Dell™ Dimension™ E521

Owner's Manual

Service Tag

cover latch release

CD or DVD eject button

CD or DVD activity light

FlexBay for optional floppy drive or Media Card Reader

microphone connector

headphone connector

diagnostic lights

hard-drive activity light

power button/ power activity light

USB 2.0 connectors (2)
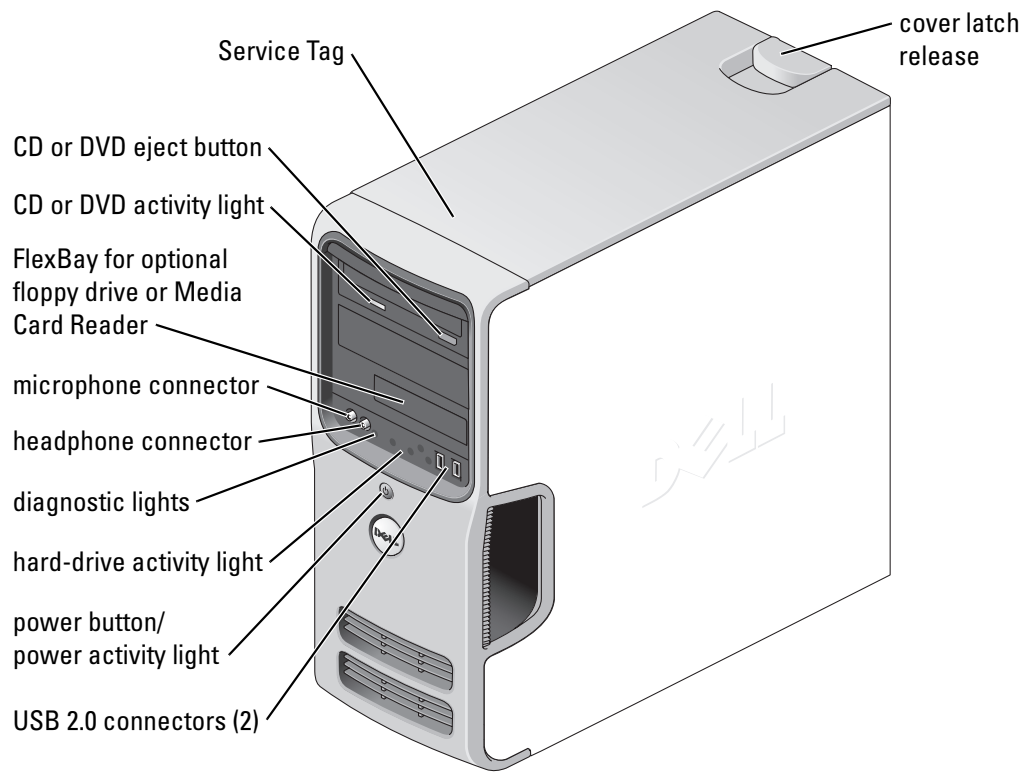
Model DCSM

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 a potential for property damage, personal injury, or death.**

Abbreviations and Acronyms

For a complete list of abbreviations and acronyms, see the "Glossary" on page 149.

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

Contents

Finding Information

📝 **NOTE:** Some features or media may be optional and may not ship with your computer. Some features or media may not be available in certain countries.

📝 **NOTE:** Additional information may ship with your computer.

What Are You Looking For?	Find it Here
• Warranty information • Terms and Conditions (U.S. only) • Safety instructions • Regulatory information • Ergonomics information • End User License Agreement	**Dell™ Product Information Guide**
• How to set up my computer	**Setup Diagram**

What Are You Looking For?	Find it Here

- Service Tag and Express Service Code
- Microsoft Windows License Label

Service Tag and Microsoft® Windows® License

These labels are located on your computer.

- Use the Service Tag to identify your computer when you use **support.dell.com** or contact support.

- Enter the Express Service Code to direct your call when contacting support.

- Solutions — Troubleshooting hints and tips, articles from technicians, and online courses, frequently asked questions
- Community — Online discussion with other Dell customers
- Upgrades — Upgrade information for components, such as memory, the hard drive, and the operating system
- Customer Care — Contact information, service call and order status, warranty, and repair information
- Service and support — Service call status and support history, service contract, online discussions with technical support
- Reference — Computer documentation, details on my computer configuration, product specifications, and white papers
- Downloads — Certified drivers, patches, and software updates

Dell Support Website — support.dell.com

NOTE: Select your region to view the appropriate support site.

NOTE: Corporate, government, and education customers can also use the customized Dell Premier Support website at **premier.support.dell.com**.

- Desktop System Software (DSS)— If you reinstall the operating system for your computer, you should also reinstall the DSS utility. DSS provides critical updates for your operating system and support for Dell™ 3.5-inch USB floppy drives, optical drives, and USB devices. DSS is necessary for correct operation of your Dell computer. The software automatically detects your computer and operating system and installs the updates appropriate for your configuration.

To download Desktop System Software:

1 Go to **support.dell.com** and click **Downloads**.

2 Enter your Service Tag or product model.

3 In the **Download Category** drop-down menu, click **All**.

4 Select the operating system and operating system language for your computer, and click **Submit.**

5 Under **Select a Device**, scroll to **System and Configuration Utilities**, and click **Dell Desktop System Software**.

What Are You Looking For?	Find it Here
• How to use Windows XP • How to work with programs and files • How to personalize my desktop	**Windows Help and Support Center** **1** Click **Start**→ **Help and Support**. **2** Type a word or phrase that describes your problem and click the arrow icon. **3** Click the topic that describes your problem. **4** Follow the instructions on the screen.

Setting Up and Using Your Computer

Front View of the Computer
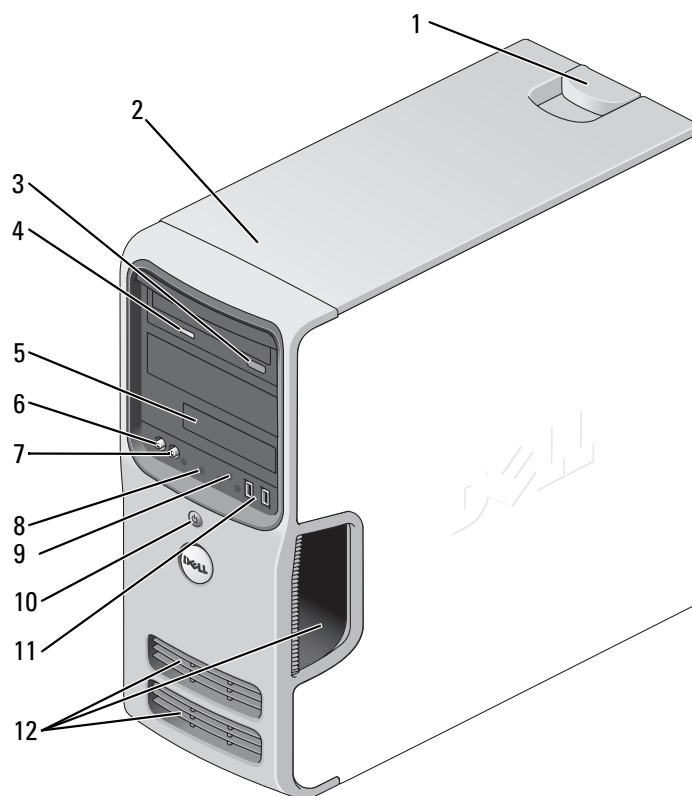
1	cover latch release	Use this latch to remove the cover. See "Removing the Computer Cover" on page 66.
2	location of Service Tag	Use the Service Tag to identify your computer when you access the Dell Support website or call technical support.
3	CD or DVD eject button	Press to eject a disk from the CD or DVD drive.
4	CD or DVD activity light	The drive light is on when the computer reads data from the CD or DVD drive.

