Removing and Replacing FRUs

This chapter describes procedures for removing and replacing field-replaceable units (FRUs) from Cisco 1002-HX Routers.

Removing and Replacing the Crypto Modules

The following sections describe the procedures for removing and replacing the Cisco ASR 1001-HX Router and Cisco ASR 1002-HX Router crypto modules.

Note The crypto modules in Cisco ASR 1001-HX Router and Cisco ASR 1002-HX Router are optional and field-upgradeable components

Removing and Replacing the Crypto Module in a Cisco ASR 1001-HX Router

Before you begin

Perform the following steps before you begin the process of installing the crypto module in a Cisco ASR 1001-HX Router:

- Shut down the router. Enter the **copy running-config startup-config** command to save the configuration to NVRAM.

- Use an ESD-preventive wrist strap.
- Remove the power supplies before you remove the chassis top cover.

Caution The top cover cannot be removed until the power supplies are removed from the chassis. The chassis has a safety mechanism built in to prevent the removal of the top cover until the power supplies are removed.

Procedure

Step 1 With an ESD wrist strap on, remove the power supplies from the chassis.

Note The chassis cover cannot be removed until the power supplies are removed from the chassis.

For instructions about how to remove the AC and DC power supplies, see:

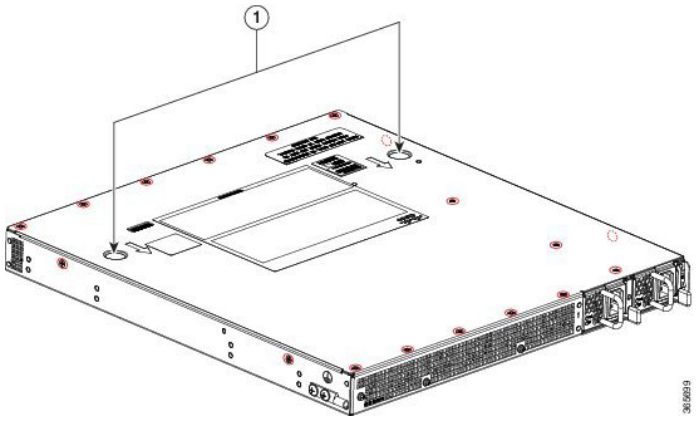
- Removing AC Power Supplies
- Removing DC Input Power Supplies

Step 2 Remove the router from the rack.

Step 3 Remove the chassis top cover by performing the following steps:

a) Remove the fourteen top surface screws on the chassis cover.
b) Remove the two screws from the left side of the chassis and the two screws from the right side of the chassis.
c) Putting your thumbs in the thumb depression shown in the following figure, slide the cover slightly backward and lift it off of the chassis.

Figure 1: Cisco ASR 1001-HX Router Top Cover Screw Locations



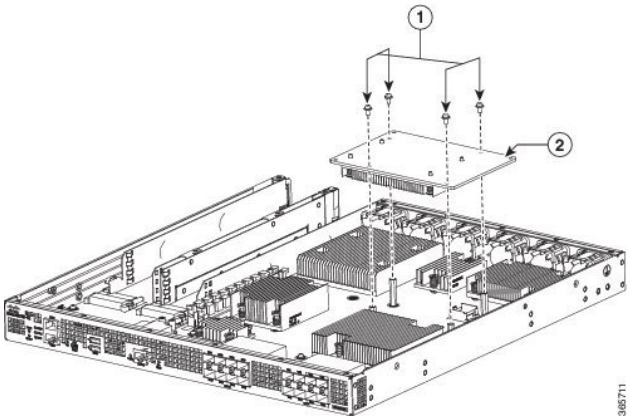
1	Thumb depression location

Step 4 Remove the crypto module from its ESD bag.

Step 5 Carefully align the crypto module with its connector on the mother board and snap into place.

Step 6 Install the four M3 x 8 mm long pan heads with a Phillips drive, screws into the location shown below and torque it to 5 in-lbs.

Figure 2: Cisco ASR 1001-HX Router Crypto Module



1	Screws	2	Crypto module

Step 7 Install the cover.

Step 8 Install the chassis in the rack.

Step 9 Power up the router by plugging in the power supplies and placing the chassis power switch to the On position.

Step 10 Use the **show platform hardware crypto-device 0 status** command to verify successful installation:

```
Router# show platform hardware crypto-device 0 status

Encryption processor is functional
```

Removing and Replacing the Crypto Module in a Cisco ASR 1002-HX Router

Before you begin

To install the crypto module, you must shut down the router and remove it from the rack. Enter the **copy running-config startup-config** command to save the configuration to NVRAM.

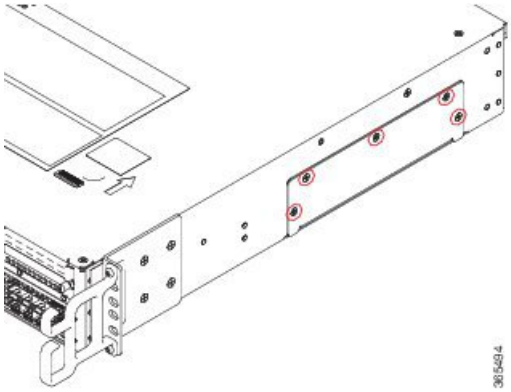
Procedure

Step 1 Power down the router by placing the chassis power switch in the Standby position and unplug the power supplies.

Step 2 Remove the router from the rack.

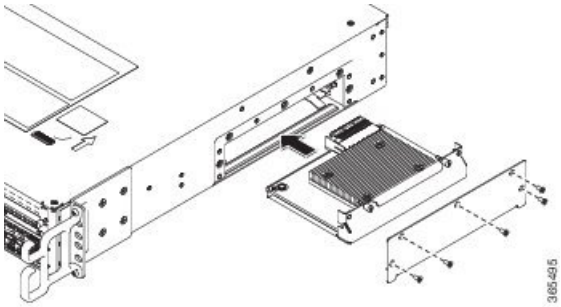
Step 3 Open the access panel on the right side of the chassis by removing the 5 screws, as shown in the following figure.

Figure 3: Access Panel Screws



Step 4 Align the crypto module with the guide rails and carefully slide the crypto module into the slot until it is fully seated.

Figure 4: Installing the Crypto Module



Step 5 Tighten the captive installation screws on the crypto module.

Step 6 Replace the access panel and screws. The types of screws are M3 x 8 mm long pan heads with a Phillips drive, and 4 screws are required per board.

Step 7 Install the chassis in the rack.

Step 8 Power up the router by plugging in the power supplies and placing the chassis power switch to the On position.

Step 9 Use the **show platform hardware crypto-device 0 status** command to verify successful installation:

```
Router# show platform hardware crypto-device 0 status

Encryption processor is functional
```

Removing AC Power Supplies

Procedure

Step 1 Ensure that the chassis power switch is in the Standby position.

Note It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 2 Unplug the power cable from the power supply.

Step 3 Press the retaining latch towards the pull handle, grasp the handle with one hand, and pull the power supply out of the slot while supporting the weight of the power supply with the other hand.

Step 4 Repeat these steps if it is required to remove the other AC power supply.

Installing AC Power Supplies

Note Do not install the power supplies with the chassis cover off.

Procedure

Step 1 Ensure that the chassis power switch on the chassis is in the Standby position.

Note It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 2 Insert the power supply module into the appropriate slot(s), making sure that the retention latch is firmly placed. You can verify that the power supply module is firmly latched by gently pulling the power supply handle.

Step 3 Insert the power supply cables firmly into the power supplies.

Note Ensure that both power supplies are inserted firmly and the power cords are in place.

Step 4 If you have changed the chassis power switch to the Standby position in Step 1, press the power switch to the On position.

The power supply LEDs are illuminated (green).

Removing DC Input Power Supplies

The DC power supply has a terminal block that is installed into the power supply terminal block header.

Procedure

Step 1 Turn off the circuit breaker from the power source.

Step 2 Ensure that the chassis power switch is in the Standby position.

Note It is not required to place the chassis power switch in the Standby position if you want to hot-swap a single power supply.

Step 3 Remove the plastic cover from the terminal block.

Step 4 Unscrew the two terminal block screws on the unit and remove the wires from the power supply.

Step 5 Press the power supply retaining latch towards the pull handle, grasp the handle with one hand, and pull the power supply out of the slot while supporting the weight of the power supply with the other hand.

