

Dell™ PowerEdge™ 2400, 2450, and 4400 Systems

# **MICROPROCESSOR UPGRADE INSTALLATION 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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**Information in this document is subject to change without notice.**

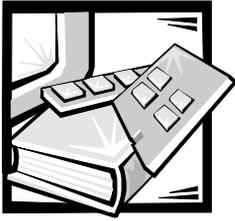
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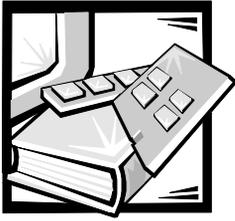
# Contents

Precautionary Measures . . . . .	1-1
Before You Begin . . . . .	1-2
Recording the System Configuration . . . . .	1-2
Updating the ESM Firmware . . . . .	1-3
Updating the BIOS . . . . .	1-3
Saving RCU Configuration Settings . . . . .	1-3
Installing an Upgrade Microprocessor in PowerEdge 2400 Systems . . . . .	1-4
Removing the Cooling Shroud, SEC Cartridge, and Heat Sink . . . . .	1-4
Installing the New SEC Cartridge and Heat Sink and Replacing the Cooling Shroud . . . . .	1-6
Reassembling and Checking the System . . . . .	1-7
Installing an Upgrade Microprocessor in PowerEdge 2450 Systems . . . . .	1-8
Removing the SEC Cartridge and Heat Sink . . . . .	1-8
Installing the New SEC Cartridge and Heat Sink . . . . .	1-11
Upgrading the Microprocessor or Installing a Secondary Microprocessor in PowerEdge 4400 Systems . . . . .	1-12
Removing a Terminator Card . . . . .	1-12
Installing a Terminator Card . . . . .	1-14
Removing the SEC Cartridge and Heat Sink Assembly . . . . .	1-14
Replacing the SEC Cartridge and Heat Sink Assembly . . . . .	1-15

## Figures

Figure 1-1. Removing the Cooling Shroud From the PowerEdge 2400 . . . . .	1-5
Figure 1-2. Removing the SEC Cartridge and Heat Sink From the PowerEdge 2400 . . . . .	1-6
Figure 1-3. Installing the SEC Cartridge and Heat Sink Into the PowerEdge 2400 . . . . .	1-7
Figure 1-4. Removing the Air Blower . . . . .	1-9

Figure 1-5.	Removing the SEC Cartridge and Heat Sink From the PowerEdge 2450. . . . .	1-10
Figure 1-6.	Installing the SEC Cartridge and Heat Sink Into the PowerEdge 2450. . . . .	1-11
Figure 1-7.	Removing a Terminator Card. . . . .	1-13
Figure 1-8.	Replacing an SEC Cartridge and Heat Sink Assembly. . . . .	1-15



# **Dell™ PowerEdge™ 2400, 2450, and 4400 Systems — Microproces- sor Upgrade Installation Guide**

This document provides information on upgrading and installing microprocessors in Dell PowerEdge 2400, 2450, and 4400 systems.

## ***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 system from electrostatic discharge (ESD).



### **WARNING FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT**

**Before you start to work on the system, 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.

**NOTICE: If your system has two microprocessors installed, the secondary microprocessor must be the same type and have the same front side bus speed and cache size as the primary microprocessor. For example, if the system you are installing has an Intel® Pentium® III primary microprocessor with 133-megahertz (MHz) front side bus speed and 256 K cache, the secondary microprocessor must match these specifications.**

**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.**

**NOTICE: The terminator card must be rated to run at 133 MHz.**

## ***Before You Begin***

Before shutting down your system, perform these preliminary steps:

- Record the system configuration settings.
- Update the embedded server management (ESM) firmware.
- Update the basic input/output system (BIOS), if necessary.
- Use the resource configuration utility (RCU) diskette to save the RCU configuration settings (see your *User's Guide* for complete information).

