



# Installing and Upgrading Internal Components in Cisco 3800 Series Routers

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This document describes how to install or upgrade components located inside Cisco 3800 series integrated services routers:

- SDRAM DIMM memory modules
- Advanced integration modules (AIMs)
- Packet voice data modules (PVDMs)
- Power supplies
- Motherboard (Cisco 3845 and 3845-NOVPN router only)
- Fan tray (Cisco 3845 and 3845-NOVPN router only)

For information about router SDRAM, AIM, PVDM, and power supply capacity, see the following sections of the [“Overview of Cisco 3800 Series Routers”](#) document:

- The [“Module and Interface Card Capacity”](#) section on page 8
- The [“Memory”](#) section on page 12
- The [“Power”](#) section on page 12

The procedures for installing or removing these components depend on your router model:

- For the Cisco 3825 and 3825-NOVPN router, you must remove the router cover to access the power supply and motherboard. Follow the [“Removing the Cover from a Cisco 3825 and 3825-NOVPN Router”](#) procedure on page -4. You must then remove the power supply, together with its tray, to access memory modules, AIMs, and PVDMs on the motherboard, or to replace the power supply. Follow the [“Removing the Power Supply Assembly from a Cisco 3825 and 3825-NOVPN Router”](#) procedure on page -5.
- The Cisco 3845 and 3845-NOVPN router motherboard slides out from the rear of the router to give access to memory modules, AIMs, and PVDMs, or to replace the motherboard. Follow the [“Removing the Plug-In Motherboard from a Cisco 3845 and 3845-NOVPN Router”](#) procedure on page -6.
- The Cisco 3845 and 3845-NOVPN router fan tray and power supplies are reached from the front of the router. Follow the [“Removing and Installing the Fan Tray and Power Supplies in a Cisco 3845 and 3845-NOVPN Router”](#) procedure on page -31.



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This document contains the following sections:

- [Safety Warnings, page 2](#)
- [Safety with Electricity, page 3](#)
- [Removing the Cover from a Cisco 3825 and 3825-NOVPN Router, page 4](#)
- [Removing the Power Supply Assembly from a Cisco 3825 and 3825-NOVPN Router, page 5](#)
- [Removing the Plug-In Motherboard from a Cisco 3845 and 3845-NOVPN Router, page 6](#)
- [Component Locations on the Motherboard, page 7](#)
- [SDRAM DIMM Removal and Installation, page 9](#)
- [AIM Installation and Removal, page 12](#)
- [PVDM Installation and Removal, page 21](#)
- [Installing a Power Supply in a Cisco 3825 and 3825-NOVPN Router, page 23](#)
- [Reinstalling the Cover on a Cisco 3825 and 3825-NOVPN Router, page 30](#)
- [Installing or Replacing the Plug-In Motherboard in a Cisco 3845 and 3845-NOVPN Router, page 30](#)
- [Removing and Installing the Fan Tray and Power Supplies in a Cisco 3845 and 3845-NOVPN Router, page 31](#)

Before you perform any of these procedures, disconnect the power and remove the cover as described in the “Safety with Electricity” section on page 3.

## Safety Warnings



### Warning

**During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 93



### Warning

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



### Warning

**This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open, or both.** Statement 1043



### Warning

**This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.** Statement 1017



### Warning

**Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord.** Statement 1

**Warning**

**Do not work on the system or connect or disconnect cables during periods of lightning activity.**  
Statement 1001

**Warning**

**Read the installation instructions before connecting the system to the power source.** Statement 1004

**Warning**

**Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.** Statement 43

**Warning**

**Hazardous network voltages are present in WAN ports regardless of whether power to the unit is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the unit first.** Statement 1026

**Warning**

**To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.** Statement 1032

## Safety with Electricity

When working on equipment that is powered by electricity, follow these guidelines:

- Locate the emergency power-off switch in the room in which you are working. Then, if an electrical accident occurs, you can quickly shut the power off.
- Before working on the router, turn off the power and unplug the power cord.
- Disconnect all power before doing the following:
  - Installing or removing a router chassis
  - Working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.

If an electrical accident occurs, proceed as follows:

- Use caution; do not become a victim yourself.
- Turn off power to the router.
- If possible, send another person to get medical aid. Otherwise, determine the condition of the victim and then call for help.
- Determine if the victim needs rescue breathing or external cardiac compressions; then take appropriate action.

## Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD can occur when printed circuit cards are improperly handled and can result in complete or intermittent failures. Always follow ESD prevention procedures when removing and replacing cards. Ensure that the router is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the router frame to safely channel unwanted ESD voltages to ground. To guard against ESD damage and shocks, the wrist strap and cord must be used properly. If no wrist strap is available, ground yourself by touching the metal part of the router.



**Caution**

For safety, periodically check the resistance value of the ESD-preventive wrist strap, which should be between 1 and 10 megohms (Mohm).

## Removing the Cover from a Cisco 3825 and 3825-NOVPN Router

You must remove the cover from a Cisco 3825 and 3825-NOVPN router to access the power supply and motherboard. The router must be removed from the rack for this procedure. You will need number 1 and number 2 Phillips screwdrivers.

If your router uses AC or DC power, observe the following warning:



**Warning**

**Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is off and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.** Statement 4

If your router uses DC power, observe the following warning:



**Warning**

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



**Caution**

Before removing the cover, make sure that the CompactFlash memory card ejector button is flush with the front panel. If the button projects from the panel, removing the cover can damage it.



**Caution**

To prevent damage to the router, do not attempt to pry off the plastic bezel.

**Step 1**

Power down the router and disconnect the power cord from the front of the router.



**Warning**

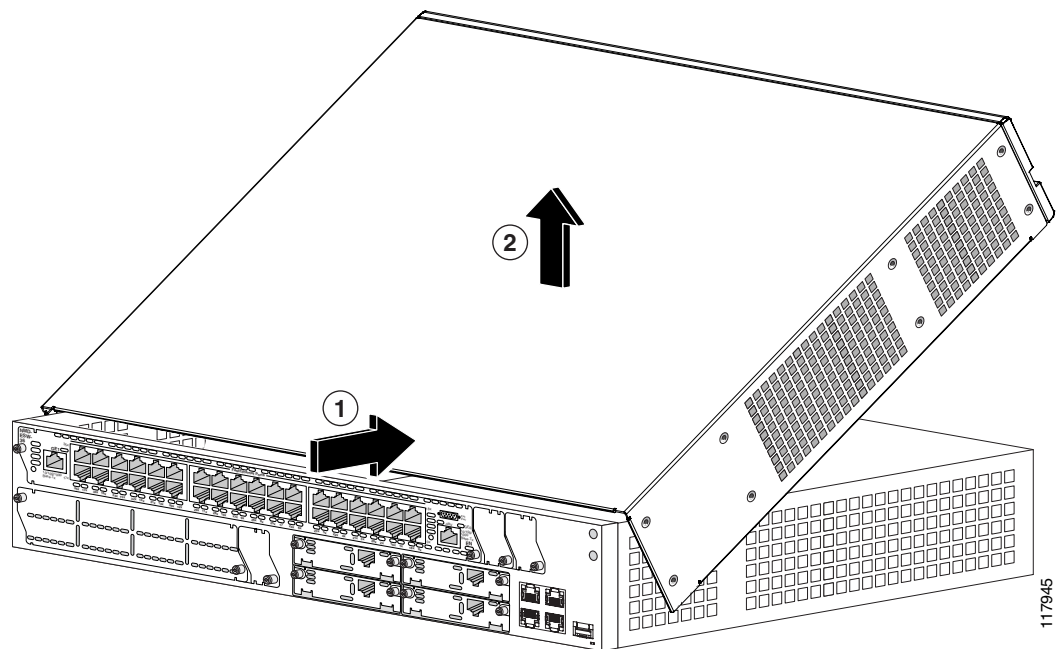
**Before opening the unit, disconnect the telephone-network cables to avoid contact with telephone-network voltages.** Statement 1041

**Step 2**

Disconnect all network interface cables from the rear panel of the router.

- Step 3** Remove the router from the rack. Remove the rack-mounting brackets from the router using the number 2 Phillips screwdriver.
- Step 4** Place the router on a flat surface. Remove the three screws from the top of the router and set them aside in a safe place.
- Step 5** Remove the three screws on each side panel and set them aside in a safe place.
- Step 6** Slide the cover toward the front of the chassis (about 1 inch [25 mm]). See [Figure 48](#).
- Step 7** Lift the cover away from the router base.
- Step 8** You must remove the Cisco 3825 and 3825-NOVPN power supply to replace it or to access components on the motherboard. Continue with the “[Removing the Power Supply Assembly from a Cisco 3825 and 3825-NOVPN Router](#)” procedure on page -5.

**Figure 48** Removing the Cover from a Cisco 3825 and 3825-NOVPN Router



|   |                          |   |                        |
|---|--------------------------|---|------------------------|
| 1 | Slide cover toward front | 2 | Remove cover from base |
|---|--------------------------|---|------------------------|

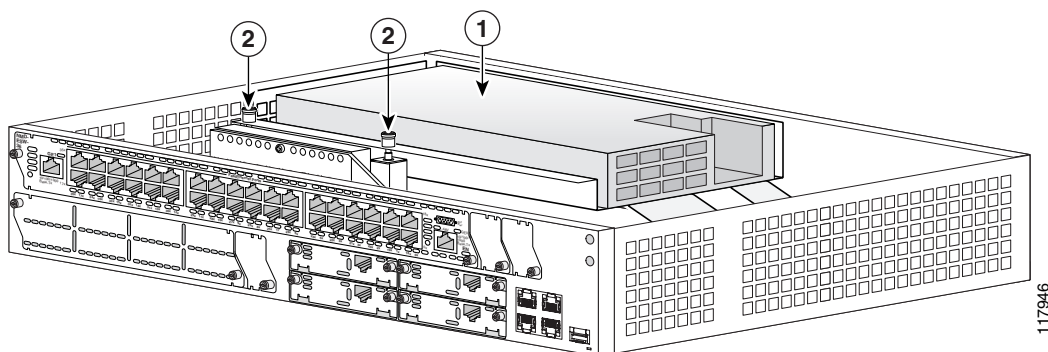
## Removing the Power Supply Assembly from a Cisco 3825 and 3825-NOVPN Router

The power supply assembly in a Cisco 3825 and 3825-NOVPN router consists of the power supply and the tray on which it is mounted.

To remove the power supply assembly from a Cisco 3825 and 3825-NOVPN router, either to replace the supply or to access the motherboard, follow this procedure. You need a number 2 Phillips screwdriver.

- Step 1** Remove the router cover, following the procedure in the [“Removing the Cover from a Cisco 3825 and 3825-NOVPN Router”](#) section on page 4.
- Step 2** Locate the power supply assembly, shown in [Figure 49](#). Remove any internal power cables from the connectors at the corner of the power supply.

