Cisco ASR 1002-F Router Overview and Installation

This chapter describes the Cisco ASR 1002-F (Fixed) Router and provides procedures for installing the Cisco ASR 1002-F Router on an equipment shelf or tabletop or in an equipment rack, and describes how to connect interface and power cables.

This chapter contains the following sections:

Cisco ASR 1002-F Router Description

The Cisco ASR 1002-F Router is one of the Cisco ASR 1000 Series Aggregation Services Routers. The Cisco ASR 1002-F Router supports all the general-purpose routing and security features of the Cisco ASR 1002 Router, and uses the same internal control and data-plane architecture as Cisco ASR 1002 Router.

The Cisco ASR 1002-F Router supports:

- The same features and components as the Cisco ASR 1002 Router

- An integrated 4xGE SPA interface
- Fixed 2.5 GB of system bandwidth and 4 GB DRAM
- A built-in 4x1GE SPA providing four small form-factor pluggable (SFP-based) GE connections, designated as SPA bay 0

.

For information about the SFP transceiver modules that are compatible with Cisco ASR 1002 Built-in Gigabit Ethernet Ports (4x1GE), refer to the “Modular Optics Compatibility” section in Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Hardware Installation Guide .

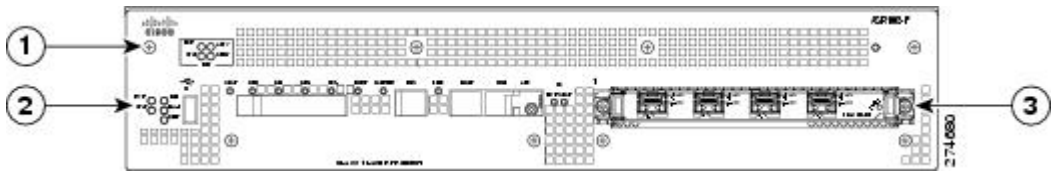
Note Only Cisco software release four code supports the Cisco ASR 1002-F Router. Do not use earlier versions of Cisco software.

This section contains the following topics:

Front View

Figure 1: Cisco ASR 1002-F Router—Front View, on page 2 shows the front of the Cisco ASR 1002-F Router with the Cisco ASR 1002-ESP-F, Cisco ASR 1000 route processor, and a SPA-4XOC12-POS installed.

Figure 1: Cisco ASR 1002-F Router—Front View

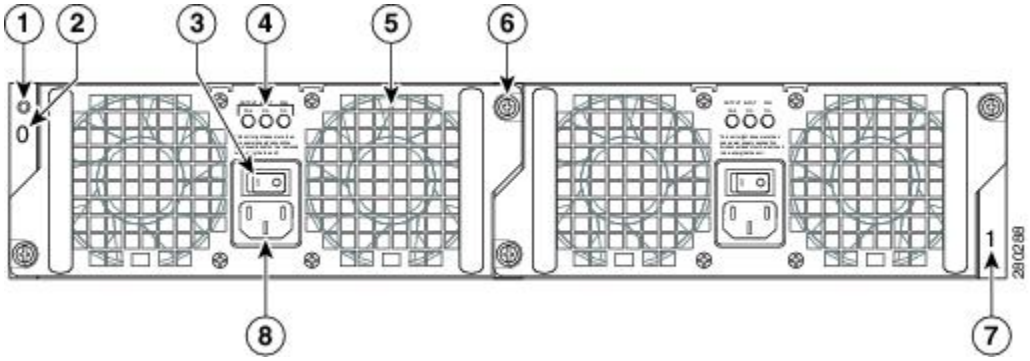


1	Integrated Cisco ASR 1002-ESP-F	3	Cisco ASR 1002-SIP10-F with a SPA installed
2	Integrated Cisco RP	—	—

Rear View

The following image shows the rear of the Cisco ASR 1002-F Router with AC power supplies installed.

Figure 2: Cisco ASR 1002-F Router With AC Power Supplies—Rear View

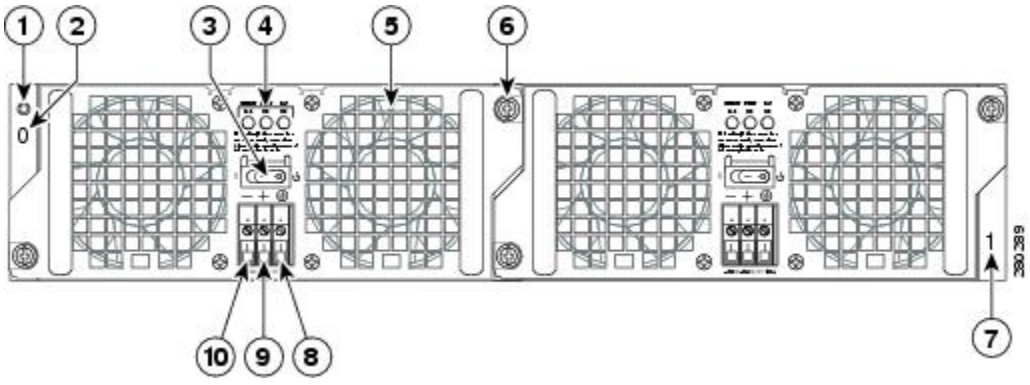


1	Chassis ESD socket	5	Fan
2	AC power supply slot 0 label	6	Captive installation screw
3	AC power supply On (|)/Off (O) switch	7	AC power supply slot 1 label
4	AC power supply LEDs	8	AC power inlet

Note On the side of the Cisco ASR 1002-F Router there is an eUSB panel door and the grounding lug as shown in the "Cisco ASR 1002-F Router Chassis Ground Lug Location and eUSB Side Panel Door" figure in the *Attaching a Chassis Ground Connection* section. This panel door 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, then the chassis should be returned.

The follwing image shows the rear of the Cisco ASR 1002-F Router with DC power supplies installed.

Figure 3: Cisco ASR 1002-F Router With DC Power Supplies—Rear View



1	Chassis ESD socket	6	Captive installation screw
2	DC power supply slot 0 label	7	DC power supply slot 1 label
3	DC power supply Standby/On (|) switch	8	Ground lead

4	DC power supply LEDs	9	Positive lead
5	Fan	10	Negative lead

Internal fans draw cooling air into the chassis and across internal components to maintain an acceptable operating temperature. The fans are located at the rear of the chassis. A two-hole ground connector lug is located on the side of the chassis. Two power supplies, either two AC power supplies or two DC power supplies, are accessed from the rear of the router.

Caution Use only AC power supplies or DC power supplies in the Cisco ASR 1002-F Router. Do not mix power supply types.

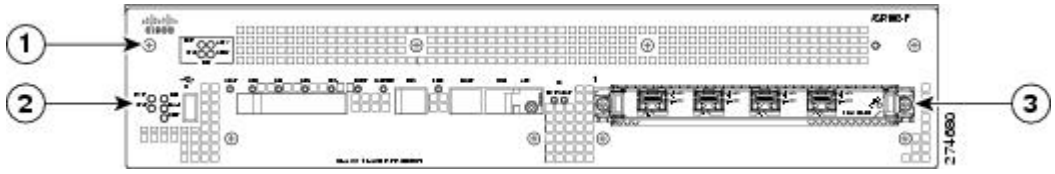
Cisco ASR 1002-F Router Slot Numbering

The Cisco ASR 1002-F Router contains:

- One Cisco integrated RP— R0
- One integrated Cisco ASR1000-ESP-F forwarding processor— F0
- One integrated ASR1002-SIP10-F—slot 0
- 4-Gigabit Ethernet built-in interface—slot 0/0
- SPA-5x1GE-V2—slot 0/1

The following figure shows the slot numbering for the Cisco ASR 1002-F Router.

Figure 4: Cisco ASR 1002-F Router Slot Numbering



1	Slot 0	3	Slot 2
2	Slot 1	—	—

Cisco ASR 1002-F Router Components

The Cisco ASR 1002-F Router system is derived from the architecture of the Cisco ASR 1002 Router. The main components of the Cisco ASR 1002-F Router are:

- Cisco integrated RP
- Cisco integrated ASR 1002-ESP-F
- Cisco ASR 1002-SIP10-F
- AC or DC power supplies

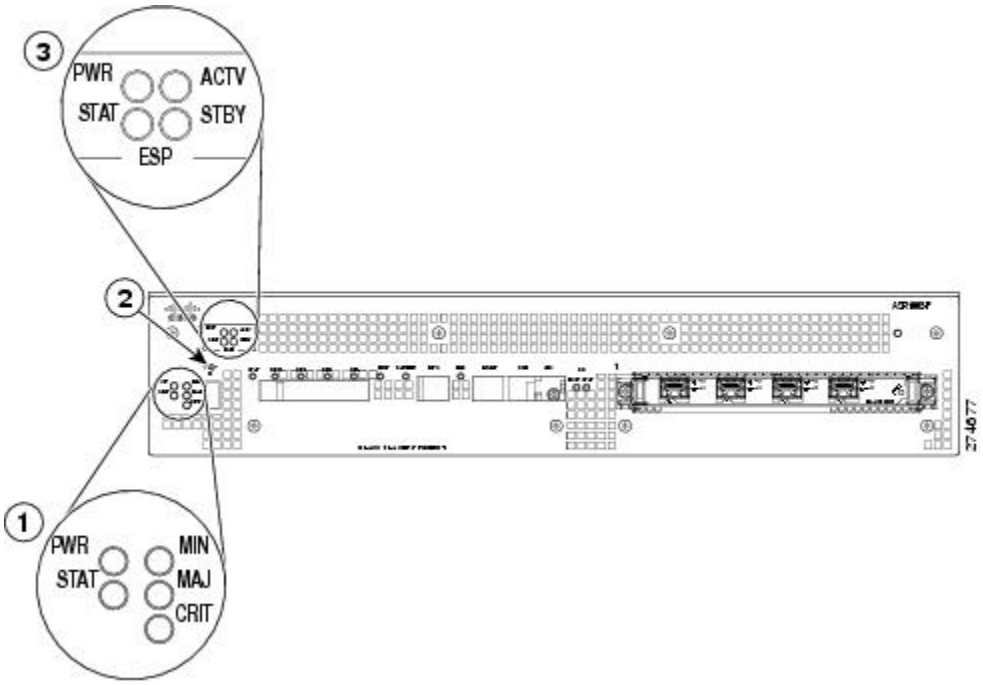
Cisco Integrated RP and Cisco ASR 1002-ESP-F Description