The upgrade procedure requires a #2 Phillips screwdriver. In addition, use a wrist-grounding strap for ESD protection.

## ***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 the upgrade 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 available at <http://support.dell.com>.

1. Insert the ESM firmware diskette 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 message `Successfully Completed Done` 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 the kit, update your BIOS with the version contained on that diskette by performing the following steps. The latest version of the BIOS is available at <http://support.dell.com>.

1. Insert the BIOS diskette 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 message `BIOS has been successfully installed` 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 diskette provided with the kit 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 is displayed.
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 at <http://support.dell.com>.*

# ***Installing an Upgrade Microprocessor in PowerEdge 2400 Systems***

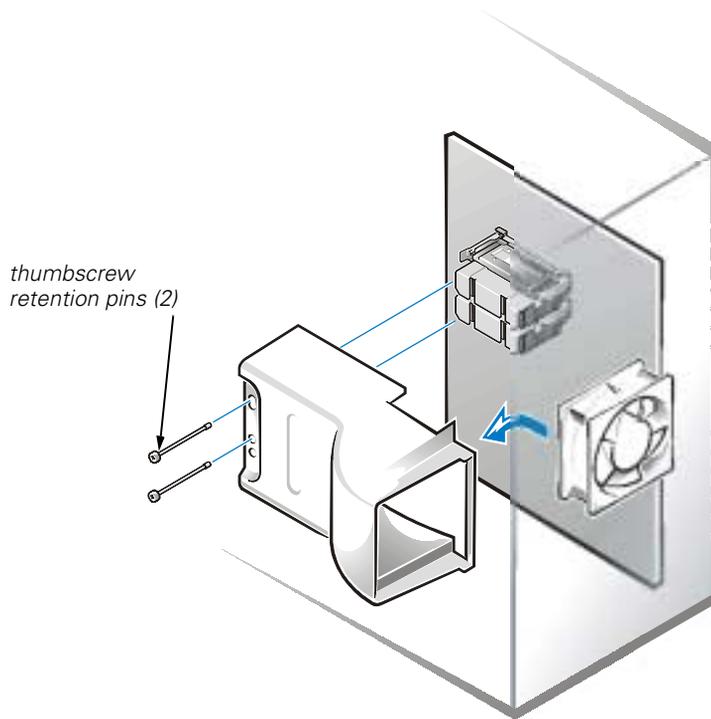
This section provides instructions for:

- Removing the cooling shroud, single-edge contact (SEC) cartridge, and heat sink
- Installing the new SEC cartridge and heat sink and replacing the cooling shroud
- Reassembling and checking the system

## ***Removing the Cooling Shroud, SEC Cartridge, and Heat Sink***

**NOTICE: Follow the instructions in “Precautionary Measures” to ensure that the system is properly shut down and disconnected from all power sources. Ensure that the system configuration screens are recorded as described in “Before You Begin.”**

1. Turn off the system, including any attached peripherals, and disconnect the power cable from the electrical outlet.
2. Remove the right-side system cover and bezel.  
  
See your system *Installation and Troubleshooting Guide* for specific instructions, if needed.
3. Remove the cooling shroud as follows:
  - a. Unscrew and remove the two retention pins (see Figure 1-1).
  - b. 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’s back panel (see Figure 1-1).



