



# Installing the Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers

This chapter describes how to install the routers and includes the following sections:



**Note** Effective July 2018, the Cisco ASR 920-10SZ-PD front panel and case are remodeled. All installation procedures, however, remain the same. The following figure shows the remodeled Cisco ASR 920-10SZ-PD and the Cisco ASR-920-8S4Z-PD router. The difference between the two variants is only the label on the front panel.

- [Prerequisites, on page 1](#)
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## Prerequisites

Before installing the 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 router. See *Unpacking and Verifying the Shipped Contents* section.
- Gathering the tools and test equipment required to properly install the router. See *Tools and Equipment* section.

For more instructions on how to prepare for the installation of the router, see *Preparing for Installation*.

# Installing the Router in a Rack

The following sections describe how to install the router in a rack. The procedures in this section apply to both horizontal and vertical mounting of the router in a rack:

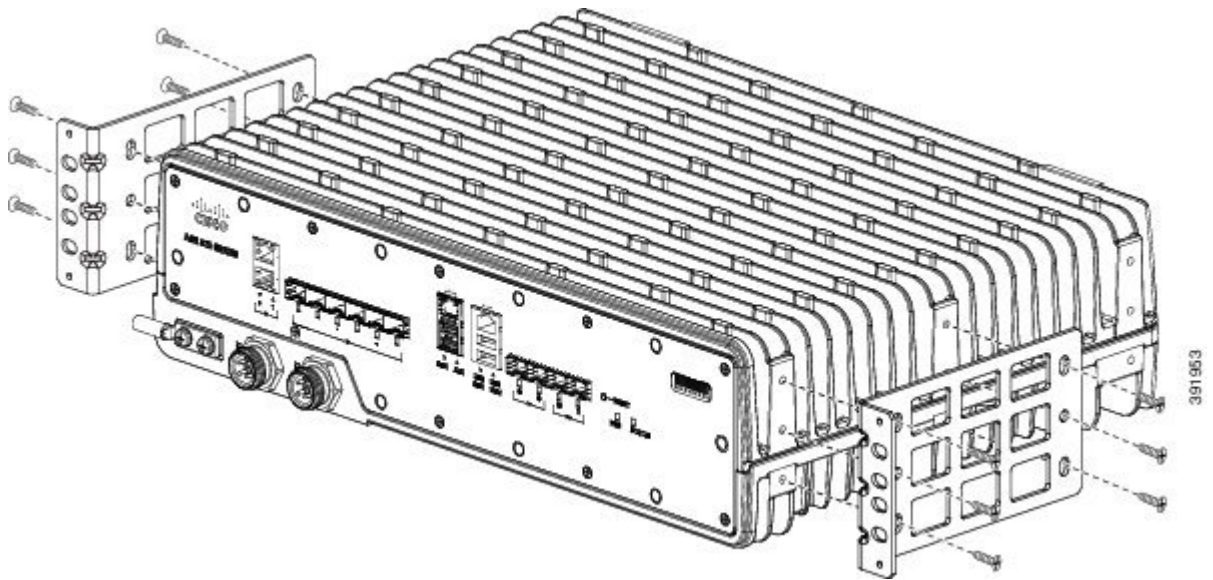
## Installing the Chassis Brackets

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

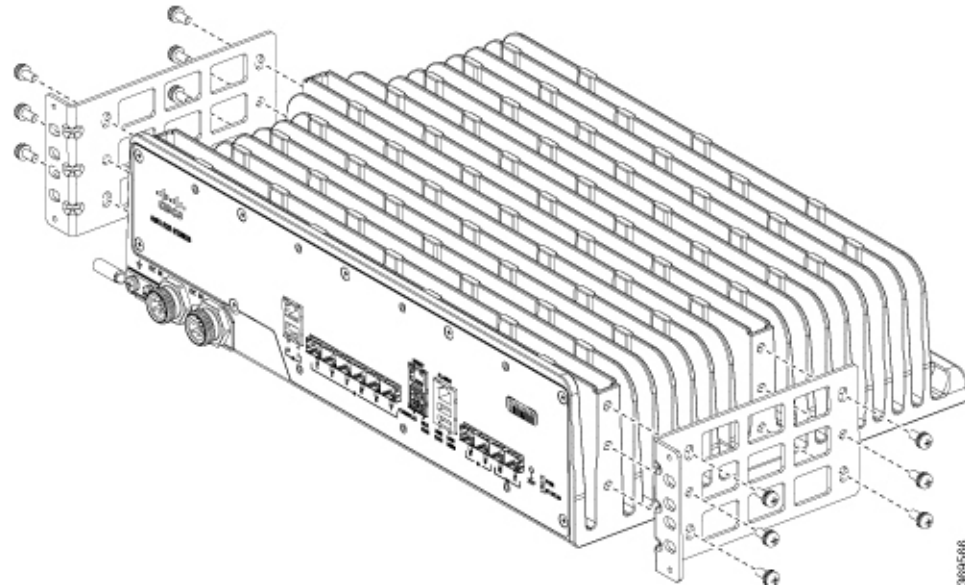
### Procedure

- Step 1** Remove the rack-mount brackets from the accessory kit and position them beside the router chassis. Figure below shows how to attach the brackets at the front position on the router for a 19-inch EIA rack.