The Cisco ASR 1002-F Router supports the following integrated components:

- Cisco integrated RP—The Cisco ASR 1000 Series integrated Route Processor (RP) for the Cisco ASR 1002-F Router is the central control processor and runs the network operating system. The Cisco integrated RP supports management interfaces such as the Management Ethernet port and console and auxiliary serial ports. It has LED status indicators, an RJ-45 plug for a BITS timing reference, and one USB port that can be used with smart cards for secure key distribution or for image or configuration file updates.
- Cisco ASR 1002-ESP-F services processor (does not support online insertion and removal)—The Cisco embedded services processor is based on the Cisco QuantumFlow Processor for next-generation forwarding and queuing. It performs all baseline packet routing operations, including MAC classification, Layer 2 and Layer 3 forwarding, quality of service (QoS) classification, policing and shaping, security access control lists (ACLs), VPNs, load balancing, and NetFlow. The Cisco ASR 1002-ESP-F can only be used in the Cisco ASR 1002-F Router and has forwarding performance of 2.5 Gbps and does not support online insertion or removal.

The following image shows the Cisco ASR 1002-F Router faceplate labels for the Cisco integrated RP and Cisco ASR 1002-ESP-F.

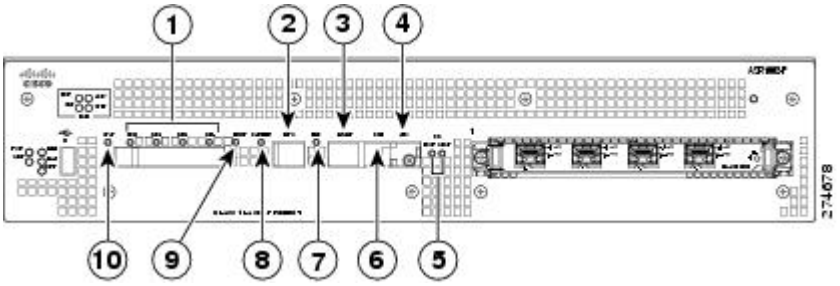
Figure 5: Cisco Integrated RP and Cisco ASR 1002-ESP-F LEDs on Cisco ASR 1002-F Router



1	Cisco RP LEDs: PWR, STAT, MIN, MAJ, CRIT	2	Cisco ASR 1002-ESP-F LEDs: PWR, STAT, ACTV, STBY

The following image shows the Cisco ASR 1002-F Router faceplate labels for the Cisco integrated RP.

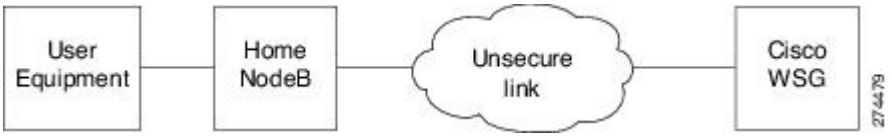
Figure 6: Cisco Integrated RP Faceplate Labels



1	Gigabit Ethernet ports 0, 1, 2, 3	6	CON
2	BITS	7	LINK
3	MGMT	8	CARRIER
4	AUX	9	BOOT
5	Cisco integrated ASR 1002-SIP10-F LEDs: PWR, STAT	10	Cisco integrated RP STAT LED

The following image shows the labels for the Cisco ASR 1002-SIP10-F SPA interface processor (SIP). The ASR 1002-F router has only one half-height removable SPA.

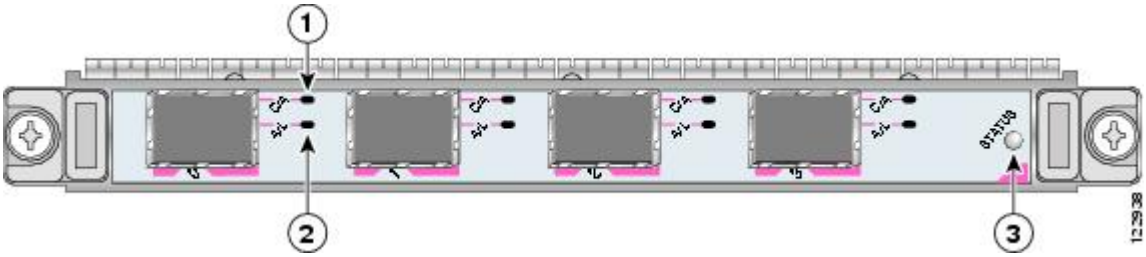
Figure 7: Cisco ASR 1002-SIP10-F SPA Interface Processor



1	Cisco ASR 1002-SIP10-F	4	Port 2
2	SPA STATUS LED	5	Port 1
3	Port 3	6	Port 0

The Cisco ASR 1002-F Router SPA has three types of LEDs: two LEDs for each port on the SPA and one STATUS LED, as shown in the following image.

Figure 8: Cisco ASR 1002-F Router SPA Faceplate



1	C/A (Carrier/Alarm)	3	SPA STATUS
2	A/L (Active/Loopback)	—	—

The following table describes the Cisco ASR 1002-F Router SPA LEDs.

Table 1: Cisco ASR 1002-F Router SPA LEDs

LED Label	Color	State	Meaning
C/A	Off	Off	SONET alarm controller is shut down.
	Green	On	Port is enabled by software and there is a valid SONET alarm signal without any alarms.
	Amber	On	Port is enabled by software and there is at least one alarm.
A/L	Off	Off	Interface is shut down.
	Green	On	Port is enabled by software and loopback is off.
	Amber	On	Port is enabled by software and loopback is on.
STATUS	Off	Off	SPA power is off.
	Green	On	SPA is ready and operational.
	Amber	On	SPA power is on and good and the SPA is being configured.

Cisco Integrated ASR 1002-SIP10-F and SPA for Cisco ASR 1002-F Router Description

The Cisco ASR 1002-SIP10-F in the Cisco ASR 1002-F Router is integrated into the chassis and you cannot insert or remove it. The Cisco integrated ASR 1002-SIP10-F provides the physical and electrical termination for one half-height SPA.

The Cisco integrated ASR 1002-SIP10-F interface supports all Cisco SPA interface processor functions and services. However, the Cisco integrated ASR 1002-SIP10-F differs in the following areas:

- Functions as the base board for the Cisco integrated RP
- Is not a field-replaceable unit (FRU) and does not support online insertion and removal (OIR)

Power Supplies in the Cisco ASR 1002-F Router

The Cisco ASR 1002-F Router power supply consists of either an AC or DC input in a closed frame power supply with two DC voltage outputs: 12 V and 3.3 V. The AC power supply operates between 85 VAC to 264 VAC and the DC power supply operates between –40.5 VDC to –72 VDC.

The power supplies are installed into the rear of the chassis and are hot pluggable. The Cisco ASR 1002-F Router supports up to 588 W of input power from an infrastructure standpoint, but the initial power supply development limit is up to 470 W of output power (AC and DC input).

AC Power Supply for the Cisco ASR 1002-F Router

The AC power supply input inlet is an IEC connector with an AC switch and the current rating on the connector and switch is 10 A. The AC power supply is secured into the chassis with two captive installation screws mounted on the faceplate.

The following table describes the LEDs on the Cisco ASR 1002-F Router.

Table 2: 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.

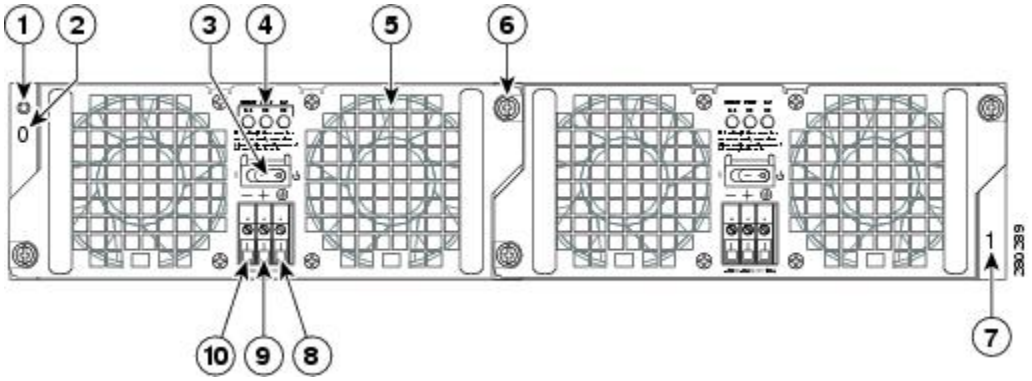
DC Power Supply for the Cisco ASR 1002-F Router

The DC power supply input connector is a Euro-style type of terminal block. It is compliant with safety agencies' guidelines and electrical requirements of the supply. The DC power supply operates within specification from –40.5 VDC to –72 VDC continuously once the power supply DC input turn-on threshold of –43.5 V has been reached.

The DC power supply input connector accepts three wires: one positive polarity, one negative polarity, and one ground. There are provisions on the front panel to use a wire tie for strain relief of the DC input wiring. The DC power supply is secured into the system chassis with two installation captive screws mounted on the faceplate.

The following image shows the DC power supply for the Cisco ASR 1002-F Router.

Figure 9: 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	DC power supply Standby/On (|) switch	8	Ground lead
4	DC power supply LEDs	9	Positive lead
5	Fan	10	Negative lead

The following table defines the Cisco ASR 1002-F Router DC power supply LEDs on the Cisco ASR 1002-F Router.