**Figure 1-1. Removing the Cooling Shroud From the PowerEdge 2400**

4. Remove the SEC cartridge and heat sink as follows.

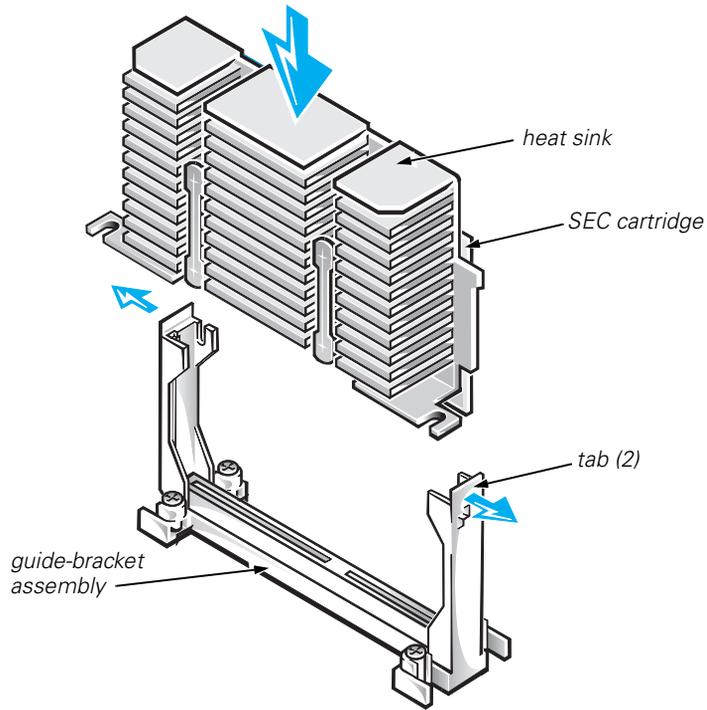


**CAUTION: When handling the SEC cartridge and heat sink, take care to avoid sharp edges on the heat sink.**



**CAUTION: The SEC cartridge and heat sink can get extremely hot during system operation. Be sure they have had sufficient time to cool before you touch them.**

- a. Pull the tab on one side of the guide-bracket assembly away from the end of the heat sink and pull up slightly on the SEC cartridge and heat sink (see Figure 1-2).
- b. Pull the tab on the other end of the guide-bracket assembly to disengage the tab on the heat sink, and then lift the SEC cartridge and heat sink away from the guide-bracket assembly (see Figure 1-2).



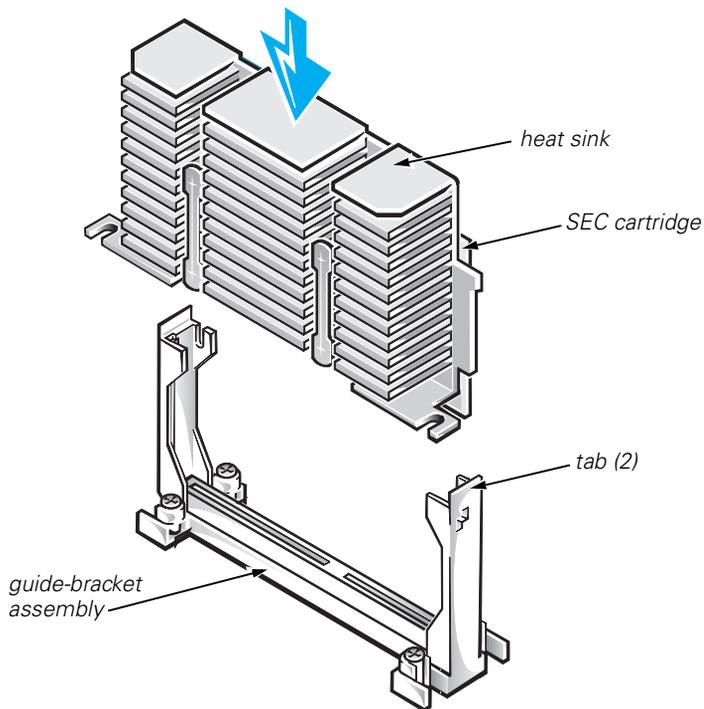
**Figure 1-2. Removing the SEC Cartridge and Heat Sink From the PowerEdge 2400**

### **Installing the New SEC Cartridge and Heat Sink and Replacing the Cooling Shroud**

**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.**

**NOTICE: The terminator card must be rated to run at 133 MHz.**

1. Slide the new SEC cartridge and heat sink into the guide-bracket assembly, and firmly seat them in the assembly until the tabs snap into place over the ends of the heat sink (see Figure 1-3).
2. 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's back panel.
3. Lower the other end of the shroud into place over the microprocessor(s).
4. Secure the shroud by reinstalling the two retention pins.



