Cisco ASR 1004 Router Overview and Installation

This chapter describes the Cisco ASR 1004 Router and the procedures for installing the Cisco ASR 1004 Router on an equipment shelf or tabletop or in equipment racks. It also describes how to connect interface and power cables.

This chapter contains the following sections:

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

Cisco ASR 1004 Router Description

The Cisco ASR 1004 Router system consists of the following system level components:

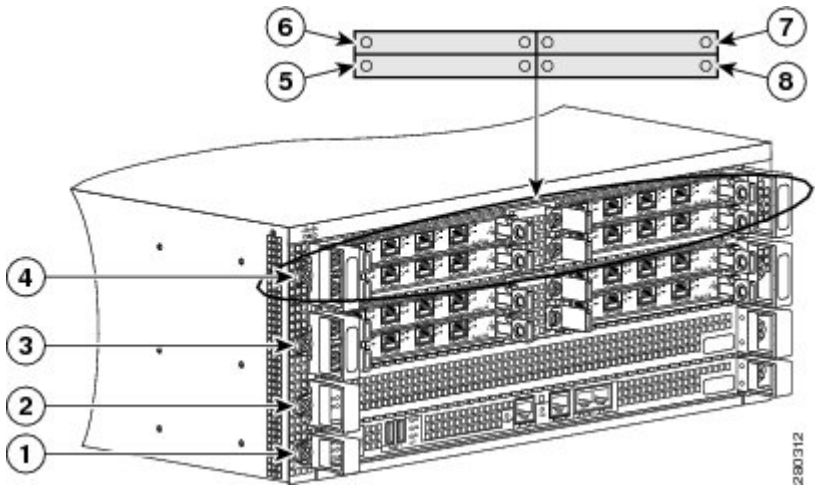
- Two Cisco ASR 1000 Series SPA Interface Processor (Cisco ASR1000-SIP10 or Cisco ASR1000-SIP40)
- One Cisco ASR 1000 Series Embedded Services Processor (Cisco ASR 1000-ESP10, Cisco ASR 1000-ESP20, or Cisco ASR1000-ESP40)
- One Cisco ASR 1000 Series Route Processor (Cisco ASR1000-RP1 or Cisco ASR1000-RP2)
- Dual (redundant) AC and DC power supplies

This section contains the following topics:

Front View

The following image shows the Cisco ASR 1004 Router with modules and filler plates installed.

Figure 1: Cisco ASR 1004 Router—Front and Side View

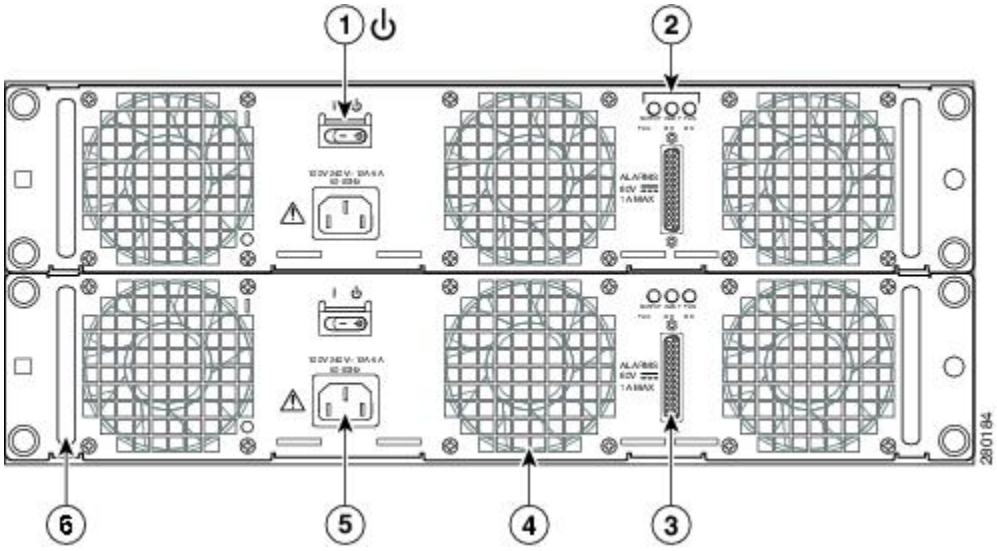


1	Slot R0 with ASR 1000 Series Route Processor	5	SPA subslot 2
2	Slot F0 with Cisco ASR1000-ESP10, Cisco ASR1000-ESP20, or Cisco ASR1000-ESP40	6	SPA subslot 0
3	ASR 1000 Series SIP slot 0	7	SPA subslot 1
4	ASR 1000 Series SIP slot 1	8	SPA subslot 3

Rear View

The following image shows the rear of the Cisco ASR 1004 Router with two AC power supplies installed.

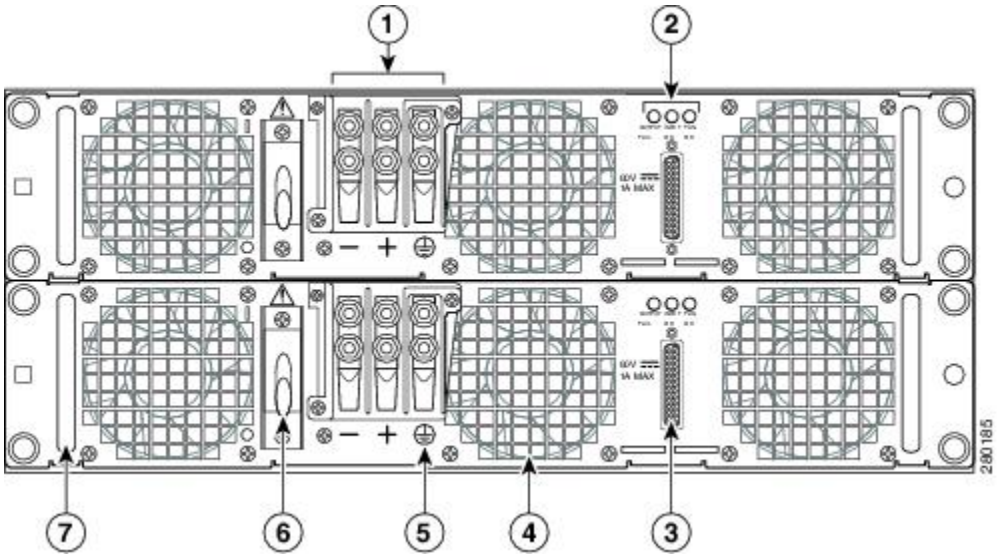
Figure 2: Cisco ASR 1004 Router Rear View with AC Power Supplies



1	AC power supply Standby switch	4	AC power supply fan
2	AC power supply LEDs	5	AC power inlet
3	AC power supply DB-25 alarm connector	6	AC power supply handle

The following image shows the rear of the Cisco ASR 1004 Router with two –48 VDC power supplies installed.

Figure 3: Cisco ASR 1004 Router Rear View With –48 VDC Power Supplies



1	–48 VDC power supply terminal block	5	Grounding symbol

2	–48 VDC power supply LEDs	6	–48 VDC power supply On/Off switch
3	–48 VDC power supply DB-25 alarm connector	7	–48 VDC power supply handle
4	–48 VDC power supply fan	—	—

Internal fans draw cooling air into the chassis and across internal components to maintain an acceptable operating temperature. (See Figure 2: Cisco ASR 1004 Router Rear View with AC Power Supplies, on page 3.) The fans are located at the rear of the chassis. A two-hole grounding lug is located on the side of the chassis. Two power supplies, either two AC power supplies or two –48 VDC power supplies, are accessed from the rear of the router.

Note You have already unpacked your chassis and read all the site requirements for your new equipment. Proceed with the installation.

Note Do not combine AC and –48 VDC power supplies in the same chassis.

