

MICROPROCESSOR UPGRADE GUIDE

Notes, Notices, Cautions, and Warnings

Throughout this guide, blocks of text may be accompanied by an icon and printed in bold type or in italic type. These blocks are notes, notices, cautions, and warnings, and they are used as follows:



NOTE: A NOTE indicates important information that helps you make better use of your computer system.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



CAUTION: A CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



WARNING: A WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious bodily injury.

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Dell™ PowerEdge™ Systems — Microprocessor Upgrade Guide



WARNING: The power supplies in a PowerEdge system may produce high voltages and energy hazards, which can cause bodily harm. Only trained service technicians are authorized to remove the computer cover and access any of the components inside the computer. For more information, see “Safety Instructions” in your system’s *Installation and Troubleshooting Guide*.

This document provides procedures for upgrading the Intel® Pentium® II or III microprocessors with either Intel Pentium II or Pentium III microprocessors in the following Dell PowerEdge systems:

- PowerEdge 1300
- PowerEdge 2300
- PowerEdge 4300
- PowerEdge 4350

Installing one or more microprocessors in your server may involve the following activities:

- Verifying the basic input/output system (BIOS) revision and saving the current configuration data
- Accessing the system board (see your system’s *Installation and Troubleshooting Guide*)
- Replacing the system board mounting plate or tray (PowerEdge 2300 and 4300)
- Installing the upgrade microprocessor
- Installing the cooling shroud (if applicable)
- Reassembling and checking the system

The upgrade procedure requires a #2 Phillips screwdriver. In addition, you should use a wrist grounding strap for electrostatic discharge (ESD) protection. Read the safety instructions in the following section.

The contents of your kit will vary, depending on the PowerEdge system and the number of microprocessors you are installing. Each kit will have one or more new Pentium II or Pentium III microprocessor(s), diskettes containing the Resource Configuration Utility (RCU), BIOS, embedded server management (ESM) firmware, and diagnostics. Also included, for some system models, is a cooling shroud and mounting hardware or a replacement system board mounting plate or tray.

Precautionary Measures

Before you perform any of the procedures in this document, take a few moments to read the following warning for your personal safety and to prevent damage to the computer system from ESD.



WARNING FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT

Before you start to work on the computer, perform the following steps in the sequence listed:

1. Turn off your computer and any devices.
2. Ground yourself by touching an unpainted metal surface on the chassis, such as the metal around the card-slot openings at the back of the computer, before touching anything inside your computer.

While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components.

3. Disconnect your computer and devices from their power sources. Also, disconnect any telephone or telecommunication lines from the computer.

Doing so reduces the potential for personal injury or shock.

In addition, take note of these safety guidelines when appropriate:

- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, make sure both connectors are correctly oriented and aligned.
- Handle components and cards with care. Don't touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a microprocessor chip by its edges, not by its pins.

If your system has two microprocessors installed, the secondary microprocessor must be the same type and have the same operating frequency and cache size as the primary microprocessor. For example, if the system you are installing has a 500-megahertz (MHz) Pentium III primary microprocessor, the secondary microprocessor must also be a 500-MHz Pentium III microprocessor.

NOTICE: Do not attempt to operate a system with one Pentium II microprocessor and one Pentium III microprocessor. Damage to one or both of the microprocessors and/or the system board may occur.

NOTICE: All empty microprocessor connectors must be populated with a terminator card. If your system supports more than one microprocessor and you are not installing the maximum number of microprocessors, the remaining microprocessor connectors must have a terminator card.

Before You Begin

Before shutting down your system, perform these preliminary steps:

- Record the system configuration
- Update the ESM firmware
- Update the BIOS (if necessary)
- Use the RCU diskette (provided in the kit) to save the RCU configuration settings (see your *User's Guide* for information).

Recording the System Configuration

View the system configuration screens in the System Setup program and make a record of the settings.

Updating the ESM Firmware

If an ESM firmware diskette is included with your kit, update your ESM firmware with the version contained on that diskette by performing the following steps. The latest version of the ESM firmware is also available online at <http://support.dell.com>.

1. Insert the ESM firmware diskette provided in the upgrade kit into the diskette drive.
2. Reboot the system.
3. After the system completes the boot routine, follow the instructions on the screen.
4. After the *Successfully Completed Done* message appears on the screen, remove the ESM firmware diskette from the diskette drive and follow the instructions on the screen to reboot the system.

Updating the BIOS

If a BIOS diskette is included with your kit, update your BIOS with the version contained on that diskette by performing the following steps. The latest version of the BIOS is also available online at <http://support.dell.com>.