**Figure 49** Cisco 3825 and 3825-NOVPN Power Supply



|          |              |          |                         |
|----------|--------------|----------|-------------------------|
| <b>1</b> | Power supply | <b>2</b> | Captive mounting screws |
|----------|--------------|----------|-------------------------|

- Step 3** Using a number 2 Phillips screwdriver, loosen the captive mounting screws on the power supply tray. Lift the power supply assembly out of the router.
- Step 4** To install or replace SDRAM DIMMs, AIMs, or PVDMs on the motherboard, continue with the [“Component Locations on the Motherboard”](#) section on page 7. To install a new power supply, continue with the [“Installing a Power Supply in a Cisco 3825 and 3825-NOVPN Router”](#) procedure on page -23.

## Removing the Plug-In Motherboard from a Cisco 3845 and 3845-NOVPN Router

To access memory modules, AIMs, and PVDMs mounted on the motherboard of a Cisco 3845 and 3845-NOVPN router, or to remove a motherboard to replace it with a new one, follow these steps. You need a number 2 Phillips screwdriver. You do not need to remove the router from the rack.

It is not necessary to power off the router to remove the motherboard, but the router does not operate until the motherboard is reinstalled.

- Step 1** Using the number 2 Phillips screwdriver, loosen the two captive thumbscrews, one on each side of the motherboard. (See [Figure 50](#).)
- Step 2** Rotate the ejector levers on each side outward, and carefully pull the motherboard straight out of the router. Place it on an antistatic surface.



**Caution**

The motherboard is an ESD-sensitive component. To avoid damage, observe all ESD precautions.

**Figure 50**      *Removing the Motherboard from a Cisco 3845 and 3845-NOVPN Router*

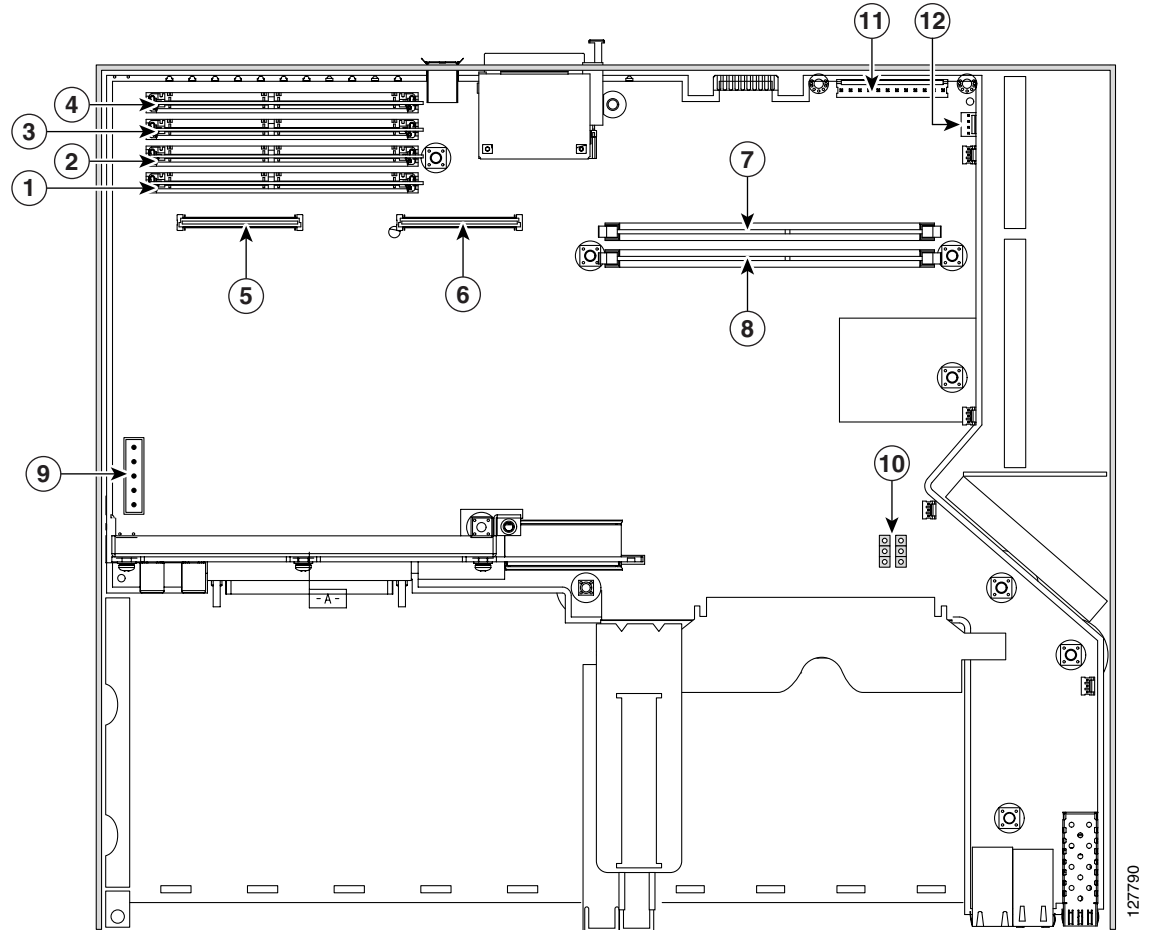
|          |                            |          |                               |
|----------|----------------------------|----------|-------------------------------|
| <b>1</b> | Loosen captive thumbscrews | <b>2</b> | Rotate ejector levers outward |
|----------|----------------------------|----------|-------------------------------|

To install or replace SDRAM DIMMs, AIMs, or PVDMs on the motherboard, continue with the [“Component Locations on the Motherboard”](#) section on page 7.

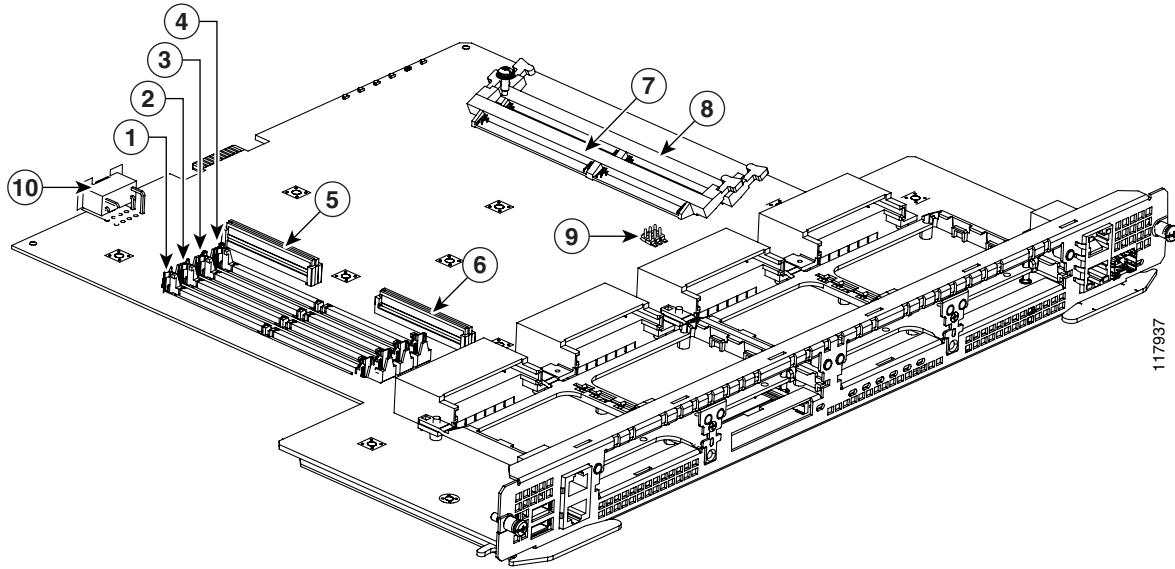
## Component Locations on the Motherboard

[Figure 51](#) and [Figure 52](#) show the locations of SDRAM DIMMs, AIMs, and PVDMs on the motherboard of Cisco 3825 and 3825-NOVPN and Cisco 3845 and 3845-NOVPN routers.

**Figure 51** *Component Locations on a Cisco 3825 and 3825-NOVPN Motherboard*



|          |       |           |                           |
|----------|-------|-----------|---------------------------|
| <b>1</b> | PVDM3 | <b>7</b>  | MEMORY 1                  |
| <b>2</b> | PVDM2 | <b>8</b>  | MEMORY 0                  |
| <b>3</b> | PVDM1 | <b>9</b>  | IP phone power connector  |
| <b>4</b> | PVDM0 | <b>10</b> | Jumper headers            |
| <b>5</b> | AIM0  | <b>11</b> | Primary power connector   |
| <b>6</b> | AIM1  | <b>12</b> | Secondary power connector |

**Figure 52**      **Component Locations on a Cisco 3845 and 3845-NOVPN Motherboard**

|          |       |           |                                       |
|----------|-------|-----------|---------------------------------------|
| <b>1</b> | PVDM3 | <b>6</b>  | AIM1                                  |
| <b>2</b> | PVDM2 | <b>7</b>  | MEM0                                  |
| <b>3</b> | PVDM1 | <b>8</b>  | MEM1                                  |
| <b>4</b> | PVDM0 | <b>9</b>  | Jumper headers                        |
| <b>5</b> | AIM0  | <b>10</b> | Power connector for fan tray assembly |

## SDRAM DIMM Removal and Installation

Cisco 3800 series routers ship with 256 MB of ECC DDR SDRAM. The two DIMM slots can be upgraded with 128-MB, 256-MB, or 512-MB DIMMs to a maximum of 1024 MB. If only one SDRAM DIMM is used, it can be installed in either DIMM connector.



### Caution

When you remove or install DIMMs, always wear an ESD-preventive wrist strap, and ensure that it makes good contact with your skin. Connect the equipment end of the wrist strap to the metal part of the router.



### Caution

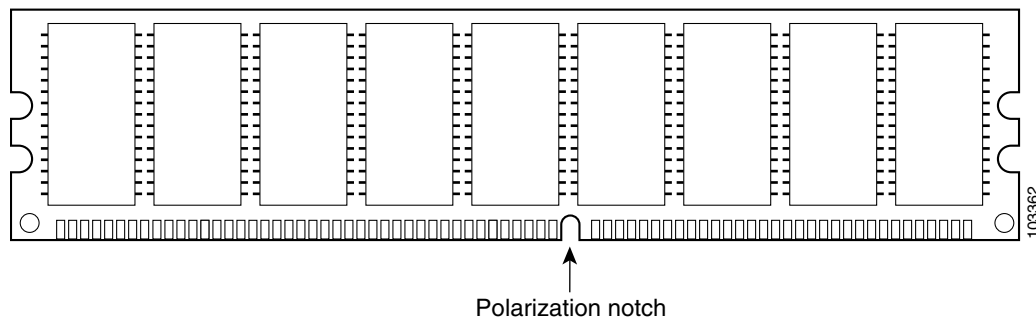
Handle DIMMs by the edges only. DIMMs are ESD-sensitive components and can be damaged by mishandling.

