



# Installing the Router

This chapter describes how to install the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router.

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## Prerequisites

Before installing the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router, it is important to prepare for the installation by:

- Preparing the site (site planning) and reviewing the installation plans or method of procedures (MOP). See *Site Planning* section.
- Unpacking and inspecting the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router. See *Receiving the Router* section.
- Gathering the tools and test equipment required to properly install the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router. See *Tools and Equipment* section.

For more instructions on how to prepare for the installation of the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router, see Chapter 2, *Preparing for Installation*.

## Installing the Router in a Rack

The procedures in this section apply to both horizontal and vertical mounting of the router in a rack.

## Installing the Chassis Brackets

The chassis is shipped with mounting brackets that can be installed on the front or rear of the chassis. To install the brackets on the front of the chassis, perform these steps:

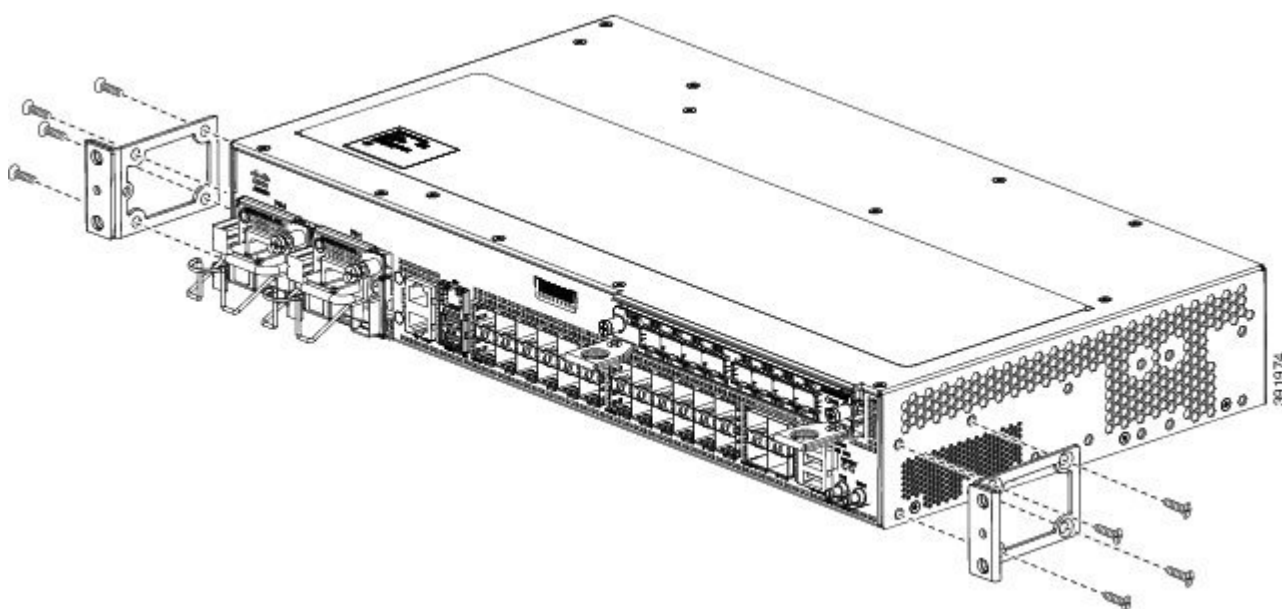
### Procedure

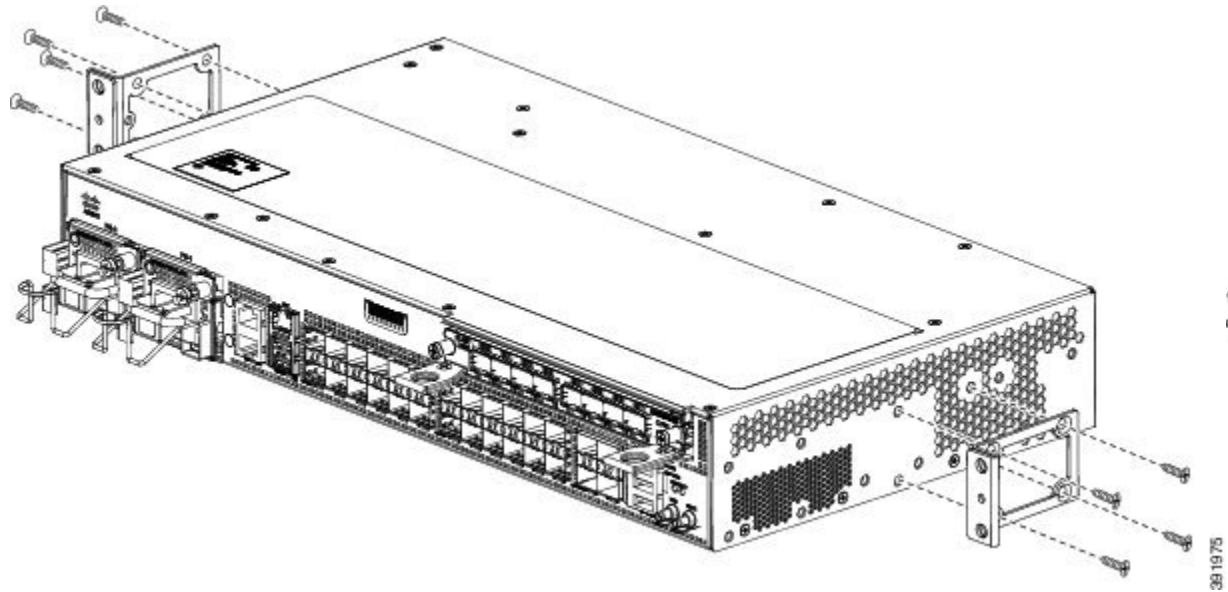
- Step 1** Remove the rack-mount brackets from the accessory kit and position them beside the router chassis.
- Step 2** Position one of the brackets against the chassis side, and align the screw holes.

### 19-inch EIA Rack

The following figures show how to attach the brackets at the front, middle, and rear positions on the Cisco ASR-920-24SZ-IM Router for a 19-inch EIA rack.

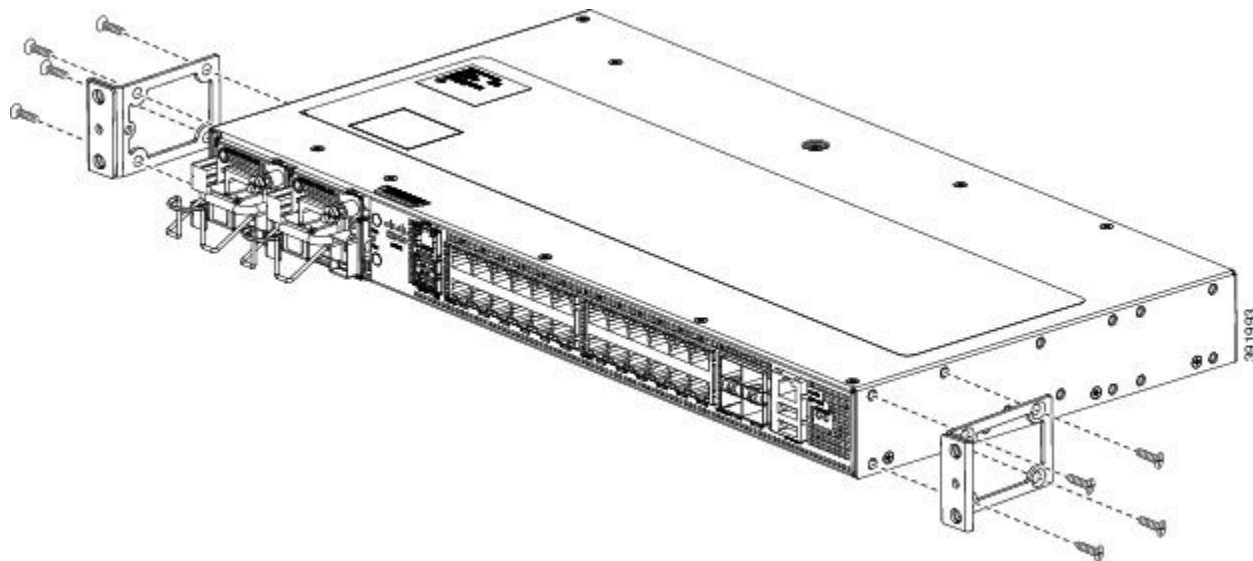
*Figure 1: Attaching Mounting Brackets to Cisco ASR-920-24SZ-IM Router for a 19-inch EIA Rack (Front, Middle, and Rear Positions)*

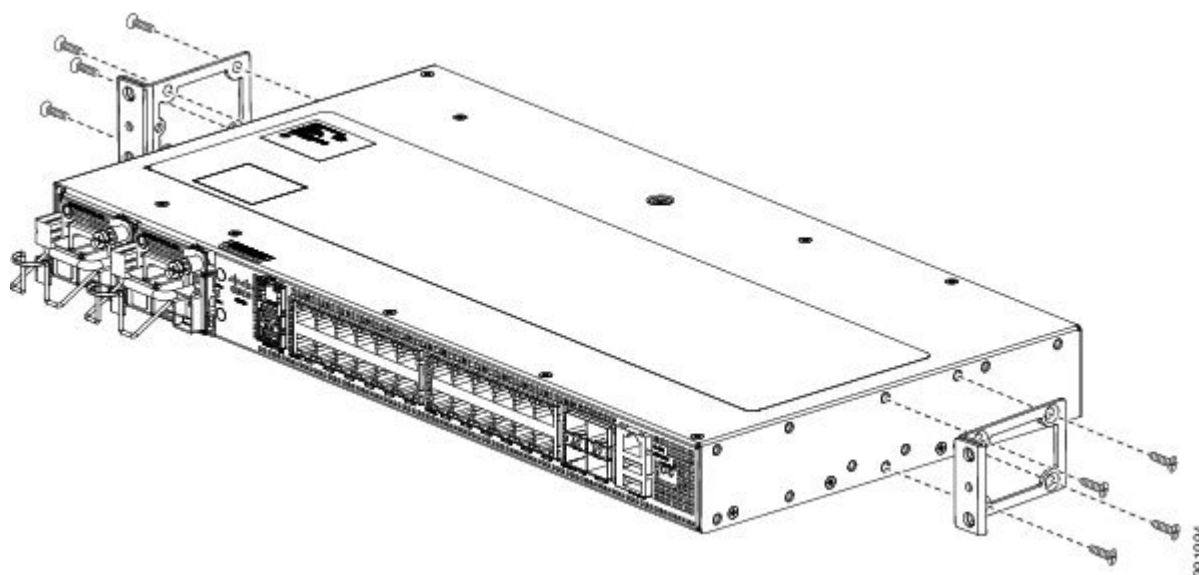




The following figures show how to attach the brackets at the front, middle, and rear positions on the Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router for a 19-inch EIA rack.

**Figure 2: Attaching Mounting Brackets to Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router for a 19-inch EIA Rack (Front, Middle, and Rear Positions)**

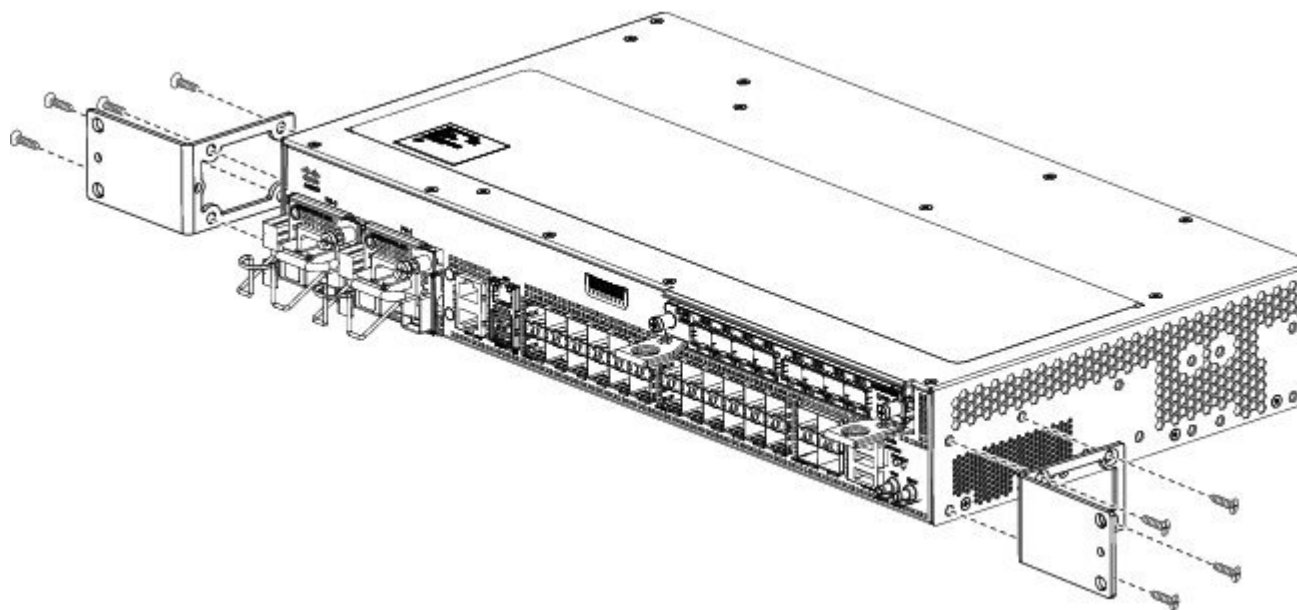


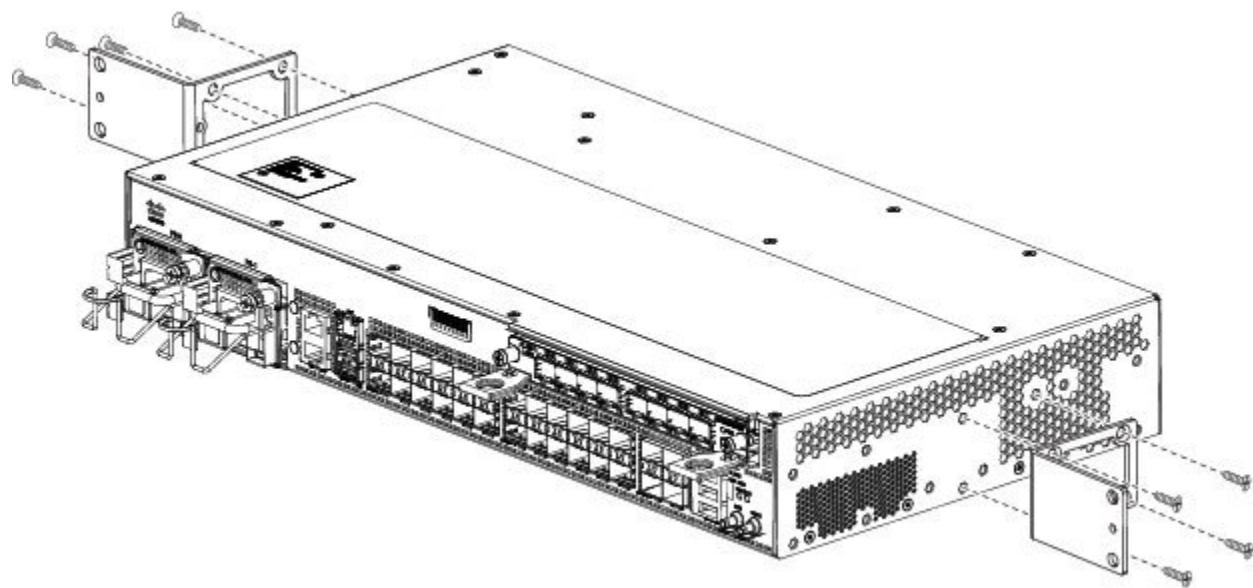


### 23-inch Rack

The following figures show how to attach the brackets on the Cisco ASR-920-24SZ-IM Router for a 23-inch rack.