Installing DC Input Power Supplies

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

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

Note Do not install the power supplies with the chassis cover off.

This section describes how to install the DC power supply input power leads to the DC input power supply. Before you begin, read these important notices:

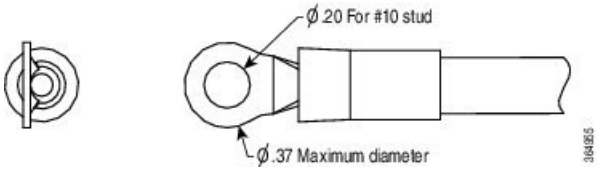
- The color coding of the DC input power supply leads depends on the color coding of the DC power source at your site. Ensure that the lead color coding you choose for the DC input power supply matches the lead color coding used at the DC power source and verify that the power source is connected to the negative (–) terminal and to the positive (+) terminal on the power supply.
- Ensure that the chassis ground is connected on the chassis before you begin installing the DC power supply. Follow the steps provided in the "Chassis Ground Connection" section.
- For DC input power cables, the wire gauge is based on the National Electrical Code (NEC) and local codes for 26 amp service at nominal DC input voltage (–40/–72 VDC). One pair 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 DC input power cables for the chassis should be 10 gauge wire and cable lengths should match within 10 percent of deviation.

Each DC input power cable is terminated at the PDU by a cable lug, as shown in the following figure.

Note DC input power cables must be connected to the PDU terminal studs in the proper positive (+) and negative (–) polarity. In some cases, the DC 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 DC cable leads. When making the measurement, the positive (+) lead and the negative (–) lead must always match the (+) and (–) labels on the power distribution unit.

Figure 5: DC Input Power Cable Lug



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

Wiring the DC Input Power Source

Warning To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

Procedure

Step 1 Turn off the circuit breaker from the power source.

Step 2 Ensure that the chassis power switch is in the Standby position.

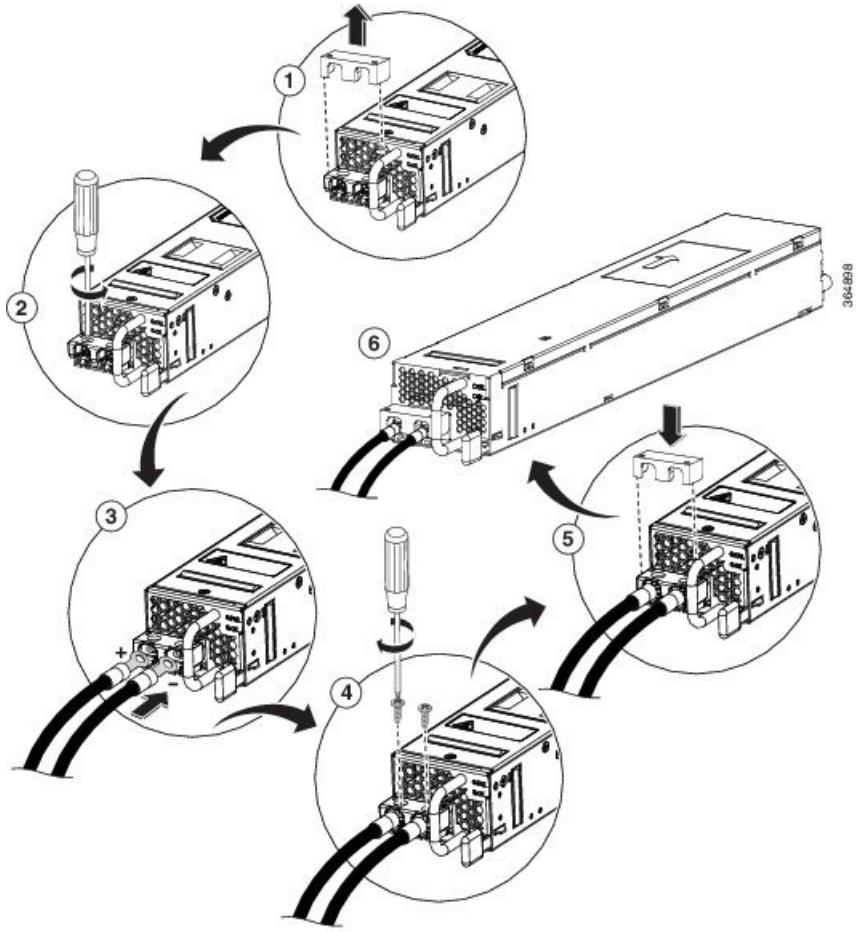
Note It is not required to place the power switch in the Standby position if you want to hot-swap a single power supply.

Step 3 Remove the plastic cover from the terminal block.

Caution Before you continue to install the terminal block ground wires, stop and perform Step 4.

Step 4 To prevent any contact with metal lead on the ground wire and the plastic cover, you must wrap the positive and negative lead cables with sleeving. Insulate the lug with shrink sleeving for each lead wire if using non-insulated crimp terminals. Sleeving is not required for insulated terminals.

Figure 6: DC Power Supply Terminal Block Ground Cable Lugs



Note This illustration shows the DC power supply for the Cisco ASR 1002-HX Router. The airflow for the Cisco ASR 1002-HX Router is reverse of what is shown in this illustration.

Step 5 For easier cable-management, insert the negative lead cable first. Replace the ground lug with cable in the following order:

a) Wire terminal
b) Screw with captive washer

Step 6 Tighten the M3 Screw with captive washer to recommended torque of 5 in-lbs 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 7 Replace the terminal block plastic cover. The plastic cover is slotted and keyed to fit correctly over the terminal block.

Step 8 Turn on the circuit breaker at the power source.

Step 9 If you have changed the chassis power switch to the Standby position in step 2, turn the power switch to the On position.

The power supply LEDs illuminate green.

Removing and Replacing USB Flash Memory Stick

The contains USB ports for a flash memory stick to store configurations or Cisco IOS XE consolidated packages.

⚠

Caution Do not remove a USB Flash memory stick when issuing a file access command or a read/write operation to the Flash memory stick when it is processing. The router might reload or the USB Flash memory stick may get damaged. Prior to the removal of the USB device, check to see if the USB activity LED on the front panel is flashing.

To remove and then replace a USB flash memory stick, follow these steps:

Procedure

Step 1 Pull the flash memory stick from the USB port.

Step 2 To replace a Cisco USB Flash memory stick, insert the module into USB port 0 or 1. The Flash memory stick can be inserted only in one way, and can be inserted or removed regardless of whether the router is powered up or not.

Removing and Replacing a DIMM

This section describes how to replace the DIMMs on the .

You might have to upgrade a DIMM for the following reasons:

- You have upgraded to a new Cisco IOS feature set or release that requires more memory.
- You are using very large routing tables or many protocols.

The DIMM component is keyed and slotted for easier connection.

Removing a DIMM from a Cisco ASR 1001-HX Router

Before you begin

Perform the following steps before you begin the process of removing and replacing a DIMM from a Cisco ASR 1001-HX Router:

- Use an ESD-preventive wrist strap.
- Back up the data that you want to save.
- Remove the power supplies before you remove the chassis top cover.

Caution The top cover cannot be removed until the power supplies are removed from the chassis. The chassis has a safety mechanism built in to prevent the removal of the top cover until the power supplies are removed.

Procedure

Step 1 With an ESD wrist strap on, remove the power supplies from the chassis.

Note The chassis cover cannot be removed until the power supplies are removed from the chassis.

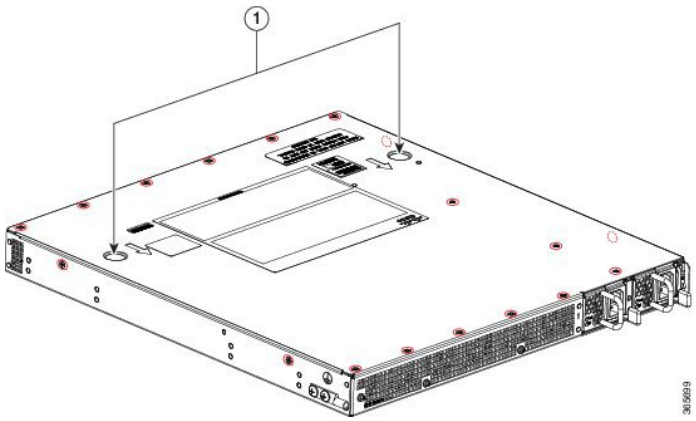
For instructions about how to remove the AC and DC power supplies, see:

- Removing AC Power Supplies
- Removing DC Input Power Supplies

Step 2 Remove the chassis top cover by performing the following steps:

a) Remove the fourteen top surface screws on the chassis cover.
b) Remove the two screws from the left side of the chassis and the two screws from the right side of the chassis.
c) Putting your thumbs in the thumb depression shown in the following figure, slide the cover slightly backward and lift it off of the chassis.