## DIMM Location and Orientation

The two SDRAM DIMM connectors are located on the motherboard and are identified as MEMORY 0 and MEMORY 1 on the Cisco 3825 and 3825-NOVPN router, and as MEM0 and MEM1 on the Cisco 3845 and 3845-NOVPN router. See [Figure 51](#) and [Figure 52](#) for DIMM locations.

DRAM DIMMs have a polarization notch on the mating edge to prevent incorrect insertion. [Figure 53](#) shows the polarization notch on a DRAM DIMM.

**Figure 53** *DRAM DIMM Polarization Notch*

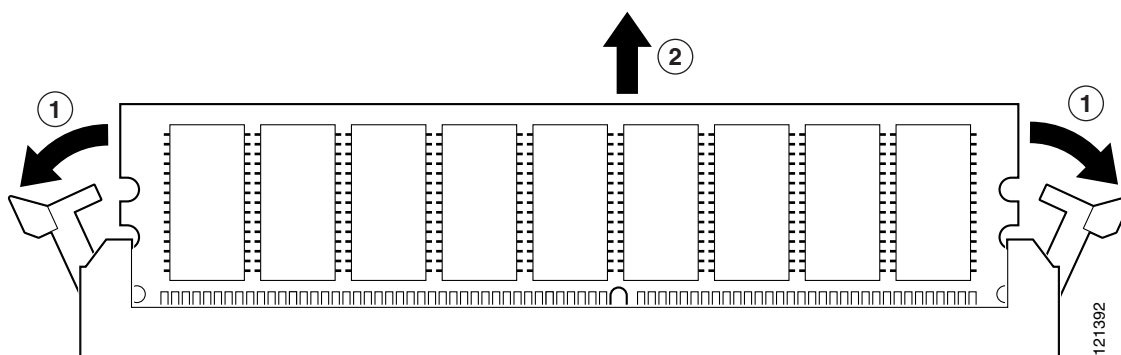


## Removing an SDRAM DIMM

To remove an SDRAM DIMM from the motherboard, follow these steps:

- Step 1** Pull the latches away from the DIMM at both ends. This lifts the DIMM slightly. Lift the DIMM completely out of the connector. See [Figure 54](#).

**Figure 54** *Removing a DRAM DIMM*



|          |                     |          |                 |
|----------|---------------------|----------|-----------------|
| <b>1</b> | Release the latches | <b>2</b> | Remove the DIMM |
|----------|---------------------|----------|-----------------|

- Step 2** Place the DIMM in an antistatic bag to protect it from ESD damage.

## Installing an SDRAM DIMM



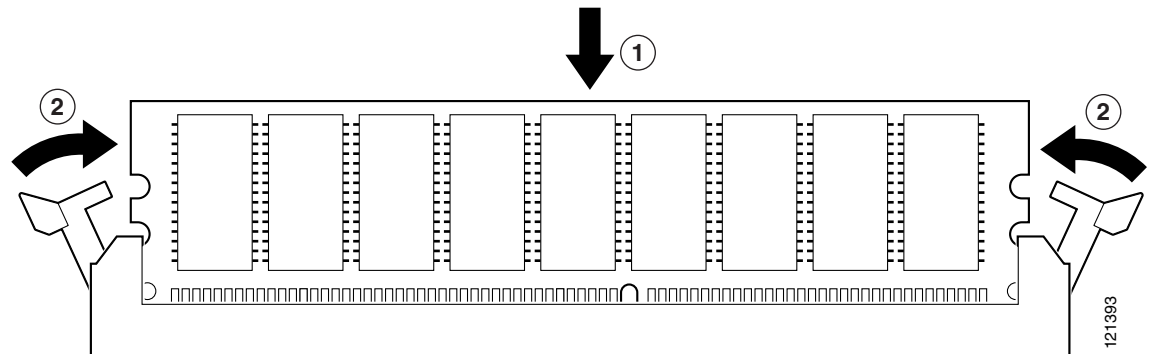
### Caution

Do not insert DIMMs into the same connector more than 25 times. Overuse can damage the connector.

To install an SDRAM DIMM, follow these steps:

- Step 1** Make sure that both latches on the DIMM connector are open.
- Step 2** Orient the DIMM so that the polarization notch lines up with the key in the connector. See [Figure 55](#).
- Step 3** Carefully insert the DIMM into the connector.
- Step 4** Carefully and firmly press the DRAM DIMM into the connector until both latches rotate to the closed position against the DIMM.

**Figure 55** *Installing a DRAM DIMM*



|          |                 |          |                                   |
|----------|-----------------|----------|-----------------------------------|
| <b>1</b> | Insert the DIMM | <b>2</b> | Latches rotate to closed position |
|----------|-----------------|----------|-----------------------------------|

To install an AIM, continue with the [“AIM Installation and Removal” procedure on page -12](#). To install a PVDM, continue with the [“PVDM Installation and Removal” procedure on page -21](#). If you are finished installing components, continue with the [“Reinstalling the Power Supply Assembly in a Cisco 3825 and 3825-NOVPN Router” procedure on page -30](#) or the [“Installing or Replacing the Plug-In Motherboard in a Cisco 3845 and 3845-NOVPN Router” procedure on page -30](#).

# AIM Installation and Removal

## Overview

Advanced integration modules (AIMs) provide hardware-based support for additional features. AIMs plug into a connector on the motherboard and require no external interfaces or connections. Each AIM sold as a spare is supplied with a label that identifies its type.

Cisco 3800 series routers have two AIM connectors, labeled AIM0 and AIM1. See [Figure 51](#) and [Figure 52](#) for AIM connector locations. [Table 7](#) lists the AIMs supported on Cisco 3800 series routers.

**Table 7** *AIMs Supported on Cisco 3800 Routers*

| Cisco Part Number                                          | Type                                    |
|------------------------------------------------------------|-----------------------------------------|
| AIM-ATM=                                                   | ATM                                     |
| ATM-COMPR4=                                                | Compression                             |
| AIM-CUE=                                                   | Unity Express                           |
| AIM2-CUE-K9                                                | Unity Express                           |
| AIM2-APPRE-104-K9                                          | AXP - Application eXtension Platform    |
| AIM-IPS                                                    | Intrusion Prevention Systems            |
| AIM-VPN/EPII-PLUS= (Cisco 3825 and 3825-NOVPN router only) | DES/3DES/AES VPN encryption/compression |
| AIM-VPN/HPII-PLUS= (Cisco 3845 and 3845-NOVPN router only) | DES/3DES/AES VPN encryption/compression |

## Accessory Kits

The mounting hardware required to install an AIM in a Cisco 3800 series router consists of two machine-thread metal standoffs, two machine-thread metal screws, and one plastic snap fit standoff.

Some AIMs are shipped with different accessory kits or more than one accessory kit. If necessary, use the plastic snap fit standoff from one kit and the machine-thread metal standoffs and machine-thread metal screws from a different kit.

Some AIMs are shipped with different accessory kits or more than one accessory kit. For most AIMs you use the threaded plastic standoff. To install the AIM2-CUE-K9 and the AIM2-APPRE-104-K9 modules in a Cisco 3800 router, use the 2 M3.0 screws, the hex standoffs, the hex standoff with the band, and the M2.5 screw in the 69-1870-01 mounting kit.

## Installing an AIM

The following procedure requires a 1/4-inch nut driver and a number 1 Phillips screwdriver.



**Caution**

When you remove or install an AIM, always wear an ESD-preventive wrist strap, and ensure that it makes good contact with your skin. Connect the equipment end of the wrist strap to the metal part of the router.



**Caution**

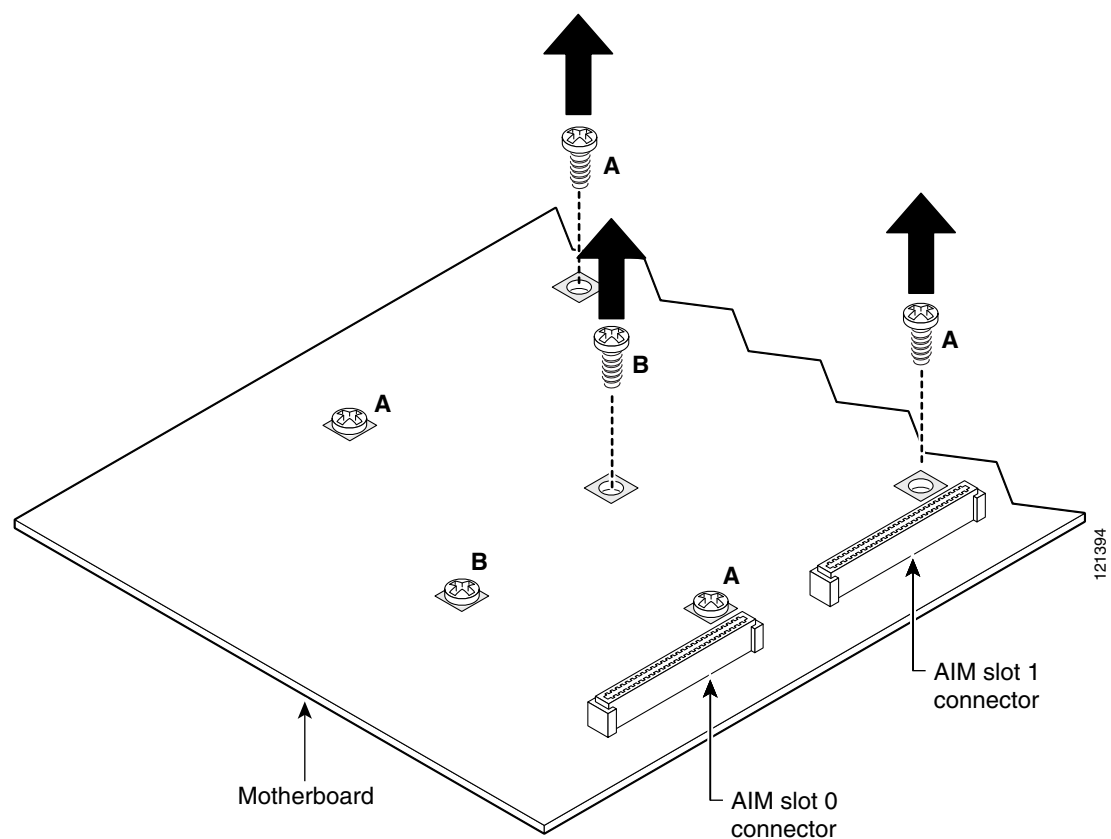
Handle AIMs by the edges only. AIMs are ESD-sensitive components and can be damaged by mishandling.

## Connecting the AIM to the Motherboard

To connect an AIM to the motherboard, follow these steps:

- Step 1** Remove the three screws from the motherboard near the AIM connector that you are going to use. [Figure 56](#) shows a typical installation.