Table 3: Cisco ASR 1002-F Router DC Power Supply LEDs

LED Label	LED	Color	Description
INPUT OK	Power supply activity	Green	The DC power supply input voltage is greater than 43.5 VDC at turn-on and remains green down to 39 VDC.
		Amber	The power supply turns off due to low input voltage (falls below 39VDC) and indicates that there is still a hazard present (voltage on the terminal block). The LED remains amber and is active to around 20 V +/-5 V.
		Off	The input is below 15V
FAN OK	Power supply fan status activity	Green	All fans are operational.
		Red	A fan failure is detected.
OUTPUT FAIL	Power supply activity	Red	The DC output is out of the specified range. When you turn the power supply on, the red LED illuminates for two to three seconds to test LED operation before going off.
		Off	The DC output voltage are within the normal operating range.

The table shows the DC power supply output voltage alarm range.

Table 4: DC Power Supply Output Voltage Alarm Threshold Ranges

Output	Minimum	Maximum
12V	10.0–11.2V	12.8–13.8V
3.3V	2.6–3.0 V	None

Power Cords Supported by the Cisco ASR 1002-F Router

The following table lists the power cords that are supported by the Cisco ASR 1002-F Router.

Table 5: Power Cords Supported by the Cisco ASR 1002-F Router

Power Cord Item Number	Description
CAB-AC-RA	Power Cord, 110 V, Right Angle
CAB-ACA-RA	Plug, Power Cord, Australian, 10 A, Right Angle
CAB-ACB10A-RA	Power Cord, Brazil, Right Angle, 10 A
CAB-ACB16A-RA	Power Cord, Brazil, Right Angle, 16 A
CAB-ACC-RA	Power Cord China, Right Angle
CAB-ACE-RA	Power Cord Europe, Right Angle
CAB-ACI-RA	Power Cord, Italian, Right Angle
CAB-ACR-RA	Power Cord Argentina, Right Angle
CAB-ACS-RA	Power Cord, Switzerland, Right Angle
CAB-ACU-RA	Power Cord UK, Right Angle
CAB-IND-RA	Power Cord India, Right Angle
CAB-JPN-RA	Power Cord-Japan, Right Angle

Installation Methods

The Cisco ASR 1002-F Router is designed for a standalone, two-rail 19-inch rack-mount (front rail only), or four-rail 19-inch rack-mount (front and rear rail).

Although rack-mounting is the preferred method of installation for the Cisco ASR 1002-F Router, you can mount the chassis on an equipment shelf or tabletop.

Note The Cisco ASR 1002-F Router usually ships fully loaded. However, you can remove components, such as the power supplies, from the chassis to make the chassis lighter for your rack installation.

Warning This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

Warning Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for Cisco ASR 1000 Series Aggregation Services Routers* publication. This document provides important safety information you should know before working with the system. Statement 200

General Rack Installation Guidelines

When planning your rack installation, consider the following guidelines:

- The Cisco ASR 1002-F Router requires a minimum of 3.5 inches or 8.9 cm of vertical rack space. Measure the proposed rack location before mounting the chassis in the rack.
- Before using a particular rack, check for obstructions (such as a power strip) that could impair rack-mount installation. If a power strip does impair a rack-mount installation, remove the power strip before installing the chassis, and then replace it after the chassis is installed.
- Allow sufficient clearance around the rack for maintenance. If the rack is mobile, you can push it back near a wall or cabinet for normal operation and pull it out for maintenance (installing or moving cards, connecting cables, or replacing or upgrading components). Otherwise, allow 19 inches/48.3 cm) of clearance to remove field-replaceable units.
- Maintain a minimum clearance of 3 inches/7.62 cm on the front and back sides of the chassis for the cooling air inlet and exhaust ports, respectively. Avoid placing the chassis in an overly congested rack or directly next to another equipment rack; otherwise, the heated exhaust air from other equipment can enter the inlet air vents and cause an overtemperature condition inside the router.

Caution To prevent chassis overheating, never install a Cisco ASR 1002-F Router in an enclosed room that is not properly ventilated or air-conditioned.

- Always install heavier equipment in the lower half of a rack to maintain a low center of gravity to prevent the rack from falling over

  .
- Install and use the cable-management brackets included with the Cisco ASR 1002-F Router to keep cables organized and out of the way of the cards and processors. Ensure that cables from other equipment already installed in the rack do not impair access to the cards or require you to disconnect cables unnecessarily to perform equipment maintenance or upgrades

  .
- Install rack stabilizers (if available) before you mount the chassis

  .

- Provide an adequate chassis ground (earth) connection for your router chassis.

In addition to the preceding guidelines, review the precautions for avoiding excessive temperature conditions in the "Site Environmental Requirements" section on page 5-9 .

The following table provides the Cisco ASR 1002-F Router dimensions and weight information.

Table 6: Cisco ASR 1002-F Router Dimensions and Weight

Cisco ASR 1002-F	Dimensions
Depth	22.50 in. (57.15 cm)(including card handles, cable-management brackets, power supply handles
Height	3.47 in. (8.813 cm)—2RU rack-mount per EIA RS-310 standard
Width	17.25 in. (43.815 cm)—19-inch rack-mount
Weight	40 lb (18.143 k)—fully configured

Guidelines for an Equipment Shelf or Tabletop Installation

The chassis should already be in the area where you will install it. If you have not determined where to install your chassis, see the "Cisco ASR 1000 Series Routers Component Overview" section on page 2-1 for information about site considerations.

If you are not rack-mounting your Cisco ASR 1000 series chassis, place it on a sturdy equipment shelf or tabletop.

When installing the Cisco ASR 1002-F Router on an equipment shelf or tabletop, ensure that the surface is clean and that you have considered the following:

- The Cisco ASR 1002-F Router requires at least 3 inches (7.62 cm) of clearance at the inlet and exhaust vents (the front and rear sides of the chassis).
- The Cisco ASR 1002-F Router should be installed off the floor. Dust that accumulates on the floor is drawn into the interior of the router by the cooling fans. Excessive dust inside the router can cause overtemperature conditions and component failures

  .
- There must be approximately 19 inches (48.3 cm) of clearance at the front and rear of the chassis to install and replace FRUs, or to access network cables and equipment.
- The Cisco ASR 1002-F Router needs adequate ventilation. Do not install it in an enclosed cabinet where ventilation is inadequate.
- Have the cable-management bracket available if you plan to install it on the front of the chassis.
- An adequate chassis ground (earth) connection exists for your router chassis

  (see the Attaching a Chassis Ground Connection, on page 24).
- Always follow proper lifting practices as outlined in the next section, when handling the chassis.

Equipment Shelf or Tabletop Installation

To mount your Cisco ASR 1002-F Router on an equipment shelf or tabletop, follow these steps:

SUMMARY STEPS

1. Remove any debris and dust from the tabletop or platform, as well as the surrounding area.
2. Lift the chassis into position on the equipment shelf or tabletop. image shows how to lift the chassis.
3. Attach the front rack-mount brackets. Locate the threaded holes in the front sides of the chassis (first holes beyond the vent holes) and use the package of black screws that shipped with the chassis.
4. Align the front rack-mount bracket to one side of the chassis.
5. Insert and tighten the screws on one side.
6. Repeat Step 4 through Step 5 on the other side of the chassis. Use all the screws to secure the rack-mount brackets to the chassis.
7. Gather the two cable-management brackets and screws that shipped with your chassis. The following image shows cable-management brackets attached on the front of the Cisco ASR 1002-F Router.
8. Screw the cable-management brackets to each side of the rack-mount brackets already attached to the chassis. Use two screws for each cable-management bracket.
9. Check that all the screws are securely tightened.

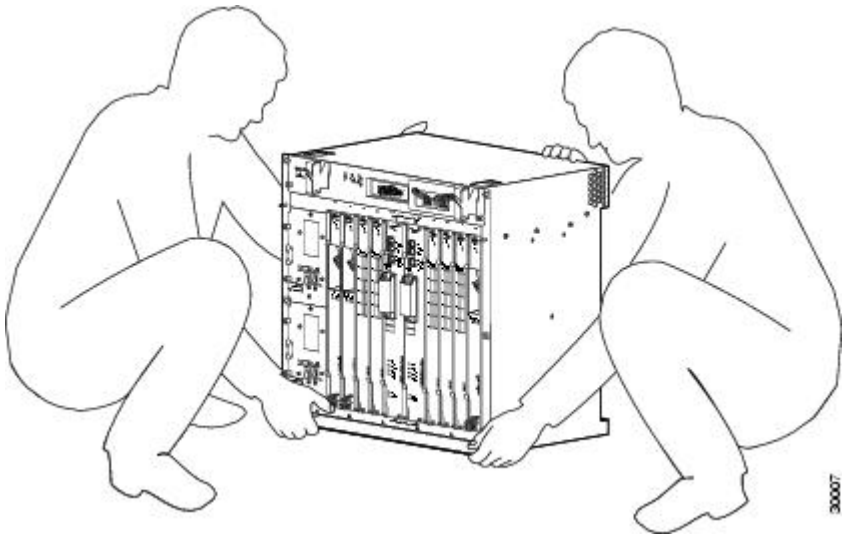
DETAILED STEPS

Step 1 Remove any debris and dust from the tabletop or platform, as well as the surrounding area.

Step 2 Lift the chassis into position on the equipment shelf or tabletop. image shows how to lift the chassis.

Warning At least two people are required to lift the chassis onto a tabletop or platform. To prevent injury, keep your back straight and lift with your legs, not your back. Statement 164

Figure 10: Lifting the Chassis



Note The chassis in the above image does not represent the Cisco ASR 1002-F Router. This is only an example of how to lift a Cisco chassis.

Step 3 Attach the front rack-mount brackets. Locate the threaded holes in the front sides of the chassis (first holes beyond the vent holes) and use the package of black screws that shipped with the chassis.

Step 4 Align the front rack-mount bracket to one side of the chassis.

Step 5 Insert and tighten the screws on one side.