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

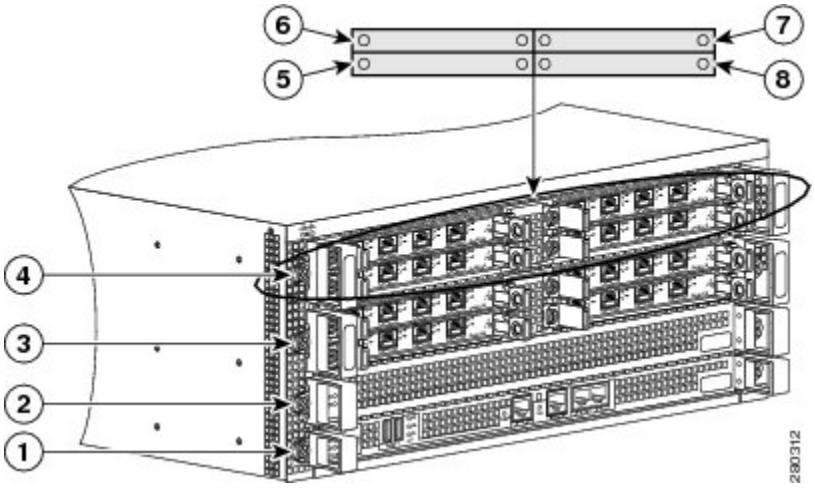
Note You have already unpacked your chassis and read all the site requirements for your new equipment. Proceed with the installation.

Cisco ASR 1004 Router Slot Numbering

The Cisco ASR 1004 Router contains two Cisco ASR 1000 Series SPA Interface Processors (SIPs) and supports four subslots for the installation of SPAs.

The following image shows the Cisco ASR 1004 Router with modules and filler plates installed.

Figure 4: Cisco ASR 1004 Router—Front and Side View



1	Slot R0 with ASR 1000 Series RP1	5	SPA subslot 2
2	Slot F0 with Cisco ASR1000-ESP10, Cisco ASR1000-ESP20, or Cisco ASR1000-ESP40	6	SPA subslot 0
3	ASR 1000 Series SIP slot 0	7	SPA subslot 1
4	ASR 1000 Series SIP slot 1	8	SPA subslot 3

Installation Methods

Although rack-mounting is the preferred method of installation for the Cisco ASR 1004 Router, you can mount the chassis:

- On an equipment shelf or tabletop
- In a19-inch wide (standard), 4-post equipment rack or two-post, using the rack-mount brackets in the accessory kit

Note The Cisco ASR 1004 Router usually ships fully loaded. However, you can remove components from the chassis to make the chassis lighter for your rack installation.

General Rack Installation Guidelines

When planning your rack installation, consider the following guidelines:

- The Cisco ASR 1004 Router requires a minimum of 4 rack units (7 inches or 17.8 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, top, and 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 1004 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 1004 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 1004 Router dimensions and weight information.

Table 1: Cisco ASR 1004 Router Dimensions and Weight

Cisco ASR 1004	Dimensions
Depth	22.50 in. (57.15 cm)(including card handles, cable-management brackets, power supply handles).
Height	6.95 in. (17.653cm) (4 rack-mount per EIA RS-310)
Width	17.25 in. (43.815 cm) (19 inch rack- mount or optional 23 Telco rack-mount)
Weight	50 pounds (fully configured) 22.6796 kg

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.

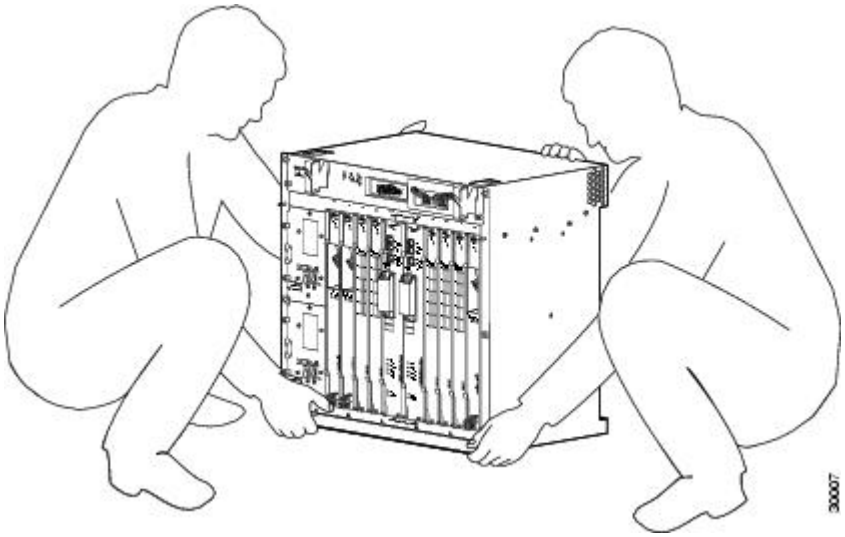
When installing the Cisco ASR 1004 Router on an equipment shelf or tabletop, ensure that the surface is clean and that you have considered the following:

- The Cisco ASR 1004 Router requires at least 3 inches (7.62 cm) of clearance at the inlet and exhaust vents (the front and top/rear sides of the chassis).
- The Cisco ASR 1004 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 1004 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 18).
- Always follow proper lifting practices as outlined in the "Electrical Safety" section on page 5-21 , when handling the chassis.

Equipment Shelf or Tabletop Installation

Note 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 5: Lifting the Chassis



Note The chassis in the image does not represent the Cisco ASR 1004 Router. This is only an example of how to lift a Cisco chassis.

SUMMARY STEPS

1. 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.
2. Align the front rack-mount bracket to one side of the chassis.
3. Insert and tighten the screws on one side.
4. Repeat Step 2 through Step 3 on the other side of the chassis. Use all the screws to secure the rack-mount brackets to the chassis.
5. Gather the two cable-management brackets and screws shipped with your chassis. The followng image shows attached cable-management brackets on the front of the Cisco ASR 1004 Router.
6. Screw the cable-management bracket to each side of the rack-mount brackets already attached to the chassis. Use two screws for each cable-management bracket. Use the package of four screws.
7. Check that all screws are securely tightened.

DETAILED STEPS

Step 1 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 2 Align the front rack-mount bracket to one side of the chassis.

Step 3 Insert and tighten the screws on one side.

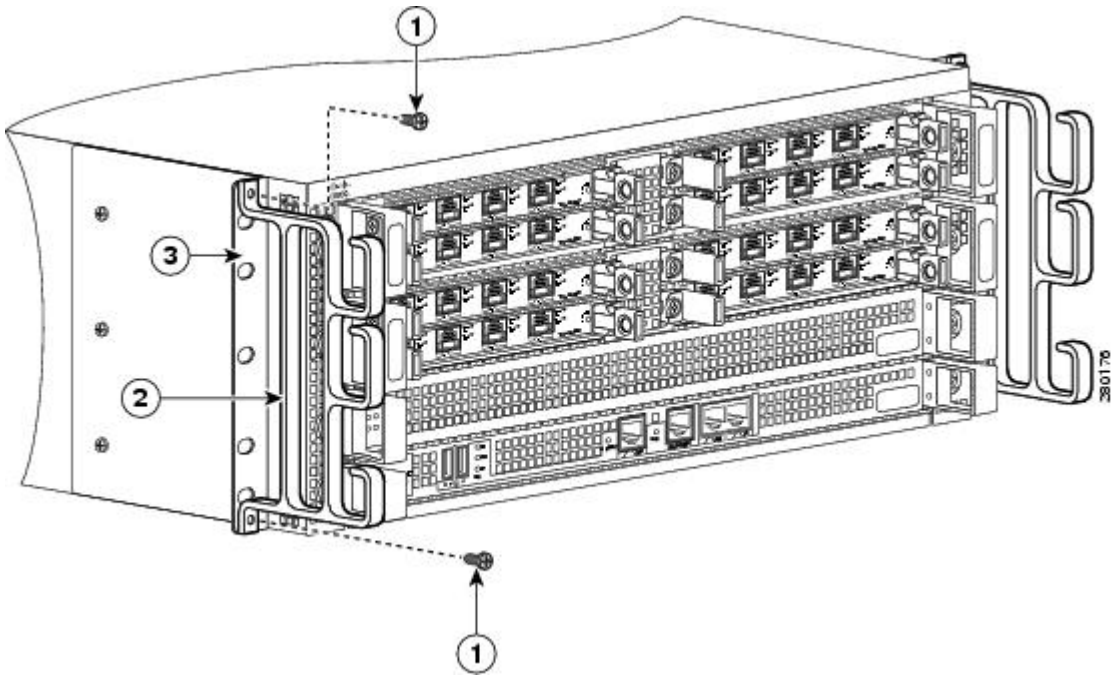
Step 4 Repeat Step 2 through Step 3 on the other side of the chassis. Use all the screws to secure the rack-mount brackets to the chassis.

