



QUICK START GUIDE



Cisco ASR 1002-F Router

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1 Documentation and Resources

Documentation for the Cisco ASR 1000 Series Aggregation Services Routers documentation is online with the exception of the regulatory compliance and safety documentation and the *Cisco ASR 1000 Series Aggregation Services Routers* documentation flyer. For detailed hardware installation instructions, refer to the online [Cisco ASR 1000 Series Aggregation Services Routers Hardware Installation Guide](#). Refer to the following documentation for more information on the Cisco ASR 1000 Aggregation Services Routers:

- Shared port adapter documentation—See the [Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Hardware Installation Guide](#) and [Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Software Configuration Guide](#)
- Configuration documentation—See the [Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide](#)

Document Revision History

The Document Revision History table below records technical changes to this document.

Document Version	Date	Change Summary
OL-19050-01	June 2009	First version of the Cisco ASR 1002-F Router

2 Obtaining Documentation and Submitting a Service Request

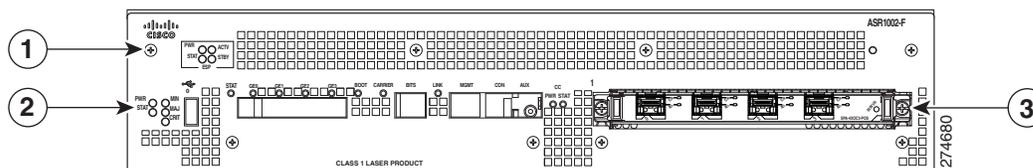
For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at: <http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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3 Cisco ASR 1002-F Router Overview

The Cisco ASR 1002-F (Fixed) Router is one of the Cisco ASR 1000 Series Aggregation Services Routers. It is the smallest router that supports all the general-purpose routing and security features of the Cisco ASR 1002 Routers. It uses the same internal control and data-plane architecture as the Cisco ASR 1002 Router. For detailed information about the Cisco ASR 1002-F Router, see [Cisco ASR 1000 Series Aggregation Services Routers Hardware Installation Guide](#). **Figure 1** shows the front of the Cisco ASR 1002-F Router.

Figure 1 Cisco ASR 1002-F Router – Front View



1	Integrated Cisco ASR1002-ESP-F	3	Cisco ASR 1002-SIP10-F
2	Integrated RP		

4 Prepare for Installation

This section contains information about tools and parts, warnings, site preparation information, and information for equipment shelf or tabletop installation and rack-mount installation.



Only trained and qualified personnel should install, replace, or service this equipment. Statement 1030



The eUSB panel door on the side of the Cisco ASR 1002-F Router must not be opened. There is a Do Not Tamper label on the panel door. Do not remove the label. If there is a problem with the eUSB flash card, the chassis should be returned.



Only Cisco software release code four supports the new Cisco ASR 1002-F Router. Do not use earlier versions of Cisco software code.

Before beginning this router installation, read the [Regulatory Compliance and Safety Information for the Cisco ASR 1000 Series Aggregation Services Routers](#) document.

Site Preparation and Unpacking

- Lift the router safely out of the packing container.
- Ensure the power service at the site is suitable for the router you are installing.
- Check the packing slip to ensure that all the proper components are present.
- Locate and have accessible the Site Log for recording information about this installation.

Tools and Parts

Use the following list of tools and parts as a checklist for preparing to install the Cisco ASR 1002-F Router:

- ESD-preventative wrist strap
- AC power cord
- Appropriate cables to connect the router to the network and to the console terminal
- Tape measure and level (optional)
- Screwdrivers: Number 2 Phillips screwdriver and 3.5-mm or 3/16-inch flat-blade screwdriver
- Chassis ground lugs and screws
- The rack-mount kit includes screws for the 19-inch rack-mount brackets (front and rear rails)
- Two cable management brackets and screws for both sides of the chassis

Prepare for Equipment Shelf or Tabletop Installation

For an equipment shelf or tabletop installation, verify the following before installing the router:

- The router is off the floor and has adequate ventilation.
- An adequate chassis ground (earth) connection exists for the router.
- The router needs at least 3 inches (7.62 cm) of clearance at the inlet and exhaust vents (front and rear of router).
- The router needs 19 inches (48.26 cm) of clearance at the front and rear to allow for installation or to access cables or equipment.

Prepare for Rack-Mount Installation

Before you begin the rack-mounting tasks:

- Decide whether or not you want to front-mount or rear-mount the chassis.
- Decide whether or not you want to attach cable-management brackets to your chassis.



Note

If you install cable-management brackets, make certain that you use the specified rack-mount ear holes as stated in the procedure and install the brackets after the chassis is mounted in the equipment rack.

- Decide if two-post or four-post rack-mount equipment will be used.

5 Rack-Mount the Router

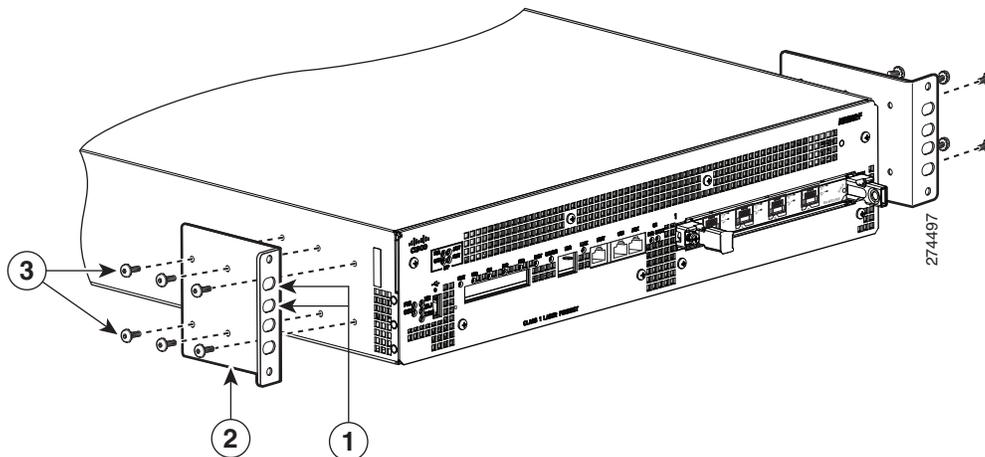
This section provides information for rack-mounting the router.

Attach the Rack-Mount Brackets—Chassis Front-Mounted

To install the rack-mount brackets on a Cisco ASR 1002-F Router for a front rack-mount configuration, follow these steps:

- Step 1** Locate the threaded holes in the front sides of the chassis.
- Step 2** Align the rack-mount bracket to the side of the router. Depending on which set of rack-mount bracket holes you choose to use to attach the rack-mount bracket to the router, the chassis will either be recessed in the rack or protrude from the rack.
- Step 3** Position the front rack-mount bracket top hole with the chassis first top hole behind the side vent holes as shown in [Figure 2](#).

Figure 2 Attaching Front Rack-Mount Brackets for the Cisco ASR 1002-F Router



1	Front rack-mount bracket ear and holes	3	Front rack-mount bracket screws
2	Front rack-mount bracket		

- Step 4** Insert and tighten the black screws on one side.
- Step 5** Repeat Step 1 through Step 4 on the other side of the chassis.

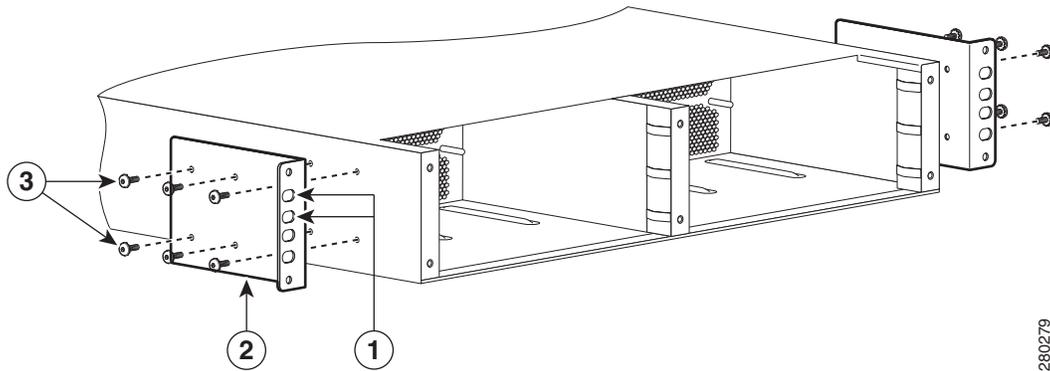
Step 6 To install the cable-management bracket, see the “[Attach the Cable-Management Brackets](#)” section on page 9.

Attach the Rack-Mount Brackets—Chassis Rear-Mounted

To install the rack-mount bracket on a Cisco ASR 1002-F Router for a rear rack-mount configuration, follow these steps:

- Step 1** Align the rack-mount bracket to the side of the router and locate the threaded ear holes in the rear sides of the chassis.
- Step 2** Position the rear rack-mount bracket top hole with the chassis from the back (See [Figure 3](#)). Make certain that you hold the rear rack-mount bracket with the ear holes facing outward and towards the rear of the chassis.

Figure 3 Attaching the Cisco ASR 1002-F Router Rear Rack-Mount Brackets



1	Rear rack-mount bracket ear and holes	3	Rear rack-mount bracket screws
2	Rear rack-mount bracket		

- Step 3** Insert and tighten the screws.
- Step 4** Repeat Step 1 through Step 3 on the other side of the chassis.

This completes the procedure for attaching rear rack-mount brackets to the chassis. Continue to the section [Four-Post Rack Installation](#), page 5 or the section [Two-Post Rack Installation](#), page 7.