5	FlexBay drive	Can contain an optional floppy drive or optional Media Card Reader. For information on using the Media Card Reader, see "Using a Media Card Reader (Optional)" on page 24.
6	microphone connector	Use the microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program. On computers with a sound card, the microphone connector is on the card.
7	headphone connector	Use the headphone connector to attach headphones and most kinds of speakers.
8	diagnostic lights (4)	Use the lights to help you troubleshoot a computer problem based on the diagnostic code. For more information, see "Diagnostic Lights" on page 53.
9	hard-drive activity light	The hard drive activity light is on when the computer reads data from or writes data to the hard drive. The light might also be on when a device such as a CD player is operating.
10	power button, power light	Press the power button to turn on the computer. The light in the center of this button indicates power state. See "Controls and Lights" on page 113 for more information. **NOTICE:** To avoid losing data, do not use the power button to turn off the computer. Instead, perform an operating system shutdown.
11	USB 2.0 connectors (2)	Use the front USB connectors for devices that you connect occasionally, such as joysticks or cameras, or for bootable USB devices (see "System Setup Options" on page 116 for more information on booting to a USB device). It is recommended that you use the back USB connectors for devices that typically remain connected, such as printers and keyboards.
12	vents	For adequate cooling, do not block any of the vents. **NOTICE:** Ensure that there is a minimum of two inches of space between all vents and any object near these vents. **NOTICE:** Keep the vent area clean and dust-free to ensure that the computer is adequately ventilated. Use only a dry cloth to clean the vent area to avoid water damage to the computer.

Back View of the Computer
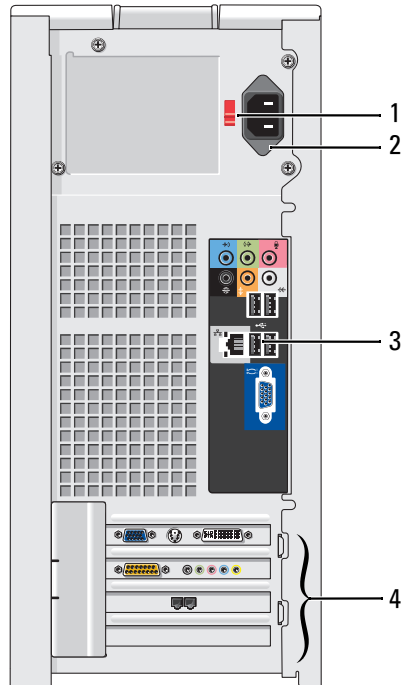
1	voltage selection switch	See the safety instructions in the *Product Information Guide* for more information.
2	power connector	Insert the power cable.
3	back panel connectors	Plug USB, audio, and other devices into the appropriate connector. See "Back Panel Connectors" on page 16 for more information.
4	card slots	Access connectors for any installed PCI and PCI Express cards.

Back Panel Connectors

1	link integrity light	• Green — A good connection exists between a 10-Mbps network and the computer. • Orange — A good connection exists between a 100-Mbps network and the computer. • Off — The computer is not detecting a physical connection to the network.
2	network adapter connector	To attach your computer to a network or broadband device, connect one end of a network cable to either a network port or your network or broadband device. Connect the other end of the network cable to the network adapter connector on the back panel of your computer. A click indicates that the network cable has been securely attached. **NOTE:** Do not plug a telephone cable into the network connector. On computers with a network connector card, use the connector on the card. It is recommended that you use Category 5 wiring and connectors for your network. If you must use Category 3 wiring, force the network speed to 10 Mbps to ensure reliable operation.
3	network activity light	Flashes a yellow light when the computer is transmitting or receiving network data. A high volume of network traffic may make this light appear to be in a steady "on" state.
4	surround connector	Use the black surround connector to attach multichannel-capable speakers.

5	line-in connector	Use the blue line-in connector to attach a record/playback device such as a cassette player, CD player, or VCR. On computers with a sound card, use the connector on the card.
6	line-out connector	Use the green line-out connector (available on computers with integrated sound) to attach headphones and most speakers with integrated amplifiers. On computers with a sound card, use the connector on the card.
7	microphone	Use the pink connector to attach a personal computer microphone for voice or musical input into a sound or telephony program. On computers with a sound card, the microphone connector is on the card.
8	side surround connector	Use the silver connector to provide enhanced surround audio for computers with 7.1 speakers. On computers with a sound card, the microphone connector is on the card.
9	center/subwoofer connector	Use the yellow connector to attach a speaker to a Low Frequency Effects (LFE) audio channel.
10	USB 2.0 connectors (4)	Use the back USB connectors for devices that typically remain connected, such as printers and keyboards. It is recommended that you use the front USB connectors for devices that you connect occasionally, such as joysticks or cameras.
11	VGA video connector	Connect the monitor's VGA cable to the VGA connector on the computer. On computers with a video card, use the connector on the card.

Setting Up a Printer

NOTICE: Complete the operating system setup before you connect a printer to the computer.

See the documentation that came with the printer for setup information, including how to:

- Obtain and install updated drivers.
- Connect the printer to the computer.
- Load paper and install the toner or ink cartridge.

For technical assistance, refer to the printer owner's manual or contact the printer manufacturer.

Printer Cable

Your printer connects to your computer with a USB cable. Your printer may not come with a printer cable, so if you purchase a cable separately, ensure that it is compatible with your printer. If you purchased a printer cable at the same time you purchased your computer, the cable may arrive in the computer box.

Connecting a Printer

✐ **NOTE:** You can connect USB devices while the computer is turned on.