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

Step 5 Gather the two cable-management brackets and screws shipped with your chassis. The followng image shows attached cable-management brackets on the front of the Cisco ASR 1004 Router.

Note Make certain that the cable-management 'U' feature device has the open end pointing upwards when you attach it to the chassis after the chassis is installed in a rack.

Figure 6: Attaching the Cable-Management Brackets to the Cisco ASR 1004 Router



1	Cable-management bracket screws	3	Chassis front rack-mount bracket ear
2	Cable-management bracket	—	—

Step 6 Screw the cable-management bracket to each side of the rack-mount brackets already attached to the chassis. Use two screws for each cable-management bracket. Use the package of four screws.

Step 7 Check that all screws are securely tightened.

What to do next

You have completed a tabletop or equipment shelf chassis installation. Go to the Attaching a Chassis Ground Connection, on page 18 to continue the installation.

Rack-Mounting the Cisco ASR 1004 Router

The Cisco ASR 1004 Router can be installed with both front or rear rack-mount brackets.

Note The chassis rack-mounting flanges are secured directly to the chassis before you lift it into the rack.

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.
2. Measure the space between the inner edges of the left front and right front mounting flanges on the equipment rack.

DETAILED STEPS

Step 1 Mark and measure the distance between two holes on the left and right mounting rails.

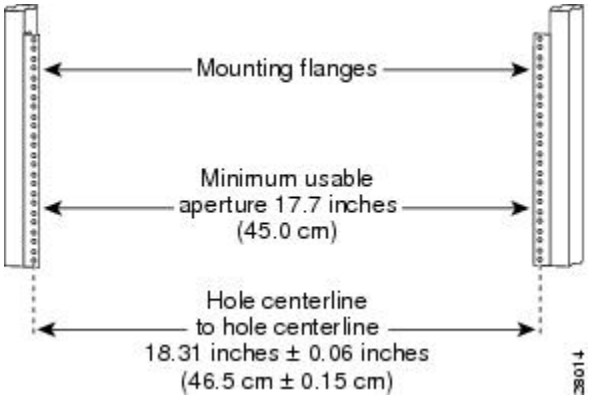
The distance should measure 18.31 inches ± 0.06 inches (46.5 cm ± 0.15 cm).

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 7: 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 installed on the chassis after you install the chassis rack-mount brackets 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. Figure 8: Attaching the Front Rack-Mount Brackets to the Cisco ASR 1004 Router, on page 12 image shows the brackets attached to the chassis. Depending on the bracket holes you use, the chassis may protrude in the rack.

To install the front rack-mount brackets on the Cisco ASR 1004 Router, perform the following steps:

SUMMARY STEPS

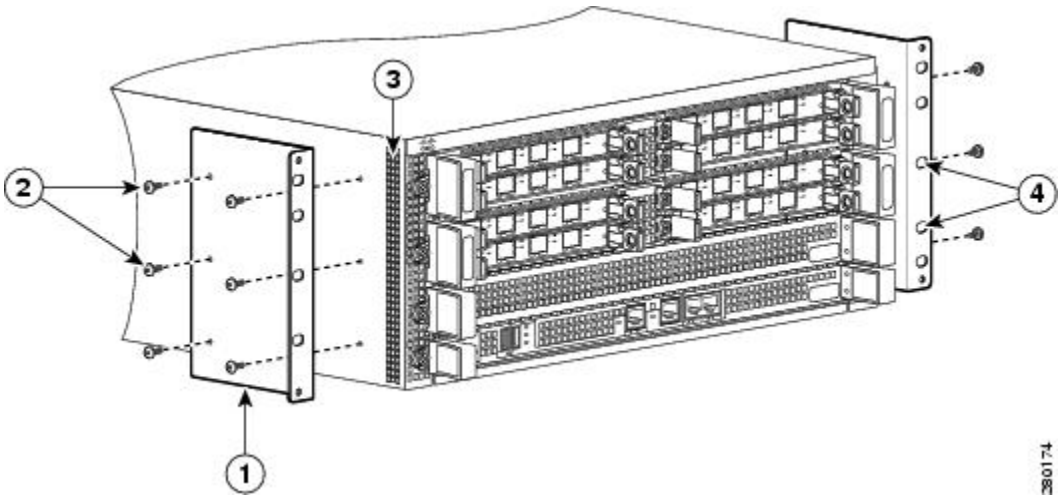
1. Locate the threaded holes on the side of the chassis. Make certain that you hold the front rack-mount bracket with the ear and holes facing outward and towards the front of the chassis (see Figure 8: Attaching the Front Rack-Mount Brackets to the Cisco ASR 1004 Router, on page 12).
2. Position the 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 black screws to secure the rack-mount brackets to the chassis.
5. Install the chassis in a rack. To install the Cisco ASR 1004 Router in a rack, go to the Installing the Cisco ASR 1004 Router in a Rack, on page 14.

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 (see Figure 8: Attaching the Front Rack-Mount Brackets to the Cisco ASR 1004 Router, on page 12).

The following shows where to attach the front rack-mount brackets to the Cisco ASR 1004 Router.

Figure 8: Attaching the Front Rack-Mount Brackets to the Cisco ASR 1004 Router



1	Front rack-mount bracket	3	Chassis side vent holes
2	Front rack-mount bracket screws	4	Front rack-mount bracket and ear holes

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 black screws to secure the rack-mount brackets to the chassis.

Step 5 Install the chassis in a rack. To install the Cisco ASR 1004 Router in a rack, go to the Installing the Cisco ASR 1004 Router in a Rack, on page 14.

What to do next

This completes the steps for attaching the front rack-mount brackets to the Cisco ASR 1004 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 front rack-mount brackets on the Cisco ASR 1004 Router, perform the following steps:

SUMMARY STEPS

1. Locate the threaded 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 second top hole from the back (see Figure 9: Attaching the Rear Rack-Mount Brackets to the Cisco ASR 1004 Router, on page 13).
3. Insert and tighten the five screws on one side.
4. After the bracket is secured to the side of the chassis, slide the two remaining components into the side rack-mount bracket.

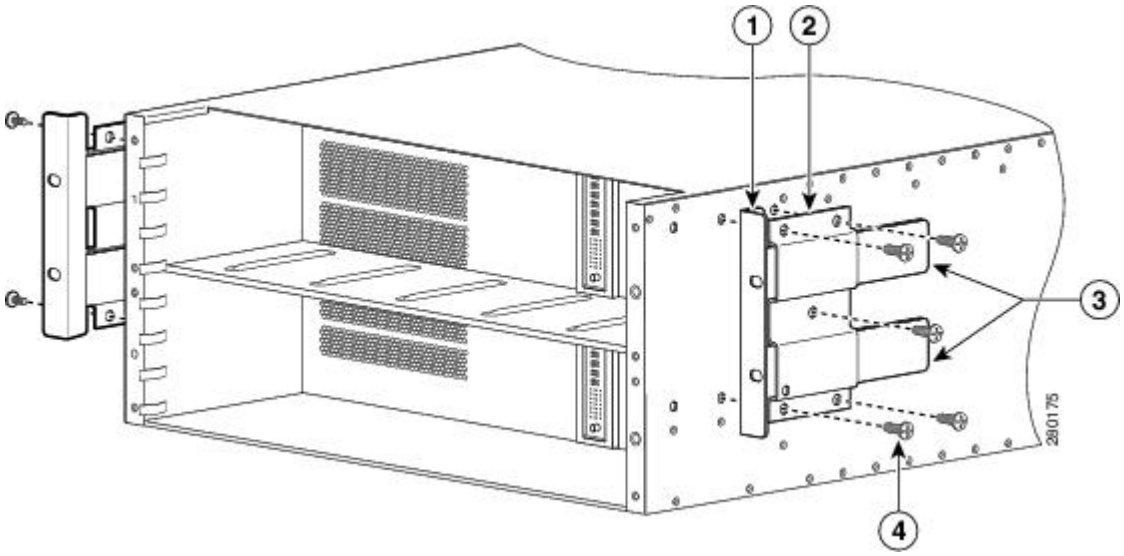
5. Repeat Step 1 through Step 3 on the other side of the chassis. Use five screws to secure the rear rack-mount brackets to the chassis.