1. Insert the BIOS diskette provided in the upgrade kit into the diskette drive.
2. Reboot the system.
3. After the system completes the boot routine, follow the instructions on the screen.
4. After the BIOS has been successfully installed message appears on the screen, remove the BIOS diskette from the diskette drive and follow the instructions on the screen to reboot the system.

Saving RCU Configuration Settings

Use the RCU to save the current system configuration settings by performing the following steps:

1. Insert the RCU diskette into the diskette drive and reboot the system.
2. When the welcome screen appears, press <Enter>.

The main menu appears.
3. Select **Step 5: Save and Exit**, and then follow the online instructions to save the current system configuration information.



NOTE: The RCU recognizes microprocessors operating at 450 MHz and faster. The latest version of the RCU is available online at <http://support.dell.com>.

Installing Upgrade Microprocessors in the PowerEdge 1300

To upgrade to Pentium II or Pentium III microprocessors in the PowerEdge 1300, perform the following steps:

1. Access the system board, which involves the following steps:
 - a. Disconnecting power and peripheral cables.
 - b. Removing the covers.
 - c. Rotating the power supply.

See your system *Installation and Troubleshooting Guide* for instructions.

2. Remove the microprocessors.

See "Removing the Microprocessors", found later in this document.

3. Remove and replace the guide brackets.

See “Removing and Replacing the Guide Brackets”, found later in this document.

4. Remove the cooling shroud.

See “Removing and Replacing the Cooling Shroud”, found later in this document.

5. Install the upgrade microprocessor.

See “Installing the Upgrade Microprocessors”, found later in this document.

6. Replace the cooling shroud.

See “Removing and Replacing the Cooling Shroud”, found later in this document.

If the upgrade kit comes with a new cooling shroud, you must install the new cooling shroud. See “Installing a New Cooling Shroud”, found later in this document.

7. Reassemble and check the system, as follows:

- a. Rotate the power supply back into position, making sure that the securing tab snaps into place.
- b. Replace the covers and front bezel. Reconnect your computer and peripherals to their power sources and turn them on.

As the system boots, it detects the presence of the new microprocessor and automatically changes the system configuration information in the System Setup program.



NOTE: After you remove and replace the cover of a PowerEdge 1300 system, the chassis intrusion detector causes the following message to be displayed at the next system start-up:

ALERT! Cover was previously removed.

- c. Enter the System Setup program and confirm that the top line in the system data area correctly identifies the installed microprocessor(s). By default, the serial numbers of Pentium III microprocessors are not displayed. See the procedures in “Using the System Setup Program” in your *User's Guide* for accessing and modifying entries in the System Setup screens.
- d. Reset the chassis intrusion detector while in the System Setup program by changing **Chassis Intrusion** to **Not Detected**.



NOTE: If a setup password has been assigned by someone else, contact your network administrator for information on resetting the chassis intrusion detector.

- e. Run the Dell Diagnostics to verify that the new microprocessor is operating correctly.

See your *User's Guide* and your computer *Installation and Troubleshooting Guide* for additional information on running the Dell Diagnostics and troubleshooting any problems that may occur.

Installing Upgrade Microprocessors in the PowerEdge 2300

To upgrade to Pentium II or Pentium III microprocessors in the PowerEdge 2300, perform the following steps.



WARNING: The power supplies in this computer system produce high voltages and energy hazards, which can cause bodily harm. Only trained service technicians are authorized to remove the computer cover and access any of the components inside the computer.

NOTICE: Observe the safety information given in “Precautionary Measures” and “Before You Begin” to ensure that the system configuration screens are recorded and the system is properly shut down and disconnected from all power sources.



NOTES: If you are installing a 600 MHz (or greater) microprocessor in your PowerEdge 2300, the system board mounting plate must be replaced. A replacement mounting plate is provided with the upgrade kit.

If you are upgrading a PowerEdge 2300 with one or two microprocessors with an operating frequency less than 600 MHz, you do not need to replace the system board mounting plate.

1. Access the system board, which involves the following steps:
 - a. Disconnecting power and peripheral cables.
 - b. Removing the covers.
 - c. Removing the front bezel.
 - d. Removing the cooling fan shroud.
 - e. Replacing the system board mounting plate or tray. Applies only when installing 600 MHz or greater microprocessors.

See your system *Installation and Troubleshooting Guide* for specific instructions, if needed.

2. If you are installing a 600 MHz or greater microprocessor, replace the system board mounting plate as follows.
 - a. Unlock and remove the front bezel.
 - b. Remove the right- and left-side computer covers.
 - c. Record the location and disconnect all external peripheral cables from their connectors on the back of the computer.
 - d. Record the location of any internal expansion card cables, and then record the slot number assignments and remove all the expansion cards.

Place the expansion cards in antistatic bags or on a grounded antistatic mat or other antistatic surface.
 - e. Record the locations and disconnect all internal cables attached to the system board.
 - f. At the left side of the system, locate and remove the three screws that secure the system board and mounting plate to the chassis (see Figure 1-1).

