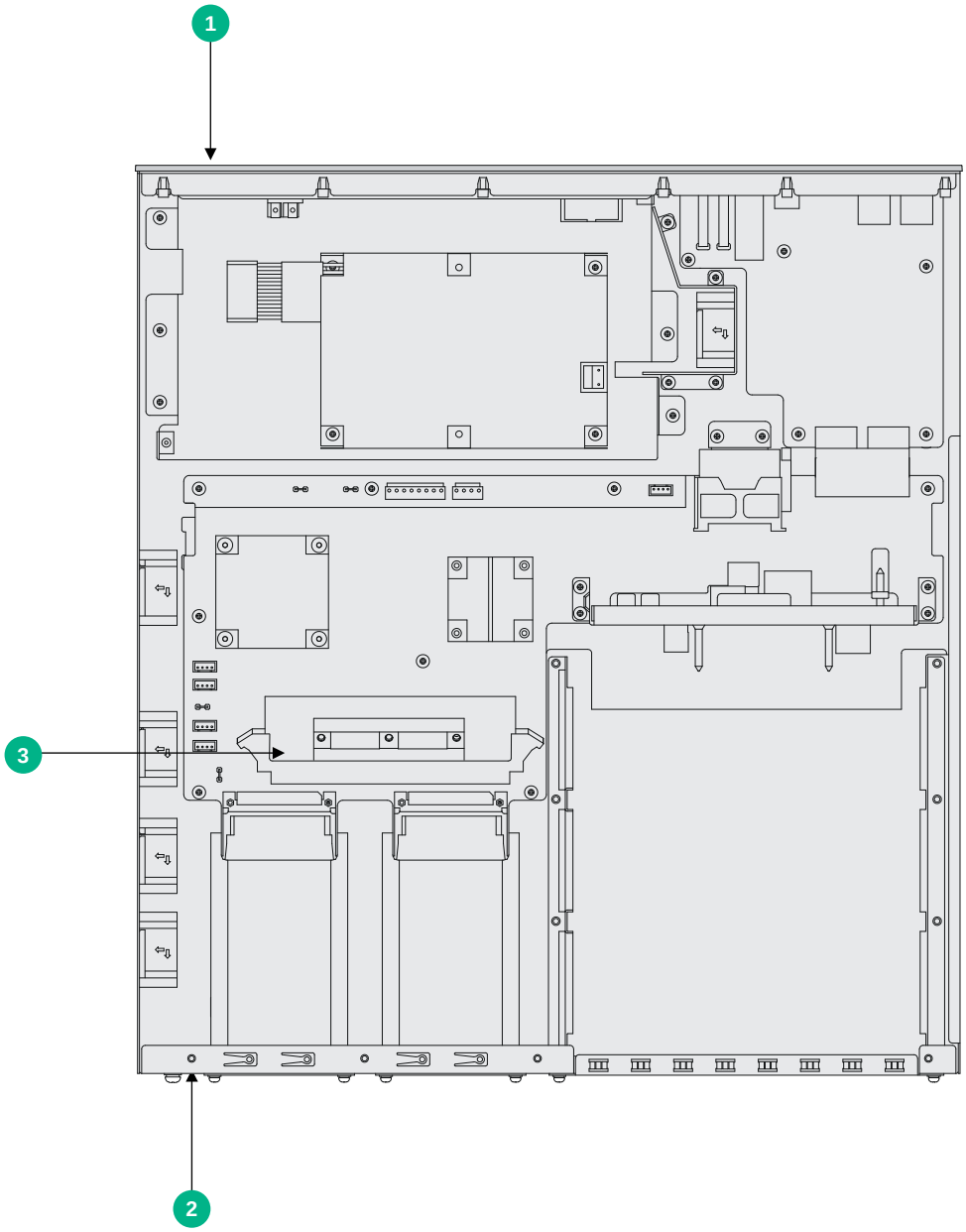


Figure 55 Lifting the chassis cover



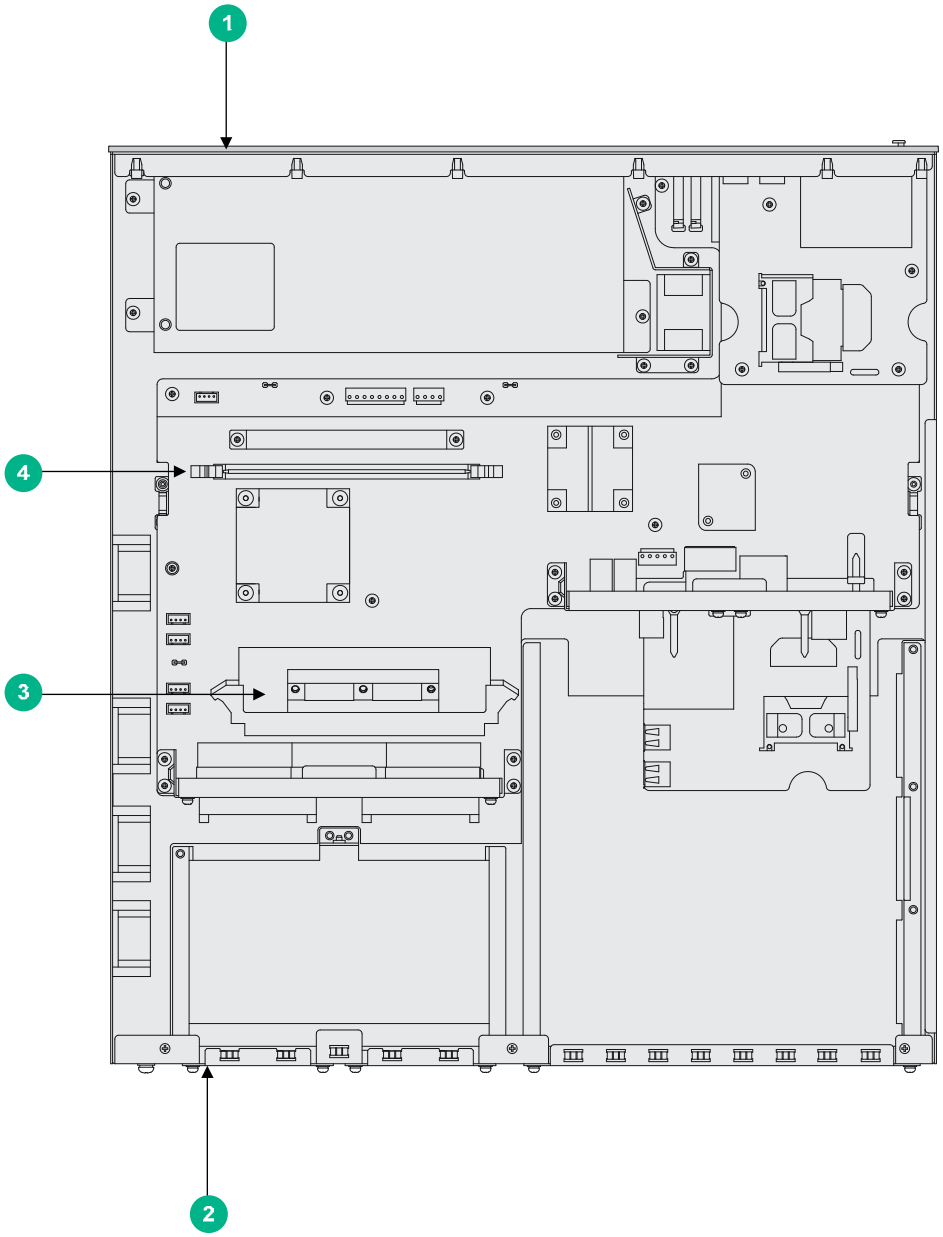
Locating internal modules

Figure 56 MSR3012 internal module locations



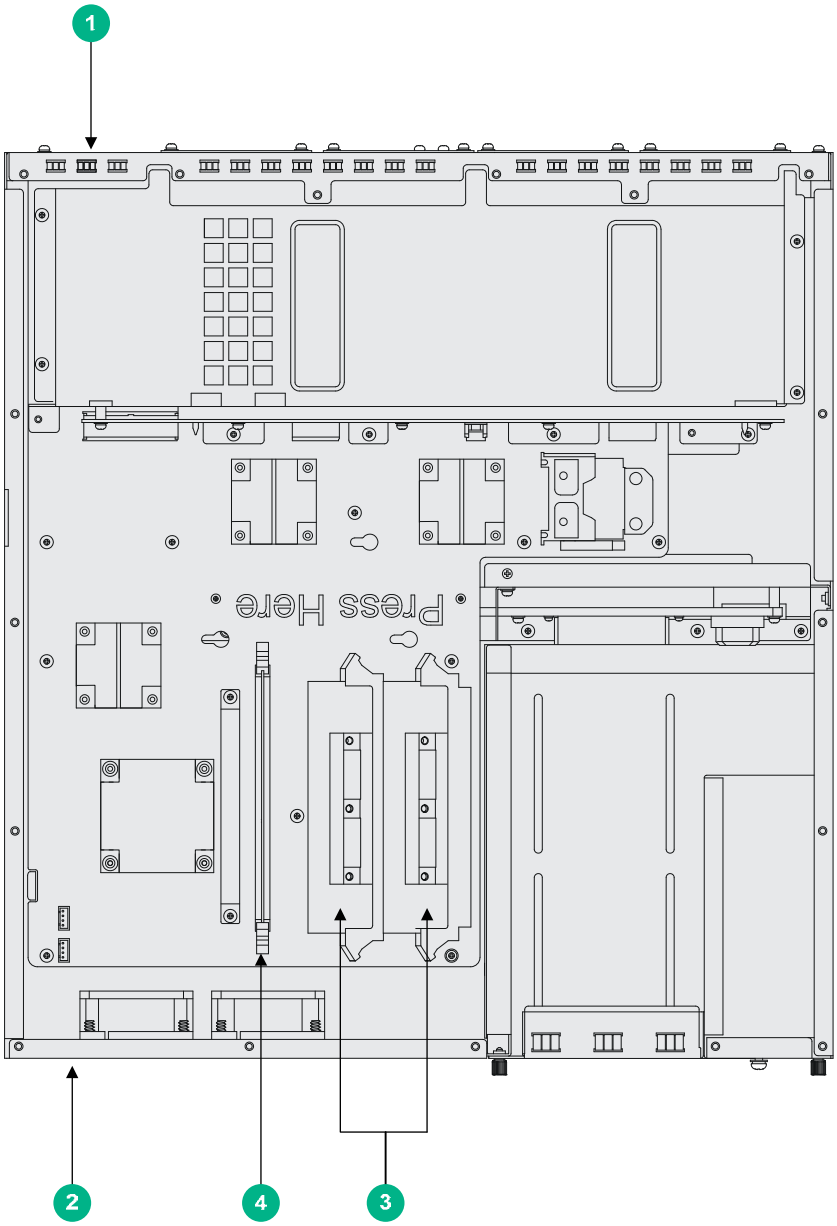
(1) Front panel	(2) Rear panel	(3) VPM

Figure 57 MSR3024 internal module locations



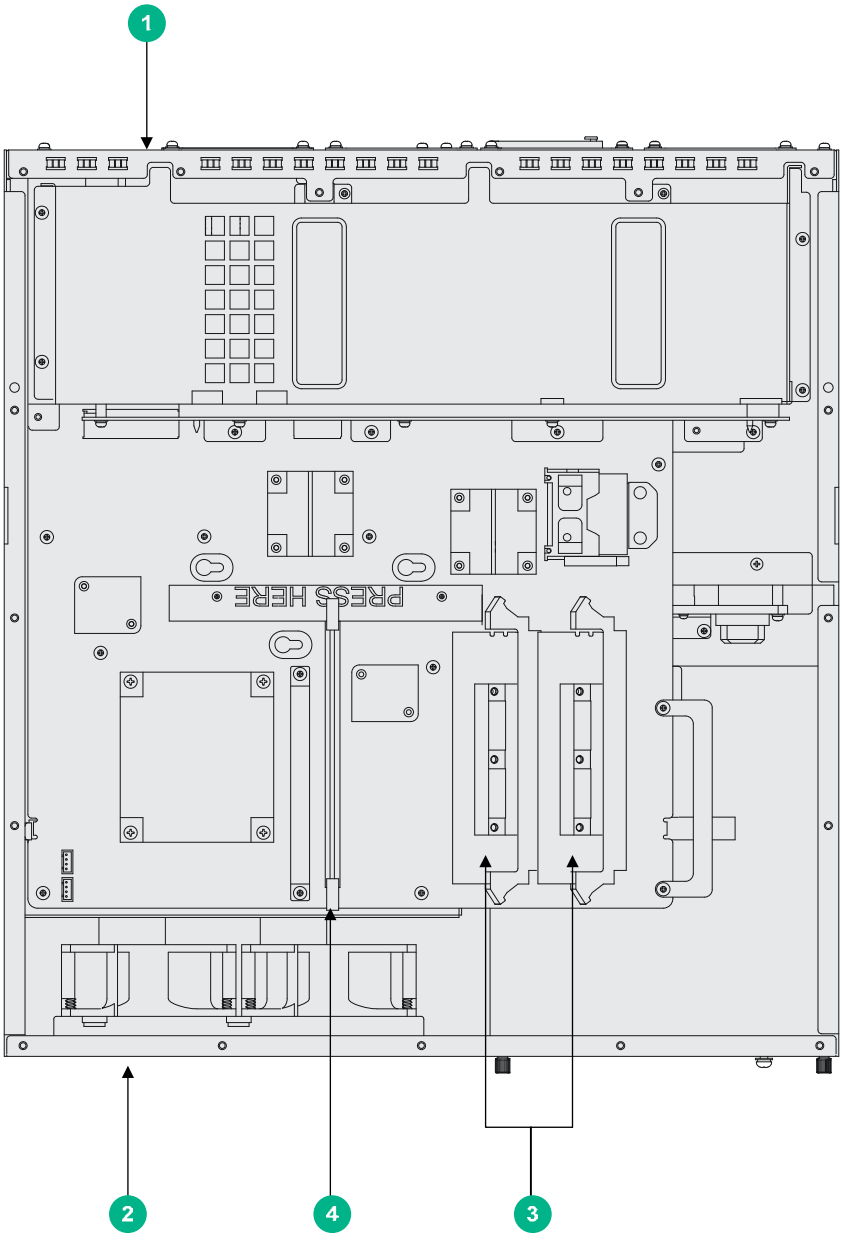
(1) Front panel	(2) Rear panel	(3) VPM
(4) Memory module		