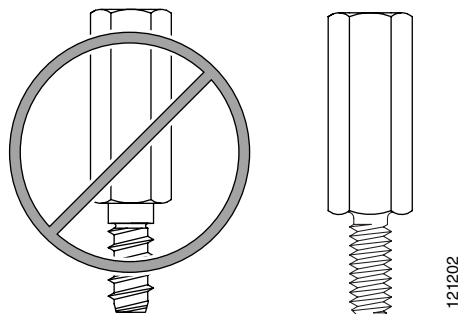
**Figure 56** *Removing Screws from a Motherboard for AIM Installation*



|          |                          |          |                           |
|----------|--------------------------|----------|---------------------------|
| <b>A</b> | Metal standoff locations | <b>B</b> | Plastic standoff location |
|----------|--------------------------|----------|---------------------------|

- Step 2** Locate the two machine-thread metal standoffs from the accessory kit. Do not use sheet metal-thread standoffs. [Figure 57](#) shows these metal standoffs.

**Figure 57** *Metal Standoffs*



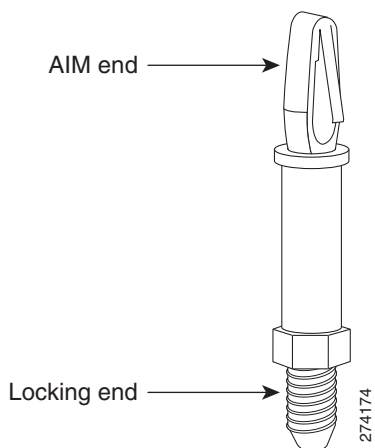
- Step 3** Install the two machine-thread metal standoffs in place of the two screws labeled A in [Figure 56](#). Use a 1/4-inch nut driver to tighten the standoffs.



**Caution** Make sure that the standoffs are straight when installed. Tighten them gently but firmly. The shoulder must be seated tight against the motherboard.

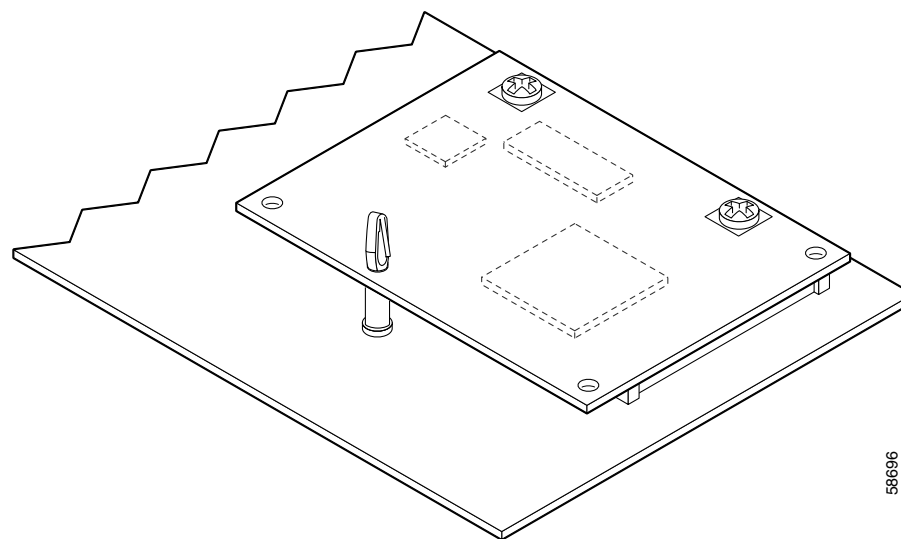
- Step 4** For some AIMs, screw the white standoff into the chassis until it is securely attached to the board.

**Figure 58** *Threaded Plastic Standoff*



- Step 5** Insert the connector on the AIM into the connector on the motherboard. Press firmly on the AIM until it seats onto the connector. The plastic standoff must snap into the hole in the AIM board. See [Figure 59](#).
- Step 6** Insert the machine-thread metal screws from the accessory kit through the AIM into the metal standoffs. See [Figure 59](#). Carefully tighten the screws with a number 1 Phillips screwdriver.
- Step 7** Check that the AIM is installed correctly on the motherboard. See [Figure 59](#).

**Figure 59** *AIM Installed on a Motherboard*



## Installing AIM2-CUE-K9 or AIM2-APPRE-104-K9 in a Cisco 3800 Router

Cisco 3800 routers have two AIM connectors—AIM slot 0 and AIM slot 1. You can install a virtual private network (VPN) encryption AIM or a voice-mail AIM in either slot, but not in both slots. You can install voice and data compression AIMS and ATM AIMS in both slots.

### Accessory Kit to Use

To install the AIM2-CUE-K9 and the AIM2-APPRE-104-K9 modules in a Cisco 3800 router, use the 2 M3.0 screws, the hex standoffs, the hex standoff with the band, and the M2.5 screw in the 69-1870-01 mounting kit. You can discard any other parts in the kit.

### Installation Procedure

To install an AIM2-CUE-K9 or AIM2-APPRE-104-K9 in a Cisco 3800 router, follow these steps.



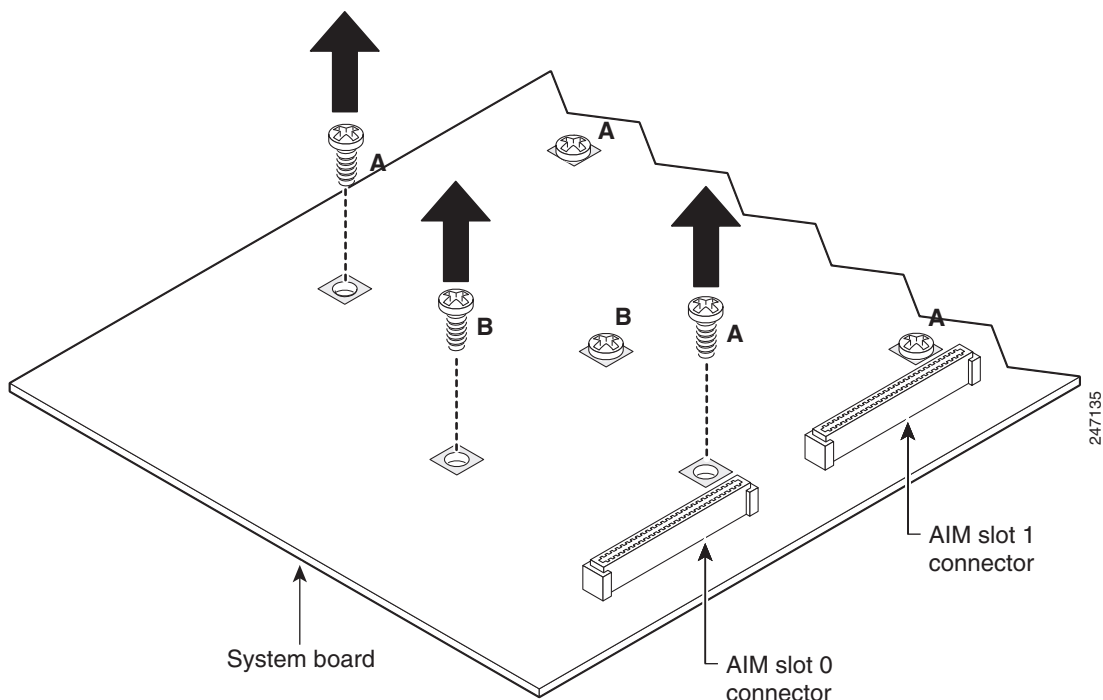
#### Note

If the mounting hardware is already in place on the system board, or if you are replacing an existing AIM, skip [Step 2](#) and [Step 3](#).

**Step 1** Locate the AIM connector.

**Step 2** Remove the three screws from the system board near the AIM connector that you are going to use. ([Figure 60](#) shows the screws to remove for AIM installation in AIM slot 0.)

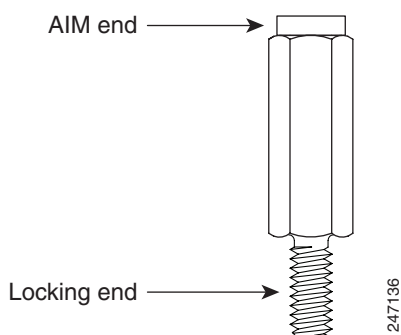
**Figure 60 Removing Screws from System Board—AIM Slot 0 Installation Shown**



| A | Metal standoff locations | B | Metal standoff with top band location |
|---|--------------------------|---|---------------------------------------|
|---|--------------------------|---|---------------------------------------|

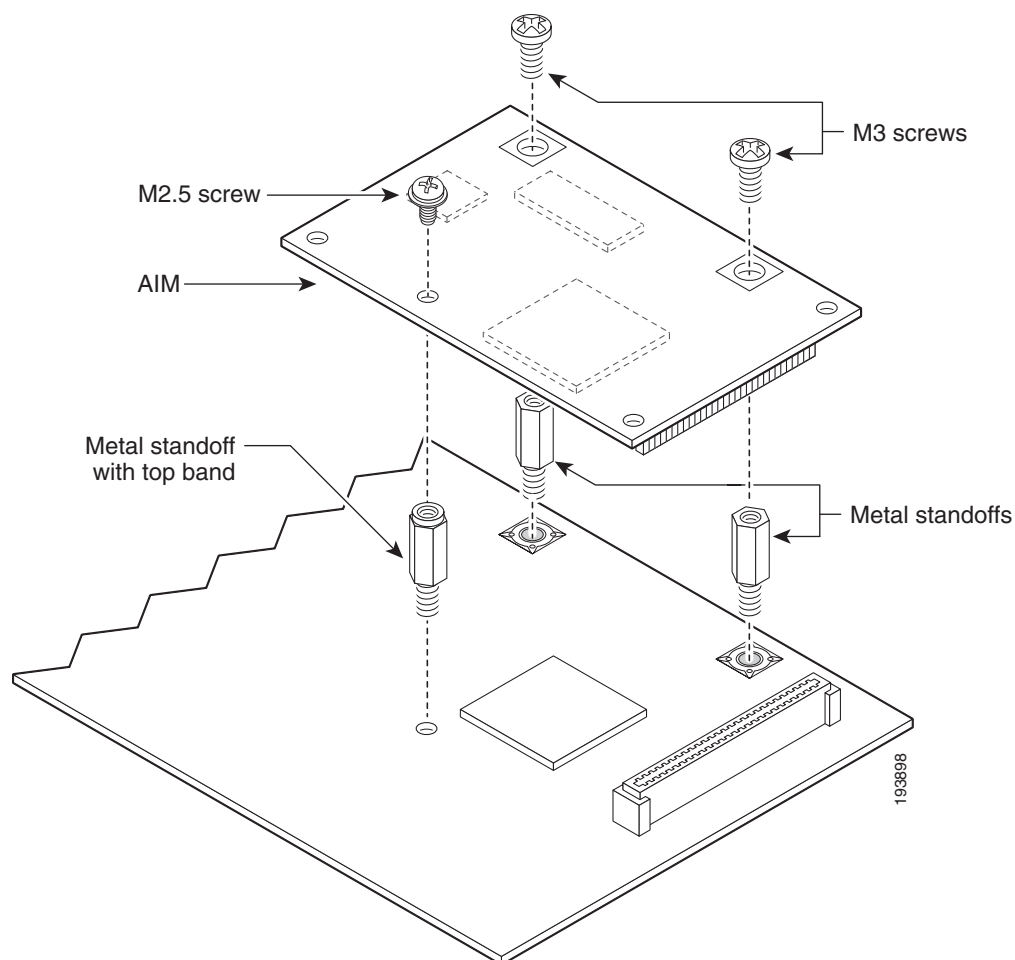
- Step 3** Install the two metal standoffs (included in the accessory kit) in place of the two screws that are labeled A in [Figure 60](#). Use a 1/4-inch nut driver to tighten the standoffs.
- Step 4** Install the hex standoff with the top band ([Figure 61](#)) in place of the screw that is labeled B in [Figure 60](#). Tighten it firmly with your fingers, or very carefully using a 3/16-inch open-end wrench. The shoulder must be seated tight against the system board. (See [Figure 62](#).)

