



Installing and Upgrading Memory and Packet Voice Data Modules

This chapter describes how to install or upgrade memory or data modules in your router and contains the following sections:

- [Opening the Chassis](#)
- [Locating Modules](#)
- [Installing a Dual In-Line Memory Module](#)
- [Installing a Packet Voice Data Module](#)
- [Closing the Chassis](#)

Safety Information

This section contains safety information that you should read before installing or upgrading memory in the router.



Warning

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



Warning

Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages.

**Warning**

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

**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.

**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.

**Warning**

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

**Warning**

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

**Warning**

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

Opening the Chassis

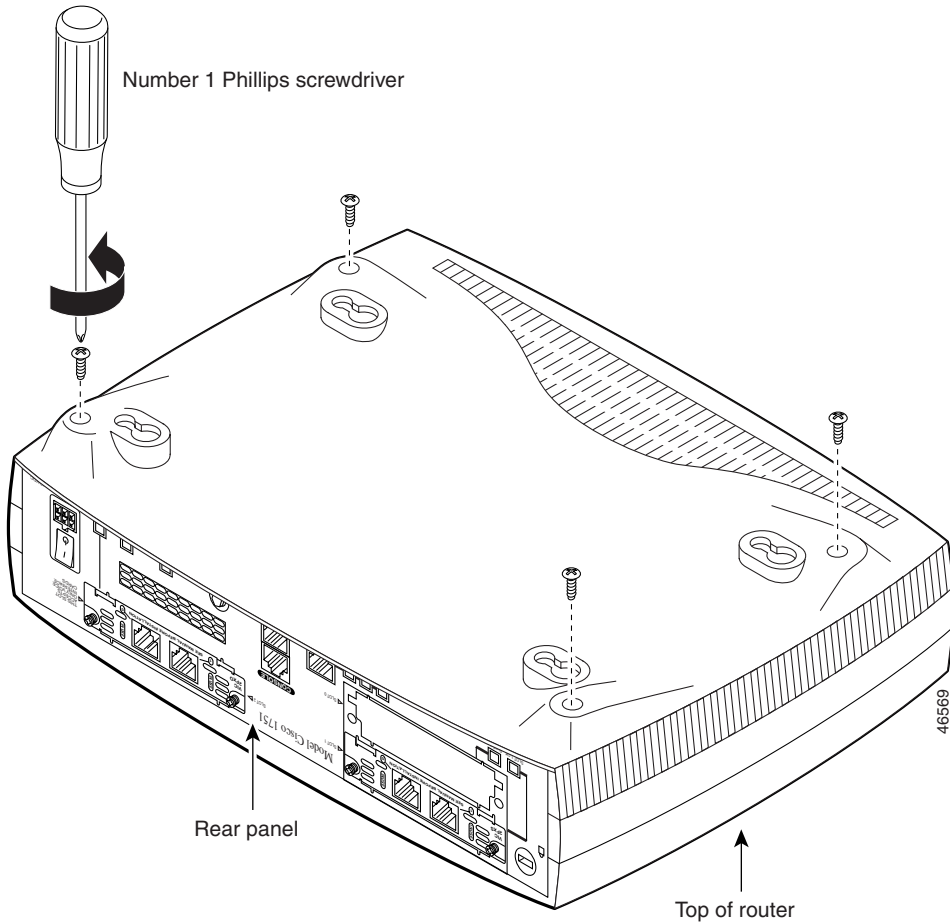
To install or upgrade memory or data modules, you must open the chassis. Opening the chassis requires a number one Phillips screwdriver.

Follow these steps to open the chassis:

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- Step 1** Make sure the router is turned off and is disconnected from the power supply.
 - Step 2** Turn the router upside down, and rest the top of the router on a flat surface.
 - Step 3** Use the Phillips screwdriver to remove the four screws that hold the top and bottom of the chassis together, as shown in [Figure C-1 on page C-4](#).
 - Step 4** Turn the router back to its original position (right-side up).

Opening the Chassis

Figure C-1 Removing the Chassis Screws



- Step 5** Gently pull the top of the router (which is facing up toward you) up and away from the bottom of the router (which is resting on a flat surface).