Figure 7: Cisco ASR 1001-HX Router Top Cover Screw Locations

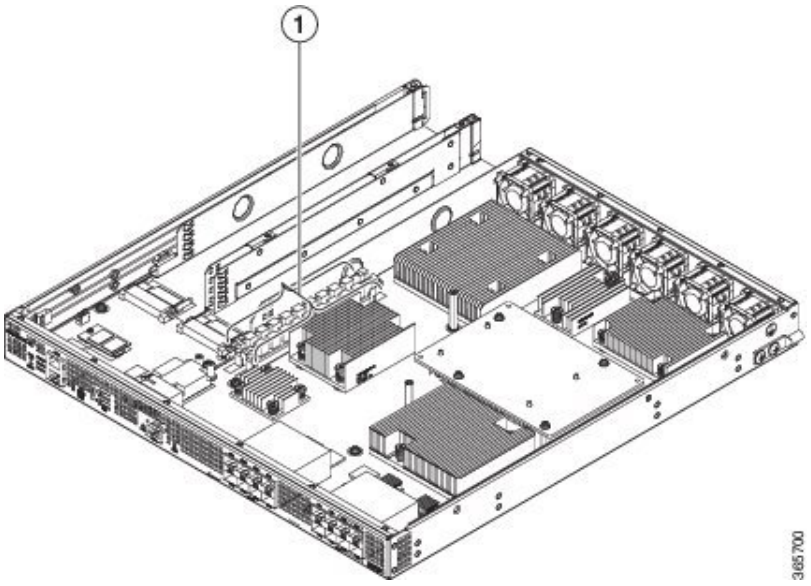


1	Thumb depression location

Step 3 Locate the DIMMs on the router.

The following figure shows the location of the DIMM slots in the Cisco ASR 1001-HX Router.

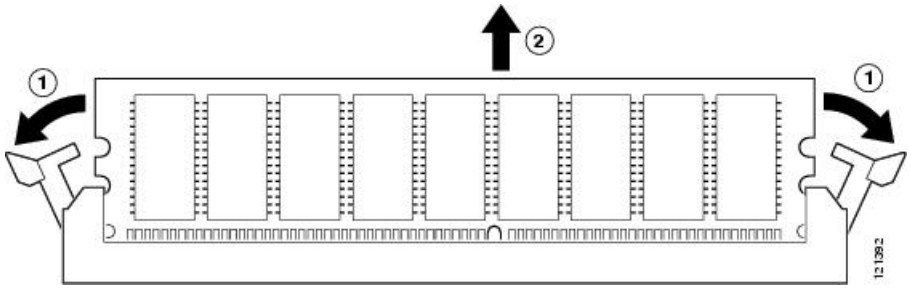
Figure 8: DIMM Location



1	DIMM location (two slots)

Step 4 Pull down the DIMM module spring latches to release the corresponding DIMM from the socket.

Figure 9: DIMM Module Spring Latches to Remove the DIMMs



Step 5 When both ends of the DIMM are released from the socket, grasp each end of the DIMM with your thumb and forefinger and pull the DIMM completely out of the socket. Handle only the edges of the DIMM; avoid touching the memory module, pins, and the metal traces (the metal fingers along the connector edge of the DIMM) along the socket edge.

Step 6 If you are upgrading the DIMM configuration from 8 GB to 16 GB using M-ASR1001HX-16GB, proceed to the "Replacing a DIMM in a Cisco ASR 1001-HX Router, on page 12" section. Otherwise, place the DIMM in an antistatic bag to protect it from ESD damage.

Replacing a DIMM in a Cisco ASR 1001-HX Router

Procedure

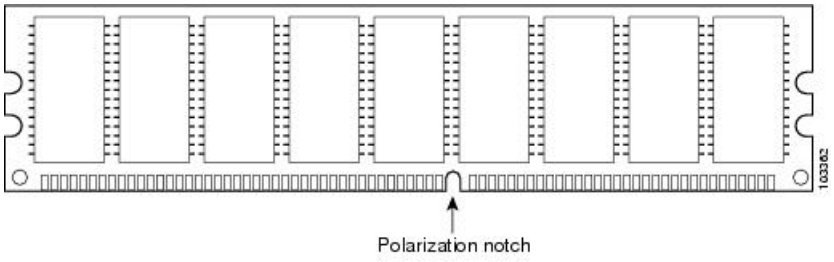
Step 1 Place the DIMM on an antistatic mat or pad while wearing an antistatic device, such as a wrist strap.

Caution DIMMs are sensitive components that can be shorted by mishandling; they are susceptible to ESD damage. Handle the DIMM by the edges only, and avoid touching the pins.

Step 2 Remove the new DIMM from the antistatic bag.

Step 3 Locate the polarization notch and align the DIMM with the socket before inserting it.

Figure 10: DIMM Polarization Notch

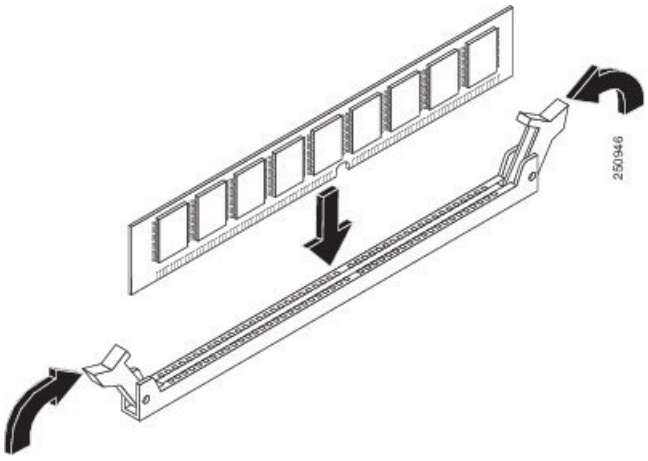


Step 4 Gently insert the new DIMM, taking care not to damage the pins on the edge of the DIMM. Using two hands, hold both sides of DIMM's top edges with your index fingers and thumbs and gently slide the DIMM straight in to the socket. Press the top of the DIMM towards the socket, being careful to apply force only on the DIMM that is parallel with the plane of the DIMM.

Caution When inserting DIMMs, use firm but not excessive pressure. If you damage a socket, you will have to return the router to the factory for repair.

Step 5 Use light insertion force and insert smoothly, but ensure that the DIMM is inserted straight. If necessary, rock the DIMM gently back and forth to seat it properly. The following figure shows how to install the DIMM in the DIMM socket.

Figure 11: Installing a DIMM in the Socket



Step 6 After the DIMM is installed, check whether the release levers are flush against the sides of the DIMM socket. If they are not, the DIMM might not be seated properly. If the DIMM appears misaligned, carefully remove it according to the removal procedure and then reseat it in the socket. Push the DIMM firmly back into the socket until the release levers are flush against the sides of the DIMM socket.

Step 7 Replace the chassis top cover:

a) Slide the cover onto the chassis ensuring that the interlock hook feature fits on the chassis cover and base.

b) Install the top surface screws and the side screws and tighten them slightly.

Step 8 Install the power supplies into the chassis and power up the router. See:

- Installing AC Power Supplies
- Installing DC Input Power Supplies

What to do next

After you have correctly installed the DIMMs, the system should reboot properly.

If the system fails to reboot properly or if the console terminal displays a checksum or memory error after you have installed the new DIMMs, ensure that all DIMMs are installed correctly. If necessary, shut down the system and remove the chassis cover. Check the DIMMs by looking straight down on them to inspect them at eye level. The DIMMs should be aligned at the same angle and the same height when properly installed. If a DIMM appears to stick out or rest in the socket at a different angle from the other, remove the DIMM and reinsert it. Replace the top chassis cover, and reboot the system for another installation check.

Note After several attempts, if the system fails to restart properly, contact a Cisco service representative for assistance. Before you call, make note of any error messages, unusual LED states, or other indications that might help solve the problem.