Four-Post Rack Installation

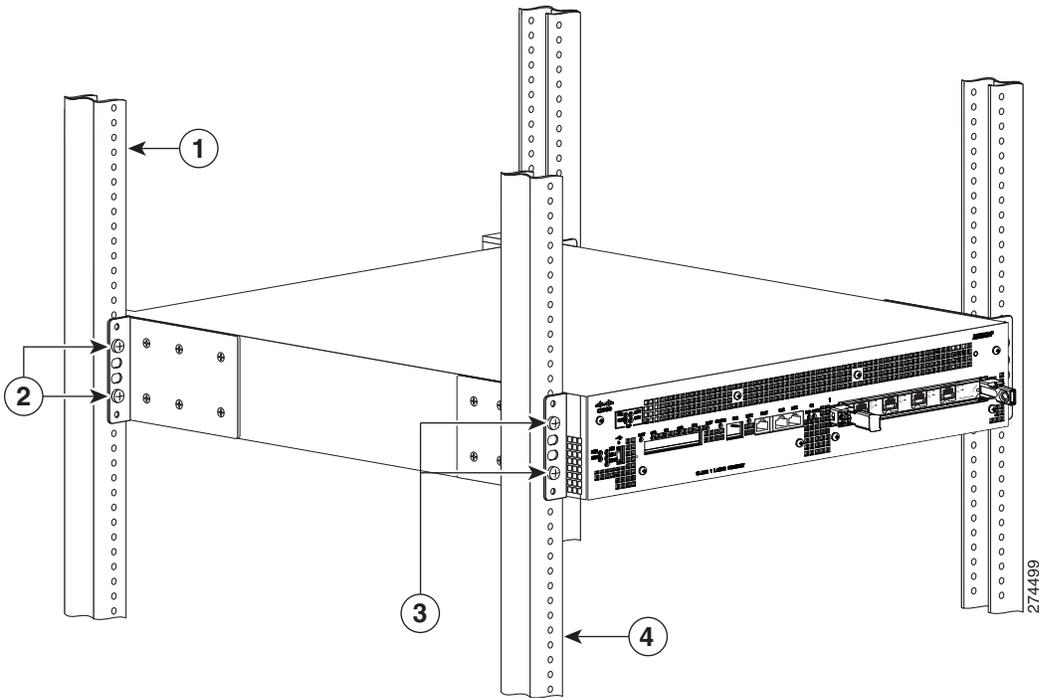
To install the chassis in a four-post rack, read the notes before you begin and then follow the steps listed in this section.

 **Note** Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm).

 **Note** We recommend that you allow at least 1 or 2 inches (2.54 or 5.08 cm) of vertical clearance between the router and any equipment directly above and below it.

[Figure 4](#) shows the Cisco ASR 1002-F Router in a four-post rack.

Figure 4 Installing the Cisco ASR 1002-F Router in a Four-Post Rack - Front and Rear Rack-Mounting



1	Rear rack equipment rail	3	Front rack-mount bracket ear and holes
2	Rear rack-mount bracket ear and holes	4	Front rack equipment rail

Note Because the rack-mount brackets support the weight of the entire chassis, be sure to use all the screws to fasten the rack-mount brackets on the chassis to the rack posts.

Note Make certain that you attach the cable-management bracket to the chassis after you install the chassis in an equipment rack.

To install the chassis in the four-post rack, complete the following steps:

- Step 1** Make sure that your path to the rack is unobstructed and if the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.
- Step 2** On the chassis, ensure that all screw fasteners on all installed components are securely tightened.
- Step 3** Lift the chassis into position between the rack posts (requires two people).
- Step 4** Position the chassis until the rack-mount bracket ears are flush against the mounting rails on the rack. At this point, if there is a third person, then that person can insert the screws while the other two people hold the chassis in place, unless the chassis is resting on a shelf.

Tip Insert the bottom screw first and then the second screw at the top of the chassis diagonally from the bottom screw. This helps secure the chassis in place while you insert the other screws.



Tip To allow space to attach the cable-management brackets to the chassis in the rack easily, make certain that you use the rack-mount bracket ear holes specified in Step 5.

- Step 5** Hold the chassis in position against the mounting rails and follow these steps:
- a. Insert the bottom screw into the second bracket ear hole from the bottom of the rack-mount bracket ear and use a hand-held screwdriver to tighten the screw to the rack rail.
 - b. Insert the top screw into the second bracket ear hole from the top of the rack-mount bracket ear hole diagonally from the bottom screw and tighten the screw to the rack rail. See [Figure 4](#).
 - c. Repeat Step 4 and Step 5 for the other side of the chassis.



Note As a result of using the specified rack-mount bracket ear holes, the cable-management bracket can be attached easily to the rack-mount bracket after the chassis is in the rack.

This completes the procedure for installing the chassis in a four-post rack. Proceed to the [“Attach the Cable-Management Brackets”](#) section on page 9 to continue the installation.

Two-Post Rack Installation

To install the chassis in a two-post rack, read the notes before you begin and then follow the steps listed in this section.



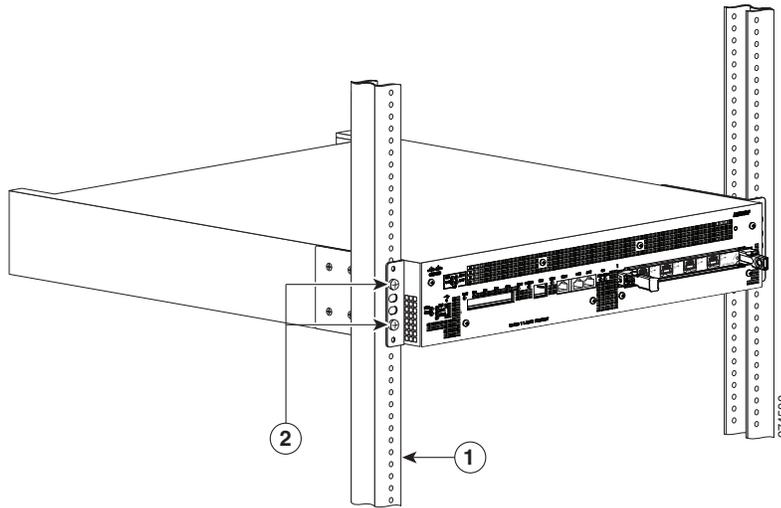
Note Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm).



Note Make certain that you attach the cable-management brackets to the chassis after you install the chassis in an equipment rack.

Figure 5 shows the Cisco ASR 1002-F Router installed in a two-post rack

Figure 5 Installing the Cisco ASR 1002-F Router in a Two-Post Rack



1	Rack equipment rail	2	Rack-mount bracket ear and holes
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 **Caution** If you are using a two-post rack, secure the rack to the floor surface to prevent tipping and avoid bodily injury and component damage.

Step 1 Position the chassis so the front is closest to you and slide the chassis into the rack, pushing it back until the rack-mount brackets meet the mounting strips or posts on both sides of the rack. To prevent injury, avoid any sudden twists or moves.

Step 2 Make certain that the chassis rack-mount bracket ears are flush against the mounting rails on the rack.

 **Note** Because the rack-mount brackets support the weight of the entire chassis, be sure to use all screws to fasten the rack-mount brackets on the chassis to the rack posts.

 **Tip** To allow space to attach the cable-management brackets to the chassis in the rack easily, make certain that you use the rack-mount bracket ear holes specified in Step 3.

Step 3 Hold the chassis in position and follow these steps:

- a. Insert the bottom screw into the fifth hole from the top of the rack-mount bracket ear and use a hand-held screwdriver to tighten the screw to the rack rail.
- b. Insert the top screw into the second bracket ear hole from the top of the rack-mount bracket ear hole diagonally from the bottom screw and tighten the screw to the rack rail. See [Figure 5](#).

Step 4 Repeat Step 2 and Step 3 for the other side of the chassis.

 **Note** As a result of using the specified rack-mount bracket ear holes, the cable-management bracket can be attached easily to the rack-mount bracket after the chassis is in the rack.

This completes the procedure for installing the chassis in a two-post rack. Proceed to the [“Attach the Cable-Management Brackets”](#) section on page 9 to continue the installation.

Attach the Cable-Management Brackets

The cable-management brackets for the Cisco ASR 1002-F Router contain one independent cable-management “U” feature with two screws for each bracket. For the Cisco ASR 1000 Series SIP, these brackets work in tandem with SPA cable-management brackets to allow installation and removal of adjacent SPAs without the need to remove cables.



Note Make certain that the cable-management bracket “U” feature (open end) is facing upwards when you attach it to the chassis.

Follow these steps to attach the cable-management brackets to both sides of the Cisco ASR 1002-F Router in the rack:

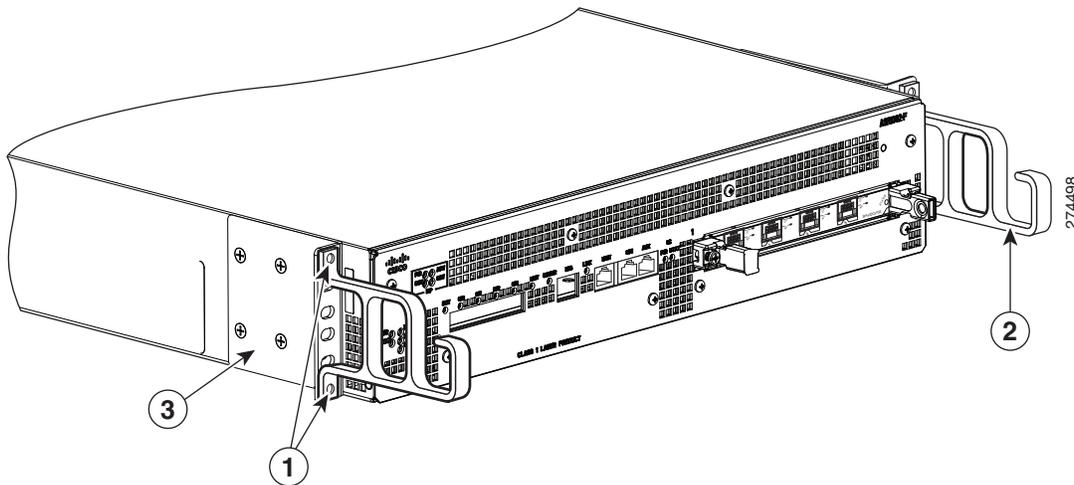
Step 1 Align the cable-management bracket to the rack-mount bracket on one side of the Cisco ASR 1002-F Router. The cable-management bracket aligns to the top hole of the chassis rack-mount bracket.



Note Use the package of four screws that came with the cable-management bracket package.

Step 2 Insert one screw through the top screw hole of the cable-management bracket and into the chassis rack-mount bracket and tighten the screw using a Phillips screwdriver.