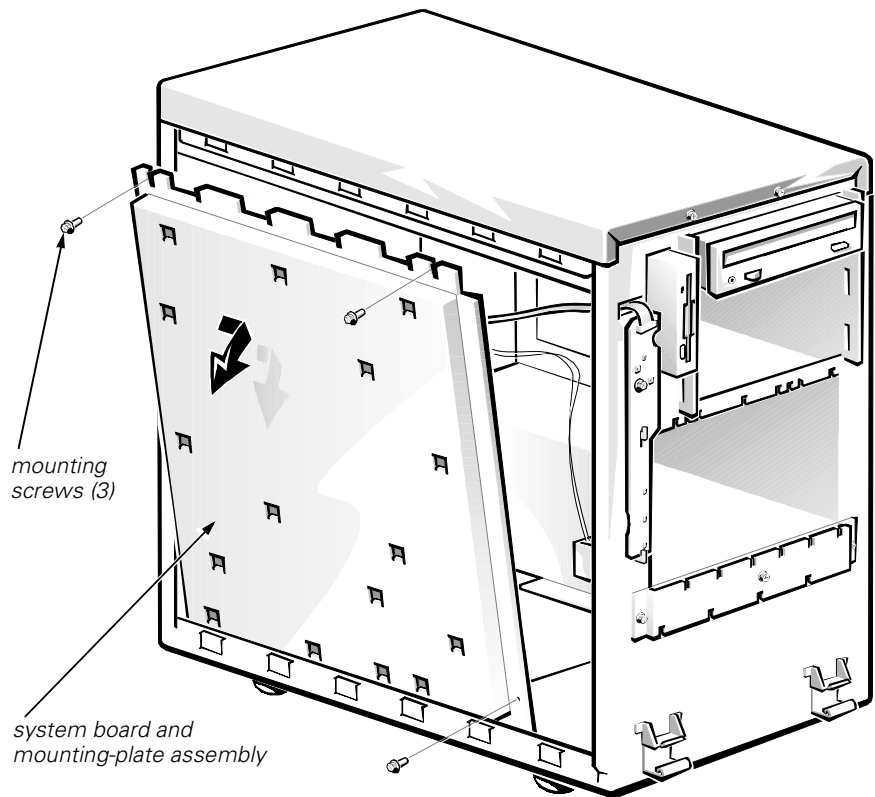


Figure 1-1. Removing the System Board Assembly

- g. Slide the system board and mounting plate assembly forward about 12.7 millimeters (mm) (0.5 inch), rotate it away from the top of the chassis, and lift it out of the chassis.
 - h. Lay the assembly with the system board facing up on a flat surface.
 - i. Remove the mounting screw from the mounting plate.
 - j. Slide the system board about 6.3 mm (0.25 inch) toward the front (left edge of the mounting plate) and lift the system board up and away from the mounting plate.
3. To install the replacement mounting plate assembly (provided in your upgrade kit) in your PowerEdge 2300 system, perform the preceding steps in reverse order.
 4. Remove the microprocessor.
See "Removing the Microprocessors", found later in this document.
 5. Remove the cooling shroud.
See "Removing and Replacing the Cooling Shroud", found later in this document.
 6. Install the upgrade microprocessor.
See "Installing the Upgrade Microprocessor", found later in this document.
 7. Replace the cooling shroud.
See "Removing and Replacing the Cooling Shroud", found later in this document.

If the upgrade kit comes with a new cooling shroud, you must install the new cooling shroud. See "Installing a New Cooling Shroud", found later in this document.
 8. Reassemble and check the system.
See "Reassembling and Checking the System", found later in this document.

Installing Upgrade Microprocessors in the PowerEdge 4300

To upgrade to Pentium II or Pentium III microprocessors in the PowerEdge 4300, perform the following steps.



NOTES: If you are installing a 600-MHz (or greater) microprocessor in your PowerEdge 4300, the system board mounting tray must be replaced. A replacement mounting tray is provided with the upgrade kit.

If you are upgrading a PowerEdge 4300 with a microprocessor with an operating frequency less than 600 MHz, you do not need to replace the system board mounting tray.

1. Remove the system board mounting tray as follows.



WARNING: The power supplies in this computer system produce high voltages and energy hazards, which can cause bodily harm. Only trained service technicians are authorized to remove the computer cover and access any of the components inside the computer.

NOTICE: Observe the information given in “Precautionary Measures” and “Before You Begin” to ensure that the system configuration screens are recorded and the system is properly shut down and disconnected from all power sources.

- a. Unlock and remove the computer cover.

For instructions, see the *Installation and Troubleshooting Guide*.