**Figure 1-3. Installing the SEC Cartridge and Heat Sink Into the PowerEdge 2400**

### **Reassembling and Checking the System**

1. Replace the right-side system cover 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. 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.

## **Installing an Upgrade Microprocessor in PowerEdge 2450 Systems**

This section provides instructions for:

- Removing the SEC cartridge and heat sink
- Installing the new SEC cartridge and heat sink

### **Removing the SEC Cartridge and Heat Sink**

**NOTICE: Follow the instructions in “Precautionary Measures” to ensure that the system is properly shut down and disconnected from all power sources. Ensure that the system configuration screens are recorded as described in “Before You Begin.”**

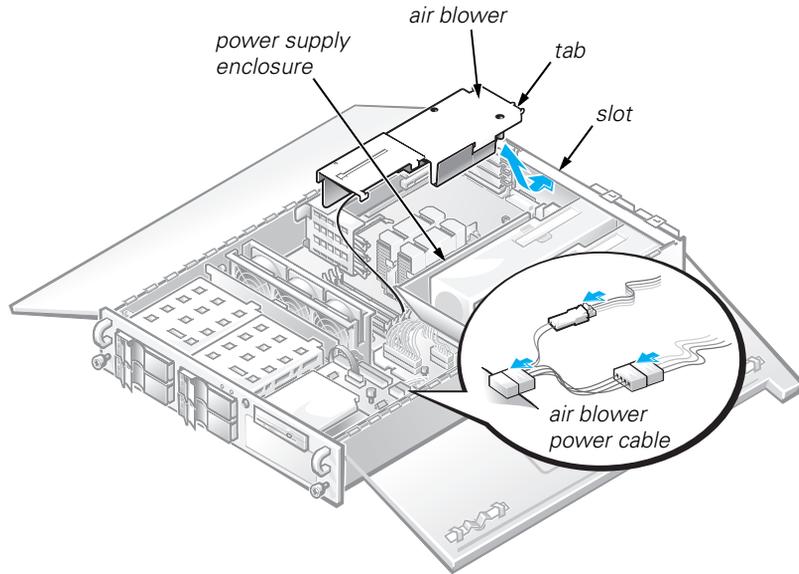
1. Turn off the system, including any attached peripherals, and disconnect the power cable from the electrical outlet.
2. Open the system cover.

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

3. Remove the air blower, if present (see Figure 1-4).
  - a. Unplug the Y-shaped air blower power cable from the interposer board.
  - b. Position your right thumb on the outside of the power supply enclosure beside the narrower front part of the air blower.
  - c. Push firmly on the power supply enclosure to move it slightly away from the air blower and allow extra clearance to remove the air blower.
  - d. With your left hand, pull the front of the air blower upward and away from the power supplies to unseat it. You should hear it unsnap.

By pulling the air blower slightly away from the power supplies, you avoid the need to use excessive force to clear the power supply enclosure.

- e. Slide the air blower slightly up and toward the front of the chassis until the metal tab at the back right of the air blower slides out of the small slot at the top back of the chassis.