Figure 58 MSR3044 internal module locations



(1) Front panel	(2) Rear panel	(3) VPMs
(4) Memory module		

Figure 59 MSR3064 internal module locations



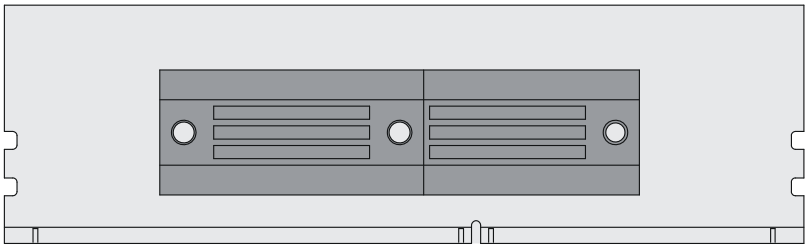
(1) Front panel	(2) Rear panel	(3) VPMs
(4) Memory module		

Replacing a VPM

VPM (Voice Processing Module) functions to implement the encryption/decryption, EC and CNG of voices. The following types of VPM modules are available on the MSR3000 routers:

- 256-channel voice processing module (256-VPM)
- 512-channel voice processing module (512-VPM)

Figure 60 VPM



To replace a VPM:

1. Pull the release latches away from the VPM at both ends so that the VPM springs up from the slot.
2. Holding the non-conductive edge, remove the VPM.

   Keep the removed VPM for future use.
3. Align the polarization notch of a new VPM with the VPM slot on the main board and insert it into the slot along the slide rails.
4. Carefully and firmly press the VPM at both ends until you hear a click. This indicates the VPM is seated in the slot.
5. Verify that the release latches have firmly locked the VPM in position.

Figure 61 Removing a VPM

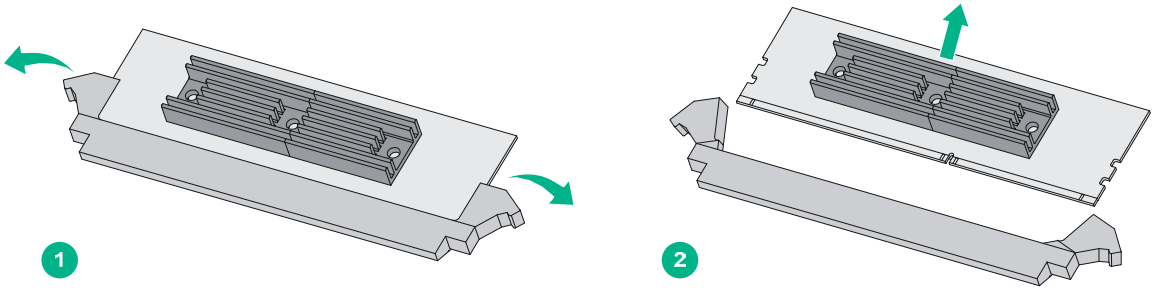
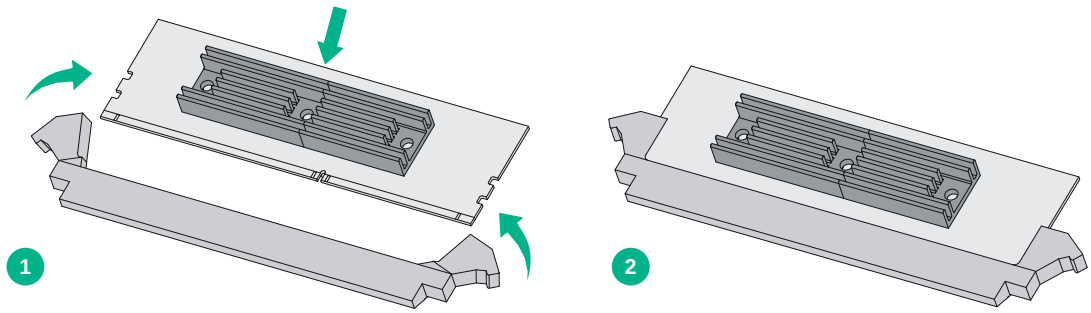


Figure 62 Installing a VPM



Replacing a memory module

An MSR3012 router does not support memory replacement.

To replace a memory module:

1. Pull the release latches away from the memory module at both ends so that the memory module springs up from the slot.
2. Holding the non-conductive edge, remove the memory module.

   Keep the removed memory module for future use.
3. Align the polarization notch of a new memory module with the memory module slot on the main board and insert the memory module into the slot along the slide rails.
4. Carefully and firmly press the memory module at both ends until you hear a click. This indicates the memory module is seated in the slot.
5. Verify that the release latches have firmly locked the memory module in position.

Figure 63 Removing a memory module

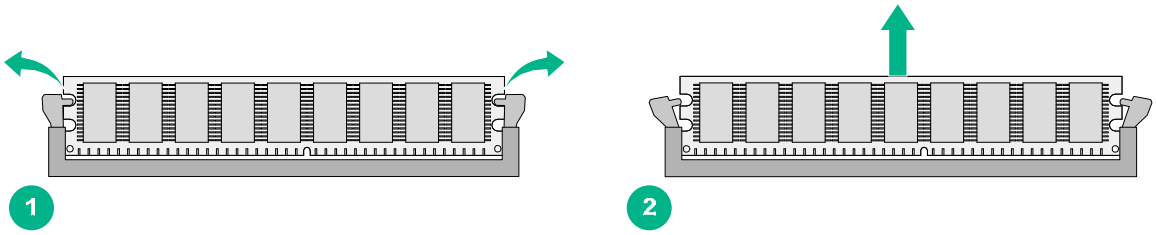
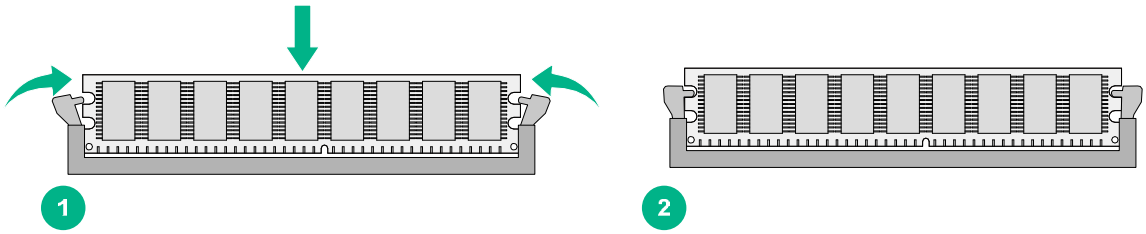


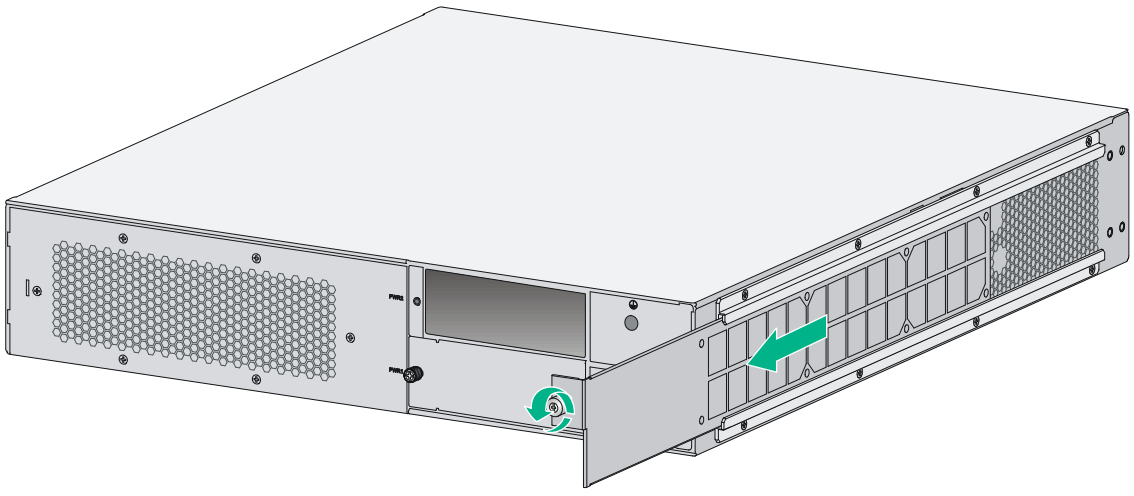
Figure 64 Installing a memory module



Replacing an air filter

1. Use a Phillips screwdriver to completely loosen the captive screws of the air filter.
2. Gently pull the air filter out along the slide rails.

Figure 65 Removing an air filter

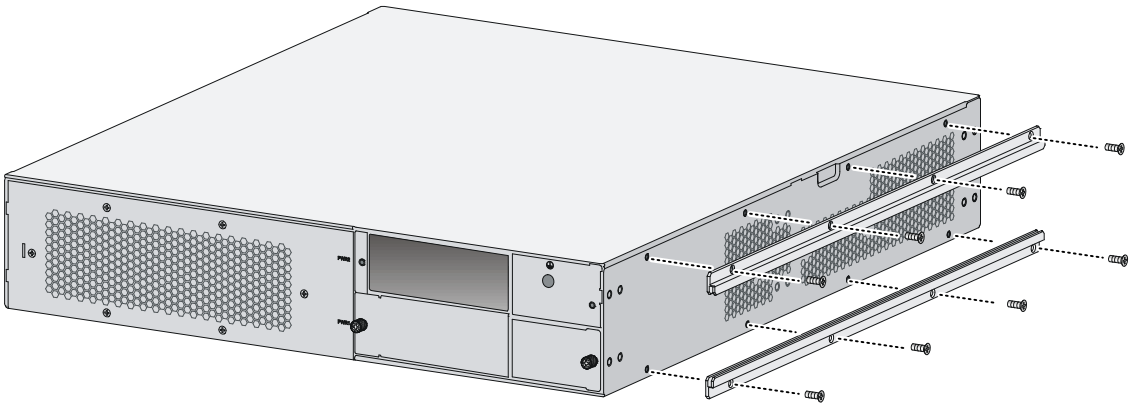


3. Install a new air filter. For the installation procedure, see "Installing the router."

   To remove the slide rails, completely loosen the fastening screws of the slide rails.

   To install new slide rails, see "Installing the router."

