

# Dell™ Vostro™ 420/220/220s Service Manual

**Models:** DCSCLF, DCSCMF, DCSCSF

# Notes, Notices, and Cautions

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
-  **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 potential for property damage, personal injury, or death.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

---

**Information in this document is subject to change without notice.**

**© 2008 Dell Inc. All rights reserved.**

Reproduction of this material in any manner whatsoever without the written permission of Dell Inc. is strictly forbidden.

Trademarks used in this text: *Dell*, the *DELL* logo, and *Vostro* are trademarks of Dell Inc.; *Intel* is a registered trademark of Intel Corporation in the U.S. and other countries; *Microsoft*, *Windows*, *Windows Vista*, and the *Windows Vista* start button logo are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries; *Bluetooth* is a registered trademark owned by Bluetooth SIG, Inc., and is used by Dell under license.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Inc. disclaims any proprietary interest in trademarks and trade names other than its own.

**Models: DCSCLF, DCSCMF, DCSCSF**

**September 2009 Rev. A01**

# Contents

<b>1 Troubleshooting . . . . .</b>	<b>9</b>
<b>    Tools . . . . .</b>	<b>9</b>
Power Lights . . . . .	9
Beep Codes . . . . .	10
System Messages . . . . .	12
Hardware Troubleshooter . . . . .	12
<b>    Dell Diagnostics . . . . .</b>	<b>13</b>
When to Use the Dell Diagnostics . . . . .	13
Starting the Dell Diagnostics From Your Hard Drive . . . . .	13
Starting the Dell Diagnostics From the Drivers and Utilities Disc . . . . .	15
Dell Diagnostics Main Menu . . . . .	16
<b>    Solving Problems . . . . .</b>	<b>18</b>
Battery Problems . . . . .	19
Drive Problems . . . . .	19
Error Messages . . . . .	21
IEEE 1394 Device Problems . . . . .	21
Keyboard Problems . . . . .	22
Lockups and Software Problems . . . . .	23
Memory Problems . . . . .	25
Mouse Problems . . . . .	25
Network Problems . . . . .	26
Power Problems . . . . .	27
Printer Problems . . . . .	28
Scanner Problems . . . . .	29

Sound and Speaker Problems . . . . .	30
Video and Monitor Problems . . . . .	31
<b>Dell Technical Update Service . . . . .</b>	<b>33</b>
<b>Dell Support Utility. . . . .</b>	<b>33</b>
Accessing the Dell Support Utility . . . . .	33
Clicking the Dell Support Icon . . . . .	33
Double-Clicking the Dell Support Icon . . . . .	34
<b>2 Working on Your Computer . . . . .</b>	<b>35</b>
<b>Recommended Tools. . . . .</b>	<b>35</b>
<b>Before Working on Your Computer . . . . .</b>	<b>35</b>
Turning Off Your Computer . . . . .	36
<b>Inside View of Your Computer . . . . .</b>	<b>37</b>
<b>System Board Components. . . . .</b>	<b>40</b>
<b>After Working on Your Computer . . . . .</b>	<b>45</b>
<b>3 Computer Cover . . . . .</b>	<b>47</b>
<b>Removing the Computer Cover. . . . .</b>	<b>47</b>
<b>Replacing the Computer Cover . . . . .</b>	<b>48</b>
<b>4 Bezel . . . . .</b>	<b>51</b>
<b>Removing the Bezel . . . . .</b>	<b>51</b>
<b>Replacing the Bezel . . . . .</b>	<b>53</b>

<b>5</b>	<b>Chassis Support Bracket . . . . .</b>	<b>55</b>
	<b>Removing the Chassis Support Bracket . . . . .</b>	<b>55</b>
	<b>Replacing the Chassis Support Bracket . . . . .</b>	<b>57</b>
<b>6</b>	<b>PCI and PCI Express Cards . . . . .</b>	<b>59</b>
	<b>Removing a PCI or PCI Express Card . . . . .</b>	<b>59</b>
	<b>Installing a PCI or PCI Express Card . . . . .</b>	<b>60</b>
	<b>Configuring Your Computer After Removing or             Installing a PCI or PCI Express Card . . . . .</b>	<b>63</b>
<b>7</b>	<b>Drives . . . . .</b>	<b>65</b>
	<b>Hard Drives . . . . .</b>	<b>65</b>
	<b>Removing a Hard Drive . . . . .</b>	<b>65</b>
	<b>Replacing or Adding a Hard Drive . . . . .</b>	<b>69</b>
	<b>Media Card Reader . . . . .</b>	<b>73</b>
	<b>Removing a Media Card Reader . . . . .</b>	<b>73</b>
	<b>Replacing or Adding a Media Card Reader . . . . .</b>	<b>77</b>
	<b>Optical Drive . . . . .</b>	<b>80</b>
	<b>Removing an Optical Drive . . . . .</b>	<b>80</b>
	<b>Replacing or Adding an Optical Drive . . . . .</b>	<b>82</b>
	<b>Removing a Drive Bay Break-Away Metal Plate . . . . .</b>	<b>85</b>
	<b>Vostro 420 and Vostro 220 . . . . .</b>	<b>85</b>
	<b>Vostro 220s . . . . .</b>	<b>86</b>

<b>8</b>	<b>I/O Panel . . . . .</b>	<b>89</b>
	<b>Removing the I/O Panel . . . . .</b>	<b>89</b>
	<b>Replacing the I/O Panel . . . . .</b>	<b>91</b>
<b>9</b>	<b>Fan . . . . .</b>	<b>93</b>
	<b>Removing the Chassis Fan . . . . .</b>	<b>93</b>
	<b>Replacing the Chassis Fan . . . . .</b>	<b>97</b>
<b>10</b>	<b>Processor Heat Sink/Fan Assembly . . .</b>	<b>99</b>
	<b>Removing the Processor Heat Sink/Fan Assembly . . .</b>	<b>99</b>
	<b>Replacing the Processor Heat Sink/Fan Assembly . . . . .</b>	<b>101</b>
<b>11</b>	<b>Memory Module(s) . . . . .</b>	<b>103</b>
	<b>Removing Memory Modules . . . . .</b>	<b>103</b>
	<b>Replacing or Adding a Memory Module. . . . .</b>	<b>104</b>
<b>12</b>	<b>Power Supply . . . . .</b>	<b>107</b>
	<b>Removing the Power Supply . . . . .</b>	<b>107</b>
	<b>Replacing the Power Supply . . . . .</b>	<b>109</b>
	<b>DC Power Supply Connectors . . . . .</b>	<b>110</b>
	<b>DC Power Supply Connector Pin Assignments . . . . .</b>	<b>112</b>

<b>13 Coin-Cell Battery</b>	<b>117</b>
<b>Removing the Coin-Cell Battery</b>	<b>117</b>
<b>Replacing the Coin-Cell Battery</b>	<b>118</b>
<b>14 System Board</b>	<b>119</b>
<b>Remove the System Board</b>	<b>119</b>
<b>Replacing a System Board</b>	<b>121</b>
<b>15 Processor</b>	<b>125</b>
<b>Removing the Processor</b>	<b>125</b>
<b>Replacing the Processor</b>	<b>126</b>
<b>16 System Setup Program</b>	<b>129</b>
<b>Overview</b>	<b>129</b>
<b>Entering the System Setup Program</b>	<b>129</b>
<b>System Setup Program Screens</b>	<b>130</b>
<b>System Setup Program Options</b>	<b>130</b>
<b>Boot Sequence</b>	<b>133</b>
Option Settings	133
Changing Boot Sequence for the Current Boot	133
Changing Boot Sequence for Future Boots	134
<b>Clearing Forgotten Passwords</b>	<b>134</b>

<b>Clearing CMOS Settings</b>	<b>135</b>
<b>BIOS</b>	<b>136</b>
Flashing the BIOS From the Hard Drive	136
<b>17 Contacting Dell</b>	<b>137</b>

# Troubleshooting

## Tools

### Power Lights



**CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

The power button light located on the front of the computer illuminates and blinks or remains solid to indicate different states:

- If the power light is blue and the computer is not responding, see "Beep Codes" on page 10.
- If the power light is blinking blue, the computer is in standby mode. Press a key on the keyboard, move the mouse, or press the power button to resume normal operation.
- If the power light is off, the computer is either turned off or is not receiving power.
  - Reseat the power cable into both the power connector on the back of the computer and the electrical outlet.
  - If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and that the power strip is turned on.
  - Bypass power protection devices, power strips, and power extension cables to verify that the computer turns on properly.
  - Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
  - Ensure that the main power cable and front panel cable are securely connected to the system board (see "System Board Components" on page 40).
- If the power light is blinking amber, the computer is receiving electrical power, but an internal power problem may exist.

- Ensure that the voltage selection switch is set to match the AC power at your location, if applicable.
- Ensure that the processor power cable is securely connected to the system board (see "System Board Components" on page 40).
- If the power light is steady amber, a device may be malfunctioning or incorrectly installed.
  - Remove and then reinstall the memory modules (see "Replacing or Adding a Memory Module" on page 104).
  - Remove and then reinstall any cards (see "PCI and PCI Express Cards" on page 59).
- Eliminate interference. Some possible causes of interference are:
  - Power, keyboard, and mouse extension cables
  - Too many devices on a power strip
  - Multiple power strips connected to the same electrical outlet

## **Beep Codes**

Your computer may emit a series of beeps during start-up if the monitor cannot display errors or problems. For example, one possible beep code may consist of three short, repeated beeps indicating that the computer has encountered a possible system board failure.

If your computer emits a series of beeps during start-up:

- 1** Write down the beep code.
- 2** Run the Dell Diagnostics to further identify the problem. (see "Dell Diagnostics" on page 13).

---

<b>Code (repetitive short beeps)</b>	<b>Description</b>	<b>Suggested Resolution</b>
1	BIOS checksum failure. Possible system board failure.	Contact Dell (see "Contacting Dell" on page 137).

---

<b>Code (repetitive short beeps)</b>	<b>Description</b>	<b>Suggested Resolution</b>
2	No memory modules are detected.	<ul style="list-style-type: none"> <li>• If two or more memory modules are installed, remove the modules (see "Replacing or Adding a Memory Module" on page 104), and then reinstall one module and restart the computer. If the computer starts normally, continue to install additional memory modules (one at a time) until you have identified a faulty module or reinstalled all modules without error.</li> <li>• If available, install working memory of the same type into your computer (see "Replacing or Adding a Memory Module" on page 104).</li> <li>• If the problem persists, contact Dell (see "Contacting Dell" on page 137).</li> </ul>
3	Possible system board failure.	Contact Dell (see "Contacting Dell" on page 137).
4	RAM Read/Write failure.	<ul style="list-style-type: none"> <li>• Ensure that no special requirements for memory module/connector placement exist (see "Replacing or Adding a Memory Module" on page 104).</li> <li>• Ensure that the memory you are using is supported by your computer.</li> <li>• If the problem persists, contact Dell (see "Contacting Dell" on page 137).</li> </ul>
5	Real time clock failure. Possible battery or system board failure.	<ul style="list-style-type: none"> <li>• Replace the battery (see "Coin-Cell Battery" on page 117).</li> <li>• If the problem persists, contact Dell (see "Contacting Dell" on page 137).</li> </ul>
6	Video BIOS Test Failure.	Contact Dell (see "Contacting Dell" on page 137).

## System Messages

 **NOTE:** If the message you received is not listed in the table, see the documentation for either the operating system or the program that was running when the message appeared.

**ALERT! PREVIOUS ATTEMPTS AT BOOTING THIS SYSTEM HAVE FAILED AT CHECKPOINT [NNNN]. FOR HELP IN RESOLVING THIS PROBLEM, PLEASE NOTE THIS CHECKPOINT AND CONTACT DELL TECHNICAL SUPPORT** — The computer failed to complete the boot routine three consecutive times for the same error (see "Contacting Dell" on page 137).

**CMOS CHECKSUM ERROR** — Possible system board failure or RTC battery low. Replace the battery (see "Replacing the Coin-Cell Battery" on page 118).

**CPU FAN FAILURE** — Processor heat sink/fan failure. Replace the heat sink/fan assembly (see "Processor Heat Sink/Fan Assembly" on page 99).

**HARD-DISK READ FAILURE** — Possible hard drive failure during hard drive boot test.

**KEYBOARD FAILURE** — Keyboard failure or keyboard cable loose (see "Keyboard Problems" on page 22).

**NO BOOT DEVICE AVAILABLE** — The system cannot detect a bootable device or partition.

- If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device.
- Enter the system setup program (see "System Setup Program" on page 129) and ensure that the boot sequence information is correct.

**NO TIMER TICK INTERRUPT** — A chip on the system board might be malfunctioning or system board failure (see "System Setup Program" on page 129 for assistance).

**NOTICE – HARD DRIVE SELF MONITORING SYSTEM HAS REPORTED THAT A PARAMETER HAS EXCEEDED ITS NORMAL OPERATING RANGE. DELL RECOMMENDS THAT YOU BACK UP YOUR DATA REGULARLY. A PARAMETER OUT OF RANGE MAY OR MAY NOT INDICATE A POTENTIAL HARD DRIVE PROBLEM.** — S.M.A.R.T error, possible hard drive failure. This feature can be enabled or disabled in BIOS setup.

## Hardware Troubleshooter

If a device is either not detected during the operating system setup or is detected, but incorrectly configured, you can use the Hardware Troubleshooter to resolve the incompatibility.

*Windows® XP:*

- 1 Click Start→Help and Support.

- 2** Type hardware troubleshooter in the search field and press <Enter> to start the search.
- 3** In the Fix a Problem section, click Hardware Troubleshooter.
- 4** In the Hardware Troubleshooter list, select the option that best describes the problem and click Next to follow the remaining troubleshooting steps.

Windows Vista®:

- 1** Click the Windows Vista start button , and click Help and Support.
- 2** Type hardware troubleshooter in the search field and press <Enter> to start the search.
- 3** In the search results, select the option that best describes the problem and follow the remaining troubleshooting steps.

## Dell Diagnostics

 **CAUTION:** Before you begin any of the procedures in this section, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### When to Use the Dell Diagnostics

If you experience a problem with your computer, perform the checks in this section, and then run the Dell Diagnostics before contacting Dell for assistance.

Start the Dell Diagnostics from your hard drive or from the *Drivers and Utilities* disc provided with your computer.

 **NOTE:** The *Drivers and Utilities* disc is optional and may not ship with your computer.

 **NOTE:** The Dell Diagnostics only operate on Dell computers.

### Starting the Dell Diagnostics From Your Hard Drive

Before running the Dell Diagnostics, enter the system setup program (see "System Setup Program" on page 129) to review your computer's configuration information, and ensure that the device you want to test is displayed in the system setup program and is active.

The Dell Diagnostics is located on a separate diagnostic utility partition on your hard drive.

 **NOTE:** If your computer does not display a screen image, contact Dell (see "Contacting Dell" on page 137).

- 1 Ensure that the computer is connected to an electrical outlet that is known to be working properly.
- 2 Turn on (or restart) your computer.
- 3 When the DELL logo appears, press <F12> immediately.

 **NOTE:** Keyboard failure may result when a key is held down for extended periods of time. To avoid possible keyboard failure, press and release <F12> in even intervals to open the **Boot Device Menu**.

If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop, and then shut down your computer and try again.

- 4 Use the up- and down-arrow keys to select **Diagnostics** from the boot menu and then press <Enter>.
-  **NOTE:** If you see a message stating that no diagnostics utility partition has been found, run the Dell Diagnostics from your *Drivers and Utilities* disc (see "Starting the Dell Diagnostics From the Drivers and Utilities Disc" on page 15).
- 5 Press any key to start the Dell Diagnostics from the diagnostics utility partition on your hard drive.
- 6 Press <Tab> to select **Test System** and then press <Enter>.
-  **NOTE:** It is recommended that you select **Test System** to run a complete test on your computer. Selecting **Test Memory** initiates the extended memory test, which can take up to thirty minutes or more to complete. When the test completes, record the test results and then press any key to return to the previous menu.
- 7 At the Dell Diagnostics Main Menu, left-click with the mouse, or press <Tab> and then <Enter>, to select the test you want to run (see "Dell Diagnostics Main Menu" on page 16).
-  **NOTE:** Write down any error codes and problem descriptions exactly as they appear and follow the instructions on the screen.
- 8 After all tests have completed, close the test window to return to the Dell Diagnostics Main Menu.

- 9 Close the Main Menu window to exit the Dell Diagnostics and restart the computer.

## Starting the Dell Diagnostics From the Drivers and Utilities Disc

Before running the Dell Diagnostics, enter the system setup program (see "System Setup Program" on page 129) to review your computer's configuration information, and ensure that the device you want to test is displayed in the system setup program and is active.

- 1 Insert the *Drivers and Utilities* disc into the optical drive.
- 2 Restart your computer.
- 3 When the DELL logo appears, press **<F12>** immediately.



**NOTE:** Keyboard failure may result when a key is held down for extended periods of time. To avoid possible keyboard failure, press and release **<F12>** in even intervals to open the **Boot Device Menu**.

If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop, and then shut down your computer and try again.

- 4 When the boot device list appears, use the up- or down- arrow keys to highlight **CD/DVD/CD-RW Drive** then press **<Enter>**.
- 5 Press any key to confirm that you want to start from the CD/DVD.
- 6 Type **1** to Run the **32 Bit Dell Diagnostics**.
- 7 At the **Dell Diagnostics Menu**, type **1** to select **Dell 32-bit Diagnostics for Resource CD (graphical user interface)**.
- 8 Press **<Tab>** to select **Test System** and then press **<Enter>**.

 **NOTE:** It is recommended that you select **Test System** to run a complete test on your computer. Selecting **Test Memory** initiates the extended memory test, which can take up to thirty minutes or more to complete. When the test completes, record the test results and then press any key to return to the previous menu.

- 9 At the Dell Diagnostics Main Menu, left-click with the mouse, or press <Tab> and then <Enter>, to select the test you want to run (see "Dell Diagnostics Main Menu" on page 16).
- 10  **NOTE:** Write down any error codes and problem descriptions exactly as they appear and follow the instructions on the screen.
- 11 After all tests have completed, close the test window to return to the Dell Diagnostics Main Menu.
- 12 Close the Main Menu window to exit the Dell Diagnostics and restart the computer.
- 13 Remove the *Drivers and Utilities* disc from the optical drive.

## Dell Diagnostics Main Menu

After the Dell Diagnostics loads the following menu appears:

Option	Function
Test Memory	Run the stand-alone memory test
Test System	Run system diagnostics
Exit	Exit the diagnostics

Press <Tab> to select the test you want to run and then press <Enter>.

 **NOTE:** It is recommended that you select **Test System** to run a complete test on your computer. Selecting **Test Memory** initiates the extended memory test, which can take up to thirty minutes or more to complete. When the test completes, record the test results and then press any key to return to this menu.

After **Test System** is selected, the following menu appears:

Option	Function
Express Test	<p>Performs a quick test of devices in the system. This typically can take 10 to 20 minutes.</p> <p><b>NOTE:</b> The Express Test requires no interaction on your part. Run Express Test first to increase the possibility of tracing a problem quickly.</p>
Extended Test	<p>Performs a thorough check of devices in the system. This typically can take an hour or more.</p> <p><b>NOTE:</b> The Extended Test periodically requires your input to answer specific questions.</p>
Custom Test	Use to test a specific device or customize the tests to be run.
Symptom Tree	This option allows you to select tests based on a symptom of the problem you are having. This option lists the most common symptoms.



**NOTE:** It is recommended that you select **Extended Test** to perform a more thorough check of devices in the computer.

For any problem encountered during a test, a message appears with an error code and a description of the problem. Write down the error code and problem description exactly as it appears and follow the instructions on the screen. If you cannot resolve the problem, contact Dell (see "Contacting Dell" on page 137).



**NOTE:** When contacting Dell support, have your Service Tag ready. The Service Tag for your computer is located at the top of each test screen.

The following tabs provide additional information for tests run from the **Custom Test** or **Symptom Tree** option:

Tab	Function
Results	Displays the results of the test and any error conditions encountered.

Tab	Function ( <i>continued</i> )
Errors	Displays error conditions encountered, error codes, and the problem description.
Help	Describes the test and any requirements for running the test.
Configuration	Displays the hardware configuration for the selected device.  The Dell Diagnostics obtains configuration information for all devices from the system setup program, memory, and various internal tests, and displays the information in the device list in the left pane of the screen.
	<b>NOTE:</b> The device list may not display the names of all components installed on your computer or all devices attached to your computer.
Parameters	Allows you to customize the test, if applicable, by changing the test settings.

## Solving Problems

Follow these tips when troubleshooting your computer:

- If you added or removed a part before the problem started, review the installation procedures and ensure that the part is correctly installed.
- If a peripheral device does not work, ensure that the device is properly connected.
- If an error message appears on the screen, write down the exact message. This message may help support personnel diagnose and fix the problem(s).
- If an error message occurs in a program, see the program's documentation.



**NOTE:** The procedures in this document were written for the Windows default view, so they may not apply if you set your Dell™ computer to the Windows Classic view.

## Battery Problems

**!** **CAUTION:** There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

**!** **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**REPLACE THE BATTERY** — If you have to repeatedly reset time and date information after turning on the computer, or if an incorrect time or date displays during start-up, replace the battery (see "Coin-Cell Battery" on page 117). If the battery still does not work properly, contact Dell at support.dell.com.

## Drive Problems

**!** **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### ENSURE THAT MICROSOFT® WINDOWS® RECOGNIZES THE DRIVE —

Windows XP:

- Click Start and click My Computer.

Windows Vista®:

- Click the Windows Vista Start button  and click Computer.

If the drive is not listed, perform a full scan with your antivirus software to check for and remove viruses. Viruses can sometimes prevent Windows from recognizing the drive.

**TEST THE DRIVE** — Insert another disc to eliminate the possibility that the original drive is defective.

**CLEAN THE DRIVE OR DISK** — See "Cleaning Your Computer" in the *Setup and Quick Reference Guide*.

### CHECK THE CABLE CONNECTIONS

**RUN THE HARDWARE TROUBLESHOOTER** — See "Hardware Troubleshooter" on page 12.

**RUN THE DELL DIAGNOSTICS** — See "Dell Diagnostics" on page 13.

## **Optical drive problems**

 **NOTE:** High-speed optical drive vibration is normal and may cause noise, which does not indicate a defect in the drive or the media.

 **NOTE:** Because of different regions worldwide and different disc formats, not all DVD titles work in all DVD drives.

### **ADJUST THE WINDOWS VOLUME CONTROL —**

- Click the speaker icon in the lower-right corner of your screen.
- Ensure that the volume is turned up by clicking the sidebar and dragging it up.
- Ensure that the sound is not muted by clicking any boxes that are checked.