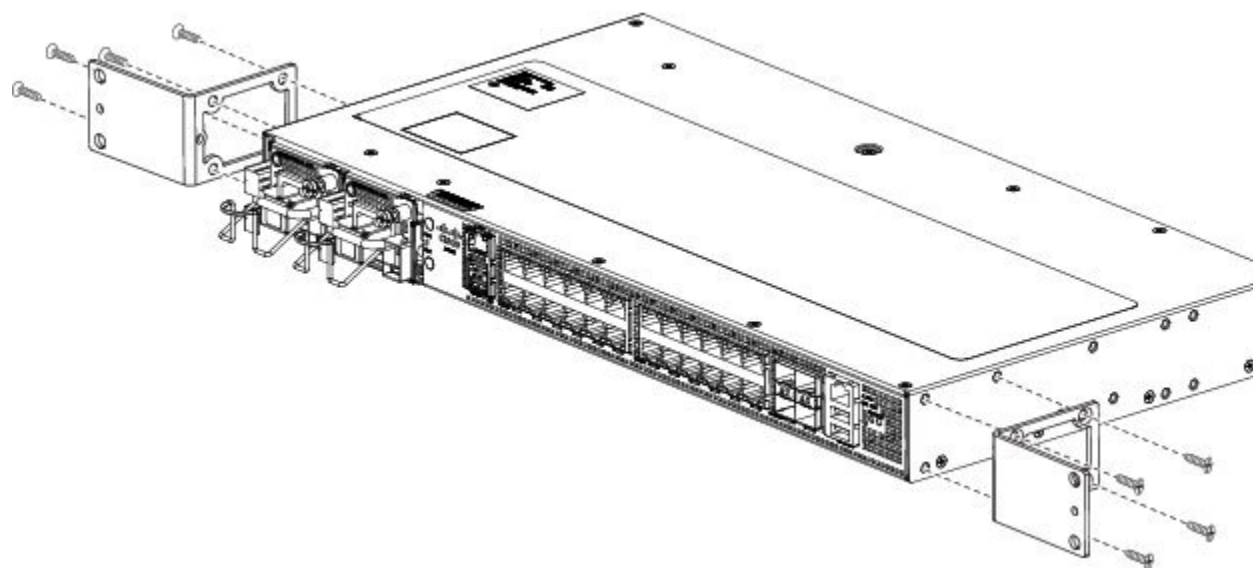
**Figure 3: Attaching Mounting Brackets to Cisco ASR-920-24SZ-IM Router for a 23-inch Rack (Front, Middle, and Rear Positions)**

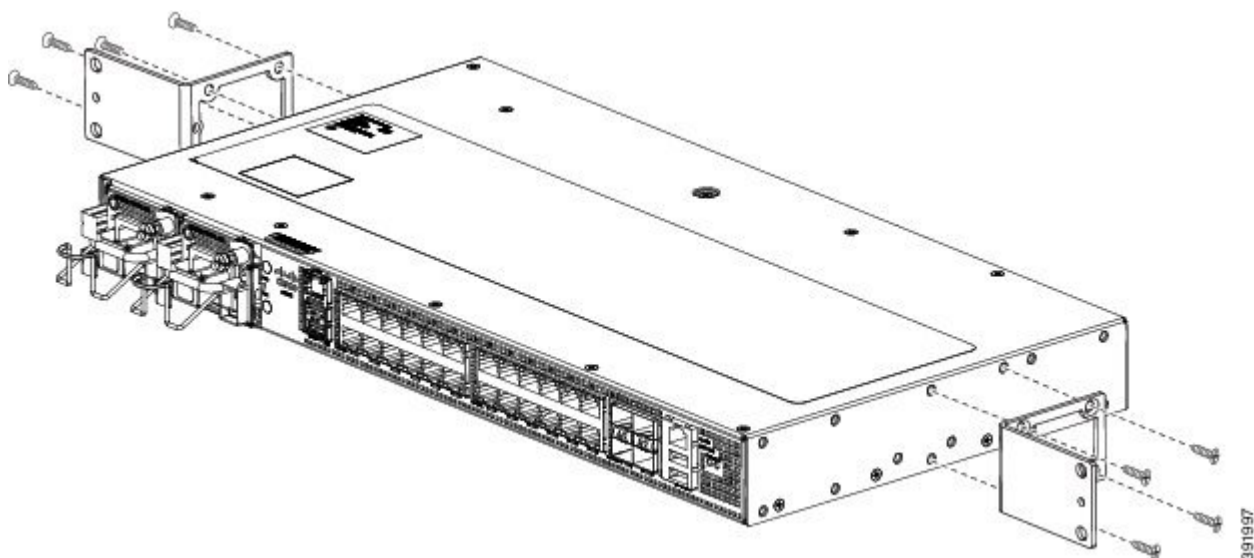




The following figures show how to attach the brackets on the Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router for a 23-inch rack.

**Figure 4: Attaching Mounting Brackets to Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router for a 23-inch Rack (Front, Middle, and Rear Positions)**

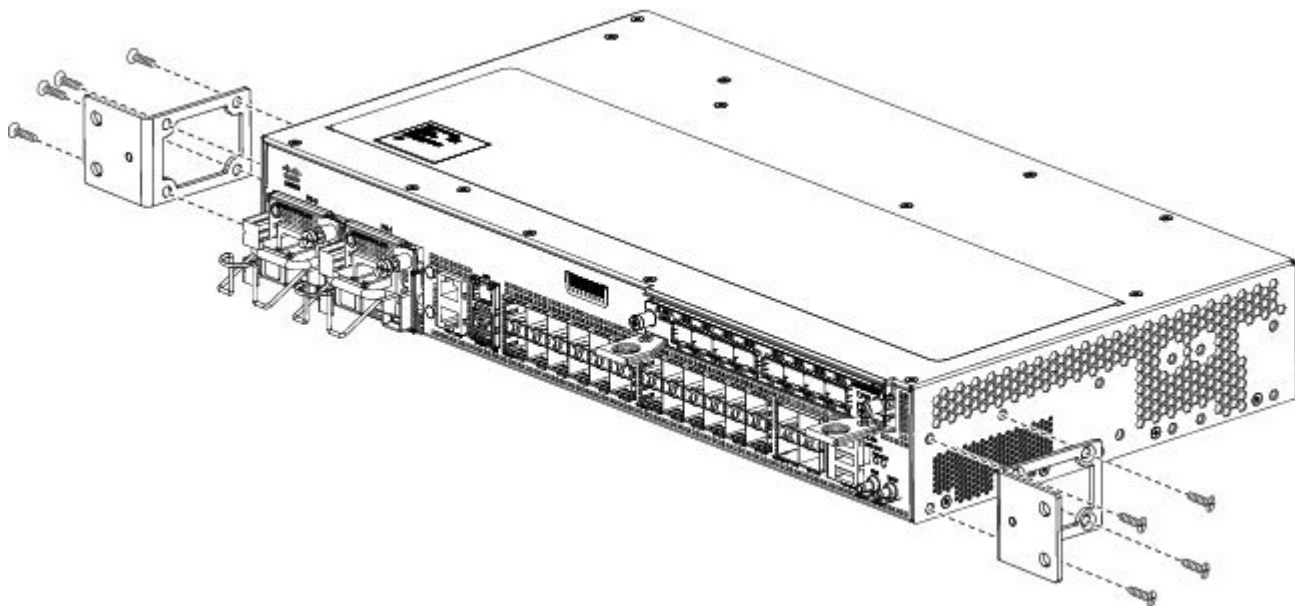


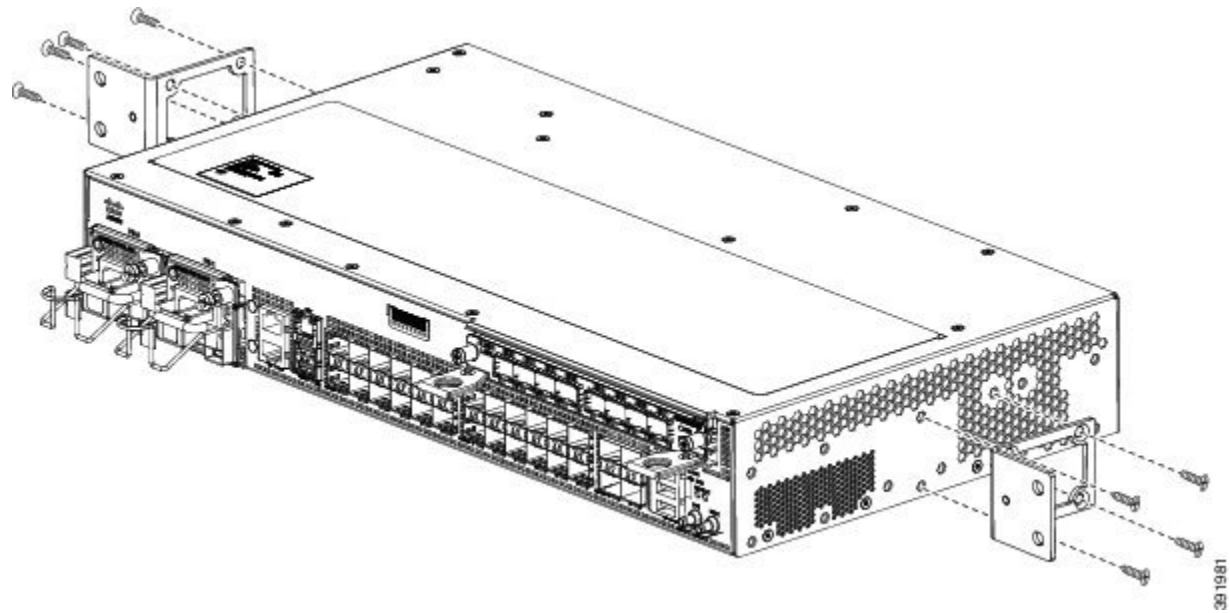


### 300-mm ETSI Rack

The following figures show how to attach the brackets on the Cisco ASR-920-24SZ-IM Router for a 300 mm ETSI rack.

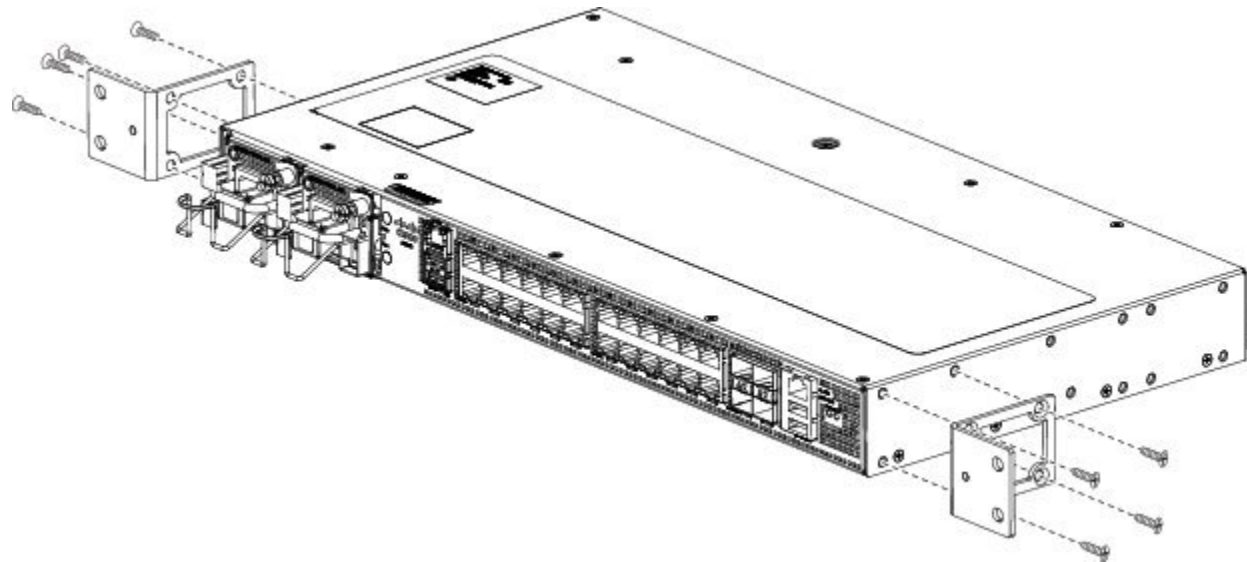
**Figure 5: Attaching Mounting Brackets to Cisco ASR-920-24SZ-IM Router for a 300 mm ETSI Rack (Front, Middle, and Rear Positions)**



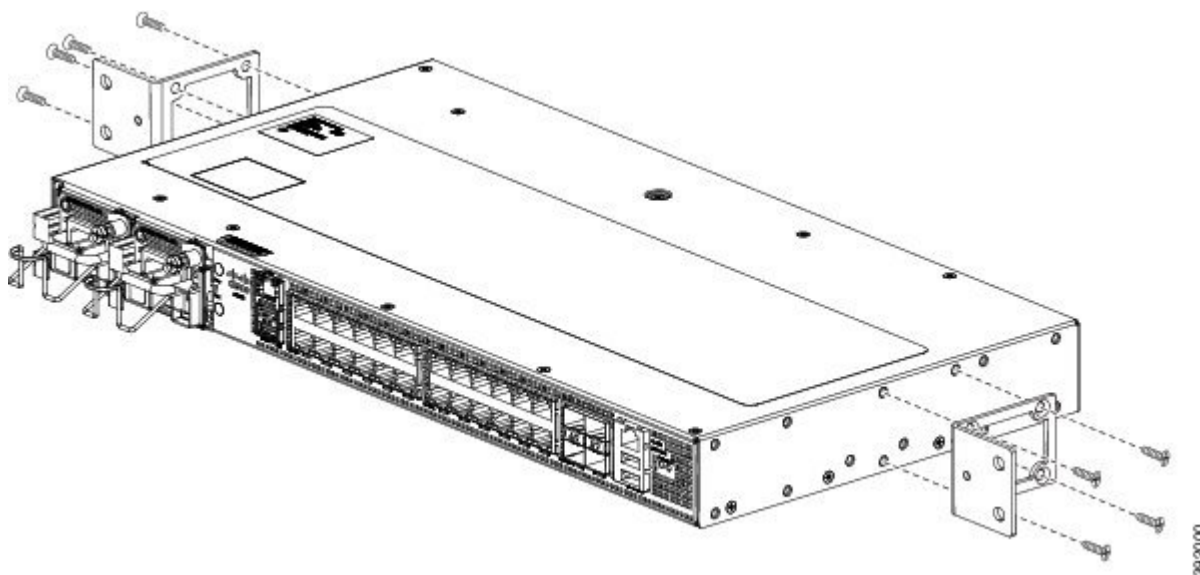


The following figures show how to attach the brackets on the Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router for a 300 mm ETSI rack.

**Figure 6: Attaching Mounting Brackets to Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router for a 300 mm ETSI Rack (Front, Middle, and Rear Positions)**







- Step 3** Secure the bracket to the chassis with the screws removed when performing Step 1. The recommended maximum torque is 10 in.-lb.
- Step 4** Repeat Step 3 for the other bracket.

## Installing the Router Chassis in the Rack



**Note** Ensure adequate air flow when mounting the router in a rack. For more information, see the *Air Flow Guidelines* section.



**Note** Install the cable guides before installing the router in a 19-inch EIA rack. See *Attaching the Cable Guides* section.

To install the router chassis in the equipment rack, perform these steps:

### Procedure

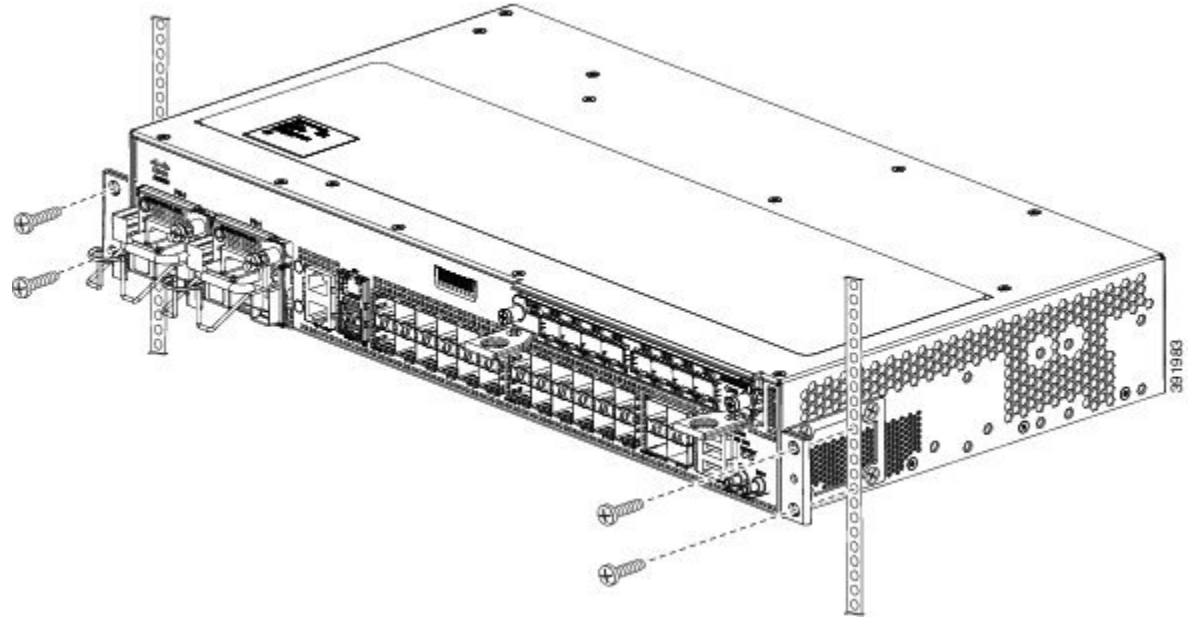
- Step 1** Position the chassis in the rack as follows:
- If the front of the chassis (front panel) is at the front of the rack, insert the rear of the chassis between the mounting posts.
  - If the rear of the chassis is at the front of the rack, insert the front of the chassis between the mounting posts.