1 Complete the operating system setup if you have not already done so.

2 Attach the USB printer cable to the USB connectors on the computer and the printer. The USB connectors fit only one way.
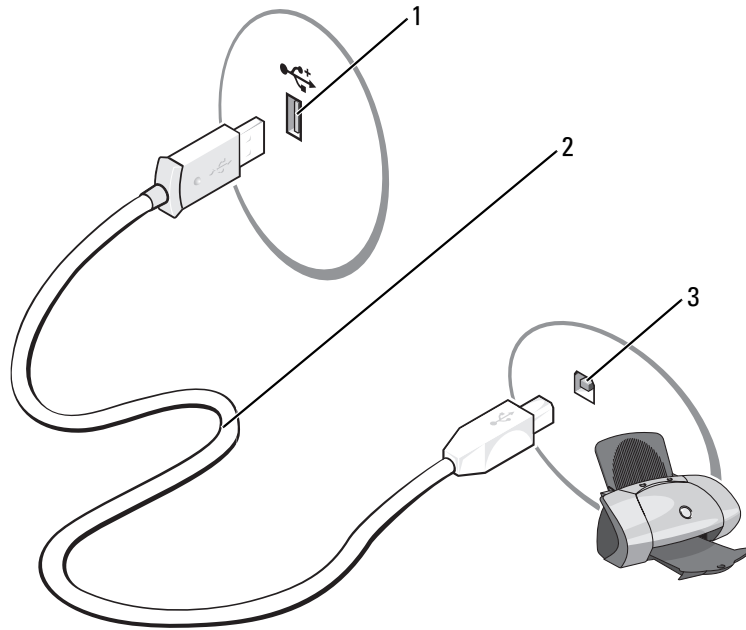
| 1 | USB connector on computer | 2 | USB printer cable | 3 | USB connector on printer |

3 Turn on the printer and then turn on the computer. If the **Add New Hardware Wizard** window appears, click **Cancel**.

4 Install the printer driver if necessary. See the documentation that came with your printer.

Connecting to the Internet

✐ **NOTE:** ISPs and ISP offerings vary by country.

To connect to the Internet, you need a modem or network connection and an Internet service provider (ISP). Your ISP will offer one or more of the following Internet connection options:

• Dial-up connections that provide Internet access through a telephone line. Dial-up connections are considerably slower than DSL and cable modem connections.

• DSL connections that provide high-speed Internet access through your existing telephone line. With a DSL connection, you can access the Internet and use your telephone on the same line simultaneously.

• Cable modem connections that provide high-speed Internet access through your local cable TV line.

If you are using a dial-up connection, connect a telephone line to the modem connector on your computer and to the telephone wall jack before you set up your Internet connection. If you are using a DSL or cable modem connection, contact your ISP for setup instructions.

Setting Up Your Internet Connection

To set up an Internet connection with a provided ISP desktop shortcut:

1 Save and close any open files, and exit any open programs.

2 Double-click the ISP icon on the Microsoft® Windows® desktop.

3 Follow the instructions on the screen to complete the setup.

If you do not have an ISP icon on your desktop or if you want to set up an Internet connection with a different ISP:

1 Save and close any open files, and exit any open programs.

2 Click the **Start** button and click **Internet Explorer**.

The **New Connection Wizard** appears.

3 Click **Connect to the Internet**.

4 In the next window, click the appropriate option:

- If you do not have an ISP and want to select one, click **Choose from a list of Internet service providers (ISPs)**.

- If you have already obtained setup information from your ISP but you did not receive a setup CD, click **Set up my connection manually**.

- If you have a CD, click **Use the CD I got from an ISP**.

5 Click **Next**.

If you selected **Set up my connection manually**, continue to step 6. Otherwise, follow the instructions on the screen to complete the setup.

NOTE: If you do not know which type of connection to select, contact your ISP.

6 Click the appropriate option under **How do you want to connect to the Internet?**, and then click **Next**.

7 Use the setup information provided by your ISP to complete the setup.

If you are having problems connecting to the Internet, see "E-Mail, Modem, and Internet Problems" on page 39. If you cannot connect to the Internet but have successfully connected in the past, the ISP might have a service outage. Contact your ISP to check the service status, or try connecting again later.

Playing CDs and DVDs

 ⊖ **NOTICE:** Do not press down on the CD or DVD tray when you open or close it. Keep the tray closed when you are not using the drive.

 ⊖ **NOTICE:** Do not move the computer when you are playing CDs or DVDs.

1 Press the eject button on the front of the drive.

2 Place the disc, label side up, in the center of the tray.

3 Press the eject button or gently push in the tray.

To format CDs for storing data, to create music CDs, or to copy CDs, see the CD software that came with your computer.

 📝 **NOTE:** Ensure that you follow all copyright laws when you create CDs.

A CD player includes the following basic buttons:

▶	Play
◀◀	Move backward within the current track
❚❚	Pause
▶▶	Move forward within the current track
◼	Stop
❙◀◀	Go to the previous track
⏏	Eject
▶▶❙	Go to the next track

A DVD player includes the following basic buttons:

◻	Stop
⏎	Restart the current chapter
▶	Play
⏩	Fast forward
⏸	Pause
⏪	Fast reverse
⏭	Advance a single frame while in pause mode
⏭	Go to the next title or chapter
↻	Continuously play the current title or chapter
⏮	Go to the previous title or chapter
⏏	Eject

For more information on playing CDs or DVDs, click **Help** on the CD or DVD player (if available).

Adjusting the Volume

📝 **NOTE:** When the speakers are muted, you do not hear the CD or DVD playing.

1 Click the **Start** button, point to **All Programs**→ **Accessories**→ **Entertainment**, and then click **Volume Control**.

2 In the **Volume Control** window, click and drag the bar in the **Volume Control** column and slide it up or down to increase or decrease the volume.

For more information on volume control options, click **Help** in the **Volume Control** window.

Adjusting the Picture

If an error message notifies you that the current resolution and color depth are using too much memory and preventing DVD playback, adjust the display properties:

1 Click the **Start** button and click **Control Panel**.

2 Under **Pick a category**, click **Appearance and Themes**.

3 Under **Pick a task...**, click **Change the screen resolution**.

4 In the **Display Properties** window, click and drag the bar in **Screen resolution** to change the setting to **800 by 600 pixels**.

5 Click the drop-down menu under **Color quality**, and then click **Medium (16 bit)**.

6 Click **OK**.

Copying CDs and DVDs

> **NOTE:** Ensure that you observe all copyright laws when creating CDs or DVDs.

This section applies only to computers that have a CD-RW, DVD+/-RW, or CD-RW/DVD (combo) drive.

> **NOTE:** The types of CD or DVD drives offered by Dell may vary by country.