Figure 66 Removing slide rails



Replacing a CF card

CAUTION:

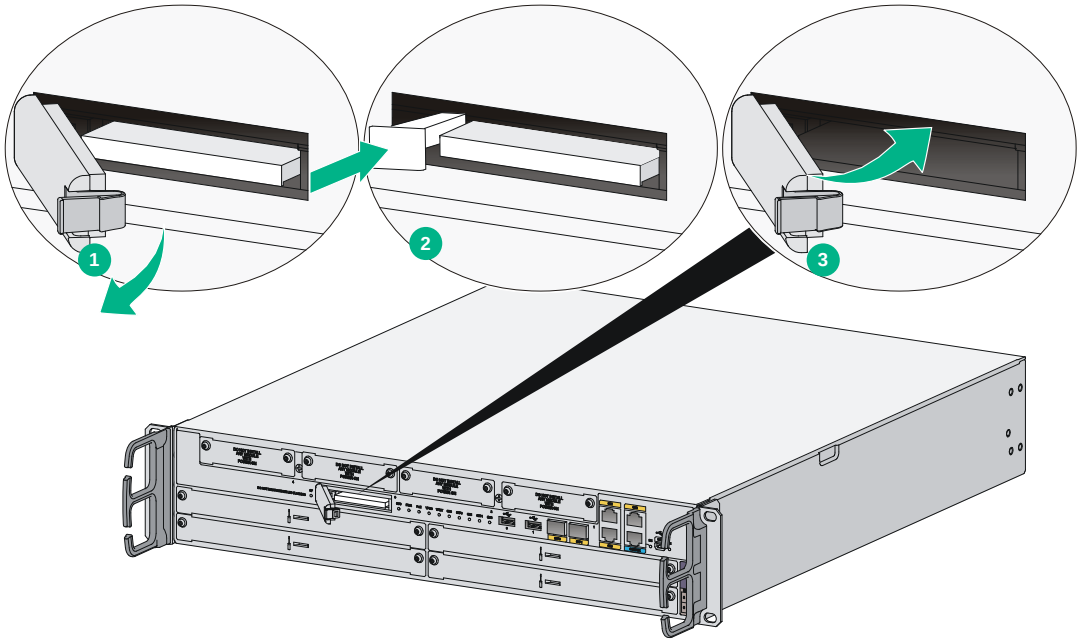
Execute the **umount cfb0:** command before you remove the CF card if the router is powered on.

To replace a CF card:

1. Press down the spring clip of the CF card cover and open the cover.
2. Press the eject button to eject the CF card part-way out of the CF card reader, and then pull the CF card out of the CF card reader.

   Keep the removed CF card for future use.

Figure 67 Removing the CF card



3. Install a new CF card. For the installation procedure, see "Installing the router."

   If you do not install a new CF card, close the CF card cover.

Replacing a SIC

CAUTION:

SIC interface modules are not hot swappable. Make sure the router is powered off before installing a SIC.

To replace a SIC:

1. Completely loosen the captive screws of the SIC.
2. Gently pull the SIC out along the slide rails.
3. Install a new SIC. For the installation procedure, see "Installing the router."

   If you do not install a SIC, install a filler panel and tighten the screws.

Figure 68 Pulling a SIC out

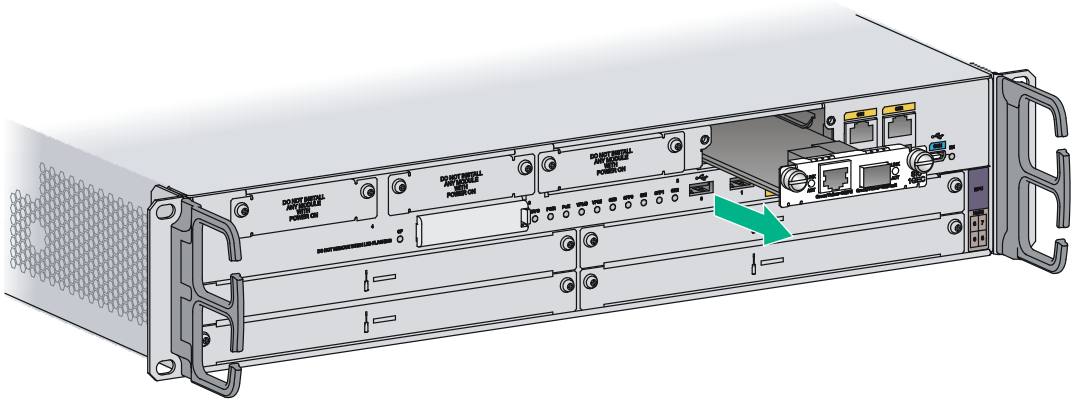
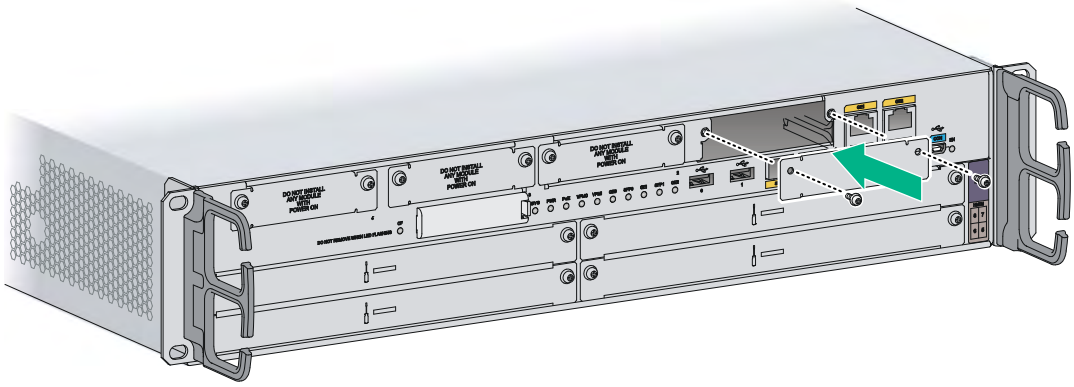


Figure 69 Installing a filler panel



Replacing a DSIC

CAUTION:

DSIC interface modules are not hot swappable. Make sure the router is powered off before installing a DSIC.

To replace a DSIC:

1. Completely loosen the captive screws of the DSIC.
2. Gently pull the DSIC out along the slide rails.

   If you need to install SIC or DSIC interface modules, see "Installing the router" for the installation procedure.

   To install filler panels, proceed to steps 3 and 4.
3. Gently push the slot divider into the DSIC slot along the slide rails and tighten the screws.
4. Install filler panels and tighten the screws.

Figure 70 Removing a DSIC

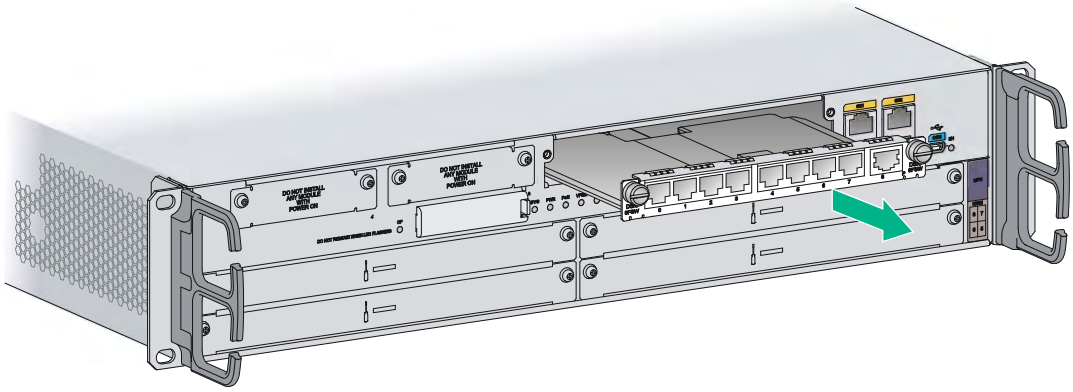


Figure 71 Installing a slot divider

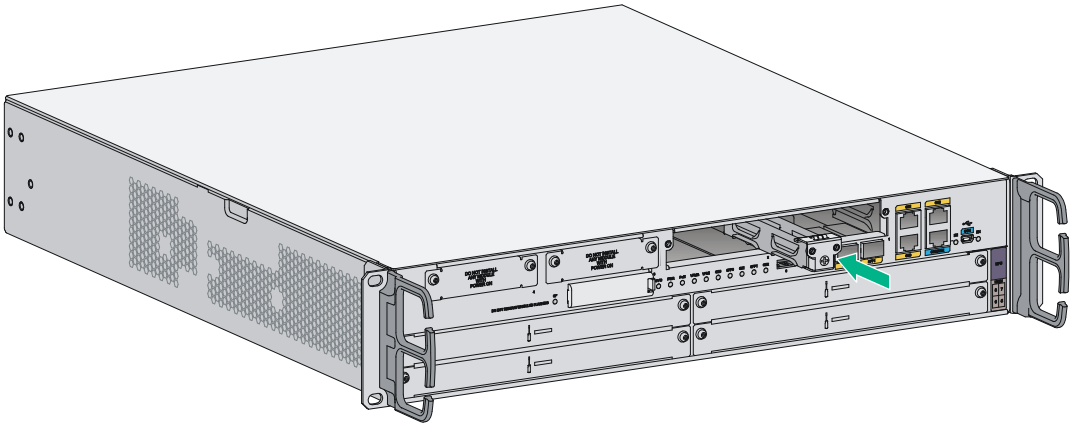
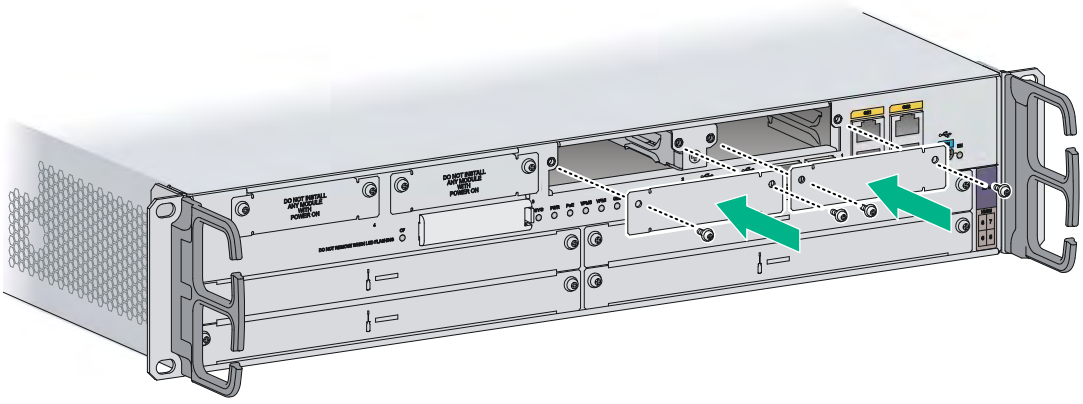


Figure 72 Installing filler panels



Replacing an HMIM

WARNING!

You can replace an HMIM when the router is powered on. However, before replacing an HMIM when the router is powered on, you must execute the **remove hmimslot** *slotnumber* command.

To replace an HMIM:

1. Completely loosen the captive screws of the HMIM.
2. Gently pull the HMIM out of the slot along the slide rails.
3. Install a new HMIM. For the installation procedure, see "Installing the router."

   If you do not install a new HMIM, install a filler panel and tighten the screws.

Figure 73 Pulling the HMIM out of the slot

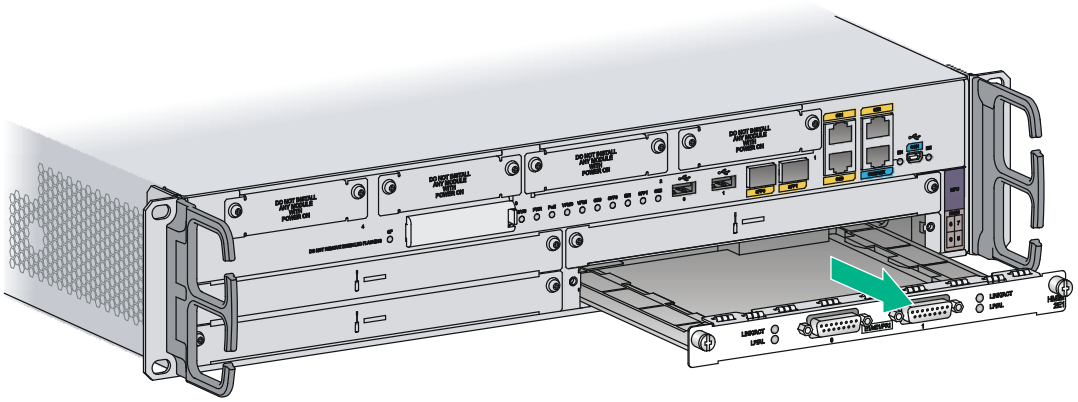
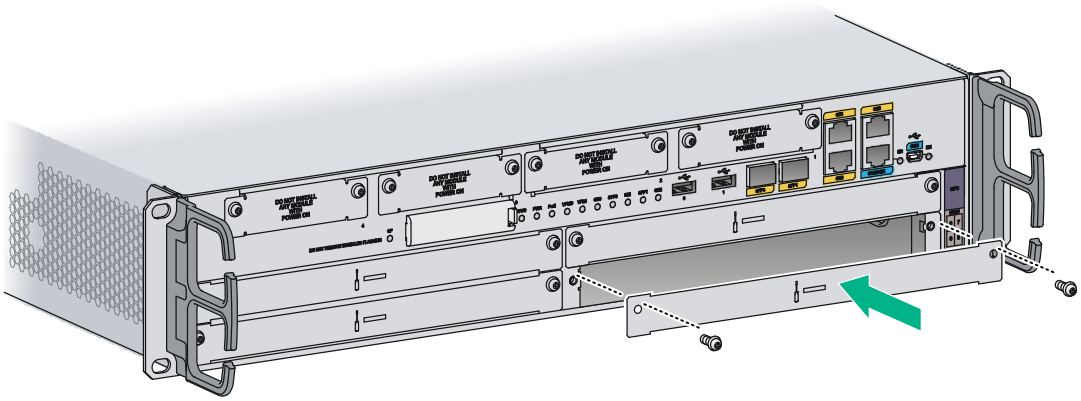