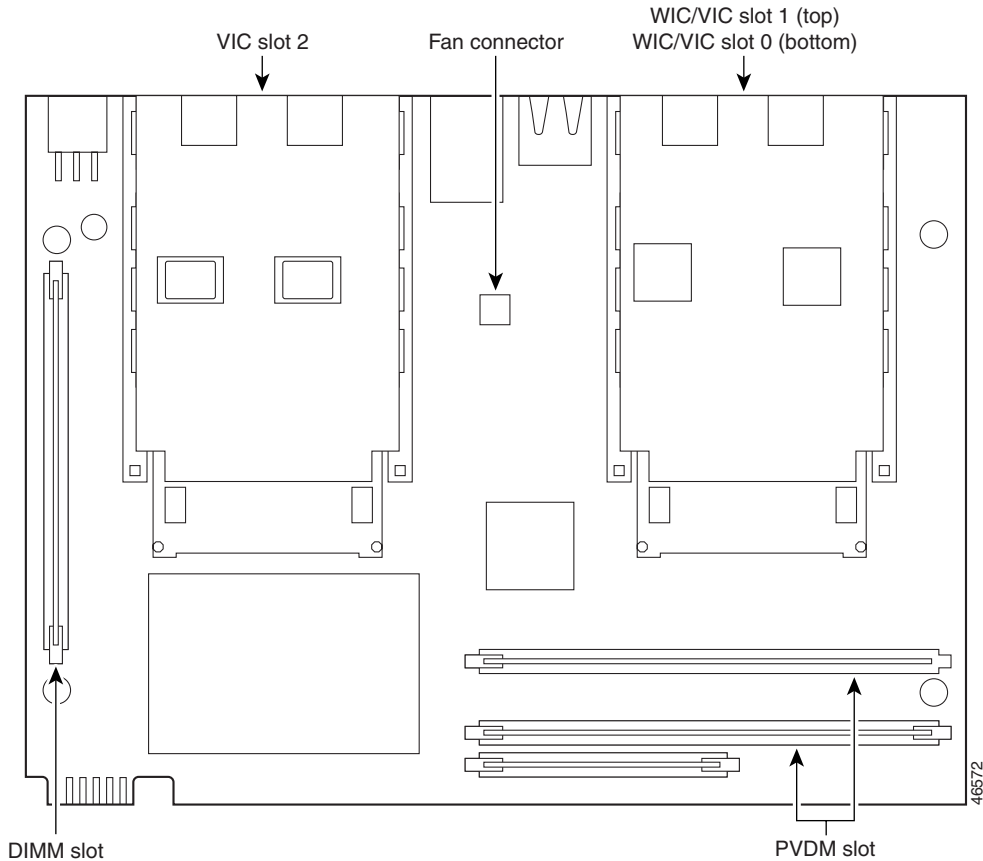
At this point, disconnect the fan, which is inside the top of the router chassis, from the motherboard. Do this by disconnecting the fan cable from the connector (labeled FAN) on the motherboard.

- Step 6** Place the router bottom on an antistatic mat and begin installing memory.

Locating Modules

Figure C-2 shows where to install a dual in-line memory module (DIMM) and packet voice data modules (PVDMs) on the motherboard.

Figure C-2 Cisco 1751 Motherboard—Module Locations



Installing a Dual In-Line Memory Module

You can install a dual in-line memory module (DIMM) to increase the amount of dynamic RAM (DRAM) in the router. DIMMs are available in the following sizes:

- 16 MB
- 32 MB
- 64 MB

The router memory size is displayed using the **show version** command. This command is described in the “Amounts of Memory” section of the “Cisco 1751 Router Overview” chapter.

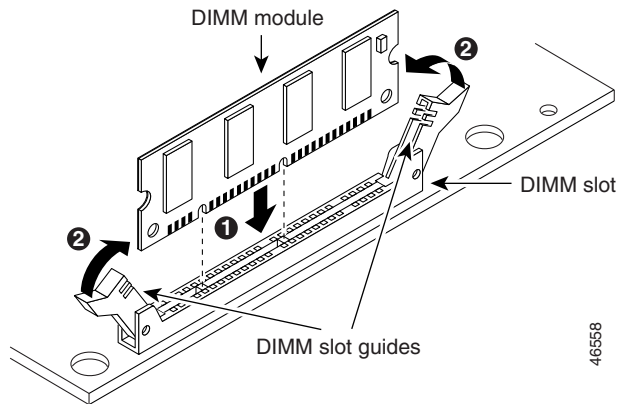
Follow these steps to install a DIMM on the router motherboard:



Warning

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

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- Step 1** Locate the DIMM slot on the motherboard, shown in [Figure C-2](#).
 - Step 2** Remove any existing DIMM by pulling the DIMM slot guides (shown in [Figure C-3](#)) away from the DIMM and down towards the motherboard.
 - Step 3** Hold the replacement DIMM with the notched edge away from you and facing the router.
 - Step 4** Insert the DIMM into the DIMM slot, making sure that the notches on the edge of the DIMM are inserted over the bars inside the DIMM slot, as in [Figure C-3](#).
 - Step 5** Press the DIMM firmly into the slot until the slot guides on each side of the slot move up and over the end of the DIMM, as in [Figure C-3](#). If the guides do not move up over the edge of the DIMM, move them with your hands.