Figure 6 Attaching the Cable-Management Brackets to the Cisco ASR 1002-F Router



1	Cable-management bracket bottom screw hole and top screw hole	3	Chassis front rack-mount bracket
2	Cable-management “U” feature		

Step 3 Insert one screw through the bottom screw hole of the cable-management bracket and into the chassis rack-mount bracket and tighten the screw using a Phillips head screwdriver. [Figure 6](#) shows the cable-management brackets attached to the chassis.

Step 4 Repeat Step 1 through Step 3 for the other side of the Cisco ASR 1002-F Router.

This completes the procedure for installing the cable-management brackets on a Cisco ASR 1002-F Router for a chassis rack-mount configuration.

Chassis Ground Connection Installation

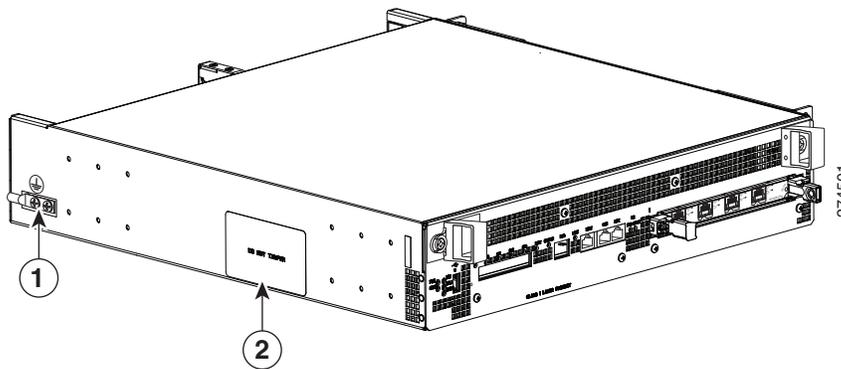
Before you connect power or turn on power to your router, you must provide an adequate chassis ground (earth) connection for the Cisco ASR 1002-F Router. The two-hole chassis ground lug and the respective screws that ship with your Cisco ASR 1002-F Router.

The following tools, equipment, and supplies are necessary to connect the system ground to the chassis:

- Phillips screwdriver
- Dual-lug chassis ground component (two) and respective screws (four) (shipped with the accessory kit)
- Grounding wire

See [Figure 7](#) for the location of the chassis ground connector on the Cisco ASR 1002-F Router.

Figure 7 Cisco ASR 1002-F Router Ground Connector Location and eUSB Panel Door



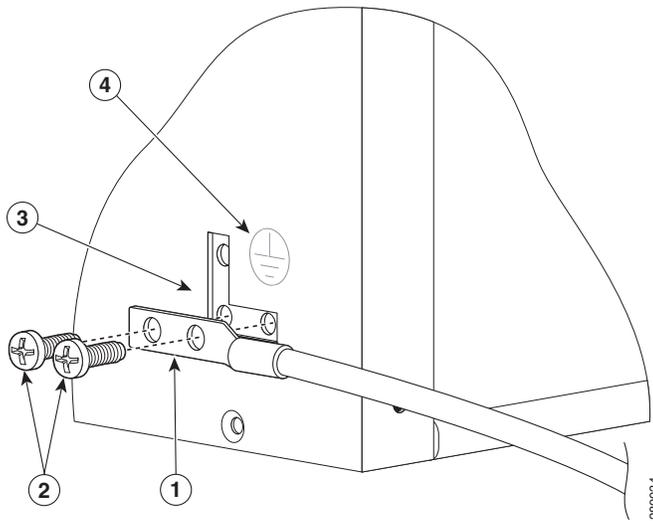
1	Cisco ASR 1002-F Router ground connector location	1	eUSB panel door
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Step 1 Use the wire stripper to strip one end of the AWG #6 wire approximately 0.75 inches (19.05 mm).

Step 2 Insert the AWG #6 wire into the wire receptacle on the ground lug.

Step 3 Use a manufacturer's recommended crimping tool to carefully crimp the wire receptacle around the wire; this step is required to ensure a proper mechanical connection.

Figure 8 Attaching a Ground Lug to the Chassis Ground Connector



1	Two-hole chassis ground lug	3	Chassis ground connector location
2	Ground lug screws	4	Earth ground symbol

- Step 4** Locate the chassis ground connector on the side of your chassis.
- Step 5** Insert the two screws through the holes in the ground lug.
- Step 6** Use the Number 2 Phillips screwdriver to carefully tighten the screws until the ground lug is held firmly to the chassis. Do not overtighten the screws.
- Step 7** Connect the opposite end of the ground wire to the appropriate ground point at your site to ensure an adequate chassis ground.

This completes the procedure for attaching a chassis ground connection. Go to the [“Connect the Router to the Network”](#) section on page 11 for information on attaching cables.

6 Connect the Router to the Network

This section provides information about cables and ports and attaching the router to the network.

- [Console and Auxiliary Port Cable Connections, page 11](#)
- [Management Ethernet Port Cable Connection, page 12](#)
- [Connect the Shared Port Adapter Cables, page 13](#)
- [Install the Cables Using the Cable-Management Bracket, page 14](#)

Console and Auxiliary Port Cable Connections

The Cisco ASR 1001 Router has two RJ-45 ports for terminal connection. A console port, which can be utilized for terminal connections and an auxiliary port for additional terminal connections as well as diagnostic utilization.

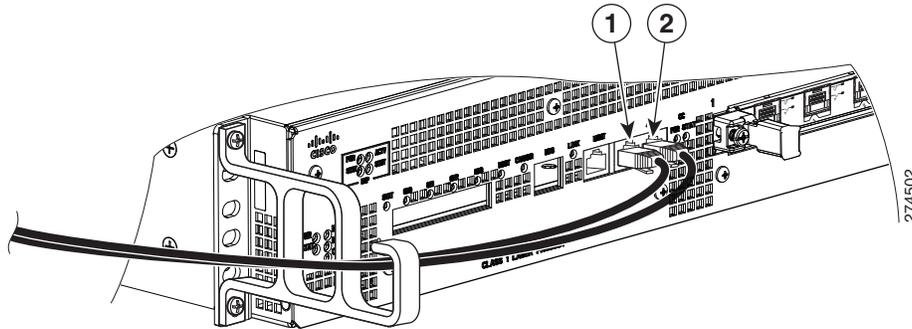


Caution

Both the console and the auxiliary ports are asynchronous serial ports; any devices connected to these ports must be capable of asynchronous transmission. To meet Class A emissions requirements on the Cisco ASR 1002-F Router, shielded cables must be used for the console and auxiliary port connections.

-
- Step 1** Before connecting a terminal to the console port, configure the terminal to match the router console port as follows: 9600 baud, 8 data bits, no parity, 1 stop bits. See [Figure 9](#) for console and auxiliary port connector location.
- Step 2** Connect to the port using the RJ-45-to-DB-9 cable.

Figure 9 Cisco ASR 1002-F Integrated Route Processor Console and Auxiliary Port Connectors



1	CON—console port	2	AUX—auxiliary port
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- Step 3** After you establish normal router operation, you can disconnect the console terminal.
-

 **Note** For console and auxiliary port pinouts, see the Cisco ASR 1002-F Router specifications in [Cisco ASR 1000 Series Aggregation Services Routers Hardware Installation Guide](#).

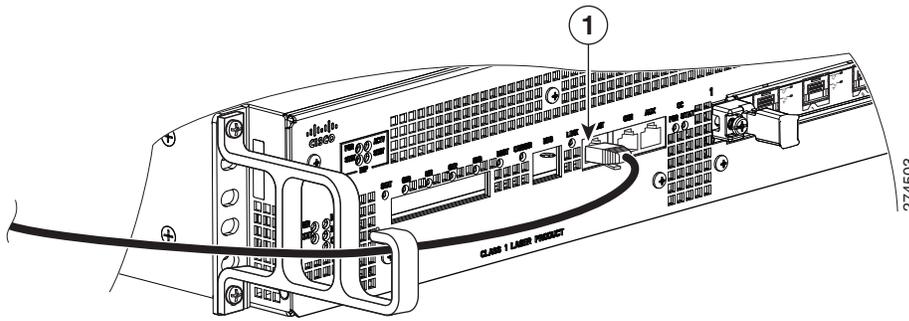
Management Ethernet Port Cable Connection

 **Caution** To comply with Class A emissions requirements, a shielded Ethernet cable must be used.

To use the Management Ethernet interface on the router, perform the following steps:

- Step 1** Insert an Ethernet RJ-45 cable into the MGMT ETHERNET port (see [Figure 10](#)).

Figure 10 Cisco ASR 1002-F Integrated Route Processor Management Ethernet Port Connector



1	Management Ethernet port	
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Step 2 Insert the other end of the RJ-45 cable to your management device or network.

Step 3 Configure the port connection to a fixed speed through the command-line interface (CLI) commands.

Connect the Shared Port Adapter Cables

The instructions for connecting the cables for the shared port adapters installed in the Cisco ASR 1002-F Router are contained in the *Cisco ASR 1000 Series Aggregation Services Routers SPA and SIP Hardware Installation Guide*.

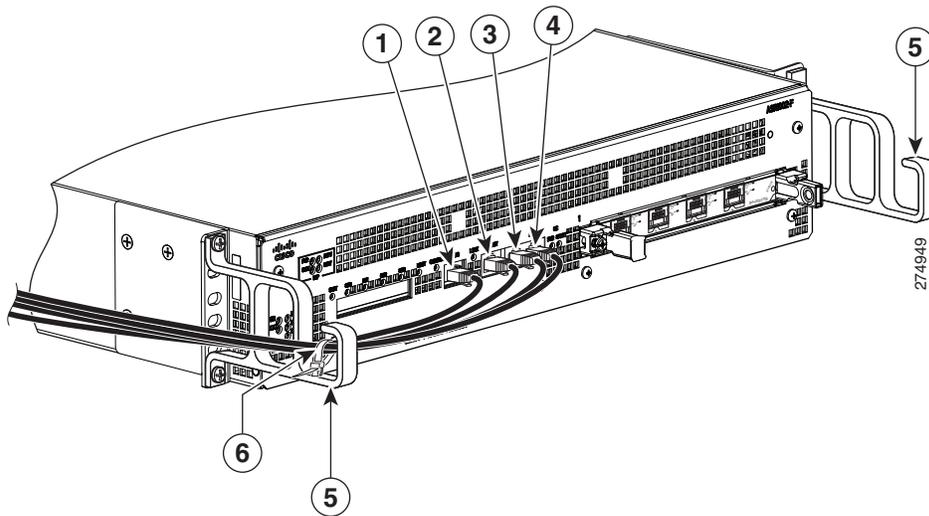
Install the Cables Using the Cable-Management Bracket

Cables coming off the front side of the Cisco ASR 1002-F integrated RP and SPAs utilize the chassis-level cable-management brackets provided on the chassis rack-mount brackets (see [Figure 11](#)).