**Figure 61 Hex Standoff with Band**



- Step 5** Plug the AIM into the AIM connector on the system board. (See [Figure 62](#).)
- Step 6** Insert the M3 screws (included in the accessory kit) through the AIM into the metal standoffs. Tighten the screws carefully with a Phillips screwdriver.
- Step 7** Insert the M2.5 screw through the AIM2-CUE-K9 or AIM2-APPRE-104-K9 into the hex standoff with the top band into the chassis until it is securely attached to the board. (See [Figure 62](#).)

**Figure 62** Connecting an AIM2-CUE-K9 to the System Board



- Step 8** Check that the AIM is installed correctly on the system board.
- Step 9** If you are finished installing modules, install the cover on the router. See the [“Prerequisites” section on page 33](#).
- Step 10** Apply the AIM label to the outside of the chassis as described in the [“AIM Installation and Removal” section on page 12](#).

## Verifying AIM Installation

Use the **show diag 0** command to obtain hardware information about an installed AIM. The following example shows the hardware revision and additional information about ATM AIM 0:

```
Router# show diag 0
.
.
.
ATM AIM 0:
```

## Applying the AIM Label

The AIM is supplied with a two-part adhesive label in the mounting kit or attached to the AIM card. Use one part of the label to identify the AIM on the motherboard, and apply the other part to the outside of the router. Apply the labels as follows:

- 
- Step 1** If the label is attached to the AIM card, carefully tear off the label at the perforation. If the label is in the mounting kit, separate the two parts at the perforation, and apply one part to the AIM card.
  - Step 2** Position the other part of the label in a blank area on the rear panel of the router, near an edge. If no suitable space is available on the rear panel, apply the label to the cover at the rear edge.




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**Note** Do not apply the AIM label to a blank cover plate; to any removable network module or interface card; or over any holes, screws, or existing labels.

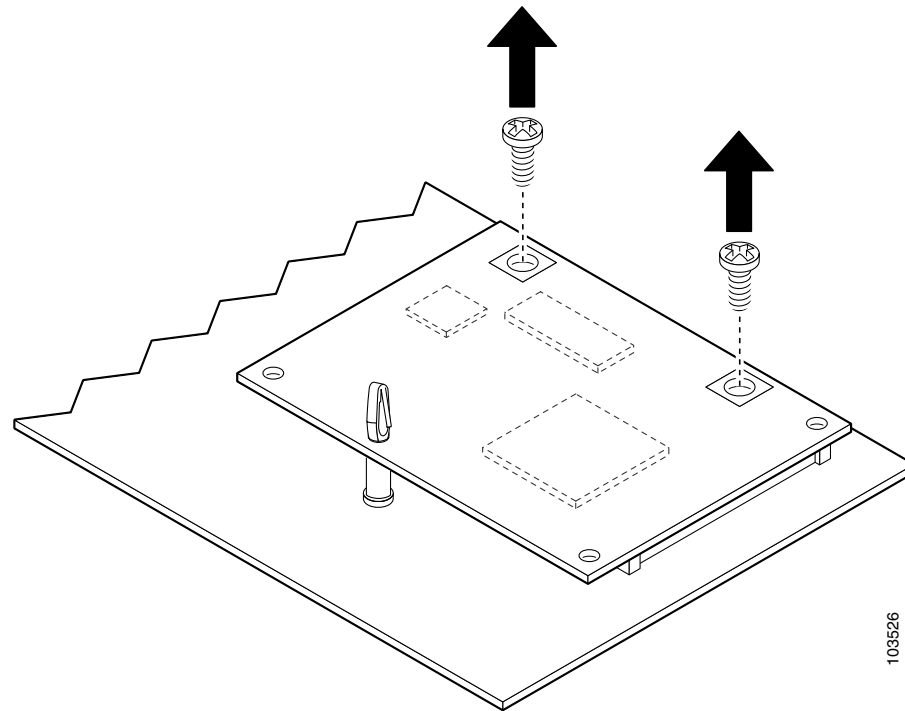
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# Removing an AIM

If you need to remove an AIM, follow this procedure. You need a number 2 Phillips screwdriver.

- Step 1** Locate the AIM to be removed.
- Step 2** Use a number 2 Phillips screwdriver to remove the two screws from the AIM as shown in [Figure 63](#).

**Figure 63** *Removing Screws from an AIM*



- Step 3** Carefully lift the AIM from the connector and the plastic standoff. Keep the AIM parallel with the motherboard to prevent damage to the connector and plastic standoff. Place the AIM in an antistatic bag to protect it from ESD damage.

To install an SDRAM DIMM, continue with the [“SDRAM DIMM Removal and Installation”](#) procedure on page -9. To install a PVDM, continue with the [“PVDM Installation and Removal”](#) procedure on page -21. If you are finished installing components, continue with the [“Reinstalling the Power Supply Assembly in a Cisco 3825 and 3825-NOVPN Router”](#) procedure on page -30 or the [“Installing or Replacing the Plug-In Motherboard in a Cisco 3845 and 3845-NOVPN Router”](#) procedure on page -30.

## Installing a CompactFlash Memory Card on the AIM

Complete the procedure below for installing a CompactFlash memory card mounted on the AIM.

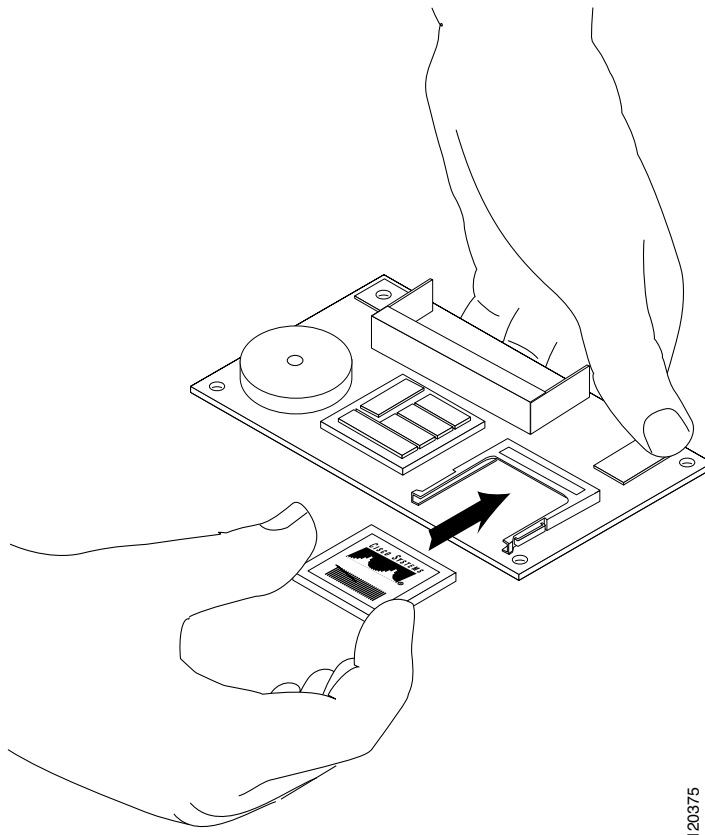


**Note**

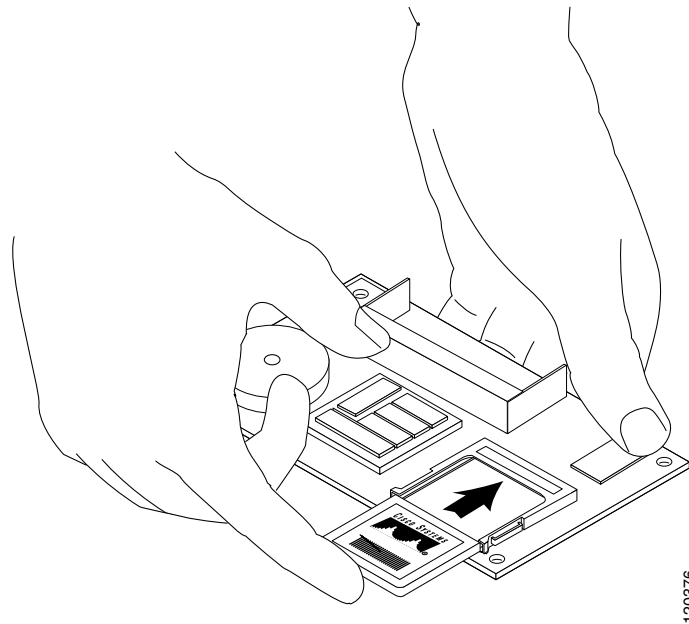
Not all AIMs require installation of a CompactFlash memory card.

- 
- Step 1** Locate the CompactFlash memory card on the AIM. (See [Figure 64](#).)
  - Step 2** Insert the connector end of the CompactFlash memory card into the connector until the card is seated in the connector. (See [Figure 64](#) and [Figure 65](#).)
  - Step 3** Reinstall the AIM as described in “[AIM Installation and Removal](#)” section on page 12.
  - Step 4** Reinstall the chassis cover as described in the “[Reinstalling the Cover on a Cisco 3825 and 3825-NOVPN Router](#)” section on page 30 and “[Installing or Replacing the Plug-In Motherboard in a Cisco 3845 and 3845-NOVPN Router](#)” section on page 30.
  - Step 5** Refer to the “[Verifying AIM Installation](#)” section on page 18.
- 

**Figure 64**      **CompactFlash Memory Card Location on the AIM**



**Figure 65 CompactFlash Memory Card Installation on the AIM**



## PVDM Installation and Removal

Cisco 3800 series routers hold up to four Cisco packet voice data modules, version II (PVDM-II), to support enhanced versions of digital signal processors (DSPs).