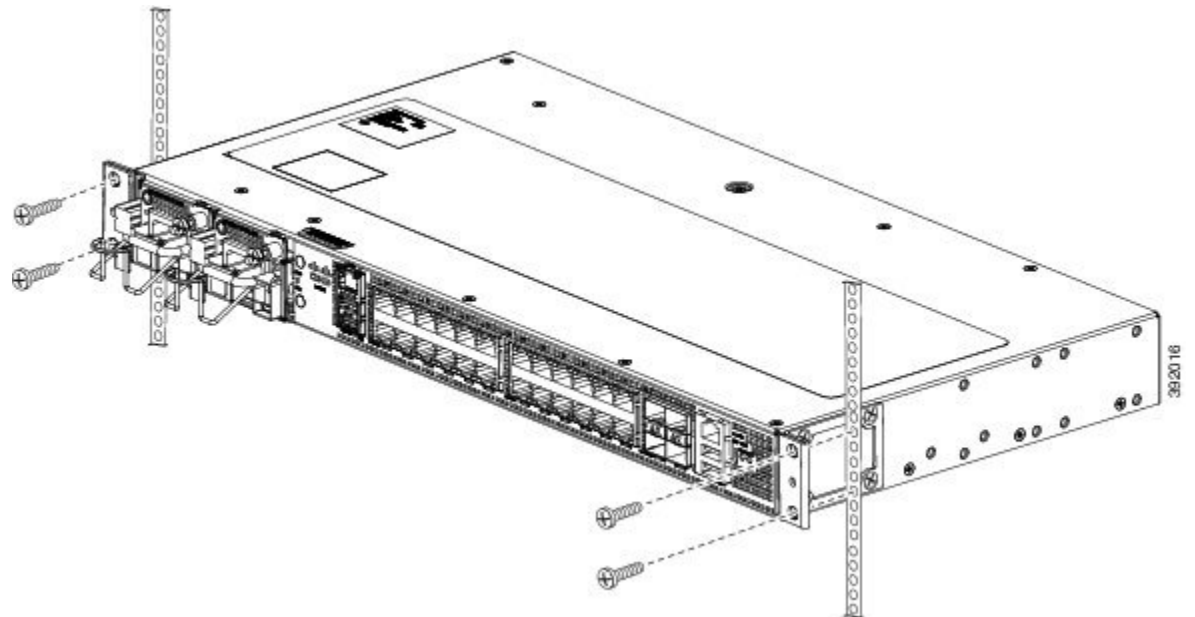
**Step 2** Align the mounting holes in the bracket (and optional cable guide) with the mounting holes in the equipment rack.

The following figures show how to install the Cisco ASR-920-24SZ-IM Router in a 19-inch EIA rack.

*Figure 7: Installing the Cisco ASR-920-24SZ-IM Router in a 19-inch EIA Rack*



*Figure 8: Installing the Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router in a 19-inch EIA Rack*



**Step 3** Install the four M6x12mm zinc-plated steel screws through the holes in the bracket and into the threaded holes in the equipment rack posts.

- Step 4** Use a tape measure and level to verify that the chassis is installed straight and level.

## Attaching the Cable Guides

The Cisco ASR-920-24SZ-IM Router supports the following cable guides:

- A920-CBL-GUIDE (left and right)—help in routing the cables from all components on the front panel thereby enabling a proper cable-bending radius.



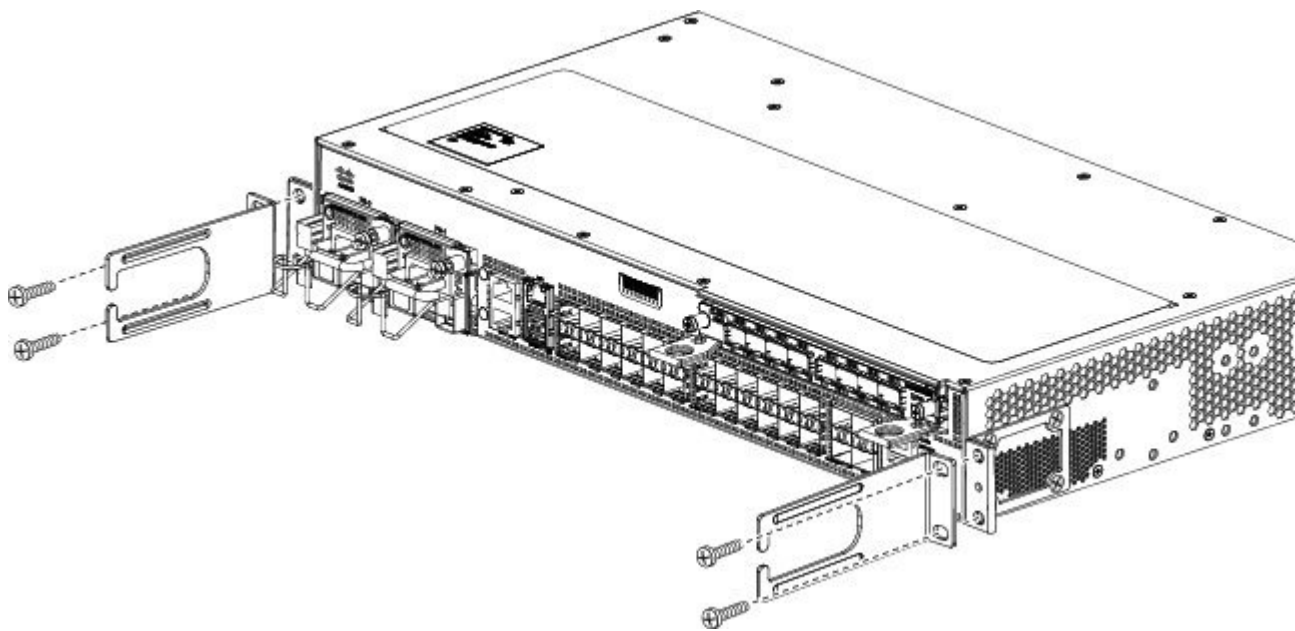
**Note** If the chassis is mounted using 19-inch brackets, you must assemble the cable guides before installing the chassis on the rack.

To install the cable guides, perform these steps:

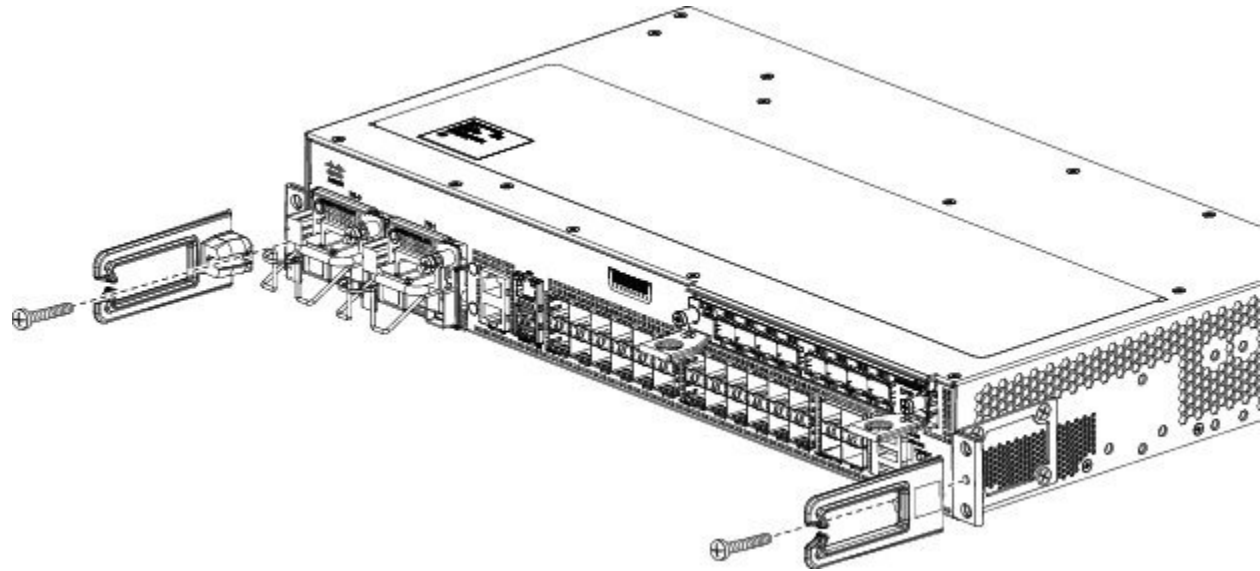
### Procedure

- Step 1** Position the cable guide-left and cable guide-right against the front of the chassis and align the four screw holes, as shown in the figure for 19-inch rack and in the figure for other racks using standard kit.

**Figure 9: Cable Guide Installation On Cisco ASR-920-24SZ-IM Router For 19-inch Rack Brackets**



*Figure 10: Installing the Cable Guides on Cisco ASR-920-24SZ-IM Router (As Per the Standard Kit)*



- Step 2** Secure the cable guides with the four M6x12mm screws supplied with the cable kit. The recommended maximum torque is 3N-m.
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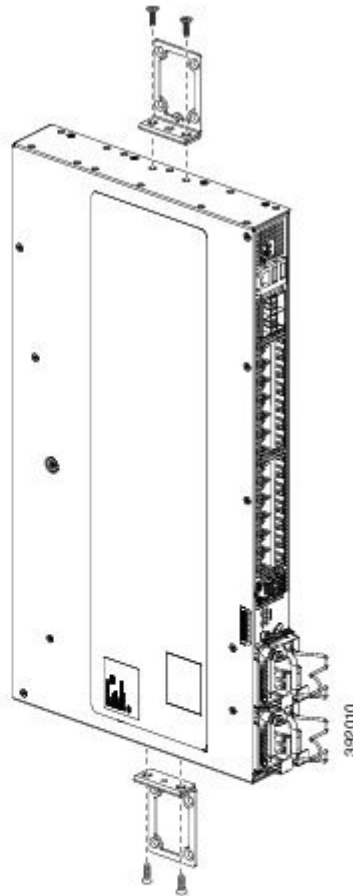
## Wall Mounting the Routers

This section shows the procedures to install the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router on a wall.

### Attaching the Brackets to the Router for Wall-Mounting

The following figure shows how to attach a 19-inch bracket to the Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router.

*Figure 11: Attaching 19-inch Brackets on Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router for Wall Mounting*



## Mounting Routers on the Wall

For the best support of the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router and cables, ensure the router is attached securely to wall studs or to a firmly attached plywood mounting backboard.



### Warning

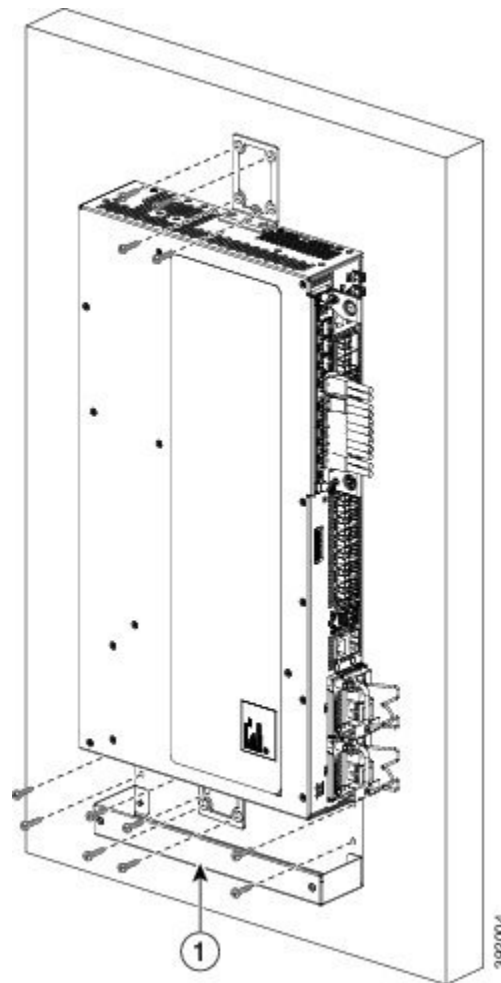
Suitable for mounting on and over a concrete or other non-combustible surface only. Statement 345

**Note****Procedure**

**Step 1** Mount the router with the front panel as shown in the following figures.

The following figures show the wall installation of Cisco ASR-920-24SZ-IM Router and the wall installation of Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router.

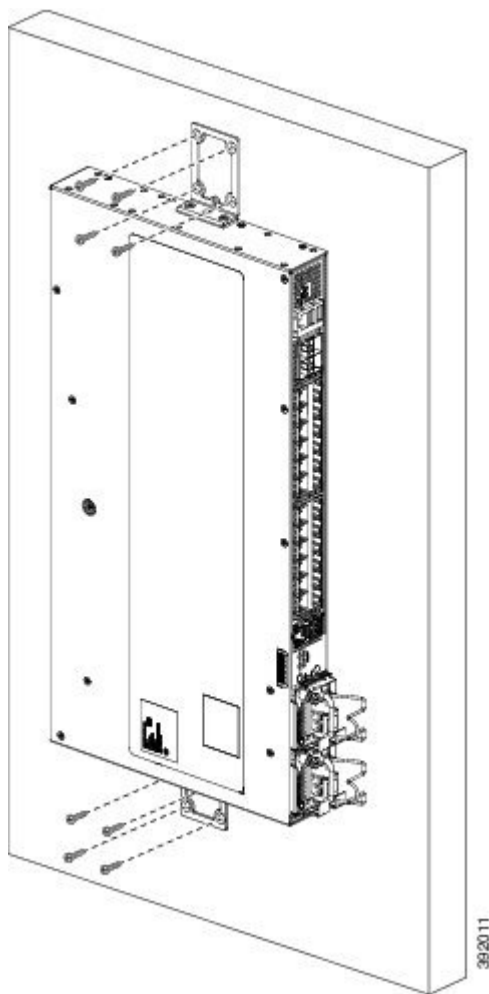
**Figure 12: Mounting the Cisco ASR-920-24SZ-IM Router on the Wall**



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Drip tray for Cisco ASR-920-24SZ-IM Router

*Figure 13: Mounting the Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router on the Wall*



**Caution** When mounting the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router vertically, ensure that the power supplies are at the bottom.

**Caution** When mounting the ASR-920-24SZ-1M to a wall, you must install the drip tray (Cisco part number 700-47267-01) as shown below to meet IEC 60950-1 product safety requirements.

To install the drip tray for Cisco ASR-920-24SZ-IM Router, complete the following steps:

- Step 2** Place the drip tray below the router as shown in the figure above.
- Step 3** Tighten the four screws to affix the drip tray to the wall.

## Installing and Removing the Interface Module

The sections describe the installation and removal of interface module on the Cisco ASR-920-24SZ-IM Router.