Removing a DIMM from a Cisco ASR 1002-HX Router

Before you begin

Perform the following steps before you begin the process of removing and replacing a DIMM from a Cisco ASR 1002-HX Router:

- Use an ESD-preventive wrist strap.
- Back up the data that you want to save.
- Remove the power supplies before you remove the chassis top cover.

Caution The top cover cannot be removed until the power supplies are removed from the chassis. The chassis has a safety mechanism built in to prevent the removal of the top cover until the power supplies are removed.

Procedure

Step 1 With an ESD wrist strap on, remove the power supplies from the chassis.

Note The chassis cover cannot be removed until the power supplies are removed from the chassis.

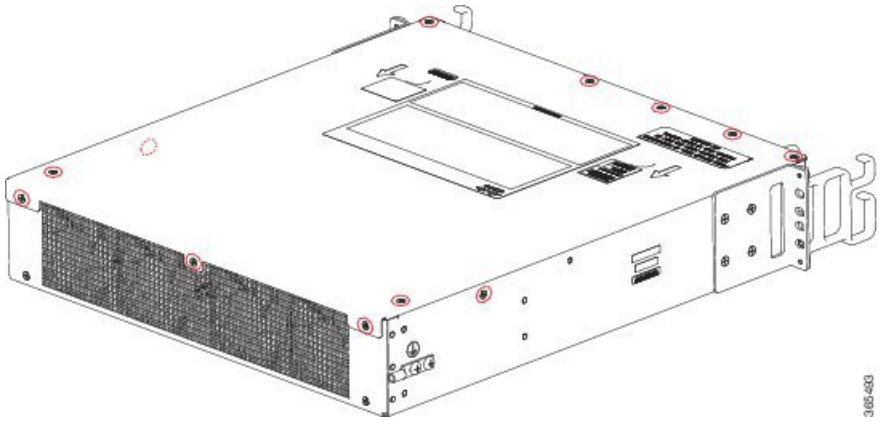
For instructions about how to remove the AC and DC power supplies, see:

- Removing AC Power Supplies
- Removing DC Input Power Supplies

Step 2 After the power supplies are removed, remove the chassis top cover by performing the following steps:

a) Remove the seven top surface screws on the chassis cover.
b) Remove the three screws from the rear of the chassis cover.
c) Remove one screw from the left side of the chassis and one screw from the right side of the chassis.

Figure 12: Cisco ASR 1002-HX Router Top Cover Screw Locations



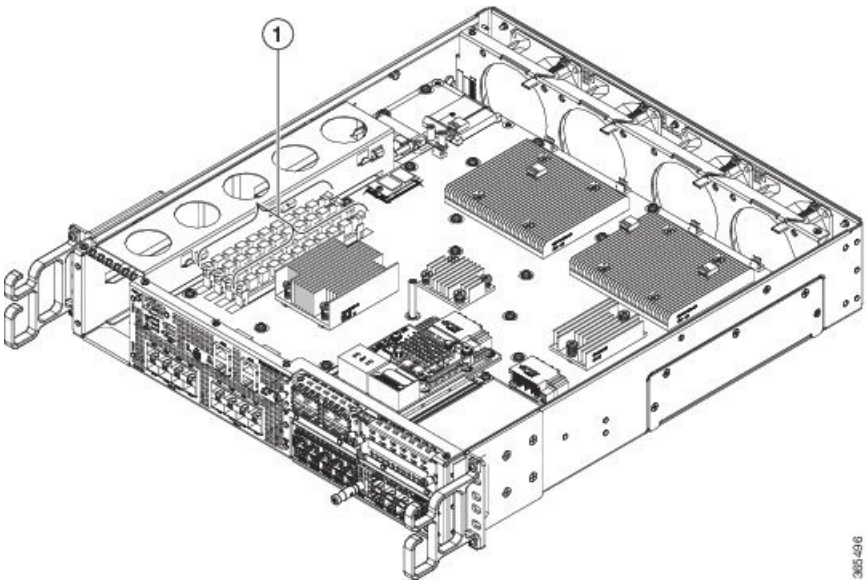
d) Using both hands, gently slide the cover slightly backward and lift it off of the chassis.

Step 3 Position the chassis so that you have the most comfortable access to the chassis to remove the DIMM.

Step 4 Locate the DIMMs on the router.

The following figure shows the location of the DIMM slots in the .

Figure 13: Cisco ASR 1002-HX Router DIMM Location



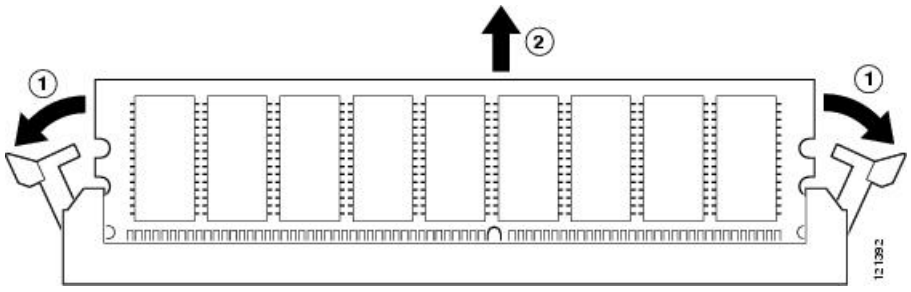
1	Cisco ASR 1002-HX Router DIMM location (four slots)

Step 5

Note If you are upgrading the DIMM configuration from 16 GB to 32 GB using M-ASR1002HX-32GB, perform the next step on the DIMM in Channel A, Slot 1.

Pull down the DIMM module spring latches to release the corresponding DIMM from the socket.

Figure 14: DIMM Module Spring Latches to Remove the DIMMs



Step 6 When both ends of the DIMM are released from the socket, grasp each end of the DIMM with your thumb and forefinger and pull the DIMM completely out of the socket. Handle only the edges of the DIMM; avoid touching the memory module, pins, and the metal traces (the metal fingers along the connector edge of the DIMM) along the socket edge.

Step 7 If you are upgrading the DIMM configuration from 16 GB to 32 GB using M-ASR1002HX-32GB, proceed to the "Replacing a DIMM in a Cisco ASR 1002-HX Router, on page 16" section. Otherwise, place the DIMM in an antistatic bag to protect it from ESD damage.

If you are removing the DIMMs without upgrading the system memory, repeat Steps 5 and 6 on the remaining DIMM.

Replacing a DIMM in a Cisco ASR 1002-HX Router

Procedure

Step 1 Place the DIMM on an antistatic mat or pad while wearing an antistatic device, such as a wrist strap.

Caution DIMMs are sensitive components that can be shorted by mishandling; they are susceptible to ESD damage. Handle the DIMM by the edges only, and avoid touching the pins.

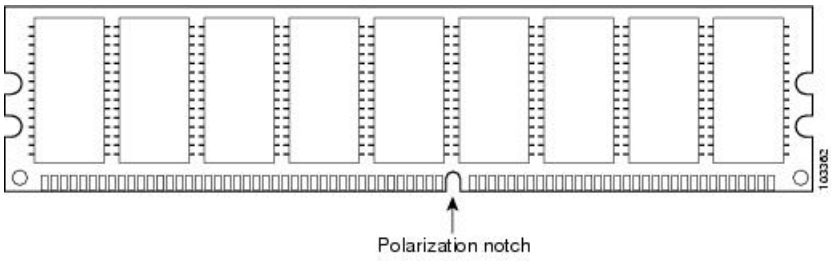
Step 2

Note If you are upgrading the DIMM configuration from 16 GB to 32 GB using M-ASR1002HX-32GB, you must move the DIMM from Channel A, Slot 1, to Channel B, Slot 2. See the "Removing and Replacing the Crypto Module in a Cisco ASR 1001-HX Router" or "Removing and Replacing the Crypto Module in a Cisco ASR 1002-HX Router"section for removal instructions, then proceed to Step 3.

Remove the new DIMM from the antistatic bag.

Step 3 Locate the polarization notch and align the DIMM with the socket before inserting it.