Figure 74 Installing a filler panel



Replacing a MIM

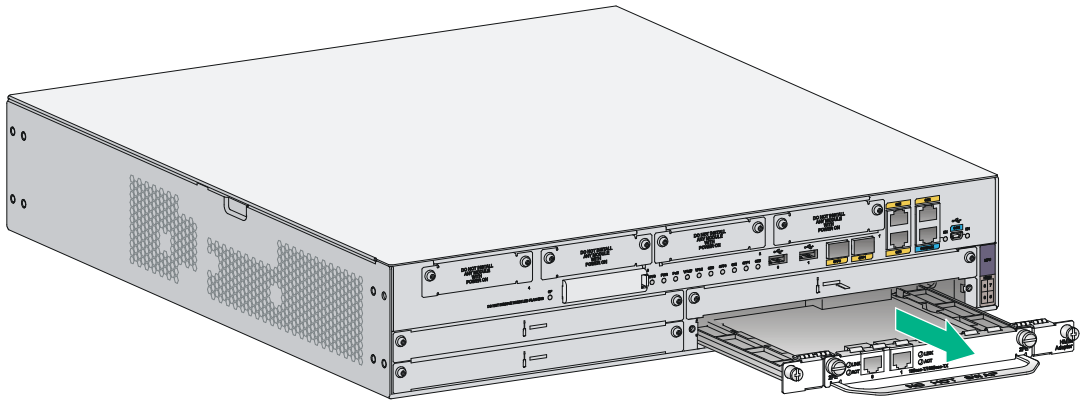
WARNING!

You can replace a MIM when the router is powered on. However, before replacing a MIM when the router is powered on, you must execute the **remove hmimslot** *slotnumber* command.

To replace a MIM:

1. Completely loosen the captive screws of the HMIM adapter.
2. Gently pull the MIM and the HMIM adapter out of the slot along the slide rails.

Figure 75 Removing a MIM and the HMIM adapter



3. Completely loosen the captive screws of the MIM, remove the screws that secure the MIM to the HMIM adapter, and pull the MIM out of the HMIM adapter along the slide rails.

   Keep the removed MIM for future use.

4. Install a new MIM. For the installation procedure, see "Installing the router."

   If you do not install a new MIM in the slot, install a filler panel and tighten the screws.

Figure 76 Removing a MIM

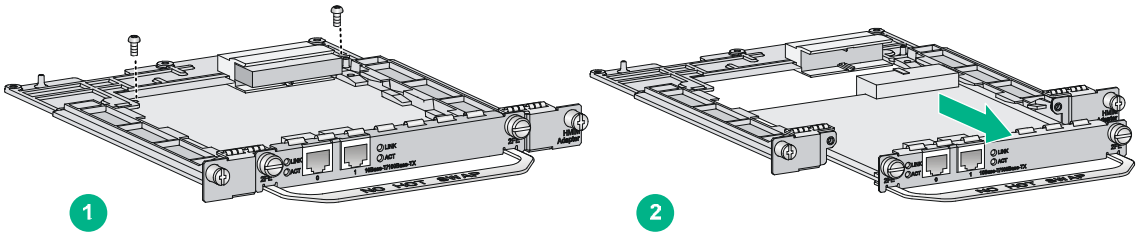
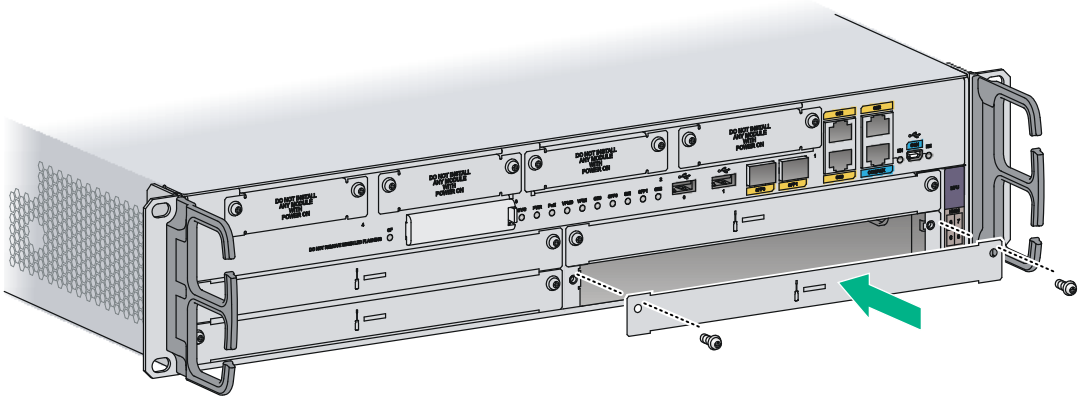


Figure 77 Installing a filler panel



Troubleshooting

IMPORTANT:

- The barcode on the router chassis contains product information that must be provided to local sales agent before you return a faulty router for service.
- Keep the tamper-proof seal on a mounting screw on the chassis cover intact, and if you want to open the chassis, contact Hewlett Packard Enterprise for permission. Otherwise, Hewlett Packard Enterprise shall not be liable for any consequence.

Troubleshooting the power supply system failure

Symptom

The router cannot be powered on. The power LED is off.

Solution

To resolve the problem:

1. Turn off the power switch of the power source.
2. Verify that the power cord of the router is correctly connected to the router and the power source.
3. Verify that the power source is operating correctly.
4. Verify that the power cord is in good condition.
5. If the problem persists, contact Hewlett Packard Enterprise Support.

Troubleshooting fan failures

Symptom

After the router starts up, the following error message appears on the configuration terminal:

```
%Jun 22 16:11:37:485 2015 HPE DEV/4/FAN FAILED:
 Fan 1 failed.
```

Solution

To resolve the problem:

1. Verify that the fans are in position.
2. Examine whether any obstacle enters the chassis and blocks the fans.
3. Examine whether any fan stops rotating.
4. Turn off the power switch.
5. If the problem persists, contact Hewlett Packard Enterprise Support.

Troubleshooting the configuration system failures

If the router operates correctly after being powered on, the boot information is displayed on the configuration terminal. If the configuration system is faulty, the configuration terminal displays garbled characters or does not display anything.

No display on the configuration terminal

Symptom

After the router is powered on, the console terminal does not display anything.

Solution

To resolve the problem:

1. Verify that the power supply system is operating correctly.
2. Verify that the console cable is properly connected and the connected serial port is the same as the port configured on the terminal.
3. Verify that the terminal is configured correctly.
   - **Bits per second**—9600.
   - **Data bits**—8.
   - **Parity**—None.
   - **Stop bits**—1.
   - **Flow control**—None.
   - **Terminal Emulation**—VT100.
4. Verify that the console cable is not broken.
5. If the problem persists, contact Hewlett Packard Enterprise Support.

Garbled characters on the configuration terminal

Symptom

After the router is powered on, the configuration terminal displays garbled characters.

Solution

To resolve the problem:

1. Verify that the **Data bits** field is set to **8** for the terminal. If the **Data bits** field is set to **5** or **6**, the terminal displays garbled characters.
2. If the problem persists, contact Hewlett Packard Enterprise Support.

No response from the serial port

Symptom

No boot information is displayed on the configuration terminal when the router starts up or restarts up.

Solution

To resolve the problem:

1. Verify that the serial cable is in good condition.
2. Verify that the serial port attributes are correct.
3. If the problem persists, contact Hewlett Packard Enterprise Support.

Troubleshooting user password loss

Symptom

If you lose your user password, you cannot log in to the system.

Solution

To resolve the problem:

1. Select **8** on the main BootWare menu to clear the console interface login password:

```
==========================<EXTEND-BOOTWARE MENU>==========================
|<1> Boot System                                                        |
|<2> Enter Serial SubMenu                                               |
|<3> Enter Ethernet SubMenu                                             |
|<4> File Control                                                       |
|<5> Modify BootWare Password                                           |
|<6> Skip Current System Configuration                                  |
|<7> BootWare Operation Menu                                            |
|<8> Skip authentication for console login                              |
|<9> Storage Device Operation                                           |
|<0> Reboot                                                             |
================================================================================
Enter your choice(0-9):8
```

   The following output indicates that you have successfully cleared the console login password.

```
Clear Application Password Success!
```

2. Select **0** from the main BootWare menu to reboot the system.

```
System is rebooting now.
System start booting...
Booting Normal Extend BootWare....
```

3. After the system restarts up, set a new password.

```
<Sysname> system-view
[Sysname] user-interface console 0
[Sysname-ui-console0] authentication-mode password
[Sysname-ui-console0] set authentication password cipher 123456
```

   The commands above configure password authentication for the console user interface and set the ciphertext password **123456**.

   For security purposes, all keys set with the **set authentication password** { **cipher** | **simple** } *password* command, including keys configured in plain text, are saved in cipher text.

4. Execute the **save** command after modifying the user password to save the new password.

```
[Sysname] save
```

   NOTE:

   As a best practice, save the modification as the default configuration file.

5. If the problem persists, contact Hewlett Packard Enterprise Support.

Troubleshooting interface module, cable, and connection failure

Symptom

After an interface module is installed and the router is powered on, the LEDs on the interface module panel indicate that the interface module is operating improperly.

Solution

To resolve the problem:

1. Verify that the interface module makes good contact with the rear panel of the router slot.
2. Verify that the router supports the interface module.
3. Verify that the interface module is installed in the specified router slot.
4. Verify that a correct cable is used.
5. Verify that the cable is correctly connected.
6. If the problem persists, contact Hewlett Packard Enterprise Support.

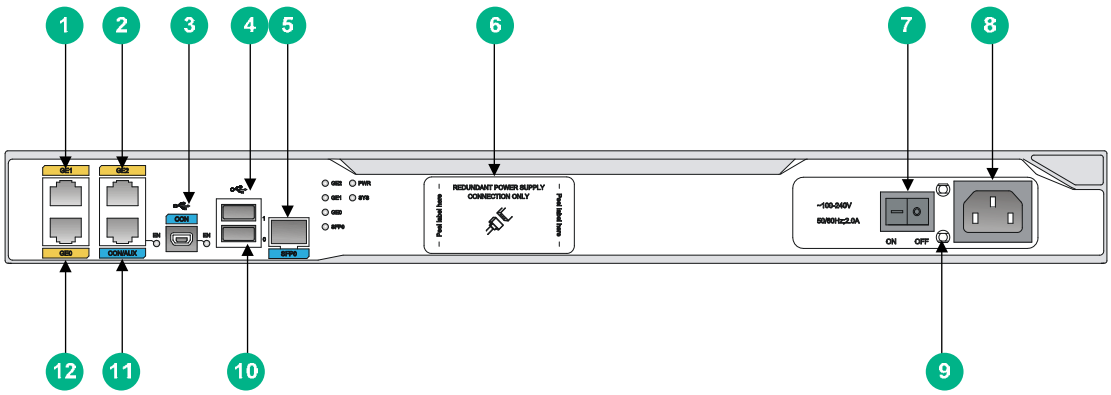
Appendix A Chassis views and technical specifications

Chassis views

The following figures are for illustration only.