## Installing the Interface Module

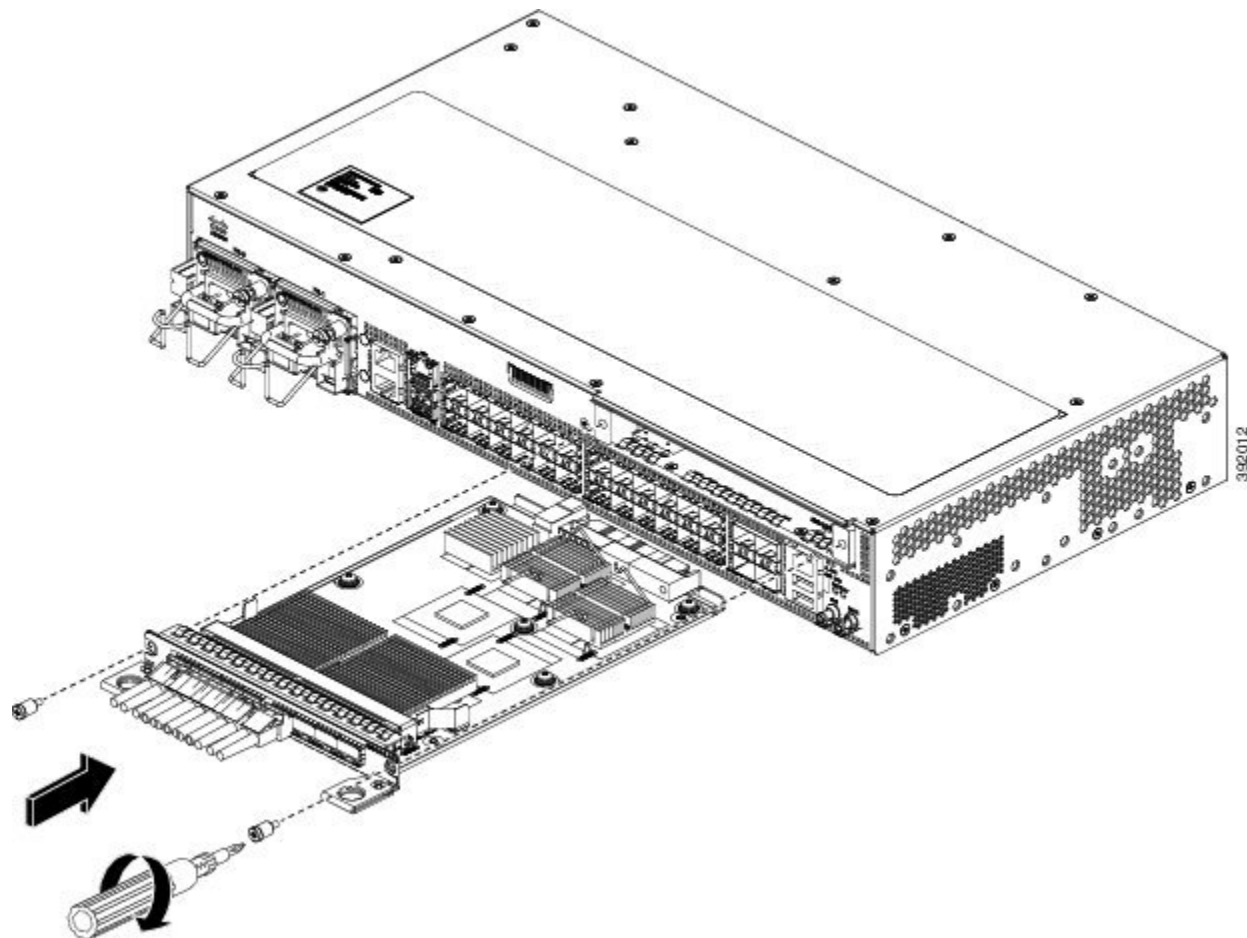


**Note** Before installing the interface module, read the Activating or Deactivating Interface Module section in the [Cisco ASR 920 Series Aggregation Services Router Configuration Guide](#).

### Procedure

- Step 1** Before inserting an interface module, make sure that the chassis is grounded.
- Step 2** If present, remove the blank filler plate covering the interface module slot. To remove, pull the blank filler plate completely out of the router slot using the captive screws.
- Step 3** To insert the interface module, carefully align the edges of the interface module between the upper and lower edges of the interface module slot in the router.
- Step 4** Carefully slide the interface module into the router slot until the interface module makes contact with the backplane. The following figure shows how to install the interface module on Cisco ASR-920-24SZ-IM Router.

**Figure 14: Inserting an Interface Module on Cisco ASR-920-24SZ-IM Router**





- Step 5** Tighten the locking thumbscrews on both sides of the interface module. The recommended maximum torque is 5.5 in.-lb (.62 N-m).
- Step 6** Connect all the cables to each interface module.

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#### What to do next



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**Caution**

Do not use interface module or power supply ejector handles to lift the chassis; using these handles to lift the chassis can deform or damage the handles.

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## Removing the Interface Module



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**Note**

Before removing the interface module, read the Activating or Deactivating Interface Module section in the [Cisco ASR 920 Series Aggregation Services Router Configuration Guide](#).

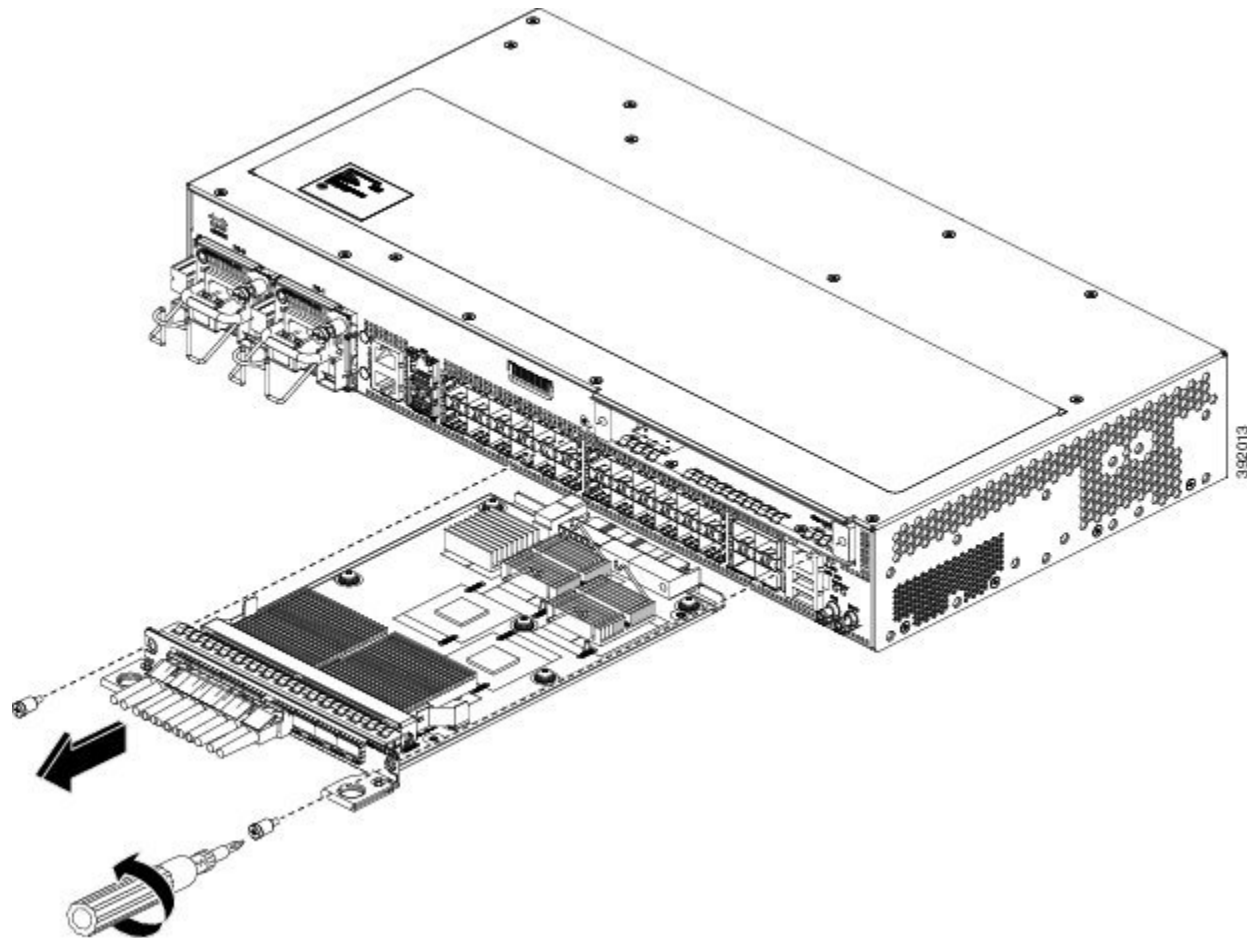
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#### Procedure

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- Step 1** To remove an interface module, disconnect all the cables from each interface module.
- Step 2** Loosen the locking thumbscrews on both sides of the interface module.
- Step 3** Slide the interface module out of the router slot by pulling on the handles. If you are removing a blank filler plate, pull the blank filler plate completely out of the router slot using the captive screws.
- Note** If the interface module slot is to remain empty, install a blank filler plate (Cisco part number 800-35323-01) over the opening, and secure it with captive installation screws.

Figure 15: Removing an Interface Module from Cisco ASR-920-24SZ-IM Router



## Hot-Swapping the Interface Module



**Note** Before hot-swapping the interface module, read the Activating or Deactivating Interface Module section in the [Cisco ASR 920 Series Aggregation Services Router Configuration Guide](#).

The Cisco ASR-920-24SZ-IM Router provides a feature that allows you to remove and replace an interface module without powering down the router. This feature, called hot-swapping or Online Insertion and Removal (OIR), allows you to remove and replace an interface module without disrupting router operation.



**Caution** The Cisco ASR-920-24SZ-IM Router does not support hot-swapping or OIR of TDM IM. To activate a TDM IM you must reload the router. Without reloading the router, the IM or associated front panel ports cannot be used. If reload is aborted, the ports 20 to 23 remain disabled and IM remains in Out-of-Service (OOS) state until next reload.

When you remove or insert an interface module while the router is powered on and running, the router does the following:

1. Determines if there is sufficient power for the module.
2. Scans the backplane for configuration changes.
3. Initializes the newly inserted module.
4. Places any previously configured interfaces on the module back to the state they were in when they were removed.

The router runs diagnostic tests on any new interfaces and the test results indicate the following:

- If the tests are successful it means the router is operating normally.
- If the new module is faulty, the router resumes normal operation, but leaves the new interfaces disabled.
- If the diagnostic tests fail, the router stops operating, which usually indicates that the new module has a problem in the bus and should be removed.

**Caution**

To avoid erroneous failure messages, note the current configuration of all the interfaces before you remove or replace an interface module, and allow at least 2 minutes for the system to reinitialize after a module has been removed or replaced. This time is recommended in order to allow for synchronization between components within the interface module and for synchronization with the RSP.

## Installing and Removing the Fan Tray

The sections describe the installation and removal of fan tray on the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router.

### Installing the Fan Tray

The fan tray is a modular unit that provides cooling to the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router. Follow these steps to install the fan tray in the chassis:

**Procedure**

- Step 1** Guide the fan tray into the chassis until it is fully seated. The following figures show how to orient the fan tray for Cisco ASR-920-24SZ-IM Router and Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router respectively.

**Caution** Keep your fingers, clothing, and jewelry away from the fans. Always handle the fan tray by the handle.

- Step 2** Secure the fan tray to the chassis using the attached captive installation screws. The recommended maximum torque is 5.5 in.-lb (.62 N-m).

Figure 16: Installing the Fan Tray on Cisco ASR-920-24SZ-IM Router

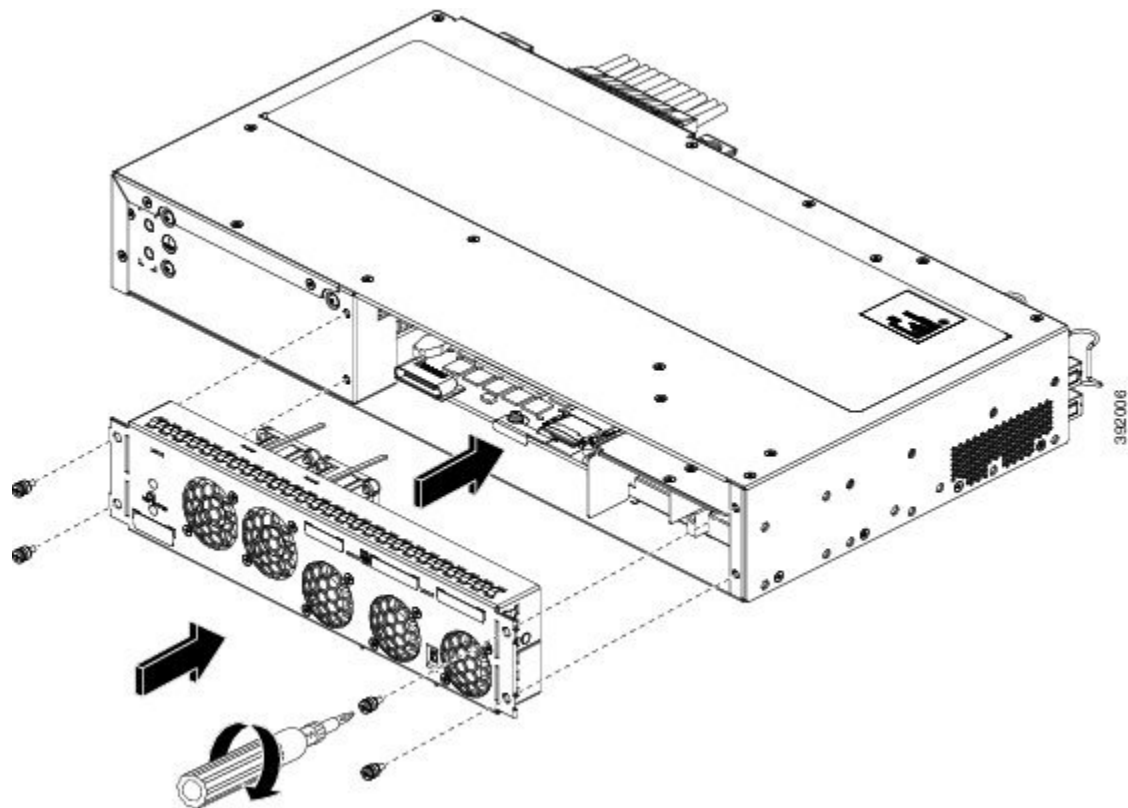
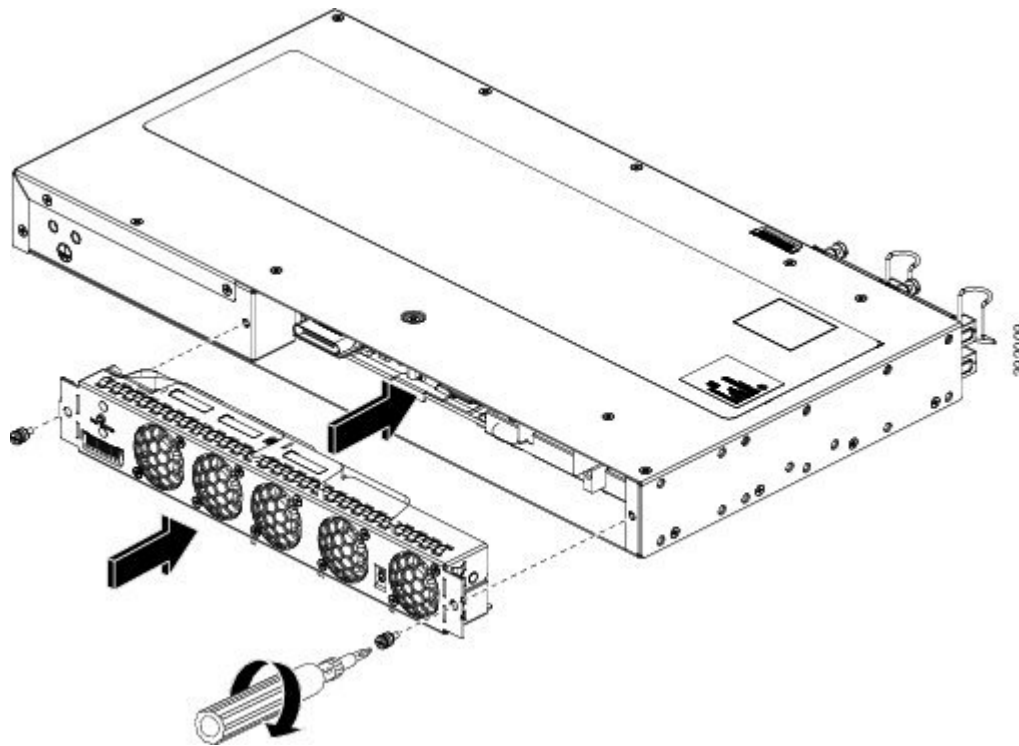


Figure 17: Installing the Fan Tray on Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router



This completes the procedure for installing or replacing the fan tray in a Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router.

For more information about air flow guidelines, see the *Air Flow Guidelines* section.

## Removing the Fan Tray

The fan tray supports online insertion and removal (OIR). There is no need to power down the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router to remove or replace the fan tray. However, the router will shut down if the fan tray is removed from the chassis for more than five minutes.