**CHECK THE SPEAKERS AND SUBWOOFER —** See "Sound and Speaker Problems" on page 30.

## **Problems writing to an optical drive**

**CLOSE OTHER PROGRAMS —** The optical drive must receive a steady stream of data during the writing process. If the stream is interrupted, an error occurs. Try closing all programs before you write to the optical.

**TURN OFF STANDBY MODE IN WINDOWS BEFORE WRITING TO A DISC —** Search for the keyword *standby* in Windows Help and Support for information on power management modes.

## **Hard drive problems**

### **RUN CHECK DISK —**

*Windows XP:*

- 1 Click Start and click My Computer.
- 2 Right-click Local Disk C:.
- 3 Click Properties→Tools→Check Now.
- 4 Click Scan for and attempt recovery of bad sectors and click Start.

*Windows Vista:*

- 1 Click Start  and click Computer.
- 2 Right-click Local Disk C:.
- 3 Click Properties→Tools→Check Now.

The User Account Control window may appear. If you are an administrator on the computer, click Continue; otherwise, contact your administrator to continue the desired action.

- 4 Follow the instructions on the screen.

## Error Messages

**!** **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

If the error message is not listed, see the documentation for the operating system or the program that was running when the message appeared.

**A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ : \* ? " < > | —** Do not use these characters in filenames.

**A REQUIRED .DLL FILE WAS NOT FOUND —** The program that you are trying to open is missing an essential file. To remove and then reinstall the program:

*Windows XP:*

- 1 Click Start→Control Panel→Add or Remove Programs→Programs and Features.
- 2 Select the program you want to remove.
- 3 Click Uninstall.
- 4 See the program documentation for installation instructions.

*Windows Vista:*

- 1 Click Start  → Control Panel→Programs→Programs and Features.
- 2 Select the program you want to remove.
- 3 Click Uninstall.
- 4 See the program documentation for installation instructions.

**drive letter :\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY —** The drive cannot read the disk. Insert a disk into the drive and try again.

**INSERT BOOTABLE MEDIA —** Insert a bootable CD or DVD.

**NOT ENOUGH MEMORY OR RESOURCES. CLOSE SOME PROGRAMS AND TRY AGAIN —** Close all windows and open the program that you want to use. In some cases, you may have to restart your computer to restore computer resources. If so, run the program that you want to use first.

**OPERATING SYSTEM NOT FOUND —** Contact Dell (see "Contacting Dell" on page 137).

## IEEE 1394 Device Problems

**!** **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **NOTE:** Your computer supports only IEEE 1394a standard.

**ENSURE THAT THE CABLE FOR THE IEEE 1394 DEVICE IS PROPERLY INSERTED INTO THE DEVICE AND INTO THE CONNECTOR ON THE COMPUTER**

**ENSURE THAT THE IEEE 1394 DEVICE IS ENABLED IN SYSTEM SETUP** — See "System Setup Program" on page 129 for assistance.

**ENSURE THAT THE IEEE 1394 DEVICE IS RECOGNIZED BY WINDOWS** —

*Windows XP:*

- 1 Click Start and click Control Panel.
- 2 Under Pick a Category, click Performance and Maintenance → System → System Properties → Hardware → Device Manager.

*Windows Vista:*

- 1 Click Start  → Control Panel → Hardware and Sound.
- 2 Click Device Manager.

If your IEEE 1394 device is listed, Windows recognizes the device.

**IF YOU HAVE PROBLEMS WITH A DELL IEEE 1394 DEVICE** — Contact Dell (see "Contacting Dell" on page 137).

**IF YOU HAVE PROBLEMS WITH AN IEEE 1394 DEVICE NOT PROVIDED BY DELL** —

Contact the IEEE 1394 device manufacturer.

## Keyboard Problems

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**CHECK THE KEYBOARD CABLE** —

- Ensure that the keyboard cable is firmly connected to the computer.
- Shut down the computer (see "Before Working on Your Computer" on page 35), reconnect the keyboard cable as shown on the setup diagram for your computer, and then restart the computer.
- Ensure that the cable is not damaged or frayed and check cable connectors for bent or broken pins. Straighten any bent pins.
- Remove any keyboard extension cables and connect the keyboard directly to the computer.

**TEST THE KEYBOARD** — Connect a properly working keyboard to the computer, and

then try using the keyboard.

**RUN THE HARDWARE TROUBLESHOOTER** — See "Hardware Troubleshooter" on page 12.

## Lockups and Software Problems

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### The computer does not start up

**CHECK THE DIAGNOSTIC LIGHTS** — See "Power Lights" on page 9.

**ENSURE THAT THE POWER CABLE IS FIRMLY CONNECTED TO THE COMPUTER AND TO THE ELECTRICAL OUTLET**

### The computer stops responding

 **NOTICE:** You may lose data if you are unable to perform an operating system shutdown.

**TURN THE COMPUTER OFF** — If you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds (until the computer turns off), and then restart your computer.

### A program stops responding

**END THE PROGRAM** —

- 1 Press <Ctrl><Shift><Esc> simultaneously to access the Task Manager.
- 2 Click the Applications tab.
- 3 Click to select the program that is no longer responding.
- 4 Click End Task.

### A program crashes repeatedly

 **NOTE:** Most software includes installation instructions in its documentation or on a CD or DVD.

**CHECK THE SOFTWARE DOCUMENTATION** — If necessary, uninstall and then reinstall the program.

## **A program is designed for an earlier Windows operating system**

### **RUN THE PROGRAM COMPATIBILITY WIZARD —**

*Windows XP:*

The Program Compatibility Wizard configures a program so that it runs in an environment similar to non-XP operating system environments.

**1** Click Start→All Programs→Accessories→Program Compatibility Wizard→Next.

**2** Follow the instructions on the screen.

*Windows Vista:*

The Program Compatibility Wizard configures a program so that it runs in an environment similar to non-Windows Vista operating system environments.

**1** Click Start  → Control Panel→ Programs→ Use an older program with this version of Windows.

**2** In the welcome screen, click Next.

**3** Follow the instructions on the screen.

## **A solid blue screen appears**

**TURN THE COMPUTER OFF —** If you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds (until the computer turns off), and then restart your computer.

## **Other software problems**

### **CHECK THE SOFTWARE DOCUMENTATION OR CONTACT THE SOFTWARE MANUFACTURER FOR TROUBLESHOOTING INFORMATION —**

- Ensure that the program is compatible with the operating system installed on your computer.
- Ensure that your computer meets the minimum hardware requirements needed to run the software. See the software documentation for information.
- Ensure that the program is installed and configured properly.
- Verify that the device drivers do not conflict with the program.
- If necessary, uninstall and then reinstall the program.

### **BACK UP YOUR FILES IMMEDIATELY**

### **USE A VIRUS-SCANNING PROGRAM TO CHECK THE HARD DRIVE, CDs, OR DVDs**

### **SAVE AND CLOSE ANY OPEN FILES OR PROGRAMS AND SHUT DOWN YOUR**

## **COMPUTER THROUGH THE START MENU**

### **Memory Problems**

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

#### **IF YOU RECEIVE AN INSUFFICIENT MEMORY MESSAGE —**

- Save and close any open files and exit any open programs you are not using to see if that resolves the problem.
- See the software documentation for minimum memory requirements. If necessary, install additional memory (see "Replacing or Adding a Memory Module" on page 104).
- Reseat the memory modules to ensure that your computer is successfully communicating with the memory.
- Run the Dell Diagnostics (see "Dell Diagnostics" on page 13).

#### **IF YOU EXPERIENCE OTHER MEMORY PROBLEMS —**

- Reseat the memory modules (see "Replacing or Adding a Memory Module" on page 104) to ensure that your computer is successfully communicating with the memory.
- Ensure that you are following the memory installation guidelines.
- Ensure that the memory you are using is supported by your computer. For more information about the type of memory supported by your computer, see "Specifications" in the *Setup and Quick Reference Guide*.
- Run the Dell Diagnostics (see "Dell Diagnostics" on page 13).

### **Mouse Problems**

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

#### **CHECK THE MOUSE CABLE —**

- Ensure that the cable is not damaged or frayed and check cable connectors for bent or broken pins. Straighten any bent pins.
- Remove any mouse extension cables, and connect the mouse directly to the computer.

- Verify that the mouse cable is connected as shown on the setup diagram for your computer.

#### **RESTART THE COMPUTER —**

- 1 Simultaneously press <Ctrl><Esc> to display the **Start** menu.
- 2 Press <u>, press the up- and down-arrow keys to highlight **Shut down or Turn Off**, and then press <Enter>.
- 3 After the computer turns off, reconnect the mouse cable as shown on the setup diagram.
- 4 Turn on the computer.

**TEST THE MOUSE —** Connect a properly working mouse to the computer, and then try using the mouse.

#### **CHECK THE MOUSE SETTINGS —**

*Windows XP*

- 1 Click Start→Control Panel→Mouse.
- 2 Adjust the settings as needed.

*Windows Vista:*

- 1 Click Start  → Control Panel→ Hardware and Sound→ Mouse.
- 2 Adjust the settings as needed.

#### **REINSTALL THE MOUSE DRIVER**

**RUN THE HARDWARE TROUBLESHOOTER —** See "Hardware Troubleshooter" on page 12.

### **Network Problems**

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**CHECK THE NETWORK CABLE CONNECTOR —** Ensure that the network cable is firmly inserted into the network connector on the back of the computer and the network jack.

**CHECK THE NETWORK LIGHTS ON THE BACK OF THE COMPUTER —** If the link integrity light is off (see "About Your Computer" in the *Setup and Quick Reference Guide*), no network communication is occurring. Replace the network cable.

#### **RESTART THE COMPUTER AND LOG ON TO THE NETWORK AGAIN**

**CHECK YOUR NETWORK SETTINGS —** Contact your network administrator or the person who set up your network to verify that your network settings are correct and

that the network is functioning.

**RUN THE HARDWARE TROUBLESHOOTER** — See "Hardware Troubleshooter" on page 12.

## Power Problems

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**IF THE POWER LIGHT IS BLUE AND THE COMPUTER IS NOT RESPONDING** — See "Power Lights" on page 9.

**IF THE POWER LIGHT IS BLINKING BLUE** — The computer is in standby mode. Press a key on the keyboard, move the mouse, or press the power button to resume normal operation.

**IF THE POWER LIGHT IS OFF** — The computer is either turned off or is not receiving power.

- Reseat the power cable in the power connector on the back of the computer and the electrical outlet.
- Bypass power strips, power extension cables, and other power protection devices to verify that the computer turns on properly.
- Ensure that any power strips being used are plugged into an electrical outlet and are turned on.
- Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
- Ensure that the main power cable and front panel cable are securely connected to the system board (see "System Board Components" on page 40).

**IF THE POWER LIGHT IS BLINKING AMBER, BEEP CODE 3** — The computer is receiving electrical power, but a system board failure may exist.

- Ensure that the voltage selection switch is set to match the AC power at your location (if applicable).
- Ensure that all components and cables are properly installed and securely connected to the system board (see "System Board Components" on page 40).

**IF THE POWER LIGHT IS STEADY AMBER** — A device may be malfunctioning or incorrectly installed.

- Ensure that the processor power cable is securely connected to the system board power connector (POWER2) (see "System Board Components" on page 40).

- Remove and then reinstall all memory modules (see "Replacing or Adding a Memory Module" on page 104).
- Remove and then reinstall any expansion cards, including graphics cards (see "PCI and PCI Express Cards" on page 59).

**ELIMINATE INTERFERENCE** — Some possible causes of interference are:

- Power, keyboard, and mouse extension cables
- Too many devices connected to the same power strip
- Multiple power strips connected to the same electrical outlet

## Printer Problems

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **NOTE:** If you need technical assistance for your printer, contact the printer's manufacturer.

**CHECK THE PRINTER DOCUMENTATION** — See the printer documentation for setup and troubleshooting information.

### ENSURE THAT THE PRINTER IS TURNED ON

### CHECK THE PRINTER CABLE CONNECTIONS —

- See the printer documentation for cable connection information.
- Ensure that the printer cables are securely connected to the printer and the computer.

**TEST THE ELECTRICAL OUTLET** — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

### VERIFY THAT THE PRINTER IS RECOGNIZED BY WINDOWS —

*Windows XP:*

- 1 Click Start→Control Panel→Printers and Other Hardware→View installed printers or fax printers.
- 2 If the printer is listed, right-click the printer icon.
- 3 Click Properties→Ports. For a parallel printer, ensure that the Print to the following port(s): setting is LPT1 (Printer Port). For a USB printer, ensure that the Print to the following port(s): setting is USB.

*Windows Vista:*

- 1 Click Start  → Control Panel→Hardware and Sound→Printer.
- 2 If the printer is listed, right-click the printer icon.

**3** Click Properties and click Ports.

**4** Adjust the settings, as needed.

**REINSTALL THE PRINTER DRIVER** — See the printer documentation for information on reinstalling the printer driver.

## Scanner Problems



**CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).



**NOTE:** If you need technical assistance for your scanner, contact the scanner's manufacturer.

**CHECK THE SCANNER DOCUMENTATION** — See the scanner documentation for setup and troubleshooting information.

**UNLOCK THE SCANNER** — Ensure that your scanner is unlocked (if the scanner has a locking tab or button).

### RESTART THE COMPUTER AND TRY THE SCANNER AGAIN

### CHECK THE CABLE CONNECTIONS —

- See the scanner documentation for information on cable connections.
- Ensure that the scanner cables are securely connected to the scanner and the computer.

### VERIFY THAT THE SCANNER IS RECOGNIZED BY MICROSOFT WINDOWS —

*Windows XP:*

**1** Click Start→Control Panel→Printers and Other Hardware→Scanners and Cameras.

**2** If your scanner is listed, Windows recognizes the scanner.

*Windows Vista:*

**1** Click Start → Control Panel→ Hardware and Sound→ Scanners and Cameras.

**2** If the scanner is listed, Windows recognizes the scanner.

**REINSTALL THE SCANNER DRIVER** — See the scanner documentation for instructions.

## Sound and Speaker Problems

**!** **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### No sound from speakers

**Note:** The volume control in MP3 and other media players may override the Windows volume setting. Always check to ensure that the volume on the media player(s) has not been turned down or off.

**CHECK THE SPEAKER CABLE CONNECTIONS** — Ensure that the speakers are connected as shown on the setup diagram supplied with the speakers. If you purchased a sound card, ensure that the speakers are connected to the card.

**ENSURE THAT THE SUBWOOFER AND THE SPEAKERS ARE TURNED ON** — See the setup diagram supplied with the speakers. If your speakers have volume controls, adjust the volume, bass, or treble to eliminate distortion.

**ADJUST THE WINDOWS VOLUME CONTROL** — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

**DISCONNECT HEADPHONES FROM THE HEADPHONE CONNECTOR** — Sound from the speakers is automatically disabled when headphones are connected to the computer's front-panel headphone connector.

**TEST THE ELECTRICAL OUTLET** — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

**ELIMINATE POSSIBLE INTERFERENCE** — Turn off nearby fans, fluorescent lights, or halogen lamps to check for interference.

### RUN THE SPEAKER DIAGNOSTICS

### REINSTALL THE SOUND DRIVER

**RUN THE HARDWARE TROUBLESHOOTER** — See "Hardware Troubleshooter" on page 12.

### No sound from headphones

**CHECK THE HEADPHONE CABLE CONNECTION** — Ensure that the headphone cable is securely inserted into the headphone connector (see "Inside View of Your Computer" on page 37).

**ADJUST THE WINDOWS VOLUME CONTROL** — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that

the sound is not muted.

## Video and Monitor Problems

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **NOTICE:** If your computer came with a PCI graphics card installed, removal of the card is not necessary when installing additional graphics cards; however, the card is required for troubleshooting purposes. If you remove the card, store it in a safe and secure location. For information about your graphics card, go to [support.dell.com](http://support.dell.com).

### The screen is blank

 **NOTE:** For troubleshooting procedures, see the monitor's documentation.

### The screen is difficult to read

#### CHECK THE MONITOR CABLE CONNECTION —

- Ensure that the monitor cable is connected to the correct graphics card.
- If you are using the optional DVI-to-VGA adapter, ensure that the adapter is correctly attached to the graphics card and monitor.
- Ensure that the monitor cable is connected as shown on the setup diagram for your computer.
- Remove any video extension cables and connect the monitor directly to the computer.
- Swap the computer and monitor power cables to determine if the monitor's power cable is defective.
- Check the connectors for bent or broken pins (it is normal for monitor cable connectors to have missing pins).

#### CHECK THE MONITOR POWER LIGHT —

- If the power light is lit or blinking, the monitor has power.
- If the power light is off, firmly press the button to ensure that the monitor is turned on.
- If the power light is blinking, press a key on the keyboard or move the mouse to resume normal operation.

**TEST THE ELECTRICAL OUTLET —** Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

**CHECK THE DIAGNOSTIC LIGHTS** — See "Power Lights" on page 9.

**CHECK THE MONITOR SETTINGS** — See the monitor documentation for instructions on adjusting the contrast and brightness, demagnetizing (degaussing) the monitor, and running the monitor self-test.

**MOVE THE SUBWOOFER AWAY FROM THE MONITOR** — If your speaker system includes a subwoofer, ensure that the subwoofer is positioned at least 60 centimeters (2 feet) away from the monitor.

**MOVE THE MONITOR AWAY FROM EXTERNAL POWER SOURCES** — Fans, fluorescent lights, halogen lamps, and other electrical devices can cause the screen image to appear *shaky*. Turn off nearby devices to check for interference.

**ROTATE THE MONITOR TO ELIMINATE SUNLIGHT GLARE AND POSSIBLE INTERFERENCE**

**ADJUST THE WINDOWS DISPLAY SETTINGS** —

*Windows XP:*

- 1 Click Start→Control Panel→Appearance and Themes.
- 2 Click the area you want to change or click the Display icon.
- 3 Try different settings for Color quality and Screen resolution.

*Windows Vista:*

- 1 Click Start  → Control Panel→Hardware and Sound→Personalization→Display Settings.
- 2 Adjust Resolution and Colors settings, as needed.

### **3D image quality is poor**

**CHECK THE GRAPHICS CARD POWER CABLE CONNECTION** — Ensure that the power cable for the graphics card(s) is correctly attached to the card.

**CHECK THE MONITOR SETTINGS** — See the monitor documentation for instructions on adjusting the contrast and brightness, demagnetizing (degaussing) the monitor, and running the monitor self-test.

### **Only part of the display is readable**

**CONNECT AN EXTERNAL MONITOR** —

- 1 Shut down your computer and connect an external monitor to the computer.
- 2 Turn on the computer and the monitor and adjust the monitor brightness and contrast controls.

If the external monitor works, the computer display or video controller may be

defective. Contact Dell (see "Contacting Dell" on page 137).

## Dell Technical Update Service

The Dell Technical Update service provides proactive e-mail notification of software and hardware updates for your computer. The service is free and can be customized for content, format, and how frequently you receive notifications.

To enroll for the Dell Technical Update service, go to [support.dell.com/technicalupdate](http://support.dell.com/technicalupdate).

## Dell Support Utility

The Dell Support Utility is installed on your computer and available from the Dell Support, , icon on the taskbar or from the **Start** button. Use this support utility for self-support information, software updates, and health scans of your computing environment.

### Accessing the Dell Support Utility

Access the Dell Support Utility from the  icon on the taskbar or from the **Start** menu.

If the Dell Support icon does not appear in your taskbar:

- 1 Click **Start**→**All Programs**→**Dell Support**→**Dell Support Settings**.
- 2 Ensure that the **Show icon on the taskbar** option is checked.

**NOTE:** If the Dell Support Utility is not available from the **Start** menu, go to [support.dell.com](http://support.dell.com) and download the software.

The Dell Support Utility is customized for your computing environment.

The  icon in the taskbar functions differently when you click, double-click, or right-click the icon.

### Clicking the Dell Support Icon

Click or right-click the  icon to perform the following tasks:

- Check your computing environment.
- View the Dell Support Utility settings.
- Access the help file for the Dell Support Utility.

- View frequently asked questions.
- Learn more about the Dell Support Utility.
- Turn the Dell Support Utility off.

### **Double-Clicking the Dell Support Icon**

Double-click the  icon to manually check your computing environment, view frequently asked questions, access the help file for the Dell Support Utility, and view Dell Support settings.

For more information about the Dell Support Utility, click the question mark (?) at the top of the **Dell Support** screen.

# Working on Your Computer

This document provides procedures for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that:

- You have performed the steps in "Working on Your Computer" on page 35.
- You have read the safety information that shipped with your computer.
- When replacing a component, you have already removed the original, if installed.



**NOTE:** The color of your computer and certain computer components may appear differently than shown in this document.

## Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Phillips screwdriver
- Small plastic scribe
- Flash BIOS update (see the Dell Support website at support.dell.com)

## Before Working on Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help ensure your own personal safety.



**CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).



**CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

 **NOTICE:** When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

 **NOTICE:** To avoid damaging the computer, perform the following steps before you begin working inside the computer.

- 1 Ensure that the work surface is flat and clean to prevent the computer cover from being scratched.
  - 2 Turn off your computer (see "Turning Off Your Computer" on page 36).
-  **NOTICE:** To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.
- 3 Disconnect all telephone or network cables from the computer.
  - 4 Disconnect your computer and all attached devices from their electrical outlets.
  - 5 Press and hold the power button while the system is unplugged to ground the system board.

 **NOTICE:** Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

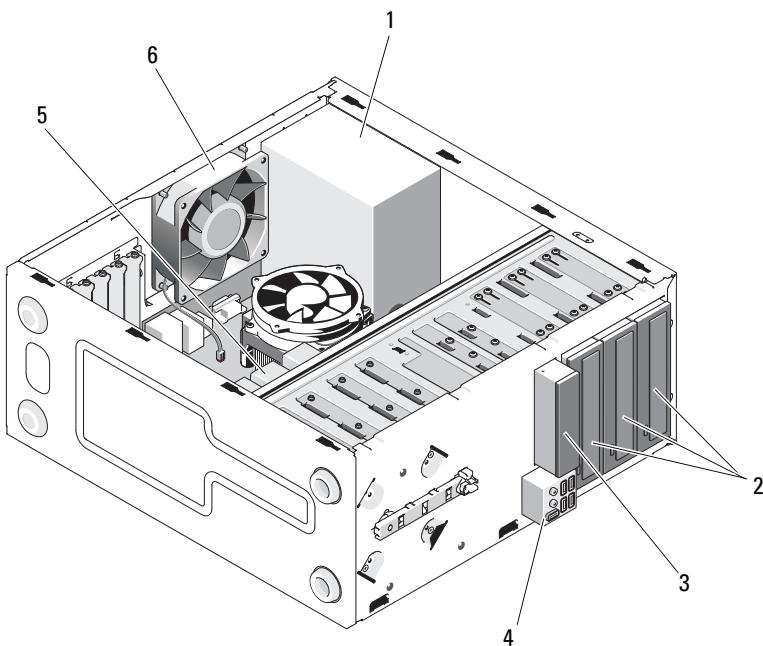
## Turning Off Your Computer

 **NOTICE:** To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

- 1 Shut down the operating system.
- 2 Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 4 seconds to turn them off.