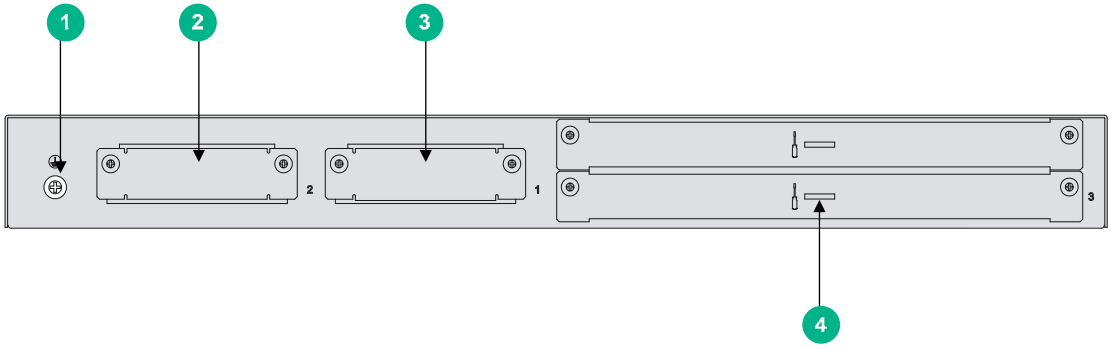
MSR3012 AC (JG409A)

Figure 78 MSR3012 AC (JG409A) front view



(1) Gigabit Ethernet port (GE1)	(2) Gigabit Ethernet port (GE2)	(3) USB console port (CON)
(4) USB port 1	(5) SFP interface (SFP0)	(6) RPS receptacle cover
(7) Power switch	(8) AC-input power receptacle	(9) Power cord bail latch
(10) USB port 0	(11) Console port/AUX port (CON/AUX)	(12) Gigabit Ethernet port (GE0)

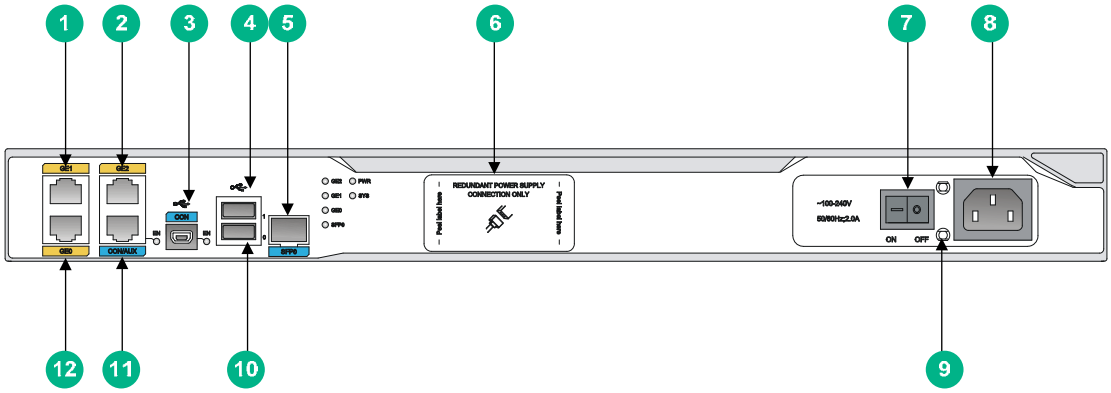
Figure 79 MSR3012 AC (JG409A) rear view



(1) Grounding terminal	(2) SIC slot (slot 2)	(3) SIC slot (slot 1)
(4) HMIM slot (slot 3)		

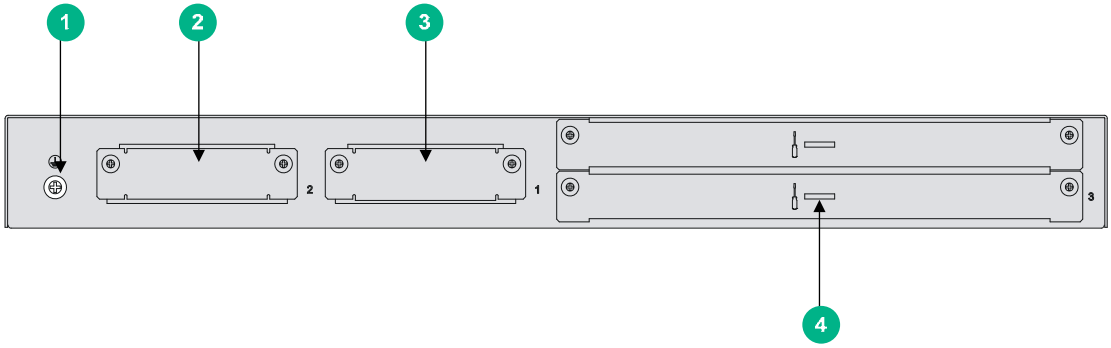
MSR3012 AC (JG409B)

Figure 80 MSR3012 AC (JG409B) front view



(1) Gigabit Ethernet port (GE1)	(2) Gigabit Ethernet port (GE2)	(3) USB console port (CON)
(4) USB port 1	(5) SFP interface (SFP0)	(6) RPS receptacle cover
(7) Power switch	(8) AC-input power receptacle	(9) Power cord bail latch
(10) USB port 0	(11) Console port/AUX port (CON/AUX)	(12) Gigabit Ethernet port (GE0)

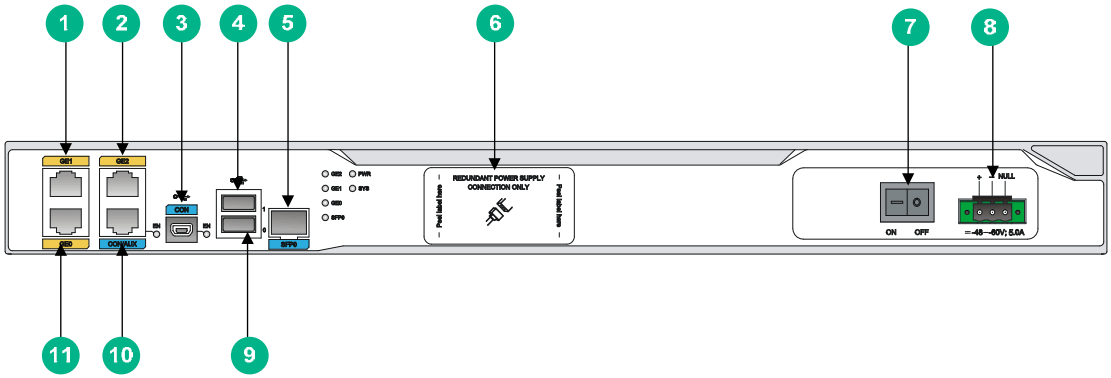
Figure 81 MSR3012 AC (JG409B) rear view



(1) Grounding terminal	(2) SIC slot (slot 2)	(3) SIC slot (slot 1)
(4) HMIM slot (slot 3)		

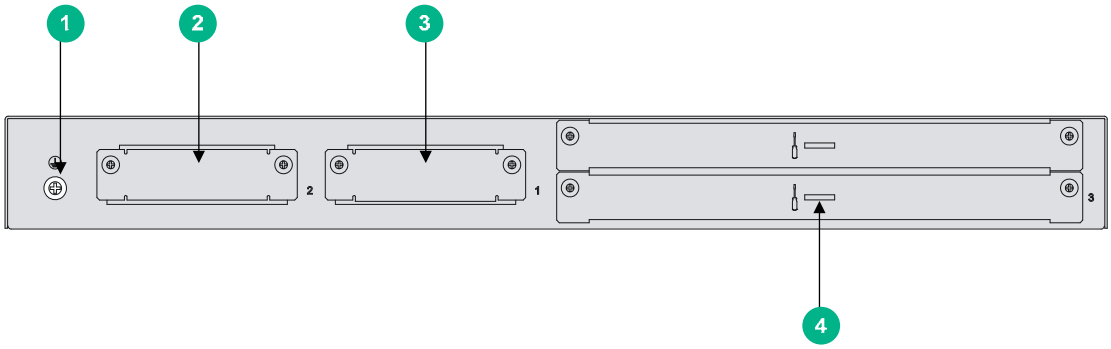
MSR3012 DC

Figure 82 MSR3012 DC front view



(1) Gigabit Ethernet port (GE1)	(2) Gigabit Ethernet port (GE2)	(3) USB console port (CON)
(4) USB port 1	(5) SFP interface (SFP0)	(6) RPS receptacle cover
(7) Power switch	(8) DC-input power receptacle	(9) USB port 0
(10) Console port/AUX port (CON/AUX)	(11) Gigabit Ethernet port (GE0)	

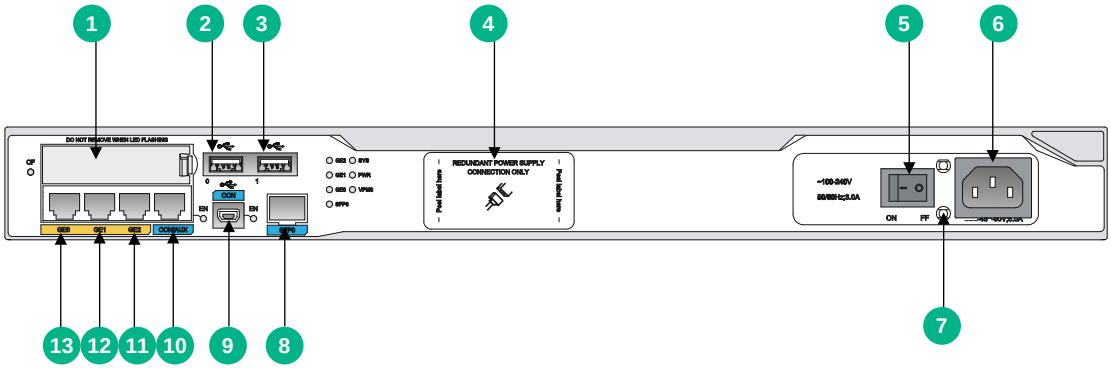
Figure 83 MSR3012 DC rear view



(1) Grounding terminal	(2) SIC slot (slot 2)	(3) SIC slot (slot 1)
(4) HMIM slot (slot 3)		

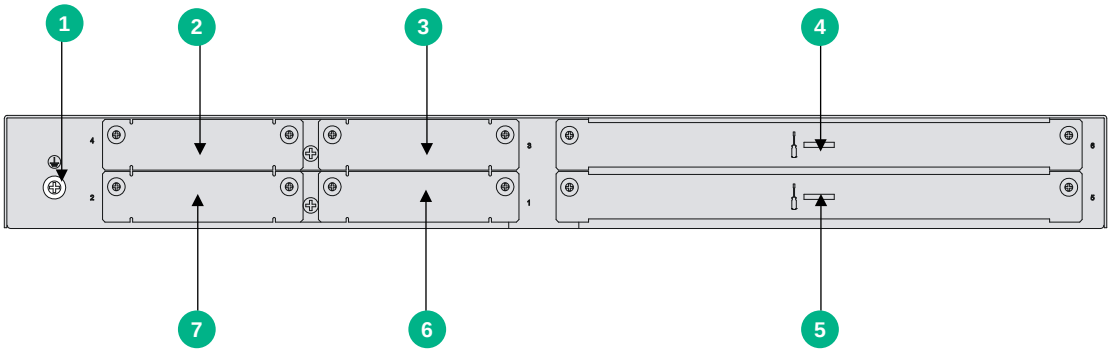
MSR3024 AC

Figure 84 MSR3024 AC front view



(1) CF card cover	(2) USB port 0	(3) USB port 1
(4) RPS receptacle cover	(5) Power switch	(6) AC-input power receptacle
(7) Power cord bail latch	(8) SFP port (SFP0)	(9) USB console port (CON)
(10) Console port/AUX port (CON/AUX)	(11) Gigabit Ethernet port (GE2)	(12) Gigabit Ethernet port (GE1)
(13) Gigabit Ethernet port (GE0)		

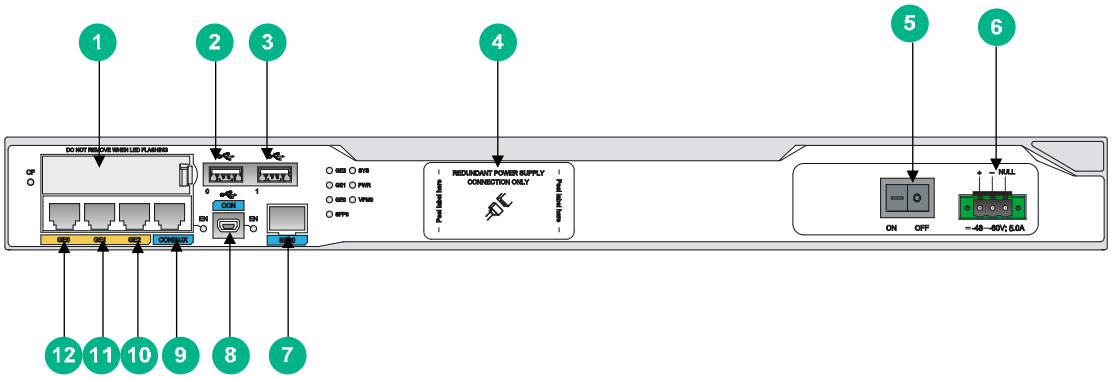
Figure 85 MSR3024 AC rear view



(1) Grounding terminal	(2) SIC slot (slot 4)	(3) SIC slot (slot 3)
(4) HMIM slot (slot 6)	(5) HMIM slot (slot 5)	(6) SIC slot (slot 1)
(7) SIC slot (slot 2)		