- b. To access the system board, release the system-board tray latch at the back lower corner of the tray (see Figure 1-2) and pull the tray open to the first stop position (or *service position*).



NOTE: From the service position, if you depress and release the tray latch and pull the tray out again, you will come to a second stop position that is used by manufacturing. To remove the tray completely from any position, depress and hold the latch, and pull the tray out of the chassis.

- c. Record the location of any internal expansion card cables, record the slot number assignments, and then remove all the expansion cards.

Place the expansion cards in antistatic bags or on a grounded antistatic mat or other antistatic surface.

- d. Record the locations and disconnect all internal cables attached to the system board.
 - e. Press and hold the tray release latch as you slide the system board and mounting tray assembly completely out of the chassis.
 - f. Lay the tray assembly with the system board facing up on a flat surface.
 - g. Remove the mounting screw from the mounting tray.
 - h. Slide the system board 6.3 mm (0.25 inch) toward the front (left edge of the mounting tray, as shown in Figure 1-3) and lift the system board away from the mounting tray.
2. To install the upgrade mounting tray assembly (provided in your upgrade kit) in your PowerEdge 4300 system, perform the preceding steps in reverse order.
 3. Remove the microprocessors.

See “Removing the Microprocessors”, found later in this document.

4. Replace the guide brackets.

See “Removing and Replacing the Guide Brackets”, found later in this document.

5. Install the upgrade microprocessor.

See “Installing the Upgrade Microprocessor”, found later in this document.

6. Reassemble and check the system.

See “Reassembling and Checking the System”, found later in this document.