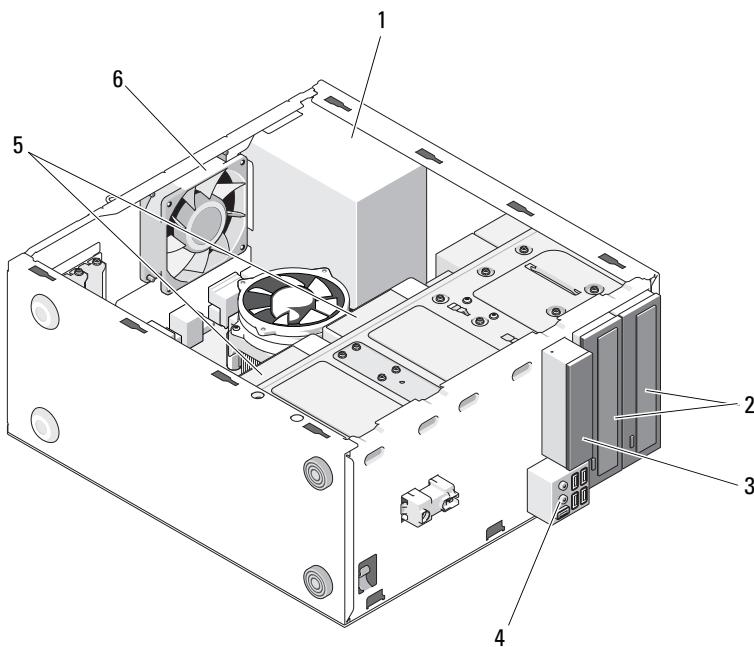
# Inside View of Your Computer

Vostro™ 420



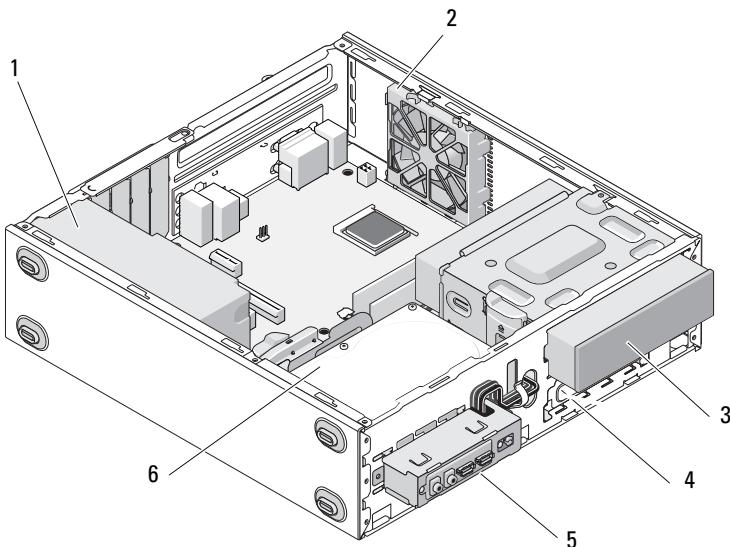
- |                                |                            |
|--------------------------------|----------------------------|
| 1 power supply                 | 2 5.25-inch drive bays (3) |
| 3 media card reader (optional) | 4 I/O panel                |
| 5 3.5-inch hard drive bays (4) | 6 chassis fan              |

## Vostro 220



- |   |                              |   |                          |
|---|------------------------------|---|--------------------------|
| 1 | power supply                 | 2 | 5.25-inch drive bays (2) |
| 3 | media card reader (optional) | 4 | I/O panel                |
| 5 | 3.5-inch hard drive bays (2) | 6 | chassis fan              |

## Vostro 220s

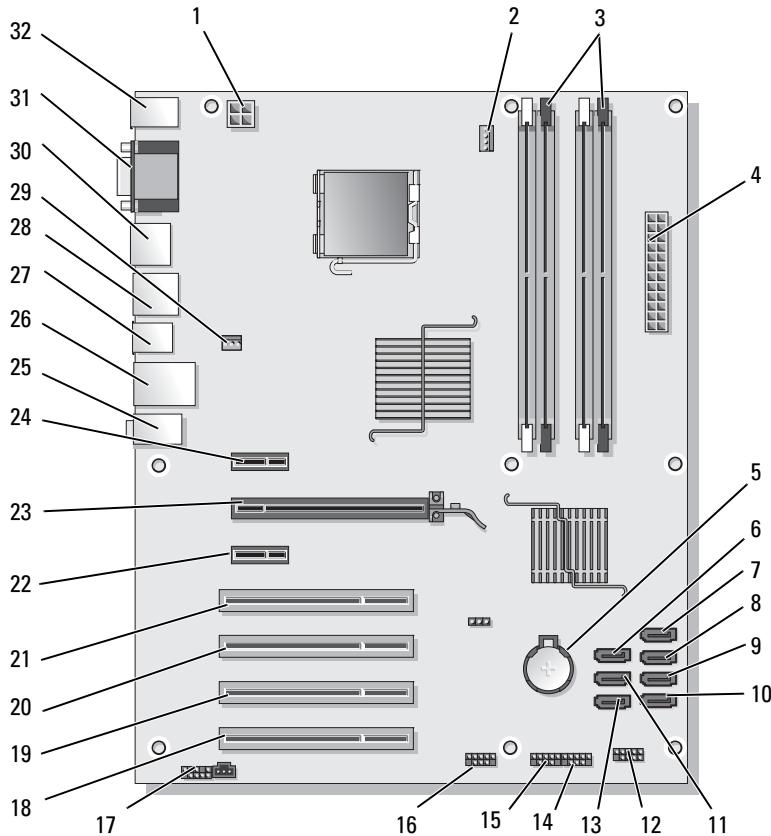


- 1 power supply
- 3 optical drive
- 5 I/O panel

- 2 chassis fan
- 4 media card reader (optional)
- 6 3.5-inch hard drive bays (2)

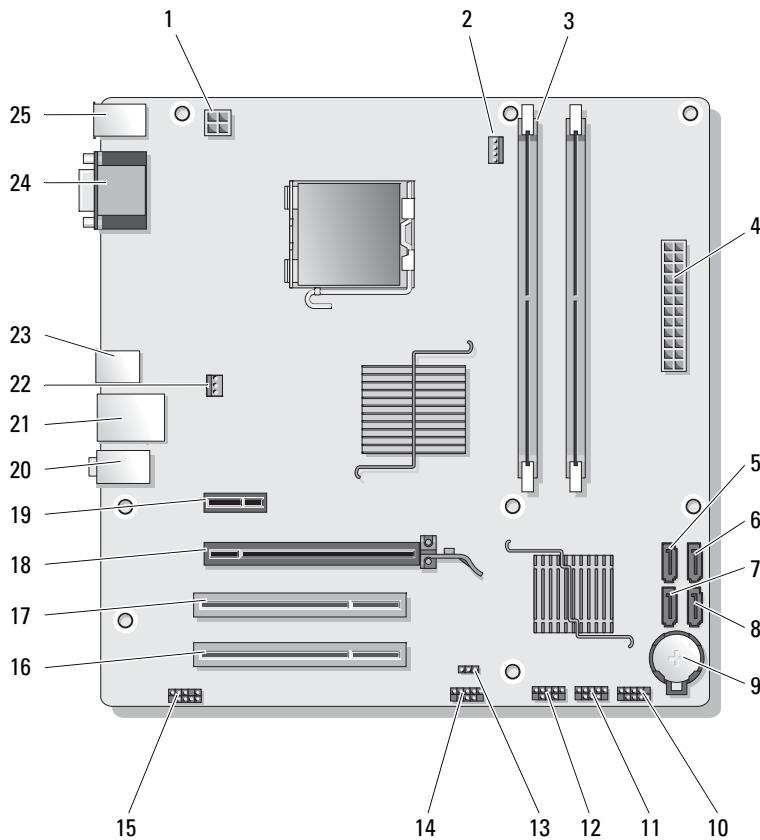
# System Board Components

Vostro 420



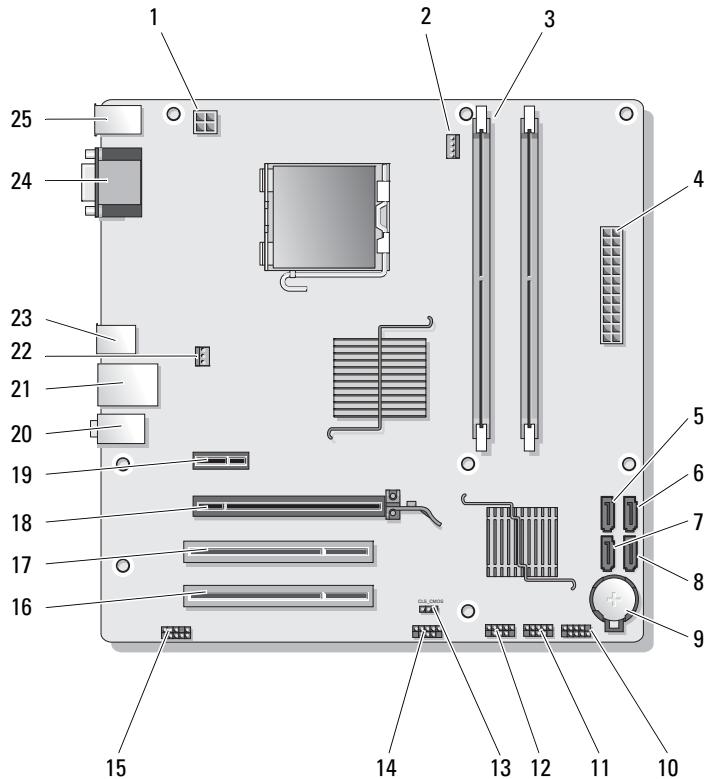
1	power connector (PWR2)	2	processor heat sink/fan assembly power	3	memory module connectors (4) (DIMM_1, DIMM_2, DIMM_3, DIMM_4)
4	main power connector (PWR1)	5	battery socket	6	serial ATA 5.25-inch drive connector (SATA4)
7	serial ATA hard drive connector (SATA3)	8	serial ATA hard drive connector (SATA2)	9	serial ATA hard drive connector (SATA1)
10	serial ATA hard drive connector (SATA0)	11	serial ATA 5.25-drive connector (SATA5)	12	front I/O panel connector
13	serial ATA 5.25-inch drive connector (SATA6)	14	USB1 connector (from front I/O panel)	15	USB2 connector (from front I/O panel)
16	USB3 system board connector	17	audio connector (F_AUDIO)	18	PCI connector (PCI4)
19	PCI connector (PCI3)	20	PCI connector (PCI2)	21	PCI connector (PCI1)
22	PCI Express x1 connector (PCIE_X1 2)	23	PCI Express x16 connector (PCIE_x16)	24	PCI Express x1 connector (PCIE_X1 1)
25	audio connectors	26	one LAN and two USB ports	27	USB ports (2)
28	USB ports (2) and E-SATA connector	29	chassis fan connector	30	Display Port
31	video (VGA) and parallel ports	32	PS/2 mouse and keyboard connectors		

## Vostro 220



1	power connector (PWR2)	2	processor heat sink/fan assembly power	3	memory module connectors (2)
4	main power connector (PWR1)	5	serial ATA drive connector (SATA2)	6	serial ATA drive connector (SATA1)
7	serial ATA drive connector (SATA3)	8	serial ATA drive connector (SATA0)	9	battery socket
10	front I/O panel connector	11	USB1 system board connector (from front I/O panel)	12	USB2 system board connector (from front I/O panel)
13	CMOS jumper (CLEAR CMOS)	14	USB3 system board connector	15	audio connector (AUDIO1) (from front I/O panel)
16	PCI connector (PCI1)	17	PCI connector (PCI2)	18	PCI Express x16 connector (PCIE_x16)
19	PCI Express x1 connector (PCIE_X1)	20	audio connectors	21	one LAN and two USB ports
22	chassis fan power	23	USB ports (2)	24	video connector (VGA)
25	PS/2 mouse and keyboard connectors				

## Vostro 220s



1	power connector (PWR2)	2	processor heat sink/fan assembly power	3	memory module connectors (2)
4	main power connector (PWR1)	5	serial ATA drive connector (SATA2)	6	serial ATA drive connector (SATA1)
7	serial ATA drive connector (SATA3)	8	serial ATA drive connector (SATA0)	9	battery socket
10	front I/O panel connector	11	USB1 system board connector (from front I/O panel)	12	USB2 system board connector (from front I/O panel)
13	CMOS jumper (CLEAR CMOS)	14	USB3 system board connector	15	audio connector (AUDIO1) (from front I/O panel)
16	PCI connector (PCI1)	17	PCI connector (PCI2)	18	PCI Express x16 connector (PCIE_x16)
19	PCI Express x1 connector (PCIE_X1)	20	audio connectors	21	one LAN and two USB ports
22	chassis fan power	23	USB ports (2)	24	video connector (VGA)
25	PS/2 mouse and keyboard connectors				

## After Working on Your Computer

After you have completed any replacement procedures, ensure that you connect any external devices, cards, cables, and so on, before turning on your computer.

- 1 Replace the computer cover (see "Replacing the Computer Cover" on page 48).
  - 2 Connect any telephone or network cables to your computer.
-  **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.
- 3 Connect your computer and all attached devices to their electrical outlets.
  - 4 Turn on your computer.

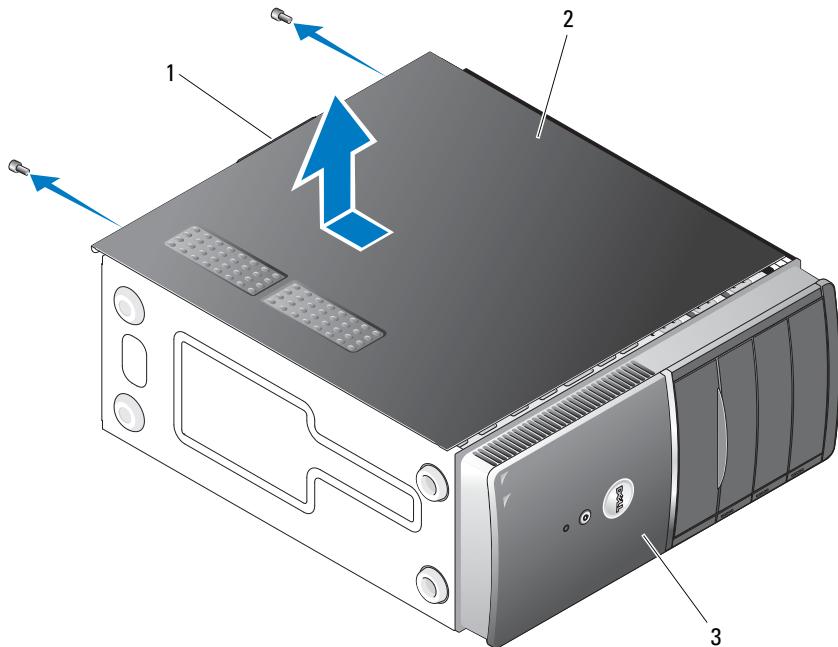
- 5** Verify that the computer works correctly by running the Dell Diagnostics. See your *Setup and Quick Reference Guide* for help running Dell Diagnostics.

# Computer Cover

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **CAUTION:** Do not operate your equipment with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, and so on) removed.
-  **NOTICE:** Ensure that sufficient space exists to support the system with the cover removed—at least 1 ft (30 cm) of desktop space.
-  **NOTICE:** The procedure for removing and replacing the computer cover is identical for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustration provided is for example only and may not represent your particular computer precisely.

## Removing the Computer Cover

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Lay the computer on its side, with the cover facing up.
- 3 Remove the two thumbscrews securing the cover.



1 handle

2 computer cover

3 front of computer, bezel

- 4 Release the computer cover by grasping the handle while sliding the cover away from the front of the computer and lifting it up.

## Replacing the Computer Cover

- 1 Ensure that all cables are connected and folded out of the way.
- 2 Ensure that no tools or extra parts are left inside the computer.
- 3 Ensure that the bezel is attached to the front of the computer (see "Replacing the Bezel" on page 53).



**NOTE:** The bezel must be installed before the cover is installed.

- 4** Holding the cover at a slight angle, slide it toward the front of the computer until the metal clips inside the cover grip and attach securely to the chassis frame beside the front bezel.
- 5** Ensure that the cover is seated and aligned correctly.
- 6** Replace and tighten the two thumbscrews that secure the computer cover.
- 7** Follow the procedure in "After Working on Your Computer" on page 45.

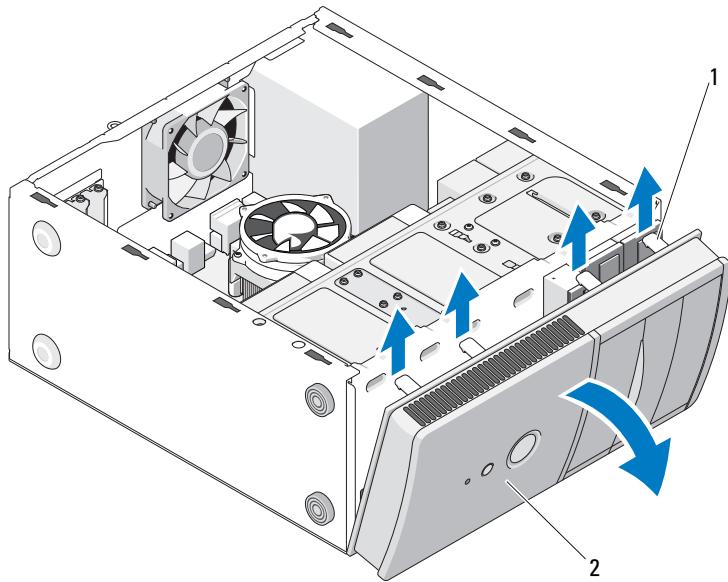


# Bezel

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** The procedure for removing and replacing the bezel is identical for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustrations provided are for example only and may not represent your particular computer precisely.

## Removing the Bezel

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3 With the computer still on its side, gently lift the clips slightly upward to release that edge of the bezel from the chassis.
- 4 Rotate the bezel away from the computer to release the hooks on the opposite edge of the bezel from the chassis.

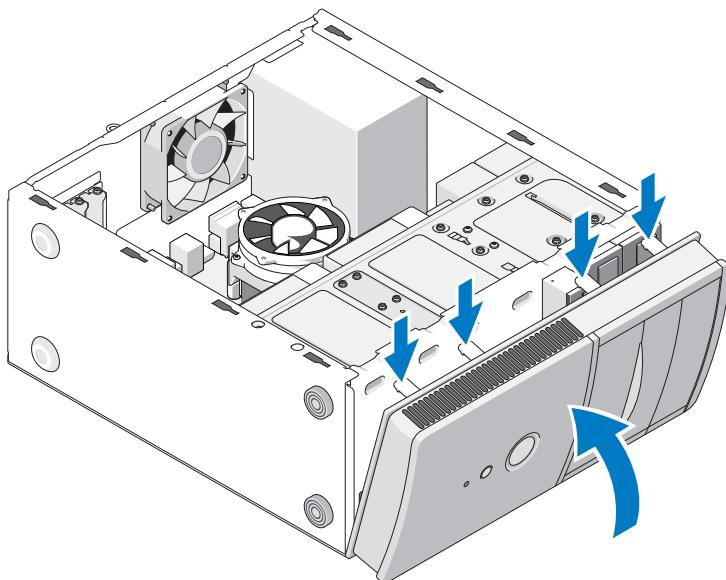


1 clips (4)

2 bezel

## Replacing the Bezel

- 1 With the computer still on its side, align and insert the bezel hooks into the slots along one edge of the front of the computer.
- 2 Rotate the bezel toward the computer until the clips snap into place on the opposite edge of the front of the computer



- 3 Perform the steps in the procedure "After Working on Your Computer" on page 45.



# 5

## Chassis Support Bracket

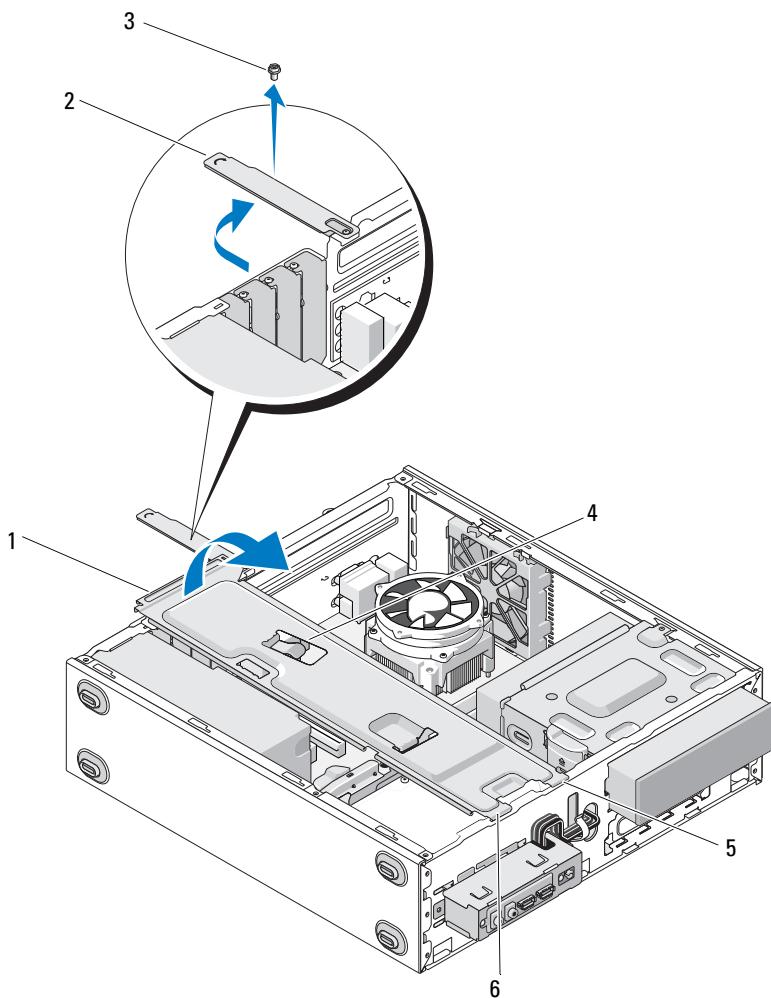
-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

### Removing the Chassis Support Bracket

 **NOTE:** Only the Vostro 220s includes a chassis support bracket. You must remove the bracket before you can remove or replace many of the computer components.