*Figure 1: Attaching Mounting Brackets for a 19-inch EIA Rack*



**Figure 2: Attaching Mounting Brackets for a 19-inch EIA Rack - Remodeled**



- Step 2** Position one of the brackets against the chassis side, and align the screw holes.
- Step 3** Secure the bracket to the chassis with the M5 screws removed when performing Step 1. The recommended maximum torque is 10 in.-lb.
- Step 4** Repeat Step 2 and Step 3 for the other bracket.

## Installing the Router Chassis in the Rack



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



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

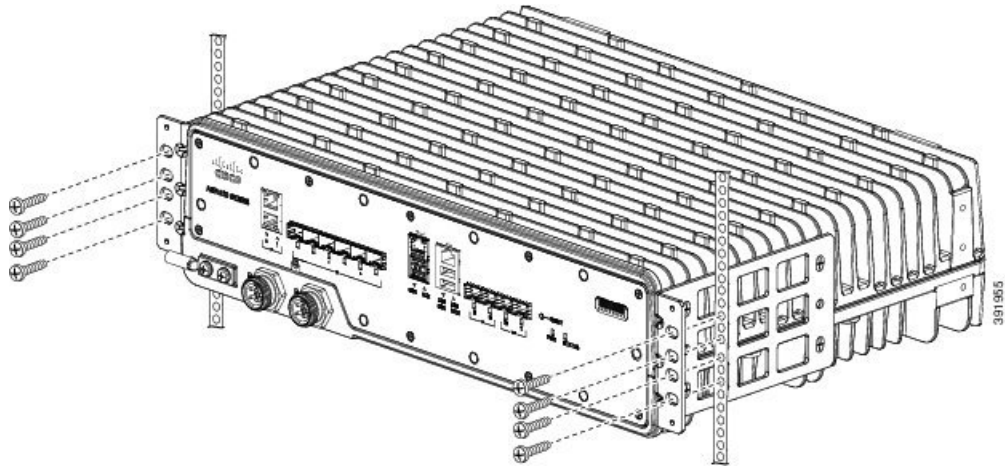
To install the router chassis in the equipment rack, perform these steps:

### Procedure

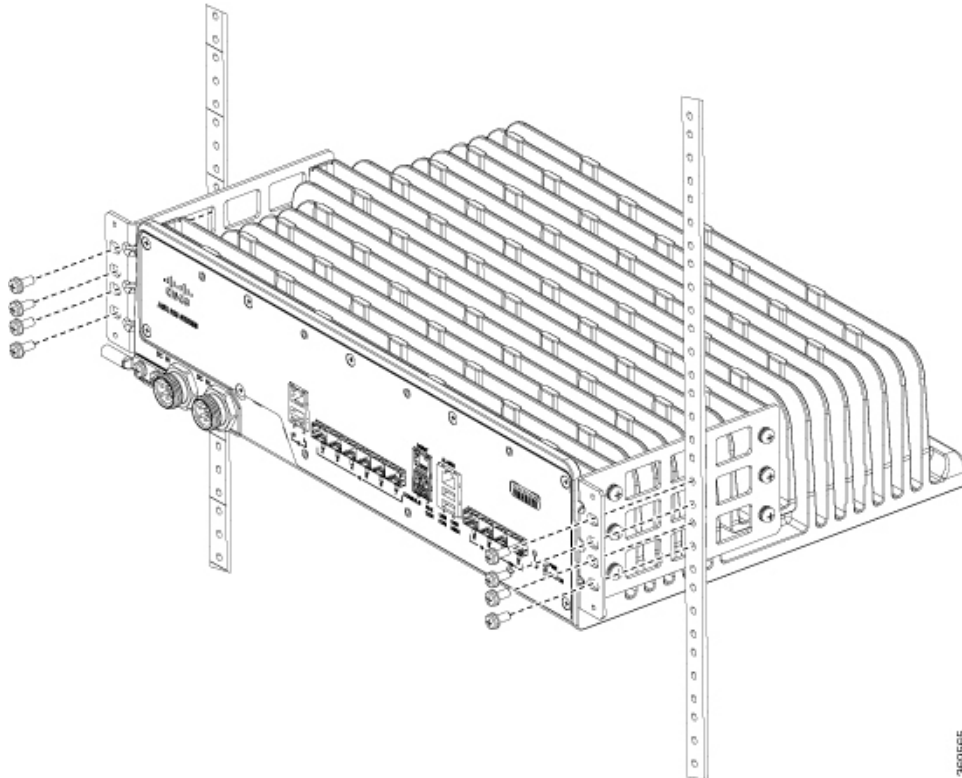
- Step 1** Insert the rear of the chassis between the mounting posts.
- Step 2** Align the mounting holes in the bracket (and optional cable guide) with the mounting holes in the equipment rack.

The following figure shows how to install the router in a 19-inch EIA rack.

*Figure 3: Installing the Chassis in a 19-inch EIA Rack*



*Figure 4: Installing the Chassis in a 19-inch EIA Rack - Remodeled*



- Step 3** Install the eight 12-24 x 3/4-inch or 10-32 x 3/4-inch 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 router supports the following cable guides:

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



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**Note** Assemble the cable guides before installing the chassis on the rack.

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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 figure below.