To secure SPA cables and input or output cables connected to the Cisco ASR 1002-F Router, follow these steps:

Step 1 When installing the network interface cables, route the cables up to and through the cable-management bracket ‘U’ device. If you are using very thin cables that slip through the bracket openings, insert nylon cable ties through the holes in the bracket and wrap them around the cables to secure them as shown in [Figure 11](#).

Figure 11 Cisco ASR 1002-F Integrated Route Processor Cable Management

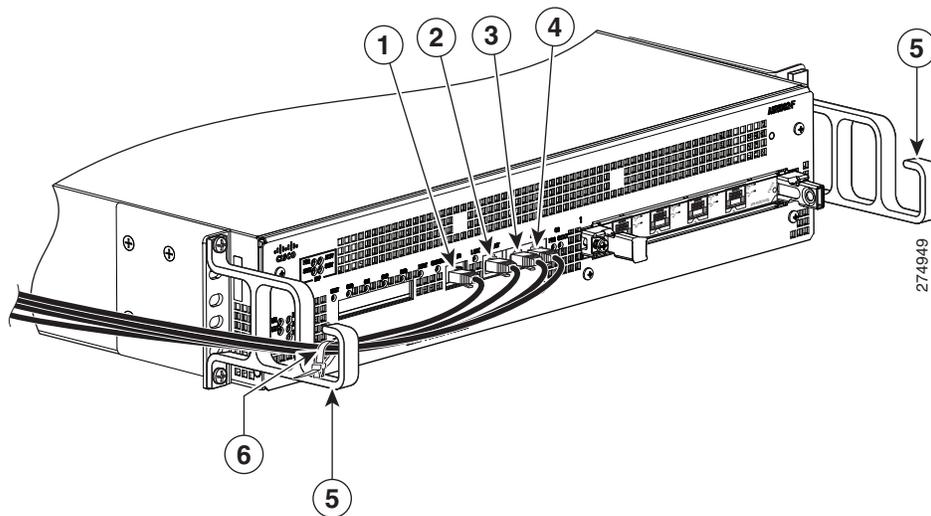


1	Building Integrated Timing Source cable	4	Auxiliary cable
2	Management Ethernet cable	5	Cable-management “U” feature
3	Console cable	6	Tie wrap for cables

Step 2 Route the excess cable out through either end of the bracket, coil it, and secure it to the rack using nylon cable ties or some other mode of attachment.

Step 3 It might be necessary to bundle longer cables to avoid tangling them. Do this at the cable-management bracket or at the rack, but leave enough slack in the cables to remove a Cisco ASR 1002-ESP-F and change cables as required. Also, do not block the power supply air vents with cables.

Figure 12 Bundling Cisco ASR 1002-F Integrated Route Processor Cables



1	Building Integrated Timing Source cable	4	Auxiliary cable
2	Management Ethernet cable	5	Cable-management “U” feature
3	Console cable	6	Tie wrap for cables

This completes the procedure for installing the cables in the cable-management bracket.

Proceed to the [“Start the System”](#) section on page 15 to complete the installation.

7 Start the System

Before you start the system, you must connect power to it.

Connect AC Power to the Cisco ASR 1002-F Router

This section provides instructions for installing the AC power supply into the Cisco ASR 1002-F Router. Read the safety warnings before you begin.

- 
Warning
Never install an AC power module and a DC power module in the same chassis. Statement 1050
- 
Warning
Installation of the equipment must comply with local and national electrical codes. Statement 1074
- 
Warning
When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

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

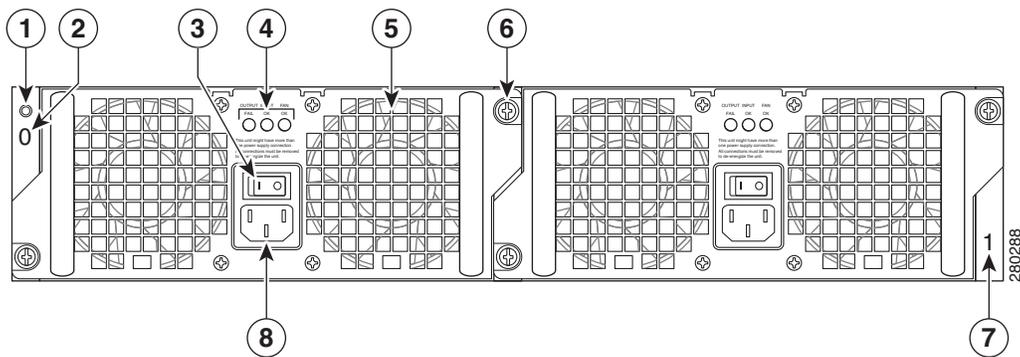
This unit has power supply connections. All connections must be removed to de-energize the unit. Statement 1028

Warning

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: AC power supplies 20 A and DC power supplies 30 A for Cisco ASR 1002-F Routers. Statement 1005

Figure 13 shows the AC power supply for the Cisco ASR 1002-F Router.

Figure 13 AC Power Supply for the Cisco ASR 1002-F Router



1	Chassis ESD socket	5	Fan
2	AC power supply slot 0 label	6	Captive installation screw
3	AC power supply On (I) /Off (O) switch	7	AC power supply slot 1 label
4	AC power supply LEDs	8	AC power inlet

Table 1 describes the AC power supply LEDs on the Cisco ASR 1002-F Router.

Table 1 Cisco ASR 1002-F Router AC Power Supply LEDs

LED Label	LED	Color	Description
INPUT OK	Power supply activity	Green	The AC input voltage is greater than 85V.
		None	If the LED is not illuminated, then either the input voltage is less than 70V, or the power supply is turned off. If the AC input voltage is between 70V and 85V, the INPUT OK LED can be on, off, or flashing.
FAN OK	Power supply fan activity A bi-color LED indicates fan status.	Green	All fans are operational.
		Red	A fan failure is detected.
OUTPUT FAIL	Power supply activity	Red	If the INPUT OK LED is illuminated, this LED is red if the DC output voltages are below the minimum limit or above the maximum limit. If the INPUT OK LED is not illuminated, this LED might be off or red.
		Off	If the INPUT OK LED is illuminated, this LED is off if the DC output voltages are within the normal operating range. If the INPUT OK LED is not illuminated, this LED might be off or red.



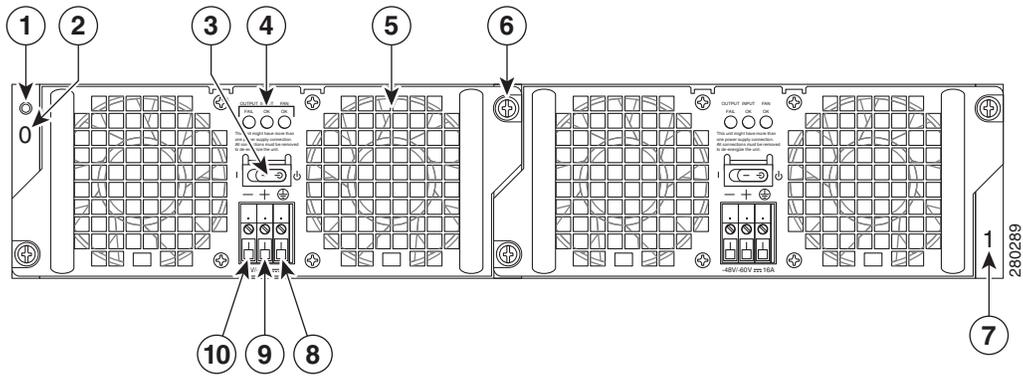
Note To connect an AC power supply to the Cisco ASR 1002-F Router, follow the steps in the [Installing the AC Power Supply](#), page 32.

Connect DC Power to the Cisco ASR 1002-F Router

The DC power supply input connector is a euro-style terminal block. A tab on the back of the power supply provides strain relief to the input wires on the power supply. The connection order is negative (-), positive (+), and ground (GND).

Figure 14 shows the DC power supply for the Cisco ASR 1002-F Router.

Figure 14 DC Power Supply for the Cisco ASR 1002-F Router



1	Chassis ESD socket	6	Captive installation screw
2	DC power supply slot 0 label	7	DC power supply slot 1 label
3	Standby switch	8	Earth ground lead
4	DC power supply LEDs	9	Positive ground lead
5	Fan	10	Negative ground lead

Table 2 describes the DC power supply LEDs on the Cisco ASR 1002-F Router.

Table 2 Cisco ASR 1002-F Router DC Power Supply LEDs

LED Label	LED	Color	Description
INPUT OK	Power supply activity	Green	Signals that the DC power supply input voltage is greater than -43.5VDC at turn-on and remains green down to -39VDC .
		Amber	The power supply turns off due to low input voltage (falls below -39VDC) and indicates that there is still a voltage present (voltage on the terminal block). The LED remains amber and is active to around $20\text{V} \pm 5\text{V}$. The LED is not illuminated if the input is below 15V .
FAN OK	Power supply fan activity	Green	All fans are operational.
		Red	A fan failure is detected.
OUTPUT FAIL	Power supply activity	Red	Output voltages below the minimum or above the maximum limits create an Output Fail alarm. When you turn the power supply on, the red LED illuminates for two to three seconds to test LED operation before going off.
		Off	DC output voltages are within the normal operating range.

To connect the DC power supply to a Cisco ASR 1002-F Router, follow these steps:

Step 1 At the rear of the router, check that the power switch is in the Standby position on the power supply.