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3 Remove the screw that secures the chassis support bracket.
- 4 Rotate the flange away from the back of the computer.
- 5 Disengage any cables stored in the cable clip at the top of the support bracket.
- 6 Lift the end of the support bracket at the back of the computer.
- 7 Slide the tabs at the other end of the bracket out of the slots in the chassis, and remove the bracket out of the computer.

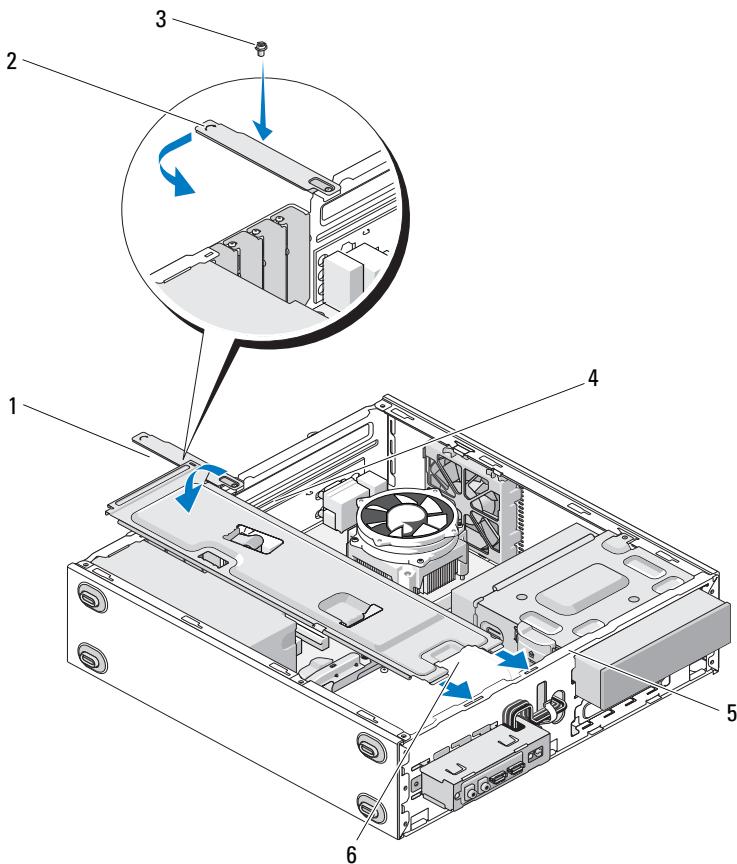
## Vostro 220s



- |   |                         |   |            |
|---|-------------------------|---|------------|
| 1 | chassis support bracket | 2 | flange     |
| 3 | screw                   | 4 | cable clip |
| 5 | tabs (2)                | 6 | slots (2)  |

## **Replacing the Chassis Support Bracket**

- 1** Holding the bracket at an angle, insert the tabs on one end of the bracket into the slots in the chassis.
- 2** While holding the bracket slightly raised, slide any cables as appropriate into the cable clip for storage.
- 3** Lower the other end of the bracket to engage the remaining tab.
- 4** Rotate the flange closed and replace and tighten the securing screw.



1 chassis support bracket

3 screw

5 slots (2)

2 flange

4 cable clip

6 tabs (2)

- 5** Perform the steps in the procedure "After Working on Your Computer" on page 45.

# PCI and PCI Express Cards

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** The procedure for removing and replacing PCI and PCI Express cards is identical (except where noted) for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustrations provided are for example only and may not represent your particular computer precisely.

## Removing a PCI or PCI Express Card

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3 If your computer is a Vostro 220s, remove the chassis support bracket (see "Removing the Chassis Support Bracket" on page 55). Otherwise, proceed to step 4.
- 4 Disconnect any cables connected to the card.
- 5 Remove the screw that secures the card to the back panel of the computer.
- 6 Remove the card from the card connector on the system board:
  - *For a PCI card*, grasp the card by its top corners, and ease it out of its connector.
  - *For a PCI Express card*, rotate the securing tab away from the card while grasping the card by its top corners, and then ease it out of its connector.

- 7** If you are removing the card to replace it with a new card, proceed to step 5 in "Installing a PCI or PCI Express Card" on page 60. Otherwise, proceed to step 8.
  - 8** If you are removing the card permanently, install a filler bracket in the empty card-slot opening at the back of the computer, using the screw you removed in step 5 to secure the filler bracket to the chassis.
-  **NOTE:** Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.
- 9** For the Vostro 220s, replace the chassis support bracket (see "Replacing the Chassis Support Bracket" on page 57).
  - 10** Follow the procedure in "After Working on Your Computer" on page 45.
  - 11** Remove the card's driver from the operating system. See the documentation that accompanied the card for instructions on removing the driver.
  - 12** To complete the removal procedure, see "Configuring Your Computer After Removing or Installing a PCI or PCI Express Card" on page 63.

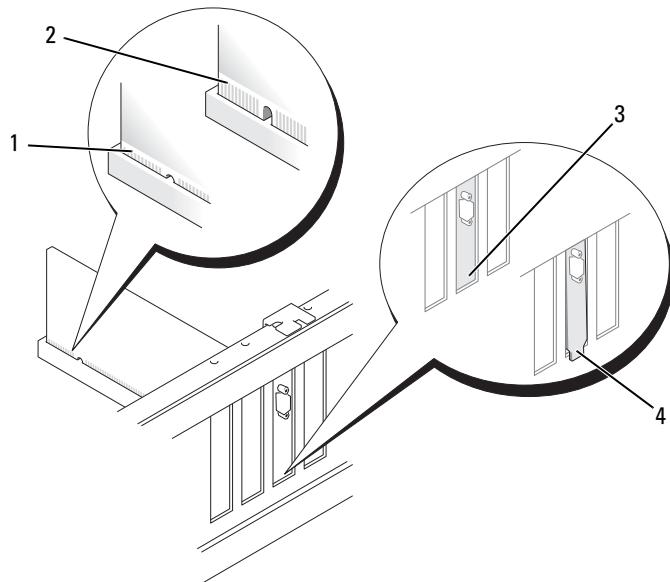
## Installing a PCI or PCI Express Card

- 1** Follow the procedures in "Before Working on Your Computer" on page 35.
- 2** Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3** If you are replacing a card you just removed in "Removing a PCI or PCI Express Card" on page 59, proceed to step 5.
- 4** If you are installing a new card into an empty expansion-card connector:
  - a** For the Vostro 220s, remove the chassis support bracket (see "Removing the Chassis Support Bracket" on page 55).
  - b** Remove the screw securing the filler bracket for that slot at the back of the computer. Set the screw aside for use in installing the card, and store the filler bracket for possible future use.
- 5** Prepare the card for installation.

See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.



**CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.**



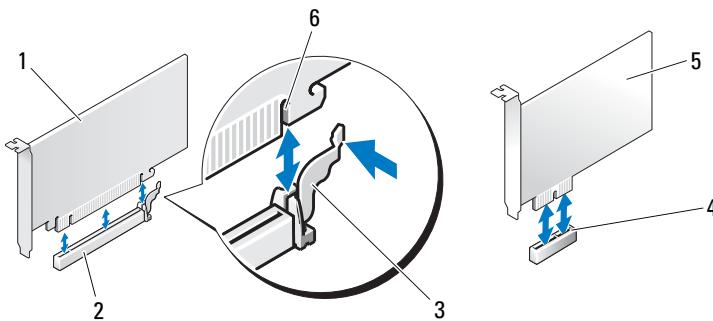
1 fully-seated card

2 not fully-seated card

3 bracket within slot

4 bracket caught outside of slot

- 6** If you are installing a PCI Express card into the x16 card connector, position the card so that the securing slot is aligned with the securing tab.



- |   |  |
|---|--|
| 1 PCI Express x16 card<br>3 securing tab<br>5 PCI Express x1 card | 2 PCI Express x16 card slot<br>4 PCI Express x1 card slot<br>6 securing slot |
|---|--|

- 7 Align the card in the connector and press down firmly. Ensure that the card is fully seated in the connector slot.
- 8 Replace and tighten the screw to secure the card in the slot.
- 9 Connect any cables that should be attached to the card.

See the documentation for the card for information about the card's cable connections.

**NOTICE:** Do not route card cables over or behind the cards, except for Vostro 220s, which provides a cable clip in a chassis support bracket. Cables routed over the cards, in the absence of a cable clip, can prevent the computer cover from closing properly or cause damage to the equipment.

- 10 For the Vostro 220s, replace the chassis support bracket (see "Replacing the Chassis Support Bracket" on page 57).
- 11 Follow the procedure in "After Working on Your Computer" on page 45.
- 12 Install any drivers required for the card as described in the documentation for the card.
- 13 To complete the installation procedure, see "Configuring Your Computer After Removing or Installing a PCI or PCI Express Card" on page 63.

# Configuring Your Computer After Removing or Installing a PCI or PCI Express Card



**NOTE:** For information on installing drivers and software for your card, see the documentation that shipped with the card.

Type of Card	Installed	Removed
Sound Card	<ol style="list-style-type: none"><li>1 Enter the system setup program (see "System Setup Program" on page 129 for instructions).</li><li>2 Go to Integrated Peripherals, select Onboard Audio Controller, and then change the setting to Disabled.</li><li>3 Connect the external audio devices to the sound card's connectors.</li></ol>	<ol style="list-style-type: none"><li>1 Enter the system setup program (see "System Setup Program" on page 129 for instructions).</li><li>2 Go to Integrated Peripherals, select Onboard Audio Controller, and then change the setting to Enabled.</li><li>3 Connect the external audio devices to the computer's back panel connectors.</li></ol>
Network Card	<ol style="list-style-type: none"><li>1 Enter the system setup program (see "System Setup Program" on page 129 for instructions).</li><li>2 Go to Integrated Peripherals, select Onboard LAN Controller, and then change the setting to Disabled, if you prefer not to use both interfaces.</li><li>3 Connect the network cable to the network card's connector.</li></ol>	<ol style="list-style-type: none"><li>1 Enter the system setup program (see "System Setup Program" on page 129 for instructions).</li><li>2 Go to Integrated Peripherals, select Onboard LAN Controller, and then change the setting to Enabled.</li><li>3 Connect the network cable to the network connector on the system board.</li></ol>



# Drives

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** The procedure for removing and replacing drives is identical (except where noted) for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustrations provided are for example only and may not represent your particular computer precisely.

## Hard Drives

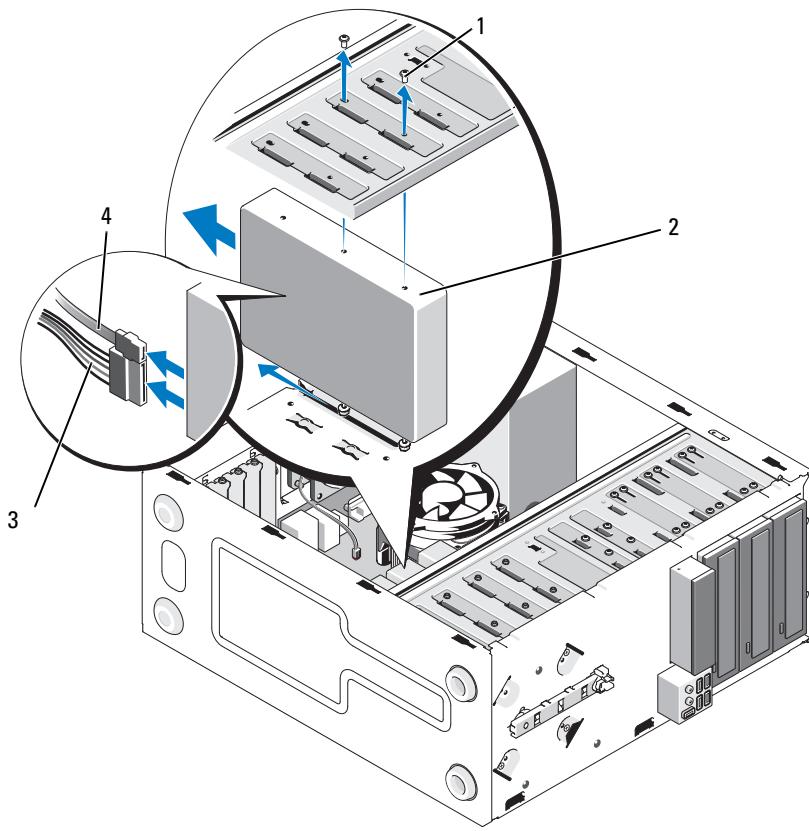
-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a surface, such as a foam pad, that will sufficiently cushion it.
-  **NOTICE:** If you are replacing a hard drive that contains data you want to keep, back up your files before you remove the drive.

### Removing a Hard Drive

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3 For the Vostro 220s, remove the chassis support bracket (see "Removing the Chassis Support Bracket" on page 55).
- 4 Disconnect the power cable and data cable from the back of the drive.
- 5 For the Vostro 420 and Vostro 220:
  - a Remove the screws securing the hard drive to the drive cage.

- b** Slide the drive out of the slot, toward the back of the computer.

**Vostro™420**



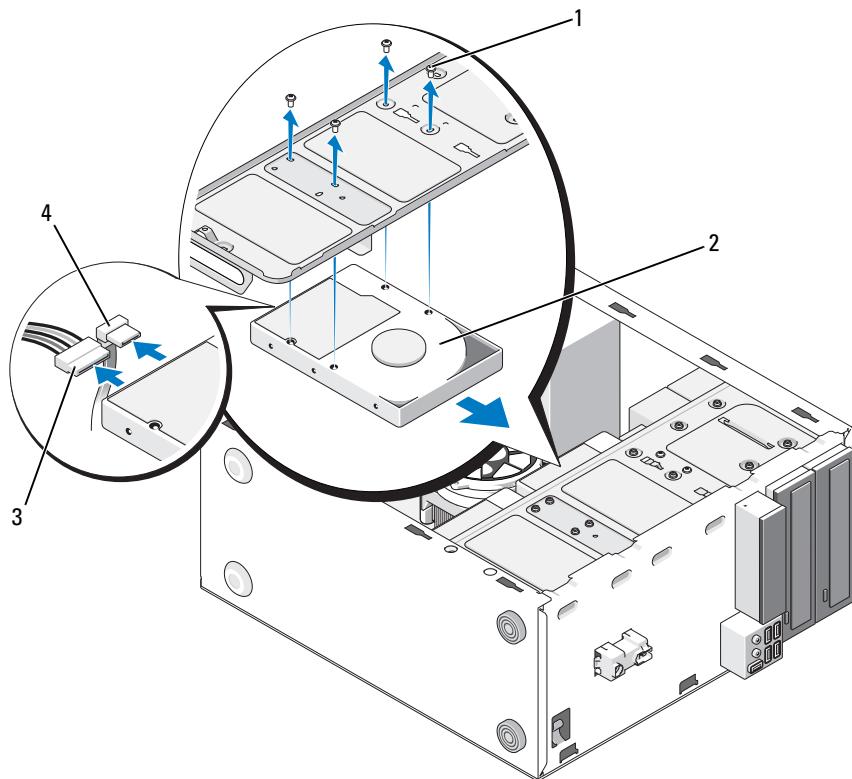
1 screws (4)

3 power cable

2 hard drive

4 data cable

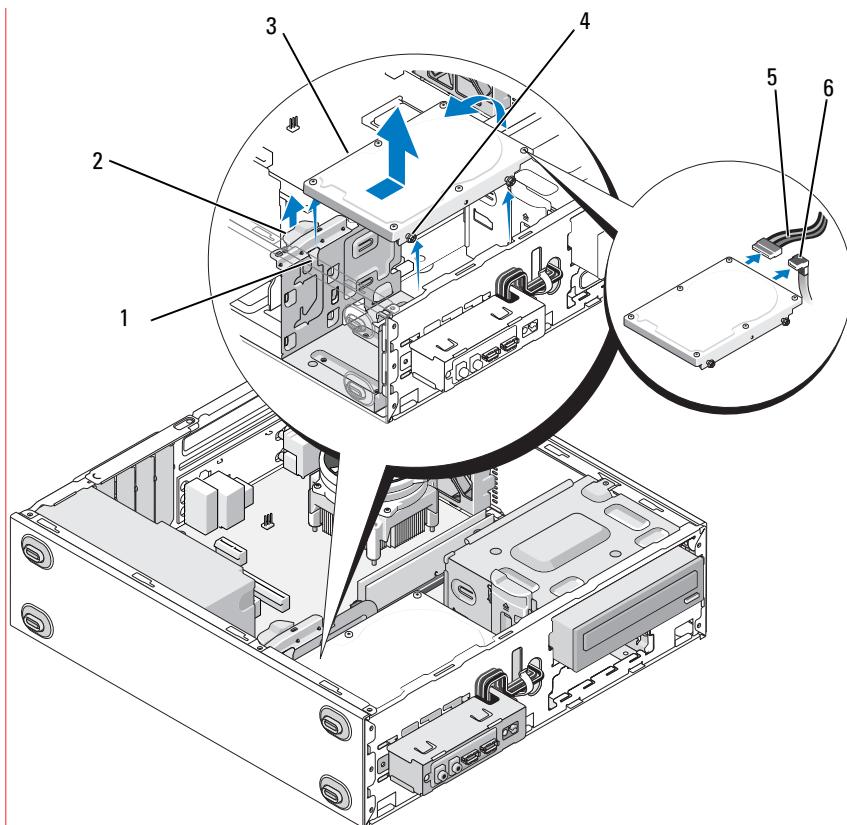
## Vostro 220



- |   |             |   |            |
|---|-------------|---|------------|
| 1 | screws (4)  | 2 | hard drive |
| 3 | power cable | 4 | data cable |

- 6** For the Vostro 220s:
- Raise and hold the hard-drive release latch.
  - Slide the drive partway out of the bay, rotate the back of the drive upward until the drive is perpendicular to the drive cage, and guide the screws through the cutaway channels in the drive cage until you can lift the drive away from the computer.
  - Repeat step a and step b for the second hard drive, if installed.

## Vostro 220s



1 cutaway channels (2)

3 hard drive

5 power cable

2 hard-drive release latch

4 screw guides (4)

6 data cable

**7** If you are installing a replacement drive, skip to step 3 in "Replacing or Adding a Hard Drive" on page 69.

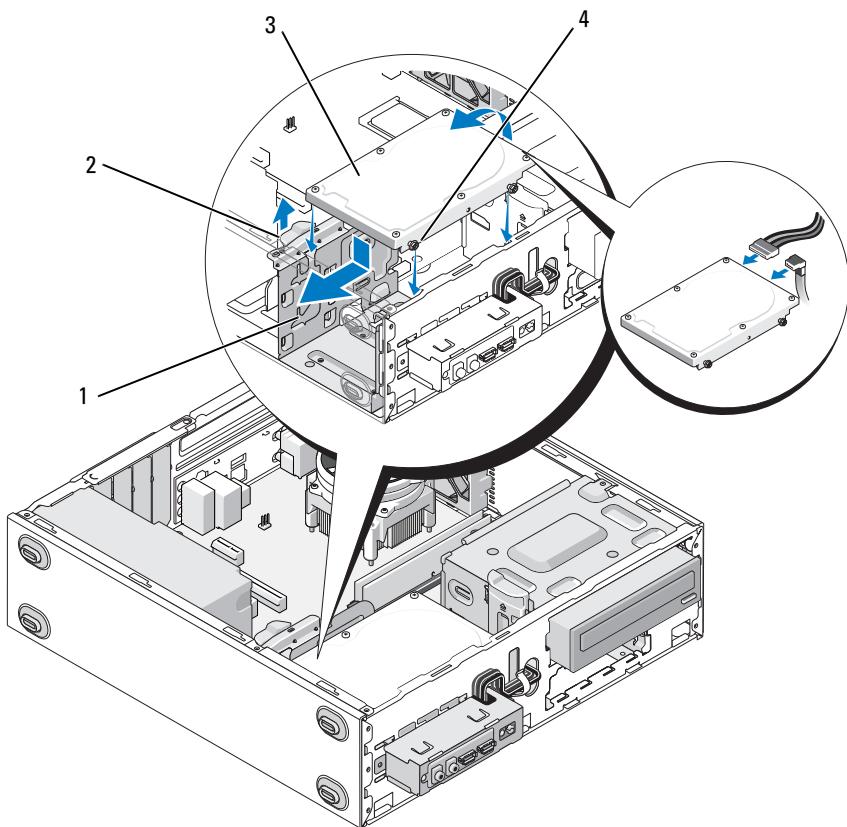
If you are removing this drive permanently and the drive bay is to remain empty, proceed to step 8.

- 8** Disconnect the data cable from the system board (see "System Board Components" on page 40) and remove the cable from the computer.
- 9** Follow the procedure in "After Working on Your Computer" on page 45.
- 10** When you restart your computer, check the drive configuration information in the system setup program:
  - a** Enter the system setup program (see "System Setup Program" on page 129 for instructions).
  - b** In the Drives section of the system setup program, under **Drive 0 through 3**, set the drive setting to the correct configuration.

## **Replacing or Adding a Hard Drive**

- 1** Follow the procedures in "Before Working on Your Computer" on page 35.
- 2** Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3** Check the documentation for the drive to verify that it is configured for your computer.
- 4** For the Vostro 220s:
  - a** Raise and hold the hard-drive release latch.
  - b** Slide the drive partway out of the bay, rotate the back of the drive upward until the drive is perpendicular to the drive cage, and guide the screws through the cutaway channels in the drive cage until you can lift the drive away from the computer.
  - c** Repeat step a and step b for the second hard drive, if installed.