*Figure 5: Cable Guide Installation For 19-inch Rack Brackets*

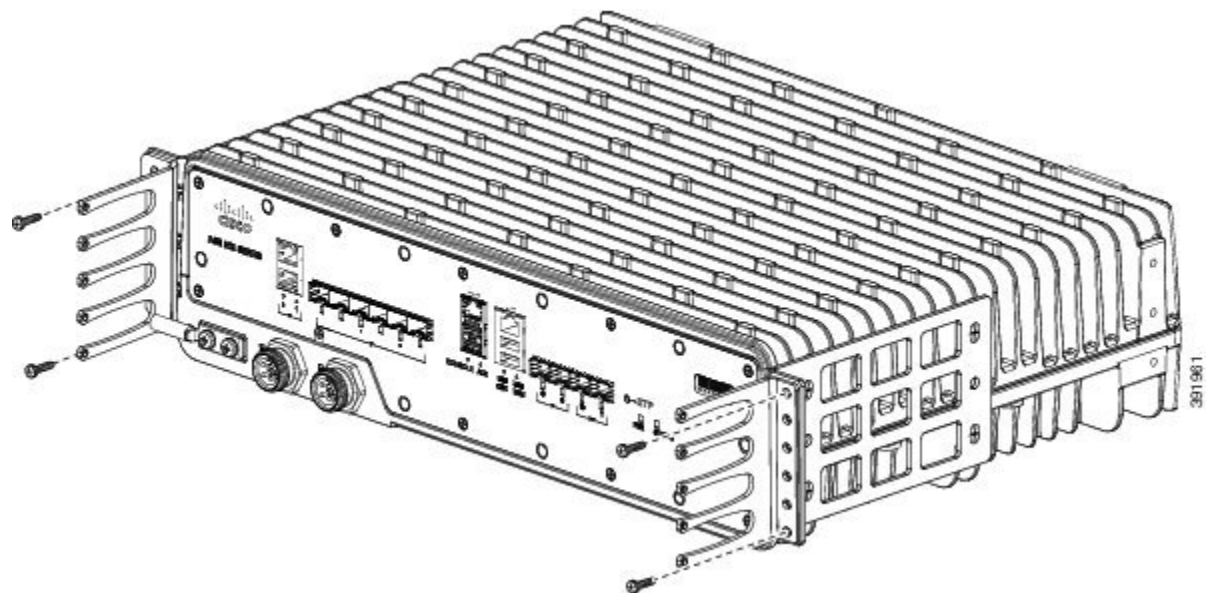
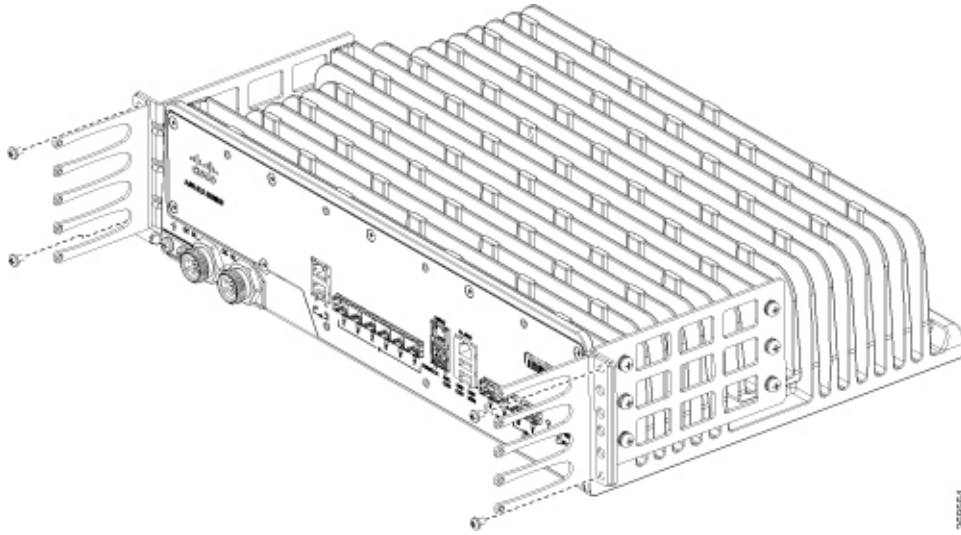


Figure 6: Cable Guide Installation For 19-inch Rack Brackets - Remodeled



- Step 2** Secure the cable guides with the four M4x6mm screws supplied with the cable guide kit. The recommended maximum torque is 10 in-lb (1.12 N-m)