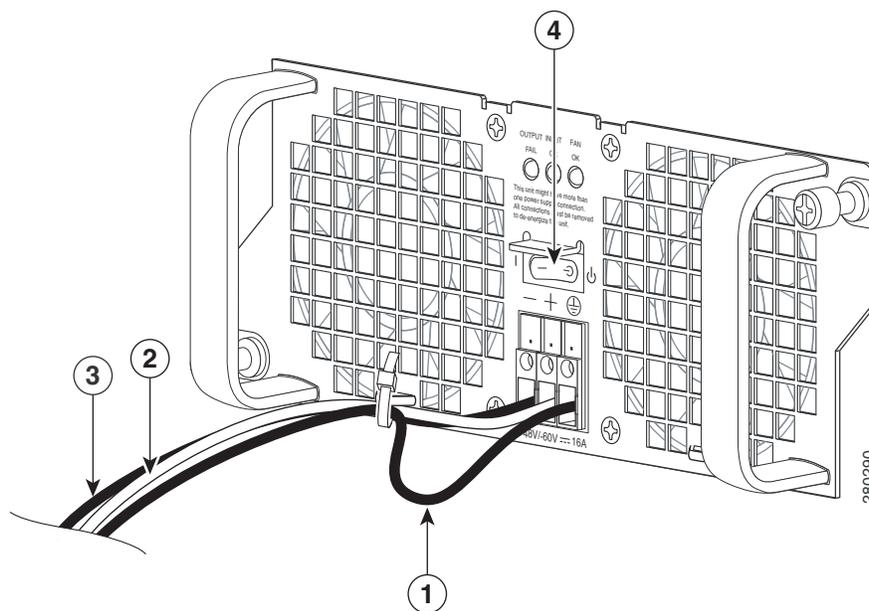


Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground. Make certain the lead color coding you choose for the DC-input power supply matches the lead color coding used at the DC power source.



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

Figure 15 Cisco ASR 1002-F Router DC Power Supply



1	Earth ground lead service loop area	3	DC power negative lead
2	DC power positive lead	4	Power supply Standby switch

Step 2 Ensure that the negative and positive leads are disconnected from the site power source.

Step 3 Using a wire stripper, strip approximately 0.55 inch (14 mm) from the positive, negative, and ground leads.

Step 4 Insert the stripped end of the ground lead all the way into the ground lead receptacle on the DC-input power supply, and tighten the receptacle screw using a 3.5 mm flat-blade screwdriver.

Step 5 Insert the stripped end of the positive lead all the way into the positive lead receptacle and tighten the receptacle screw using the same 3.5 mm flat-blade screwdriver. Repeat this step for the negative lead.



Note Make sure the entire stripped end of each lead is inserted all the way into its receptacle. If any exposed wire at the stripped end of a lead is visible after inserting the lead into its receptacle, remove the lead from the receptacle, use the wire stripper to cut the stripped end of the lead, and repeat Step 3 through Step 5.

Step 6 After tightening the receptacle screw for the ground, positive, and negative DC-input leads, use a cable tie to secure the three leads to the power supply faceplate.



Caution When securing the earth ground, positive, and negative DC-input leads to the power supply faceplate, leave a service loop in the ground lead, (see Figure 15, item 1), to ensure that the ground lead is the last lead to disconnect from the power supply if a great deal of strain is placed on all three leads.

Step 7 Connect the ground, positive, and negative leads to the power source.

Step 8 Turn on the branch source breaker.

Step 9 Place the Standby switch in the On (I) position.

This completes the procedure for connecting DC-input power.

Verify Power Supply Operation

Follow this procedure to verify the power supplies are operating correctly.

Step 1 Check that the power supply LEDs are illuminated as follows:

- INPUT OK LED is green.
- FAN OK LED is green.
- OUTPUT FAILED LED is not illuminated.

Step 2 To ensure that the power supply is running, enter the `show platform` command. This output sample is from a Cisco ASR 1002-F Router.

```
#show platform
Chassis type: ASR1002-F
```

The following is a sample output display:

Slot	Type	State	Insert Time
1	ASR1000-SIP10	ok	00:03:19
1/1	SPA-8X1GE-V2	ok	00:02:23
2	ASR1000-SIP10	ok	00:03:19
2/0	SPA-1X10GE-L-V2	ok	00:02:22
2/1	SPA-8X1GE-V2	ok	00:02:17
R0	ASR1000-RP1	ok, active	00:03:19
F0	ASR1000-ESP10	ok, active	00:03:19
P0	ASR1002-PWR-AC	ok	00:02:50
P1	ASR1002-PWR-AC	ps, fail	00:02:50

Slot	CPLD Version	Firmware Version
1	07091401	12.2(33r)XN2
2	07091401	12.2(33r)XN2
R0	08060301	12.2(0:0)
F0	08041102	12.2(33r)XN2



Note If the LEDs indicate a power problem or the power supply state shows “ps,fail”, then contact a customer service representative for assistance or additional instructions.

Start the Cisco ASR 1002-F Router

Check the following conditions before you start the Cisco ASR 1002-F Router:

- The Cisco ASR 1002-F Router has one slot for the Cisco ASR1002-SIP10-F. Make certain that the SPA is firmly seated in its subslot and its captive installation screws are securely tightened.



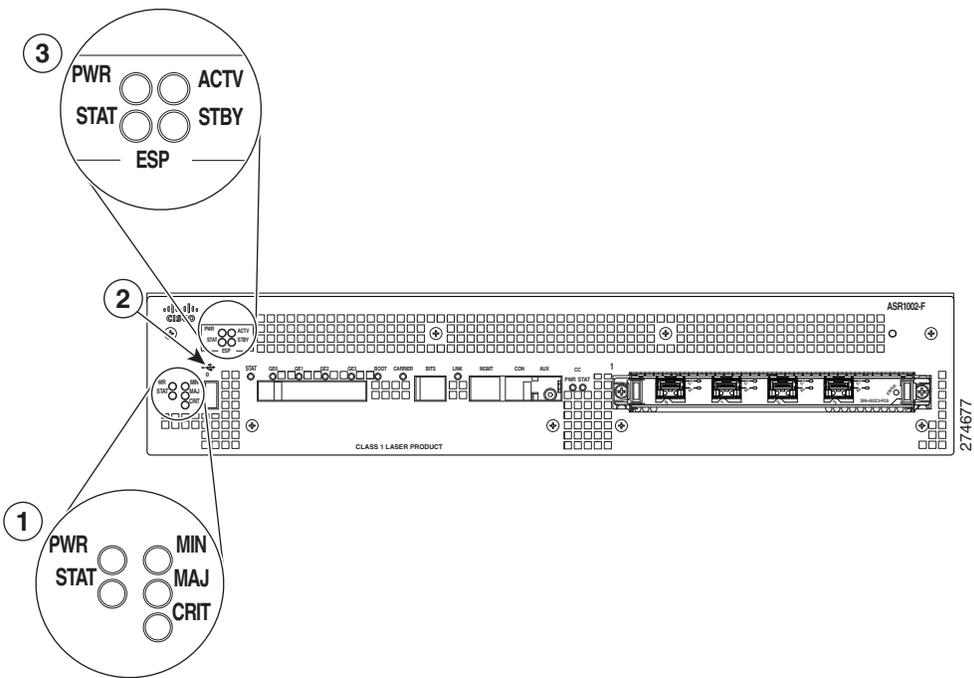
Note The ASR 1002-F Router has only one half-height removable SPA.

- The integrated Cisco ASR1002-ESP-F forwarding processor in the Cisco ASR 1002-F Router is secured and its captive screws are securely tightened.
- All network interface cables are connected.
- The console terminal is turned on.

Follow these steps to start the Cisco ASR1002-F Router:

-
- Step 1** Turn on power. The green INPUT OK LED on the power supply turns on. (Both power supplies are required in the Cisco ASR 1002-F Router.)
 - Step 2** Listen for the fans; you should immediately hear them operating.
 - Step 3** During the boot process, observe the system LEDs. The PWR LED should be green. The STAT LED lights yellow to indicate booting and then green when Cisco IOS is running.
-

Figure 16 Integrated Cisco ASR1002-RP1 and Cisco ASR1002-ESP-F LEDs on Cisco ASR 1002-F Router



1	Cisco ASR1002-RP1 LEDs	3	Cisco ASR1002-ESP-F LEDs
2	USB 0 connector		

Table 3 provides information about the LEDs on the Cisco ASR 1002-F Router faceplate.

Table 3 Cisco ASR 1002-F Router LED Activity

LED Label	LED	Color	Behavior Description
PWR	Power	Solid green	All power requirements are within specification.
		Off	The router is in standby mode.
STAT	System status	Solid green	Cisco IOS has successfully booted.
		Yellow	BOOT ROM has successfully loaded.
		Red	System failure.
MIN	Minor	Amber	Minor alarm indicator.
MAJ	Major	Solid red	Major alarm indicator.
CRIT	Critical	Solid red	Critical alarm indicator. On at power up
**Built-in 4xGE SPA SFP Port Status	4 LEDs total, one for each SFP	Off	Port is not enabled.
		Amber	Port enabled. Problem with the Ethernet link.
		Green	Port enabled and the Ethernet link is valid.

**For more information about the small form-factor pluggable (SFP) transceiver modules that are compatible with Cisco ASR 1002 Built-in Gigabit Ethernet Ports (4x1GE), refer to the Modular Optics Compatibility section in the [Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Hardware Installation Guide](#).

Table 4 provides information about the Cisco ASR1002-ESP-F LEDs in the Cisco ASR 1002-F Router as the system starts.

Table 4 Cisco ASR1002-ESP-F LED Activity

LED Label	LED	Color	Behavior Description
PWR	Power	Solid green	All power supplies are within operational limits.
		Off	The router is in standby mode.
STAT	Status	Green	Code has successfully downloaded and is operational.
		Yellow	BOOT ROM has successfully loaded.
		Red	Not booted.
ACTV	Active	Green	The integrated services processor is green when active.
STBY	Standby	None	Always be off.

During the boot process, observe the system LEDs. The STATUS LED comes on immediately as amber, then turns to green when the Cisco IOS is booted.