## Vostro 220s



1 cutaway channels (2)

3 hard drive

2 hard-drive release latch

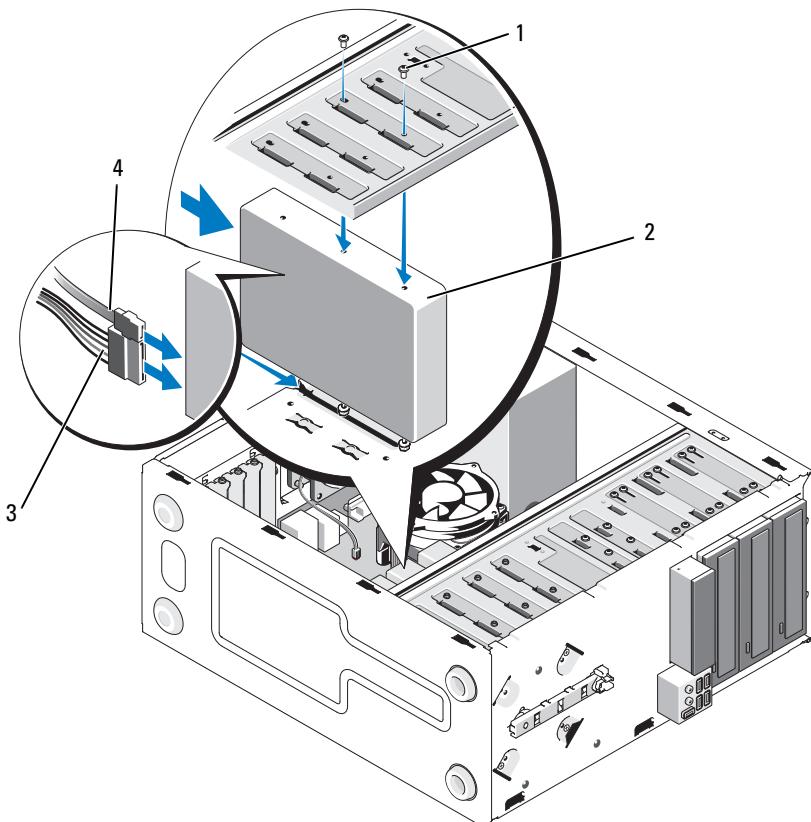
4 screw guides (4)

**5** For the Vostro 420 and Vostro 220:

**a** Slide the hard drive into the hard drive bay.

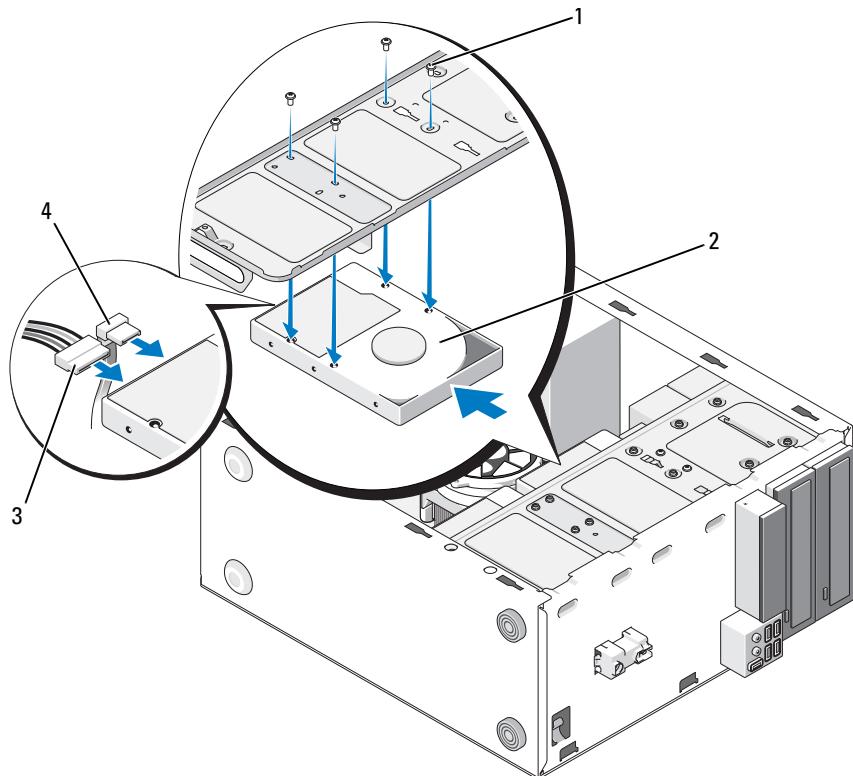
**b** Align the holes on the side of the hard drive with the holes in the drive cage, and install the screws to secure the hard drive in the bay.

## Vostro 420



- |   |   |   |            |
|---|---|---|------------|
| 1 | screws (4 total: 2 screws to guide<br>drive into slot; 2 screws to secure<br>drive in slot) | 2 | hard drive |
| 3 | power cable   | 4 | data cable |

## Vostro 220



1 screws (4)

2 hard drive

3 power cable

4 data cable

- 6 Connect the power and data cables to the back of the drive.

**► NOTICE:** The connectors are "keyed" for correct insertion; that is, a notch or a missing pin on one connector fits with a tab or a filled-in hole on the other connector. Align the cable connectors correctly before inserting them to avoid damage to the connectors.

- 7 Ensure that the other end of the data cable is connected to an interface connector labeled "SATA0," "SATA1," "SATA2," or "SATA3" on the system board (see "System Board Components" on page 40).

- 8** Check all cables to ensure that they are properly connected and firmly seated.
- 9** For the Vostro 220s, replace the chassis support bracket (see "Replacing the Chassis Support Bracket" on page 57).
- 10** Follow the procedure in "After Working on Your Computer" on page 45.
- 11** When you restart your computer, check the drive configuration information in the system setup program:
  - a** Enter the system setup program (see "System Setup Program" on page 129 for instructions).
  - b** In the **Drives** section of the system setup program, under **Drive 0 through 3**, set the drive setting to the correct configuration.
- 12** See the documentation that came with the drive for instructions on installing any software required for drive operation.

## Media Card Reader



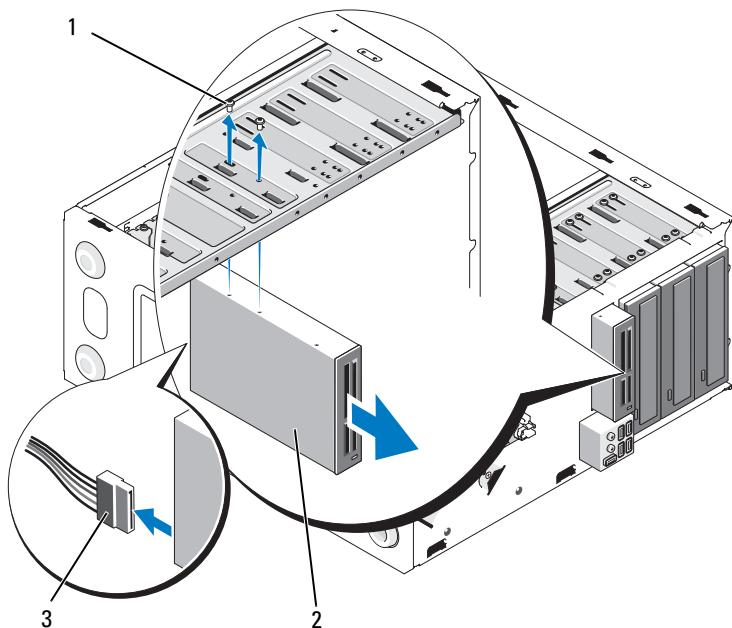
**CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).



**CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

### Removing a Media Card Reader

- 1** Follow the procedures in "Before Working on Your Computer" on page 35.
- 2** Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3** Remove the bezel (see "Removing the Bezel" on page 51).

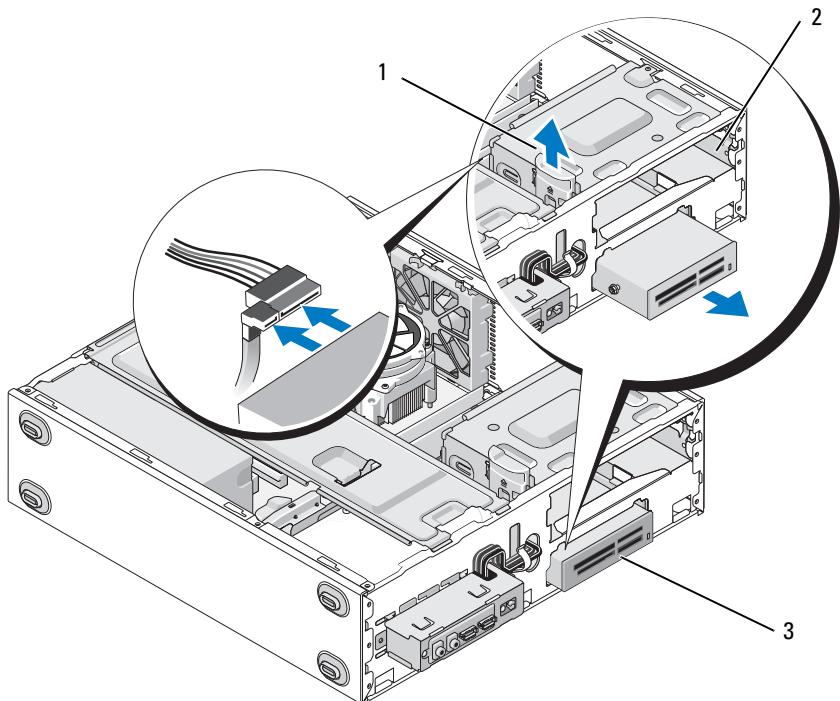


1 screws (2)

2 media card reader

3 USB interface cable

- 4 Disconnect the USB cable from the back of the media card reader.
- 5 For the Vostro 420 and Vostro 220, remove the two screws securing the device to the drive cage.  
*For the Vostro 220s, lift the release latch that secures both the optical drive and the 3.5-inch device in their respective drive cages.*



1 release latch

2 optical drive bay

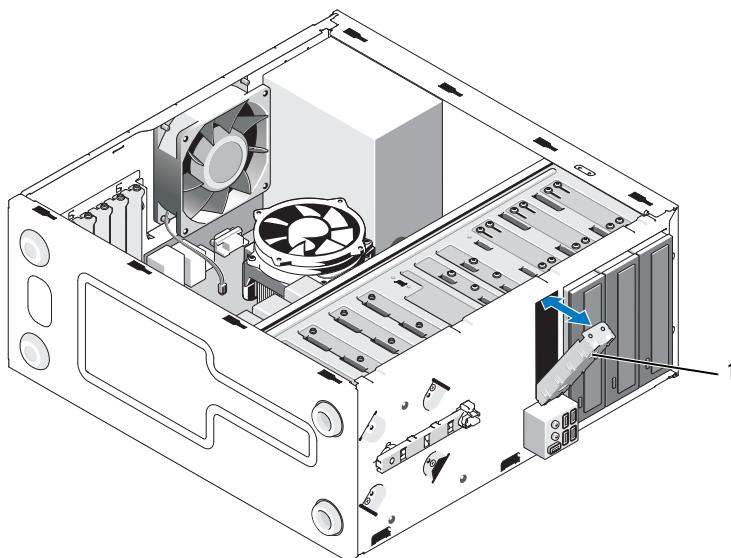
3 media card reader

- 6 Slide the device out through the front of the computer.
- 7 *If you are installing a replacement device, skip to step 5 in "Replacing or Adding a Media Card Reader" on page 77.*  
*If you are removing the device permanently and the drive bay is to remain empty, proceed to step 8.*
- 8 Disconnect the USB interface cable from the system board (see "System Board Components" on page 40), and remove the cable from the computer.
- 9 Install a 3.5-inch front-panel insert into the empty bay:

- a** Holding the front-panel insert at an angle, insert one end into the drive bay opening.
- b** Push the other end of the insert into the opening until it fits into place.

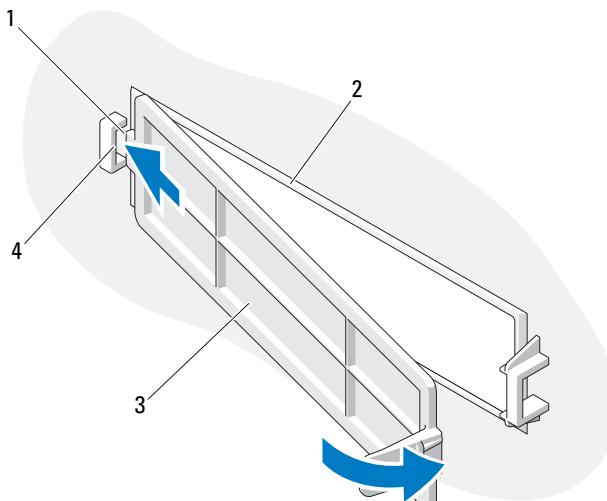


**NOTE:** To comply with FCC regulations, install the 3.5-inch front-panel insert whenever the device is permanently removed from the computer.



**1** 3.5-inch front-panel insert

- 10** For the Vostro 220s, push the release latch down to resecure the optical drive.
- 11** Install the cover for the empty bay onto the bezel:
  - a** From the inside of the bezel, while holding the cover at an angle, insert the tab on one end of the cover into the slot on the corresponding end of the bezel opening.
  - b** Lower the cover until it fits securely in the bezel opening.



1 tab

2 inside of bezel

3 cover for empty bay

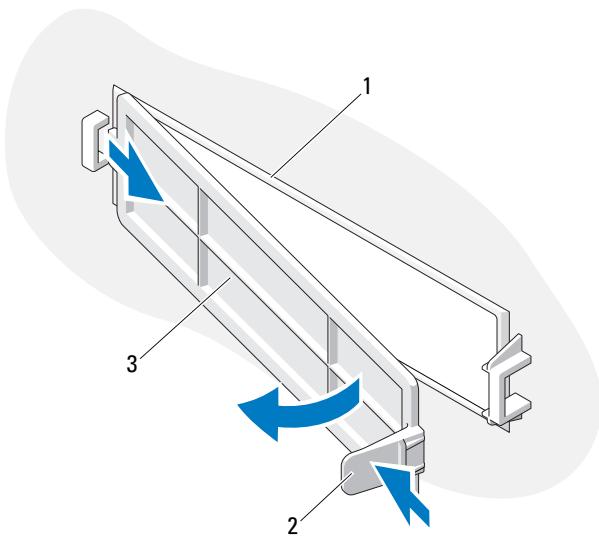
4 slot in bezel opening

- 12** Replace the bezel (see "Replacing the Bezel" on page 53).
- 13** Follow the procedure in "After Working on Your Computer" on page 45.
- 14** Enter the system setup program (see "System Setup Program" on page 129 for instructions) and update the drive settings.

## Replacing or Adding a Media Card Reader

- 1** Follow the procedures in "Before Working on Your Computer" on page 35.
- 2** Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3** Remove the bezel (see "Removing the Bezel" on page 51).
- 4** If you are adding a media card reader in a computer that has not had a device previously installed in the 3.5-inch drive bay, you must first:
  - a** Remove the break-away metal plate from the empty 3.5-inch drive bay (see "Removing a Drive Bay Break-Away Metal Plate" on page 85).

- b** For the Vostro 220s, lift the release latch that secures both the optical drive and the 3.5-inch device in their respective drive cages.
- c** Remove the empty-bay cover from the bezel: From the inside of the bezel, press the release latch on the cover, and lift the cover from the bezel.



- 1 inside of bezel
  - 2 release latch
  - 3 cover for empty bay
- 5** Remove the media card reader from its packaging.
  - 6** For the Vostro 220s, install two screws on each side of the media card reader.
  - 7** Gently slide the device into the bay from the front of the computer.
  - 8** For the Vostro 420 and Vostro 220:
    - a** Align the screw holes in the device with the screw hole and slot in the drive cage.
    - b** Replace and tighten the two screws to secure the device in the drive cage.

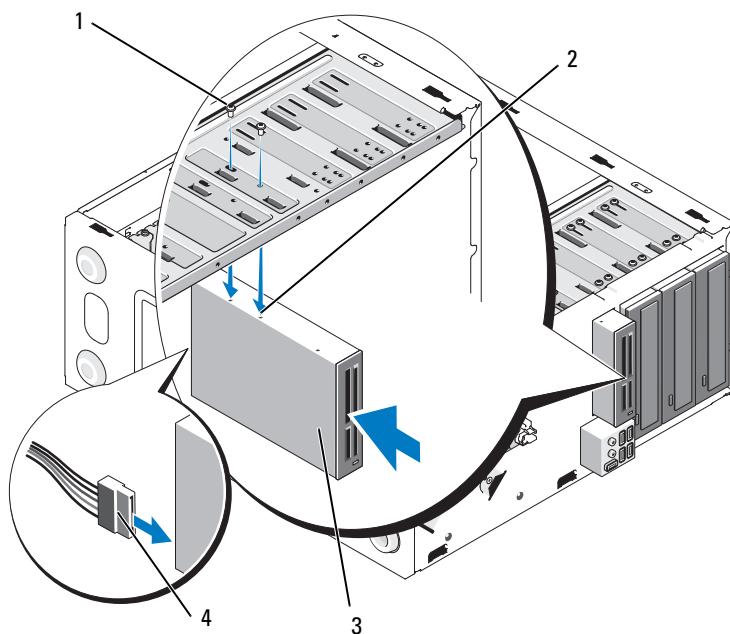
**9** For the Vostro 220s, push the release latch down to secure the optical drive and the 3.5-inch device in their respective drive cages.

 **NOTE:** Install the media card reader into the drive bay before you connect the USB interface cable to the back of the device.

**10** Connect the USB interface cable to the back of the device.

 **NOTICE:** The connectors are "keyed" for correct insertion; that is, a notch or a missing pin on one connector fits with a tab or a filled-in hole on the other connector. Align the cable connectors correctly before inserting them to avoid damage to the connectors.

**11** Ensure that the other end of the USB interface cable is connected to a USB connector on the system board (see "System Board Components" on page 40).



1 screws (2)

2 screw holes (2)

3 media card reader

4 USB interface cable

**12** Replace the bezel (see "Replacing the Bezel" on page 53).

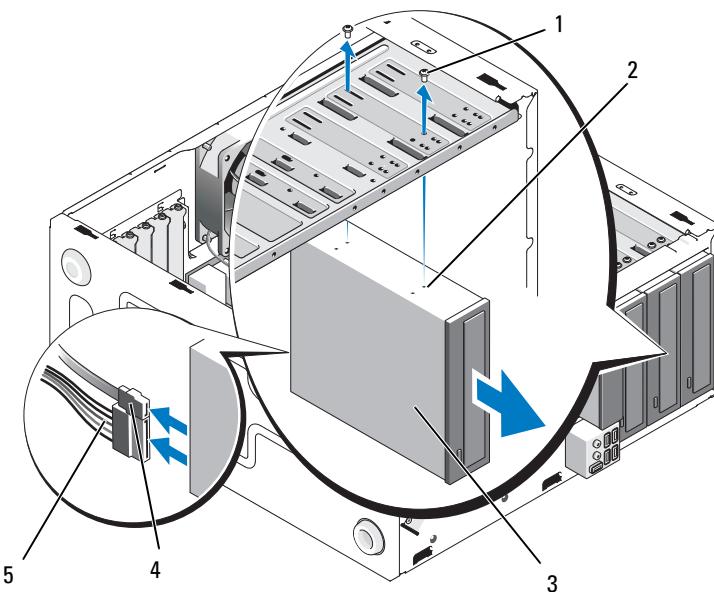
- 13** Follow the procedure in "After Working on Your Computer" on page 45.
- 14** See the documentation that came with the drive for instructions on installing any software required for drive operation.
- 15** Enter the system setup program (see "System Setup Program" on page 129 for instructions) and update the drive settings.

## Optical Drive

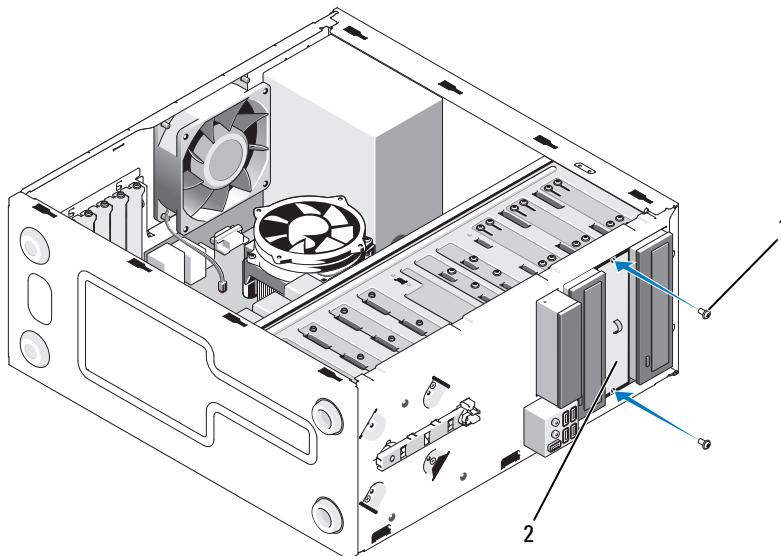
-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

### Removing an Optical Drive

- 1** Follow the procedures in "Before Working on Your Computer" on page 35.
- 2** Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3** Remove the bezel (see "Replacing the Bezel" on page 53).
- 4** Disconnect the power cable and data cable from the back of the drive.



- |                 |                   |
|-----------------|-------------------|
| 1 screws (2)    | 2 screw holes (4) |
| 3 optical drive | 4 data cable      |
| 5 power cable   |                   |
- 5** For the Vostro 420 and Vostro 220, remove the two screws securing the optical drive to the drive cage.
- 6** Slide the optical drive out through the front of the computer.
- 7** *If you are installing a replacement drive, skip to step 5 in "Replacing or Adding an Optical Drive" on page 82.*
- If you are removing this drive permanently and the drive bay is to remain empty, proceed to step 8.*
- 8** Disconnect the data cable from the system board (see "System Board Components" on page 40), and remove the cable from the computer.
- 9** For the Vostro 420 and Vostro 220, use two screws to attach a 5.25-inch front-panel insert to the front of the empty bay.



1 screws (2)

2 5.25-inch front-panel insert



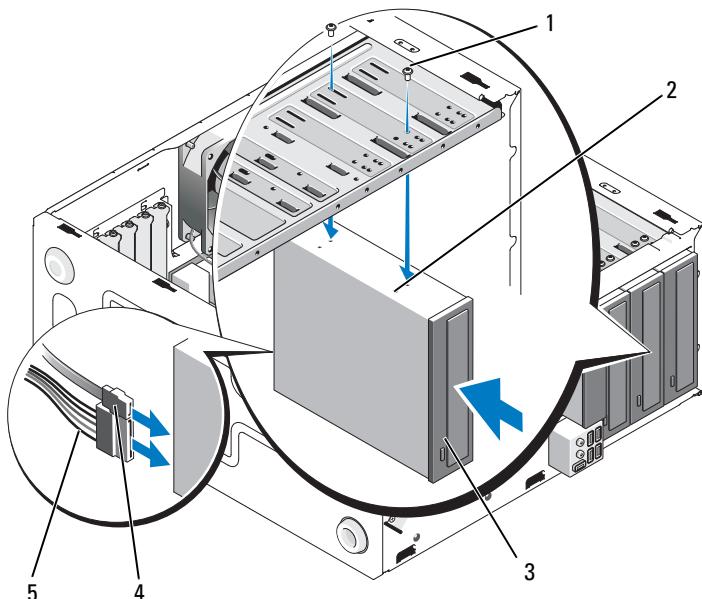
**NOTE:** To comply with FCC regulations, install the 5.25-inch front-panel insert whenever an optical drive is permanently removed from the computer.

- 10 Replace the bezel (see "Replacing the Bezel" on page 53).
- 11 Follow the procedure in "After Working on Your Computer" on page 45.
- 12 Enter the system setup program (see "System Setup Program" on page 129 for instructions) and update the drive settings.

## Replacing or Adding an Optical Drive

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3 Remove the bezel (see "Removing the Bezel" on page 51).