Figure 15: DIMM Polarization Notch

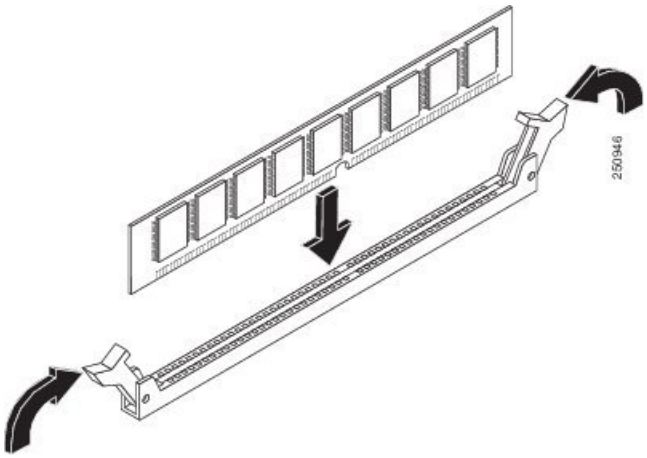


Step 4 Gently insert the new DIMM, taking care not to damage the pins on the edge of the DIMM. Using two hands, hold both sides of DIMM's top edges with your index fingers and thumbs and gently slide the DIMM straight in to the socket. Press the top of the DIMM towards the socket, being careful to apply force only on the DIMM that is parallel with the plane of the DIMM.

Caution When inserting DIMMs, use firm but not excessive pressure. If you damage a socket, you will have to return the router to the factory for repair.

Step 5 Use light insertion force and insert smoothly, but ensure that the DIMM is inserted straight. If necessary, rock the DIMM gently back and forth to seat it properly. The following figure shows how to install the DIMM in the socket for the Cisco ASR 1002-HX Router.

Figure 16: Installing a DIMM in the Socket



Step 6 After the DIMM is installed, check whether the release levers are flush against the sides of the DIMM socket. If they are not, the DIMM might not be seated properly. If the DIMM appears misaligned, carefully remove it according to the removal procedure and then reseat it in the socket. Push the DIMM firmly back into the socket until the release levers are flush against the sides of the DIMM socket.

Step 7 If you are upgrading the DIMM configuration from 16 GB to 32 GB using M-ASR1002HX-32GB, repeat Steps 2 through 6 to install the upgrade DIMMs in Channel A, Slots 0 and 1.

Step 8 Replace the Cisco ASR 1002-HX Router top cover:

a) Slide the cover onto the chassis ensuring that the interlock hook feature fits on the chassis cover and base.

b) Install the top surface screws, the rear screws, and the side screws and tighten them slightly.

Step 9 Install the power supplies into the chassis and power up the router. See:

- Installing AC Power Supplies
- Installing DC Input Power Supplies

What to do next

After you have correctly installed the Cisco ASR 1002-HX Router DIMMs, the system should reboot properly.

If the system fails to reboot properly or if the console terminal displays a checksum or memory error after you have installed the new DIMMs, ensure that all DIMMs are installed correctly. If necessary, shut down the system and remove the chassis cover. Check the DIMMs by looking straight down on them to inspect them at eye level. The DIMMs should be aligned at the same angle and the same height when properly installed. If a DIMM appears to stick out or rest in the socket at a different angle from the other, remove the DIMM and reinsert it. Replace the top chassis cover, and reboot the system for another installation check.

Note After several attempts, if the system fails to restart properly, contact a Cisco service representative for assistance. Before you call, make note of any error messages, unusual LED states, or other indications that might help solve the problem.

Removing and Replacing an EPA

The online insertion and removal (OIR) feature allows you to install and replace an Ethernet port adapter (EPA) while the router is operating. You do not have to shut down the system's power, although you should not run traffic through the EPA while it is being removed. OIR is a method that is seamless to end users on the network, maintains all routing information, and preserves sessions.

Note As you disengage the EPA from the router, OIR shuts down all the active interfaces in the EPA.

Note For detailed information about EPA software commands, such as preparing for OIR of EPAs, and activating and deactivating configuration examples, see the *Cisco ASR 1000 Series Modular Interface Processor Installation Guide*.

We suggest you have the following tools and parts readily available for installing an EPA:

- Number 2 Phillips or a 3/16-inch flat-blade screwdriver
- EPA or blank filler plate (EPA-BLANK=)
- Any SFP modules that you have to install (and have not already installed)
- Cables
- Your own ESD-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, field-replaceable units (FRUs), and spares
- Antistatic mat or surface, or static shielding bag

If you need additional equipment, contact a service representative for ordering information.

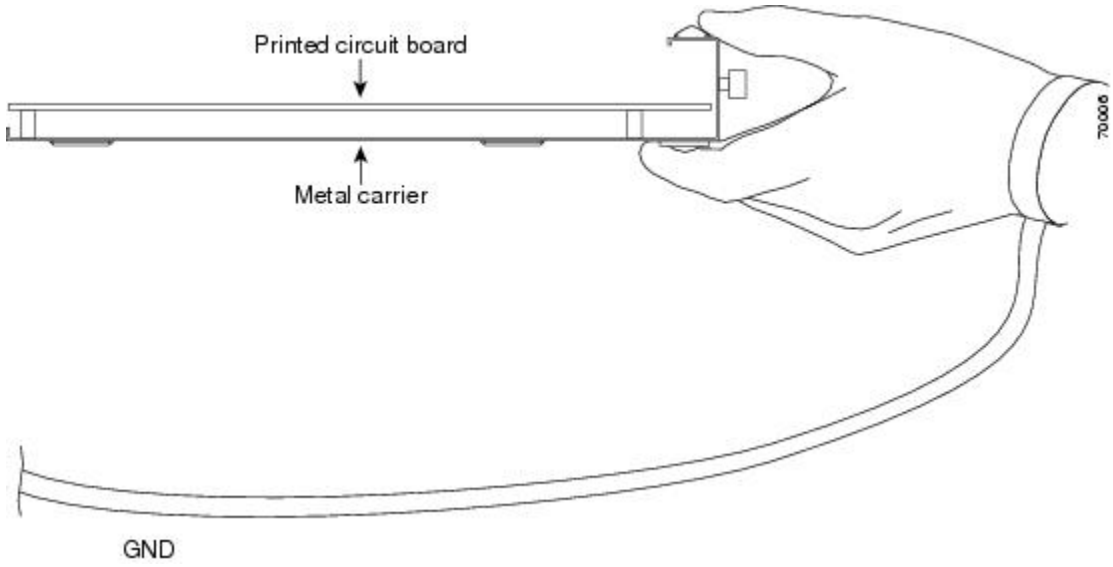
Electrostatic Discharge Prevention

Electrostatic discharge (ESD) damages equipment and impairs electrical circuitry. ESD occurs when printed circuit boards are improperly handled and results in complete or intermittent failures.

Each EPA circuit board is mounted to a metal carrier and is sensitive to ESD damage. an EPA consists of a printed circuit board that is fixed in a metal carrier. Electromagnetic interference (EMI) shielding, connectors, and a handle are integral components of the carrier.

When the subslot is not in use, an EPA blank filler plate must fill the empty subslot to allow the router to conform to EMI emission requirements and to allow proper airflow across the installed modules. If you plan to install the EPA in the subslot that is not in use, you must first remove the EPA blank filler plate.

Figure 17: Handling an EPA



Although the metal carrier helps to protect the EPA from ESD, wear a preventive antistatic strap whenever you handle the EPA. Ensure that the strap makes good skin contact and connect the strap's clip to an unpainted chassis surface to safely channel unwanted ESD voltages to ground.

If no wrist strap is available, ground yourself by touching the metal part of the chassis.

The following are the guidelines for preventing ESD damage:

- Always use an ESD wrist strap or ankle strap when installing or replacing an EPA. Ensure that the ESD strap makes contact with your skin.
- Handle the EPA by its metal carrier edges and handles; avoid touching the printed circuit board or any connector pins.
- When removing the EPA, place it on an antistatic surface with the printed circuit board components facing upward, or in a static shielding bag.

Removing an EPA

Procedure

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

Step 2 Stop the EPA so that there is no traffic running through the EPA when it is removed.

Caution Removing an EPA while traffic is flowing through the ports may cause system disruption.

a) At the `router#` prompt, enter **hw-module subslot 0/2 stop** and press **Enter**.
b) At the `router#` prompt, enter **end** and press **Enter**.

Step 3 Disconnect all the cables from the EPA.

Step 4 Loosen the captive screw in the center of the EPA by turning it counterclockwise.

Step 5 Slide the EPA out of the EPA slot.

Replacing an EPA

Procedure

Step 1 Locate the guide rails that hold the EPA in place.