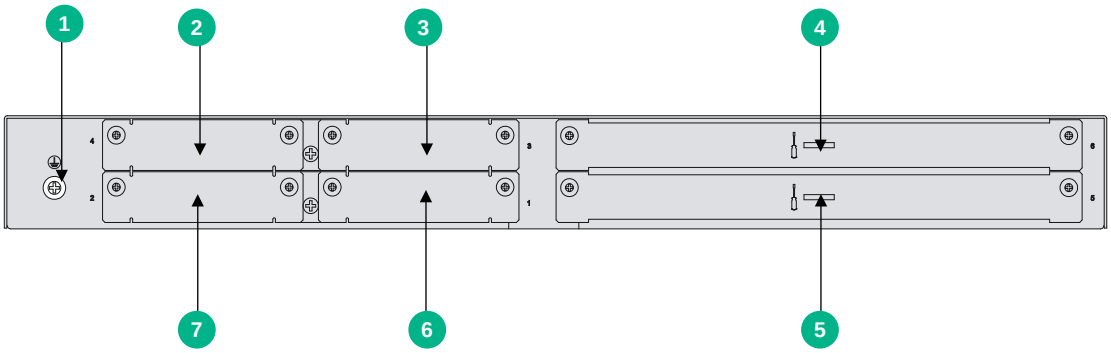
MSR3024 DC

Figure 86 MSR3024 DC front view



(1) CF card cover	(2) USB port 0	(3) USB port 1
(4) RPS receptacle cover	(5) Power switch	(6) DC-input power receptacle
(7) SFP port (SFP0)	(8) USB console port (CON)	(9) Console port/AUX port (CON/AUX)
(10) Gigabit Ethernet port (GE2)	(11) Gigabit Ethernet port (GE1)	(12) Gigabit Ethernet port (GE0)

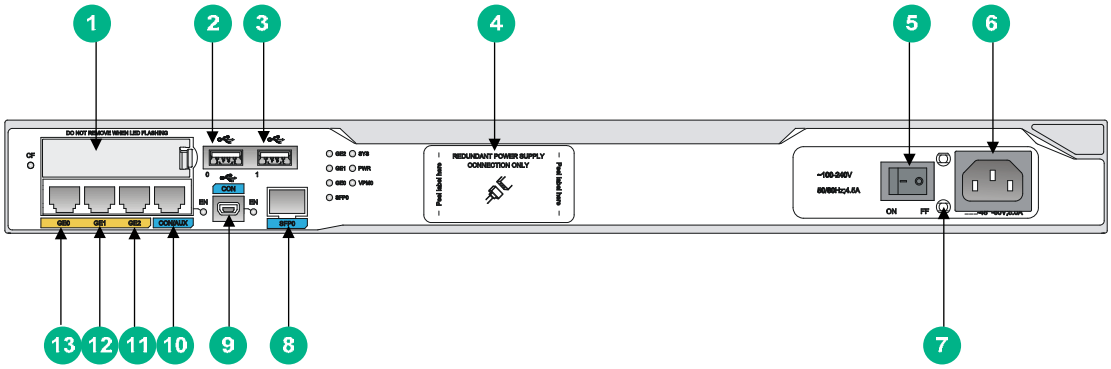
Figure 87 MSR3024 DC rear view



(1) Grounding terminal	(2)SIC slot (slot 4)	(3) SIC slot (slot 3)
(4) HMIM slot (slot 6)	(5) HMIM slot (slot 5)	(6) SIC slot (slot 1)
(7) SIC slot (slot 2)		

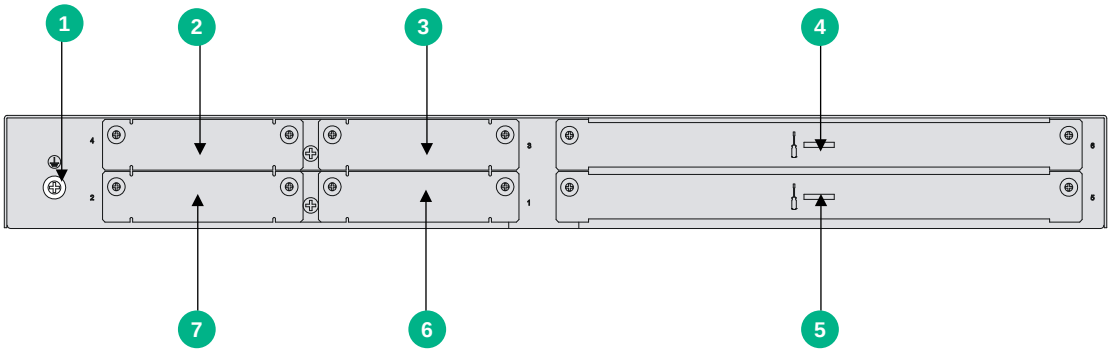
MSR3024 PoE

Figure 88 MSR3024 PoE front view



(1) CF card cover	(2) USB port 0	(3) USB port 1
(4) RPS receptacle cover	(5) Power switch	(6) AC-input power receptacle
(7) Power cord bail latch	(8) SFP port (SFP0)	(9) USB console port (CON)
(10) Console port/AUX port (CON/AUX)	(11) Gigabit Ethernet port (GE2)	(12) Gigabit Ethernet port (GE1)
(13) Gigabit Ethernet port (GE0)		

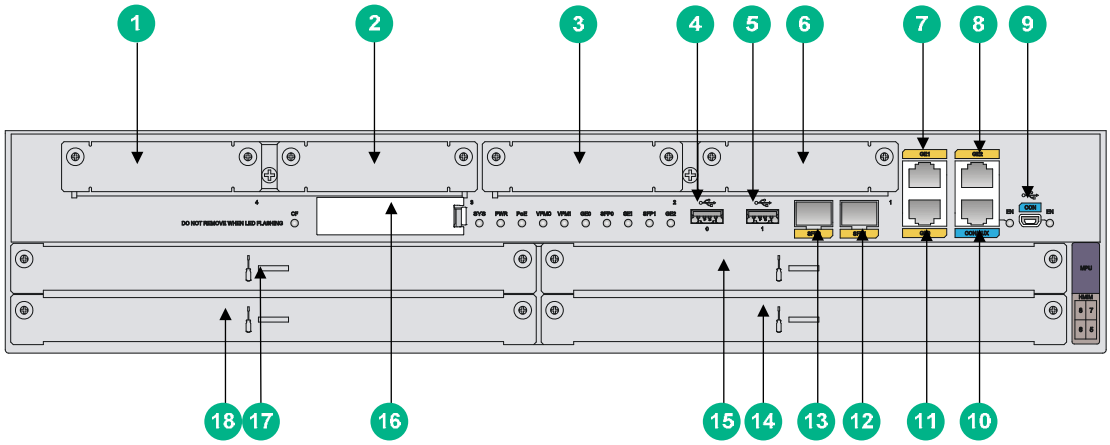
Figure 89 MSR3024 PoE rear view



(1) Grounding terminal	(2)SIC slot (slot 4)	(3) SIC slot (slot 3)
(4) HMIM slot (slot 6)	(5) HMIM slot (slot 5)	(6) SIC slot (slot 1)
(7) SIC slot (slot 2)		

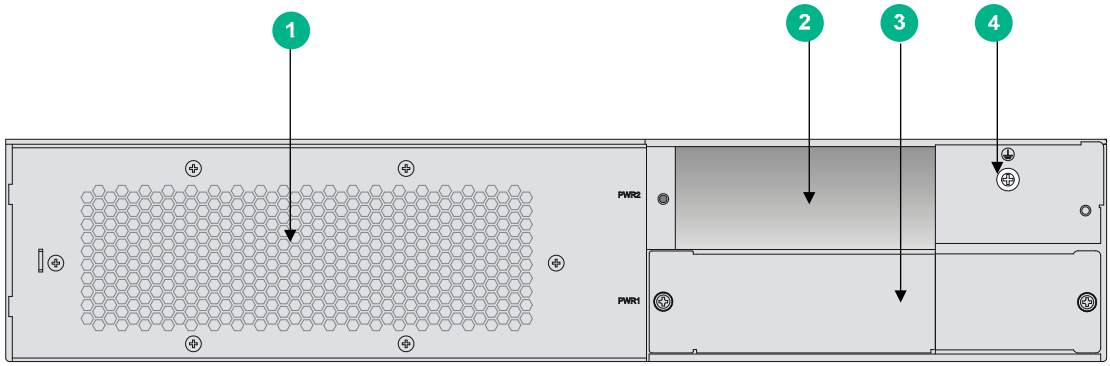
MSR3044

Figure 90 MSR3044 front view



(1) SIC slot (slot 4)	(2) SIC slot (slot 3)	(3) SIC slot (slot 2)
(4) USB port 0	(5) USB port 1	(6) SIC slot (slot 1)
(7) Gigabit Ethernet port (GE1)	(8) Gigabit Ethernet port (GE2)	(9) USB console port (CON)
(10) Console port/AUX port (CON/AUX)	(11) Gigabit Ethernet port (GE0)	(12) SFP port (SFP1)
(13) SFP port (SFP0)	(14) HMIM slot (slot 5)	(15) HMIM slot (slot 7)
(16) CF card cover	(17) HMIM slot (slot 8)	(18) HMIM slot (slot 6)

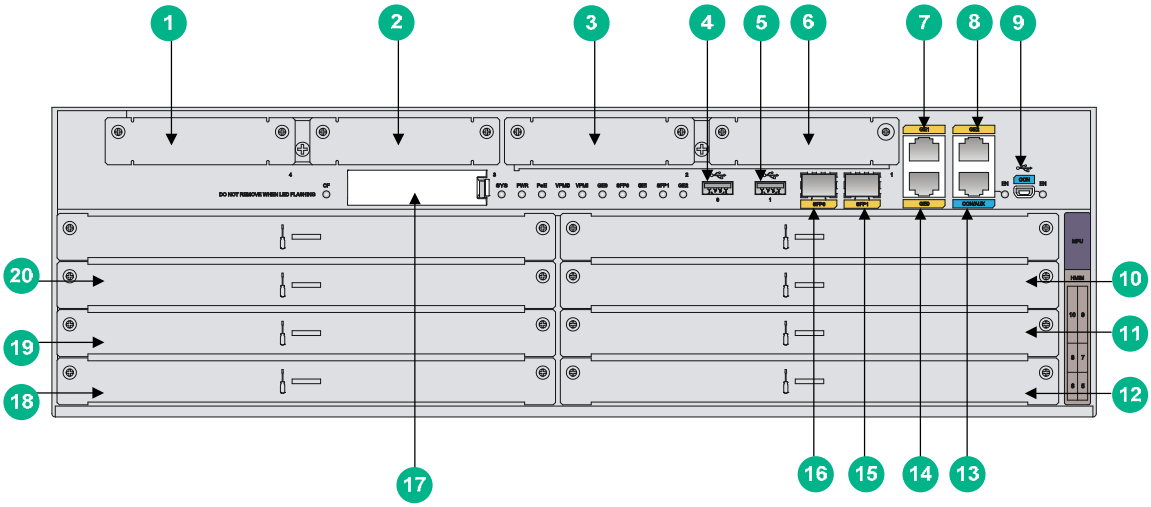
Figure 91 MSR3044 rear view



(1) Fan ventilation panel	(2) Power supply slot (PWR2)	(3) Power supply slot (PWR1)
(4) Grounding terminal		