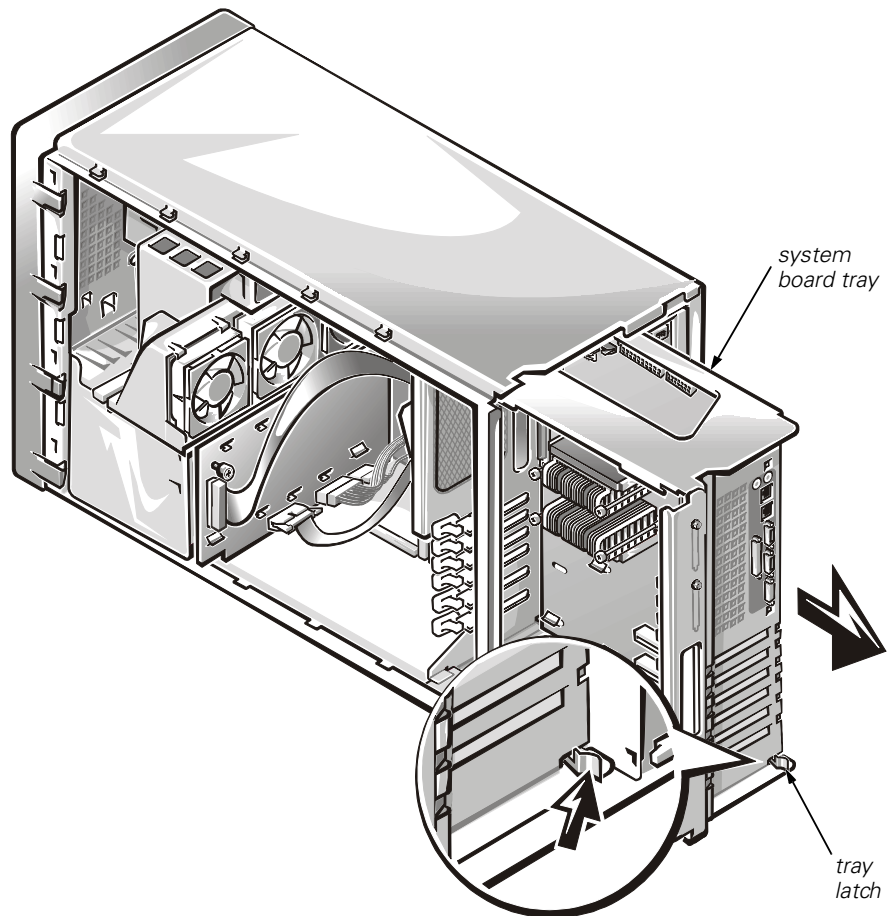


Figure 1-2. Removing the System Board Mounting Tray

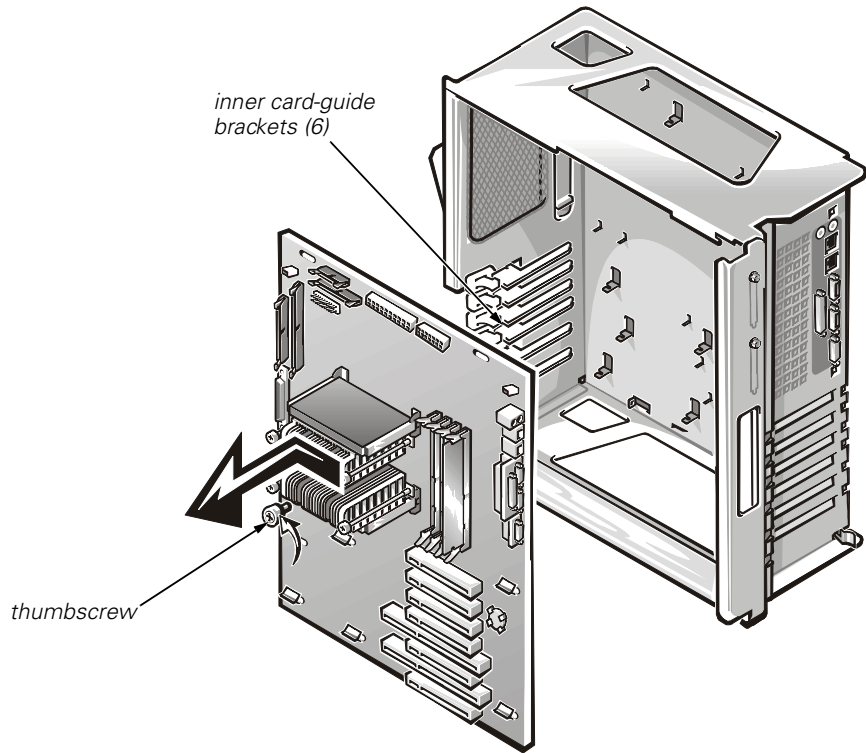


Figure 1-3. Removing the System Board

Installing Upgrade Microprocessors in the PowerEdge 4350

To upgrade to Pentium II or Pentium III microprocessors in the PowerEdge 4350, perform the following steps:

1. Access the system board, which involves the following steps:
 - a. Disconnecting power and peripheral cables.
 - b. Removing the covers.
 - c. Removing the front bezel.
 - d. Removing the cooling fan shroud.

See your system *Installation and Troubleshooting Guide* for specific instructions, if needed.

2. Remove the microprocessors.
See “Removing the Microprocessors”, found later in this document.
3. Remove and replace the guide brackets.
See “Removing and Replacing the Guide Brackets”, found later in this document.
4. Install the upgrade microprocessor.
See “Installing the Upgrade Microprocessor”, found later in this document.
5. Reassemble and check the system.
See “Reassembling and Checking the System”, found later in this document.

Removing the Microprocessors

To remove the current microprocessors from the system board, perform the following steps.



CAUTION: The microprocessor and heat sink assembly can get extremely hot during system operations. Be sure that it has had sufficient time to cool before touching it.



CAUTION: When handling the microprocessor and heat sink assembly, take care to avoid sharp edges on the heat sink.

1. Unscrew and remove the two large thumbscrew retention pins that secure the microprocessor to the system board.
2. Press the microprocessor’s release latches inward until they snap into position (see Figure 1-4).



NOTE: Figure 1-4 illustrates the SEC cartridge. The heat sink on the single-edge connector cartridge 2 (SECC2) package is different.

3. Grasp the microprocessor assembly firmly and pull it away from the microprocessor guide bracket assembly.

You must use up to 15 pounds (lb) of force to disengage the microprocessor from the connector.