## Installing the Front Cover

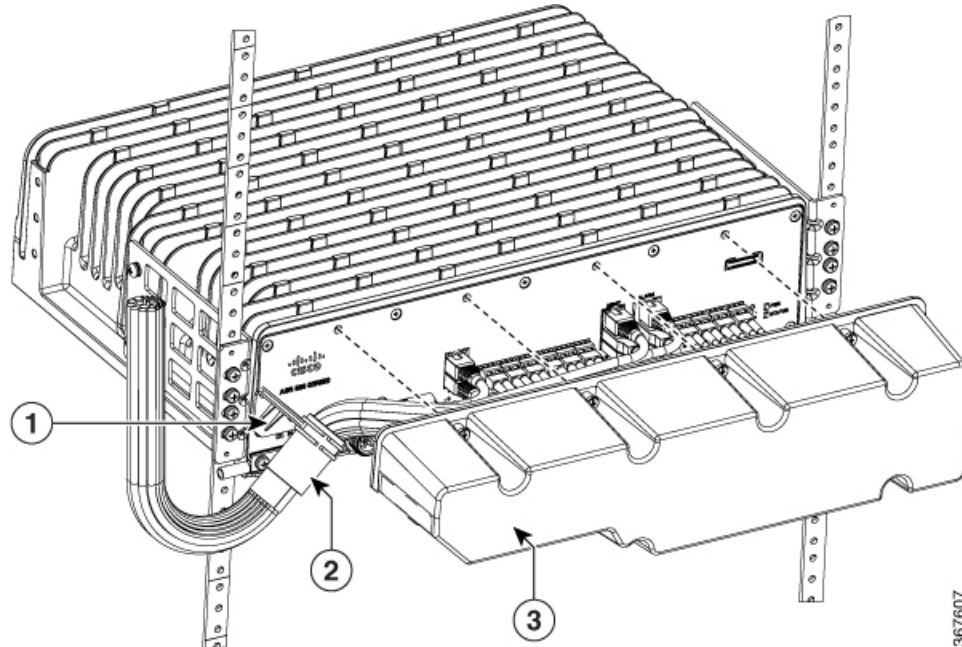
### Before you begin

The front cover protects the system from dust. Ensure the disturbance to cable routing is minimal to avoid loss of connection.

### Procedure

- Step 1** Place the cable sleeve close to the router.
- Step 2** Secure the fiber or cable bundle in the cable tube. Slide the cable tube into the cable sleeve as shown in the following figure.
- Step 3** Slide the front cover over the cable tube and secure it with the fasteners on the cable cover.

Figure 7: Installing the Front Cover Assembly



1	Cable Sleeve	2	Cable Tube
3	Front Cover	—	—

Watch [Protecting the Cisco ASR 920-10SZ-PD Router \(Video\)](#).

## Connect the Chassis Ground and Power

Before you connect the power or turn on power to the router, you must provide an adequate chassis ground (earth) connection to your router.

### Grounding the Router

The router provides a grounding point on either side of the unit for a two-hole lug.



#### Caution

Before making connections to the router, ensure that you disconnect the power at the circuit breaker. Otherwise it may result in severe injury to yourself, or damage to the router.



#### 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

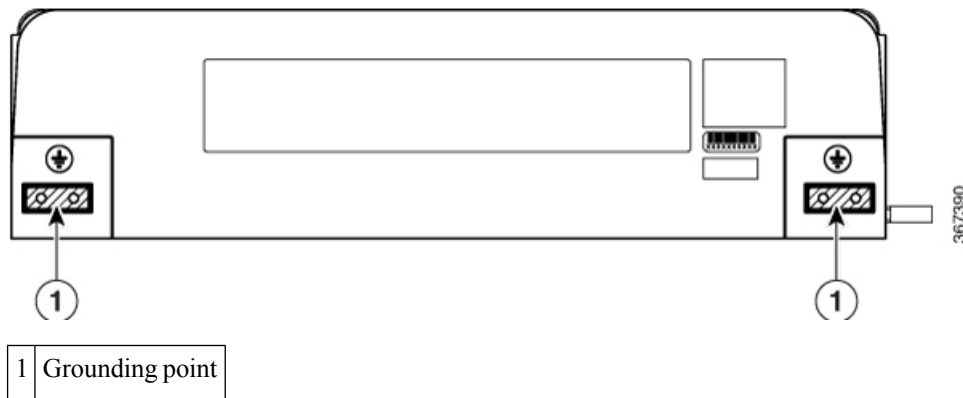


**Warning** When installing the unit, the ground connection must always be made first and disconnected last. Statement 42

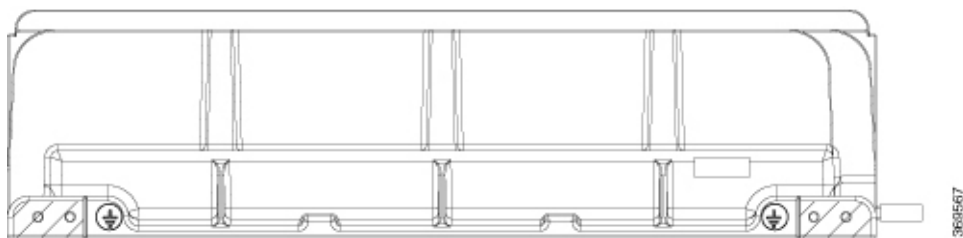
The following figure shows one of the grounding points of the router, for ease of installation. The other grounding point is on the front panel, which can also be used for grounding the router.

Effective July 2018, the Cisco ASR-920-10SZ-PD rear panel is remodeled. All installation procedures, however, remain the same. The following figure shows the remodeled rear Cisco ASR 920-10SZ-PD Router.

**Figure 8: Grounding Point on the Router**



**Figure 9: Grounding Point on the Remodeled Router**



Perform the steps given below to ground the router using a two-hole lug and the corresponding mounting point. Most routers require a 6-AWG ground connection. Verify your router requirements for the ground connection.

## Materials Required

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

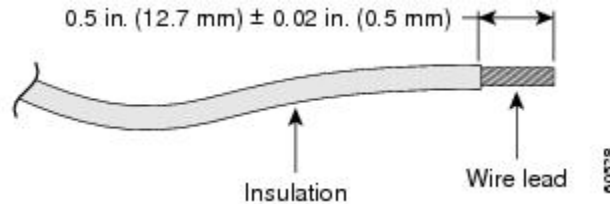
- Ratcheting torque screwdriver with Phillips head that exerts up to 15 pound-force inches (lbf-in) of pressure for attaching the ground wire to the router.
- Crimping tool as specified by the ground lug manufacturer.
- 6-AWG or larger copper wire for the grounding wire
- Appropriate wire-stripping tools