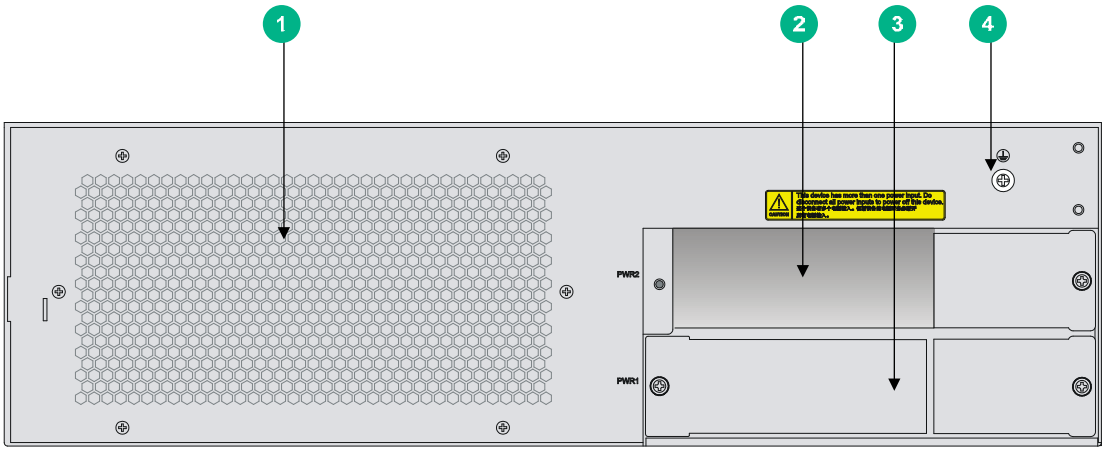
MSR3064

Figure 92 MSR3064 front view



(1) SIC slot (slot 4)	(2)SIC slot (slot 3)	(3) SIC slot (slot 2)
(4) USB port 0	(5) USB port 1	(6) SIC slot (slot 1)
(7) Gigabit Ethernet port (GE1)	(8) Gigabit Ethernet port (GE2)	(9) USB console port (CON)
(10) HMIM slot (slot 5)	(11) HMIM slot (slot 7)	(12) HMIM slot (slot 9)
(13) Console port/AUX port (CON/AUX)	(14) Gigabit Ethernet port (GE0)	(15) SFP port (SFP1)
(16) SFP port (SFP0)	(17) CF card cover	(18) HMIM slot (slot 6)
(19) HMIM slot (slot 8)	(20) HMIM slot (slot 10)	

Figure 93 MSR3064 rear view



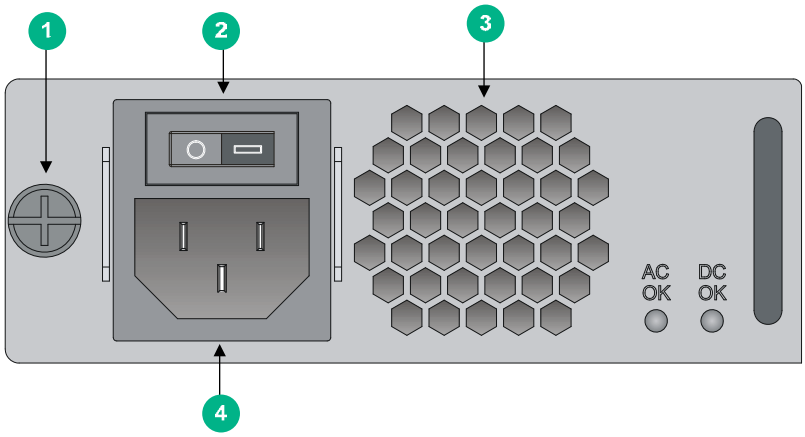
(1) Fan ventilation panel	(2) Power supply slot (PWR2)	(3) Power supply slot (PWR1)
(4) Grounding terminal		

Appearance of power supplies

You can install one power supply, or two power supplies for redundancy.

AC power supply

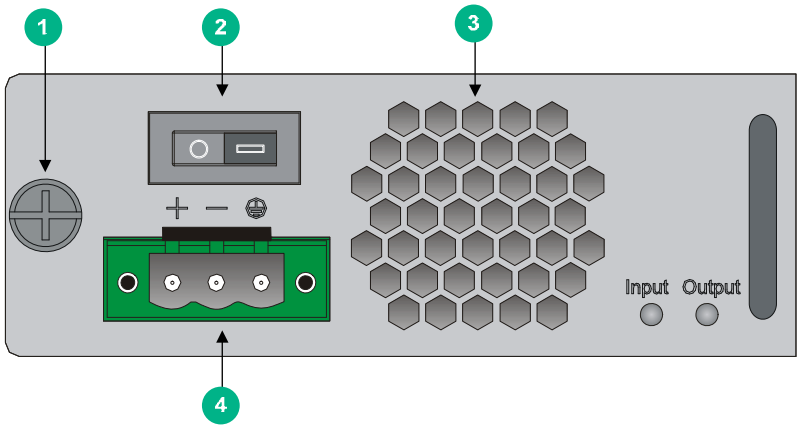
Figure 94 AC power supply



(1) Captive screw	(2) Power switch
(3) Air outlet vent	(4) Power receptacle

DC power supply

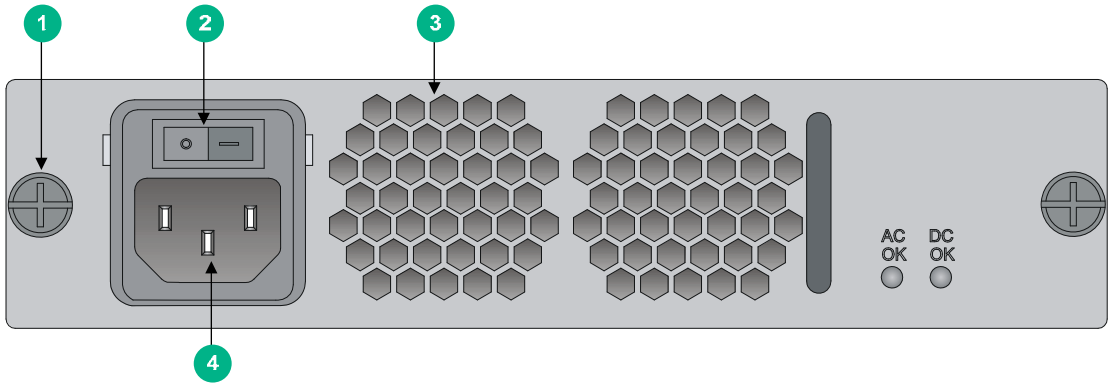
Figure 95 DC power supply



(1) Captive screw	(2) Power switch
(3) Air outlet vent	(4) Power receptacle

PoE power supply

Figure 96 PoE power supply



(1) Captive screw	(2) Power switch
(3) Air outlet vent	(4) Power receptacle

Technical specifications

Table 7 Technical specifications

Item	3012	3024	3044	3064
CON/AUX ports	1			
USB console ports	1			
USB ports	2			
Gigabit Ethernet ports	3			
SIC/DSIC slots	2 SIC slots	4 SIC slots/2 DSIC slots		
HMIM slots	1	2	4	6
VPM slots	N/A	1	2	2
Memory	• JG409A/JG410A: 1 GB DDR3 • JG409B: 2 GB DDR3	DDR3 • 2 GB (default) • 4 GB (maximum)		
Built-in CF card memory	256 MB			
External CF card memory	4 GB (maximum)			
CF card slots	1			
Dimensions (H × W × D) (excluding rubber feet and mounting brackets)	44.2 × 440 × 484.3 mm (1.74 × 17.32 × 19.07 in)	44.2 × 440 × 484.3 mm (1.74 × 17.32 × 19.07 in)	88.1 × 440 × 480 mm (3.47 × 17.32 × 18.90 in)	130.5 × 440 × 480 mm (5.14 × 17.32 × 18.90 in)
Power supply slots	N/A	N/A	2 Slot 1 supports PoE	2 Both slots support PoE

Item	3012	3024	3044	3064
AC power supply	Rated voltage range: 100 VAC to 240 VAC @ 50 Hz/60 Hz			
DC power supply	Rated voltage range: –48 VDC to –60 VDC			
Rated power for AC/DC power supply	125 W	125 W	AC: 300 W	AC: 300 W
Rated power for PoE power supply	Not supported	275 W	750 W	750 W
Rated power for each PoE port	15.4 W			
RPS power	800 W	800 W	N/A	N/A
Operating temperature	0°C to 45°C (32°F to 113°F)			
Relative humidity (noncondensing)	5% to 90%			

Table 8 AC power supply specifications

Item	Specification
Model	PSR300-12A2
Rated input voltage range	100 VAC to 240 VAC @ 50 Hz or 60 Hz
Rated power	300 W

Table 9 DC power supply specifications

Item	Specification
Model	PSR300-12D2
Rated input voltage range	–48 VDC to –60 VDC
Rated power	300 W

Table 10 PoE power supply specifications

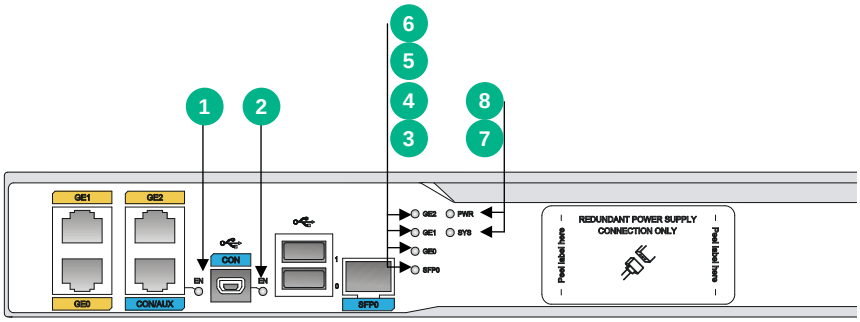
Item	Specification
Model	PSR750-A
Rated input voltage range	100 VAC to 240 VAC @ 50 Hz or 60 Hz
Rated power	300 W to the system 450 W to PDs

Appendix B LEDs

Panel LEDs

MSR3012

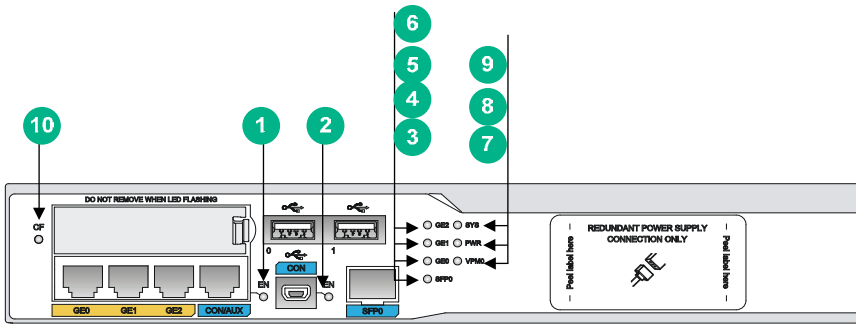
Figure 97 MSR3012 LEDs



(1) Console port LED	(2) USB console port LED	(3) SFP port LED (SFP0)
(4) Gigabit Ethernet port LED (GE0)	(5) Gigabit Ethernet port LED (GE1)	(6) Gigabit Ethernet port LED (GE2)
(7) System LED (SYS)	(8) Power supply LED (PWR)	

MSR3024

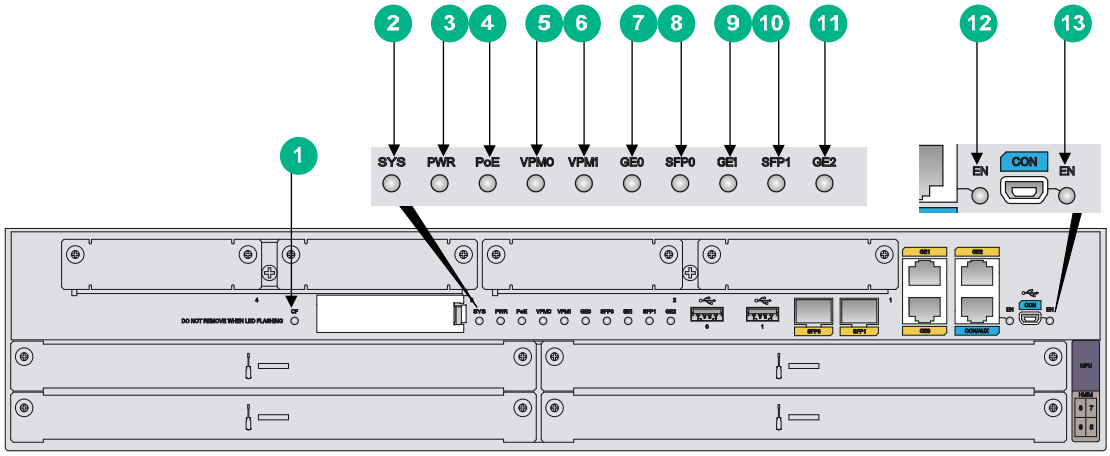
Figure 98 MSR3024 LEDs



(1) Console port LED	(2) USB console port LED	(3) SFP port LED(SFP0)
(4) Gigabit Ethernet port LED (GE0)	(5) Gigabit Ethernet port LED (GE1)	(6) Gigabit Ethernet port LED (GE2)
(7) Power supply LED (PWR)	(8) System LED (SYS)	(9) CF card LED
(10) VPM (slot 0) LED (VPM0)		