Step 2 Align the EPA with the guide rails and carefully slide the EPA all the way all the way into the slot until the EPA stops.

Step 3 Use a number 2 Phillips screwdriver to fully seat the EPA by turning the captive screw clockwise.

When fully seated, the EPA should be flush with the router faceplate.

Note Avoid overtorquing the EPA captive screw when installing the EPA. Tighten the captive screw on the EPA to a torque of 11 +/-1 inch-pounds.

Step 4 Restart the EPA using the following steps:

a) At the `router#` prompt, enter **hw-module subslot 0/2 start** and press **Enter**.

b) At the `router#` prompt, enter **end** and press **Enter**.

Step 5 Use the **show platform** command to verify whether the status of subslot 0/2 is OK.

```
Router# show platform

Chassis type: ASR1002-HX

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         ASR1002-HX          ok                    00:07:52
 0/0      BUILT-IN-EPA-8x1G   ok                    00:07:00
 0/1      BUILT-IN-EPA-8x10G  ok                    00:07:00
 0/2      EPA-18X1GE          ok                    00:07:01
.
.
.
```

Removing and Replacing a NIM

The OIR feature allows you to install and replace a NIM while the router is operating. You do not have to shut down the system's power although you should not run traffic through the NIM while it is being removed. OIR is a method that is seamless to end users on the network, and maintains all routing information and preserves sessions.

Note As you disengage the NIM from the router, OIR shuts down all the active interfaces in the NIM.

We recommend that you have the following tools and parts readily available for installing a NIM:

- Number 2 Phillips or a 3/16-inch flat-blade screwdriver
- NIM
- Cables
- Your own ESD-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, FRUs, and spares
- Antistatic mat or surface, or static shielding bag

If you need additional equipment, contact a Cisco service representative for ordering information.

For information about electrostatic discharge prevention, see the “Electrostatic Discharge Prevention” section on page 7-15.

Removing a NIM

Procedure

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

Step 2 Stop the NIM so that there is no traffic running through the NIM when it is removed, using the following steps:

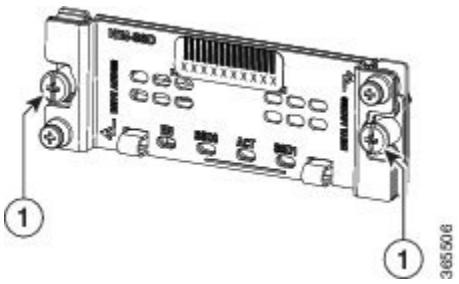
Note Removing a NIM while traffic is flowing through the ports may cause system disruption.

a) At the `router#` prompt, enter **hw-module subslot 0/3 stop** and press **Enter**.
b) At the `router#` prompt, enter **end** and press **Enter**.

Step 3 Disconnect all the cables from the NIM.

Step 4 Unscrew the captive installation screws on either side of the NIM.

Figure 18: Captive Installation Screws Location



1	Captive screws on the NIM

Step 5 Pull out the NIM out of the chassis.

Step 6 Place the NIM in an antistatic bag to protect it from electrostatic discharge (ESD) damage.

Replacing a NIM

Procedure

Step 1 To insert a NIM, locate the guide rails that hold the NIM in place. They are at the top left and top right of the NIM slot and are recessed about an inch.

Step 2 Carefully slide the NIM all the way in using both hands until the NIM is firmly seated in the NIM interface connector. When fully seated, the NIM might be slightly behind the faceplate.

Step 3 After the NIM is properly seated, fasten the NIM in place with the captive installation screws on either side of the NIM.

Note Ensure that you screw down the captive installation screws to provide appropriate connectivity.

The NIM should power up after installation.

Step 4 Use the **show platform** command to verify whether the status of subslot 0/3 is OK.

Removing and Replacing Fans

Removing the Fans from a Cisco ASR 1001-HX Router

Before you begin

Perform the following steps before you begin the process of removing the fans from a Cisco ASR 1001-HX Router:

- Use an ESD-preventive wrist strap.
- Back up the data that you want to save.
- Remove the power supplies before you remove the chassis top cover.

Caution The top cover cannot be removed until the power supplies are removed from the chassis. The chassis has a safety mechanism built in to prevent the removal of the top cover until the power supplies are removed.

Procedure

Step 1 With an ESD wrist strap on, remove the power supplies from the chassis.

Note The chassis cover cannot be removed until the power supplies are removed from the chassis.

For instructions about how to remove the AC and DC power supplies, see:

- Removing AC Power Supplies
- Removing DC Input Power Supplies

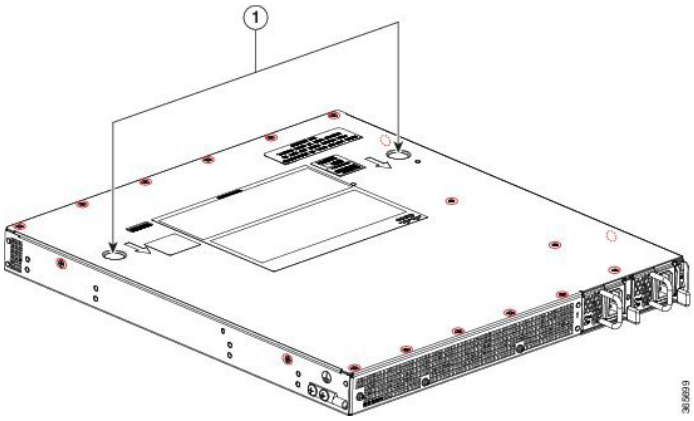
Step 2 Remove the chassis top cover by performing the following steps:

a) Remove the fourteen top surface screws on the chassis cover.

b) Remove the two screws from the left side of the chassis and the two screws from the right side of the chassis.

c) Putting your thumbs in the thumb depression shown in the following figure, slide the cover slightly backward and lift it off of the chassis.

Figure 19: Cisco ASR 1001-HX Router Top Cover Screw Locations

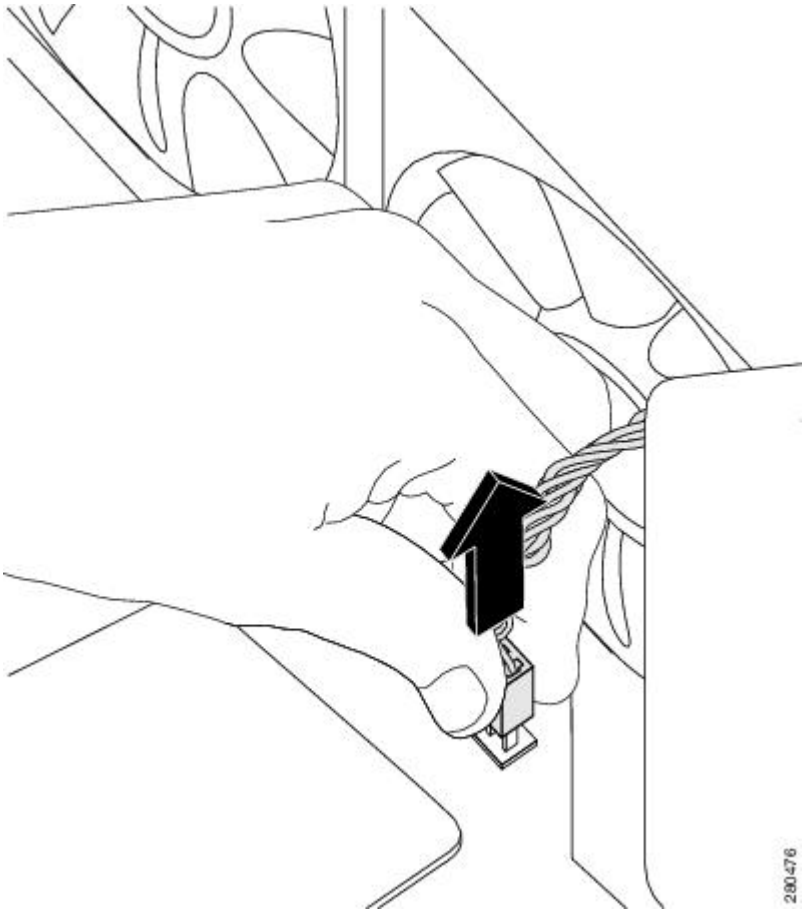


1	Thumb depression location

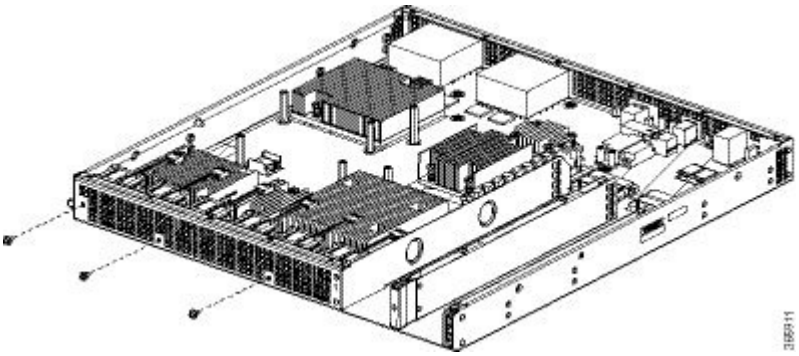
Step 3 Position the chassis so that you have the most comfortable access to the chassis to remove the fans.