**Figure 1-4. Removing the Air Blower**

4. Remove the SEC cartridge and heat sink as follows.

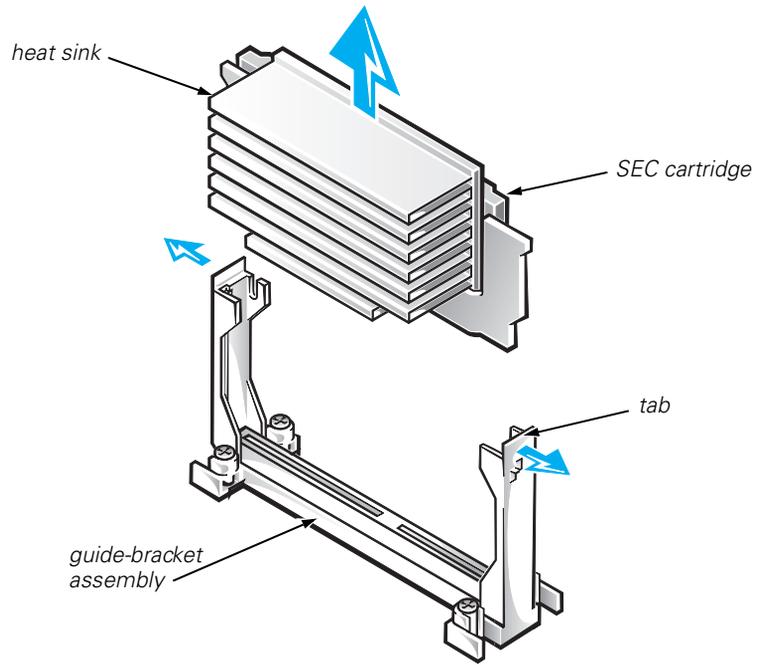


**CAUTION: The SEC cartridge and heat sink can become extremely hot during system operation. Be sure that they have had sufficient time to cool before you touch them.**



**CAUTION: When handling the SEC cartridge and heat sink, take care to avoid sharp edges on the heat sink.**

- a. Pull the tab on one side of the guide-bracket assembly away from the end of the heat sink and pull up slightly on the SEC cartridge and heat sink (see Figure 1-5).
- b. Pull the tab on the other end of the guide-bracket assembly to disengage the tab on the heat sink. Then lift the SEC cartridge and heat sink away from the guide-bracket assembly (see Figure 1-5).



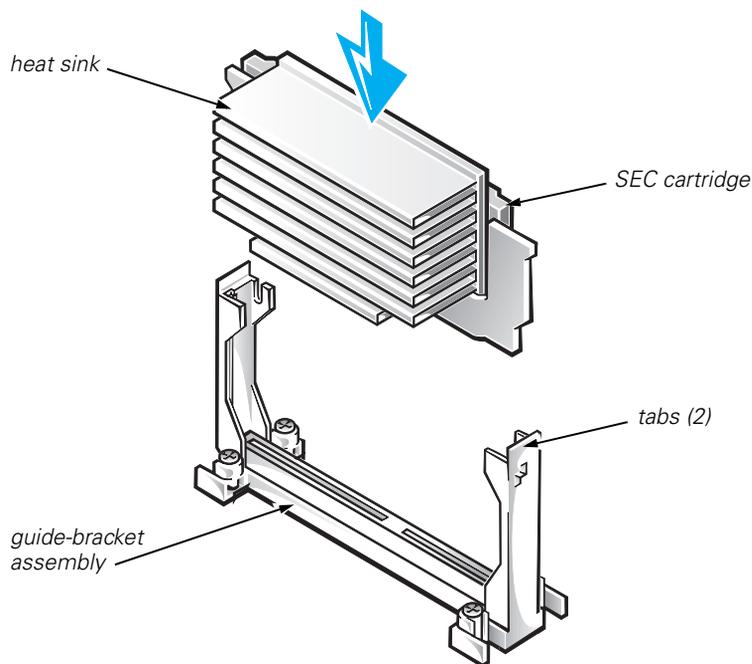
**Figure 1-5. Removing the SEC Cartridge and Heat Sink From the PowerEdge 2450**

## **Installing the New SEC Cartridge and Heat Sink**

**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.**

**NOTICE: The terminator card must be rated to run at 133 MHz.**

1. Slide the SEC cartridge and heat sink into the guide-bracket assembly, and firmly seat them in the assembly until the tabs snap into place over the ends of the heat sink (see Figure 1-6).