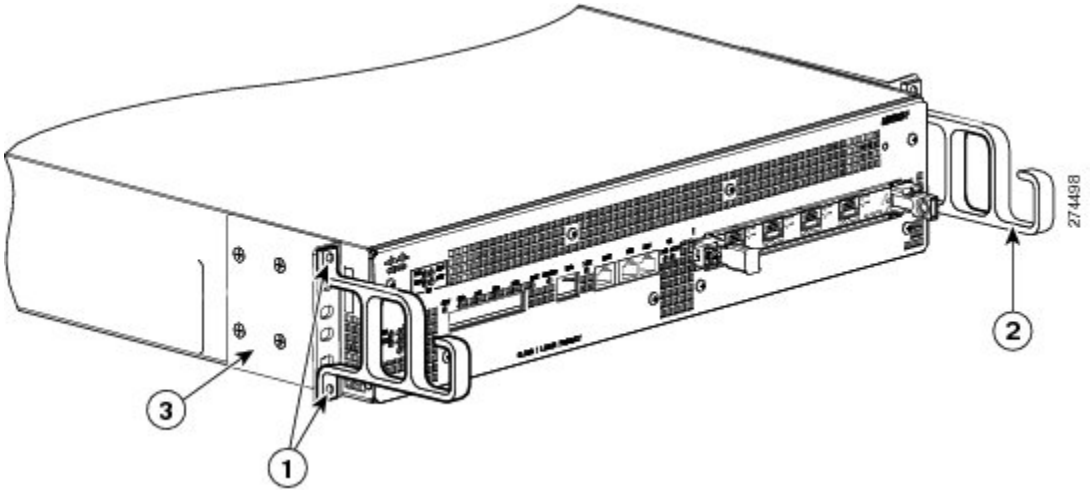
Step 6 Repeat Step 4 through Step 5 on the other side of the chassis. Use all the screws to secure the rack-mount brackets to the chassis.

Note The chassis rack-mount brackets must be installed first so that you can attach the cable-management brackets to the chassis rack-mount brackets after the chassis is installed in the rack.

Step 7 Gather the two cable-management brackets and screws that shipped with your chassis. The following image shows cable-management brackets attached on the front of the Cisco ASR 1002-F Router.

Note Make certain that the cable-management bracket "U" feature device has the open end pointing upwards when you attach it to the chassis

Figure 11: Attaching the Cable-Management Brackets to the Cisco ASR 1002-F Router



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

Step 8 Screw the cable-management brackets to each side of the rack-mount brackets already attached to the chassis. Use two screws for each cable-management bracket.

Step 9 Check that all the screws are securely tightened.

What to do next

Go to the Attaching a Chassis Ground Connection, on page 24 to continue the installation.

Rack-Mounting the Cisco ASR 1002-F Router

The Cisco ASR 1002-F Router can be installed in an existing rack with equipment or in an empty rack with no equipment. The chassis can be mounted in two equipment rack types:

- Two-post rack, 19-inch or 23-inch equipment rack. Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm). The height of the chassis is 3.47 inches (8.8 cm). Airflow through the chassis is from front to back

  .

Note If you are using a two-post rack, secure the rack to the floor surface to prevent tipping and avoid bodily injury.

- Four-post, 19-inch equipment rack. Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm). The height of the chassis is 3.47 inches/8.8 cm). Airflow through the chassis is from front to back.

The Cisco ASR 1002-F Router can be installed with both front or rear rack-mount brackets.

Verifying Rack Dimensions

Before you install the chassis, measure the space between the vertical mounting flanges (rails) on your equipment rack to verify that the rack conforms to the measurements shown in the following image.

SUMMARY STEPS

1. Mark and measure the distance between two holes on the left and right mounting rails. The distance should measure 18.31 inches ± 0.06 inches (46.5 cm ± 0.15 cm).
2. Measure the space between the inner edges of the left front and right front mounting flanges on the equipment rack. The space must be at least 17.7 inches (45 cm) to accommodate the chassis, which is 17.25 inches (43.8 cm) wide and fits between the mounting posts on the rack.

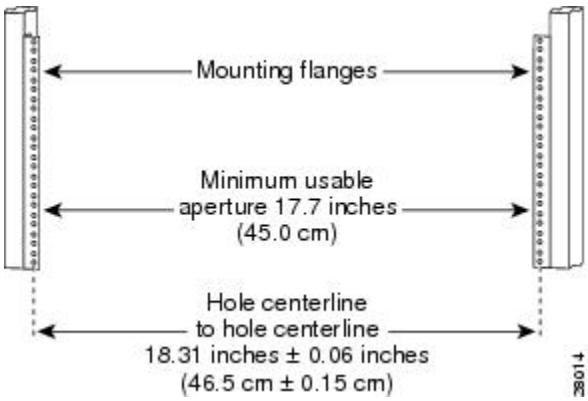
DETAILED STEPS

Step 1 Mark and measure the distance between two holes on the left and right mounting rails. The distance should measure 18.31 inches ± 0.06 inches (46.5 cm ± 0.15 cm).

Note Measure for pairs of holes near the bottom, middle, and top of the equipment rack to ensure that the rack posts are parallel.

Step 2 Measure the space between the inner edges of the left front and right front mounting flanges on the equipment rack. The space must be at least 17.7 inches (45 cm) to accommodate the chassis, which is 17.25 inches (43.8 cm) wide and fits between the mounting posts on the rack.

Figure 12: Verifying Equipment Rack Dimensions



Attaching the Chassis Rack-Mount Brackets

This section explains how to attach the front and rear rack-mount brackets to the chassis. Before installing the chassis in the rack, you must install the rack-mount brackets on each side of the chassis.

The parts and tools required for installing the rack-mount brackets and cable-management brackets are listed in the "Tools and Equipment" section on page 5-23 .

Note The cable-management brackets are attached to the chassis after you install the chassis rack-mount brackets on the chassis and mount the chassis in the rack.

Chassis Front Rack-Mount Brackets

Determine where in the rack you want the chassis to be mounted. If you are mounting more than one chassis in the rack, then start from the bottom up or the center of the rack.

To install the front rack-mount brackets on the Cisco ASR 1002-F Router, perform the following steps:

SUMMARY STEPS

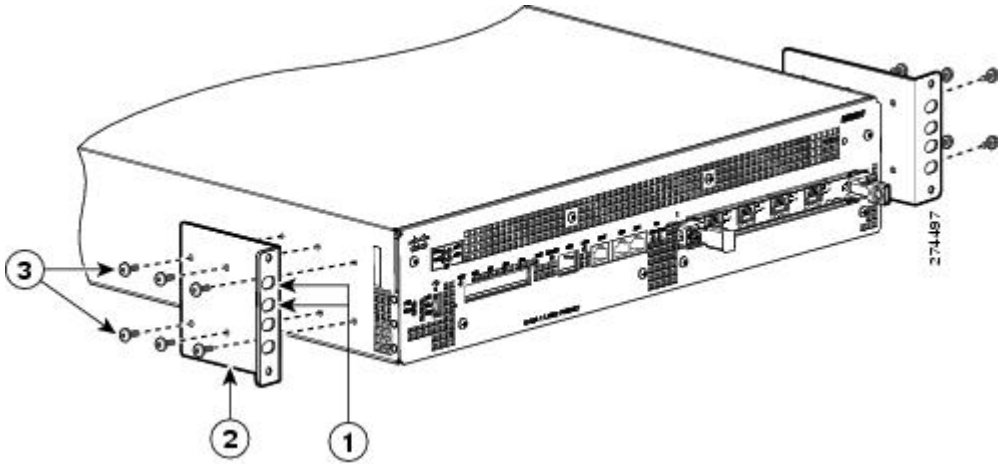
1. Locate the threaded holes on the side of the chassis. Make certain that you hold the front rack-mount bracket with the ear and holes facing outward and towards the front of the chassis.
2. Position the front rack-mount bracket top hole with the chassis first top hole behind the side vent holes.
3. Insert and tighten the black screws on one side.
4. Repeat Step 1 through Step 3 on the other side of the chassis. Use the black screws to secure the rack-mount brackets to the chassis.
5. Install the chassis in a rack. To install the Cisco ASR 1002-F Router in a rack, go to the Installing the Cisco ASR 1002-F Router in a Rack.

DETAILED STEPS

Step 1 Locate the threaded holes on the side of the chassis. Make certain that you hold the front rack-mount bracket with the ear and holes facing outward and towards the front of the chassis.

The following image shows where to attach the front rack-mount brackets to the Cisco ASR 1002-F Router. Depending on the bracket holes you use, the chassis may protrude in the rack.

Figure 13: Attaching the Front Rack-Mount Brackets to 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 2 Position the front rack-mount bracket top hole with the chassis first top hole behind the side vent holes.

Step 3 Insert and tighten the black screws on one side.

Step 4 Repeat Step 1 through Step 3 on the other side of the chassis. Use the black screws to secure the rack-mount brackets to the chassis.

Step 5 Install the chassis in a rack. To install the Cisco ASR 1002-F Router in a rack, go to the Installing the Cisco ASR 1002-F Router in a Rack.

What to do next

This completes the steps for attaching the front rack-mount brackets to the Cisco ASR 1002-F Router.

Chassis Rear Rack-Mount Brackets

If you are rack-mounting the chassis using the rear rack-mount brackets, then this type of installation provides for the chassis being recessed in the rack.