 **Note** The system boots differently depending on the configuration that ships with your system. The display below is a snapshot of messages that are output on the console of the Cisco ASR 1002-F Router system after power-up and during IOS booting. This is only an example of what you might see from any Cisco ASR 1000 Series Router.

Step 4 Observe the initialization process. When the system boot is complete (a few seconds), the Cisco ASR 1002-F integrated route processor begins to initialize. The console screen displays a script and system banner.

```
ASR 1002-F-16-rp0-rommon 2 >boot
bootflash:asr1000rp1-advipservicesk9.v122_33_xn_asr_rls0_throttle_20080114_045627.bin
Located asr1000rp1-advipservicesk9.v122_33_xn_asr_rls0_throttle_20080114_045627.bin
Image size 218869964 inode num 18, bks cnt 53436 blk size 8*512
#####
#####
```

```
#####
#####
#####
#####
.
.
.
.
.*Feb 13 13:01:34.034: %ASR1000_OIR-2-INSSPA: SPA inserted in subslot
*Feb 13 13:01:34.370: %SYS-5-RESTART: System restarted --
Cisco IOS Software, IOS-XE Software (PPC_LINUX_IOSD-ADVENTERPRISEK9-M), Version 12.2(33)XNA, RELEASE
SOFTWARE
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2008 by Cisco Systems, Inc.
Compiled Thu 01-May-08 00:29 by mcpre*Feb 13 13:01:36.253: %DYNCMD-7-CMDSET_LOADED: The Dynamic Command
set has been loaded from the Shell Manager
*Feb 13 13:01:36.326: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
Router>
```



Note You have the option of proceeding with the **setup** command facility to configure the interfaces or exiting from setup and using configuration commands to configure global (system-wide) and interface-specific parameters. You do not have to configure the interfaces immediately; however, you cannot enable the interfaces or connect them to any networks until you have configured them. For detailed software configuration information, see the [Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide](#).

8 Configure the Router

Use this section for information on configuring the Cisco ASR 1002-F Router.

Using the Console to Access the CLI

To access the command-line interface using the console, follow these steps:

Your system is booting and if you answer No, at the prompt:

```
--- System Configuration Dialog ---
```

```
Would you like to enter the initial configuration dialog? [yes/no]: no
```

Step 1 Press **Return** to enter user EXEC mode. The following prompt appears:

```
Router>
```

Step 2 From user EXEC configuration mode, enter the **enable** command as shown in the following example:

```
Router> enable
```

Step 3 At the password prompt, enter your system password. If an enable password has not been set on your system, this step may be skipped. The following example shows entry of the password called *enablepass*:

```
Password: enablepass
```

Step 4 When your enable password is accepted, the privileged EXEC configuration mode prompt appears:

```
Router#
```

Step 5 You now have access to the CLI in privileged EXEC mode and you can enter the necessary commands to complete your desired tasks.

Step 6 To exit the console session, enter the **quit** command as shown in the following example:

```
Router# quit
```

Configure Global Parameters Using the Set-up Facility

When you first start the setup program, you must configure the global parameters. These parameters are used for controlling system-wide settings. Complete the following steps to enter global parameters:

Step 1 Connect a console terminal to the console port. This is only an example of the output display; prompts may vary. When you see this information, you have successfully booted your router:

```
Restricted Rights Legend
```

```
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Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.
```

```
    cisco Systems, Inc.
    170 West Tasman Drive
    San Jose, California 95134-1706
```

```
    .
    --- System Configuration Dialog ---
```

```
Would you like to enter the initial configuration dialog? [yes/no]: yes
```

```
Press RETURN to get started!
```

Step 2 The first sections of the configuration script appear only at an initial system startup. On subsequent uses of the setup facility, the script begins with a System Configuration Dialog as shown in the following example:

Step 3 When asked if you would like to enter the initial configuration dialog, enter **yes**.

```
Would you like to enter the initial configuration dialog? [yes/no] yes
```

```
At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.
```

```
Basic management setup configures only enough connectivity for management of the system, extended setup
will ask you to configure each interface on the system.
```

```
--- System Configuration Dialog ---
```

```
Would you like to enter the initial configuration dialog? [yes/no]: y
```

```
At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.
```

```
Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system
```

```
Would you like to enter basic management setup? [yes/no]: n
```

```
First, would you like to see the current interface summary? [yes]: y
```

```
Any interface listed with OK? value "NO" does not have a valid configuration
```

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0/0	unassigned	NO	unset	down	down
GigabitEthernet0/0/1	unassigned	NO	unset	down	down

```
GigabitEthernet0/0/2  unassigned      NO  unset  down          down
GigabitEthernet0/0/3  unassigned      NO  unset  down          down
GigabitEthernet0      unassigned      YES unset  administratively down down
```

Configuring global parameters:

Enter host name [Router]:

The enable secret is a password used to protect access to privileged EXEC and configuration modes. This password, after entered, becomes encrypted in the configuration.

Enter enable secret: test

The enable password is used when you do not specify an enable secret password, with some older software versions, and some boot images.

Enter enable password: tests

The virtual terminal password is used to protect access to the router over a network interface.

Enter virtual terminal password: test

Configure SNMP Network Management? [yes]: n

Configure IP? [yes]: y

Configure RIP routing? [no]:

Configure bridging? [no]:

Configure CLNS? [no]:

Configuring interface parameters:

Do you want to configure GigabitEthernet0/0/0 interface? [yes]: n

Do you want to configure GigabitEthernet0/0/1 interface? [yes]: n

Do you want to configure GigabitEthernet0/0/2 interface? [yes]: n

Do you want to configure GigabitEthernet0/0/3 interface? [yes]: n

Do you want to configure GigabitEthernet0 interface? [no]: n

The following configuration command script was created:

```
hostname Router
enable secret 5 $1$6r./$U5wHcV3uRWkKWK/fap474.
enable password tests
line vty 0 4
password test
no snmp-server
!
ip routing
no bridge 1
no clns routing
!
interface GigabitEthernet0/0/0
shutdown
no ip address
!

interface GigabitEthernet0/0/1
shutdown
no ip address
!
.
.
.
end
```

[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]:

Router#reload
Proceed with reload? [confirm]

*Jan 11 06:59:29.476: %SYS-5-RELOAD: Reload requested by console. Reload Reason: Reload command.

System Bootstrap, Version 12.2(20071105:235056) [gschnorr-mcp_rommon_rel_1_25 101], DEVELOPMENT SOFTWARE
Copyright (c) 1994-2007 by cisco Systems, Inc.
Compiled Mon 05-Nov-07 16:50 by gschnorr-mcp_rommon_rel_1_25

Current image running: Boot ROM1
Last reset cause: LocalSoft
SATA drive PCI config error

ASR1000-RP1 platform with 2097152 Kbytes of main memory

rommon 1 > b tftp:images/packages_crypto/asr1000rp1-advipservicesk9.mcp_dev_20080109_101550.bin

IP_ADDRESS: 2.1.6.5
IP_SUBNET_MASK: 255.255.0.0
DEFAULT_GATEWAY: 2.1.0.1
TFTP_SERVER: 2.0.0.2
TFTP_FILE: images/packages_crypto/asr1000rp1-advipservicesk9.mcp_dev_20080109_101550.bin

Using midplane macaddr

TFTP_MACADDR: 00:14:a8:ff:42:ff
TFTP_VERBOSE: Progress
TFTP_RETRY_COUNT: 18
TFTP_TIMEOUT: 7200
TFTP_CHECKSUM: Yes
ETHER_PORT: 3
ETHER_SPEED_MODE: Auto Detect

link up 1000Mbps/FD.....

Receiving images/packages_crypto/asr1000rp1-advipservicesk9.mcp_dev_20080109_101550.bin from 2.0.0.2
!!
!!

File reception completed.
Boot image size = 206741708 (0xc52a0cc) bytes

Using midplane macaddr
Package header rev 0 structure detected
Calculating SHA-1 hash...done
validate_package: SHA-1 hash:
 calculated a8301e1e:17821e94:07654c49:4ca6fe49:518af2c2
 expected a8301e1e:17821e94:07654c49:4ca6fe49:518af2c2
Image validated

PPC/IOS XE loader version: 0.0.3
loaded at: 00800000 0CD2C004
zimage at: 00807673 009B8E53
initrd at: 009B9000 01006E53
isord at: 01007000 0CD2A000
avail ram: 00400000 00800000

Kernel load:
Uncompressing image... dst: 00000000 lim: 00400000 start: 00807673 size: 001B17E0...done.
Now booting the IOS XE kernel

```
%IOSXEBOOT-4-BOOT_PARAMETER: (rp/0): Booting with custom BOOT_PARAM setting
%IOSXEBOOT-4-DEBUG_CONF: (rp/0): File /misc/scratch/debug.conf is absent, ignoring
```

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cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706

Cisco IOS Software, IOS-XE Software (PPC_LINUX_IOSD-ADVENTERPRISEK9-M), Version 12.2(33)XNA, RELEASE SOFTWARE

Technical Support: <http://www.cisco.com/techsupport>
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Image text-base: 0x10062810, data-base: 0x132AED48

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<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to export@cisco.com.

```
cisco ASR1000 (RP1) processor with 548011K/6147K bytes of memory.
8 FastEthernet interfaces
6 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
2097152K bytes of physical memory.
947711K bytes of eUSB flash at bootflash:.
253407K bytes of USB flash at usb0:.
--- System Configuration Dialog ---
```

```
Would you like to enter the initial configuration dialog? [yes/no]: n
```



Note Basic management setup configures enough connectivity for managing the system; extended setup will ask you to configure each interface on the system. For detailed information about setting global parameters, refer to the *Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide*.

Check the Running Configuration Settings

To check the value of the settings you have entered, enter the **show running-config** command at the `Router#` prompt:

```
Router# show running-config
```

To review changes you make to the configuration, use the EXEC mode **show startup-config** command to see the changes and copy **run-start** command stored in NVRAM.

Save the Running Configuration to NVRAM

To store the configuration or changes to your startup configuration in NVRAM, use the `copy running-config startup-config` command to save your configuration changes to the startup configuration so that the changes will not be lost if the software reloads or a power outage occurs. For example:

```
Router# copy running-config startup-config
Building configuration...
```

It might take a minute or two to save the configuration. After the configuration has been saved, the following output appears:

```
[OK]
Router#
```

This task saves the configuration to NVRAM.