### Caution

The router can stay active for up to 5 minutes if the temperature is below the ambient limit. However, in the event of an overtemperature alarm, the router can shut down in less than 5 minutes. In the event of a critical temperature alarm, the router shuts down immediately.



### Caution

To avoid erroneous failure messages, allow at least 2 minutes for the system to reinitialize after the fan tray has been removed or replaced.

Follow these steps to remove and replace the fan tray on the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router:

## Procedure

- Step 1** Using a No. 2 Phillips screwdriver or your fingers, loosen the captive installation screws that secures the fan tray to the chassis. Figure 3-18 shows the front of the Cisco ASR-920-24SZ-IM Router fan tray, including the captive installation screws. Figure 3-19 shows the front of the Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router fan tray, including the captive installation screws.

*Figure 18: Removing the Fan Tray From Cisco ASR-920-24SZ-IM Router*

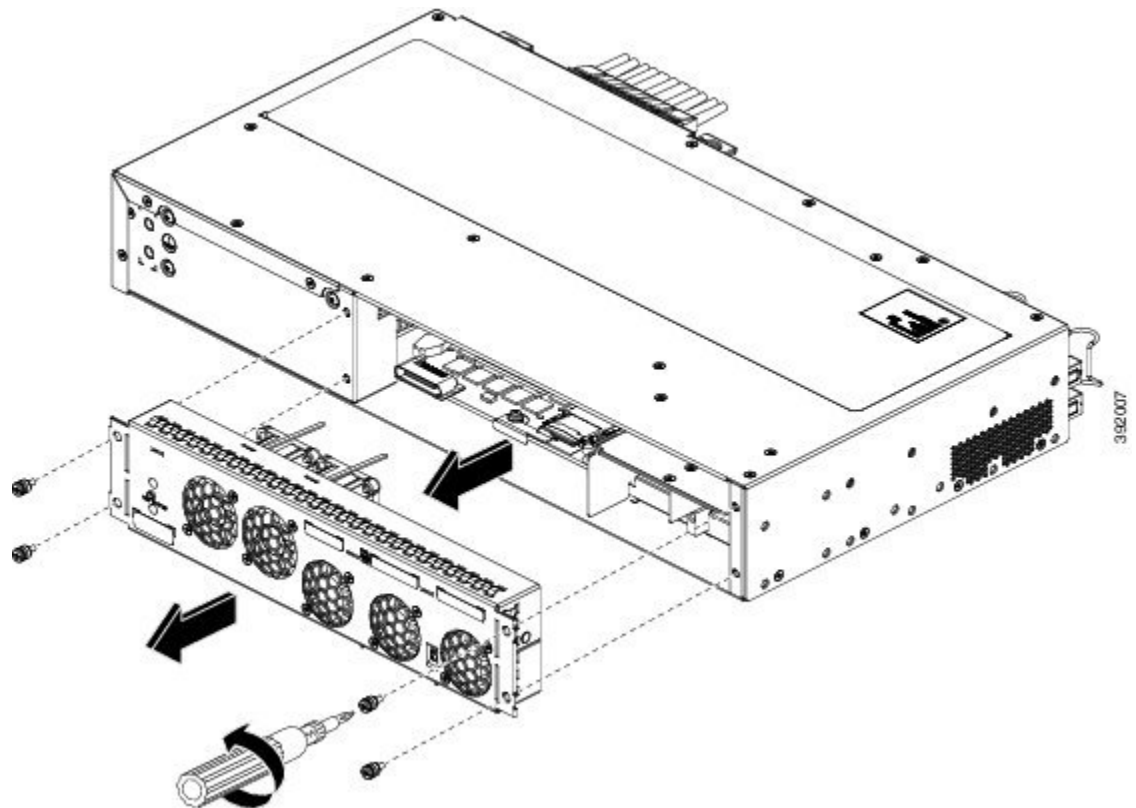
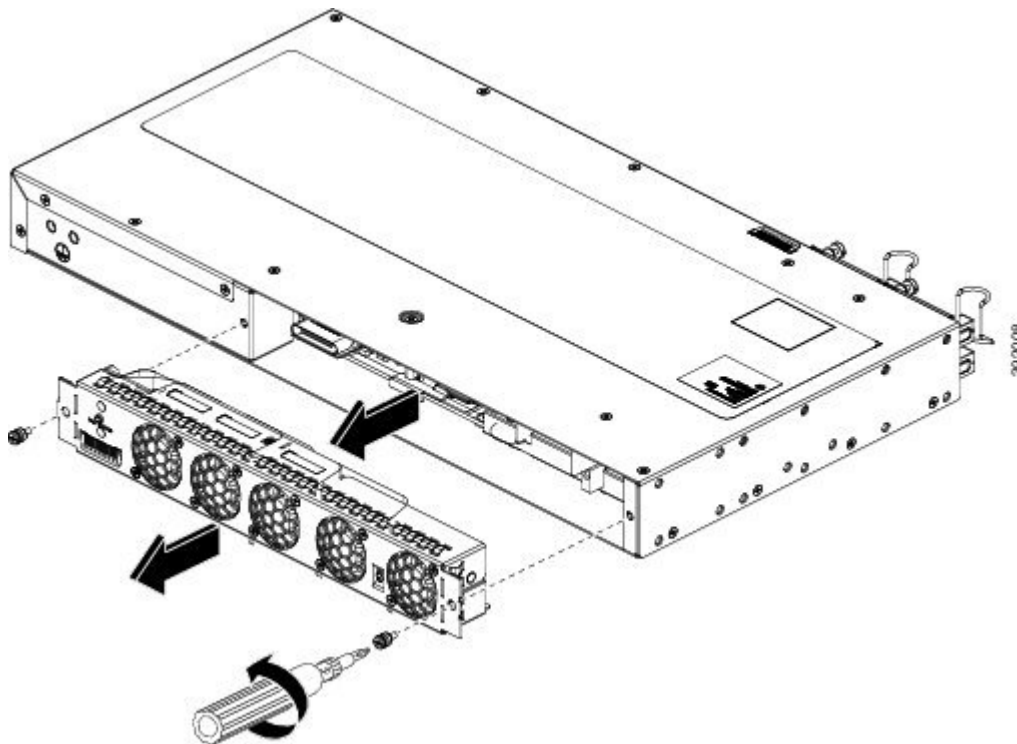


Figure 19: Removing the Fan Tray From Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Route



**Caution** Keep your fingers, clothing, and jewelry away from the fans. Always handle the fan tray by the handle.

**Step 2** Pull the fan tray towards you, no more than 1 inch, to disengage it from the power receptacle on the midplane. The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing. Statement 263

**Step 3** Wait at least 5 seconds to allow the fans to stop spinning. Then, pull the fan tray backward towards you and out of the chassis.

**Note** As the fan tray slides out of the chassis, support the bottom of the fan tray with one hand and keep your other hand on the fan tray handle.

This completes the steps for removing the fan tray from the chassis.

To install a new fan tray, follow the steps in the *Installing the Fan Tray* section.

## Installing the Power Supply

The Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router provides the choice of two different power supplies:

- DC power—48 V/60 Vdc or 24 Vdc



The DC power supply uses 2 position terminal block-style connector. The terminal block connector is of suitable size to carry the appropriate AWG wire size to handle the input current of the power supply. ON/OFF switch is provided.

- AC power—100 VAC to 240 VAC

The AC power supply has an IEC 320-type power receptacle and a 15-A service connector. You can use standard straight power cords with the AC power supply. The power supply includes a power cord retainer clip that can only accept straight power cords. No ON/OFF switch is provided.

Each power supply provides a single primary input power connection. You can install dual-power supplies for redundancy.


**Warning**

Read the installation instructions before connecting the system to the power source. Statement 1004


**Note**

Products that have an AC power connection are required to have an external surge protective device (SPD) provided as part of the building installation to comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety.


**Caution**

Do not use interface module or power supply ejector handles to lift the chassis; using these handles to lift the chassis can deform or damage the handles.

The sections provide more information on the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router power supplies:

## Preventing Power Loss

Use the following guidelines to prevent power loss to the router:

- To prevent loss of input power, ensure that the total maximum load on each circuit supplying the power supplies is within the current ratings of the wiring and breakers.
- In some systems, you can use an UPS to protect against power failures at your site. Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router, which can have substantial current-draw fluctuations due to bursty data traffic patterns.

## Power Connection Guidelines

This section provides guidelines for connecting the device power supplies to the site power source.


**Warning**

This equipment is intended to be grounded to comply with emission and immunity requirements. Ensure that the switch functional ground lug is connected to earth ground during normal use. Statement 1064

**Warning**

The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019

**Warning**

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

## Guidelines for DC-Powered Systems

Basic guidelines for DC-powered systems include the following:

- Each chassis power supply should have its own dedicated input power source. The source must comply with the safety extra-low voltage (SELV) requirements in the UL 60950, CSA 60950, EN 60950, and IEC 60950 standards.
- The circuit must be protected by a dedicated two-pole circuit breaker. The circuit breaker should be sized according to the power supply input rating and local or national code requirements.
- The circuit breaker is considered the disconnect device and should be easily accessible.
- The system ground is the power supply and chassis ground.
- Do not connect the DC return wire to the system frame or to the system-grounding equipment.
- Use the grounding lug to attach a wrist strap for ESD protection during servicing.

## Guidelines for AC-Powered Systems

Basic guidelines for AC-powered systems include the following:

- Each chassis power supply should have its own dedicated branch circuit.
- The circuit breaker should be sized according to the power supply input rating and local or national code requirements.
- The AC power receptacles used to plug in the chassis must be the grounding type. The grounding conductors that connect to the receptacles should connect to protective earth ground at the service equipment.

## Installing a DC Power Supply

The sections describe how to install a DC power supply in the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router:

**Note**

This equipment is suitable for installation in Network Telecommunications Facilities and locations where the NEC applies. The equipment is suitable for installation as part of the Common Bonding Network (CBN).

**Caution**

The grounding architecture of this product is DC-isolated (DC-I) for DC-powered products. DC-powered products have a nominal operating DC voltage of 48 VDC. Minimal steady state DC operating voltage is 19.2 VDC.

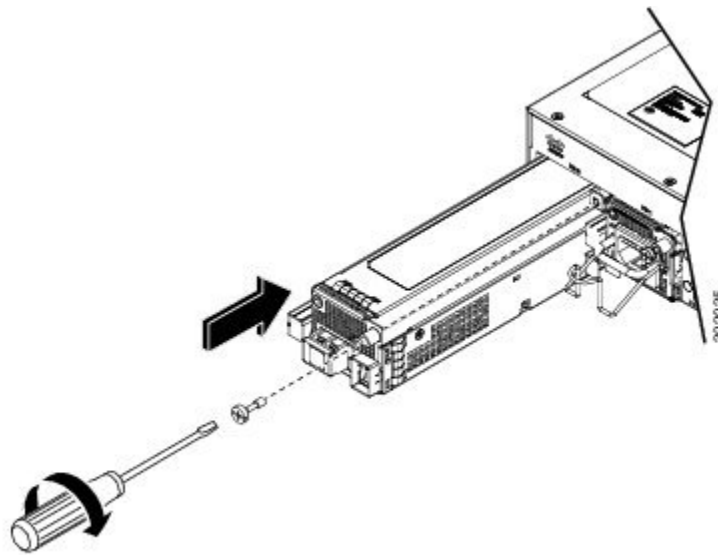
## Installing a DC Power Supply Module

Perform the following procedure to install a power supply module:

### Procedure

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- Step 1** Ensure that the system (earth) ground connection has been made. For ground connection installation instructions, see the *Installing the Chassis Ground Connection* section.
- Step 2** If present, remove the blank power supply filler plate from the chassis power supply bay opening by loosening the captive installation screws.
- Step 3** Verify that power to the DC circuit connected to the power supply you are installing is off. To ensure that power has been removed from the DC circuits, locate the circuit breakers for the DC circuits, switch the circuit breakers to the OFF position, and tape the circuit-breaker switches in the OFF position.
- Step 4** Grasp the power supply metal tab with one hand. Place your other hand underneath the power supply. Slide the power supply into the power supply bay as shown in the figure below. Make sure that the power supply is fully seated in the bay.

**Figure 20: Installing a DC Power Supply**



- Step 5** Tighten the captive installation screw of the power supply. The recommended maximum torque is 5.5 in.-lb (.62 N-m).

If you are installing a redundant DC power supply, repeat these steps for the second power source too.

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## Attach Cables to the DC Power Supply



**Note** When installing DC power supply, use 14 AWG, 90°C wires. Always ensure that the building's installation for short-circuit (overcurrent) protection does not exceed 15A.

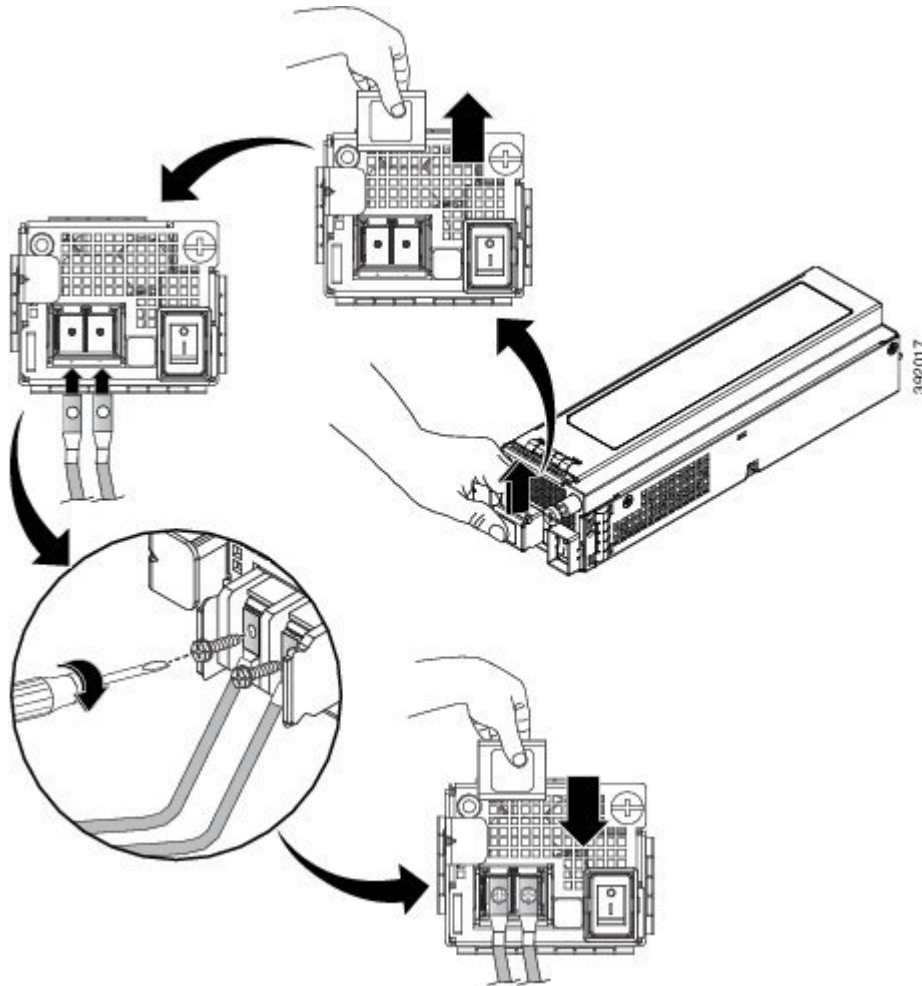
To attach the DC power supplies:

### Procedure

**Step 1** Open the DC power supply guard.

**Step 2** Attach the DC supply wires in the designated screws. See the figure below.

*Figure 21: Connecting the DC Power Supply Wires*



**Step 3** Close the DC power supply guard.

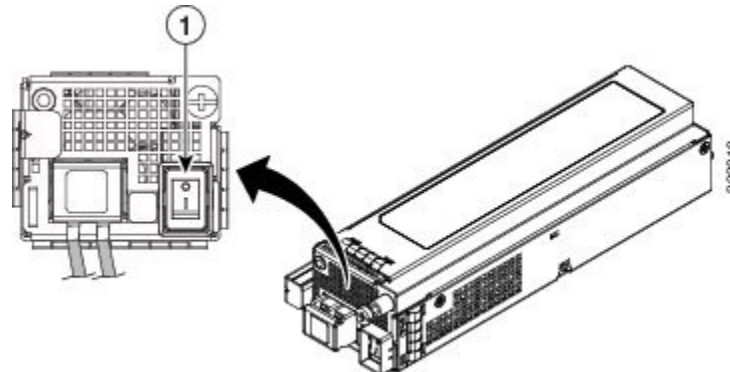
## Power On the DC Power Supply

After the router is either rack mounted or mounted on the wall, perform these tasks to complete the installation:

### Procedure

**Step 1** Power on the DC power supply. See the figure below.

*Figure 22: Powering on the DC Power Supply*



1	power on/off switch
---	---------------------

**Step 2** Connect the front-panel ports.

## Removing and Replacing a DC Power Supply

This section provides information about removing and replacing a DC power supply in the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router.