DETAILED STEPS

Step 1 Locate the threaded 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 1004 Router.

Figure 9: Attaching the Rear Rack-Mount Brackets to the Cisco ASR 1004 Router



1	Rear rack-mount bracket ear and holes	3	Rear rack-mount bracket components that slide into rear bracket that is attached to the chassis
2	Rear rack-mount bracket (first bracket to attach to chassis)	4	Rear rack-mount bracket screws

Step 2 Position the rear rack-mount bracket top hole with the chassis second top hole from the back (see Figure 9: Attaching the Rear Rack-Mount Brackets to the Cisco ASR 1004 Router, on page 13).

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

Step 4 After the bracket is secured to the side of the chassis, slide the two remaining components into the side rack-mount bracket.

Step 5 Repeat Step 1 through Step 3 on the other side of the chassis. Use five 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 1004 Router.

Caution Before you mount the Cisco ASR 1004 Router in a rack, make certain you read 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. For cable-management installation instructions, go to the Attaching a Chassis Ground Connection, on page 18.

Installing the Cisco ASR 1004 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. Because the rack-mount brackets support the weight of the entire chassis, be sure to use all screws to fasten the two rack-mount brackets to the rack posts.

Warning 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:

SUMMARY STEPS

1. On the chassis, ensure that all screw fasteners on the installed components are securely tightened.
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. See the next sections on the types of racks you can use to install the chassis.
3. (Optional) Install a shelf in the rack to support the Cisco ASR 1004 Router. If you use a shelf, this will help support the chassis while you secure it to the rack.
4. With two people, lift the chassis into position between the rack posts.
5. Align the mounting bracket holes with the rack post holes and attach the chassis to the rack.
6. Position the chassis until the rack-mounting flanges are flush against the mounting rails on the rack.
7. Hold the chassis in position against the mounting rails and follow these steps:
8. Tighten all screws on each side to secure the chassis to the equipment rack.

DETAILED STEPS

Step 1 On the chassis, ensure that all screw fasteners 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. See the next sections on the types of racks you can use to install the chassis.

Step 3 (Optional) Install a shelf in the rack to support the Cisco ASR 1004 Router. If you use a shelf, this will help support the chassis while you secure it to the rack.

Step 4 With two people, lift the chassis into position between the rack posts.

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

Note If you are using a shelf then 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 and follow these steps:

a) The Cisco ASR 1004 rack-mount ears contain 8 ear holes. Insert the bottom screw into the third hole up from the bottom of the rack-mount ear and use a hand-held screwdriver to tighten the screw to the rack rail.

Note In the next step, insert the top screw diagonally from the bottom screw that you just attached.This helps with keeping the chassis in place.

b) Insert the top screw into the third hole down from the top of the rack-mount ear and tighten the screw to the rack rail.

c) Insert a screw in the middle of the rack-mount bracket on both sides of the chassis.

d) Repeat these steps 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 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 1004 chassis on a two-post rack or a four-post rack. For instructions, see the Two-Post Rack Installation, on page 15 or the Four-Post Rack Installation, on page 17.

Two-Post Rack Installation

The Cisco ASR 1004 Router can be installed on a two-post rack, either 19 inch or 23 inch.

Note Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26cm). The height of the chassis is 6.95 inches (17.653 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.

SUMMARY STEPS

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.
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.

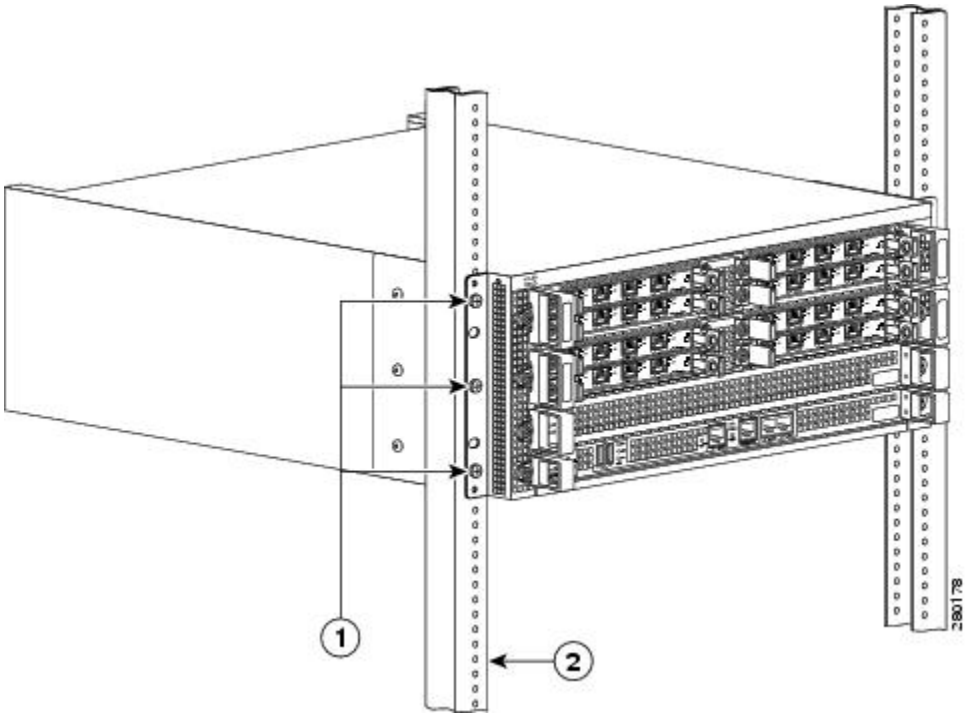
3. Keeping the brackets flush against the posts or mounting strips, align the holes in the brackets with the holes on the rack or mounting strip.
4. For each bracket, insert and tighten two screws to the rack on both sides.

DETAILED STEPS

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 following image shows where to attach the chassis rack-mount brackets to the equipment rack.

Figure 10: Attaching the Rear Rack-Mount Brackets to the Cisco ASR 1004 Router



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

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, on page 18 to continue the installation.

Four-Post Rack Installation

The Cisco ASR 1004 Router can be flush-mounted in a 19-inch equipment rack using the rack-mounting kit provided with your system. The Cisco ASR 1004 Router can be mounted into the rack using two recommended methods:

- Installing the chassis in an existing rack with equipment.
- Installing an empty chassis in a rack with no equipment installed.

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 (48.26cm). The height of the chassis is 6.95 inches (17.653 cm). Airflow through the chassis is from front to back.

Note Make sure the rack is stabilized.

SUMMARY STEPS

1. (Optional) Install a shelf in the rack to support the Cisco ASR 1004 Router. If you are using a shelf then 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.Using two people, lift the chassis into the rack using the side handles and grasping underneath the power supply bays.
2. Position the chassis until the rack-mounting flanges are flush against the mounting rails on the rack.
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. The following image shows the rear rack-mount brackets and the front rack-mount brackets on the Cisco ASR 1004 Router.
4. Finger-tighten 4 more screws to the rack rails on each side of the chassis.
5. Tighten all screws on each side to secure the chassis to the equipment rack.
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.