The following instructions explain how to make an exact copy of a CD or DVD. You can also use Sonic DigitalMedia for other purposes, such as creating music CDs from audio files stored on your computer or backing up important data. For help, open Sonic DigitalMedia and then click the question mark icon in the upper-right corner of the window.

How to Copy a CD or DVD

> **NOTE:** CD-RW/DVD combo drives cannot write to DVD media. If you have a CD-RW/DVD combo drive and you experience recording problems, check for available software patches on the Sonic support website at www.sonic.com.

The DVD-writable drives installed in Dell™ computers can write to and read DVD+/-R, DVD+/-RW and DVD+R DL (dual layer) media, but cannot write to and may not read DVD-RAM or DVD-R DL media.

> **NOTE:** Most commercial DVDs have copyright protection and cannot be copied using Sonic DigitalMedia.

1 Click Start→ All Programs→ Sonic→ DigitalMedia Projects→ Copy→ Disc Copy.

2 To copy the CD or DVD:

• *If you have one CD or DVD drive*, ensure that the settings are correct and click the **Disc Copy** button. The computer reads your source CD or DVD and copies the data to a temporary folder on your computer hard drive.

When prompted, insert a blank CD or DVD into the drive and click **OK**.

• *If you have two CD or DVD drives*, select the drive into which you have inserted your source CD or DVD and click the **Disc Copy** button. The computer copies the data from the source CD or DVD to the blank CD or DVD.

Once you have finished copying the source CD or DVD, the CD or DVD that you have created automatically ejects.

Using Blank CDs and DVDs

CD-RW drives can write to CD recording media only (including high-speed CD-RW) while DVD-writable drives can write to both CD and DVD recording media.

Use blank CD-Rs to record music or permanently store data files. After creating a CD-R, you cannot write to that CD-R again (see the Sonic documentation for more information). Use blank CD-RWs to write to CDs or to erase, rewrite, or update data on CDs.

Blank DVD+/-Rs can be used to permanently store large amounts of information. After you create a DVD+/-R disc, you may not be able to write to that disc again if the disc is "finalized" or "closed" during the final stage of the disc creation process. Use blank DVD+/-RWs if you plan to erase, rewrite, or update information on that disc later.

CD-Writable Drives

Media Type	Read	Write	Rewritable
CD-R	Yes	Yes	No
CD-RW	Yes	Yes	Yes

DVD-Writable Drives

Media Type	Read	Write	Rewritable
CD-R	Yes	Yes	No
CD-RW	Yes	Yes	Yes
DVD+R	Yes	Yes	No
DVD-R	Yes	Yes	No
DVD+RW	Yes	Yes	Yes
DVD-RW	Yes	Yes	Yes
DVD+R DL	Yes	Yes	No

Helpful Tips

- Use Microsoft® Windows® Explorer to drag and drop files to a CD-R or CD-RW only after you start Sonic DigitalMedia and open a DigitalMedia project.

- Use CD-Rs to burn music CDs that you want to play in regular stereos. CD-RWs do not play in most home or car stereos.

- You cannot create audio DVDs with Sonic DigitalMedia.

- Music MP3 files can be played only on MP3 players or on computers that have MP3 software installed.

- Commercially available DVD players used in home theater systems may not support all available DVD formats. For a list of formats supported by your DVD player, see the documentation provided with your DVD player or contact the manufacturer.

- Do not burn a blank CD-R or CD-RW to its maximum capacity; for example, do not copy a 650-MB file to a blank 650-MB CD. The CD-RW drive needs 1–2 MB of the blank space to finalize the recording.

- Use a blank CD-RW to practice CD recording until you are familiar with CD recording techniques. If you make a mistake, you can erase the data on the CD-RW and try again. You can also use blank CD-RWs to test music file projects before you record the project permanently to a blank CD-R.

- See the Sonic website at **www.sonic.com** for additional information.

Using a Media Card Reader (Optional)

Use the Media Card Reader to transfer data directly to your computer.

The Media Card Reader supports the following memory types:

- xD-Picture Card
- SmartMedia (SMC)
- CompactFlash Type I and II (CF I/II)
- MicroDrive Card
- SecureDigital Card (SD)
- MultiMediaCard (MMC)
- Memory Stick (MS/MS Pro)

For information on installing a Media Card Reader, see "Installing a Media Card Reader" on page 103.
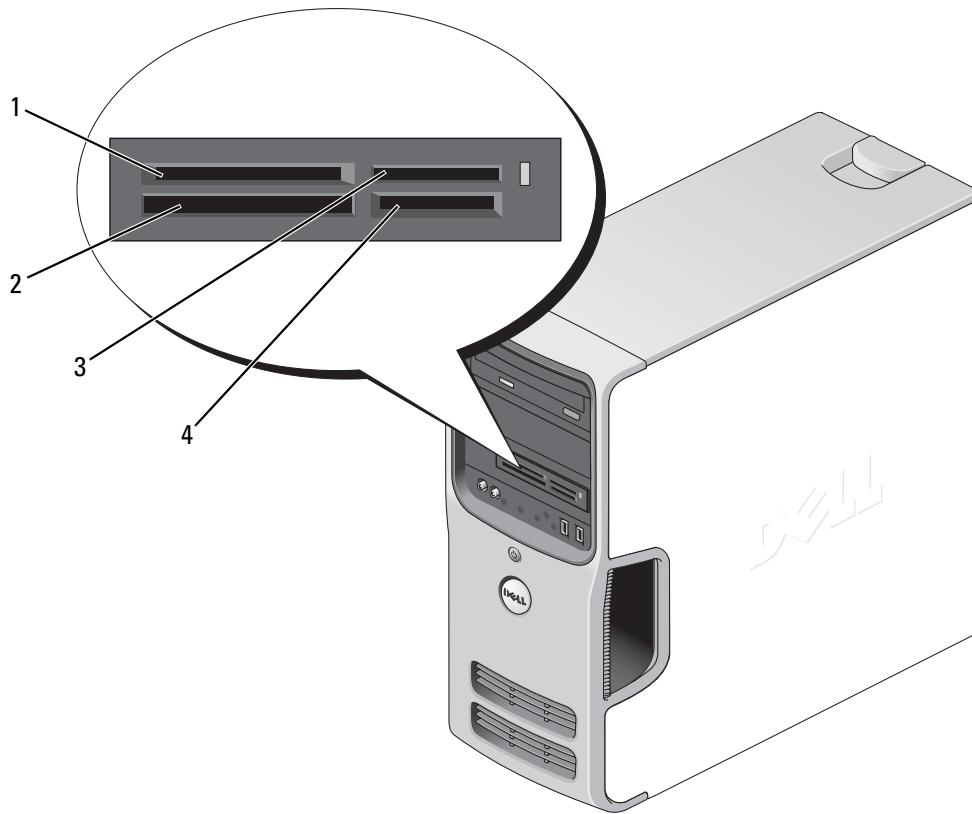
1	xD-Picture Card and SmartMedia (SMC)	2	CompactFlash Type I and II (CF I/II) and MicroDrive Card	3	Memory Stick (MS/MS Pro)
4	SecureDigital Card (SD)/ MultiMediaCard (MMC)				

To use the Media Card Reader:

1 Check the media or card to determine the proper orientation for insertion.

2 Slide the media or card into the appropriate slot until it is completely seated in the connector.

If you encounter resistance, do not force the media or card. Check the card orientation and try again.