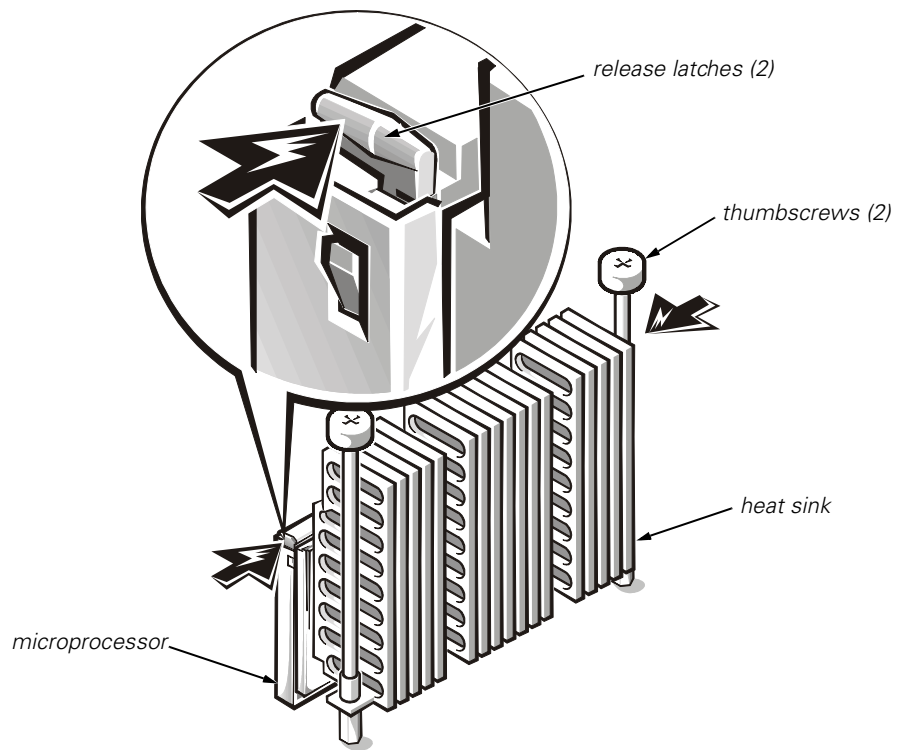


Figure 1-4. Removing the Microprocessor

Removing and Replacing the Guide Brackets

To remove the guide bracket assembly, perform the following steps:

1. Remove any terminator card installed in the guide bracket.
2. Remove any microprocessor assembly installed in the guide bracket.
3. Use a #2 Phillips screwdriver to loosen the four captive nuts that secure the guide bracket assembly to the system board (see Figure 1-5).
4. Lift up the assembly to remove it from the four threaded posts.

To install the new guide bracket assembly, perform the following steps:

1. Position the guide bracket over the four threaded posts (see Figure 1-6).

You can install the guide bracket only one way (the captive nuts will not align with the threaded posts if installed incorrectly).