To install the rear rack-mount brackets on the Cisco ASR 1002-F Router, perform the following steps:

SUMMARY STEPS

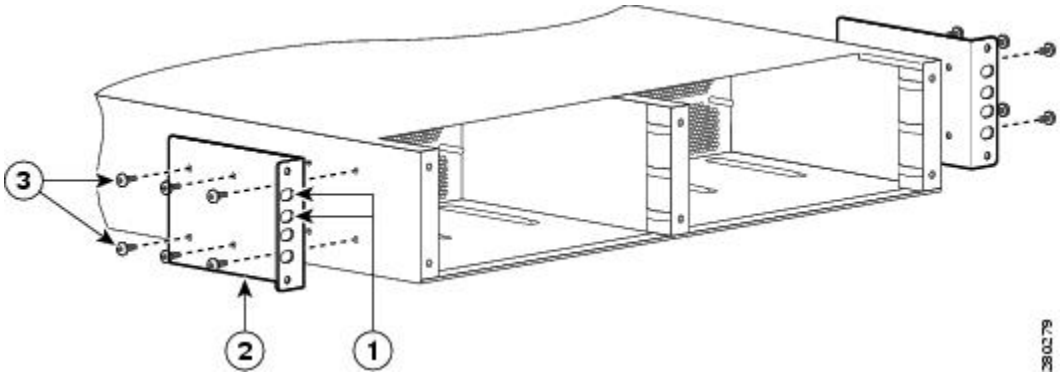
1. Locate the threaded ear holes on the rear side of the chassis. Make certain that you hold the rear rack-mount bracket with the ear and holes facing outward and towards the rear of the chassis.
2. Position the rear rack-mount bracket top hole with the chassis top hole from the back.
3. Insert and tighten the screws on one side.
4. Repeat Step 1 through Step 3 on the other side of the chassis. Use the remaining screws to secure the rear rack-mount brackets to the chassis.

DETAILED STEPS

Step 1 Locate the threaded ear holes on the rear side of the chassis. Make certain that you hold the rear rack-mount bracket with the ear and holes facing outward and towards the rear of the chassis.

The following image shows where to attach the rear rack-mount brackets to the Cisco ASR 1002-F Router.

Figure 14: Attaching the Rear Rack-Mount Brackets to the Cisco ASR 1002-F Router



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

Step 2 Position the rear rack-mount bracket top hole with the chassis top hole from the back.

Step 3 Insert and tighten the screws on one side.

Step 4 Repeat Step 1 through Step 3 on the other side of the chassis. Use the remaining screws to secure the rear rack-mount brackets to the chassis.

What to do next

This completes the steps for attaching the rear rack-mount brackets to the Cisco ASR 1002-F Router.

Caution Before you mount the Cisco ASR 1002-F Router in a rack, make certain you understand which rack-mount bracket ear holes to use when positioning the chassis in the rack. As a result of using the designated ear holes on the rack-mount bracket, the cable-management bracket installation will be made easier.

Installing the Cisco ASR 1002-F Router in a Rack

After installing the rack-mount brackets on the chassis, you mount the chassis by securing the rack-mount brackets to two posts or mounting strips in the rack using the screws provided.

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 to the rack posts.

Danger To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable.

The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack

  .
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

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.

To install the chassis in the rack, perform the following steps:

Step 1 On the chassis, ensure that all screws on the installed components are securely tightened.

Step 2 Make sure that your path to the rack is unobstructed. If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized. For chassis rack-mount installation types, see the “Two-Post Rack Installation” or the “Four-Post Rack Installation.”

Step 3 (Optional) Install a shelf in the rack to support Cisco ASR 1002-F Router. If you use a shelf, this will help support the chassis while you secure it to the rack.

Step 4 Lift the chassis into position between the rack posts.

Step 5 Align the mounting bracket ear holes with the rack post holes to attach the chassis to the rack.

Note If you are using a shelf, raise the chassis to the level of the shelf. Let the bottom of the chassis rest on the brackets, but continue to support the chassis.

Step 6 Position the chassis until the rack-mounting flanges are flush against the mounting rails on the rack.

Step 7 Hold the chassis in position against the mounting rails in the equipment rack and follow these steps:

a) Insert the bottom screw into the second bracket ear hole up from the bottom of the rack-mount 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 ear diagonally from the bottom screw and tighten the screw to the rack rail.

c) Insert the four screws to secure the chassis to the rack equipment.

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

Step 8 Tighten all screws on each side to secure the chassis to the equipment rack.

What to do next

You can install your Cisco ASR 1002-F Router on a two-post or four-post rack. See the "*Two-Post Rack Installation*" or the "*Four-Post Rack Installation*."

Two-Post Rack Installation

The Cisco ASR 1002-F Router can be installed on a two-post rack, either a 19-inch or 23-inch rack.

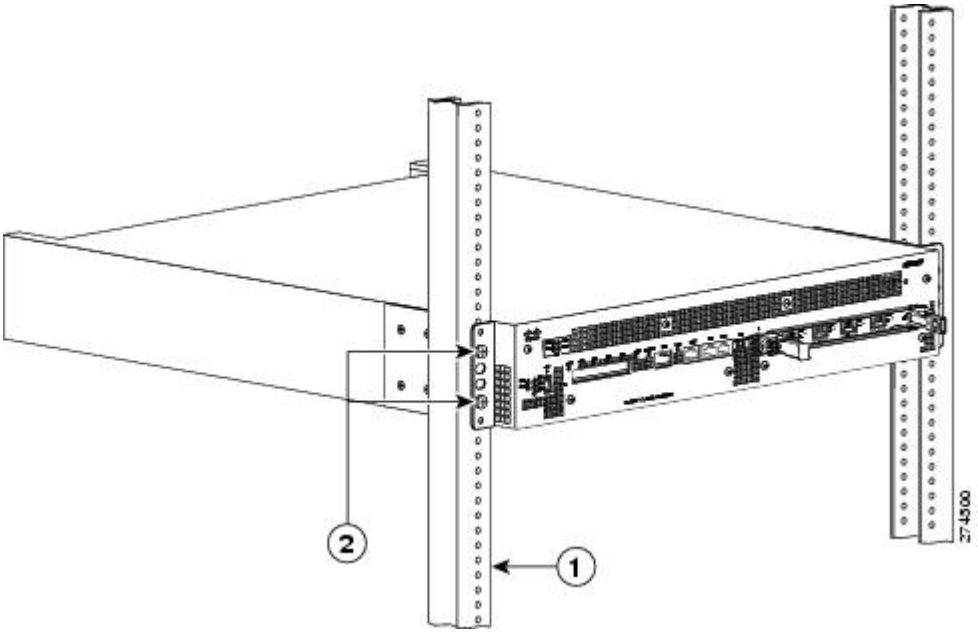
Note Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm). The height of the chassis is 3.47 inches (8.8 cm). Airflow through the chassis is from front to back.

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 lift it carefully into the rack. To prevent injury, avoid any sudden twists or moves.

The folowing image shows the Cisco ASR 1002-F Router on a two-post rack.

Figure 15: Installing the Cisco ASR 1002-F Router on a Two-Post Equipment Rack



1	Rack equipment rail	2	Front rack-mount bracket ear and holes

Step 2 Slide the chassis into the rack, pushing it back until the brackets meet the mounting strips or posts on both sides of the rack.

Step 3 Keeping the brackets flush against the posts or mounting strips, align the holes in the brackets with the holes on the rack or mounting strip.

Step 4 For each bracket, insert and tighten two screws to the rack on both sides.

What to do next

This completes the procedure for installing the chassis on a two-post rack. Proceed to the Attaching a Chassis Ground Connection. to continue the installation.

Four-Post Rack Installation

The Cisco ASR 1002-F Router can be flush-mounted in a 19-inch equipment rack using the rack-mounting kit provided with your system. When handling the chassis, always follow proper lifting practices. See the "*Chassis-Lifting Guidelines*" 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). The height of the chassis is 3.47 inches (8.8 cm). Airflow through the chassis is from front to back.

Caution Make sure the rack is stabilized.

Step 1 (Optional) Install a shelf in the rack to support the Cisco ASR 1002-F Router. If you are using a shelf, raise the chassis to the level of the shelf. Let the bottom of the chassis rest on the brackets, but continue to support the chassis. Lift the chassis into the rack, grasping underneath the power supply bays.

Step 2 Position the chassis until the rack-mounting flanges are flush against the mounting rails on the rack.

Note Use the second hole up from the bottom of the rack-mount bracket and the second hole down from the top of the rack-mount bracket. This will make it easier to attach the cable-management brackets to the chassis in the equipment rack.

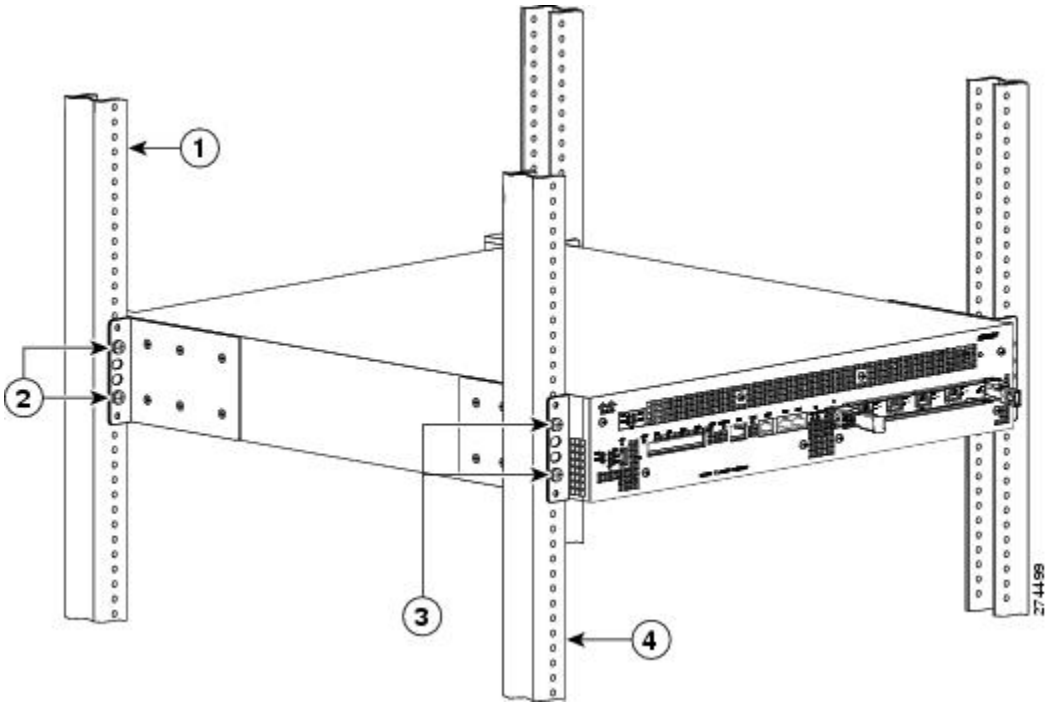
Step 3 Hold the chassis in position against the mounting rails while the second person finger-tightens a screw to the rack rails on each side of the chassis.