Connecting Two Monitors

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

If you purchased a graphics card that supports dual monitors, follow these instructions to connect and enable your monitors. The instructions tell you how to connect either two monitors (each with a VGA connector), one monitor with a VGA connector and one monitor with a DVI connector, or a TV.

⊃ **NOTICE:** If you are connecting two monitors that have VGA connectors, you must have the optional DVI adapter to connect the cable. If you are connecting two flat-panel monitors, at least one of them must have a VGA connector. If you are connecting a TV, you may connect only one monitor (VGA or DVI) in addition to the TV.

Connecting Two Monitors With VGA Connectors

1 Follow the procedures in "Before You Begin" on page 65.

🖉 **NOTE:** If your computer has integrated video, do not connect either monitor to the integrated video connector. If the integrated video connector is covered by a cap, do not remove the cap to connect the monitor or the monitor will not function.

2 Connect one of the monitors to the VGA (blue) connector on the back of the computer.

3 Connect the other monitor to the optional DVI adapter and connect the DVI adapter to the DVI (white) connector on the back of the computer.
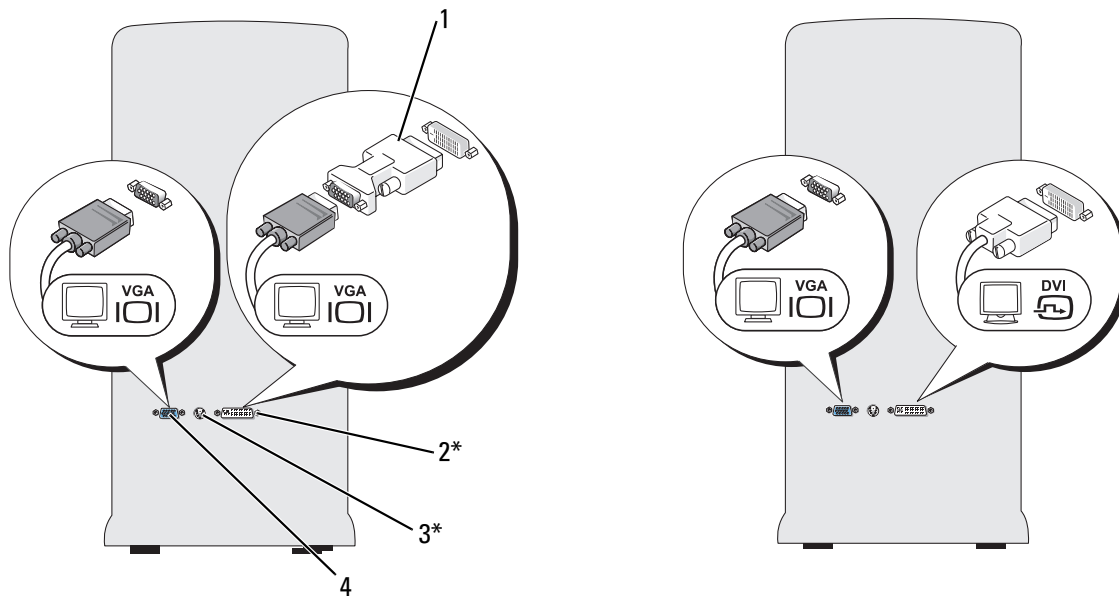
*May not be present on your computer

1	optional DVI adapter	2	DVI (white) connector	3	TV-OUT connector
4	VGA (blue) connector				

Connecting One Monitor With a VGA Connector and One Monitor With a DVI Connector

1 Follow the procedures in "Before You Begin" on page 65.

2 Connect the VGA connector on the monitor to the VGA (blue) connector on the back of the computer.

3 Connect the DVI connector on the other monitor to the DVI (white) connector on the back of the computer.

Connecting a TV

> **NOTE:** You must purchase an S-video cable, available at most consumer electronics stores, to connect a TV to your computer. It is not included with your computer.

1 Follow the procedures in "Before You Begin" on page 65.

2 Connect one end of the S-video cable to the optional TV-OUT connector on the back of the computer.

3 Connect the other end of the S-video cable to the S-video input connector on your TV.

4 Connect the VGA or DVI monitor.

Changing the Display Settings

1 After you connect the monitor(s) or TV, turn on the computer.

The Microsoft® Windows® desktop displays on the primary monitor.

2 Enable clone mode or extended desktop mode in the display settings.

- In clone mode, both monitors display the same image.
- In extended desktop mode, you can drag objects from one screen to the other, effectively doubling the amount of viewable work space.

For information on changing the display settings for your graphics card, see the user's guide in the Help and Support Center (click the **Start** button, click **Help and Support**, click **User and system guides**, click **Device guides**, and then click the guide for your graphics card).

Setting Up a Home and Office Network

Connecting to a Network Adapter

> **NOTICE:** Plug the network cable into the network adapter connector on the computer. Do not plug the network cable into the modem connector on the computer. Do not plug a network cable into a telephone wall jack.

1 Connect the network cable to the network adapter connector on the back of your computer.

Insert the cable until it clicks into place, and then gently pull it to ensure that it is secure.

2 Connect the other end of the network cable to a network device.
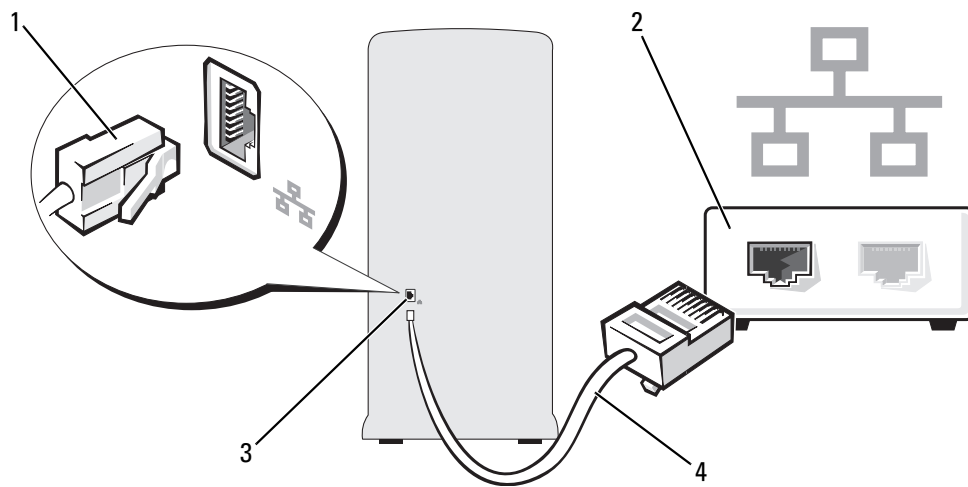
1	network adapter connector	2	network device	3	network adapter connector on computer
4	network cable				

Network Setup Wizard

The Microsoft® Windows® XP operating system provides a Network Setup Wizard to guide you through the process of sharing files, printers, or an Internet connection between computers in a home or small office.