2. Tighten the four captive nuts using a #2 Phillips screwdriver.

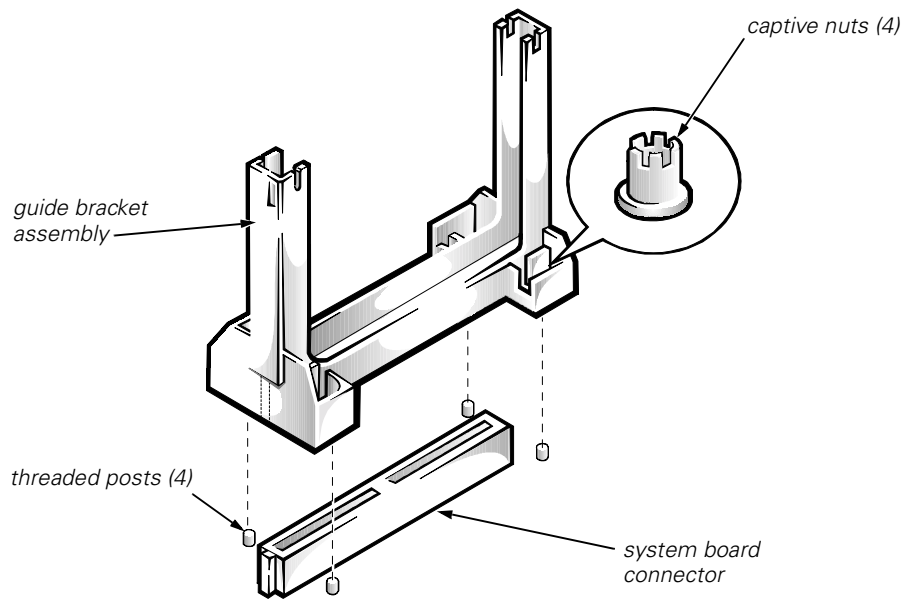


Figure 1-5. Removing the Old Guide Bracket Assembly

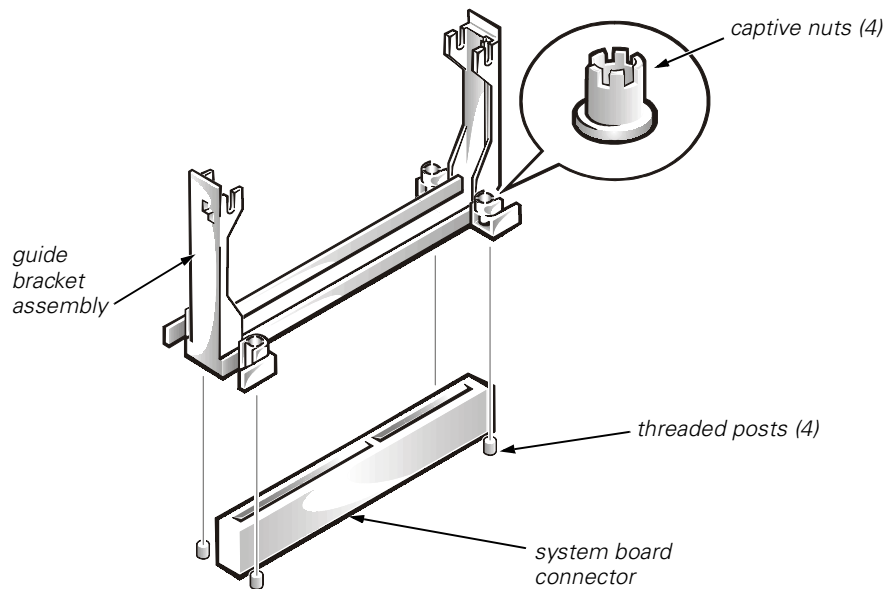


Figure 1-6. Installing the New Guide Bracket Assembly

Removing and Replacing the Cooling Shroud

The plastic cooling shroud inside the system is used to improve airflow over the microprocessors. You may need to remove this shroud to access certain components on the system board.

Removing the Cooling Shroud

To remove the cooling shroud, perform the following steps.

NOTICE: Observe the information given in “Precautionary Measures” and “Before You Begin” to ensure that the system configuration screens are recorded and the system is properly shut down and disconnected from all power sources.

1. Turn off the system, including any attached peripherals, and disconnect the power cable from the electrical outlet.
2. Remove the right-side computer cover.
3. Unscrew and remove the two retention pins (see Figure 1-7).
4. Remove the shroud by lifting the end of the shroud closest to the microprocessor(s) until the opposite end of the shroud disengages from the cooling fan on the system back panel.

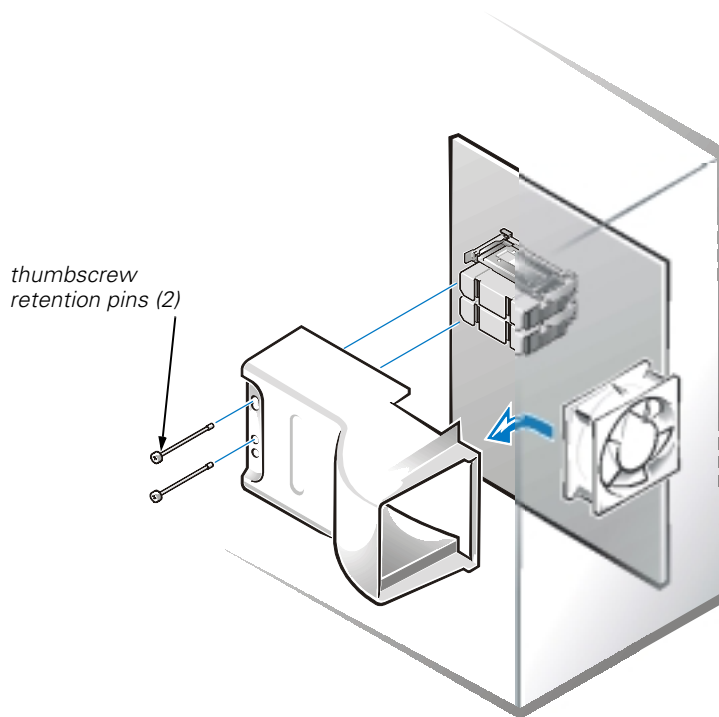


Figure 1-7. Removing the Cooling Shroud

Replacing the Cooling Shroud

To replace the cooling shroud, perform the following steps:

1. Hook the upper edge of the large opening on the end of the cooling shroud over the top of the cooling fan on the system back panel.
2. Lower the other end of the shroud into place over the microprocessor(s).
3. Secure the shroud by reinstalling the two retention pins.

Installing the Upgrade Microprocessor

NOTICE: Do not attempt to operate a system with one Pentium II microprocessor and one Pentium III microprocessor. Damage to one or both of the microprocessors and/or the system board may occur.

NOTICE: All empty microprocessor connectors must be populated with a terminator card. If your system supports more than one microprocessor and you are not installing the maximum number of microprocessors, the remaining microprocessor connectors must have a terminator card.

To install an upgrade microprocessor, perform the following steps:

1. Insert the new microprocessor into the system board connector (see Figure 1-8).
2. Press the microprocessor firmly into its connector until it is fully seated and the latches snap into place.

You must use up to 25 lb of force to fully seat the microprocessor.

For Pentium III microprocessors, you do not need to change the jumper settings on the system board.

For Pentium II microprocessors, set the speed jumper to the speed of the microprocessor.

Upgrade microprocessors have a heat sink with a notch for engaging a threaded stud on the system board, as shown in Figure 1-8.