Figure C-3 Installing a DIMM

Installing a Packet Voice Data Module

You can install up to two packet voice data modules (PVDMs) to support enhanced versions of digital signal processors (DSPs).

There are five types of PVDMs:

- PVDM-4—Supports one DSP
- PVDM-8—Supports up to two DSPs
- PVDM-12—Supports up to three DSPs
- PVDM-16—Supports up to four DSPs
- PVDM-20—Supports up to five DSPs

Each DSP supports two analog voice ports or one ISDN BRI port. Each analog VIC used with the Cisco 1751 router has two voice ports and requires a single DSP. The 2-port ISDN Voice-BRI requires two DSPs. [Table C-1](#) shows the possible combinations of PVDMs and voice ports for the Cisco 1751 router.

The Cisco 1751 router has two PVDM slots. Any of the PVDMs can occupy either slot. The total number of DSPs provided by one or two PVDMs installed in those slots must be greater than or equal to the number of DSPs required by the number and type of VICs installed, as described in [Table C-1](#).

For example, if you have one PVDM (a single DSP), and you want to increase the number of DSPs to 3, you can either add a PVDM-8 in the second slot, or you can replace the PVDM-4 with a PVDM-12.

Table C-1 PVDM and VIC Combinations

PVDM	Number of DSPs	Supported VIC Combinations
PVDM-4	1	1 analog VIC
PVDM-8	2	Up to 2 analog VICs or 1 voice-BRI VIC
PVDM-12	3	Up to 3 analog VICs or 1 analog VIC + 1 voice-BRI VIC
PVDM-16	4	Up to 3 analog VICs or Up to 2 voice-BRI VICs or Up to 2 analog VICs + 1 voice-BRI VIC
PVDM-20	5	Up to 3 analog VICs or Up to 2 voice-BRI VICs or Up to 2 analog VICs + 1 voice-BRI VIC or 1 analog VIC + up to 2 voice-BRI VICs

Follow these steps to install a PVDM on the router motherboard:



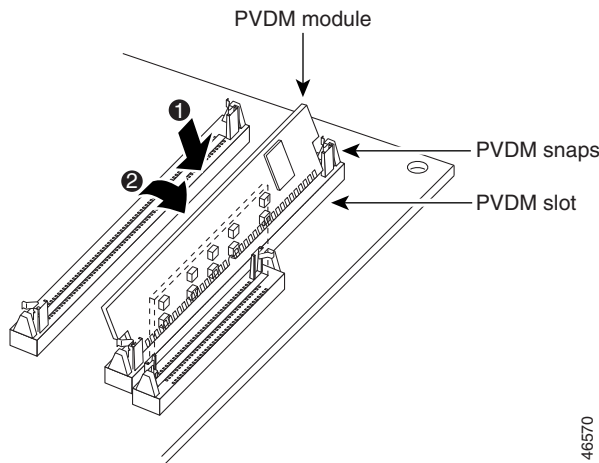
Warning

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

- Step 1** Locate the PVDM slots on the motherboard. (See [Figure C-2](#).)
- Step 2** Remove any existing PVDMs by pulling the PVDM snaps away from the PVDM. (See [Figure C-4](#).)
- Step 3** Hold the replacement PVDM with the double-notched edge on your left.
- Step 4** Insert the PVDM into the PVDM slot, making sure that the notches on the edge of the PVDM are inserted over the bars inside the PVDM slot. (See [Figure C-4](#).)

- Step 5** Push the module towards the slot and press firmly until you hear a clicking sound, and the module is firmly seated in the slot. Make sure that the snaps on both ends of the PVDM are engaged. (See [Figure C-4](#).)

Figure C-4 Installing a PVDM



Closing the Chassis

After installing memory or data modules on the motherboard, close the chassis by following these steps:

- Step 1** If you disconnected the fan from the motherboard as described in the “[Opening the Chassis](#)” section, reconnect the fan cable to the connector labeled FAN on the motherboard.
- Step 2** Locate the posts that protrude from the inside of the chassis cover and the corresponding openings on the chassis bottom.
- Step 3** Line up the posts with the corresponding openings, as shown in [Figure C-5](#), and carefully slide the posts into the openings. Be careful not to damage the router motherboard with the posts.
- Step 4** Replace the screws that you removed when opening the chassis. (See [Figure C-1](#).)

Closing the Chassis

Figure C-5 Closing the Chassis