## Procedure

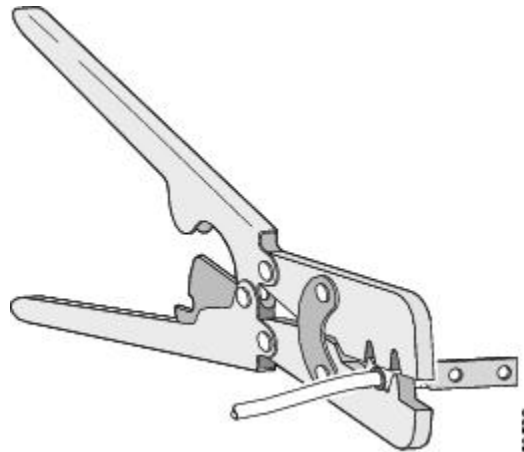
- Step 1** Remove the two-hole lug from the router.
- Step 2** Set the parts aside.
- Step 3** If your ground wire is insulated, use a wire-stripping tool to strip the ground wire to 0.5 inch  $\pm$  0.02 inch (12.7 mm  $\pm$  0.5 mm) for the ring terminal (see the following figure)

**Figure 10: Stripping a Ground Wire**



- Step 4** Slide the open end of your 2-hole ground lug over the exposed area of the ground wire.
- Step 5** Using a crimping tool (as specified by the ground lug manufacturer), crimp the ground lug to the ground wire as shown in figure below.

**Figure 11: Crimping a Ground Lug on to the Ground Wire**



- Step 6** 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 7** 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.




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**Warning** 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 213.

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

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**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.

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## 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.

## 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 router, which can have substantial current-draw fluctuations due to bursty data traffic patterns.

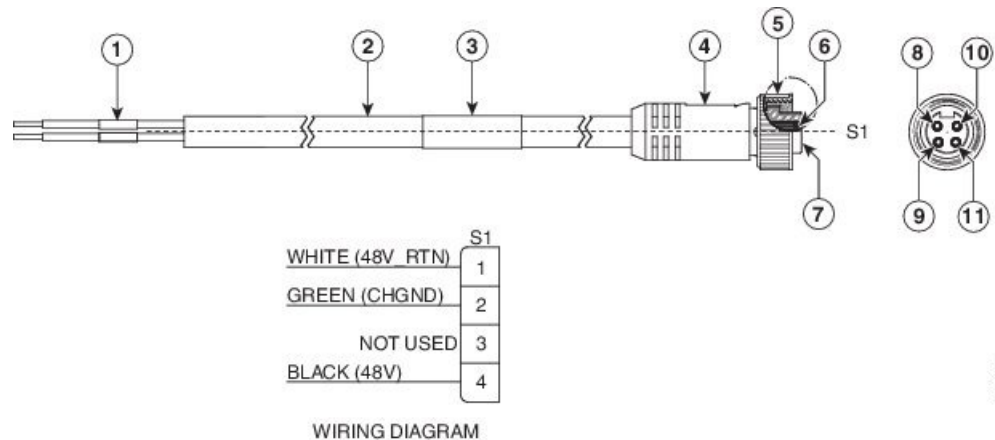
Use the information in the [Table 1](#) to estimate the power requirements and heat dissipation of a router based on a given configuration of the router. Determining power requirements is useful for planning the power distribution system needed to support the router.

# Assembling and Connecting the DC Power Cable to the Router

## Materials Required

- Three-meter long over-molded power cable marked with positive, negative, and grounding.

Figure 12: Four-pin Power Connector



1	DC plug	5	Coupling nut
2	Cable	6	Contact socket
3	Wrap label	7	Insulator
4	Overmold	8, 9, 10, 11	Contacts

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.



**Note** A circuit breaker of maximum 15 A should be used.



**Warning** A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022



**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).

**Warning**

Connect the unit only to DC power source that complies with the safety extra-low voltage (SELV) requirements in IEC 60950 based safety standards. Statement 1033

**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 24V and -48 VDC.

## Before You Begin

When powering the router with DC power, you must ensure that DC power can be conveniently removed from the unit. The power should not be removed by disconnecting the DC power connector on the unit.

## Procedure

**Procedure**

- 
- Step 1** Fix the connector side to the router.
  - Step 2** Ensure that the notch on the connector is aligned with the contact socket on the cable. See Four-pin Power Connector figure .
  - Step 3** Tighten coupling nut fully so that the connector is fastened to the router.
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## Powering On the Router

After the router is rack mounted, perform these tasks to complete the installation:

- Power on the router.
- Connect the front-panel ports. See the *Connecting to SFP Modules* section, to complete the installation.

## Activating the DC Power Supply

Perform the following procedure to activate a DC power supply:

**Procedure**

- 
- Step 1** Remove the tape from the circuit-breaker router handle, and restore power by moving the circuit-breaker router handle to the On (I) position.
  - Step 2** Verify power supply operation by checking if the front panel LED (PWR) is ON.

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

## 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 into an SFP Module Slot* figure. These field-replaceable modules provide interfaces.

See the Supported SFPs and PIDs 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.