3. Repeat steps 1 and 2 for your second upgrade microprocessor or to install a terminator card.

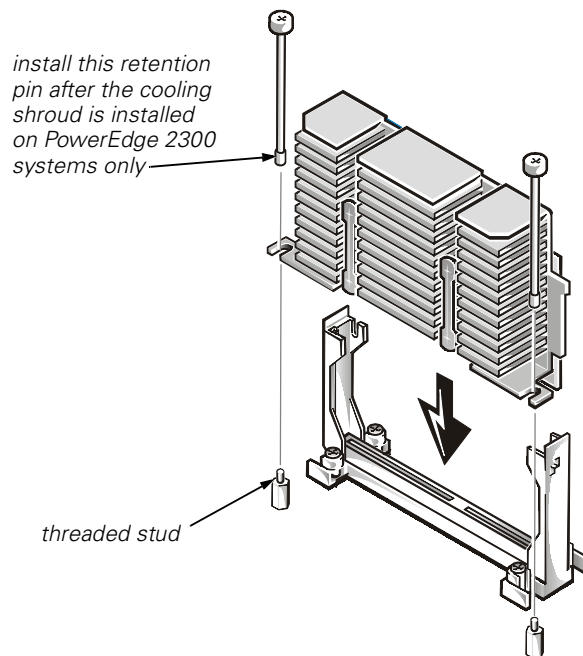


Figure 1-8. Installing the Microprocessor

Installing a New Cooling Shroud in the PowerEdge 1300 and 2300

If a cooling shroud came with your microprocessor upgrade kit and your system is a PowerEdge 1300 or PowerEdge 2300, you *must* install the cooling shroud provided in the upgrade kit.

To install a cooling shroud, perform the following steps:

1. Carefully position the shroud into place with the square opening over the bulk-head fan and the top of the shroud's other end resting over the microprocessors, as shown in Figure 1-9.
2. Gently squeeze the tabs to compress the latch as you lower the shroud on the microprocessor's heat sink and allow it to snap securely into place on the heat sink(s).

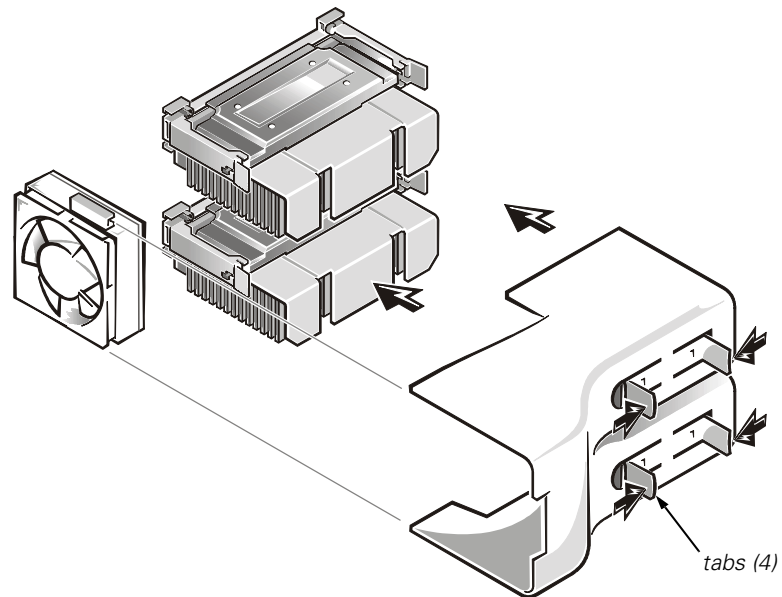


Figure 1-9. Installing a New Cooling Shroud Assembly

Reassembling and Checking the System

To reassemble the system and perform verification checks, perform the following steps.



NOTE: The following procedures apply to PowerEdge 2300, 4300, and 4350 systems. For PowerEdge 1300 systems, see step 7 under "Installing Upgrade Microprocessors in the PowerEdge 1300", found earlier in this document.

1. Close the computer panel doors (for PowerEdge 4350 systems only) or replace the covers and front bezel, and reconnect your computer and peripherals to their power sources and turn them on.

As the system boots, it detects the presence of the new microprocessor and automatically changes the system configuration information in the System Setup program. The following message appears:

`Second processor detected`

2. Enter the System Setup program and confirm that the top line in the system data area correctly identifies the installed microprocessor(s). By default, the serial numbers of Pentium III microprocessors are not displayed. See the procedures in "Using the System Setup Program" in your *User's Guide* for accessing and modifying entries in the System Setup screens.

Reset the chassis intrusion detector while in the System Setup program by changing **Chassis Intrusion** to **Not Detected**.



NOTE: If a setup password has been assigned by someone else, contact your network administrator for information on resetting the chassis intrusion detector.

3. Run the Dell Diagnostics to verify that the new microprocessor is operating correctly.

See your *User's Guide* and your *Installation and Troubleshooting Guide* for additional information on running the Dell Diagnostics and troubleshooting any problems that may occur.