**Note** The Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router power supplies are hot-swappable. If you have installed redundant power supplies, you can replace a single power supply without interrupting power to the router.



**Caution** To avoid erroneous failure messages, allow at least 2 minutes for the system to reinitialize after a power supply has been removed or replaced.



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



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



**Warning** Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030



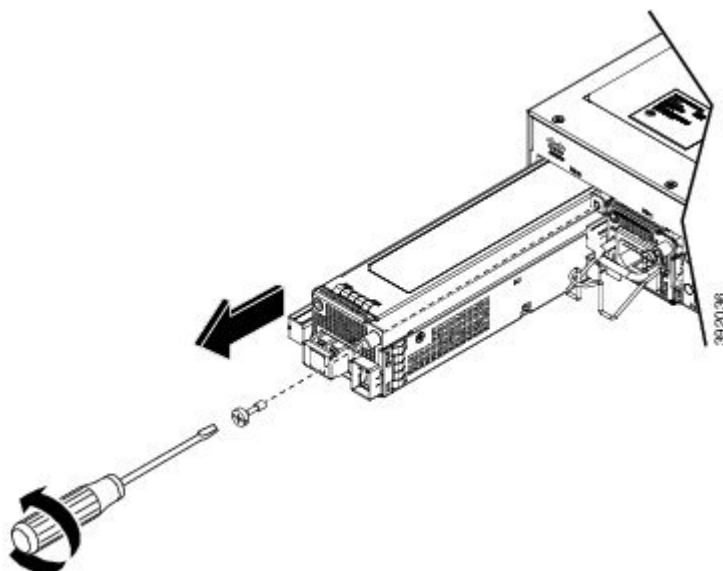
**Warning** Installation of the equipment must comply with local and national electrical codes. Statement 1074

Follow these steps to remove and replace the DC power supply on the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router:

### Procedure

- Step 1** Before servicing the power supply, switch off the circuit breaker in your equipment area. As an additional precaution, tape the circuit-breaker switch in the Off position.
- Step 2** Slip on the ESD-preventive wrist strap that was included in the accessory kit.
- Step 3** Switch the power supply circuit-breaker switch to the Off (O) position.
- Step 4** Pull the terminal block plug connector out of the terminal block head in the power supply.
- Step 5** Loosen the captive screw on the DC power supply. See the figure below.

*Figure 23: Removing a DC Power Supply*



**Caution** Do not use the captive installation screw to pull out the power supply.

- Step 6** Grasping the power supply handle with one hand, pull the power supply out from the chassis while supporting it with the other hand.
- Step 7** Replace the DC power supply within 5 minutes. See *Installing a DC Power Supply* figure. If the power supply bay is to remain empty, install a blank filler plate (Cisco part number 800-39165-01) over the opening, and secure it with captive installation screws.
- 

## Installing an AC power Supply

The sections describe how to install an AC power supply in the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router:



### Warning

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

---

## Installing an AC Power Supply Module

Follow these steps to install an AC power supply module:

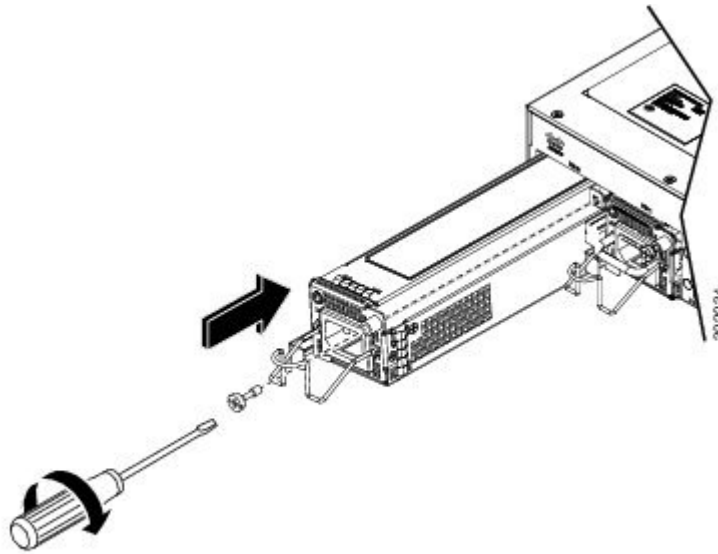
### Procedure

---

- Step 1** Ensure that the system (earth) ground connection has been made. For ground connection installation instructions, see the *Installing the Chassis Ground Connection* section.
- Step 2** If necessary, remove the blank power supply filler plate from the chassis power supply bay opening, by loosening the captive installation screws.
- Step 3** Grasp the power supply handle with one hand. Place your other hand underneath the power supply, as shown in the figure below. Slide the power supply into the power supply bay. Make sure that the power supply is fully seated in the bay.



Figure 24: Installing the AC Power Supply



**Step 4** Tighten the captive installation screw of the power supply. The recommended maximum torque is 5.5 in.-lb (.62 N-m).

**Warning** Power supply captive installation screws must be tight to ensure protective grounding continuity.  
Statement 289

---

## Activate an AC Power Supply

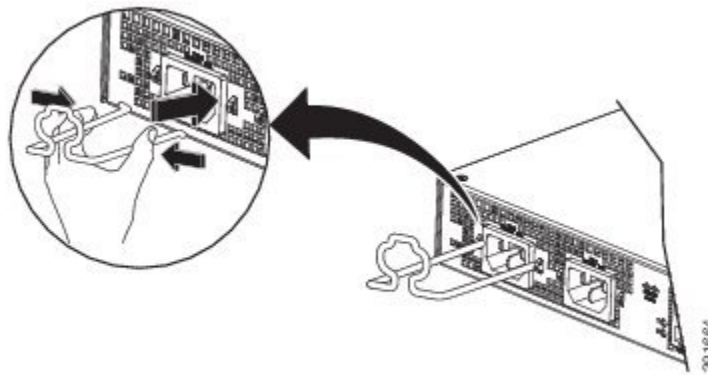
Follow these steps to activate an AC power supply:

### Procedure

---

**Step 1** Attach the AC power retainer cord as shown in the figure below.

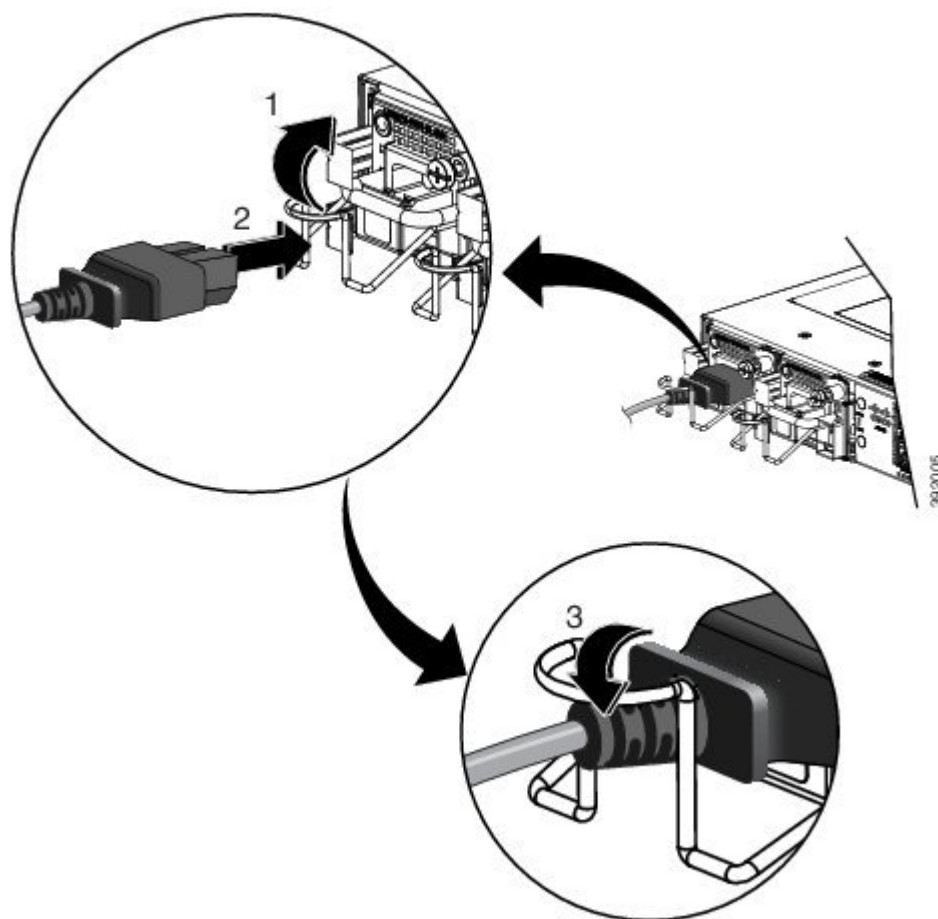
*Figure 25: Attaching the AC Power Retainer Cord*



**Step 2** Lift the power retainer and plug in the AC power supply.

**Step 3** Push the retainer cord towards the power supply cord to lock it in place as shown in the figure below.

Figure 26: Locking the Power Retainer Cord



- Step 4** Connect the other end of the power cord to an AC-input power source.
- Step 5** Verify power supply operation by checking that the power supply LED is green.
- Step 6** If the LEDs indicate a power problem, see *LED Indicators* section for troubleshooting information.
- Step 7** If you are installing a redundant power supply, repeat these steps for the second power source.

**Note** If you are installing a redundant AC power supply, ensure that each power supply is connected to a separate power source in order to prevent power loss in the event of a power failure.

## Removing and Replacing an AC Power Supply

This section describes how to remove and replace an AC power supply.



**Note** The Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router power supplies are hot-swappable. If you have installed redundant power supplies, you can replace a single power supply without interrupting power to the router.



**Caution** To avoid erroneous failure messages, allow at least 2 minutes for the system to reinitialize after a power supply has been removed or replaced.



**Warning** When you install the unit, the ground connection must always be made first and disconnected last. Statement 1046



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



**Warning** Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030



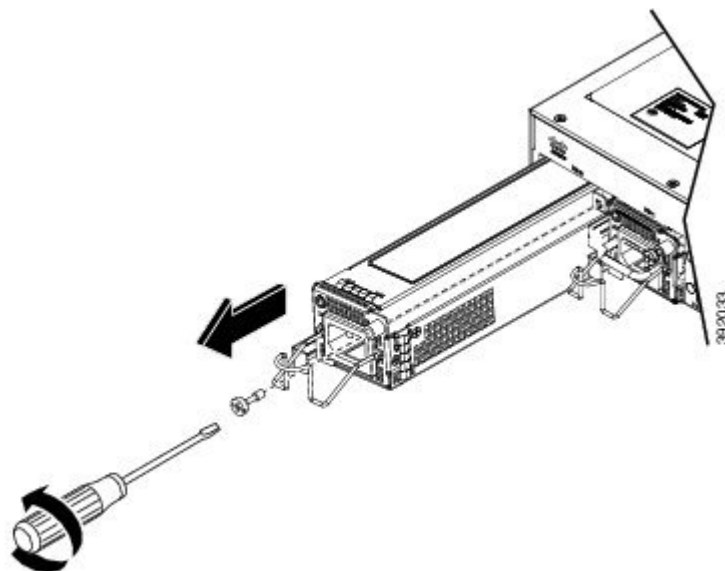
**Warning** Installation of the equipment must comply with local and national electrical codes. Statement 1074

Follow these steps to remove and replace an AC power supply:

#### Procedure

- Step 1** Disconnect the power cord from the power source. Do not touch the metal prongs on the power cord when it is still connected to the power supply.
- Step 2** Remove the power cord from the power connection on the power supply. Do not touch the metal prongs embedded in the power supply.
- Step 3** Loosen the captive installation screw as shown in the figure below.

Figure 27: Removing the AC Power Supply



**Caution** Do not use the captive installation screw or the power retainer to pull out the power supply.

- Step 4** Grasp the AC power supply metal tab with one hand, and slide it part of the way out of the chassis. Place your other hand underneath the power supply, and slide it completely out of the chassis. See *Installing the AC Power Supply* figure.
- Step 5** Replace the AC power supply within 5 minutes. See *Installing the AC Power Supply* figure. If the power supply bay is to remain empty, install a blank filler plate (Cisco part number 800-39165-01) over the opening, and secure it with captive installation screws.

## Installing and Removing SFP Modules

These sections describe how to install and remove SFP modules. The modules are inserted into the SFP module slots as depicted in *Installing an SFP Module without a Bale-Clasp Latch into an SFP Module Slot on Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router* figure. These field-replaceable modules provide interfaces.

See the *Supported PIDs* section for the list of SFP modules that the router supports. Each port must match the wavelength specifications on the other end of the cable. For reliable communications, the cable must not exceed the stipulated cable length.

Use only Cisco SFP modules on the Cisco router. Each SFP module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for Cisco to identify and validate that the SFP module meets the requirements for the router.

For detailed instructions on installing, removing, and cabling the SFP module, see the SFP module documentation.

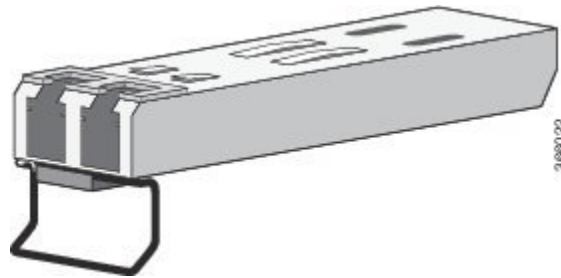
## Installing SFP Modules

The figure below shows an SFP module that has a bale-clasp latch.

**Caution**

We strongly recommend that you do not install or remove fiber-optic SFP modules with cables attached because of the potential damage to the cables, the cable connector, or the optical interfaces in the SFP module. Disconnect all cables before removing or installing an SFP module. Removing and installing an SFP module can shorten its useful life. Do not remove and insert SFP modules more often than is absolutely necessary.

**Figure 28: SFP Module with a Bale-Clasp Latch**

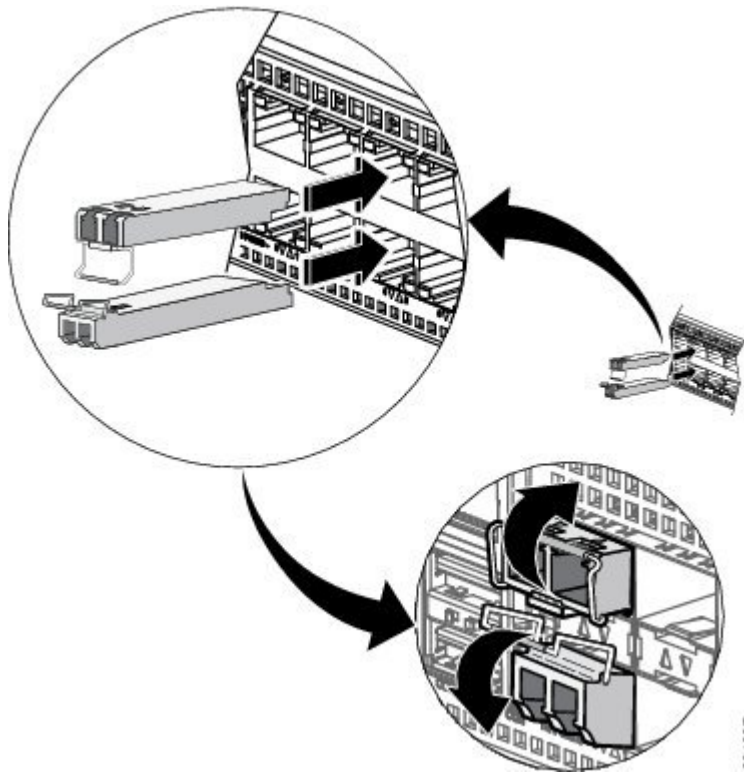


To insert an SFP module into the module slot, follow these steps:

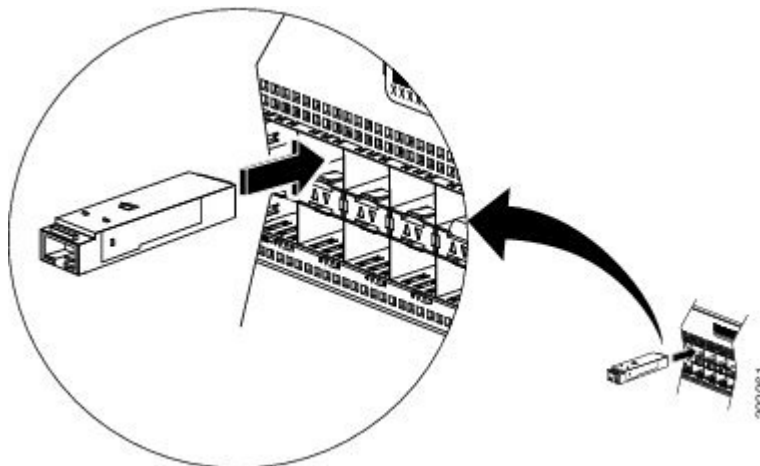
**Procedure**

- 
- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.
- Some SFP modules identify the top side of the module with send (TX) and receive (RX) markings or arrows that show the direction of the connection.
- Step 2** If the SFP module that you are using has the markings, use them to identify the top side of the module.
- Step 3** Align the SFP module in front of the slot opening.
- Step 4** Insert the SFP module into the slot until you feel the connector on the module snap into place in the rear of the slot. See *Installing an SFP Module with a Bale-Clasp Latch into an SFP Module Slot on Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router* figure for installing SFP Module with a Bale-Clasp Latch and *Installing an SFP Module without a Bale-Clasp Latch into an SFP Module Slot on Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router* figure for installing SFP Module without a Bale-Clasp Latch.