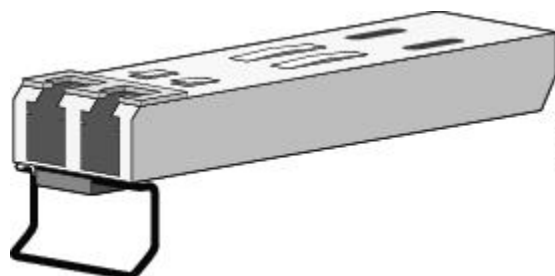
## Installing SFP Modules

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 13: SFP Module with a Bale-Clasp Latch**



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

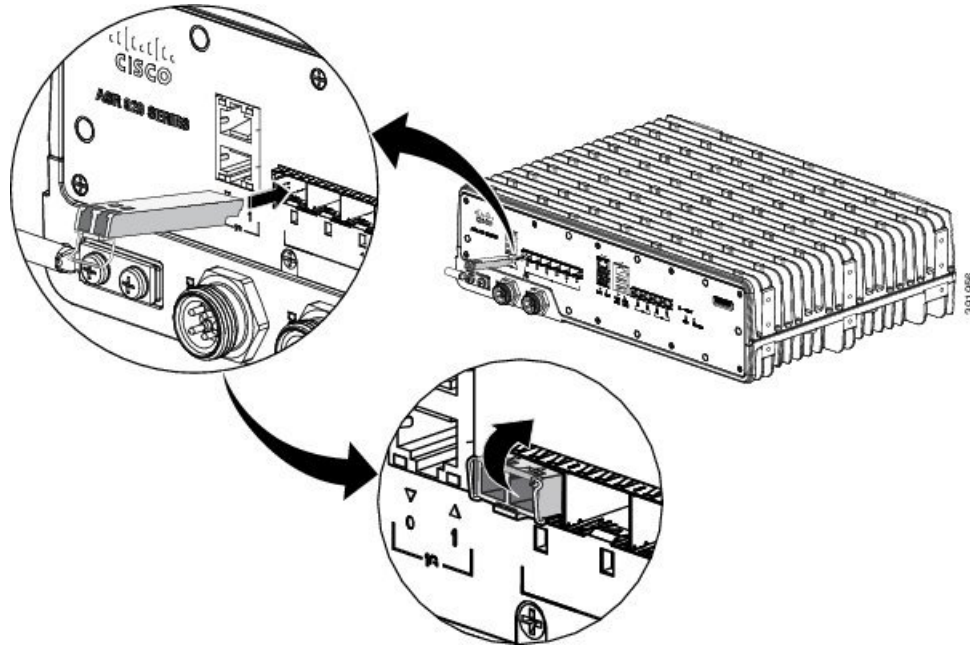
### Procedure

**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.

**Figure 14: Installing an SFP Module into an SFP Module Slot**



**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

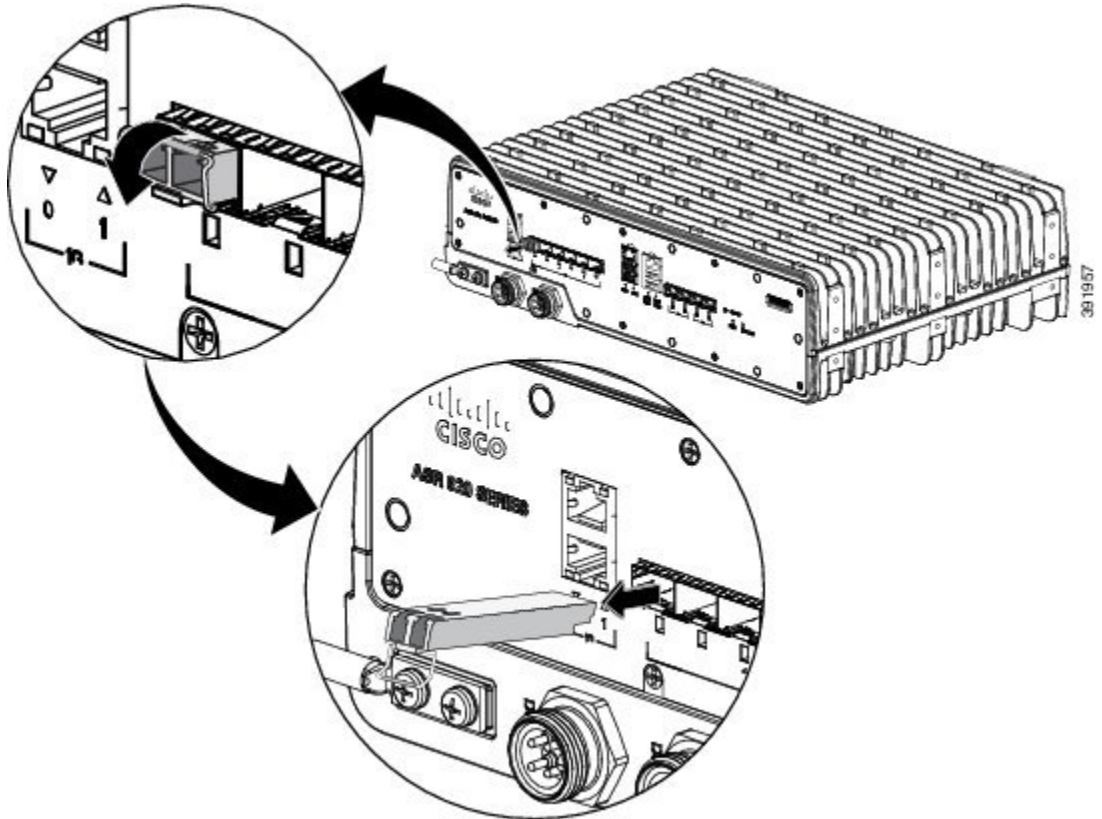
- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.
- Step 2** Disconnect the cable from the SFP module, and insert a dust plug into the cable end.