The fans are located at the rear of the chassis.

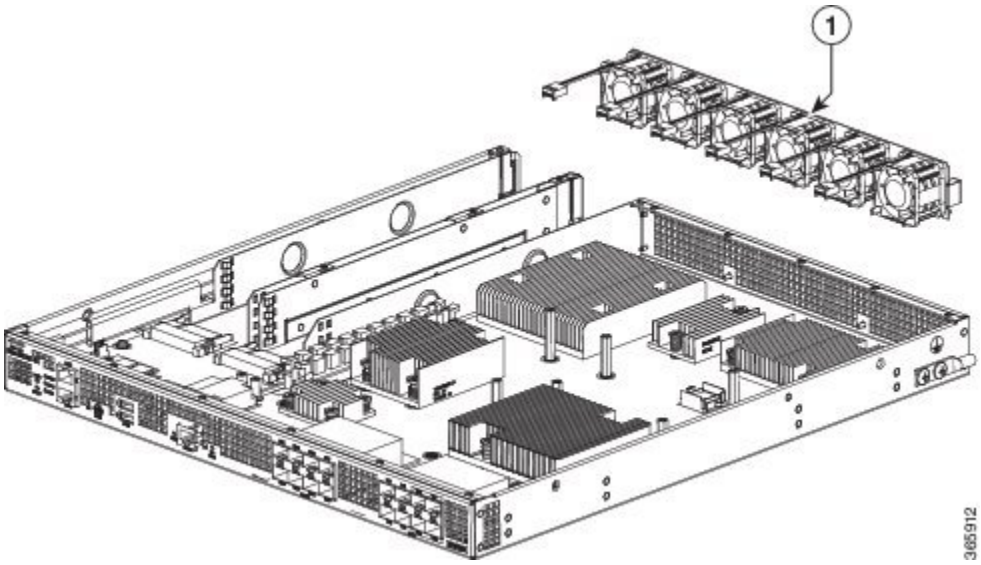
Step 4 Unplug the six fan connectors from the motherboard.



Step 5 Remove the three screws from the rear of the chassis as shown in the following figure.



Step 6 Rotate the fan tray slightly forward, and then lift it out of the chassis as shown in the following figure.

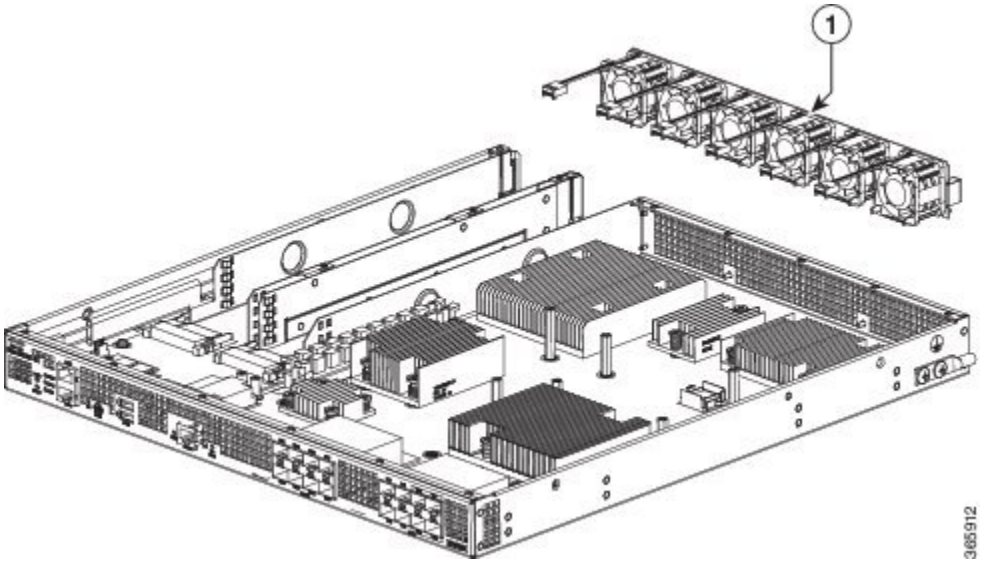


1	Fan tray

Replacing the Fans in a Cisco ASR 1001-HX Router

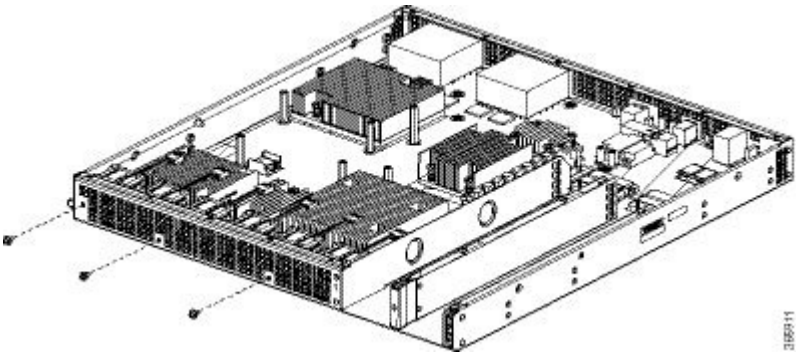
Procedure

Step 1 Gently insert the fan tray into the rear of the chassis.



1	Fan tray

Step 2 Use three screws to attach the fan trays to the chassis.



Step 3 Plug the six fan connectors into the motherboard.

Step 4 Replace the chassis top cover:

a) Slide the cover onto the chassis ensuring that the interlock hook feature fits on the chassis cover and base.
b) Install the top surface screws and the side screws and tighten them slightly.

Step 5 Install the power supplies into the chassis and power up the router. See:

- Installing AC Power Supplies
- Installing DC Input Power Supplies

Removing the Fans from a Cisco ASR 1002-HX Router

Before you begin

Perform the following steps before you begin the process of removing the fans from a Cisco ASR 1002-HX Router:

- Use an ESD-preventive wrist strap.
- Back up the data that you want to save.
- Remove the power supplies before you remove the chassis top cover.

Caution The top cover cannot be removed until the power supplies are removed from the chassis. The chassis has a safety mechanism built in to prevent the removal of the top cover until the power supplies are removed.

Procedure

Step 1 With an ESD wrist strap on, remove the power supplies from the chassis.

Note The chassis cover cannot be removed until the power supplies are removed from the chassis.

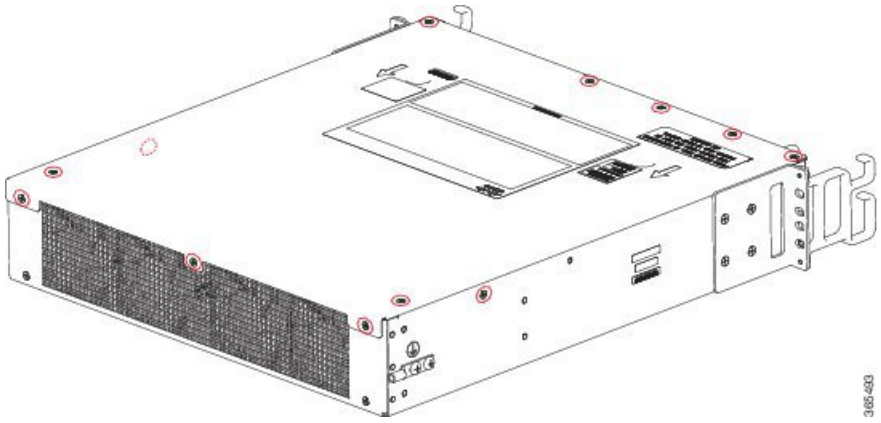
For instructions about how to remove the AC and DC power supplies, see:

- Removing AC Power Supplies
- Removing DC Input Power Supplies

Step 2 After the power supplies are removed, remove the chassis top cover by performing the following steps:

a) Remove the seven top surface screws on the chassis cover.
b) Remove the three screws from the rear of the chassis cover.
c) Remove one screw from the left side of the chassis and one screw from the right side of the chassis.