**Caution**

When you remove or install PVDMs, always wear an ESD-preventive wrist strap, and ensure that it makes good contact with your skin. Connect the equipment end of the wrist strap to the metal part of the router.

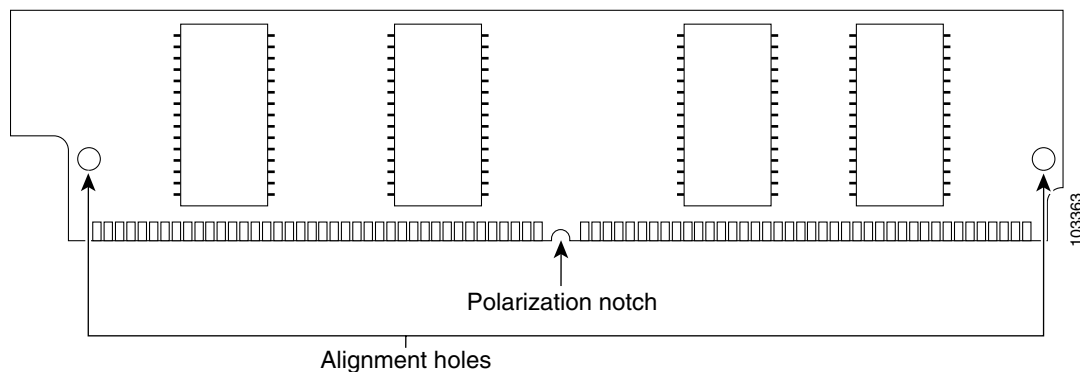


**Caution**

Handle PVDMs by the edges only. PVDMs are ESD-sensitive components and can be damaged by mishandling.

## PVDM Location and Orientation

The four PVDM connectors are located on the motherboard and are identified as PVDM0, PVDM1, PVDM2, and PVDM3. See [Figure 51](#) and [Figure 52](#) for PVDM locations. PVDMs have a polarization notch on the mating edge to prevent incorrect insertion. [Figure 66](#) shows the polarization notch on a PVDM.

**Figure 66** *PVDM Polarization Notch*

## Installing a PVDM

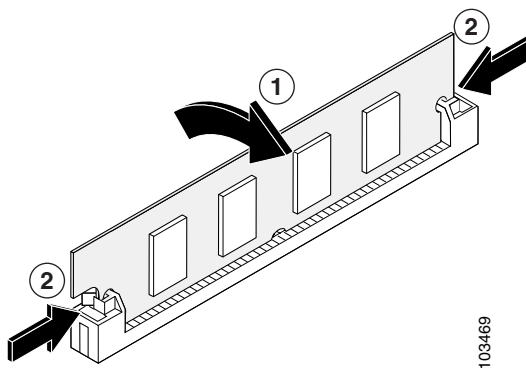
To install a PVDM, follow these steps:



### Note

Install PVDMs beginning with the PVDM 0 connector.

- Step 1** Locate the PVDM connector on the motherboard. See [Figure 51](#) and [Figure 52](#) for PVDM connector locations.
- Step 2** Orient the PVDM so that the polarization notch lines up with the key on the connector. See [Figure 66](#).
- Step 3** Hold the PVDM at an angle and insert it carefully into the PVDM connector. Tilt the PVDM up to the vertical position so that the clips snap into place at both ends. See [Figure 67](#).

**Figure 67** *Installing a PVDM*

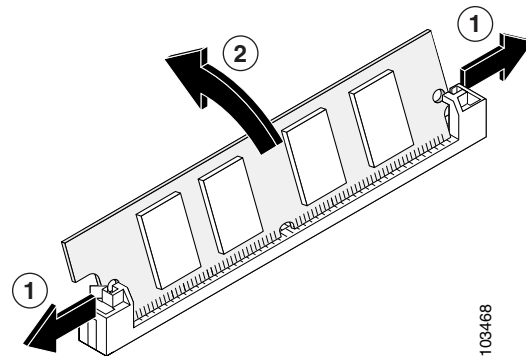
- |          |                          |          |                       |
|----------|--------------------------|----------|-----------------------|
| <b>1</b> | Tilt PVDM up to vertical | <b>2</b> | Clips snap into place |
|----------|--------------------------|----------|-----------------------|

## Removing a PVDM

To remove a PVDM from the motherboard, follow these steps:

- Step 1** Pull the PVDM retaining clips away from the PVDM at both ends, and then tilt the PVDM until it can be removed from the connector. See [Figure 68](#).

**Figure 68** Removing a PVDM



|          |               |          |               |
|----------|---------------|----------|---------------|
| <b>1</b> | Release clips | <b>2</b> | Tilt the PVDM |
|----------|---------------|----------|---------------|

- Step 2** Place the PVDM in an antistatic bag to protect it from ESD damage.

To install an SDRAM DIMM, continue with the [“SDRAM DIMM Removal and Installation”](#) procedure on page -9. To install an AIM, continue with the [“AIM Installation and Removal”](#) procedure on page -12. If you are finished installing components, continue with the [“Reinstalling the Power Supply Assembly in a Cisco 3825 and 3825-NOVPN Router”](#) procedure on page -30 or the [“Installing or Replacing the Plug-In Motherboard in a Cisco 3845 and 3845-NOVPN Router”](#) procedure on page -30.

## Installing a Power Supply in a Cisco 3825 and 3825-NOVPN Router

Three types of power supplies are available for the Cisco 3825 and 3825-NOVPN router:

- An AC power supply, driven by external AC power
- A DC power supply, driven by external DC power
- An IP phone power supply, driven by external AC power. This supply provides power for the router and a complement of IP phones attached to the router.

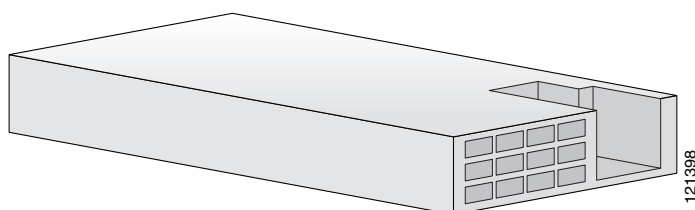
The following sections describe how to install each type of power supply.

## Removing the Existing Power Supply

To remove the existing power supply from a Cisco 3825 and 3825-NOVPN router, follow these steps:

- Step 1** Remove the router cover, following the procedure in the [“Removing the Cover from a Cisco 3825 and 3825-NOVPN Router”](#) section on page 4.
- Step 2** Remove the power supply and tray assembly, following the procedure in the [“Removing the Power Supply Assembly from a Cisco 3825 and 3825-NOVPN Router”](#) section on page 5.
- Step 3** Turn the power supply assembly over so that the tray is on top.
- Step 4** Using a number 1 Phillips screwdriver, remove the two screws that hold the power supply to the tray. Separate the power supply from the tray. See [Figure 69](#).

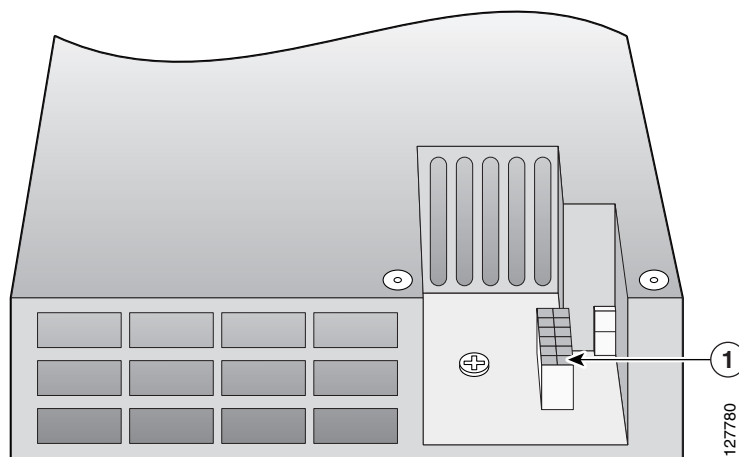
**Figure 69** Cisco 3825 and 3825-NOVPN Power Supply Removed from the Tray



## Installing an AC Power Supply

The AC power supply has a single power connector, as shown in [Figure 70](#).

**Figure 70** AC Power Supply



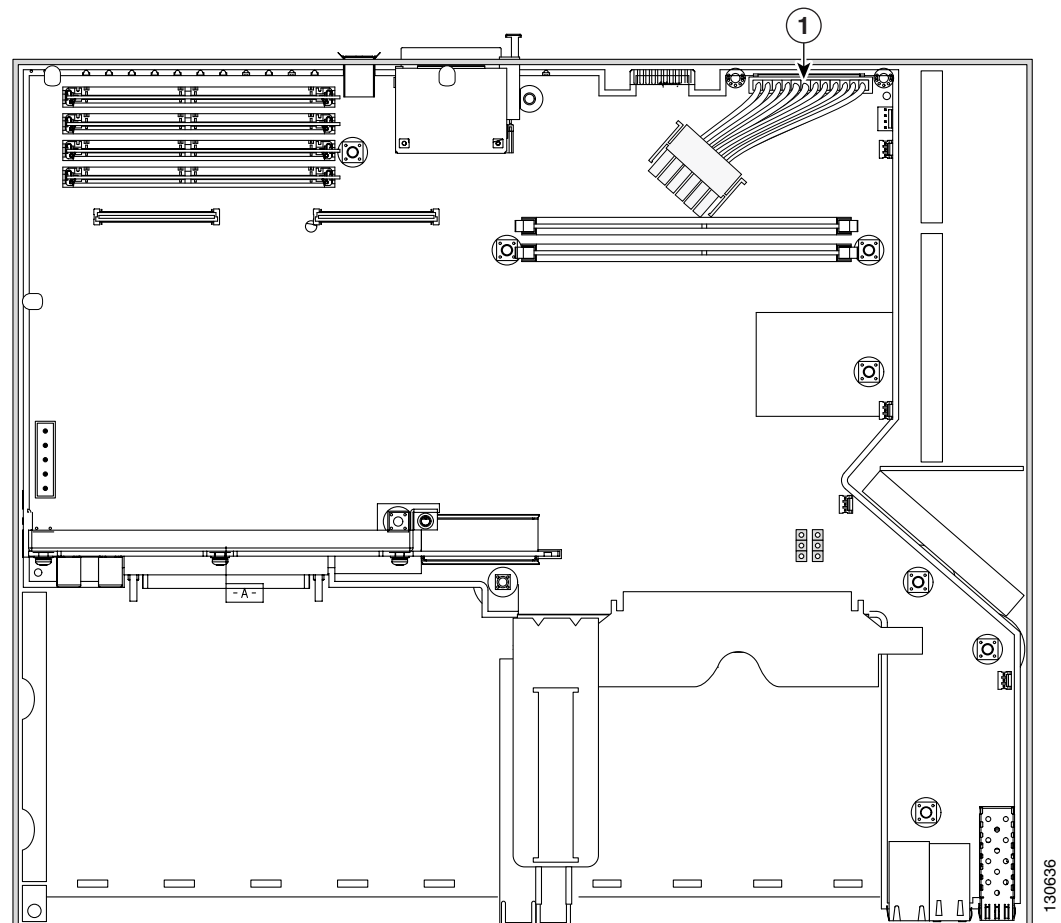
|          |                         |
|----------|-------------------------|
| <b>1</b> | Primary power connector |
|----------|-------------------------|

Follow these steps to attach the power supply to the power supply tray.