To review changes you make to the configuration, use the EXEC mode `show startup-config` command to see the changes and `copy run-start` command stored in NVRAM.



Note Using the `copy run-start` command saves the configuration settings that you created in the router using configuration mode and the setup facility. If you fail to do this, your configuration will be lost the next time you reload the router.

Perform Other Configuration Tasks

To make advanced configuration changes after you establish the basic startup configuration for your router, refer to the *Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide* and modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware. These publications contain additional information on using the `configure` command. The configuration publications also provide information about the following tasks:

- Understanding command modes
- Booting and rebooting the router
- Understanding software packages and architecture for the Cisco ASR 1002-F Router
- Software Upgrades

9 After Installation

This section contains hardware replacement instructions for the Cisco ASR 1002-F Router SPAs and power supplies and how to safely power off the router.



Note Unless otherwise noted, the Cisco ASR 1002-F Router power supplies removal and installation remain the same as the existing Cisco ASR 1002 Router.



Note For a complete list of Cisco ASR 1000 Series Routers field replaceable units, go to the *Cisco ASR 1000 Series Aggregation Services Router Hardware Installation and Initial Configuration Guide, Chapter 9*.

The following topics are covered in this section:

- [Powering Off the Cisco ASR 1002-F Router Safely, page 30](#)
- [Replace the Shared Port Adapters, page 30](#)
- [Replace a Power Supply in the Cisco ASR 1002-F Router, page 31](#)

**Warning**

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

Statement 1030

Powering Off the Cisco ASR 1002-F Router Safely

This section explains how to shut down the Cisco ASR 1002-F Router. It is recommended that before turning off all power to the chassis, you issue the **reload** command. This insures that the operating system cleans up all the file systems. Once the reload operation is complete, then the Cisco ASR 1002-F Router can be powered off safely.

To remove power from a Cisco ASR 1002-F Router safely, follow this procedure and see the examples:

Step 1 Slip on the ESD-preventative wrist strap that was included in the accessory kit.

Step 2 Enter the **reload** command.

Step 3 Confirm the reload command:

```
Rmcp-2ru-1#reload
Proceed with reload? [confirm]
Aug 17 00:06:47.051 R0/0: %PMAN-5-EXITACTION: Process manager is exiting: prs exit with reload chassis
code
```

Step 4 After confirming the reload command, wait until the system bootstrap message displays before powering off the system.

```
System Bootstrap, Version 12.2(33r)XN2, RELEASE SOFTWARE (fc1)
Technical Support: tap://www.cisco.com/techsupport
Copyright (c) 2010 by cisco Systems, Inc.
```

```
Current image running: Boot ROM0
Last reset cause: LocalSoft
```

```
ASR1000-RP1 platform with 4194303 Kbytes of main memory
```

```
mcp-2ru-1-rp0-rommon 1>
```

Step 5 Remove any power cables from the Cisco ASR 1002-F Router.

- a. For power supplies with a circuit breaker switch, position the switch to the Off (O) position.
- b. For power supplies with a Standby switch, place the Standby switch in the Standby position.

**Note**

After powering off the router, wait a minimum of 30 seconds before powering it on again.

Replace the Shared Port Adapters

The shared port adapter (SPA) on the integrated Cisco ASR1002-SIP10-F in the Cisco ASR 1002-F Router support online insertion and removal (OIR); but the integrated Cisco ASR1002-SIP10-F does not support OIR and is not field-upgradeable.

Before removing any shared port adapter, shut down the interface so that there is no traffic running through the shared port adapter when it is removed. Removing a shared port adapter while traffic is flowing through the ports can cause system disruption.

Step 1 Attach an ESD wrist strap between you and an unpainted chassis surface.

Step 2 Disconnect all cables from the shared port adapter.

Step 3 Remove the shared port adapter from the chassis subslot. Grasp the handle and pull the shared port adapter or blank panel from the router.

Step 4 Locate the shared port adapter slot guides inside the Cisco ASR 1002-F Router.



Caution The shared port adapter must slide into the slot guides under the chassis lid. Do not allow the shared port adapter components to come in contact with the system board or the shared port adapter could be damaged.

Step 5 Carefully slide the shared port adapter into the shared port adapter slot until it is firmly seated and then securely tightened the captive screws. When installed, the shared port adapter input/output panel should be flush with the face of the router.

Step 6 Reconnect any cables and place the cables through the cable-management brackets.

Step 7 If the shared port adapter fails to come up, reseal or reinsert the shared port adapter; do not use excessive force.

Step 8 Power on the router by turning the power switch to the On (I) position.

Replace a Power Supply in the Cisco ASR 1002-F Router

This section provides instructions for removing and replacing the AC power supply and the DC power supply in a Cisco ASR 1002-F Router. Before you begin, make certain the chassis is grounded.



Note Four power supplies must be installed in the chassis at all times, with a minimum of two power supplies (one per zone) connected to the mains in order to power on the system and ensure sufficient cooling. The system fans are inside the power supply units and must spin for cooling. Because all the system fans can be powered by one power supply, the second power supply unit does not have to be powered on, but must be connected.



Caution If you remove a power supply from a system that has four power supplies that are connected and powered on, the system can run only for a maximum of five minutes before shutting down. However, because the fans and power elements are independent within the power supply, the replacement power supply does not have to be energized within five minutes. The only requirement is that the power supply be installed in the chassis in order to energize the fans and maintain proper system cooling.

Removing an AC Power Supply

To remove a Cisco ASR 1002-F Router AC power supply that is not operating normally (and then replace the AC power supply within five minutes), follow this procedure:

Step 1 Slip on the ESD-preventative wrist strap that was included in the accessory kit.

Step 2 Turn the switch to the off (O) position and unplug the AC power cord.

Step 3 Unscrew all of the power supply captive screws.

Step 4 Grasping the power supply handles, pull the power supply from the chassis. When you remove the AC power supply, you will see the following type of messages in the log report:

```
#show log
Syslog logging: enabled (0 messages dropped, 6 messages rate-limited, 0 flushes, 0 overruns, xml
disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

Console logging: disabled
```

```
Monitor logging: level debugging, 0 messages logged, xml disabled,
                  filtering disabled
Buffer logging:  level debugging, 81 messages logged, xml disabled,
                  filtering disabled
Exception Logging: size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled
```

No active filter modules.

```
Trap logging: level informational, 78 message lines logged
```

Log Buffer (10000000 bytes):

```
*Jan 10 06:08:14.713: %CMRP-3-PEM_REMOVE_SHUT: R0/0: cmand: The system will shut down in 5 minutes
*Jan 10 06:08:14.718: %ASR1000_PEM-6-REMPPEM_FM: PEM/FM slot P1 removed
*Jan 10 06:08:28.966: %ASR1000_PEM-6-INSPEM_FM: PEM/FM slot P1 inserted
```

The second is after enabling console logging. Output is at the console (and in the log).

```
2ru_perf2#conf Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
2ru_perf2(config)#log con
% Ambiguous command: "log con"
2ru_perf2(config)#logg con
2ru_perf2(config)#^Z
2ru_perf2#
*Jan 10 06:08:54.643: %SYS-5-CONFIG_I: Configured from console by console
2ru_perf2#
2ru_perf2# *Jan 10 06:09:05.023: %CMRP-3-PEM_REMOVE_SHUT: R0/0: cmand: The system will shut down in 5
minutes
*Jan 10 06:09:05.026: %ASR1000_PEM-6-REMPPEM_FM: PEM/FM slot P0 removed
*Jan 10 06:09:10.500: %ASR1000_PEM-6-INSPEM_FM: PEM/FM slot P0 inserted
2ru_perf2#
```

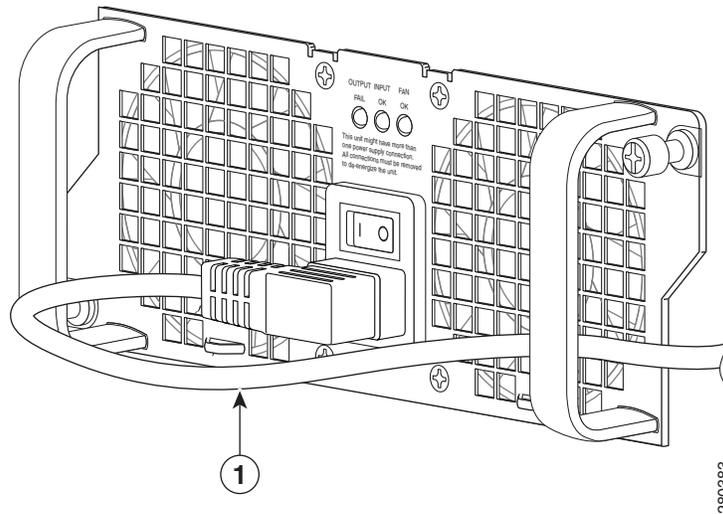
Step 5 Replace the AC power supply within five minutes or the system will shutdown

You have removed an AC power supply from the Cisco ASR 1002-F Router and now must replace the AC power supply within five minutes.

Installing the AC Power Supply

- Step 1** Insert an AC power supply in power supply Slot 0 or power supply Slot 1 until it is full seated.
- Step 2** Tighten the captive installation screws.
- Step 3** At the rear of the router, check that the power switch is in the Off (O) position.
- Step 4** Insert the AC power cord into the power inlet and then turn it On (I).
- Step 5** To ensure that the AC power cord does not interfere with other cables or wires, dress the AC power cable in one of the following ways.
 - a. Leave a small service loop in the AC power cord from the inlet and then secure the power cord through the AC power supply handle as shown in [Figure 17](#). Or go to 5b.