MSR3044

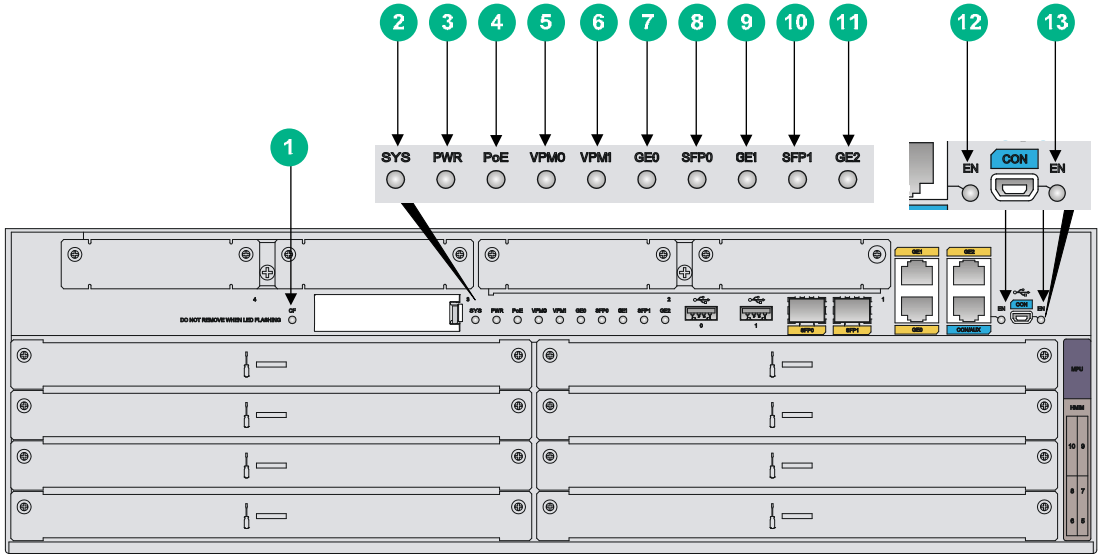
Figure 99 MSR3044 LEDs



(1) CF card LED	(2) System LED (SYS)	(3) Power supply LED (PWR)
(4) PoE power supply LED	(5) VPM (slot 0) LED (VPM0)	(6) VPM (slot 1) LED (VPM1)
(7) Gigabit Ethernet port LED (GE0)	(8) SFP port LED (SFP0)	(9) Gigabit Ethernet port LED (GE1)
(10) SFP port LED (SFP1)	(11) Gigabit Ethernet port LED (GE2)	(12) Console port LED
(13) USB console port LED		

MSR3064

Figure 100 MSR3064 LEDs



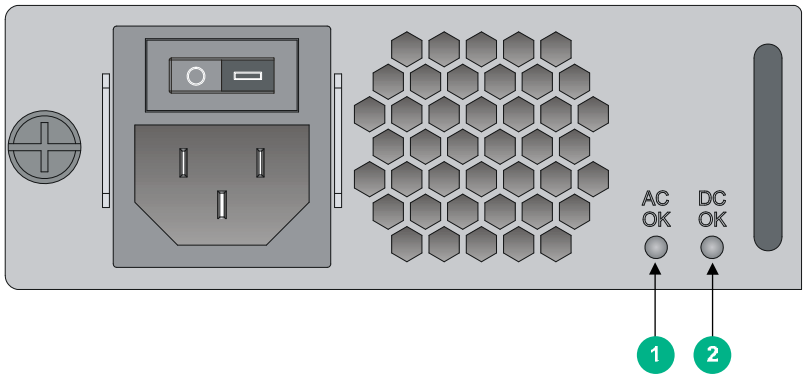
(1)CF card LED	(2) System LED (SYS)	(3) Power supply LED (PWR)
(4) PoE power supply LED	(5) VPM (slot 0) LED (VPM0)	(6) VPM (slot 1) LED (VPM1)
(7) Gigabit Ethernet port LED (GE0)	(8) SFP port LED (SFP0)	(9) Gigabit Ethernet port LED (GE1)

(10) SFP port LED (SFP1)	(11) Gigabit Ethernet port LED (GE2)	(12) Console port LED
(13) USB console port LED		

Power supply LEDs

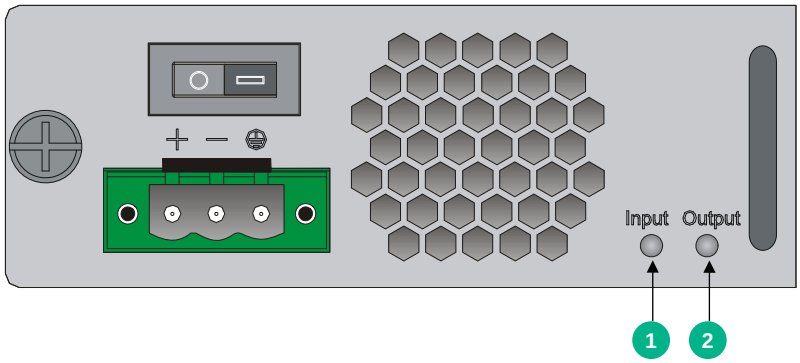
Appearance

Figure 101 AC power supply LEDs



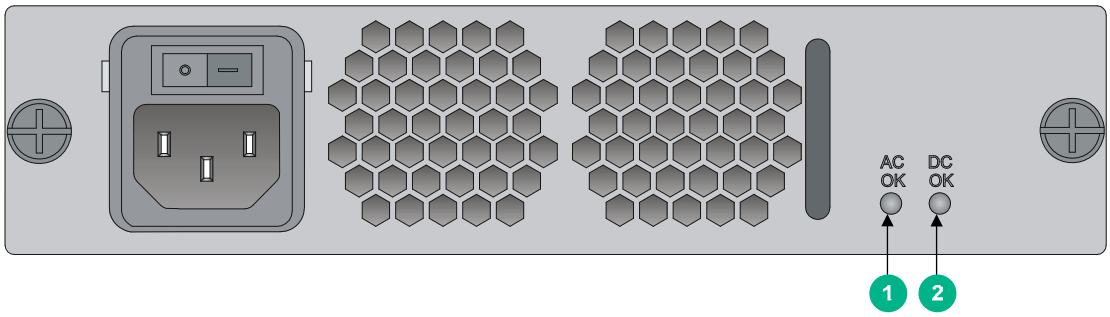
(1) Power input LED	(2) Power output LED

Figure 102 DC power supply LEDs



(1) Power input LED	(2) Power output LED

Figure 103 PoE power supply LEDs



(1) Power input LED	(2) Power output LED

LED description

LEDs	State	Description
SYS	Flashing green (8 Hz)	The BootWare runs.
	Steady green	The SDRAM is performing self-test.
	Flashing green (1 Hz)	Comware has started with the configuration file and the router has booted up.
	Flashing yellow (1 Hz)	The DDR3 SDRAM has failed the self-test.
	Flashing yellow (8 Hz)	The extended segment does not exist.
	Steady yellow	The boot image does not exist.
	Off	No power input, or exceptions have occurred.
PWR	Steady green	The power supply is operating correctly.
	Off	No power input.
PoE	Steady green	The power supply is operating correctly.
	Steady yellow	The internal power supply for at least one PoE has failed or no power supply for the PoE port.
	Off	No power input.
CF card LED	Steady green	An inserted CF card has passed the detection.
	Flashing green	The system is accessing the CF card. The CF card cannot be removed.
	Steady yellow	An inserted CF card did not pass the detection.
	Off	No CF card is inserted or the inserted CF card cannot be identified.
VPM	Steady green	An inserted VPM has passed the detection.
	Steady yellow	An inserted VPM did not pass the detection.
	Off	No VPM in the slot.
USB console port LED	Steady on	The router is using the USB console port for configuration.
	Off	The router is not using the USB console port.
Console port	Steady on	The router is using the console port for configuration.

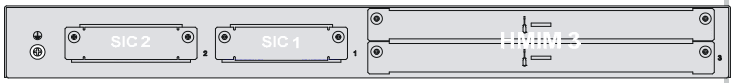
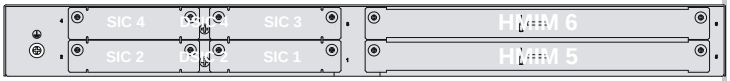
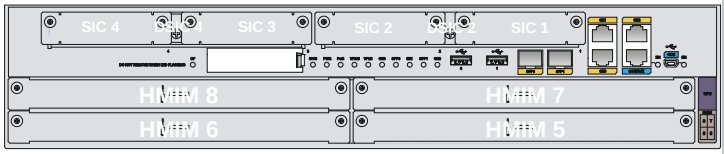
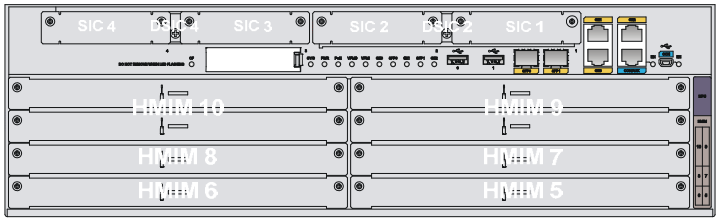
LEDs	State	Description
LED	Off	The router is not using the console port.
GE	Steady green	A 1000 Mbps link is present.
	Flashing green	Data is being received or transmitted at 1000 Mbps.
	Steady yellow	A 10/100 Mbps link is present.
	Flashing yellow	Data is being received or transmitted at 10/100 Mbps.
	Off	No link is present.
SFP	Steady green	A link is present on the SFP interface.
	Flashing green	Data is being transmitted or received on the SFP interface.
	Steady yellow	The SFP transceiver didn't pass the detection.
	Off	No link is present on the SFP interface.
AC OK	Off	No power input or the power input is faulty.
	Steady green	The power is input properly.
DC OK	Off	No power output or the power output is faulty.
	Steady green	The power is output properly.
Input	Off	No power input or the power input is faulty.
	Steady green	The power is input properly.
Output	Off	No power output or the power output is faulty.
	Steady green	The power is output properly.
AC OK	Off	No power input or the power input is faulty.
	Steady green	The power is input properly.
DC OK	Off	No power output or the power output is faulty.
	Steady green	The power is output properly.

Appendix C Slot arrangement

Each of the MSR3000 routers provides slots for SIC and HMIM interface cards. On the MSR3024, MSR3044, and MSR3064, you can combine two SIC slots into one DSIC slot by removing the slot divider.

The fixed ports on the MSR3000 panel are located in slot 0.

Table 11 Slot arrangement on the MSR3000 routers

Model	Slot arrangement	Interface name
MSR3012		• (In standalone mode.) The interface name is in the *x*/*y* format. *x* represents the slot number and *y* represents the interface number. For example, the first Gigabit Ethernet interface on the HMIM-4GEE interface module in slot 5 is named GE5/0. • (In IRF mode.) The interface name is in the *x*/*y*/*z* format. *x* represents the member ID, *y* represents the slot number, and *z* represents the interface number. For example, the first Gigabit Ethernet interface on the HMIM-4GEE module in slot 5 on member device 1 is named GE1/5/0.
MSR3024		
MSR3044		
MSR3064		
: Slots for SIC interface cards : Slots for DSIC interface cards : Slots for HMIM interface cards		

Document conventions and icons

Conventions

This section describes the conventions used in the documentation.

Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.

Command conventions

Convention	Description
Boldface	**Bold** text represents commands and keywords that you enter literally as shown.
Italic	*Italic* text represents arguments that you replace with actual values.
[ ]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x | y | ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x | y | ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x | y | ... } *	Asterisk marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one.
[x | y | ...] *	Asterisk marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.

GUI conventions

Convention	Description
Boldface	Window names, button names, field names, and menu items are in Boldface. For example, the **New User** window appears; click **OK**.
>	Multi-level menus are separated by angle brackets. For example, **File** > **Create** > **Folder**.

Symbols

Convention	Description
⚠ **WARNING!**	An alert that calls attention to important information that if not understood or followed can result in personal injury.
△ **CAUTION:**	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
ⓘ **IMPORTANT:**	An alert that calls attention to essential information.
NOTE:	An alert that contains additional or supplementary information.
TIP:	An alert that provides helpful information.

Network topology icons

Convention	Description
	Represents a generic network device, such as a router, switch, or firewall.
	Represents a routing-capable device, such as a router or Layer 3 switch.
	Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features.
	Represents an access controller, a unified wired-WLAN module, or the access controller engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a wireless terminator unit.
	Represents a wireless terminator.
	Represents a mesh access point.
	Represents omnidirectional signals.
	Represents directional signals.
	Represents a security product, such as a firewall, UTM, multiservice security gateway, or load balancing device.
	Represents a security card, such as a firewall, load balancing, NetStream, SSL VPN, IPS, or ACG card.

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
  - Hewlett Packard Enterprise Support Center **Get connected with updates** page:
    Software Depot website:
  -

- To view and update your entitlements, and to link your contracts, Care Packs, and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:
  S

IMPORTANT:
Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

Remote support

Remote support is available with supported devices as part of your warranty, Care Pack Service, or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product’s service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the following website:

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.

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