1 Click the **Start** button, point to **All Programs**→ **Accessories**→ **Communications**, and then click **Network Setup Wizard**.

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

3 Click **Checklist for creating a network**.

NOTE: Selecting the connection method **This computer connects directly to the Internet** enables the integrated firewall provided with Windows XP Service Pack.

4 Complete the checklist and required preparations.

5 Return to the Network Setup Wizard and follow the instructions on the screen.

Power Management

The Microsoft® Windows® XP power management features can reduce the amount of electricity your computer uses when it is on and you are not using it. You can reduce power to just the monitor or the hard drive, or you can use standby mode or hibernate mode to reduce power to the entire computer. When the computer exits from a power conservation mode, the Windows desktop is restored to the state it was in before it entered the mode.

NOTE: Windows XP Professional includes security and networking features not available in Windows XP Home Edition. When a Windows XP Professional computer is connected to a network, different options related to security and networking appear in certain windows.

Standby Mode

Standby mode conserves power by turning off the display and the hard drive after a time-out. When the computer exits from standby mode, it returns to the operating state it was in before it entered standby mode.

To set standby mode to automatically activate after a defined period of inactivity:

1 Click the **Start** button and click **Control Panel**.

2 Under **Pick a category**, click **Performance and Maintenance**.

3 Under **or pick a Control Panel icon**, click **Power Options**.

To immediately activate standby mode without a period of inactivity, click the **Start** button, click **Turn Off Computer**, and then click **Stand by**.

To exit from standby mode, press a key on the keyboard or move the mouse.

NOTICE: If your computer loses power while in standby mode, it may lose data.

Hibernate Mode

Hibernate mode conserves power by copying system data to a reserved area on the hard drive and then completely turning off the computer. When the computer exits from hibernate mode, the desktop is restored to the state it was in before it entered hibernate mode.

To activate hibernate mode:

1 Click the **Start** button and click **Control Panel**.

2 Under **Pick a category**, click **Performance and Maintenance**.

3 Under **or pick a Control Panel icon**, click **Power Options**.

4 Define your hibernate settings on the **Power Schemes** tab, **Advanced** tab, and **Hibernate** tab.

To exit from hibernate mode, press the power button. The computer may take a short time to exit from hibernate mode. Pressing a key on the keyboard or moving the mouse does not bring the computer out of hibernation, because the keyboard and the mouse do not function when the computer is in hibernate mode.

Because hibernate mode requires a special file on your hard drive with enough disk space to store the contents of the computer memory, Dell creates an appropriately sized hibernate mode file before shipping the computer to you. If the computer's hard drive becomes corrupted, Windows XP recreates the hibernate file automatically.

Power Options Properties

Define your standby mode settings, hibernate mode settings, and other power settings in the **Power Options Properties** window. To access the **Power Options Properties** window:

1 Click the **Start** button and click **Control Panel**.

2 Under **Pick a category**, click **Performance and Maintenance**.

3 Under **or pick a Control Panel icon**, click **Power Options**.

4 Define your power settings on the **Power Schemes** tab, **Advanced** tab, and **Hibernate** tab.

Power Schemes Tab

Each standard power setting is called a scheme. If you want to select one of the standard Windows schemes installed on your computer, choose a scheme from the **Power schemes** drop-down menu. The settings for each scheme appear in the fields below the scheme name. Each scheme has different settings for starting standby mode or hibernate mode, turning off the monitor, and turning off the hard drive.

The **Power schemes** drop-down menu displays the following schemes:

- **Always On** (default) — If you want to use your computer with no power conservation.
- **Home/Office Desk** — If you use your computer as a home or office computer and you require minimal power conservation.
- **Presentation** — If you want your computer to run without interruption (using no power conservation).
- **Minimal Power Management** — If you want your computer to run with minimal power conservation.
- **Max Battery** — If your computer is a portable computer and you run your computer from batteries for extended periods of time.

If you want to change the default settings for a scheme, click the drop-down menu in the **Turn off monitor**, **Turn off hard disks**, **System stand by**, or **System hibernates** field, and then select a time-out from the displayed list. Changing the time-out for a scheme field permanently changes the default settings for that scheme, unless you click **Save As** and enter a new name for the changed scheme.

NOTICE: If you set the hard drive (hard disk) to time-out before the monitor does, your computer may appear to be locked up. To recover, press any key on the keyboard or click the mouse. To avoid this problem, always set the monitor to time-out before the hard drive.

Advanced Tab

The **Advanced** tab allows you to:

- Place the power options icon ⛃ in the Windows taskbar for quick access.
- Set the computer to prompt you for your Windows password before the computer exits from standby mode or hibernate mode.
- Program the power button to activate standby mode, activate hibernate mode, or turn off the computer.

To program these functions, click an option from the corresponding drop-down menu and click **OK**.

Hibernate Tab

The **Hibernate** tab allows you to enable hibernate mode. If you want to use the hibernate settings you defined on the **Power Schemes** tab, click the **Enable hibernate support** check box on the **Hibernate** tab.

For more information on power management options:

1. Click the **Start** button and click **Help and Support**.
2. In the **Help and Support** window, click **Performance and maintenance**.
3. In the **Performance and maintenance** window, click **Conserving power on your computer**.

Enabling Cool 'n' Quiet™ Technology

Cool 'n' Quiet technology controls your computer's processor performance automatically, dynamically adjusting the operating frequency and voltage, according to the task at hand. When an application does not require full performance, significant amounts of power can be saved. Performance is designed to still be responsive, with maximum processor performance being delivered when required, and automatic power savings when possible.

1. Run the system setup program and enable Cool 'n' Quiet technology using the Power Management options (see "System Setup" on page 115).
2. Click on the **Start**→ **Settings**→ **Control Panel**→ **Power Options** to access the **Power Options Properties** window.
3. From the **Power Schemes** tab, click the Power Schemes drop-down menu and select **Minimal Power Management** and then click **OK**.