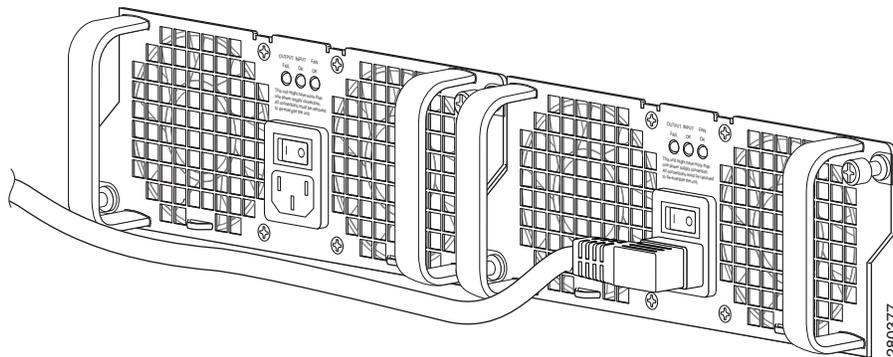
Figure 17 Cisco ASR 1002-F Router AC Power Cord



1 AC power cord and service loop

- b. Take the power cord and run it below the handles of the power supply in slot 1 (the power supply you are connecting) and the power supply in slot 0 (left) as shown in [Figure 18](#). Make sure the power cord is hanging loosely so that it cannot be disconnected from the AC power inlet.

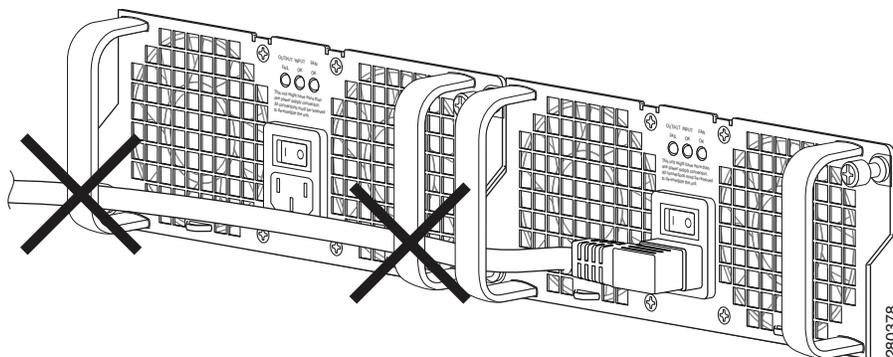
Figure 18 Cisco ASR 1002-F Router AC Power Cord - Left and Right




Caution

Do not run the AC power cord through the power supply handles as shown in [Figure 19](#).

Figure 19 AC Power Supply Cord Cabling for the Cisco ASR 1002-F Router



 **Note** Using a tie wrap for the AC power cable is optional and not necessary. However, if you do attach the AC power cable to a power supply tab and then you remove the AC power cable for some reason, check for any damage to the cable after you cut the tie wrap off. If the power cord is damaged, replace it immediately.

 **Note** Turn the power supply switch to On (I) after both sides of the power cord are connected.

- Step 6** Plug the AC power supply cable into the AC power source.
- Step 7** Place the AC power supply switch to the On (I) position.
- Step 8** The power supply LEDs light when power is supplied to the router.
-

This completes the procedure for connecting an AC power supply in the Cisco ASR 1002-F Router. You have completed a live change-out procedure (that is, removing and replacing an AC power supply) for an AC power supply not operating properly in the Cisco ASR 1002-F Router within five minutes.

Removing the DC Power Supply

Before you can remove a DC power supply from the Cisco ASR 1002-F Router, you must remove power from the power supply.

 **Caution** Make certain that the chassis ground is connected before you begin removing and installing the power supply.

To remove the DC power supply from the Cisco ASR 1002-F Router, follow this procedure:

- Step 1** Slip on the ESD-preventative wrist strap that was included in the accessory kit.
- Step 2** Place the power supply switch in the Standby position.
- Step 3** Turn off the branch circuit breaker before touching terminal screws. Then start loosening terminal block screws to remove wires.
- Step 4** Remove the ground leads from the terminal block in this order.
- Negative ground lead
 - Positive ground lead
 - Ground lead
- Step 5** Unscrew all of the power supply captive installation screws.
-

 **Note** Four power supplies must be installed in the chassis at all times, with a minimum of two power supplies (one per zone) connected to the mains in order to power on the system and ensure sufficient cooling. The system fans are inside the power supply units and must spin for cooling. Because all the system fans can be powered by one power supply, the second power supply unit does not have to be powered on, but must be connected.

 **Caution** If you remove a power supply from a system that has four power supplies that are connected and powered on, the system can run only for a maximum of five minutes before shutting down. However, because the fans and power elements are independent within the power supply, the replacement power supply does not have to be energized within five minutes. The only requirement is that the power supply be installed in the chassis in order to energize the fans and maintain proper system cooling.

- Step 6** Grasping the power supply handles, pull the power supply from the chassis.

Step 7 Replace the DC power supply within five minutes or the system will shutdown.

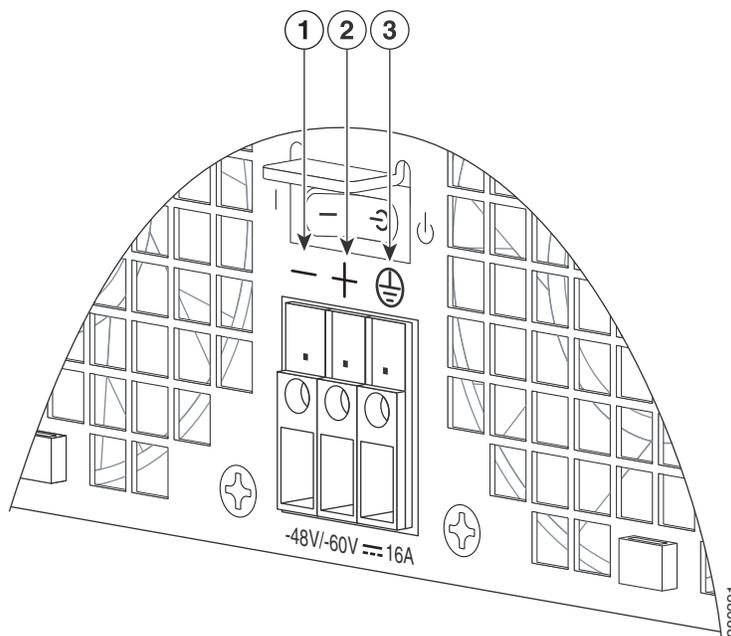
You have completed the procedure for removing a DC power supply from the Cisco ASR 1002-F Router.

Installing the DC Power Supply

This section provides information about replacing a DC power supply in the Cisco ASR 1002-F Router.

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.

Figure 20 Cisco ASR 1002-F Router Terminal Block



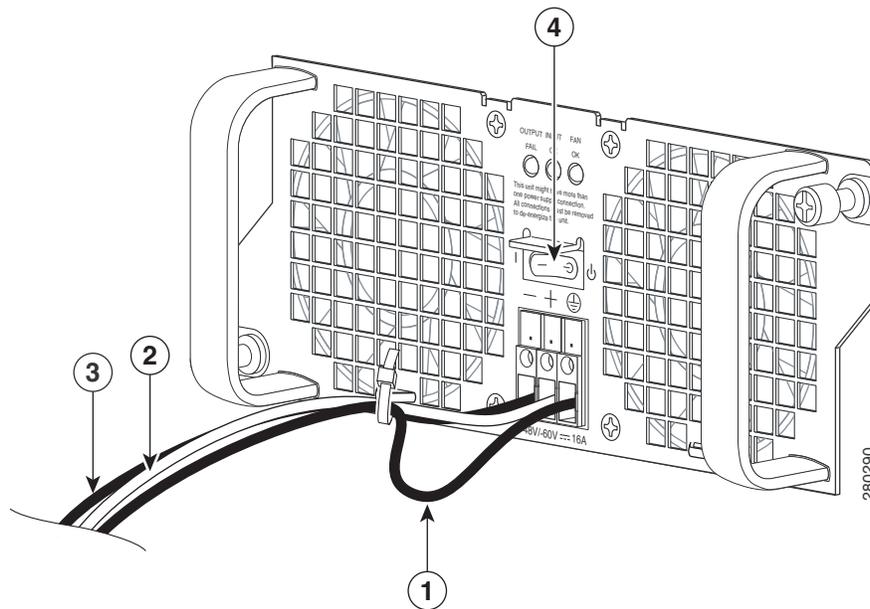
1	Negative lead	3	Earth ground symbol
2	Positive lead		

Warning **Never install an AC power module and a DC power module in the same chassis.** Statement 1050

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

- Step 1** At the rear of the router, check that the power supply Standby switch is in the Standby position.
- Step 2** Ensure that the negative and positive leads are disconnected from the site power source and the circuit breaker is turned off.
- Step 3** Insert a DC power supply in power supply slot 0 or power supply slot 1 until it is full seated.
- Step 4** Using a wire stripper, strip approximately 0.55 inch (14 mm) from the negative, positive, and ground lead.

Figure 21 Cisco ASR 1002-F Router DC Power Supply



1	Ground lead wire	3	Positive lead wire
2	Negative lead wire	4	DC power supply Standby switch

- Step 5** Insert the stripped end of the ground lead all the way into the ground lead receptacle on the DC-input power supply, and tighten the receptacle screw using a 3.5 mm flat-blade screwdriver to a torque of 0.5 to 0.6Nm.
- Step 6** Insert the stripped end of the positive lead all the way into the positive lead receptacle and tighten the receptacle screw using the same 3.5 mm flat-blade screwdriver. Repeat this step for the negative lead.

 **Note** Make sure the entire stripped end of each lead is inserted all the way into its receptacle. If any exposed wire at the stripped end of a lead is visible after inserting the lead into its receptacle, remove the lead from the receptacle, use the wire stripper to cut the stripped end of the lead, and repeat Step 4 through Step 6.

Step 7 After tightening the receptacle screw for the ground, positive, and negative DC-input leads, use a cable tie to secure the three leads to the power supply faceplate.

 **Note** When securing the ground, positive, and negative DC-input leads to the power supply faceplate, leave extra service loop in the ground lead to ensure that the ground lead is the last lead to disconnect from the power supply if a great deal of strain is placed on all three leads.

- Step 8** Turn the branch circuit breaker on at your site and the turn the Standby switch to the On (I) position.
- Step 9** Check that the power supply LEDs light when power is supplied to the router.

You have completed the procedure for installing a DC power supply in the Cisco ASR 1002-F Router.



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