**Figure 1-6. Installing the SEC Cartridge and Heat Sink Into the PowerEdge 2450**

2. Replace the air blower housing assembly, if it was removed in step 3 of the previous procedure.
3. Replace the system cover.
4. Reconnect your system and peripherals to their power sources.

# Upgrading the Microprocessor or Installing a Secondary Microprocessor in PowerEdge 4400 Systems

Each microprocessor is contained within an SEC cartridge and heat sink assembly. The system board has two guide-bracket assemblies, which hold the SEC cartridge and heat sink assemblies. If your system has only one microprocessor, the secondary guide-bracket assembly must contain a terminator card.

If you add a second microprocessor to the system, its maximum speed need not match that of the primary microprocessor, but the internal operating speed of the faster microprocessor will be reduced to match the speed of the slower microprocessor.

**NOTICE: If you are upgrading a system by installing a secondary microprocessor, you must order an upgrade kit from Dell. The upgrade kit from Dell contains the correct version of the microprocessor for use as a secondary microprocessor.**

## Removing a Terminator Card

To remove a terminator card, perform the following steps.

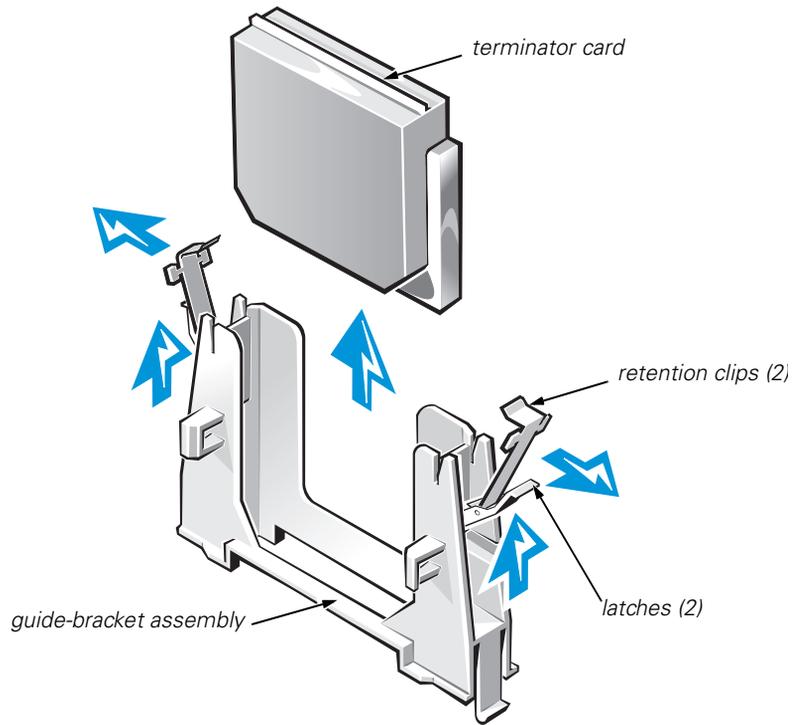


**WARNING: Before you perform this procedure, you must turn off the computer and disconnect it from its AC power source. For more information, see "Safety First—For You and Your Computer" in the Dell PowerEdge Systems Installation and Troubleshooting Guide.**

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.

**NOTICE: See "Protecting Against Electrostatic Discharge" in the safety instructions at the front of your system Installation and Troubleshooting Guide.**

2. Remove the computer cover.
3. Remove the cooling shroud.
4. Lift the latches on each end of the guide-bracket assembly (see Figure 1-7).



**Figure 1-7. Removing a Terminator Card**

5. Pivot the retention clips away from the guide-bracket assembly.
6. Slide the terminator card out of the guide-bracket assembly.

### ***Installing a Terminator Card***

To install a terminator card in the guide-bracket assembly, perform the following steps:

1. Slide the terminator card into the guide-bracket assembly until the edge connector on the terminator card is firmly seated in the connector on the system board.
2. Place the retention clips on each end of the guide bracket in the notches on the ends of the guide bracket, and then close the two latches to secure the terminator card in the bracket.