**Tip** For reattachment, note which cable connector plug is send (TX) and which is receive (RX).

**Step 3** Unlock and remove the SFP module, as shown in the following figure.

If the module has a bale-clasp latch, pull the bale out and down to eject the module. 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 15: Removing a Bale-Clasp Latch SFP Module**



**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



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**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.

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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

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**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.

**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 turns Yellow, 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 network interface 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.

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## 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*.

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

## Connecting to Fiber-Optic SFP Modules

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



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**Warning** Class 1 laser product. Statement 1008

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**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.

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### Procedure

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**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 turns Yellow, 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.

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## Connect the Router to the Network

The following sections describe how to connect a router to the network:



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**Note** Connect only SELV services to all the router ports.

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## Connect Console Cables

The following sections describe how to connect to the 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.



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

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### Procedure

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**Step 1** Connect a USB Type A-to-Type A cable to the USB console port, as shown in figure below.

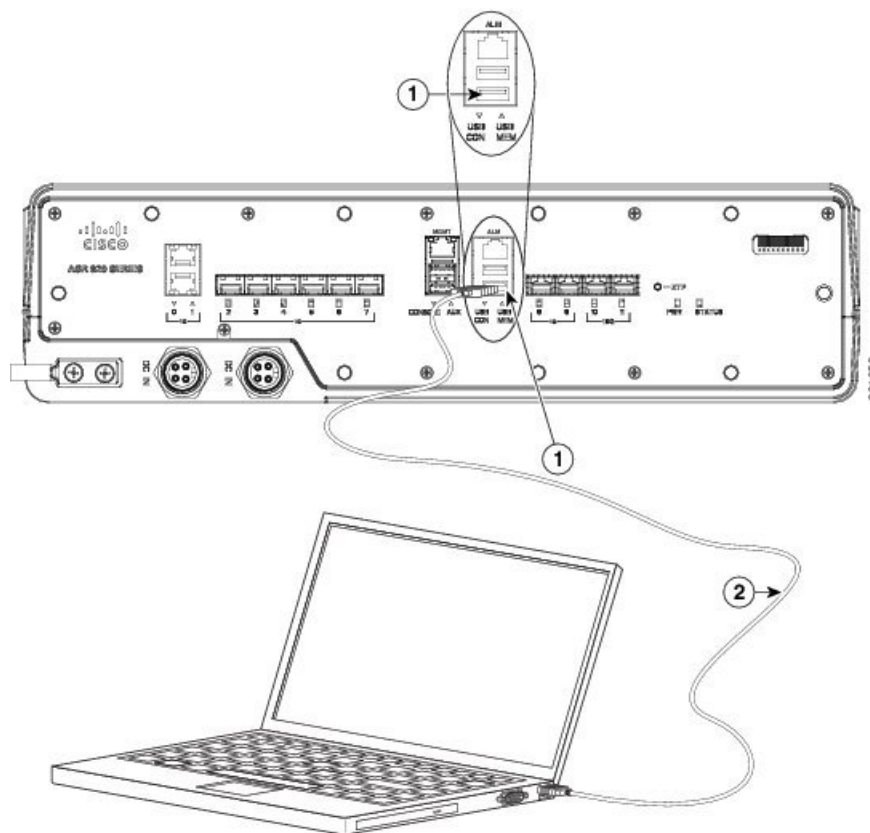
**Note** You cannot use the USB port and the EIA port concurrently. When the USB port is used, it takes priority over the EIA port.

**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. This software should be configured with the following parameters:

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

Figure 16: Connecting the USB Console Cable to the router



Label	Cable	Label	Cable
1	USB Type-A console port	2	USB Type-A (male) to USB Type-A (male) 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