- 4** If you are adding an optical drive in a bay that has not had a device previously installed in it, remove the break-away metal plate (front-panel insert) from the empty drive bay (see "Removing a Drive Bay Break-Away Metal Plate" on page 85).
- 5** Remove the optical drive from its packaging.
- 6** Gently slide the optical drive into the bay from the front of the computer.
- 7** For the Vostro 420 and Vostro 220:
  - a** Align the screw slots in the optical drive with the screw slots on the drive cage.
  - b** Replace and tighten the two screws securing the optical drive.
- 8** Connect the power cable and data cable to the back of the drive.  
 **NOTICE:** The connectors are "keyed" for correct insertion; that is, a notch or a missing pin on one connector fits with a tab or a filled-in hole on the other connector. Align the cable connectors correctly before inserting them to avoid damage to the connectors.
- 9** Ensure that the other end of the data cable is connected to the SATA4, SATA5, or SATA6 connector on the system board (see "System Board Components" on page 40).



1 screws (2)

2 screw holes

3 optical drive

4 data cable

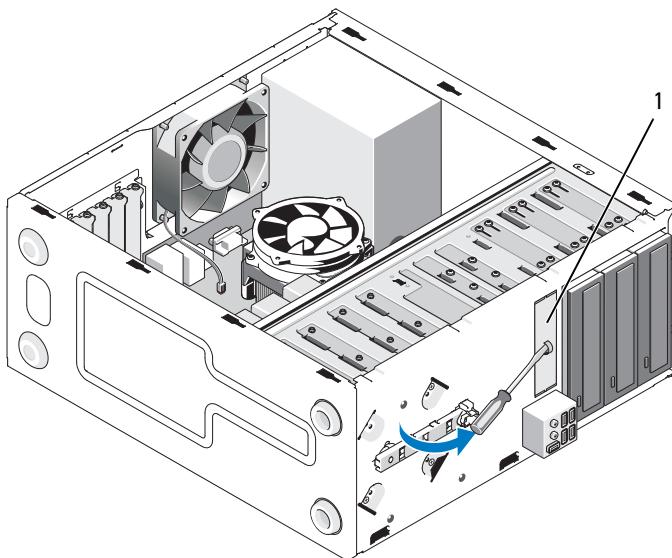
5 power cable

- 10** Replace the bezel (see "Replacing the Bezel" on page 53).
- 11** Follow the procedure in "After Working on Your Computer" on page 45.
- 12** See the documentation that came with the drive for instructions on installing any software required for drive operation.
- 13** Enter the system setup program (see "System Setup Program" on page 129 for instructions) and update the drive settings.

# Removing a Drive Bay Break-Away Metal Plate

## Vostro 420 and Vostro 220

### Vostro 420



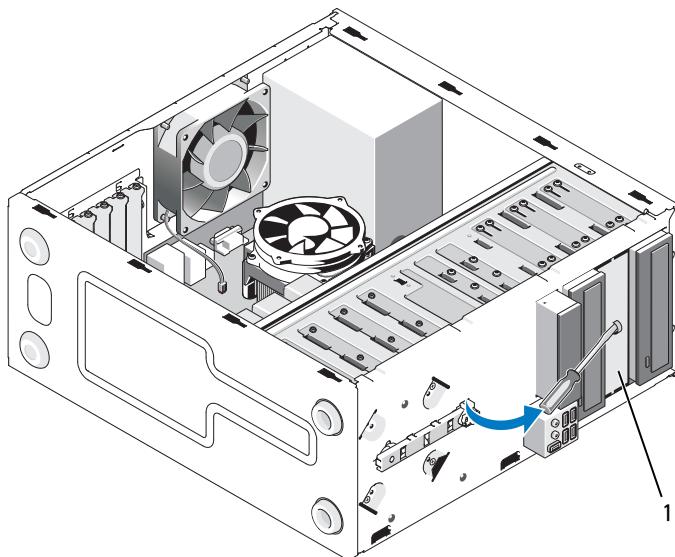
1 3.5-inch bay break-away metal plate

To remove the 3.5-inch bay break-away metal plate, insert the tip of a Phillips screwdriver into the slot on the plate, and rotate the screwdriver outwards for leverage to twist and ultimately break the two metal tabs that attach the plate to the chassis.

 **NOTE:** Discard the 3.5-inch bay metal plate once it is removed. It is not designed for reuse. A front-panel insert is available for covering the opening of the empty 3.5-inch bay (once the break-away metal plate has been initially removed) should you decide to permanently remove a device from the 3.5-inch bay.

The break-away metal plates for the 5.25-inch drive bays can be reused as front-panel inserts to cover an empty 5.25-inch drive bay. Before removing a metal plate for an optical drive bay (5.25-inch drive bay), notice whether it is

still a break-away plate or whether it is attached with two screws. Remove the two screws, if installed, or use the Phillips screwdriver to break away the plate, as appropriate.



- 1 5.25-inch bay metal plate (for empty optical-drive bay)

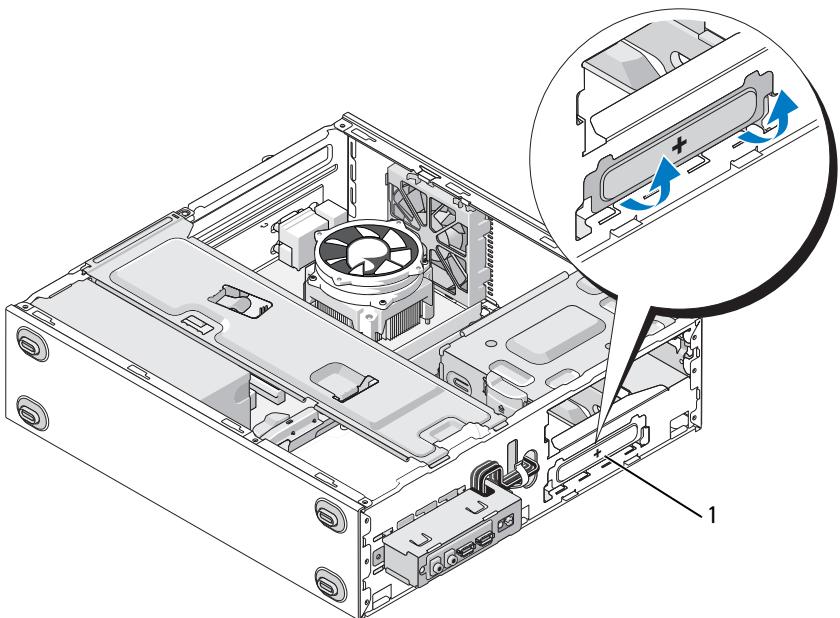
 **NOTE:** Store 5.25-inch metal plates for reuse should you decide to permanently remove an optical drive in the future. Only the break-away metal plates for the optical drive bays have screw holes for reuse. An empty optical-drive bay opening must be covered by a metal plate (front-panel insert) to retain FCC ratings.

## Vostro 220s

To remove the 3.5-inch bay break-away metal plate, rotate the upward to twist and ultimately break the metal tabs that attach the plate to the chassis.

 **NOTE:** Discard the 3.5-inch bay metal plate once it is removed. It is not designed for reuse. A front-panel insert is available for covering the opening of the empty 3.5-inch bay (once the break-away metal plate has been initially removed) should you decide to permanently remove a device from the 3.5-inch bay.

## Vostro 220s



1 3.5-inch bay break-away metal plate



# I/O Panel

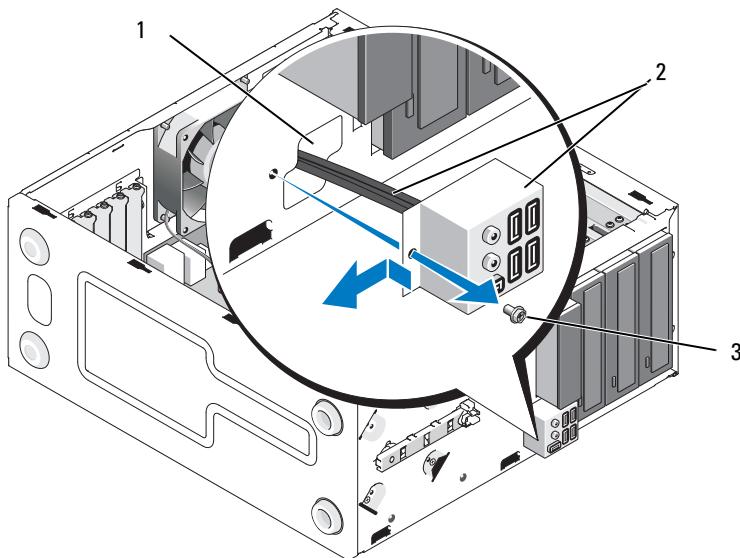
-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** The procedure for removing and replacing the I/O panel is identical (except where noted) for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustrations provided are for example only and may not represent your particular computer precisely.

## Removing the I/O Panel

-  **NOTE:** Note the routing of all cables as you remove them so that you can reroute them correctly when installing the new I/O panel.
  - 1 Follow the procedures in "Before Working on Your Computer" on page 35.
  - 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
  - 3 Remove the bezel (see "Removing the Bezel" on page 51).
  - 4 Disconnect the I/O panel cables from the system board.
  - 5 For the Vostro 220s:
    - a Remove the chassis support bracket (see "Removing the Chassis Support Bracket" on page 55).
    - b Remove any hard drives from the hard drive cage (see "Removing a Hard Drive" on page 65).
  - 6 Disengage the cables from the metal clip(s), if present, that secure(s) the cables along the inside of the chassis.
  - 7 Remove the screw that secures the I/O panel to the front panel.
-  **NOTICE:** When sliding the I/O panel out of the computer, guide the cables carefully through the bays, holes, and front-panel opening to prevent damage to the cable connectors and the cable routing clip(s) (if present).

- 8** Ease the I/O panel away from the computer as you guide the cables through the bays, holes, and front-panel opening.

**Vostro 420**

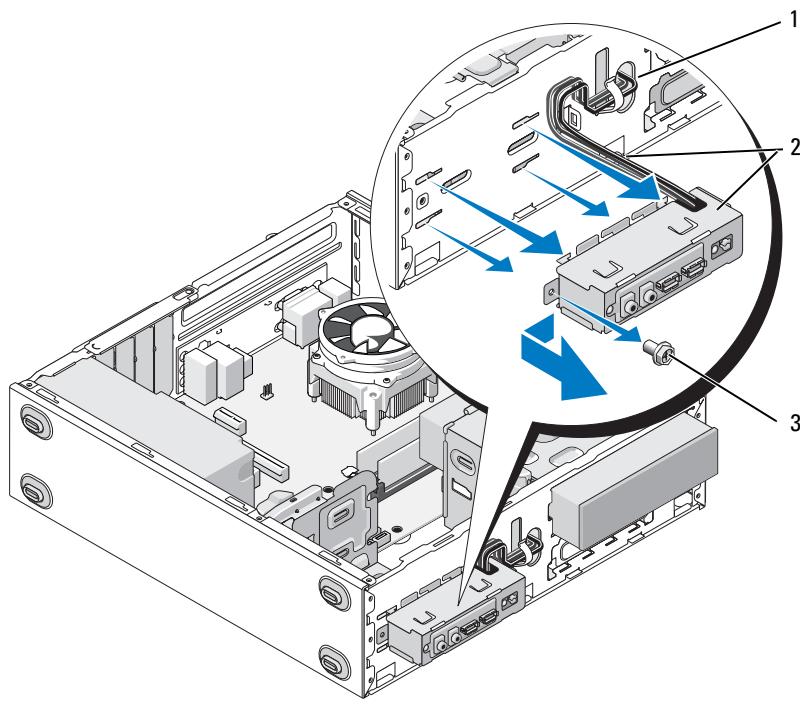


1 front-panel opening

2 I/O panel and cables

3 screw

## Vostro 220s



1 front-panel opening

2 I/O panel and cables

3 screw

## Replacing the I/O Panel

**NOTICE:** Take care not to damage the cable connectors and the cable routing clip(s) (if present) when sliding the I/O panel into the computer.

- 1 Route the I/O panel cables into the chassis through the I/O panel opening, and guide them through the various holes and bays.
- 2 Slide the I/O panel cables into the cable clip(s) (if present).
- 3 Replace and tighten the screw that secures the I/O panel.
- 4 Reconnect the cables to the system board (see "System Board Components" on page 40).

- 5** For the Vostro 220s:
  - a** Replace the chassis support bracket (see "Replacing the Chassis Support Bracket" on page 57).
  - b** Replace any hard drives in the hard drive cage (see "Replacing or Adding a Hard Drive" on page 69) that you removed in step 5 of "Removing the I/O Panel" on page 89.
- 6** Follow the procedure in "After Working on Your Computer" on page 45.

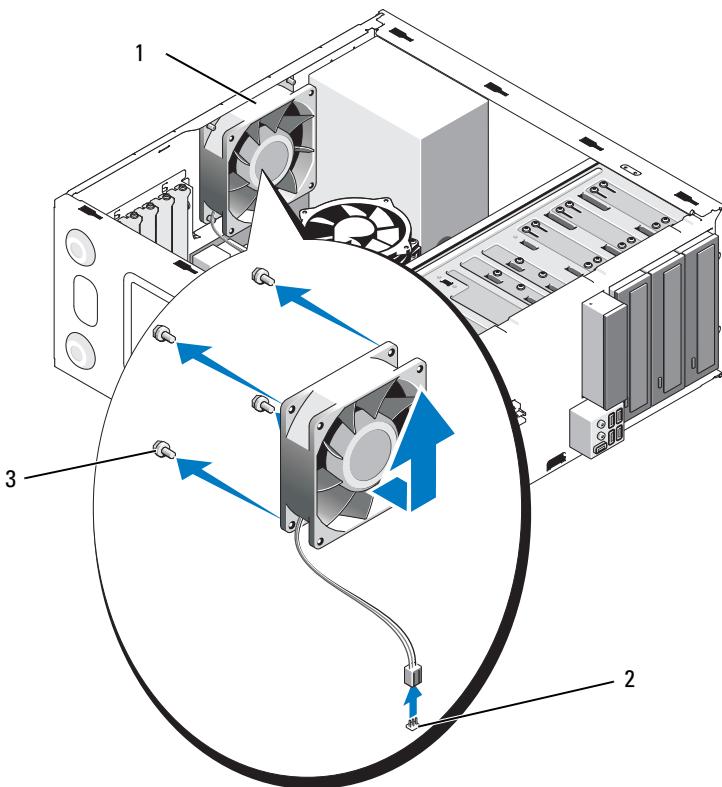
# Fan

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against likelihood of electric shock, laceration from moving fan blades, or other unexpected injuries, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** The procedure for removing and replacing the chassis fan is identical (except where noted) for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustrations provided are for example only and may not represent your particular computer precisely.

## Removing the Chassis Fan

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3 Disconnect the chassis fan cable from the system board.
- 4 While holding the chassis fan in place, remove the screw(s) that secure(s) the fan to the chassis.
- 5 For the Vostro 220s, slide the fan toward the front of the computer to disengage it from the chassis.
- 6 Ease the fan toward the center of the computer, and lift the fan out of the chassis.

## Vostro 420

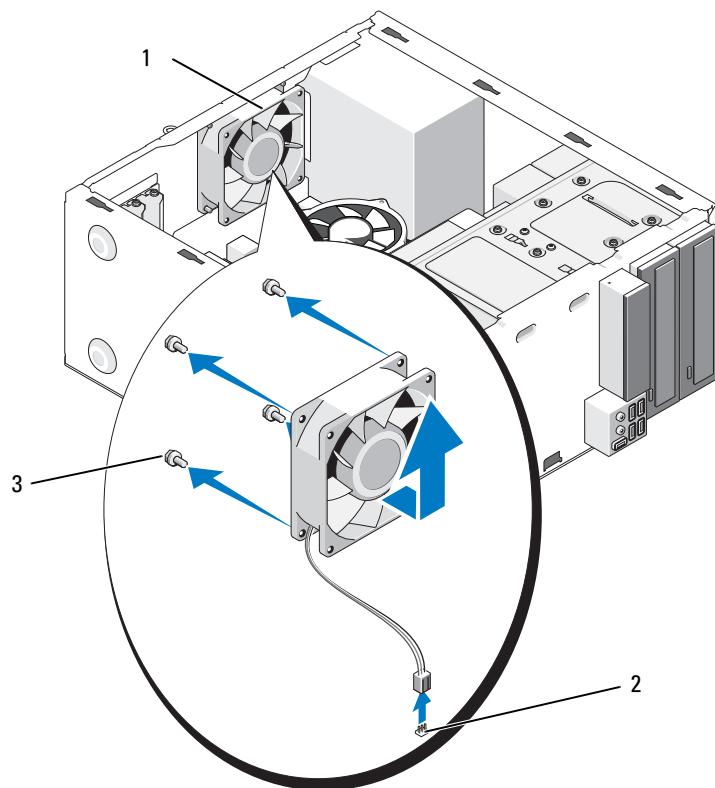


1 chassis fan

3 screws (4)

2 system board power connector

## Vostro 220

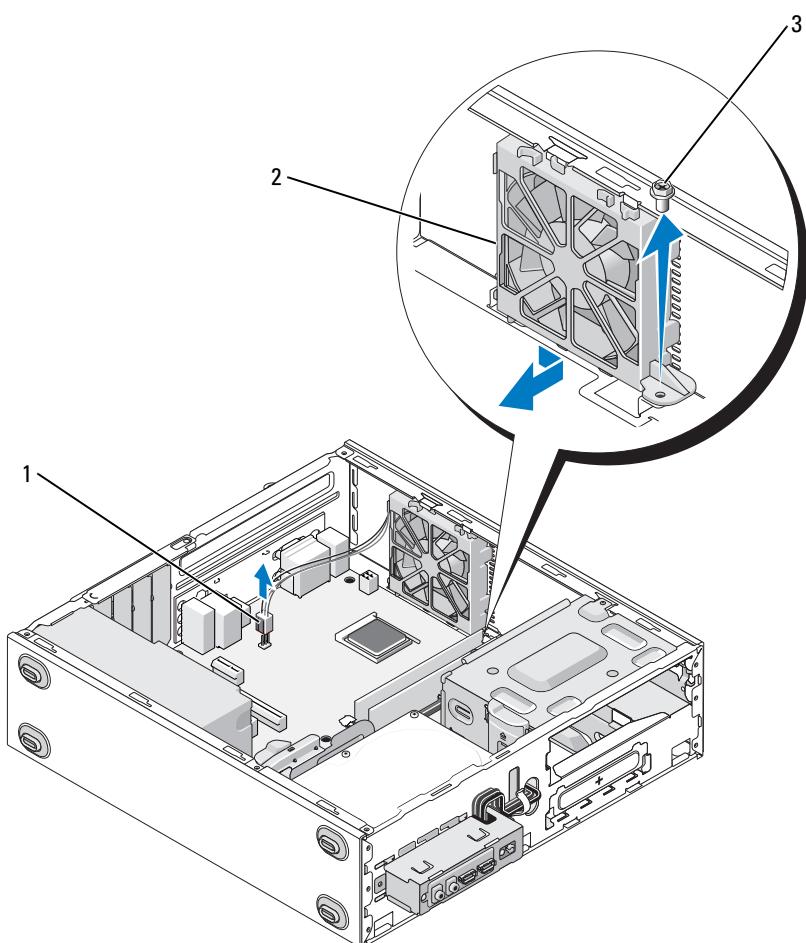


1 chassis fan

2 system board power connector

3 screws (4)

## Vostro 220s



- 1 system board power connector  
3 screw

- 2 chassis fan

## Replacing the Chassis Fan

- 1** For the Vostro 220s:
  - a** Lower the fan into the chassis such that the screw hole in the fan is offset and slightly forward of the screw hole in the fan mount on the chassis.
  - b** Press the fan into the side of the chassis, and then slide it toward the back of the computer until it sets against the stops.
  - c** Proceed to step 3.
- 2** While holding the chassis fan in place, align the screw hole(s) and install the screw(s) that secure the fan to the chassis.
- 3** Attach the fan cable to the system board (see "System Board Components" on page 40).
- 4** Follow the procedure in "After Working on Your Computer" on page 45.



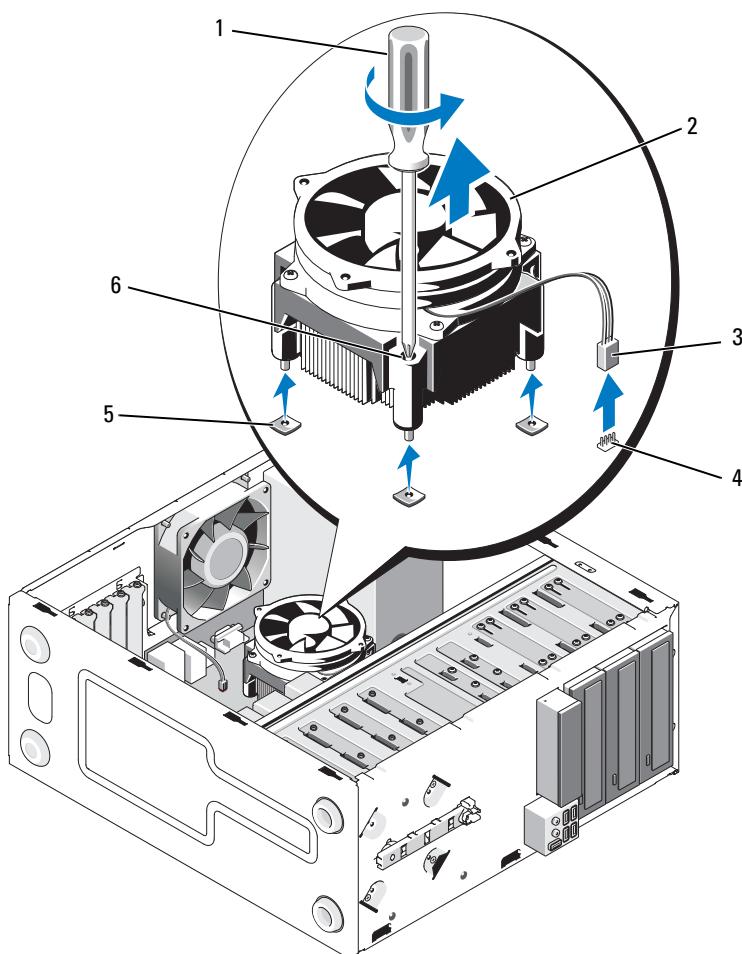
# Processor Heat Sink/Fan Assembly

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against likelihood of electric shock, laceration from moving fan blades, or other unexpected injuries, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** The procedure for removing and replacing the processor heat sink/fan assembly is identical for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustration provided is for example only and may not represent your particular computer precisely.

## Removing the Processor Heat Sink/Fan Assembly

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3 Disconnect the heat sink/fan assembly cable from the system board.
- 4 Loosen the four captive screws that attach the heat sink/fan assembly to the system board.