Step 4 Tighten the screws to the rack rails on each side of the chassis.

Step 5 Tighten all the screws on each side to secure the chassis to the equipment rack.

The following figure shows the Cisco ASR 1002-F Router on a four-post rack.

Figure 16: Installing the Cisco ASR 1002-F Router on a Four-Post Equipment Rack



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

Step 6 Use a level to verify that the tops of the two brackets are level, or use a measuring tape to verify that both brackets are the same distance from the top of the rack rails.

What to do next

This completes the procedure for installing the chassis on a four-post rack. Proceed to the "*Attaching the Cable-Management Bracket*" section to continue the installation.

Attaching the Cable-Management Bracket

The cable-management brackets mount to each rack-mount bracket on the chassis to provide cable-management to both sides of the chassis (parallel with card orientation). These brackets are screw mounted to the rack-mount brackets to allow easy installation and removal of cables.

The cable-management brackets for the Cisco ASR 1002-F Router contain one independent cable-management "U" features with two screws for each bracket.

Note Make certain that the cable-management bracket "U" feature 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:

SUMMARY STEPS

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.
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.
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 screwdriver (see Figure 17: Attaching the Cable-Management Brackets to the Cisco ASR 1002-F Router, on page 24).
4. Repeat Step 1 through Step 3 for the other side of the Cisco ASR 1002-F Router.

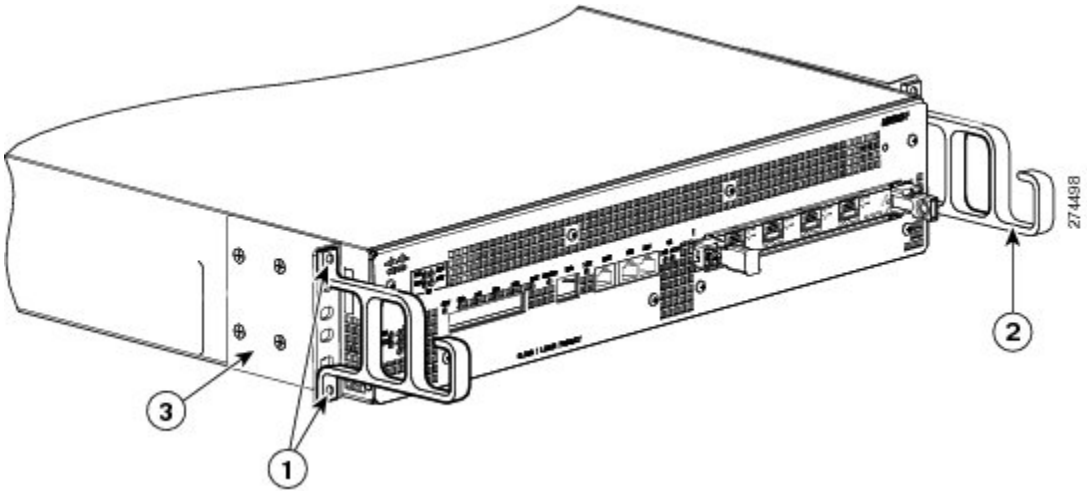
DETAILED STEPS

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.

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.

The following image shows where to attach the cable-management brackets to the Cisco ASR 1002-F Router.

Figure 17: Attaching the Cable-Management Brackets to the Cisco ASR 1002-F Router



1	Cable-management bracket top screw hole and bottom screw hole	3	Chassis front rack-mount bracket
2	Cable-management bracket "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 screwdriver (see Figure 17: Attaching the Cable-Management Brackets to the Cisco ASR 1002-F Router, on page 24).

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

What to do next

This completes the procedure for installing the cable-management brackets on the Cisco ASR 1002-F Router.

Attaching a Chassis Ground Connection

Connecting the Cisco ASR 1002-F chassis to ground is required for all DC-powered installations and any AC-powered installation where compliance with Telcordia grounding requirements is necessary.

Caution The grounding lug must be installed, all cards or filler plates must be fully inserted, screwed in, and grounded to prevent a potential hazard in a telecom line.

Have the recommended tools and supplies available before you begin this procedure.

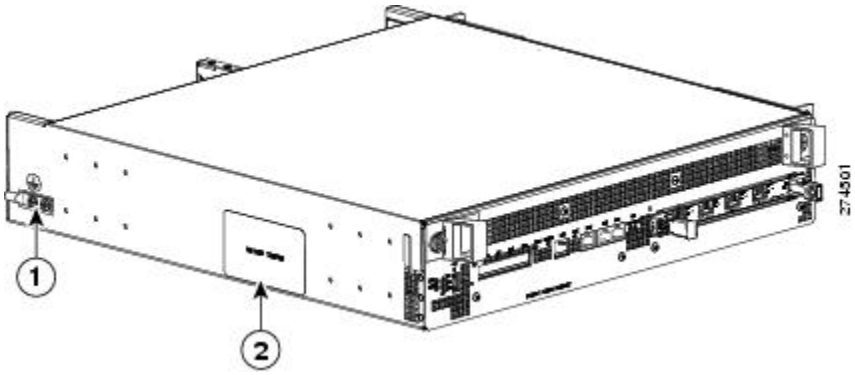
Warning This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

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 chassis grounding lug and the respective screws are provided in the accessory kit that ships with your Cisco ASR 1002-F Router.

Caution The grounding wire is always the first to be installed or connected and the last to be removed or disconnected.

The following image shows the location of the ground connector on the side of the Cisco ASR 1002-F Router.

Figure 18: Cisco ASR 1002-F Router Chassis Ground Lug Location and eUSB Side Panel Door



1	Cisco ASR 1002-F Router ground connector location	2	eUSB panel door

To attach the grounding lug to the chassis ground connector on your chassis, follow these steps:

SUMMARY STEPS

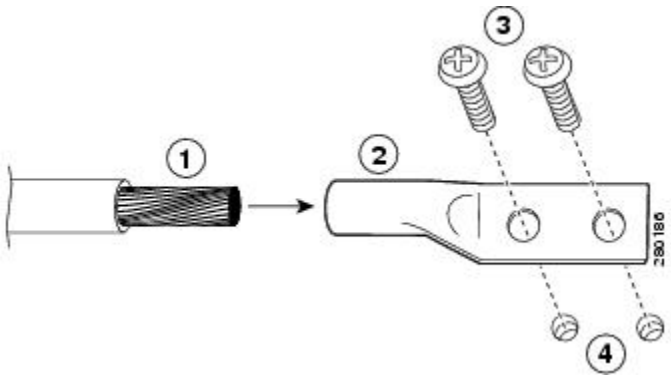
1. Use the wire stripper to strip one end of the AWG #6 wire approximately 0.75 inches (19.05 mm).
2. Insert the AWG #6 wire into the wire receptacle on the grounding lug as shown in the following image.
3. Use the manufacturers's recommended crimping tool to carefully crimp the wire receptacle around the wire; this step is required to ensure a proper mechanical connection.
4. Locate the chassis ground connector on the side of your chassis as shown in the following imave.
5. Insert the two screws through the holes in the grounding lug as shown in Figure 20: Attaching a Grounding Lug to the Chassis Ground Connector, on page 26.
6. Use the Number 2 Phillips screwdriver to carefully tighten the screws until the grounding lug is held firmly to the chassis. Do not overtighten the screws.
7. Connect the opposite end of the ground wire to the appropriate grounding point at your site to ensure an adequate chassis ground.

DETAILED STEPS

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 grounding lug as shown in the following image.

Figure 19: Attaching the Ground Wire to the Grounding Lug



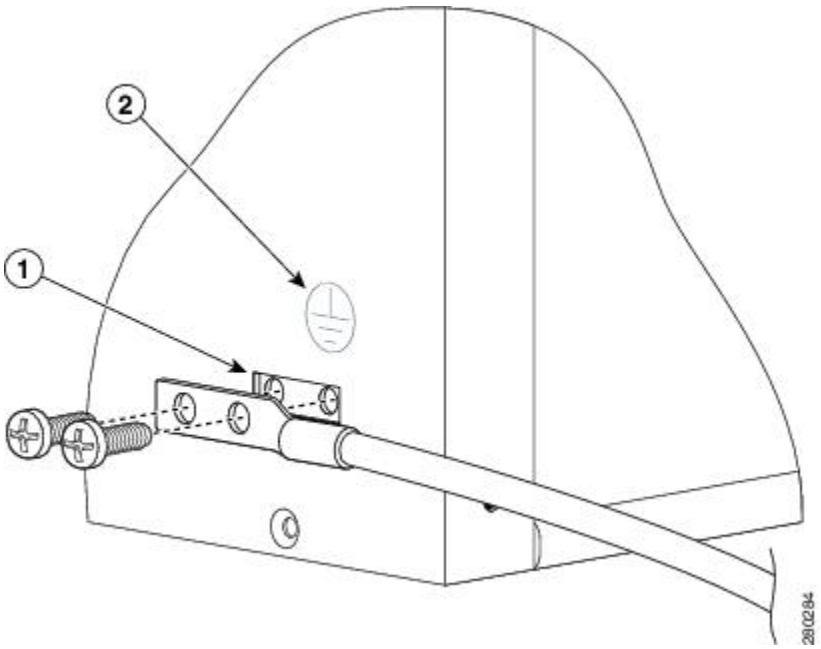
1	Ground wire	3	Ground lug screws
2	Grounding lug	4	Chassis ground connector holes

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

Step 4 Locate the chassis ground connector on the side of your chassis as shown in the following imave.

Step 5 Insert the two screws through the holes in the grounding lug as shown in Figure 20: Attaching a Grounding Lug to the Chassis Ground Connector, on page 26.