DETAILED STEPS

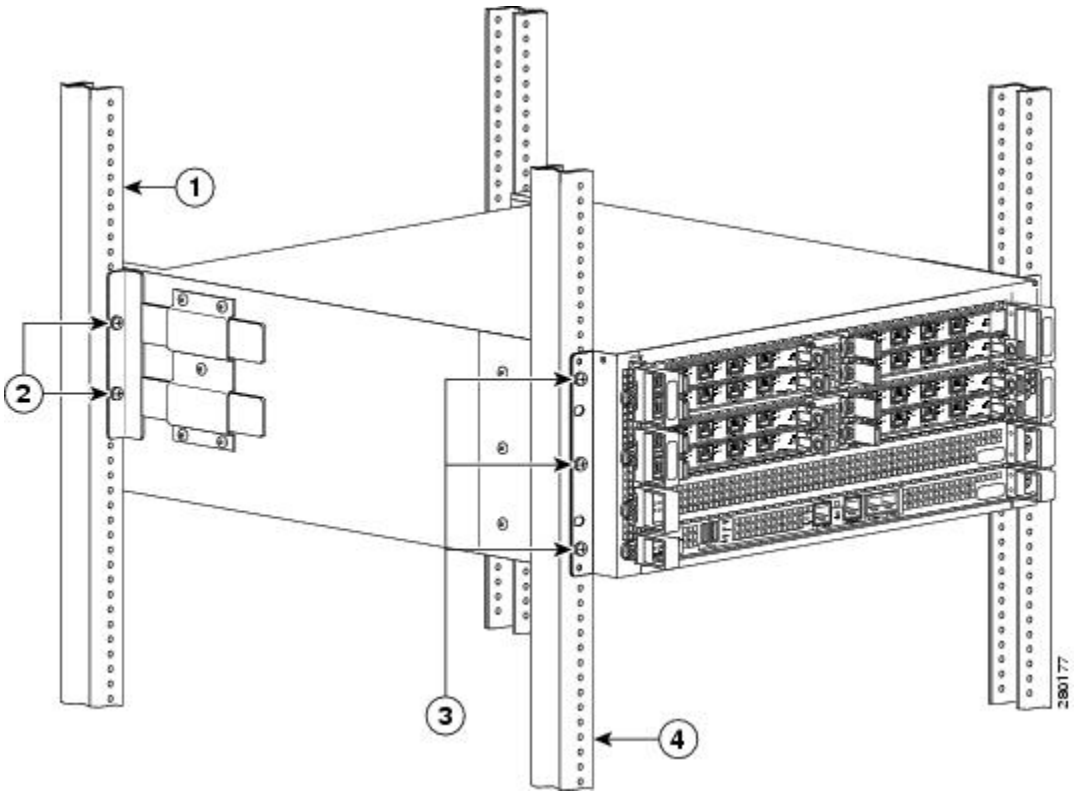
Step 1 (Optional) Install a shelf in the rack to support the Cisco ASR 1004 Router. If you are using a shelf then raise the chassis to the level of the shelf. Let the bottom of the chassis rest on the brackets, but continue to support the chassis.Using two people, lift the chassis into the rack using the side handles and 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 third hole up from the bottom of the rack-mount bracket and the third hole down from the top of the rack-mount bracket.

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. The following image shows the rear rack-mount brackets and the front rack-mount brackets on the Cisco ASR 1004 Router.

Figure 11: Cisco ASR 1004 Router on a Four-Post Rack—Front and Rear Rack-Mounting



1	Equipment rack rear rail	3	Front rack-mount bracket ear and holes
2	Chassis rear rack-mount bracket and ear holes	4	Equipment rack front rail

Step 4 Finger-tighten 4 more screws to the rack rails on each side of the chassis.

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

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 in the rack. Proceed to the Attaching a Chassis Ground Connection, on page 18 to continue the installation.

Attaching a Chassis Ground Connection

Connecting the Cisco ASR 1004 Router 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 dual-lug chassis ground stud must be installed, the SIP and SPA must be fully inserted and screwed in and earthed 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 chassis, you must provide an adequate chassis ground (earth) connection for the chassis. A chassis ground connector is provided on each Cisco ASR 1004 Router. (See the image on the following section "Recommended Tools and Supplies.") There is a grounding stud on the side of the chassis and on the –48 VDC power supply (primary grounding stud).

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

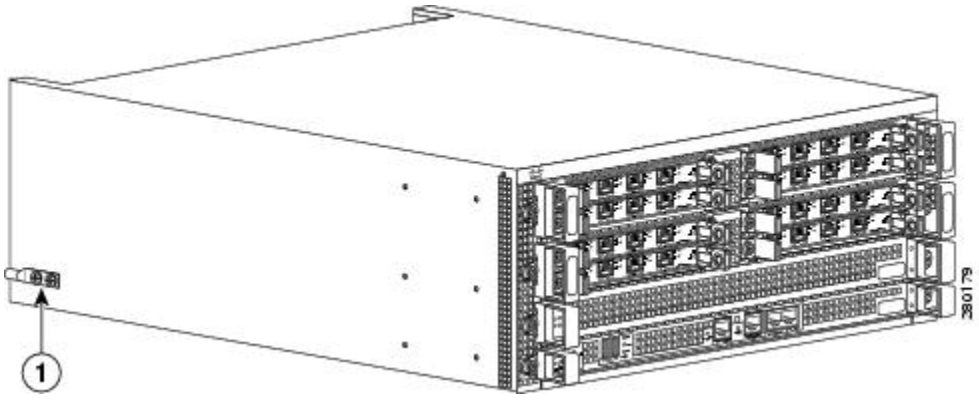
Recommended Tools and Supplies

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

- Phillips screwdriver
- Dual-lug chassis ground component
- Grounding wire

The following image shows the location of the dual ground lug on the rear of the of Cisco ASR 1004 Router.

Figure 12: Chassis Ground Lug Location on the Cisco ASR 1004 Router



1	Chassis ground connector on the Cisco ASR 1004 Router

Use the following procedure to attach the grounding lug to the chassis ground connector on your chassis:

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.
3. Use the crimping tool to carefully crimp the wire receptacle around the wire; this step is required to ensure a proper mechanical connection.
4. Attach the grounding lug with the wire on the left to avoid having the grounding wire overlapping the power supply. The following image shows how to attach the grounding screws.
5. Locate the chassis ground connector on the side of your chassis.
6. Insert the two screws through the holes in the grounding lug as shown in Figure 13: Attaching a Grounding Lug to the Chassis Ground Connector, on page 20.
7. 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.
8. Connect the opposite end of the grounding wire to the appropriate grounding point at your site to ensure an adequate chassis ground.

DETAILED STEPS

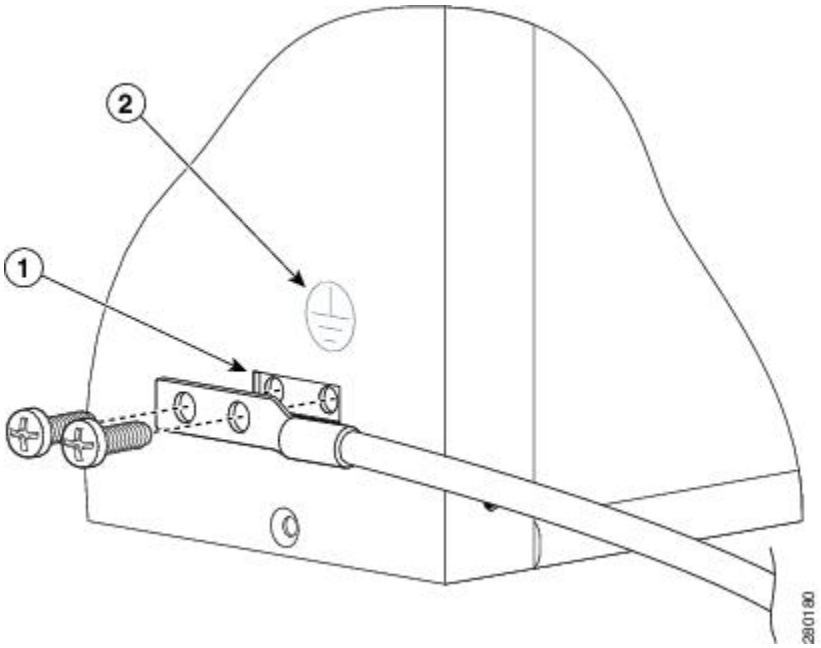
Step 1 Use the wire stripper to strip one end of the AWG #6 wire approximately 0.75 inches (19.05 mm).

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

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

Step 4 Attach the grounding lug with the wire on the left to avoid having the grounding wire overlapping the power supply. The following image shows how to attach the grounding screws.

Figure 13: Attaching a Grounding Lug to the Chassis Ground Connector



1	Chassis ground connector	2	Ground symbol

Step 5 Locate the chassis ground connector on the side of your chassis.