-  **CAUTION:** The heat sink/fan assembly may become very hot during normal operation. Be sure that it has had sufficient time to cool before you touch it.
-  **NOTICE:** A strong thermal solution bond may exist between the processor and heat sink. Do not use excessive force to separate the heat sink/fan assembly from the processor to avoid damaging the processor.
- 5 Lift the heat sink/fan assembly upward gently, and remove it from the computer. Lay the assembly with the fan facing downward, and with the thermal grease facing upward.



1 Phillips screwdriver

2 heat sink/fan assembly

3 heat sink/fan cable

4 system board fan connector

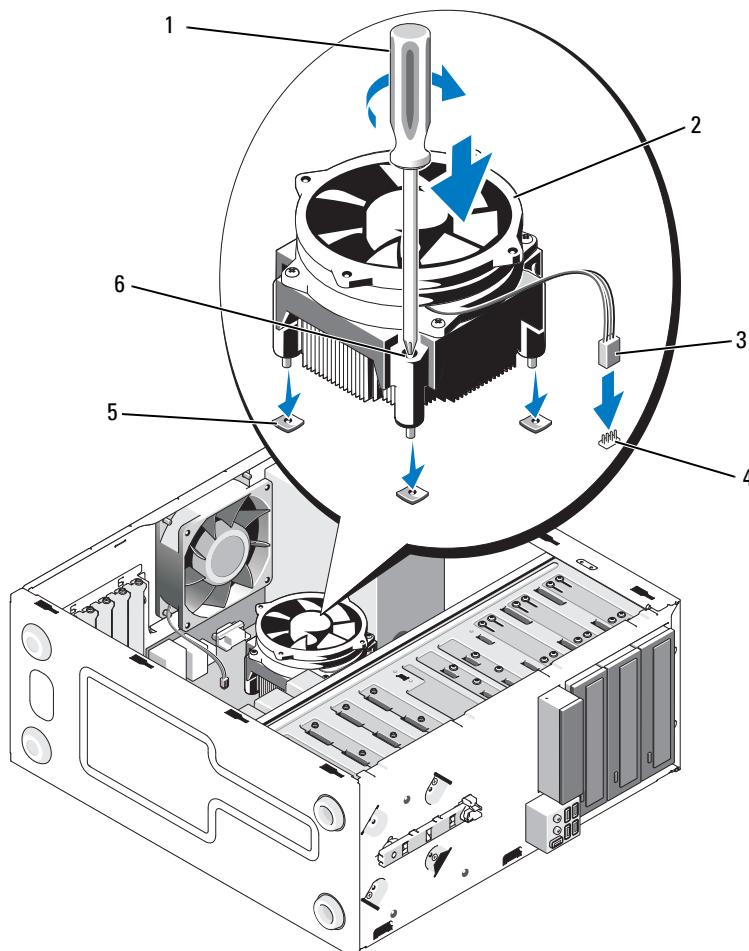
5 screw holes with rubber bushings (4)

6 captive screws (4)

# Replacing the Processor Heat Sink/Fan Assembly

**NOTICE:** Unless a new heat sink is required for the new processor, reuse the original heat sink/fan assembly when you replace the processor.

- 1 Apply thermal solution to the heat sink as needed.
- 2 Align the four captive screws on the heat sink/fan assembly with the holes and rubber bushings on the system board.



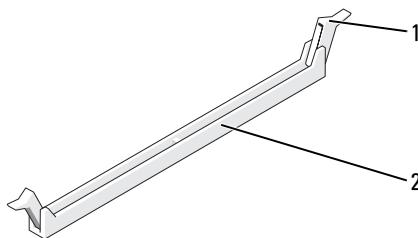
- |   |                                  |   |                            |
|---|----------------------------------|---|----------------------------|
| 1 | Phillips screwdriver             | 2 | heat sink/fan assembly     |
| 3 | heat sink/fan cable              | 4 | system board fan connector |
| 5 | screw holes with rubber bushings | 6 | captive screws (4)         |
- 3** Tighten the captive screws evenly to secure the heat sink/fan assembly to the system board.
- 4**  **NOTICE:** Ensure that the assembly is correctly seated and secure.
- 5** Attach the heat sink/fan assembly cable to the system board (see "System Board Components" on page 40).
- 5** Follow the procedure in "After Working on Your Computer" on page 45.

# Memory Module(s)

**⚠ CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

## Removing Memory Modules

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Replacing the Computer Cover" on page 48).
- 3 Locate the memory modules on the system board (see "System Board Components" on page 40).
- 4 Press out the securing clip at each end of the memory module connector.



1 securing clips (2)

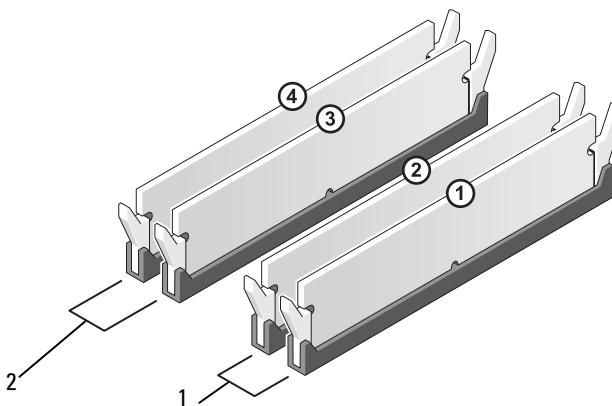
2 memory module connector

- 5 Grasp the module and pull it upwards.

If the module is difficult to remove, gently ease the module back and forth to remove it from the connector.

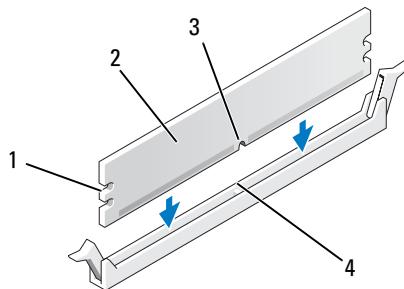
# Replacing or Adding a Memory Module

- ➡ **NOTICE:** Do not install ECC memory modules.
- ➡ **NOTICE:** If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules, even if you purchased the new modules from Dell. If possible, do not pair an original memory module with a new memory module. Otherwise, your computer may not start properly. The recommended memory configurations for Vostro 420 are:
  - 1) A pair of matched memory modules installed in DIMM connectors 1 and 2, or
  - 2) A pair of matched memory modules installed in DIMM connectors 1 and 2 and another matched pair installed in DIMM connectors 3 and 4.
- ➡ **NOTE:** If you install mixed pairs of PC2-5300 (DDR2 667-MHz) and PC2-6400 (DDR2 800-MHz) memory modules, the modules function at the speed of the slowest module installed.
- ➡ **NOTE:** Ensure that you install a single memory module in DIMM connector 1, the connector closest to the processor, before you install modules in any other connector.
- ➡ **NOTE:** Vostro 420 can accommodate four DIMMs; Vostro 220 and Vostro 220s can accommodate two DIMMs.



- 1 Pair A: matched pair of memory modules in connectors DIMM\_1 and DIMM\_2
- 2 Pair B: matched pair of memory modules in connectors DIMM\_3 and DIMM\_4

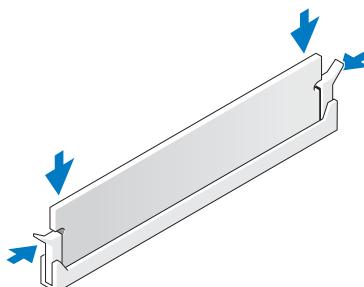
- 1 Align the notch on the bottom of the module with the crossbar in the connector.



- |   |             |   |               |
|---|-------------|---|---------------|
| 1 | cutouts (2) | 2 | memory module |
| 3 | notch       | 4 | crossbar      |

**NOTICE:** To avoid damage to the memory module, press the module straight down into the connector while you apply equal force to each end of the module.

- 2 Insert the module into the connector until the module snaps into position. If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.



- 3 Follow the procedure in "After Working on Your Computer" on page 45.
- 4 When the message appears stating that memory size has changed, press <F1> to continue.
- 5 Log on to your computer.

- 6** Right-click the **My Computer** icon on your Windows® desktop and click **Properties**.
- 7** Click the **General** tab.
- 8** To verify that the memory is installed correctly and being recognized by the computer, check the amount of memory (RAM) listed.

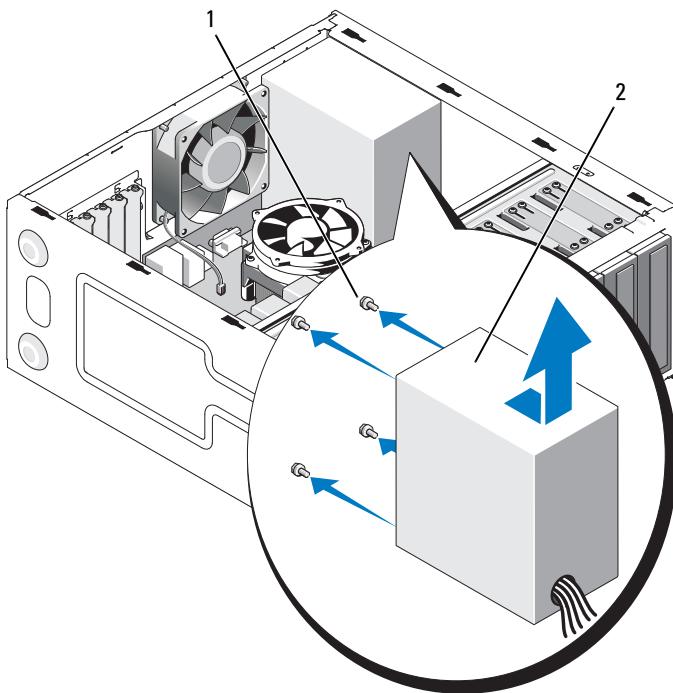
# Power Supply

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** The procedure for removing and replacing the power supply is identical (except where noted) for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustrations provided are for example only and may not represent your particular computer precisely.

## Removing the Power Supply

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
-  **NOTICE:** Note the routing of the DC power cables underneath the metal routing clips (if present) in the computer chassis as you remove them from the system board and drives. You must reroute these cables properly when you reinstall the power supply to prevent them from being pinched or crimped.
- 3 For the Vostro 220s:
  - a Remove the chassis support bracket (see "Removing the Chassis Support Bracket" on page 55).
  - b Slide the optical drive forward far enough to gain access to the PWR1 connector on the system board.
  - c Remove any installed PCI or PCI Express cards (see "Removing a PCI or PCI Express Card" on page 59).
- 4 Disconnect the DC power cables from the system board (see "System Board Components" on page 40) and the drives.
- 5 Disengage the cables from the routing clips (if present) on the chassis.
- 6 Remove the screws that attach the power supply to the back of the computer chassis.

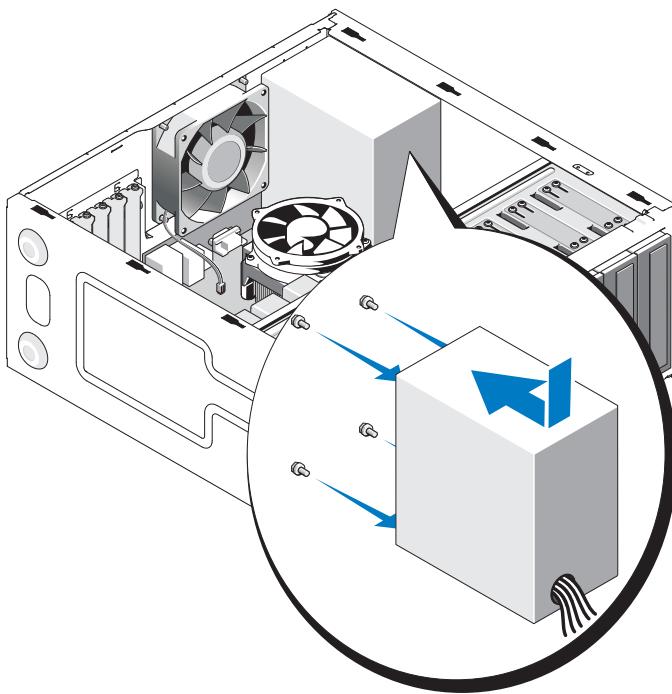
- 7** Press down on the power supply retention clips.



**1** screws (4) (only 3 screws for Vostro 220s)    **2** power supply

- 8** Slide the power supply toward the front of the computer and lift it out.

# Replacing the Power Supply

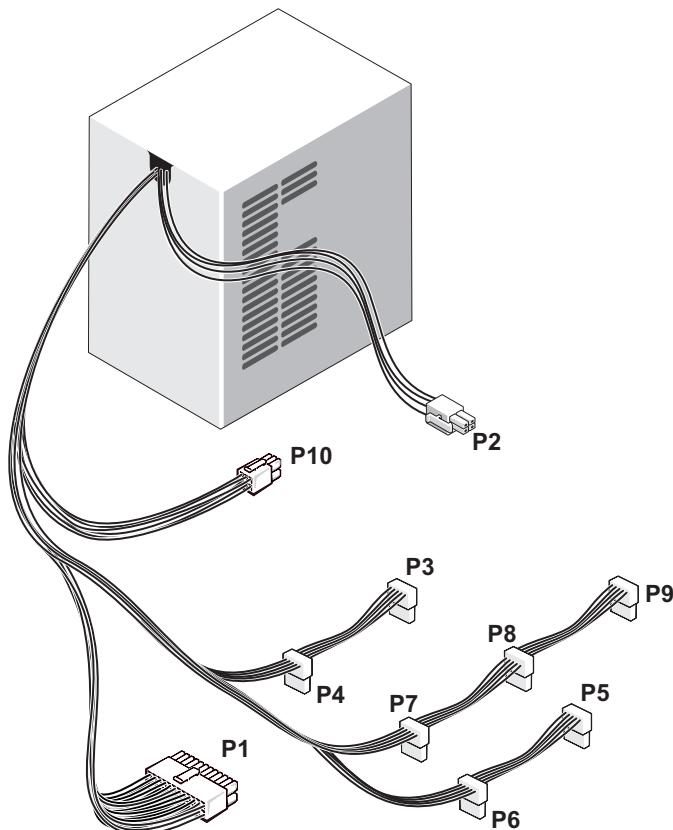


- 1 Set the replacement power supply into place.
- 2 Replace and tighten the screws that secure the power supply to the back of the computer chassis.  
**⚠ CAUTION:** Failure to replace and tighten all screws may cause electrical shock as these screws are a key part of the grounding system.
- 3 Reconnect the DC power cables to the system board and drives.  
**► NOTICE:** Route the DC power cables as you insert them into the routing clips (if present). The cables must be properly routed to prevent the cables from being damaged.
- 4 For the Vostro 220s:  
**☛ NOTE:** Double-check all cable connections to ensure that they are secure.

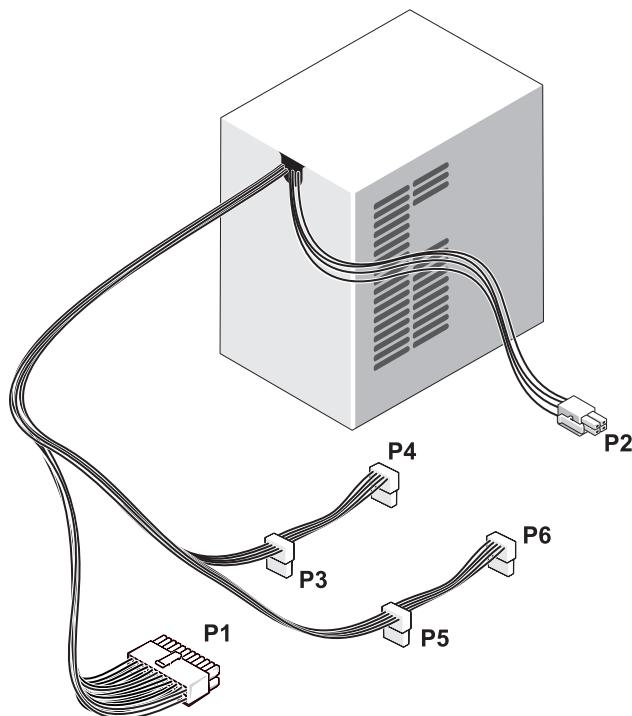
- a** Reinstall any PCI or PCI Express cards (see "Installing a PCI or PCI Express Card" on page 60).
  - b** Slide the optical drive back into the drive bay.
  - c** Replace the chassis support bracket (see "Replacing the Chassis Support Bracket" on page 57).
- 5** Follow the procedure in "After Working on Your Computer" on page 45.

## DC Power Supply Connectors

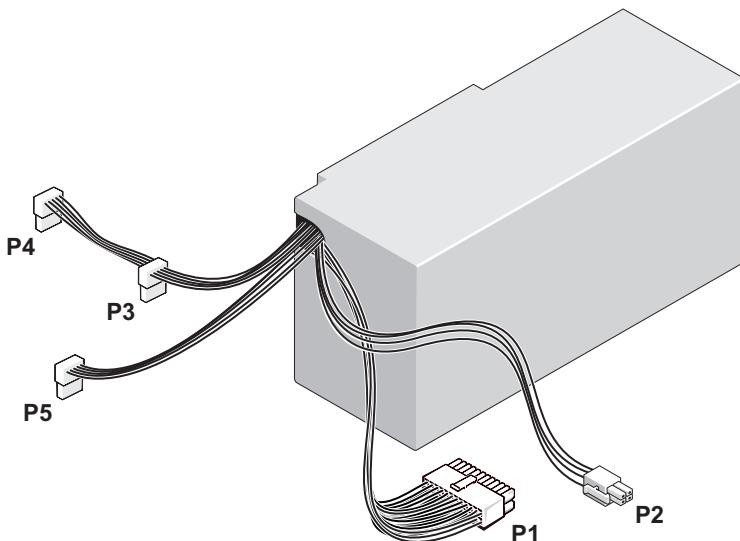
### Vostro 420



## Vostro 220

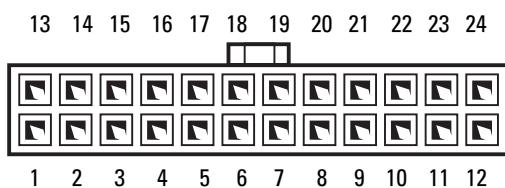


## Vostro 220s



## DC Power Supply Connector Pin Assignments

### *DC Power Connector P1*



Pin Number	Signal name	Wire Color	Wire Size
1	3.3 V	Orange	20 AWG
2	3.3 V	Orange	20 AWG
3	RTN	Black	20 AWG
4	5 V	Red	20 AWG

<b>Pin Number</b>	<b>Signal name</b>	<b>Wire Color</b>	<b>Wire Size</b>
5	RTN	Black	20 AWG
6	5 V	Red	20 AWG
7	RTN	Black	20 AWG
8	POK	Gray	22 AWG
9	5 V AUX	Purple	20 AWG
10	+12 V	Yellow	20 AWG
11	+12 V	Yellow	20 AWG
12	3.3 V	Orange	20 AWG
13	3.3 V	Orange	20 AWG
14	-12 V	Blue	22 AWG
15	RTN	Black	20 AWG
16	PS_ON	Green	22 AWG
17	RTN	Black	20 AWG
18	RTN	Black	20 AWG
19	RTN	Black	20 AWG
20	OPEN		
21	5 V	Red	20 AWG
22	5 V	Red	20 AWG
23	5 V	Red	20 AWG
24	RTN	Black	20 AWG

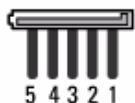
### **DC Power Connector P2**



<b>Pin Number</b>	<b>Signal Name</b>	<b>18-AWG Wire</b>
1	GND	Black

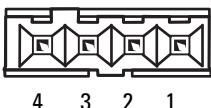
<b>Pin Number</b>	<b>Signal Name</b>	<b>18-AWG Wire</b>
2	GND	Black
3	+12 VADC	Yellow
4	+12 VADC	Yellow

***DC Power Connectors P3, P4, P5, P6, P7, and P8***



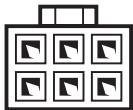
<b>Pin Number</b>	<b>Signal name</b>	<b>18-AWG Wire</b>
1	+3.3 VDC	Orange
2	GND	Black
3	+5 VDC	Red
4	GND	Black
5	+12 VBDC	White

***DC Power Connector P9***



<b>Pin Number</b>	<b>Signal Name</b>	<b>22-AWG Wire</b>
1	+5 VDC	Red
2	GND	Black
3	GND	Black
4	+12 VADC	Yellow

### ***DC Power Connector P10***



<b>Pin Number</b>	<b>Signal Name</b>	<b>22-AWG Wire</b>
1	+12 VDC	Yellow
2	+12 VDC	Yellow
3	+12 VDC	Yellow
4	GND	Black
5	GND	Black
6	GND	Black

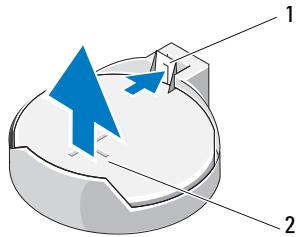


## Coin-Cell Battery

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
-  **NOTICE:** The procedure for removing and replacing the coin-cell battery is identical (except where noted) for the Vostro 420, Vostro 220, and Vostro 220s computers.

### Removing the Coin-Cell Battery

- 1 Record all the screens in the system setup program so that you can restore the correct settings in step 4 of "Replacing the Coin-Cell Battery" on page 118. See "System Setup Program" on page 129 for assistance with the system setup program.
  - 2 Follow the procedures in "Before Working on Your Computer" on page 35.
  - 3 Remove the computer cover (see "Removing the Computer Cover" on page 47).
  - 4 For the Vostro 220s, remove the chassis support bracket (see "Removing the Chassis Support Bracket" on page 55).
-  **NOTICE:** If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.



1 release latch

2 battery (positive side)

- 5 Carefully press the release latch away from the battery to allow the battery to pop up from the socket.
- 6 Remove the battery from the system and properly dispose of the battery.

## Replacing the Coin-Cell Battery

- 1 Insert the new battery into the socket with the side labeled "+" facing up, and then snap the battery into place. Ensure that it is securely retained within the battery socket.
- 2 For the Vostro 220s, replace the chassis support bracket (see "Replacing the Chassis Support Bracket" on page 57).
- 3 Follow the procedure in "After Working on Your Computer" on page 45.
- 4 Enter the system setup program (see "System Setup Program" on page 129 for instructions) and restore the settings you recorded in step 1. Also, enter the correct date and time.