- Step 1** Turn the tray right side up. Align the new power supply with the front wall of the tray.
- Step 2** Replace and tighten the screws that hold the power supply to the tray.

Verify that the primary power cable is connected to the motherboard as shown in [Figure 71](#).

**Figure 71** Primary Power Cable Motherboard Connection



|   |                     |  |
|---|---------------------|--|
| 1 | Primary power cable |  |
|---|---------------------|--|

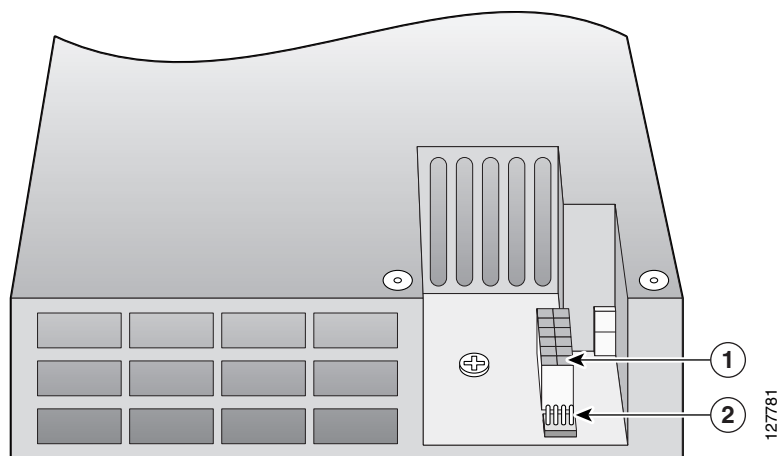
If you are finished installing components inside the router, continue with the [“Reinstalling the Power Supply Assembly in a Cisco 3825 and 3825-NOVPN Router”](#) procedure on page -30.

To install an SDRAM DIMM, continue with the [“SDRAM DIMM Removal and Installation”](#) procedure on page -9. To install an AIM, continue with the [“AIM Installation and Removal”](#) procedure on page -12. To install a PVDM, continue with the [“PVDM Installation and Removal”](#) procedure on page -21.

## Installing a DC Power Supply

The DC power supply has two power connectors, as shown in [Figure 72](#).

**Figure 72**      **DC Power Supply**



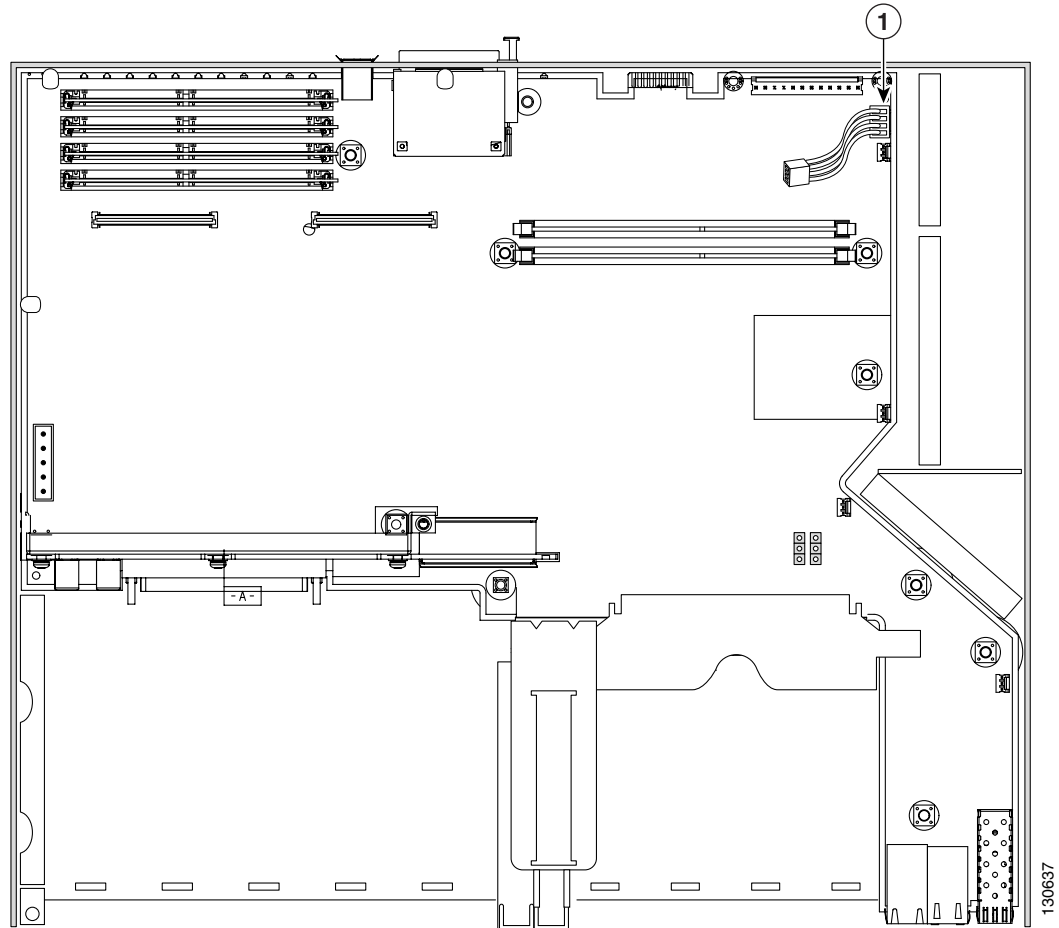
|          |                         |          |                           |
|----------|-------------------------|----------|---------------------------|
| <b>1</b> | Primary power connector | <b>2</b> | Secondary power connector |
|----------|-------------------------|----------|---------------------------|

Follow these steps to attach the power supply to the power supply tray.

- 
- Step 1**    Turn the tray right side up. Align the new power supply with the front wall of the tray.
- Step 2**    Replace and tighten the screws that hold the power supply to the tray.
- 

Verify that the primary power cable is connected to the motherboard as shown in [Figure 71](#).

Make sure that the secondary power cable is connected to the motherboard as shown in [Figure 73](#).

**Figure 73**      **Secondary Power Cable Motherboard Connection**

|          |                       |
|----------|-----------------------|
| <b>1</b> | Secondary power cable |
|----------|-----------------------|

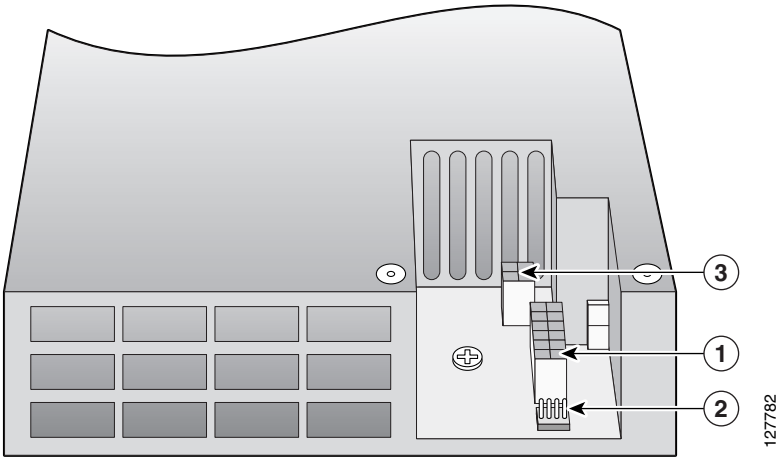
If you are finished installing components inside the router, continue with the [“Reinstalling the Power Supply Assembly in a Cisco 3825 and 3825-NOVPN Router”](#) procedure on page -30.

To install an SDRAM DIMM, continue with the [“SDRAM DIMM Removal and Installation”](#) procedure on page -9. To install an AIM, continue with the [“AIM Installation and Removal”](#) procedure on page -12. To install a PVDM, continue with the [“PVDM Installation and Removal”](#) procedure on page -21.

# Installing an IP Phone Power Supply

The IP phone power supply has three connectors, as shown in [Figure 74](#).

**Figure 74** AC Power Supply With IP Phone Power Support



|   |                           |   |                          |
|---|---------------------------|---|--------------------------|
| 1 | Primary power connector   | 3 | IP phone power connector |
| 2 | Secondary power connector |   |                          |

Follow these steps to attach the power supply to the power supply tray.

- Step 1

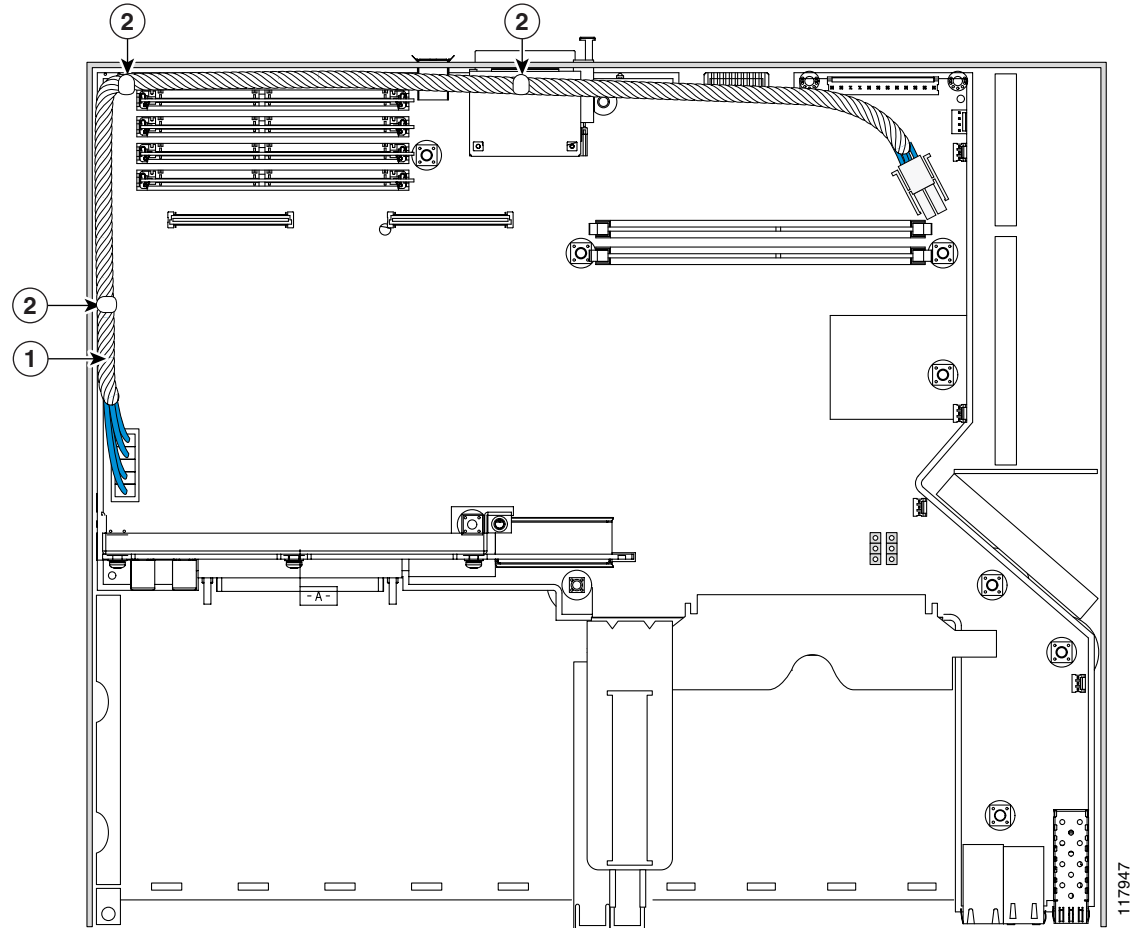
Turn the tray right side up. Align the new power supply with the front wall of the tray.
- Step 2

Replace and tighten the screws that hold the power supply to the tray.