Step 6 Insert the two screws through the holes in the grounding lug as shown in Figure 13: Attaching a Grounding Lug to the Chassis Ground Connector, on page 20.

Step 7 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 8 Connect the opposite end of the grounding 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. To continue, go to the Attaching the Cable-Management Bracket, on page 21.

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 1004 Router contain three independent cable-management "U" type features with four screws and provides cable dressing of each card module slots. For Cisco ASR 1000 SIPs, these brackets work in tandem with shared port adapter product feature cable-management device to allow installation and removal of adjacent cards without the need to remove cables.

Note Make certain that the cable-management bracket "U" type 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 1004 Router in the equipment rack:

SUMMARY STEPS

1. Align the cable-management bracket to the rack-mount bracket on one side of the Cisco ASR 1004 Router. The cable-management bracket aligns to the top hole of the chassis rack-mount bracket.
2. Using a Phillips screwdriver, insert the screw through cable-management bracket and into the chassis rack-mount and tighten the screw.
3. Using the bottom rack-mount ear hole, insert the screw through cable-management bracket and into the chassis rack-mount (see Figure 14: Chassis Rack-Mount Bracket Ear Holes for the Cable-Management Bracket, on page 22).

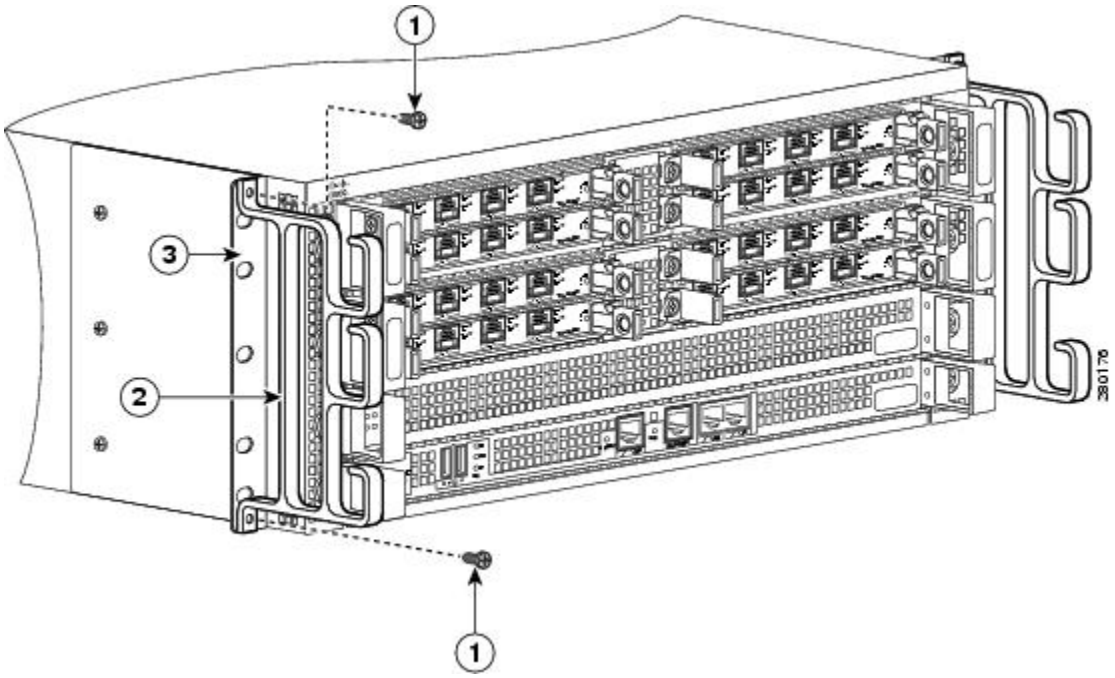
DETAILED STEPS

Step 1 Align the cable-management bracket to the rack-mount bracket on one side of the Cisco ASR 1004 Router. The cable-management bracket aligns to the top hole of the chassis rack-mount bracket.

Step 2 Using a Phillips screwdriver, insert the screw through cable-management bracket and into the chassis rack-mount and tighten the screw.

The following image shows where to attach the cable-management brackets to the Cisco ASR 1004 Router in a rack.

Figure 14: Chassis Rack-Mount Bracket Ear Holes for the Cable-Management Bracket



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

Step 3 Using the bottom rack-mount ear hole, insert the screw through cable-management bracket and into the chassis rack-mount (see Figure 14: Chassis Rack-Mount Bracket Ear Holes for the Cable-Management Bracket, on page 22).

What to do next

This completes the procedure for installing the cable-management brackets on the chassis in a rack.

Connecting the Shared Port Adapter Cables

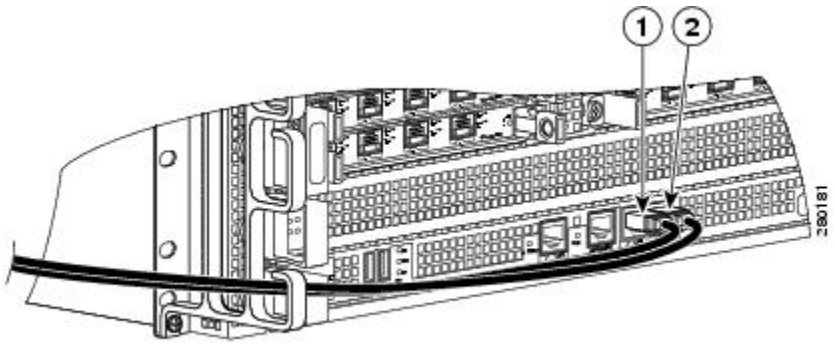
The instructions for connecting the cables for the shared port adapter installed in the Cisco ASR 1004 Router are contained in the respective configuration documents for each port adapter. For example, if you are

connecting the optical fiber cables for the PA-POS-OC3 port adapter, see PA-POS-OC3 Port Adapter Installation and Configuration at the following location:

http://www.cisco.com/en/US/partner/docs/interfaces_modules/port_adapters/install_upgrade/pos/pa-pos-oc3_install_config/paposoc3.html

Connecting the Console and Auxiliary Port Cables

The Cisco ASR 1004 Router has a DCE-mode console port for connecting a console terminal and an auxiliary port for additional connections to your chassis. The auxiliary port can also be used for diagnostics. The following shows the CON and AUX ports on the Cisco ASR 1000 Series route processor.



1	Console port - CON	2	Auxiliary port - AUX

The Cisco ASR 1004 Router uses RJ-45 ports for both the auxiliary port and the console port. Both the console and the auxiliary ports are asynchronous serial ports; any devices connected to these ports must be capable of asynchronous transmission.

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.

For console and auxiliary port pinouts for the RJ-45 connector, see "Cisco ASR 1004 Router Specifications" section on page A-5 . Both ports are configured as asynchronous serial ports.

SUMMARY STEPS

1. Before connecting a terminal to the console port, configure the terminal to match the chassis console port as follows: 9600 baud, 8 data bits, no parity, 1 stop bits (9600 8N1).
2. After you establish normal router operation, you can disconnect the terminal.

DETAILED STEPS

Step 1 Before connecting a terminal to the console 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 After you establish normal router operation, you can disconnect the terminal.

Connecting the Ethernet Management Port Cable

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

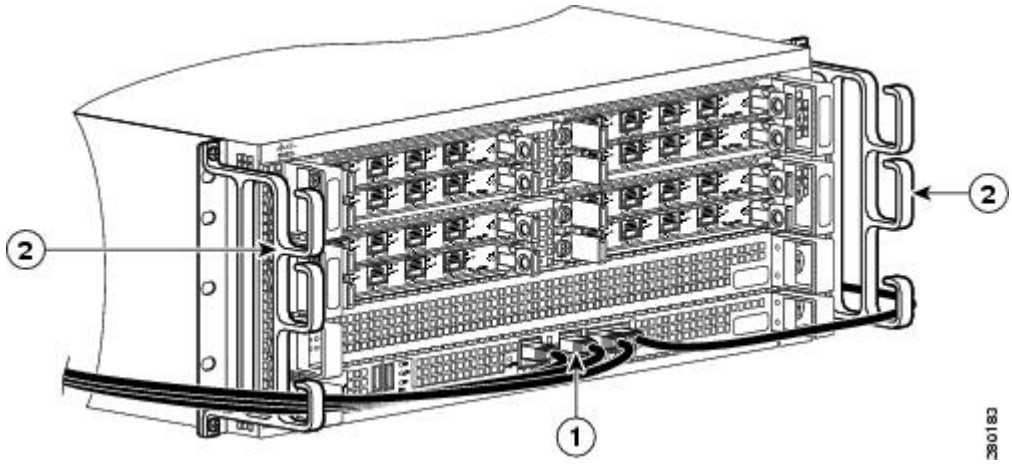
However, when the Fast Ethernet Management port is configured to a fixed speed (10/100/1000 Mbps) through command-line interface (CLI) commands, the port is forced to MDI mode.