About RAID Configurations

This section provides an overview of the RAID configuration you may have selected when you purchased your computer. Your computer supports RAID level 1. A RAID level 1 is recommended for users that desire a high level of data integrity.

The drives in a RAID configuration should be the same size in order to ensure that the larger drive does not contain unallocated (and therefore unusable) space.

RAID Level 1 Configuration

RAID level 1 uses a data-redundancy storage technique known as mirroring to enhance data integrity. When data is written to the primary drive, the data is also duplicated, or mirrored, on the second drive in the configuration. A RAID level 1 configuration sacrifices high data-access rates for its data redundancy advantages.

serial ATA RAID configured for RAID level 1	
segment 1	segment 1 duplicated
segment 2	segment 2 duplicated
segment 3	segment 3 duplicated
segment 4	segment 4 duplicated
segment 5	segment 5 duplicated
segment 6	segment 6 duplicated
hard drive 1	hard drive 2
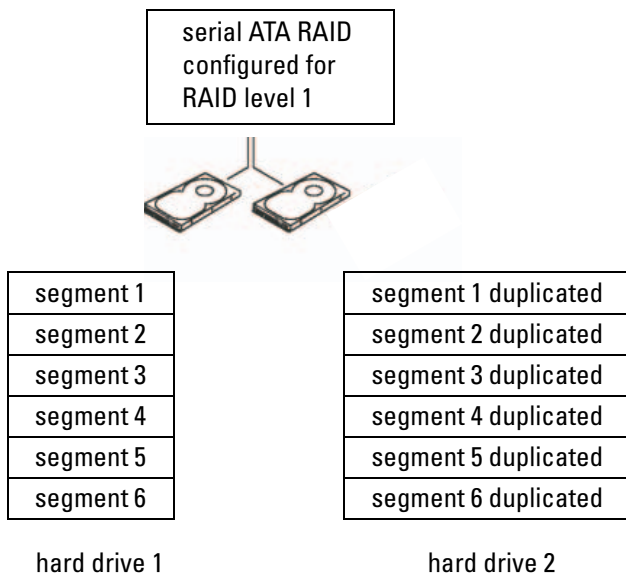
If a drive failure occurs, subsequent read and write operations are directed to the surviving drive. A replacement drive can then be rebuilt using the data from the surviving drive.

✎ **NOTE:** In a RAID level 1 configuration, the size of the configuration is equal to the size of the smallest drive in the configuration.

Configuring Your Hard Drives for RAID

Your computer can be configured for RAID, even if you did not select a RAID configuration when the computer was purchased. For an explanation of RAID levels and their requirements, see "About RAID Configurations" on page 31. For information on how to install a hard drive, see "Hard Drives" on page 92.

You can use one of two methods to configure RAID hard drive volumes. The first method uses the Nvidia MediaShield ROM utility and is performed *before* you install the operating system onto the hard drive. The second method uses Nvidia MediaShield and is performed *after* you have installed the operating system and Nvidia RAID drivers.

Both methods require that you set your computer to RAID-enabled mode before you begin.

Setting Your Computer to RAID-Enabled Mode

1 Enter the system setup (see "Entering System Setup" on page 115).

2 Press the up- and down-arrow keys to highlight **Drives**, then press <Enter>.

3 Press the up- and down-arrow keys to highlight the applicable SATA drive, then press <Enter>.

4 Press the left- and right-arrow keys to highlight **RAID On**, and then press <Enter>. Repeat the process, as needed, for each SATA hard drive.

    🖉 **NOTE:** For more information about RAID options, see "System Setup Options" on page 116.

5 Press <Esc>, press the left- and right-arrow keys to highlight **Save/Exit**, and then press <Enter> to exit system setup and resume the boot process.

Using the Nvidia MediaShield ROM Utility

    ⊘ **NOTICE:** The following procedure will result in the loss of all data on your hard drive(s). Back up any data you want to keep before continuing.

Hard drives of any size may be used to create a RAID configuration. Ideally, however, the drives should be of equal size to avoid unallocated or unused space. For an explanation of RAID levels and their requirements, see "About RAID Configurations" on page 31. For information on how to install a hard drive, see "Installing a Hard Drive" on page 93.

1 Enable RAID for each applicable hard drive on your computer (see "Setting Your Computer to RAID-Enabled Mode" on page 33).

2 Restart the computer.

3 Press <Ctrl><N> when prompted to enter the RAID BIOS.

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

The **Define a New Array** window appears.

4 Press <Tab> to navigate to the **RAID Mode** field.

To create a RAID 1 configuration, use the arrow keys to select **Mirroring**.

5 Press <Tab> to navigate to the **Free Disks** field.

6 Use the up- and down-arrow keys to select a hard drive to include in the RAID array and then use the right-arrow key to move the selected drive from the **Free Disks** field to the **Array Disks** field. Repeat for each disk you want to include in the RAID array.

    🖉 **NOTE:** Your computer supports a maximum of two drives per RAID 1 array.

7 After assigning the hard drives to an array, press <F9>.

The **Clear disk data** prompt appears.

    ⊘ **NOTICE:** You will lose all data on the selected drives in the next step.

8 Press <Y> to clear all data from the selected drives.

The **Array List** window appears.

9 To review the details of the array that you set up, use the arrow keys to highlight the array in the **Array Detail** window and press <Enter>.

The **Array Detail** window appears.

> ✍ **NOTE:** To delete an array, use the arrow keys to select the array and press <D>.

10 Press <Enter> to return to the previous screen.

11 Press <Ctrl><X> to exit the RAID BIOS.

Using Nvidia MediaShield

Nvidia MediaShield allows you to create, view, and manage RAID configurations.

> ✍ **NOTE:** Use Nvidia MediaShield to create a RAID configuration only when you are adding one or more new hard drives to an existing (non-RAID) single-drive computer, and you want to configure the new drive(s) into a RAID array.

Hard drives of any size may be used to create a RAID configuration using Nvidia MediaShield. Ideally, however, the drives should be of equal size to avoid unallocated or unused space. For an explanation of RAID levels and their requirements, see "About RAID Configurations" on page 31.

Creating a RAID Array

> ⊃ **NOTICE:** The following procedure will result in the loss of all data on your hard drive(s). Back up any data you want to keep before continuing.

1 Enable RAID on your hard drives (see "Setting Your Computer to RAID-Enabled Mode" on page 33).

2 After rebooting your computer, launch Nvidia MediaShield.

3 Click **Create** under **System Tasks**.

The **NVIDIA Create Array Wizard** appears and lists the disks that are available for configuration.

4 Click **Next**.

5 Click **Custom**, then click **Next**.

6 Use the drop-down box to select **Mirroring** (RAID 1).

7 Click **Next**.

The **Free Disk Selection** window appears.