Figure 20: Cisco ASR 1002-HX RouterTop Cover Screw Locations

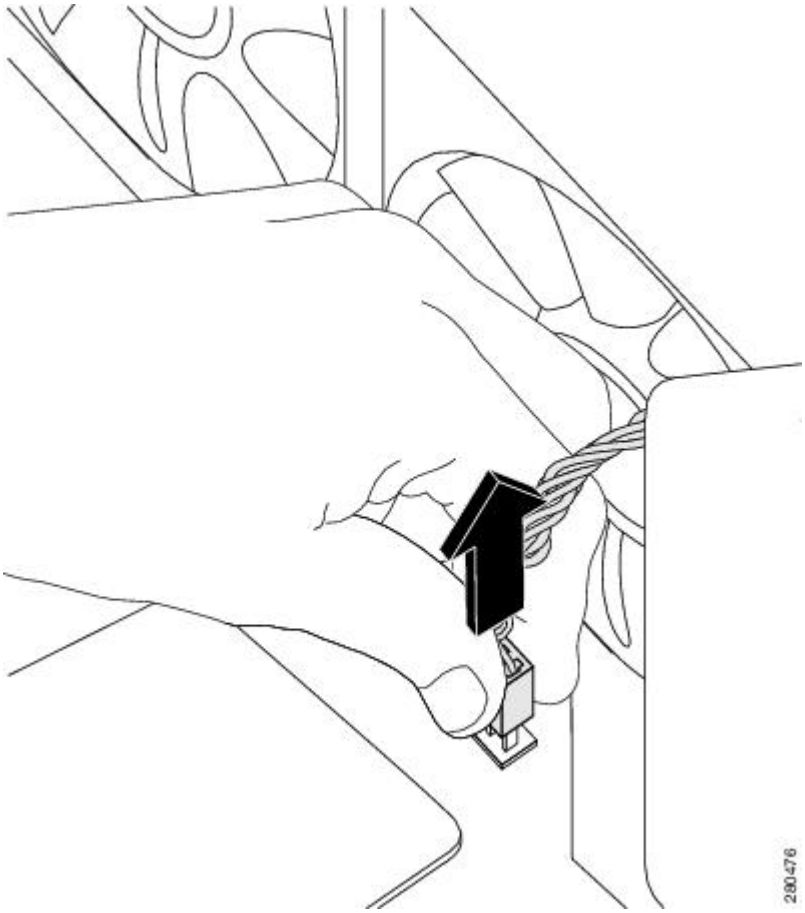


d) Using both hands, gently slide the cover slightly backward and lift it off of the chassis.

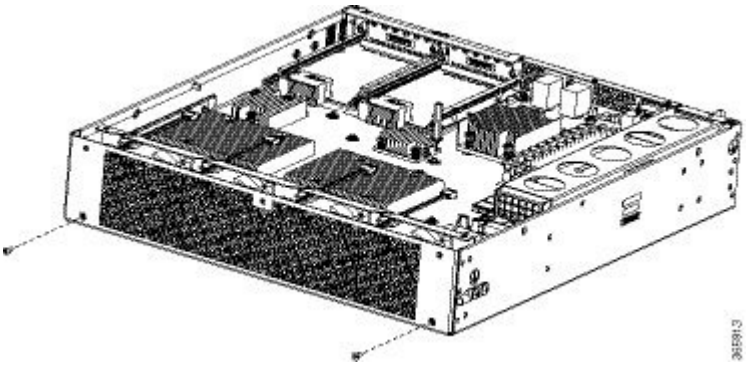
Step 3 Position the chassis so that you have the most comfortable access to the chassis to remove the fans.

The fans are located at the rear of the chassis.

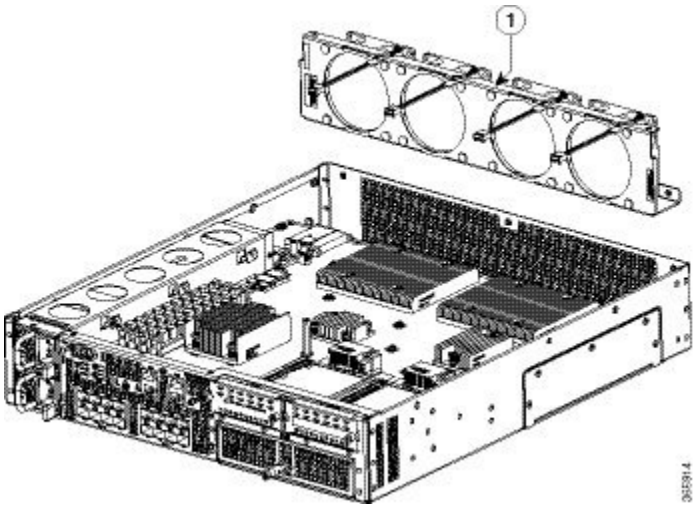
Step 4 Unplug the four fan connectors from the motherboard.



Step 5 Remove the two screws from the rear of the chassis as shown in the following figure.



Step 6 Lift the fan tray up and out of the chassis as shown in the following figure.

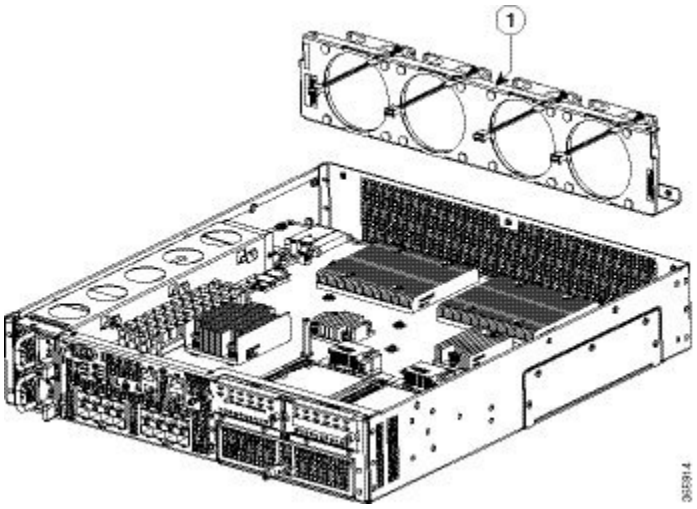


1	Fan tray

Replacing the Fans in a Cisco ASR 1002-HX Router

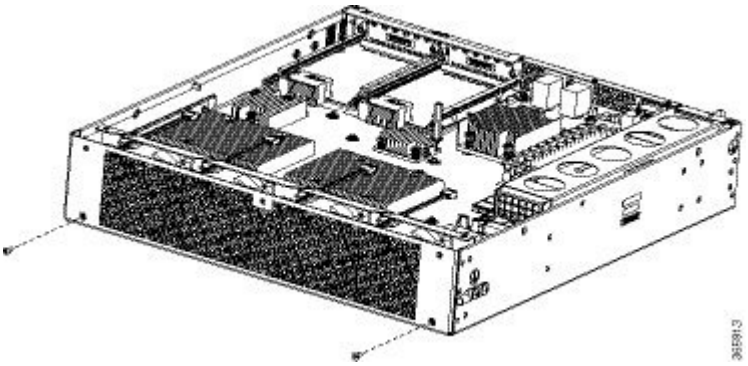
Procedure

Step 1 Gently insert the fan tray into the rear of the chassis.



1	Fan tray

Step 2 Use two screws to attach the fan trays to the chassis.



Step 3 Plug the four fan connectors into the motherboard.

Step 4 Replace the Cisco ASR 1002-HX Router top cover:

a) Slide the cover onto the chassis ensuring that the interlock hook feature fits on the chassis cover and base.

b) Install the top surface screws, the rear screws, and the side screws and tighten them slightly.

Step 5 Install the power supplies into the chassis and power up the router. See:

- Installing AC Power Supplies
- Installing DC Input Power Supplies

Repacking the Router

If your system is damaged, you must repack it for return shipment.

Before you return the router or move the router to a different location, repack the system using the original packaging material.