When in a fixed-speed configuration and MDI mode:

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

The following figure shows the MGMT Ethernet port connector.

Figure 15: Cisco ASR 1000 Series Route Processor MGMT Ethernet Port Connector



1	MGMT Ethernet port	2	Cable-management bracket and U feature device

Connecting Power to Cisco ASR 1004 Router

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

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

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

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

This section provides the procedures for connecting AC-input and –48 VDC input power to your Cisco ASR 1004 Router.

The –48 VDC power supply for the Cisco ASR 1006, ASR 1004, and ASR 1002 routers operate at individual specifications. The following table shows the common input ranges and circuit breaker requirements.

Table 2: Cisco ASR 1000 Series Router –48 VDC 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	16	20	30	12	10
For example, the Cisco ASR 1002 Router –48 VDC power supply, with 16 Amp 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.

Note Detailed instructions for removing and replacing the Cisco ASR 1000 Series AC and DC power supplies are in Chapter 14, “Removing and Replacing FRUs from the Cisco ASR 1000 Series Routers.”

Power Cords Supported by the Cisco ASR 1004 Router

Table 3: Power Cords Supported by the Cisco ASR 1004 Router , on page 26 lists the power cords that are supported by the Cisco ASR 1004 Router.

Table 3: Power Cords Supported by the Cisco ASR 1004 Router

Power Cord Item Number	Description
CAB-AC-RA	Power Cord, 110 V, Right Angle
CAB-AC10A-90L-AU	10 A AC Power Cord, Left Angle (Australia) (bundle option)
CAB-AC10A-90L-EU	10 A AC Power Cord, Left Angle (Europe) (bundle option)
CAB-AC10A-90L-IT	10 A AC Power Cord, Left Angle (Italy) (bundle option)
CAB-AC10A-90L-UK	10 A AC Power Cord, Left Angle (United Kingdom) (bundle option)
CAB-AC15A-90L-US	15 A AC Power Cord, Left Angle (United States) (bundle option)
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-JPN-RA	Power Cord-Japan, Right Angle

Connecting AC Input Power to Cisco ASR 1004 Router

Follow these steps to connect an AC input power supply to the Cisco 1004 chassis:

SUMMARY STEPS

1. Insert an AC power supply in power supply slot 0 or power supply slot 1 until it is fully seated.
2. Tighten the captive screws.
3. Insert the AC power cable into the power inlet.
4. Plug the power supply cable into the power source.
5. Turn the power supply switch to the On position.

DETAILED STEPS

Step 1 Insert an AC power supply in power supply slot 0 or power supply slot 1 until it is fully seated.

Step 2 Tighten the captive screws.

Step 3 Insert the AC power cable into the power inlet.

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

Note For additional AC power cable strain relief, secure the cable to the power supply handle by inserting a nylon cable tie through the hole in the handle and around the cable.

Figure 16: Cisco ASR 1004 Router AC Power Supply, on page 27 shows the Cisco ASR 1004 Router AC power supply.

Figure 16: Cisco ASR 1004 Router AC Power Supply

1	AC power supply Standby switch	4	AC power supply fan
2	AC power supply LEDs	5	AC power inlet
3	DB-25 alarm connector	6	AC power supply handle

Note Shielded cables must be used to connect to the DB-25 alarm connector on both the AC and –48 VDC power supplies in order to comply with FCC/EN55022/CISPR22 Class A emissions requirements. See the "How Cisco ASR1000-RP Alarm Monitoring Works" section on page 2-22 .

Step 5 Turn the power supply switch to the On position.

What to do next

This completes the procedure for connecting AC input power.

Connecting --48 VDC Input Power to Cisco ASR 1004 Router

This section describes how to connect the –48 VDC power supply in the Cisco ASR 1004 Router.

#unique_225 unique_225_Connect_42_fig_1168352 shows the –48 VDC power supply.

1	–48 VDC power supply terminal block and plastic cover	5	–48 VDC power supply ground symbol
2	–48 VDC power supply LEDs	6	–48 VDC power supply On (|)/ Off (O)
3	DB-25 alarm connector	7	–48 VDC power supply handle
4	–48 VDC power supply fan	—	—

Note Shielded cables must be used to connect to the DB-25 alarm connector on both the AC and –48 VDC power supplies in order to comply with FCC/EN55022/CISPR22 Class A emissions requirements. See the "How Cisco ASR1000-RP Alarm Monitoring Works" section on page 2-22 .

Before you begin, read these important notices:

- The color coding of the –48 VDC input power supply leads depends on the color coding of the –48 VDC power source at your site. Typically, green or green/yellow is used for ground (GND), black is used for –48 V on negative (–) terminal and red is used for RTN on the positive (+) terminal. Make certain the lead color coding you choose for the –48 VDC input power supply matches lead color coding used at the –48 VDC power source.
- For –48 VDC input power cables, select the appropriate wire gauge based on the National Electrical Code (NEC) and local codes for 60-amp service at nominal –48 VDC input voltage (–48/–60 VDC). Three pairs of cable leads, source DC (–) and source DC return (+), are required for each power distribution unit (PDU). These cables are available from any commercial cable vendor. All input power cables for the chassis should have the same wire gauge and cable lengths should match within 10 percent of deviation.

Each DC input power cable is terminated at the PDU by a cable lug. The cable lugs must be dual-hole, and have a 45-degree angle tongue. They must be able to fit over #10 power terminal stud.

Note –48 VDC input power cables must be connected to the PDU terminal studs in the proper positive (+) and negative (–) polarity. In some cases, the –48 VDC cable leads are labeled, which is a relatively safe indication of the polarity. However, you must verify the polarity by measuring the voltage between the –48 VDC cable leads. When making the measurement, the positive (+) lead and the negative (–) lead must always match the (+) and (–) labels on the PDU.

- A ground cable is required for each –48 VDC PDU. We recommend that you use at least 6-AWG multistrand copper wire. This wire is not available from Cisco Systems; it is available from any commercial cable vendor.

The ground wire cable lug should be dual-hole (as shown in Figure 17: Cisco ASR 1004 Router –48 VDC Power Supply Grounding Wire and Stud, on page 29) and able to fit over M6 terminal studs at 0.625-inch (15.88-mm) centers. Recommended lug terminal wire size Panduit part number:

- • LCD8-14A-L for 8AWG wire size
  • LCD6-14A-L for 6AWG wire size

Note To avoid hazardous conditions, all components in the area where –48 VDC input power is accessible must be properly insulated. Therefore, before installing the –48 VDC cable lugs, be sure to insulate the lugs according to the manufacturer's instructions.

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

To connect the Cisco ASR 1004 Router DC power supply, follow these steps:

SUMMARY STEPS

1. Make certain that the chassis grounding is connected before you begin installing the –48 VDC power supply.
2. Locate the terminal block and remove the plastic cover.

3. On the –48 VDC power supply terminal block, locate the **GND** connection which must be connected first and follow these steps:
4. Attach the other end of the cable to the site ground connection.
5. You must wrap the positive and negative cables with sleeving. Take each wire and cover the area from the lug to the wire with heavy shrink sleeving.
6. For easier cable-management, insert the negative cable first. Replace the ground lug with cable in the following order:
7. Tighten the Kepnut screw (use the screwdriver to tighten the screw in the terminal block to a torque of 8 in-lbs / 4 per.) and repeat the same steps for the positive stud and wire.
8. Use tie wraps to secure the wires, so that the wires are not pulled from the terminal block by casual contact. Ti-wrap studs are located below the supply terminal block.
9. Replace the terminal block plastic cover, which slides over the terminal block; then tighten the screws (tighten the screw to a torque of 5 in-lbs / 1 per.).
10. Remove the tape from the circuit-breaker switch handle and move the circuit-breaker handle to the on position, if you taped the circuit breaker.
11. Switch the On/Off circuit breaker switch to the On (|) position.