**Figure 29:** Installing an SFP Module with a Bale-Clasp Latch into an SFP Module Slot on Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router



**Figure 30:** Installing an SFP Module without a Bale-Clasp Latch into an SFP Module Slot on Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router



**Caution** Do not remove the dust plugs from the fiber-optic SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light. Store the dust plugs for later use.

**Step 5** Insert the cable connector into the SFP module:



- For fiber-optic SFP modules, insert the LC cable into the SFP module.
- For copper 1000BASE-T SFP modules, insert the RJ-45 cable connector into the SFP module.

## Removing SFP Modules

To remove an SFP module from a module receptacle, follow these steps:

### Procedure

- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.
- Step 2** Disconnect the cable from the SFP module, and insert a dust plug into the cable end.
- Tip** For reattachment, note which cable connector plug is send (TX) and which is receive (RX).
- Step 3** SFP module with Bale-Clasp Latch—Pull the bale out and down to eject the module as shown in the figure below. If the bale-clasp latch is obstructed and you cannot use your index finger to open it, use a small, flat-blade screwdriver or other long, narrow instrument to open the bale-clasp latch.

*Figure 31: Removing a SFP Module with Bale-Clasp Latch From Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router*

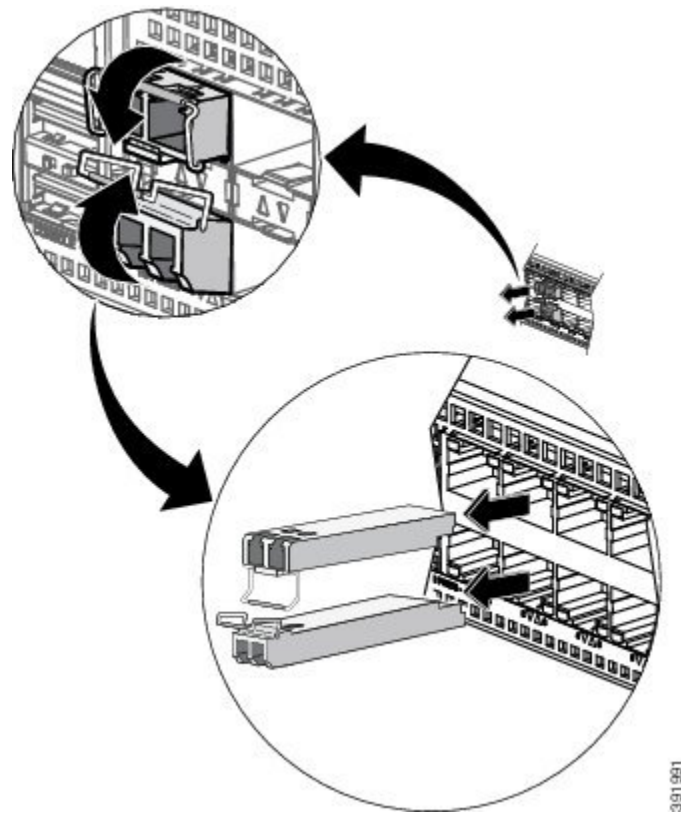
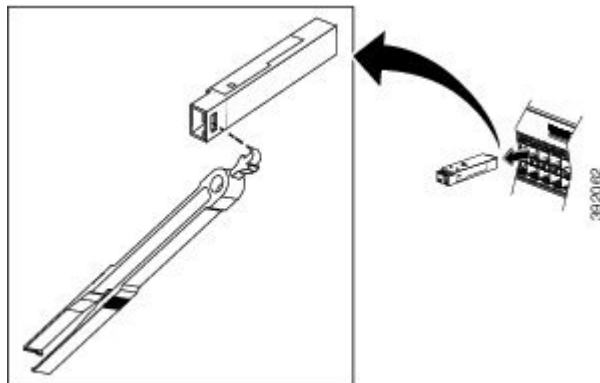


Figure 32: Removing a SFP Module without Bale-Clasp Latch From Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router



SFP module without Bale-Clasp Latch—Use the extraction tool to remove the SFP by inserting the tool into the side of the SFP module and pulling it out of the module slot as shown in the figure below.

- Step 4** Grasp the SFP module between your thumb and index finger, and carefully remove it from the module slot.
- Step 5** For fiber-optic SFP modules, insert a dust plug into the optical ports of the SFP module to keep the optical interfaces clean.
- Step 6** Place the removed SFP module in an antistatic bag or other protective environment.

## Connecting to the 10/100/1000 Ports



### Note

The router 10/100/1000 ports configure themselves to operate at the speed of attached devices. If the attached ports do not support autonegotiation, you can explicitly set the speed and duplex parameters. Connecting devices that do not autonegotiate or that have their speed and duplex parameters manually set can reduce performance or result in no linkage.

To maximize performance, choose one of these methods for configuring the Ethernet ports:

- Let the ports autonegotiate both speed and duplex.
- Set the port speed and duplex parameters on both ends of the connection.

### Procedure

- Step 1** When connecting to workstations, servers, and routers, connect a straight-through cable to an RJ-45 connector on the front panel. When connecting to routers or repeaters, use a crossover cable.

**Note** You can use the **mdix auto** interface configuration command in the CLI to enable the automatic medium-dependent interface crossover (auto-MDIX) feature. When the auto-MDIX feature is enabled, the router detects the required cable type for copper Ethernet connections and configures the interfaces accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a copper 10/100/1000, or an SFP module port on the router, regardless of the type of device on the other end of the connection.

- Step 2** Connect the other end of the cable to an RJ-45 connector on the other device. The port LED turns on when both the router and the connected device have established link.
- If the port LED does not turn on, the device at the other end might not be turned on, or there might be a cable problem or a problem with the adapter installed in the attached device.
- Note** On user network interface (UNI) ports, the port LED is green after the link is established.
- Step 3** Reconfigure and reboot the connected device, if necessary.
- Step 4** Repeat Steps 1 through 3 to connect each device.
- 

## Connecting to SFP Modules

This section describes how to connect to SFP modules. For instructions on how to connect to fiber-optic SFP modules, see the *Connecting to Fiber-Optic SFP Modules* section.

For instructions about how to install or remove an SFP module, see the *Installing and Removing SFP Modules* section.

## Connecting to Fiber-Optic SFP Modules

Follow these steps to connect a fiber-optic cable to an SFP module:



### Warning

Class 1 laser product. Statement 1008

---



### Caution

Do not remove the rubber plugs from the SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light.

---

### Procedure

---

- Step 1** Remove the rubber plugs from the module port and fiber-optic cable, and store them for future use.
- Step 2** Insert one end of the fiber-optic cable into the SFP module port.
- Step 3** Insert the other cable end into a fiber-optic connector on a target device.
- Step 4** Observe the port status LED.
- The LED turns green when the router and the target device have an established link.
- If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be problem with the adapter installed in the target device.
- Step 5** If necessary, reconfigure and restart the router or target device.
-

# Installing the Chassis Ground Connection

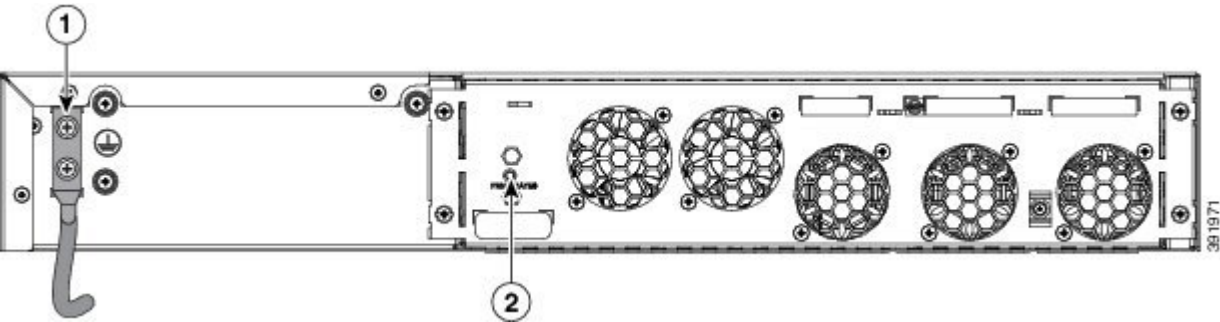
Before you connect the power or turn on the power to the Cisco ASR-920-24SZ-IM Router, you must provide an adequate chassis ground (earth) connection to your router.

This section describes how to ground the Cisco ASR-920-24SZ-IM Router chassis. The grounding lug location is on the back panel of the router.



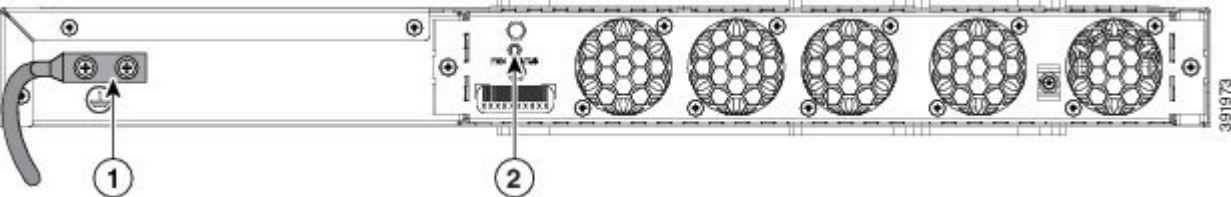
**Tip** Ensure that the grounding lug wire does not cover the fan opening.

Figure 33: Attaching a Grounding Lug to the Rear of the Cisco ASR-920-24SZ-IM Router



1	Grounding lugs	2	Fan status LED
---	----------------	---	----------------

Figure 34: Attaching a Grounding Lug to the Rear of the Cisco ASR-920-24SZ-M, ASR-920-24TZ-M Router



1	Grounding lugs	2	Fan status LED
---	----------------	---	----------------

To ensure that the chassis ground connection that you provide is adequate, you need the following parts and tools:

- Ratcheting torque screwdriver with Phillips head that exerts up to 15 in.-lb (1.69 N-m) of torque for attaching the ground wire to the router
- Crimping tool as specified by the ground lug manufacturer
- 6-AWG or larger copper wire for the ground wire
- Wire-stripping tools appropriate to the wire you are using

**Caution**

Before making connections to the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router, ensure that you disconnect the power at the circuit breaker. Otherwise, severe injury to you or damage to the router may occur.

**Warning**

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

**Warning**

Use copper conductors only. Statement 1025

**Warning**

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

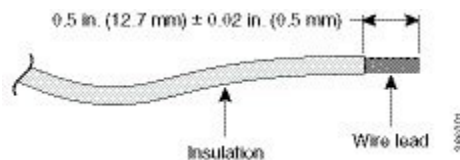
This unit is to be installed in a restrictive access location and must be permanently grounded to a minimum 6-AWG copper ground wire.

Perform the following procedure to ground the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router using a 2-hole lug and the corresponding mounting point. Most carriers require a minimum 6-AWG ground connection. Verify your carrier's requirements for the ground connection.

### Procedure

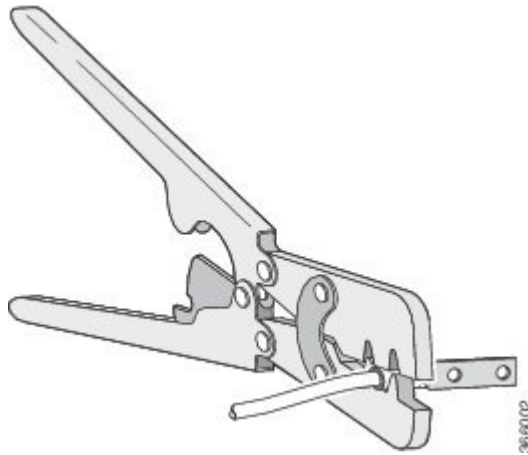
- Step 1** If your ground wire is insulated, use a wire-stripping tool to strip the ground wire to 0.5 inch  $\pm$  0.02 inch (12.7 mm  $\pm$  0.5 mm) (See the figure below).

**Figure 35: Stripping a Ground Wire**



- Step 2** Slide the open end of your 2-hole ground lug over the exposed area of the ground wire.
- Step 3** Using a crimping tool (as specified by the ground lug manufacturer), crimp the ground lug to the ground wire as shown in the figure below.

*Figure 36: Crimping a Ground Lug on to the Ground Wire*



- Step 4** Use a Phillips head screwdriver to attach the 2-hole ground lug and wire assembly to the router with the 2 pan-head Phillips head screws.
- Step 5** Connect the other end of the ground wire to a suitable grounding point at your site.

## Power Connection Guidelines

This section provides guidelines for connecting the Cisco ASR 920 Series Aggregation Services Router power supplies to the site power source.



### Warning

This equipment is intended to be grounded to comply with emission and immunity requirements. Ensure that the switch functional ground lug is connected to earth ground during normal use. Statement 1064



### Warning

The plug-socket combination must be accessible at all times because it serves as the main disconnecting device. Statement 1019



### Warning

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

## Guidelines for DC-Powered Systems

Basic guidelines for DC-powered systems include the following:

- Each chassis power supply should have its own dedicated input power source. The source must comply with the safety extra-low voltage (SELV) requirements in the UL 60950, CSA 60950, EN 60950, and IEC 60950 standards.

- The circuit must be protected by a dedicated two-pole circuit breaker. The circuit breaker should be sized according to the power supply input rating and local or national code requirements.
- The circuit breaker is considered the disconnect device and should be easily accessible.
- The system ground is the power supply and chassis ground.
- Do not connect the DC return wire to the system frame or to the system-grounding equipment.
- Use the grounding lug to attach a wrist strap for ESD protection during servicing.
- Ensure the DC return is grounded at the source side.

## Guidelines for AC-Powered Systems

Basic guidelines for AC-powered systems include the following:

- Each chassis power supply should have its own dedicated branch circuit.
- The circuit breaker should be sized according to the power supply input rating and local or national code requirements.
- The AC power receptacles used to plug in the chassis must be the grounding type. The grounding conductors that connect to the receptacles should connect to protective earth ground at the service equipment.

## Prevent Power Loss

Use the following guidelines to prevent power loss to the router:

- To prevent loss of input power, ensure that the total maximum load on each circuit supplying the power supplies is within the current ratings of the wiring and breakers.
- In some systems, you can use an UPS to protect against power failures at your site. Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the Cisco ASR 920 Series Router, which can have substantial current-draw fluctuations due to bursty data traffic patterns.

Determining power requirements is useful for planning the power distribution system needed to support the router.