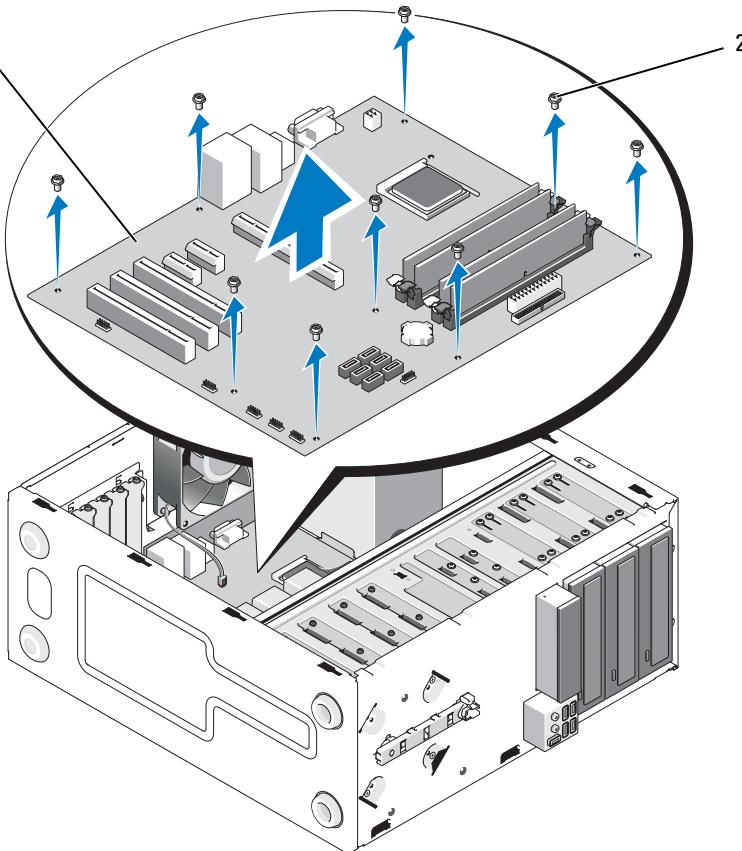
# System Board

-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** To guard against likelihood of electric shock, laceration by moving fan blades, or other unexpected injuries, always unplug your computer from the electrical outlet before removing the cover.
-  **NOTICE:** The procedure for removing and replacing the system board is identical (except where noted) for the Vostro 420, Vostro 220, and Vostro 220s computers; the illustration provided is for example only and may not represent your particular computer precisely.

## Remove the System Board

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3 For the Vostro 220s:
  - a Remove the chassis support bracket (see "Removing the Chassis Support Bracket" on page 55).
  - b Slide the optical drive forward far enough to gain access to the PWR1 connector on the system board.
- 4 Remove all expansion cards (see "Removing a PCI or PCI Express Card" on page 59). Store them temporarily in separate antistatic packaging to prevent damage from discharge of static electricity.
- 5 Disconnect all the CD/DVD/hard drive data cables from the system board.
- 6 Disconnect all front panel cables from the system board.
- 7 Disconnect the DC power cables from the system board.
- 8 If the system board is being replaced with another system board:
  - a Remove the processor heat sink/fan assembly (see "Removing the Processor Heat Sink/Fan Assembly" on page 99).

- b** Remove the memory modules from the system board (see "Replacing or Adding a Memory Module" on page 104) and place them individually into antistatic packaging.
  - c** Remove the processor from the system board (see "Removing the Processor" on page 125) and place it into antistatic packaging.
- 9** Disconnect the chassis fan cable from the system board.
- 10** Disconnect any additional cables from the system board.
- 11** Remove the screws that secure the system board to the computer chassis.
- !** **CAUTION: The system board is extremely fragile. Exercise great care when handling the system board.**
- 12** Carefully lift the system board out of the computer chassis and place it into antistatic packaging.

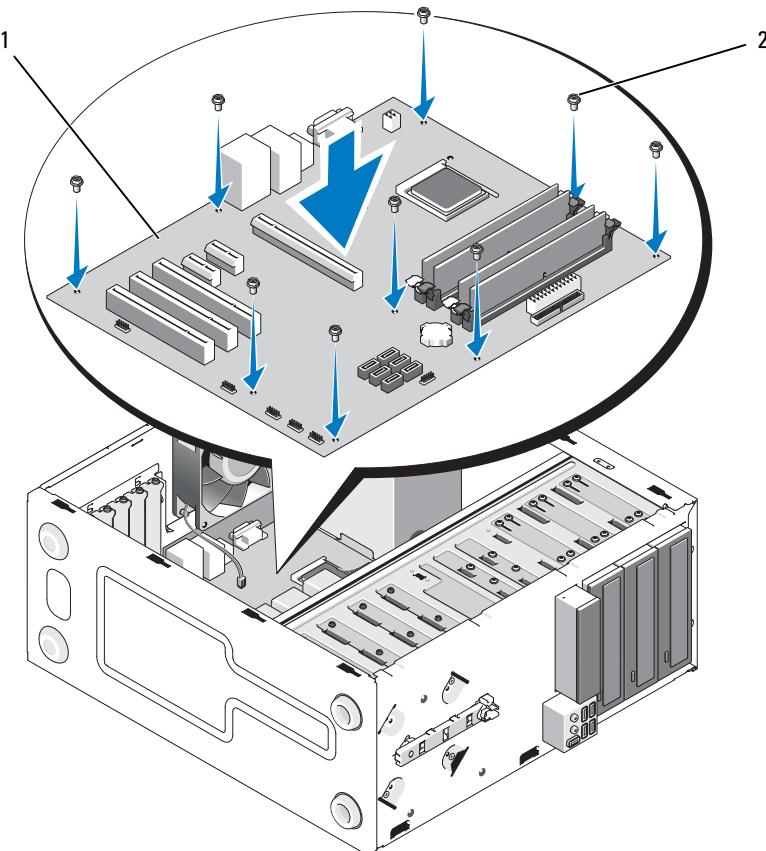


1 system board

2 screws (9)

## Replacing a System Board

- 1 Align the holes of the system board with the screw holes in the chassis, ensuring that the back panel connectors are properly aligned in the openings on the back of the chassis.



- 2 Replace the screws that secure the system board to the chassis. Avoid over-tightening the screws.

**! CAUTION:** Failure to replace and tighten all screws properly may not provide adequate grounding of the system board and result in system failures.

- 3 Connect the chassis fan cable to the system board.
- 4 If the system board is being replaced with a new system board:
  - a Install the memory modules onto the system board (see "Replacing or Adding a Memory Module" on page 104).

- b** Install the processor onto the system board (see "Replacing the Processor" on page 126).
    - a** Install the processor heat sink/fan assembly (see "Replacing the Processor Heat Sink/Fan Assembly" on page 101).
- 5** Connect the power supply cables to the system board (see "System Board Components" on page 40 for connector locations).
- 6** Connect all front panel cables to the system board (see "System Board Components" on page 40 for connector locations).
- 7** Connect all the data cables from the drives to the system board (see "System Board Components" on page 40 for connector locations).
- 8** Connect any additional cables to the system board as required.
- 9** Install all expansion cards (see "Installing a PCI or PCI Express Card" on page 60).
- 10** Slide the optical drive back fully into the drive bay.
- 11** Check all cable connections throughout the computer chassis to ensure that they are secure. See "System Board Components" on page 40 to help identify connectors on the system board.
- 12** Follow the procedure in "After Working on Your Computer" on page 45.



## Processor

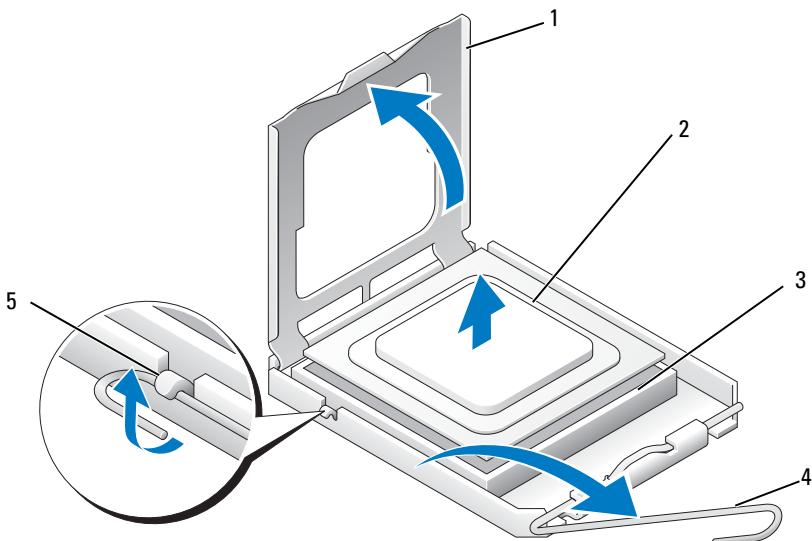
-  **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **NOTICE:** Do not perform the following steps unless you are familiar with hardware removal and replacement. Performing these steps incorrectly could damage your system board. For information about contacting Dell, see "Contacting Dell" on page 137.

### Removing the Processor

- 1 Follow the procedures in "Before Working on Your Computer" on page 35.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 47).

 **CAUTION:** Despite having a plastic shield, the heat sink assembly may be very hot during normal operation. Be sure that it has had sufficient time to cool before you touch it.

- 3 Remove the processor heat sink/fan assembly from the computer (see "Removing the Processor Heat Sink/Fan Assembly" on page 99).
  -  **NOTE:** Unless a new heat sink is required for the new processor, reuse the original heat sink/fan assembly when you replace the processor.
- 4 Push the release lever down and then press it outward to release it from the retention hook that secures it.
- 5 Raise the processor cover, if applicable.



1 processor cover  
3 socket  
5 retention hook

2 processor  
4 release lever

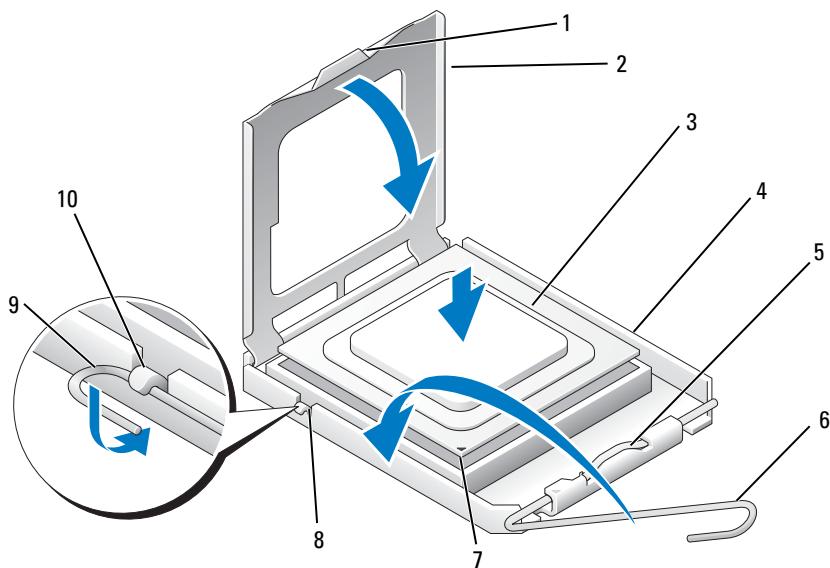
- ☞ **NOTICE:** When replacing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.
- 6 Lift the processor to remove it from the socket and place it into antistatic packaging.

## Replacing the Processor

- ☞ **NOTICE:** Ground yourself by touching an unpainted metal surface, such as on the back of the computer.
- ☞ **NOTICE:** You must position the processor correctly in the socket to avoid permanent damage to the processor and the computer when you turn on the computer.
- 1 Unpack the new processor, being careful not to touch the underside of the processor.



**NOTICE:** Socket pins are delicate. To avoid damage, ensure that the processor is aligned properly with the socket, and do not use excessive force when you install the processor. Be careful not to touch or bend the pins on the system board.



1	tab	2	processor cover
3	processor	4	processor socket
5	retention latch	6	release lever
7	processor pin-1 indicator	8	alignment notch
9	retention hook	10	alignment notch

- 2 Pivot the release lever fully and ensure that the processor cover remains raised.
- 3 Orient the two alignment notches on the processor with the two alignment notches on the socket.
- 4 Align the pin-1 corners of the processor and socket, and set the processor lightly in the socket, ensuring that the processor is positioned correctly.

-  **NOTICE:** To avoid damage, ensure that the processor aligns properly with the socket, and do not use excessive force when you press the processor into the socket.
  - 5 Press the processor lightly into the socket until it is fully seated.
  - 6 Lower the processor cover.
-  **NOTE:** Ensure that the tab on the cover is positioned such that it will be underneath the retention latch when the release lever is rotated and secured underneath the retention hook.
  - 7 Pivot the release lever back towards the socket, and secure it underneath the retention hook.
  - 8 Clean the thermal grease from the bottom of the heat sink.
-  **NOTICE:** Ensure that you apply new thermal grease. New thermal grease is critical for ensuring adequate thermal bonding, which is a requirement for optimal processor operation.
  - 9 Apply new thermal grease to the top of the processor.
  - 10 Replace the processor heat sink/fan assembly (see "Replacing the Processor Heat Sink/Fan Assembly" on page 101).
-  **NOTICE:** Ensure that the heat sink/fan assembly is correctly seated and secure.
  - 11 Follow the procedure in "After Working on Your Computer" on page 45.

# System Setup Program

## Overview

Use the system setup program as follows:

- To change the system configuration information after you add, change, or remove any hardware in your computer
- To set or change a user-selectable option such as the user password
- To read the current amount of memory or set the type of hard drive installed

Before you use the system setup program, it is recommended that you write down the system setup screen information for future reference.

 **NOTICE:** Unless you are an expert computer user, do not change the settings for this program. Certain changes can make your computer work incorrectly.

## Entering the System Setup Program

- 1 Turn on (or restart) your computer.
- 2 When the blue DELL™ logo is displayed, you must watch for the F2 prompt to appear.
- 3 Once this F2 prompt appears, press <F2> immediately.  
 **NOTE:** The F2 prompt indicates that the keyboard has initialized. This prompt can appear very quickly, so you must watch for it to display, and then press <F2>. If you press <F2> before you are prompted, the computer cannot acknowledge the keystroke.
- 4 If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then, shut down your computer (see "Turning Off Your Computer" on page 36) and try again.

## System Setup Program Screens

The system setup program screen displays current or changeable configuration information for your computer. Information on the screen is divided into three areas: the options list, active options field, and key functions.

<p><b>Options List</b> — This field appears on the left side of the system setup program window. The field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features.</p>	<p><b>Option Field</b> — This field contains information about each option. In this field you can view your current settings and make changes to your settings. Use the right and left arrow keys to highlight an option. Press &lt;Enter&gt; to make that selection active.</p>
<p>Scroll up and down the list with the up-and down-arrow keys. As an option is highlighted, the <b>Option Field</b> displays more information about that option and the option's current and available settings.</p>	<p><b>Key Functions</b> — This field appears below the <b>Option Field</b> and lists keys and their functions within the active system setup program field.</p>

## System Setup Program Options



**NOTE:** Depending on your computer and installed devices, the items listed in this section may not appear, or may not appear exactly as listed.

---

### **System Info**

---

System Info	Lists system information such as the computer name, and other system-specific information.
BIOS Info	Shows the BIOS version number and date information.
Service Tag	Displays computer service tag number for support purposes.
CPU Info	Identifies whether the computer's processor supports Hyper-Threading and lists the processor type, processor bus speed, processor ID, clock speed, and L2 cache.
Memory Info	Indicates amount of installed memory, memory speed, channel mode (dual or single), and type of memory installed.

---

### **Standard CMOS Features**

---

Date/Time	Displays current date and time settings. Date (mm:dd:yy)
SATA Info	Displays the SATA drives integrated in the system (SATA -0; SATA-1; SATA-2; SATA-3; SATA-4; SATA-5).
SATA Mode	AHCI by default
Halt On	All Error; All; But Keyboard. (All, But Keyboard by default)

---

### **Advanced BIOS Features**

---

CPU Feature	<ul style="list-style-type: none"><li>• SpeedStep—Enabled; Disabled (Enabled by default)</li><li>• Execute Disable Bit—Enabled; Disabled (Enabled by default)</li><li>• Hyper-Threading—Enabled; Disabled (Enabled by default)</li><li>• Core Multi-Processing—Enabled; Disabled (Enabled by default)</li><li>• Intel(R) C-STATE tech—Enabled; Disabled (Enabled by default)</li></ul>
Boot Up NumLock Status	Off; On (On by default)
Quiet Boot	Enabled; Disabled (Enabled by default)

---

### **Boot Configuration**

---

Hard Disk Boot Priority	Used to set the device priority of hard drives. The items displayed are dynamically updated according to the hard drives detected.
Removable Drives Boot Priority	Used to set the device priority of removable devices such as media card readers. The items displayed are dynamically updated according to the removable devices connected.
First Boot Device	Removable; Hard Disk; CDROM; USB-CDROM; Legacy LAN; Disabled (Removable by default)
Second Boot Device	Removable; Hard Disk; CDROM; USB-CDROM; Legacy LAN; Disabled (Hard disk by default)
Third Boot Device	Removable; Hard Disk; CDROM; USB-CDROM; Legacy LAN; Disabled (CD-ROM by default)
Boot Menu Security	Enabled; Disabled (Disabled by default)

---

#### **Advanced Chipset Features**

---

Init Display First	Onboard, PCI, PCI-Express (PCI-Express by default)
--------------------	--

---

#### **Integrated Peripherals**

---

USB Controller	Enabled or Disabled (Enabled by default)
Onboard Audio Connector	Enabled or Disabled (Enabled by default)
Onboard LAN Connector	Enabled or Disabled (Enabled by default)
Onboard LAN Boot ROM	Enabled or Disabled (Disabled by default)
Serial Port	OFF, COM 1, AUTO, COM 3 (AUTO by default)

---

#### **Power Management Setup**

---

ACPI Suspend Type	S1(POS); S3(STR) (S3(STR) by default)
AC Recovery	Power Off, Power On, Last State (Power Off by default)
Remote Wake Up	Enabled; Disabled (Enabled by default)
Auto Power On	Enabled; Disabled (Disabled by default)
Auto Power On Date	0
Auto Power On Time	0:00:00

---

#### **Load Defaults**

---

Load Optimal Defaults	Resets CMOS defaults to factory install values.
--------------------------	---

---

## Boot Sequence

This feature allows you to change the boot sequence for devices.

### Option Settings

- **Diskette Drive** — The computer attempts to boot from a floppy drive (if installed). If the floppy disk in the drive is not bootable, if no floppy disk is in the drive, or if there is no floppy drive installed in the computer, the computer generates an error message.
- **Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.
- **CD Drive** — The computer attempts to boot from the CD drive. If no CD is in the drive, or if the CD has no operating system, the computer generates an error message.
- **USB Flash Device** — Insert the memory device into a USB port and restart the computer. When F12 = Boot Menu appears in the upper-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu.



**NOTE:** To boot to a USB device, the device must be bootable. To make sure that your device is bootable, check the device documentation.

### Changing Boot Sequence for the Current Boot

You can use this feature, for example, to tell the computer to boot from the CD drive so that you can run the Dell Diagnostics on the Dell *Drivers and Utilities* disc, but you want the computer to boot from the hard drive when the diagnostic tests are complete. You can also use this feature to restart your computer to a USB device such as a floppy drive, memory key, or CD-RW drive.

- 1 If you are booting to a USB device, connect the USB device to a USB connector.
- 2 Turn on (or restart) your computer.

- When F2 = Setup, F12 = Boot Menu appears in the upper-right corner of the screen, press <F12>.

If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then shut down your computer and try again.

The **Boot Device Menu** appears, listing all available boot devices. Each device has a number next to it.

- At the bottom of the menu, enter the number of the device that is to be used for the current boot only.

For example, if you are booting to a USB memory key, highlight **USB Flash Device** and press <Enter>.



**NOTE:** To boot to a USB device, the device must be bootable. To make sure your device is bootable, check the device documentation.

## Changing Boot Sequence for Future Boots

- Enter the system setup program (see "Entering the System Setup Program" on page 129).
- Use the arrow keys to highlight the **Boot Sequence** menu option and press <Enter> to access the menu.



**NOTE:** Write down your current boot sequence in case you want to restore it.

- Press the up- and down-arrow keys to move through the list of devices.
- Press the spacebar to enable or disable a device (enabled devices have a checkmark).
- Press plus (+) or minus (-) to move a selected device up or down the list.

## Clearing Forgotten Passwords



**CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance)

- Follow the procedures in "Before Working on Your Computer" on page 35.
- Remove the computer cover (see "Removing the Computer Cover" on page 47).
- Locate the 3-pin password connector (PSWD) on the system board.

- 4** Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.
- 5** Wait for approximately five seconds to clear the password.
- 6** Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3 to enable the password feature.
- 7** Follow the procedure in "After Working on Your Computer" on page 45.

## Clearing CMOS Settings



**CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance)

- 1** Follow the procedures in "Before Working on Your Computer" on page 35.
- 2** Remove the computer cover (see "Removing the Computer Cover" on page 47).
- 3** Reset the current CMOS settings:
  - a** Locate the 3-pin CMOS jumper (CLEAR CMOS) on the system board (see "System Board Components" on page 40).
  - b** Remove the jumper plug from the CMOS jumper (CLEAR CMOS) pins 2 and 3.
  - c** Place the jumper plug on the CMOS jumper (CLEAR CMOS) pins 1 and 2 and wait approximately five seconds.
  - d** Remove the jumper plug and replace it on the CMOS jumper (CLEAR CMOS) pins 2 and 3.
- 4** Follow the procedure in "After Working on Your Computer" on page 45.
- 5** Reboot your computer.  
Your computer will emit five beeps, and then issue a CMOS checksum error.
- 6** Press <F1> to continue.

# **BIOS**

The system setup program resides within the BIOS on the system board. If you install a new system board, you may need to update (or *flash*) the BIOS.

## **Flashing the BIOS From the Hard Drive**

- 1** Turn on the computer.
- 2** Locate the latest BIOS update file for your computer at [support.dell.com](http://support.dell.com).
- 3** Click **Download Now** to download the file.
- 4** If the **Export Compliance Disclaimer** window appears, click **Yes, I Accept this Agreement**.

The **File Download** window appears.

- 5** Click **Save this program to disk**, and then click **OK**.

The **Save In** window appears.

- 6** Click the down arrow to view the **Save In** menu, select **Desktop**, and then click **Save**.

The file downloads to your desktop.

- 7** Click **Close** if the **Download Complete** window appears.

The file icon appears on your desktop and is titled the same as the downloaded BIOS update file.

- 8** Double-click the file icon on the desktop and follow the instructions on the screen.

## Contacting Dell

To contact Dell for sales, technical support, or customer service issues:

- 1** Visit [support.dell.com](http://support.dell.com).
- 2** Verify your country or region in the **Choose a Country/Region** drop-down menu at the bottom of the page.
- 3** Click **Contact Us** on the left side of the page.
- 4** Select the appropriate service or support link based on your need.
- 5** Choose the method of contacting Dell that is convenient for you.