### ***Removing the SEC Cartridge and Heat Sink Assembly***

To remove the SEC cartridge and heat sink assembly, perform the following steps.



**CAUTION:** The SEC cartridge and heat sink assembly can get extremely hot during system operation. Be sure that the assembly has had sufficient time to cool before you touch it.



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



**WARNING:** Before you perform this procedure, you must turn off the computer and disconnect it from its AC power source. For more information, see "Safety First—For You and Your Computer" in the *Dell PowerEdge Systems Installation and Troubleshooting Guide*.

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.

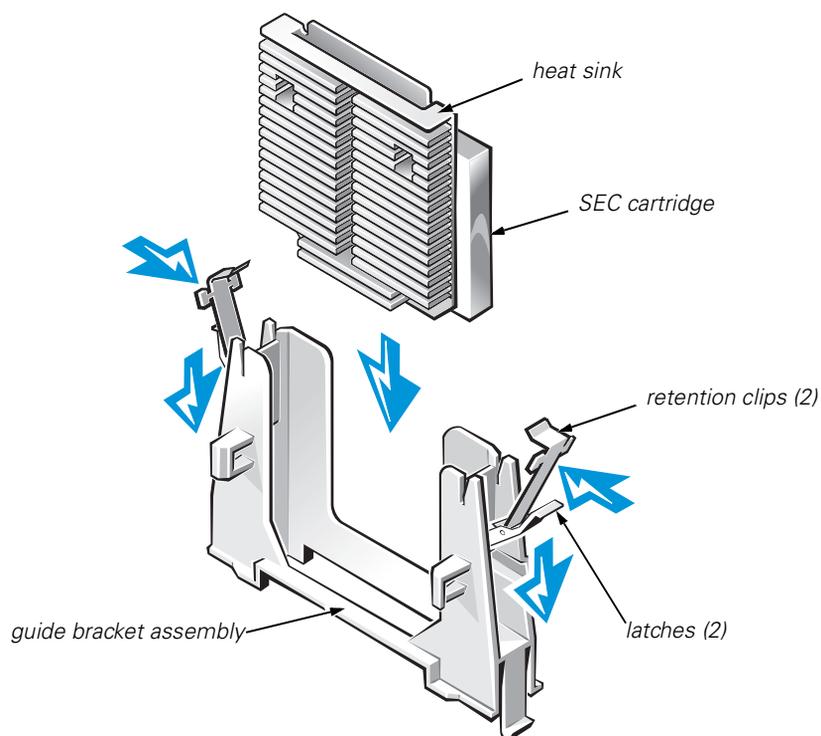
**NOTICE:** See "Protecting Against Electrostatic Discharge" in the safety instructions at the front of your system *Installation and Troubleshooting Guide*.

2. Remove the computer cover.
3. Remove the cooling shroud.
4. Lift the latches on each end of the guide-bracket assembly.
5. Pivot the retention clips away from the guide-bracket assembly.
6. Slide the SEC cartridge and heat sink assembly out of the guide-bracket assembly.

## Replacing the SEC Cartridge and Heat Sink Assembly

To install the replacement SEC cartridge and heat sink assembly, perform the following steps:

1. Remove the terminator card or old SEC cartridge from the guide bracket assembly.
2. Slide the SEC cartridge and heat sink assembly into the guide-bracket assembly until the edge connector on the SEC cartridge is firmly seated in the connector on the system board (see Figure 1-8).
3. Place the retention clips on each end of the guide bracket in the notches on the ends of the guide bracket, and then close the two latches to secure the SEC cartridge and heat sink assembly in the bracket.
4. Replace the cooling shroud and computer cover.



**Figure 1-8. Replacing an SEC Cartridge and Heat Sink Assembly**