## Activating a DC Power Supply

Perform the following procedure to activate a DC power supply:

### Procedure

- 
- |               |  |
|---------------|--|
| <b>Step 1</b> | Remove the tape from the circuit-breaker router handle, and restore power by moving the circuit-breaker router handle to the On (I) position.  |
| <b>Step 2</b> | Verify power supply operation by checking if the respective power supply front panel LED (PS0 or PS1) is green.  |
| <b>Step 3</b> | If the LEDs indicate a power problem, see the <i>Troubleshooting</i> section.  |
| <b>Step 4</b> | If you are connecting a redundant DC power supply, repeat these steps for the second power source.   |
| <b>Note</b>   | If you are connecting a redundant DC power supply, ensure that each power supply is connected to a separate power source in order to prevent power loss in the event of a power failure. |
-

## Activating an AC Power Supply

Perform the following procedure to activate an AC power supply:

### Procedure

---

- Step 1** Plug the power cord into the power supply.
- Step 2** Connect the other end of the power cord to an AC-input power source.
- Step 3** Verify power supply operation by checking if the respective power supply front panel LED (PS0 or PS1) is green.
- Step 4** If the LEDs indicate a power problem, see the *Troubleshooting* section for troubleshooting information.
- Step 5** If you are connecting a redundant AC power supply, repeat these steps for the second power source.

**Note** If you are connecting a redundant AC power supply, ensure that each power supply is connected to a separate power source in order to prevent power loss in the event of a power failure.

---

## Connecting a Router to the Network

The sections describe how to connect a Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router to the network:



**Note** Connect only SELV services to all the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router ports.

---

## Connecting Console Cables

This section describes how to connect to the Cisco ASR 920 Router using console cables:

### Connecting to the USB Serial Port Using Microsoft Windows

This procedure shows how to connect to the USB serial port using Microsoft Windows.



**Note** Install the USB device driver before establishing a physical connection between the router and the PC, by plugging the USB console cable into the USB serial port. Otherwise, the connection fails. For more information, see the *Installing the Cisco USB Device Driver* section.

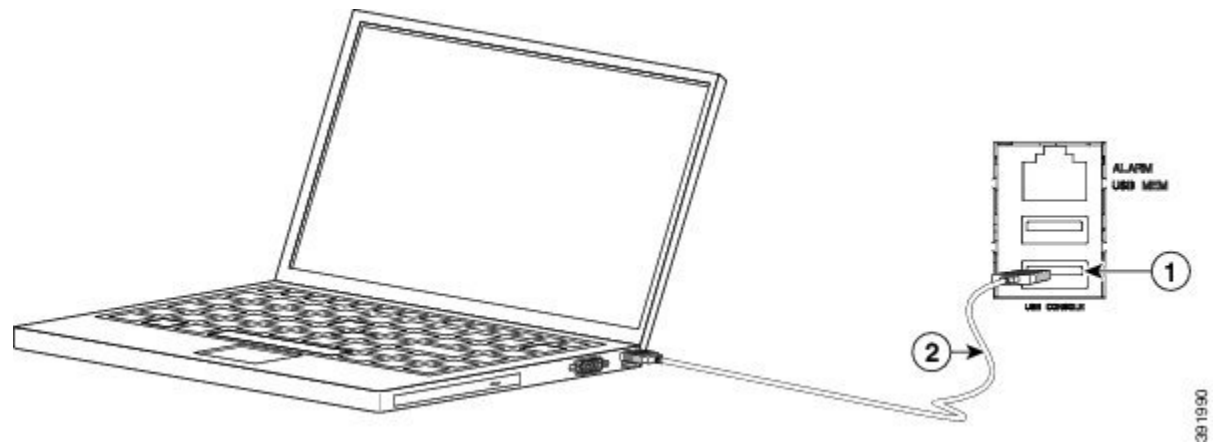
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## Procedure

- Step 1** Connect a USB Type A-to-Type A cable to the USB console port, as shown in figure. If you are using the USB serial port for the first time on a Windows-based PC, install the USB driver now according to the instructions in the following sections:
- Installing the Cisco USB Device Driver
  - Uninstalling the Cisco USB Device Driver
- Note** You cannot use the USB port and the EIA port concurrently. When the USB port is used, it takes priority over the EIA port.
- Step 2** Connect the USB Type A cable to the PC.
- Step 3** To communicate with the router, start a terminal emulator application, such as Microsoft Windows HyperTerminal. Configure the software with the following parameters:
- 9600 baud
  - 8 data bits
  - no parity
  - 1 stop-bit
  - no flow control

**Figure 37: Connecting the USB Console Cable to the Cisco ASR 920 Router**



Label	Cable	Label	Cable
1	USB Type-A console port	2	USB USB Type-A to USB Type-A console cable

## Connecting to the Console Port Using Mac OS X

This procedure describes how to connect a Mac OS X system USB port to the console using the built-in OS X terminal utility.

### Procedure

**Step 1** Use the Finder to choose Applications > Utilities > Terminal.

**Step 2** Connect the OS X USB port to the router.

**Step 3** Enter the following commands to find the OS X USB port number:

#### Example:

```
macbook:user$ cd /dev
macbook:user$ ls -ltr /dev/*usb*
crw-rw-rw-  1 root  wheel   19,   6 Dec  9 16:25 /dev/tty.usbmodem1411
crw-rw-rw-  1 root  wheel   19,   7 Dec  9 16:25 /dev/cu.usbmodem1411DT-macbook:dev user$
```

**Step 4** Connect to the USB port with the following command followed by the router USB port speed:

#### Example:

```
macbook:user$ screen /dev/tty.usbmodem1411 9600
```

To disconnect the OS X USB console from the terminal window, enter Ctrl-a followed by Ctrl-\

## Connecting to the Console Port Using Linux

This procedure shows how to connect a Linux system USB port to the console using the built-in Linux terminal utility.

### Procedure

**Step 1** Open the Linux terminal window.

**Step 2** Connect the Linux USB port to the router.

**Step 3** Enter the following commands to find the Linux USB port number:

#### Example:

```
root@usb-suse# cd /dev
root@usb-suse /dev# ls -ltr *ACM*
crw-r--r--  1 root    root    188,   0 Jan 14 18:02 ttyACM0
root@usb-suse /dev#
```

**Step 4** Connect to the USB port with the following command, followed by the router USB port speed:

#### Example:

```
root@usb-suse /dev# screen /dev/ttyACM0 9600
```

To disconnect the Linux USB console from the terminal window, enter Ctrl-a followed by : then quit

---

## Installing the Cisco USB Device Driver

A USB device driver must be installed the first time a Microsoft Windows-based PC is connected to the USB serial port on the router.

This procedure describes how to install the Microsoft Windows USB device driver in Microsoft Windows XP / Windows Vista / Windows 2000 / Windows 7 / Windows 8. Download the driver for your router model from the Tools and Resources Download Software site, [USB Console Software](#) category.



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**Note** To Download the driver, you must have a valid service contract associated to your Cisco.com profile.

---

### Procedure

---

- Step 1** Unzip the file asr-9xx\_usbconsole\_drivers.zip.
  - Step 2** Double-click xrusbser\_ver2100\_installer.exe in the XR21x141x-Win-DriversOnly-Vers2.1.0.0/EXE folder. Installation Wizard GUI is displayed.
  - Step 3** Click Next. The InstallShield Wizard Completed window is displayed.
  - Step 4** Click Finish.
  - Step 5** Connect the USB cable to the PC and router USB console ports. Follow the on-screen instructions to complete the installation of the driver.
  - Step 6** XR21V1401 USB UART Device driver successfully installed message is displayed.  
The USB console is ready for use.
- 

## Uninstalling the Cisco USB Device Driver

This procedure describes how to uninstall the Microsoft Windows USB device driver in Microsoft Windows XP / Windows Vista / Windows 2000 / Windows 7 / Windows 8.



---

**Note** Disconnect the router console terminal before uninstalling the driver.

---

### Procedure

---

- Step 1** Choose Start > Control Panel > Add or Remove Programs (Uninstall a program).
- Step 2** Scroll to Windows Driver Package - Exar corporation (xrusbser) Ports and click Remove. The Program Maintenance window is displayed.

**Step 3** Click Yes to uninstall the driver.

## Connecting to the EIA Console Port



**Note** The US-to-RJ45 adapter cable and the DB9 console cable are not included with the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router; they can be ordered separately from Cisco.



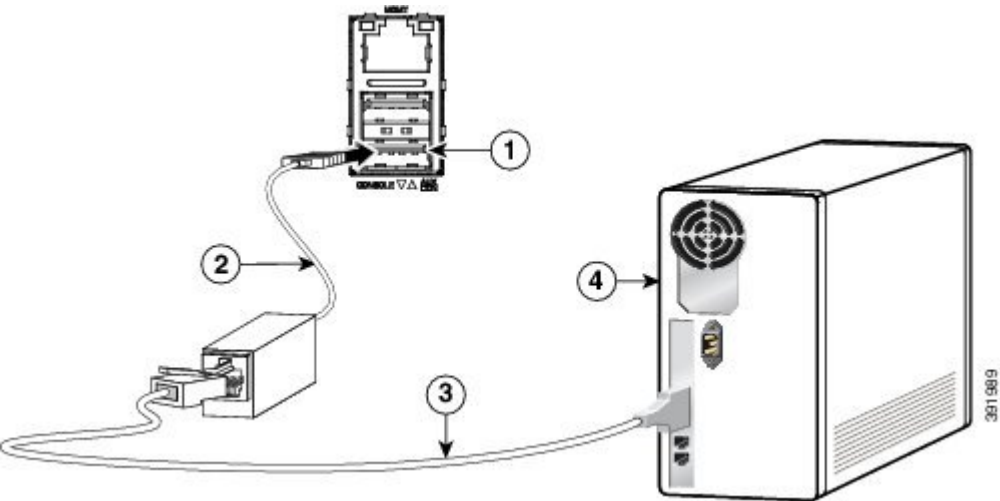
**Note** The serial console cable kit is not included with the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router; it is ordered separately.

To connect a terminal to the EIA Console port on the router, follow these steps:

### Procedure

- Step 1** Connect the USB end of the USB-to RJ-45 cable to the EIA Console port.
- Step 2** Connect the RJ-45 end of the DB-9 adapter cable to the USB-to RJ-45 cable, as shown in the figure below.

Figure 38: Connecting a Modem to the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router



1	EIA Console port	2	USB-to-RJ-45 adapter
3	RJ-45 to DB-9 cable	4	Desktop or system

- Step 3** Connect the DB-9 end of the console cable to the DB-9 end of the terminal.
- Step 4** To communicate with the router, start a terminal emulator application, such as Microsoft Windows HyperTerminal. This software should be configured with the following parameters:

- 9600 baud
- 8 data bits
- no parity
- 1 stop-bit
- no flow control

---

## Connecting a Management Ethernet Cable

When using the Ethernet Management port in the default mode (speed-auto and duplex-auto) the port operates in the auto-MDI/MDI-X mode. The port automatically provides the correct signal connectivity through the Auto-MDI/MDI-X feature. The port automatically senses a crossover or straight-through cable and adapts to it.

However, when the Ethernet Management port is configured to a fixed speed (10, 100, or 1000 Mbps) through command-line interface (CLI) commands, the port is forced to the MDI mode.

When in a fixed-speed configuration and MDI mode:

- Use a crossover cable to connect to an MDI port
- Use a straight-through cable to connect to an MDI-X port



### Warning

To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the Management Ethernet ports only to intra-building or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring. Statement

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## Installing and Removing SFP and SFP+ Modules

The Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router supports a variety of SFP and SFP+ modules, including optical and Ethernet modules. For information on how to install and remove SFP and SFP+ modules, see the documentation for the SFP or SFP+ module at:

[http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod_installation_guides_list.html)

For information about inspecting and cleaning fiber-optic connections, see:

[http://www.cisco.com/en/US/partner/tech/tk482/tk876/technologies\\_white\\_paper09186a0080254eba.shtml](http://www.cisco.com/en/US/partner/tech/tk482/tk876/technologies_white_paper09186a0080254eba.shtml)



### Caution

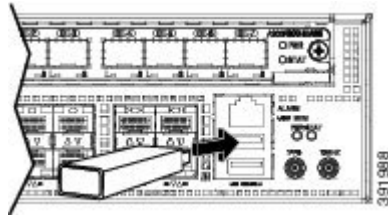
We recommend that you wait for 30 seconds between the removal and insertion of an SFP on an interface module. We recommend this to allow the transceiver software to initialize and synchronize with the Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router. Changing an SFP quicker could result in transceiver initialization issues that disable the SFP.

## Connecting a USB Flash Device

To connect a USB flash device to the Cisco ASR 920 Router, insert the memory stick in the USB port labeled USB MEM. The flash memory module can be inserted only one way, and can be inserted or removed regardless of whether the router is powered up or not.

The following figure shows the USB port connector on the Cisco ASR 920 Router.

**Figure 39: Cisco ASR 920 Router Flash Token Memory Stick**



## Removing a USB Flash Device

To remove and replace a USB flash token memory stick from and into a Cisco ASR 920 Router, follow these steps:

### Procedure

**Step 1** Execute the **eject usb0:** command before removing the USB from the router.

#### Example:

```
rommon 2 > eject usb0
rommon 2 >
```

If you do not run this command before removing the USB, the following error message is displayed:

```
rommon 2 > dir usb0:
usb_stor_BBB_comdat:usb_bulk_msg error
failed to send CBW status 34
RESET:stall
usb_stor_BBB_comdat:usb_bulk_msg error
failed to send CBW status 34
RESET:stall
usb_stor_BBB_comdat:usb_bulk_msg error
```

**Step 2** Pull the memory stick from the USB port.

**Step 3** To replace the Cisco USB flash memory stick, simply insert the module into the USB port labeled USB MEM, as shown in figure. The flash memory module can be inserted only one way, and can be inserted or removed regardless of whether the router is powered up or not.

This completes the USB flash memory installation procedure.

## Connecting Timing Cables

The sections describe how to connect timing cables to the Cisco ASR 920 Router:

**Warning**

To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the ToD ports only to intra-building or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring.

## Connecting a Cable to the BITS Interface

The following steps describe how to connect a cable to the router's BITS port:

### Procedure

- Step 1** Confirm that the router is powered off.
- Step 2** Connect one end of the cable to the BITS port using a straight-through, shielded RJ48C-to-RJ48C cable.
- Step 3** Connect the other end to the BTS patch or demarcation panel at your site.
- Step 4** Turn on the power to the router.

For information about the BITS port pinouts, see the *Troubleshooting* section.

## Connecting Cables to the GPS Interface

The sections describe how to connect cables from the Cisco ASR 920 Router to a GPS unit for input or output timing of frequency:

**Note**

When installing the cables to the RSP, we recommend that you leave a service loop of extra cable to enable fan tray removal.

## Connecting a Cable to the Input 10-Mhz or 1-PPS Interface

### Procedure

- Step 1** Connect one end of a shielded mini-coax cable to the GPS unit.
- Step 2** Connect the other end of the shielded mini-coax cable to the 10-Mhz or 1-PPS port on the RSP of the Cisco ASR 920 Router.

## Connecting a Cable to the Output 10-Mhz or 1-PPS Interface

### Procedure

---

- Step 1** Connect one end of a shielded mini-coax cable to the Slave unit.
- Step 2** Connect the other end of the shielded mini-coax cable to the 10-Mhz or 1-PPS port on the RSP of the Cisco ASR 920 Router.
- 

## Connecting a Cable to the ToD Interface

### Procedure

---

- Step 1** Connect one end of a straight-through Ethernet cable to the GPS unit.
- Step 2** Connect the other end of the straight-through Ethernet cable to the ToD or 1-PPS port on the RSP of the Cisco ASR 920 Router.

**Note** For instructions on how to configure clocking, see the *Cisco ASR 920 Series Aggregation Services Routers Configuration Guide*.

---

## Connecting Ethernet Cables

The Cisco ASR 920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M Router interface modules support RJ-45 and Ethernet SFP ports. For instructions on how to connect cables to Ethernet SFP ports, see the *Connecting Cables to SFP Modules* section.

The RJ-45 port supports standard straight-through and crossover Category 5 unshielded twisted-pair (UTP) cables. Cisco does not supply Category 5 UTP cables; these cables are available commercially.



### Warning

To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the Gigabit Ethernet ports only to intra-building or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring.

---

Follow these steps to connect a cable to a copper Gigabit Ethernet port:

### Procedure

---

- Step 1** Confirm that the router is powered off.
- Step 2** Connect one end of the cable to the Gigabit Ethernet port on the router.



**Step 3** Connect the other end to the BTS patch or demarcation panel at your site.

---

## Connecting Cables to SFP Modules

For information on connecting cables to Cisco optical and Ethernet SFP interfaces, see:

[http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod_installation_guides_list.html).

## Connector and Cable Specifications

For more information on cable specifications and pinouts, see the Troubleshooting section.