DETAILED STEPS

Step 1 Make certain that the chassis grounding is connected before you begin installing the –48 VDC power supply.

Step 2 Locate the terminal block and remove the plastic cover.

a) Unscrew and remove the two screws.
b) Slide the plastic cover off of the terminal block.

Step 3 On the –48 VDC power supply terminal block, locate the **GND** connection which must be connected first and follow these steps:

a) Using the two-hole grounding lug, replace the washers and Kepnut screw in the following order.

- • Flat washer
  • Grounding cable lug
  • Kepnut screw

b) Tighten the Kepnut screws (use the screwdriver to tighten the screw in the terminal block to a torque of 8 in-lbs / 2 per.) on the power supply studs.

Figure 17: Cisco ASR 1004 Router –48 VDC Power Supply Grounding Wire and Stud, on page 29 shows the –48 VDC power supply grounding wire and stud.

Figure 17: Cisco ASR 1004 Router –48 VDC Power Supply Grounding Wire and Stud

Step 4 Attach the other end of the cable to the site ground connection.

Caution Before you continue to install the terminal block wires, stop and perform Step 5. To prevent any contact with metal lead on the wire and the plastic cover.

Step 5 You must wrap the positive and negative cables with sleeving. Take each wire and cover the area from the lug to the wire with heavy shrink sleeving.

Figure 18: Cisco ASR 1004 Router –48 VDC Power Supply Cable Connection, on page 30 shows the –48 VDC power supply cable connection.

Figure 18: Cisco ASR 1004 Router –48 VDC Power Supply Cable Connection

1	Power supply stud and wire	4	Flat washer
2	Ground lug nut	5	Kepnut screw
3	Ground symbol	—	—

Step 6 For easier cable-management, insert the negative cable first. Replace the ground lug with cable in the following order:

a) Flat Washer
b) Ground lug with negative wire
c) Kepnut screw

Step 7 Tighten the Kepnut screw (use the screwdriver to tighten the screw in the terminal block to a torque of 8 in-lbs / 4 per.) and repeat the same steps for the positive stud and wire.

Note Secure the wires coming in from the terminal block so that they cannot be disturbed by casual contact.

Step 8 Use tie wraps to secure the wires, so that the wires are not pulled from the terminal block by casual contact. Ti-wrap studs are located below the supply terminal block.

Step 9 Replace the terminal block plastic cover, which slides over the terminal block; then tighten the screws (tighten the screw to a torque of 5 in-lbs / 1 per.).

Step 10 Remove the tape from the circuit-breaker switch handle and move the circuit-breaker handle to the on position, if you taped the circuit breaker.

Step 11 Switch the On/Off circuit breaker switch to the On (|) position.

What to do next

This completes the procedure for connecting the –48 VDC power supply in the Cisco ASR 1004 Router.

Connecting a Terminal to the Cisco ASR Series 1000 Route Processor Console Port

The Cisco ASR 1004 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 1004 Router. The console cable kit contains:

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

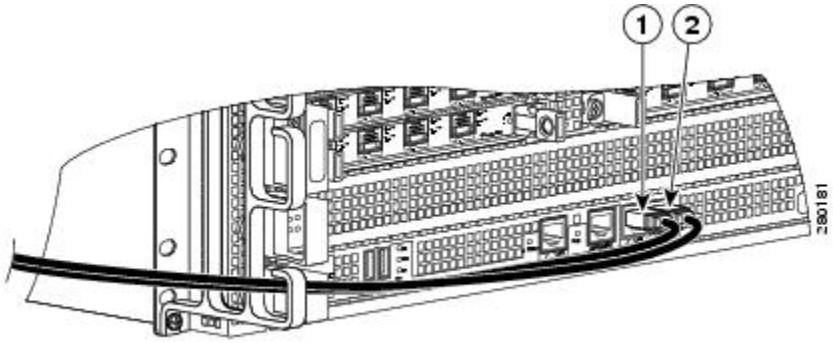
A crossover cable reverses pin connections from one end to the other. In other words, it connects pin 1 (at one end) to pin 8 (at the other end), pin 2 to pin 7, pin 3 to pin 6, and so on. You can identify a crossover cable by comparing the two modular ends of the cable. Hold the cable ends in your hand, 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 a route processor.

Note Each Cisco ASR 1000 Series Route Processor 1 must have a console port connection (typically to a terminal server) if you are running a redundant configuration in the chassis.

The following shows the route processor console port.

Figure 19: Cisco ASR 1004 Router ASR 1000 Series Route Processor Console Port



1	CON port connection	2	AUX port connection

SUMMARY STEPS

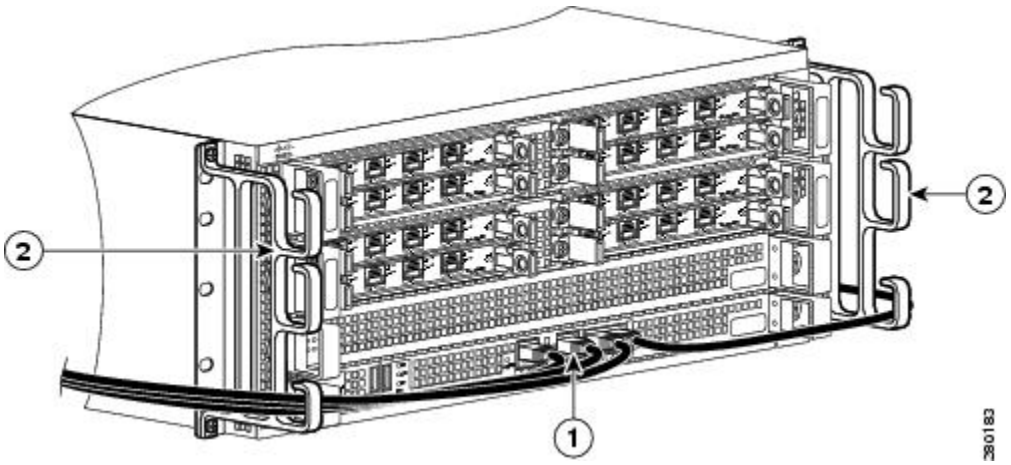
1. Connect one end of the RJ-45 cables to the serial RJ-45 port (CON) on the Cisco ASR 1000 Series Route Processor 1 (see Figure 19: Cisco ASR 1004 Router ASR 1000 Series Route Processor Console Port, on page 31).
2. Run the cable up and through the cable-management bracket and connect the other end of the RJ-45 cable to the RJ-45 adapter (see the following image).
3. Connect the adapter to your video terminal to complete the cable connection.
4. Power on your video terminal.
5. Configure your video terminal to match the following default console port settings:
6. Go to the Connecting the Network Management and Signal System Cables, on page 32 to continue the installation.

DETAILED STEPS

Step 1 Connect one end of the RJ-45 cables to the serial RJ-45 port (CON) on the Cisco ASR 1000 Series Route Processor 1 (see Figure 19: Cisco ASR 1004 Router ASR 1000 Series Route Processor Console Port, on page 31).

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 following image).

Figure 20: Cisco ASR 1004 Router Cable-Management Bracket



1	BITS port connection	2	Cable-management bracket U feature device

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
- No flow control

Step 6 Go to the Connecting the Network Management and Signal System Cables, on page 32 to continue the installation.

Connecting the Network Management and Signal System Cables

The Cisco ASR 1004 Router has connections to both the internal Ethernet management network and the external data network.

- T

  he internal Ethernet management network connections are made through an Ethernet port on the front panel of the Cisco ASR 1000 Series Route Processor 1.

- The external data network connections are made through front panel ports on several types of SPAs.

Keep the following guidelines in mind when connecting external cables to the Cisco ASR 1004 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.