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- 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          9,  66 Apr  1 16:46 tty.usbmodem1a21 DT-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.usbmodem1a21 9600
```

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

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## 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

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- 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, and Windows 8. Download the driver for your router model from the Tools and Resources Download Software site, USB Console Software category, at:

<https://www.cisco.com/downloads/ct/m/ct/mfi/2803764&fwid=71056&swid=2885122&class=313&ind=AVAILABLE&cid=&type=txt>



**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 Driver

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



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

### Procedure

- Step 1** Choose Start > Control Panel > Add or Remove Programs.

- 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 USB-to-RJ45 adapter cable and the DB9 console cable are not included with the router; they can be ordered separately from Cisco.

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**Note** The serial console cable kit is not included with the router; it is ordered separately.

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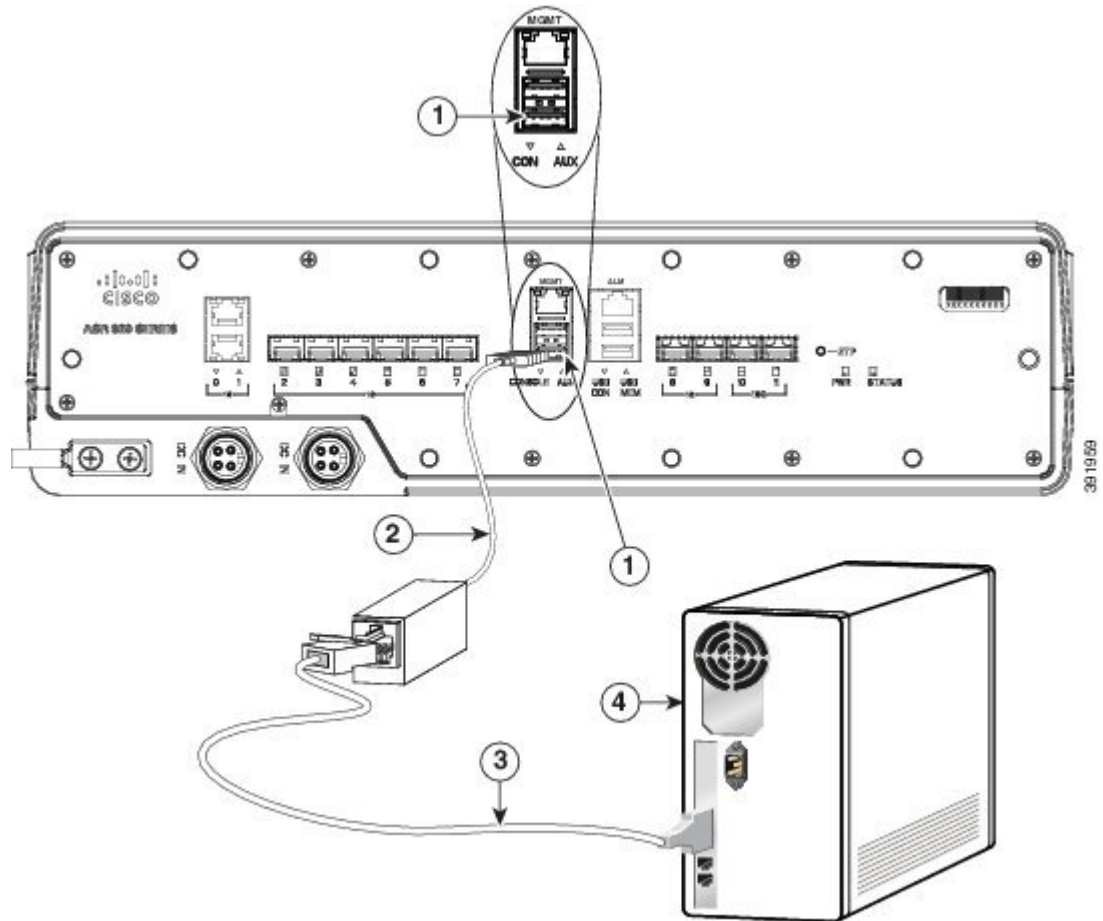
To connect a terminal to the EIA Console port on the router, follow these steps:

### Procedure

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- 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 figure below.

Figure 17: Connecting a Terminal to the Router



Label	Component	Label	Component
1	EIA Console port	3	RJ-45 to DB-9 cable
2	USB-to-RJ45 adapter	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

## Connect a Management Ethernet Cable



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**Note** It is recommended that you retain the RJ-45 dust caps for the ports (RJ-45, SFP, and USB ports) that are not used.

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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



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**Note** 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.

---

## Install and Remove SFP and SFP+ Modules

The 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)



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**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 router. Changing an SFP more quickly could result in transceiver initialization issues that disable the SFP.

---

## Connecting a USB Flash Device

To connect a USB flash device to the router, remove the dust cap and insert the memory stick in the USB port labeled USB MEM.

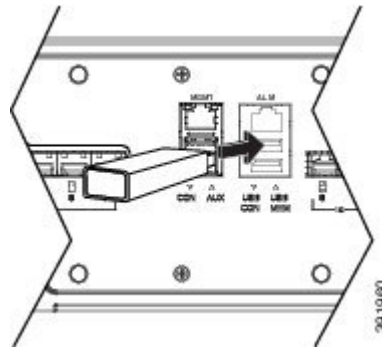


**Note** Retain the dust caps for later use.

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.

Figure below shows the USB port connector on the router.

**Figure 18: Router Flash Token Memory Stick**



## Removing and Replacing a USB Flash Device

To remove and replace a USB flash token memory stick from and into a router, follow these steps:



**Note** If the USB flash device is abruptly removed, the constant sync operations of the file system in progress fail due to the USB device removal. These errors occur with ext2 or ext3 or ext4 file systems and are not seen with fat32 file system. This is a default behavior on any Linux platform.

The following error messages are displayed when you remove the USB device:

```
*Jun 24 10:29:45.766: %IOSXE-3-PLATFORM: R0/0: kernel: EXT2-fs (sda1): previous I/O error
to superblock detected
*Jun 24 10:29:45.878: %IOSXE-3-PLATFORM: R0/0: kernel: EXT2-fs (sda1): previous I/O error
to superblock detected
*Jun 24 10:29:46.012: %IOSXE-3-PLATFORM: R0/0: kernel: EXT2-fs (sda1): previous I/O error
to superblock detected
*Jun 24 10:29:46.013: %IOSXE-3-PLATFORM: R0/0: kernel: EXT2-fs (sda1): previous I/O error
to superblock detected
```

### 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 router Flash Token Memory Stick 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.

**Note** If you are permanently removing the USB Flash device, reinstall the dust cap in the USB port.

## Connecting Ethernet Cables



**Note** To achieve good performance, it is recommended to use Shielded Twisted Pair (STP) Cat 5E/Cat 6 cables for all RJ-45 ports on the router.

The 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*.

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



**Note** 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 metallicly 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 metallicly to OSP wiring.

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

### Procedure

**Step 1** Connect one end of the cable to the Gigabit Ethernet port on the router.

**Step 2** Connect the other end to the BTS patch or demarcation panel at your site.

## Connect 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 [Troubleshooting](#).