Verify that the primary power cable is connected to the motherboard as shown in [Figure 71](#).

Make sure that the secondary power cable is connected to the motherboard as shown in [Figure 73](#).

Install the IP phone power cable as shown in [Figure 75](#). Make sure that the cable is held in place by the three cable brackets, as shown in the illustration.

**Figure 75** *IP Phone Power Cable Motherboard Connection*

|          |                      |          |                |
|----------|----------------------|----------|----------------|
| <b>1</b> | IP phone power cable | <b>2</b> | Cable brackets |
|----------|----------------------|----------|----------------|

If you are finished installing components inside the router, continue with the [“Reinstalling the Power Supply Assembly in a Cisco 3825 and 3825-NOVPN Router”](#) procedure on page -30.

To install an SDRAM DIMM, continue with the [“SDRAM DIMM Removal and Installation”](#) procedure on page -9. To install an AIM, continue with the [“AIM Installation and Removal”](#) procedure on page -12. To install a PVDM, continue with the [“PVDM Installation and Removal”](#) procedure on page -21.

## Reinstalling the Power Supply Assembly in a Cisco 3825 and 3825-NOVPN Router

To reinstall the power supply assembly after removing it for any of the procedures in this document, follow these steps:

- 
- Step 1** Place the power supply assembly into the router, as shown in [Figure 49](#), being careful not to pinch any cables.
  - Step 2** Using a number 2 Phillips screwdriver, fasten the captive screws on the power supply assembly to the router chassis.
  - Step 3** Connect the internal power cables to the connectors on the power supply. AC power supplies without IP phone power support have one connector, as seen in [Figure 70](#). DC power supplies have two connectors, as seen in [Figure 72](#). AC power supplies with IP phone power support have three connectors, as seen in [Figure 74](#).
  - Step 4** Continue with the [“Reinstalling the Cover on a Cisco 3825 and 3825-NOVPN Router” procedure on page -30](#).
- 

## Reinstalling the Cover on a Cisco 3825 and 3825-NOVPN Router

To reinstall the router cover, follow these steps. You need a number 1 Phillips screwdriver.

- 
- Step 1** Place the router on a flat surface, with the front panel facing you.
  - Step 2** Place the cover on the base, with about 1 inch (25 mm) of clearance between the cover and the rear panel.
  - Step 3** Slide the cover back onto the base, making sure that the hook at the rear edge of the cover, near the left side, fits underneath the card cage on the rear panel of the router.
  - Step 4** Reinstall the three screws on the top of the cover and the three screws on each side.
  - Step 5** Reinstall the router in the rack.
  - Step 6** Reconnect power and network interface cables. See the [“Connecting Cables to Cisco 3800 Series Routers”](#) section for detailed information.
  - Step 7** Power on the router. See the [“Powering Up Cisco 3800 Series Routers”](#) section for detailed information.
- 

## Installing or Replacing the Plug-In Motherboard in a Cisco 3845 and 3845-NOVPN Router

To reinstall a plug-in motherboard in a Cisco 3845 and 3845-NOVPN router, or to install a replacement motherboard after removing the old one, follow these steps. You need a number 2 Phillips screwdriver.

- 
- Step 1** Place the router so that the rear panel with the empty motherboard slot faces you.

- Step 2** Make sure that the ejector levers on the motherboard are fully open. Carefully insert the motherboard into the router slot until the connector is engaged, and then close the ejector levers to fully seat the board.
- Step 3** Use a number 2 Phillips screwdriver to tighten the two captive retention screws, one on each side of the motherboard.

## Removing and Installing the Fan Tray and Power Supplies in a Cisco 3845 and 3845-NOVPN Router

The Cisco 3845 and 3845-NOVPN router accommodates two hot-swappable power supplies in bays at the front of the router. A single power supply meets router requirements. The second power supply provides redundancy, load sharing, and increased router availability. Either power supply can be removed without affecting router operation. Any combination of two power supplies is permitted.



**Caution**

To comply with Telcordia NEBS GR-1089-Core and EN 300386 requirements, you must use foil twisted-pair cable that is properly grounded at both ends.



**Caution**

Ensure the device is not installed in close proximity to other devices which could lead to excessive pre-heating of air at the air intake of the router.



**Caution**

Your chassis installation must allow unrestricted airflow for chassis cooling.

To remove or install a power supply, you must first remove the fan tray assembly. Follow the same procedure to replace the fan tray assembly with a new one.

**Step 1**

Flip open the four small doors on the edges of the router front panel to gain access to the screws holding the fan tray assembly. See [Figure 76](#). Use a number 2 Phillips screwdriver to loosen these screws and remove the fan tray assembly.

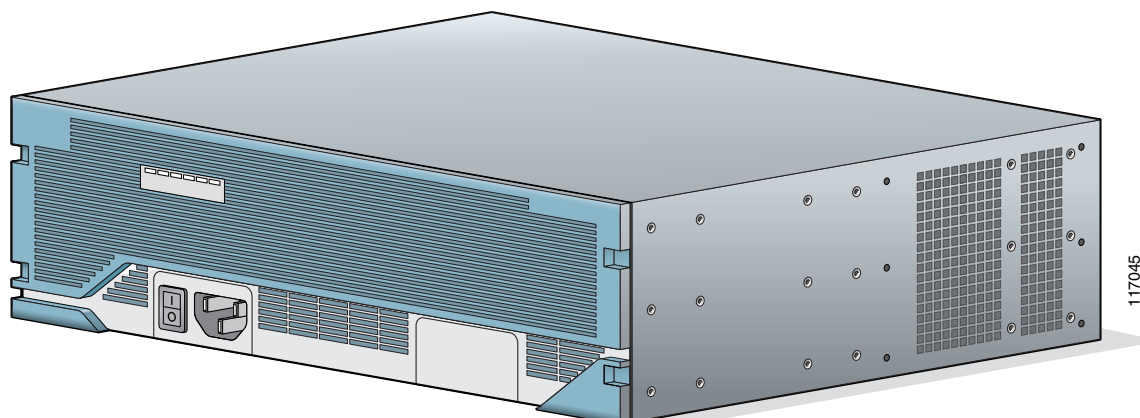
To replace the fan tray assembly without removing or installing power supplies, continue with [Step 6](#).



**Caution**

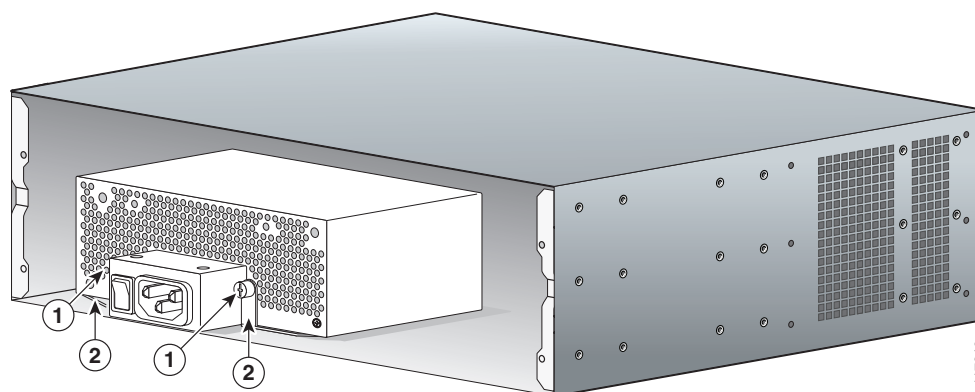
If the router is operating on a second power supply, it can run for up to 5 minutes without fans. During this period you see a fan tray warning message on the console.

**Figure 76** Fan Tray Assembly on the Front Panel of a Cisco 3845 and 3845-NOVPN Router



- Step 2** To remove a power supply, use a flat-blade or number 2 Phillips screwdriver to loosen the two captive thumbscrews. Holding the thumbscrews, rotate the ejector levers on each side of the power supply outward. Fold the handle up, and pull the power supply out by the handle. See [Figure 77](#). An AC power supply is shown as an example.

**Figure 77** Removing the Power Supply from a Cisco 3845 and 3845-NOVPN Router (AC Shown)



|          |                            |          |                               |
|----------|----------------------------|----------|-------------------------------|
| <b>1</b> | Loosen captive thumbscrews | <b>2</b> | Rotate ejector levers outward |
|----------|----------------------------|----------|-------------------------------|

- Step 3** Make sure that the ejector levers on the new or replacement power supply are extended out away from the power supply. Insert the power supply into the router from the front. The power supply has a built-in connector; you do not need to attach any cables.
- Step 4** Rotate the ejector levers inward until the power supply latches into place. Fold down the handle. Use a flat-blade or number 2 Phillips screwdriver to tighten the captive thumbscrews.
- Step 5** If necessary, use a flat-blade screwdriver to pry off the plastic panel from the front of the fan tray assembly at the power supply location. Use a number 1 Phillips screwdriver to remove the metal cover plate.

**Step 6** Replace the fan tray assembly and tighten the mounting screws.

---

## Cisco 3800 Series Router Installation and Preventive Maintenance

Periodic inspection and cleaning of the external surface of the router is recommended to minimize the negative impact of environmental dust or debris on the router performance. The frequency of inspection and cleaning is dependent upon the severity of the environmental conditions. Cleaning involves vacuuming of router air intake and exhaust vents.



### Caution

Fans are dynamic Electro-Mechanical devices. As such, fans can fail for various electronic reasons, and will eventually fail due to mechanical wear-out. Sites with ambient temperatures consistently above 25 degree C and with potentially high levels of dust or debris may require fan servicing.

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