Figure 20: Attaching a Grounding Lug to the Chassis Ground Connector



1	Chassis ground connector	2	Ground symbol

Step 6 Use the Number 2 Phillips screwdriver to carefully tighten the screws until the grounding 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 grounding point at your site to ensure an adequate chassis ground.

What to do next

This completes the procedure for attaching a chassis ground connection. Go to the following cabling sections for information on attaching cables.

Connecting the Shared Port Adapter Cables

The instructions for connecting the cables for the shared port adapter (SPA) installed in the Cisco ASR 1002-F Router are contained in the respective configuration documents for SPAs. For detailed SPA information, see Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Hardware Installation Guide .

Connecting the Console and Auxiliary Port Cables

This section describes how to attach a cable to the Cisco integrated RP console or auxiliary ports on the Cisco ASR 1002-F Router. The Cisco ASR 1002-F Router uses RJ-45 ports for both the auxiliary port and console port to attach a console terminal.

Caution To meet Class A emission requirements on the Cisco ASR 1002-F Router, shielded cables must be used for the console and auxiliary port connectors.

Before you can use the console interface on the router using a terminal or PC, you must perform the following steps:

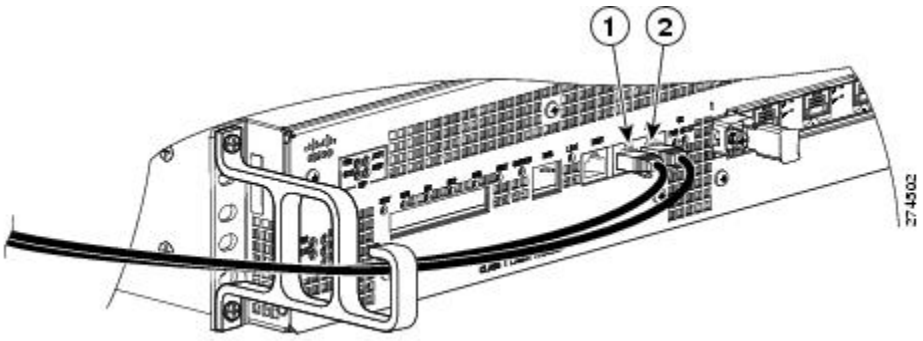
Step 1 Before connecting a terminal to the console port or auxiliary port, configure the terminal to match the chassis console port as follows: 9600 baud, 8 data bits, no parity, 1 stop bits (9600 8N1).

Step 2 Connect to the port using an RJ-45 cable to a DB-9 cable.

Note For information about how to change the default settings to meet the requirements of your terminal or host, see *Cisco IOS Terminal Services Configuration Guide*. For route processor pinout specifications, see the “Cisco ASR1000-RP2 Pinout Specifications” section.

The following figure shows the integrated RP console and auxiliary port connectors.

Figure 21: Cisco ASR 1002-F Router Integrated RP Console and Auxiliary Port Connectors



1	Console port (CON)	2	Auxiliary port (AUX)

Step 3 After you establish normal router operation, you can disconnect the console terminal.

What to do next

Note A connection will not be established when setting up an out-of-band connection or modem connection in the auxiliary port and the console port.

Connecting a Cable to the Management Ethernet Port

This section describes how to attach a cable to the Cisco Management Ethernet port on the Cisco ASR 1002-F Router.

Step 1 Insert an Ethernet RJ-45 cable into the MGMT ETHERNET port (see).

Figure 22: Cisco ASR 1002-F Router Integrated RP Management Ethernet Port Connector

1	Management Ethernet port

Step 2 Insert the other end of the RJ-45 cable into your management device or network.

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

Connecting Power to the Cisco ASR 1002-F Router

Warning The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed in empty slots. Statement 1077

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

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

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

This section provides the procedures for connecting AC-input and DC input power to your Cisco ASR 1002-F Router.

The DC power supply for the Cisco ASR 1006, Cisco ASR 1004, Cisco ASR 1002, and Cisco ASR 1002-F routers operate at individual specifications. The following table shows the common input ranges and circuit breaker requirements.

Table 7: Cisco ASR 1000 Series Router DC Power Supply System Input Requirements

Cisco ASR 1000 Series Router DC Power Supply	**System Input Rating (Amps)**	**Circuit Breaker Amps**	**AWG # Wire**		
		Minimum	Maximum	Minimum	Maximum
Cisco ASR 1006	40	Always 50	Always AWG #6 wire		
Cisco ASR 1004	24	30	40	10	8
Cisco ASR 1002 and Cisco ASR 1002-F 1	16	20	30	12	10
1 The Cisco ASR 1002-F Router DC power supply, with 16 A input rating must use an AWG #12 gauge wire for a 20 A circuit breaker and an AWG #10 gauge wire for a 30 A circuit breaker.					

Note All Cisco ASR 1000 Series Router AC power supplies must be connected to a branch circuit that does not exceed 20 A.

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 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

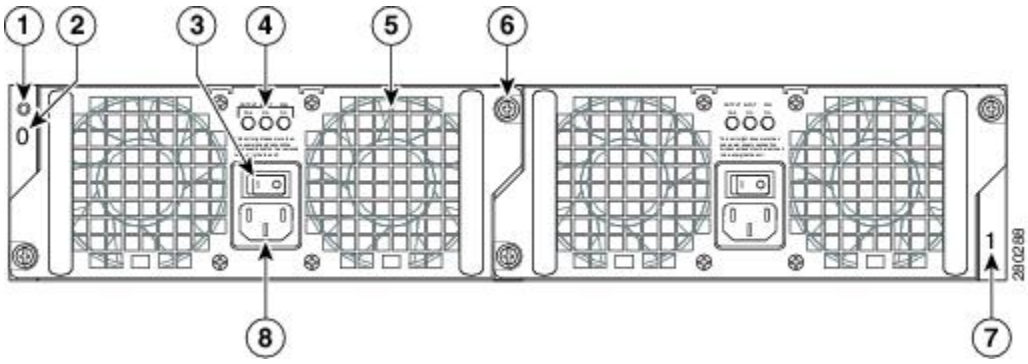
Warning This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

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. Statement 1005

Connecting AC Input 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. shows the AC power supply labels. The following image shows the Cisco ASR 1002-F Router AC power supply.

Figure 23: Cisco ASR 1002-F Router AC Power Supply Labels



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

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

SUMMARY STEPS

1. At the rear of the router, check that the power switch is in the Off (O) position.
2. Insert the AC power cable into the power supply AC inlet.
3. 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:
4. Plug the AC power supply cable into the AC power source.

DETAILED STEPS

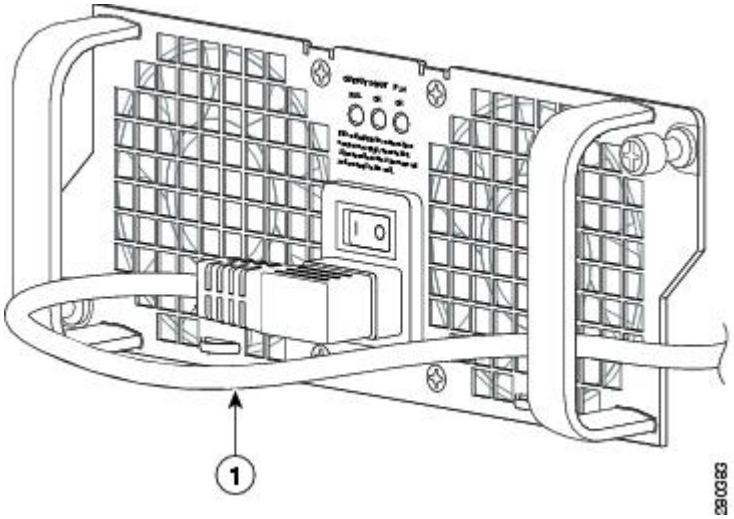
Step 1 At the rear of the router, check that the power switch is in the Off (O) position.

Step 2 Insert the AC power cable into the power supply AC inlet.

Step 3 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 secure the power cord through the AC power supply handle as shown in the following image.

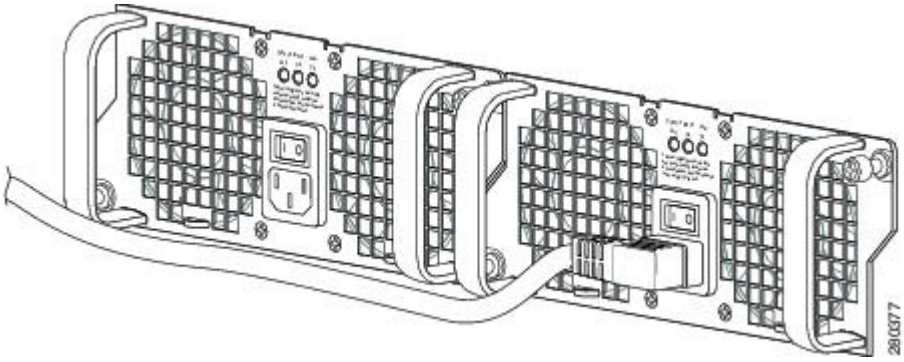
Figure 24: Cisco ASR 1002-F Router AC Power Supply in Slot 1 with Power Cord



1	AC power cord and service loop	—	—

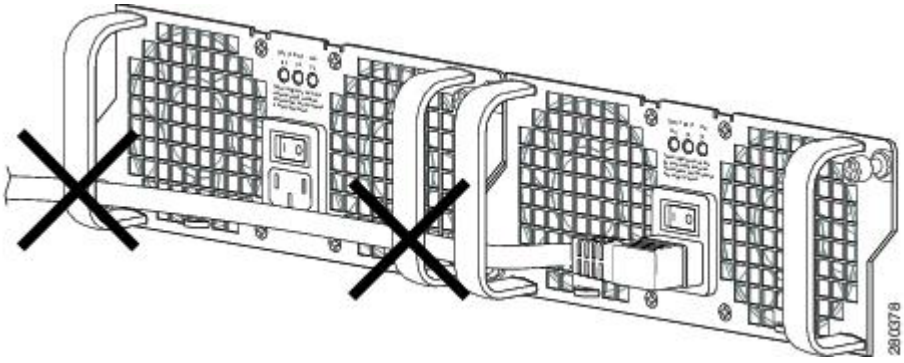
b) Run the power cord below the handles of power supplies in slot 0 and slot 1. Make sure the power cord is hanging loose so that it will not be disconnected from the AC power inlet as shown in the foloiwng image.

Figure 25: Cisco ASR 1002-F Router AC Power Supplies in Slot 0 and Slot 1 with Power Cord



Caution Do not run the AC power cord through the power supply handles as shown in the following image.

Figure 26: Incorrect Cabling on the Cisco ASR 1002-F Router AC Power Supplies



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

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 4 Plug the AC power supply cable into the AC power source.

What to do next

This completes the procedure for connecting AC input power to the Cisco ASR 1002-F Router.

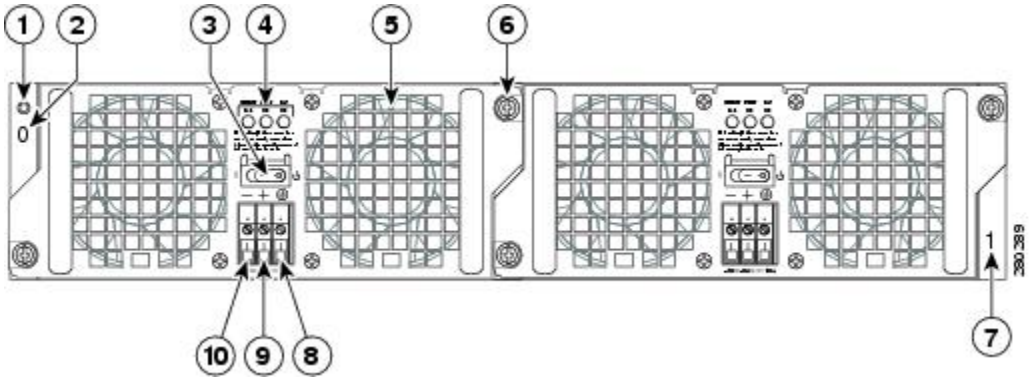
Connecting DC Input Power to the Cisco ASR 1002-F Router

The DC power supply input connector is a Euro-style type terminal block. A means to provide strain relief to the input wires is provided on the power supply. The connection order is negative (–), positive (+), and ground (GND); but this is the order from left to right that the terminals appear on the power supply, not the order in which the leads should be connected during installation. The order the leads should be connected is ground (GND), positive (+), and negative (–).

The recommended branch circuit breaker for the Cisco ASR 1002-F Router DC power supply is 30 A. Use an AWG #10 wire gauge on the 30 A circuit.

The following image shows the DC power supply for the Cisco ASR 1002-F Router.

Figure 27: 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	DC power supply switch Standby/On (|)	8	Ground lead
4	DC power supply LEDs	9	Positive lead
5	Fan	10	Negative lead

This section describes how to connect the 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 the lead color coding used at the DC power source.

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

To connect the DC power supply, follow these steps:

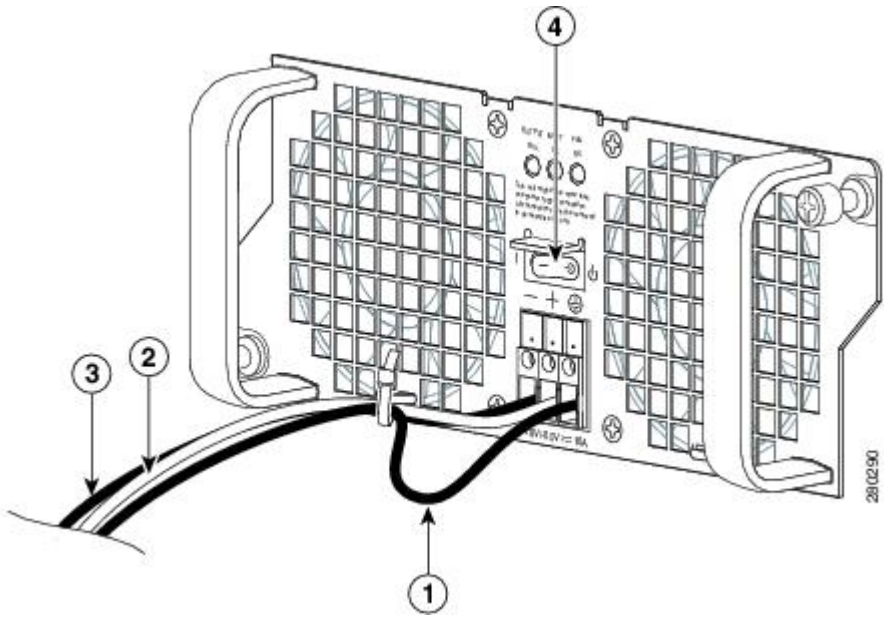
SUMMARY STEPS

1. At the rear of the router, check that the power supply Standby switch is in the Standby position (see the following image).
2. Ensure that the negative and positive leads are disconnected from the site power source.
3. Using a wire stripper, strip approximately 0.55 inch (14 mm) from the negative, positive, and ground leads.
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 to a torque of 0.5 to 0.6Nm.
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.
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, as shown in Figure 28: Cisco ASR 1002-F Router DC Power Supply Terminal Block Cable Connections, on page 35. When securing the ground, positive, and negative DC-input leads to the power supply faceplate, leave a small 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.
7. Connect the ground, positive, and negative leads to the power source.
8. Turn the branch source breaker on at your site and place the DC Standby switch in the On (|) position.
9. Check that the power supply LEDs light when power is supplied to the router.

DETAILED STEPS

Step 1 At the rear of the router, check that the power supply Standby switch is in the Standby position (see the following image).

Figure 28: Cisco ASR 1002-F Router DC Power Supply Terminal Block Cable Connections



1	Ground lead with service loop and cable tie	3	Negative lead wire
2	Positive lead wire	4	DC 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 negative, positive, 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 to a torque of 0.5 to 0.6Nm.

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.

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 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, as shown in Figure 28: Cisco ASR 1002-F Router DC Power Supply Terminal Block Cable Connections, on page 35. When securing the ground, positive, and negative DC-input leads to the power

supply faceplate, leave a small 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 7 Connect the ground, positive, and negative leads to the power source.

Step 8 Turn the branch source breaker on at your site and place the DC Standby switch in the On (|) position.

Step 9 Check that the power supply LEDs light when power is supplied to the router.

What to do next

This completes the procedure for connecting a DC power supply in the Cisco ASR 1002-F Router.

Connecting a Terminal to the Cisco Integrated RP Console Port and Auxiliary Port

Cisco integrated route processor has an asynchronous serial (EIA/TIA-232) RJ-45 console port labeled CON on its front panel. You can connect this port to most types of video terminals through use of the console cable kit that is included with your Cisco ASR 1002-F Router. The console cable kit contains:

- One RJ-45 to RJ-45 crossover cable
- One RJ-45 to DB-9 (female) adapter

A crossover cable reverses pin connections from one end to the other. In other words, it connects pin 1 (at one end) to pin 8 (at the other end), pin 2 to pin 7, pin 3 to pin 6, and so on. You can identify a crossover cable by comparing the two modular ends of the cable. Hold the cable ends in your hand, side-by-side, with the tabs at the back. Ensure that the wire connected to the outside (left) pin of the left plug (pin 1) is the same color as the wire connected to the outside (right) pin of the right plug (pin 8).

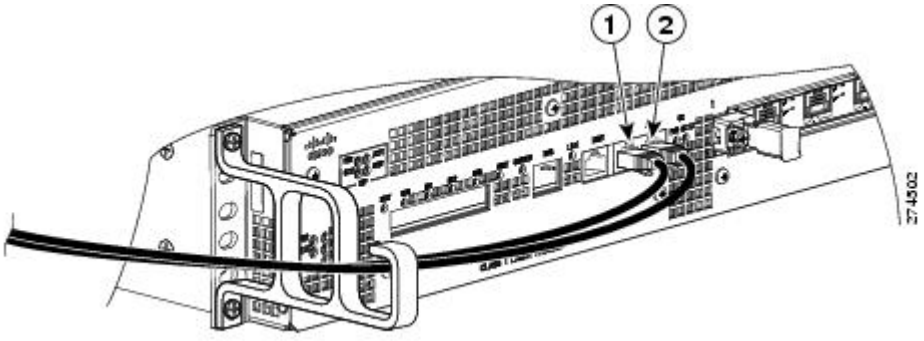
Use the following procedure to connect a video terminal to the console port on the integrated RP.

Note Each Cisco ASR 1000 Series route processor must have a console port connection (typically to a terminal server) if you are running a redundant configuration in the chassis.

Step 1 Connect one end of the RJ-45 cables to the serial console RJ-45 port (CON) on the Cisco integrated RP.

The following figure shows the Cisco ASR 1002-F Router integrated RP console and auxiliary port connection.

Figure 29: Cisco ASR 1002-F Router Integrated RP Console and Auxiliary Port Connection



1	Console port (CON)	2	Auxiliary port (AUX)

Step 2 Run the cable up and through the cable-management bracket and connect the other end of the RJ-45 cable to the RJ-45 adapter (see the above figure).

Step 3 Connect the adapter to your video terminal to complete the cable connection.

Step 4 Power on your video terminal.

Step 5 Configure your video terminal to match the following default console port settings: 9600 baud, 8 data bits, no parity generation or checking, 1 stop bit, and no flow control

What to do next

Go to the "*Connecting Cables*" section to continue the installation.

Connecting Cables

Keep the following guidelines in mind when connecting external cables to the Cisco ASR 1002-F Router:

- To reduce the chance of interference, avoid crossing high-power lines with any interface cables.
- Verify all cabling limitations (particularly distance) before powering on the system

.