> ✍ **NOTE:** Only RAID-enabled hard drives are listed as free disks.

8 Click to select the drives that will make up the RAID configuration, click **Next**, and then click **Next** again.

> ✍ **NOTE:** Your computer supports a maximum of two drives per RAID 1 array.

The **Clearing System Data** window appears.

NOTICE: The **Clear System Data** option deletes all data on the selected drive.

9 Click **Next**.

10 Click **Finish** to create the RAID configuration.

The MediaShield RAID management utility window appears and lists the array along with any other installed hard drives.

Deleting a RAID Array

NOTE: While this procedure deletes the RAID 1 volume, it also splits the RAID 1 volume into two non-RAID hard drives with a partition, and leaves any existing data files intact.

NOTE: If your computer currently boots to RAID and you delete the RAID volume, your computer will become unbootable.

1 Launch Nvidia MediaShield.

2 Click to select the array you want to delete.

3 Click **Delete Array** in the **System Tasks** pane.

The **NVIDIA Delete Array Wizard** appears.

4 Click **Next**.

A confirmation screen appears with the name and size of the array that you have marked for deletion.

5 Click **Finish** to delete the RAID configuration.

The MediaShield RAID management utility window appears and lists any remaining arrays along with any other installed hard drives.

Rebuilding a RAID Configuration

If one of the hard drives in a RAID array fails, you can rebuild the array by restoring the data to a replacement drive.

NOTE: Rebuilding an array can only be performed on RAID 1 configurations.

1 Launch Nvidia MediaShield.

2 Click to select your RAID configuration (**Mirroring**) in the management utility window.

3 Select **Rebuild Array** in the **System Tasks** pane.

The **NVIDIA Rebuild Array Wizard** appears.

4 Click **Next**.

5 Select the hard drive you want to rebuild by clicking the checkbox beside it.

6 Click **Next**.

7 Click **Finish**.

The MediaShield RAID management utility window appears and displays the status of the rebuild process.

✍ **NOTE:** You can use your computer while the computer is rebuilding the array.

✍ **NOTE:** You can use any available (RAID-enabled) free disk to rebuild an array.

2

Solving Problems

Troubleshooting Tips

Follow these tips when you troubleshoot 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 technical support personnel diagnose and fix the problem.

- If an error message occurs in a program, see the program's documentation.

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 in the *Product Information Guide*.**

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 "Replacing the Battery" on page 109). If the battery still does not work properly, contact Dell (see "Contacting Dell" on page 126).

Drive Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

ENSURE THAT MICROSOFT® WINDOWS® RECOGNIZES THE DRIVE — Click the **Start** button and click **My Computer**. If the floppy, CD, or DVD 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.

ENSURE THAT THE DRIVE IS ENABLED IN THE SYSTEM SETUP PROGRAM — See "System Setup" on page 115)

TEST THE DRIVE —
- Insert another floppy disk, CD, or DVD to eliminate the possibility that the original one is defective.
- Insert bootable media and restart the computer.

CLEAN THE DRIVE OR DISK — See "Cleaning Your Computer" on page 123.

CHECK THE CABLE CONNECTIONS

RUN THE HARDWARE TROUBLESHOOTER — See "Resolving Software and Hardware Incompatibilities" on page 59.

RUN THE DELL DIAGNOSTICS — See "Dell Diagnostics" on page 56.

CD and DVD drive problems

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

📝 **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 slidebar 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 50.

Problems writing to a CD/DVD-RW drive

CLOSE OTHER PROGRAMS — The CD/DVD-RW drive must receive a steady stream of data when writing. If the stream is interrupted, an error occurs. Try closing all programs before you write to the CD/DVD-RW.

TURN OFF STANDBY MODE IN WINDOWS BEFORE WRITING TO A CD/DVD-RW DISC —
1 Click the **Start** button and click **Control Panel**.
2 Under **Pick a category**, click **Performance and Maintenance**.
3 Under **or pick a Control Panel icon**, click **Power Options**.
4 From the **Power Schemes** tab, select **Always On**.

Hard drive problems

RUN CHECK DISK —
1 Click the **Start** button and click **My Computer**.
2 Right-click **Local Disk C:**.
3 Click **Properties**.
4 Click the **Tools** tab.
5 Under **Error-checking**, click **Check Now**.
6 Click **Scan for and attempt recovery of bad sectors**.
7 Click **Start**.

E-Mail, Modem, and Internet Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

✍ **NOTE:** Connect the modem to an analog telephone jack only. The modem does not operate while it is connected to a digital telephone network.

CHECK THE MICROSOFT OUTLOOK® EXPRESS SECURITY SETTINGS — If you cannot open your e-mail attachments:
1 In Outlook Express, click **Tools**, click **Options**, and then click **Security**.
2 Click **Do not allow attachments** to remove the checkmark.

CHECK THE TELEPHONE LINE CONNECTION —
CHECK THE TELEPHONE JACK —
CONNECT THE MODEM DIRECTLY TO THE TELEPHONE WALL JACK —
USE A DIFFERENT TELEPHONE LINE —
- Verify that the telephone line is connected to the jack on the modem. (The jack has either a green label or a connector-shaped icon next to it.)
- Ensure that you feel a click when you insert the telephone line connector into the modem.
- Disconnect the telephone line from the modem and connect it to a telephone. Listen for a dial tone.
- If you have other telephone devices sharing the line, such as an answering machine, fax machine, surge protector, or line splitter, then bypass them and use the telephone to connect the modem directly to the telephone wall jack. If you are using a line that is 3 m (10 ft) or more in length, try a shorter one.

RUN THE MODEM HELPER DIAGNOSTICS — Click the **Start** button, point to **All Programs**, and then click **Modem Helper**. Follow the instructions on the screen to identify and resolve modem problems. (Modem Helper is not available on all computers.)

VERIFY THAT THE MODEM IS COMMUNICATING WITH WINDOWS —
1 Click the **Start** button and click **Control Panel**.
2 Click **Printers and Other Hardware**.
3 Click **Phone and Modem Options**.
4 Click the **Modems** tab.
5 Click the COM port for your modem.
6 Click **Properties**, click the **Diagnostics** tab, and then click **Query Modem** to verify that the modem is communicating with Windows.
   If all commands receive responses, the modem is operating properly.

ENSURE THAT YOU ARE CONNECTED TO THE INTERNET — Ensure that you have subscribed to an Internet provider. With the Outlook Express e-mail program open, click **File**. If **Work Offline** has a checkmark next to it, click the checkmark to remove it and connect to the Internet. For help, contact your Internet service provider.

Error Messages

If the 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:

1 Click the **Start** button, click **Control Panel**, and then click **Add or Remove Programs**.

2 Select the program you want to remove.

3 Click the **Change or Remove Program** icon.

4 See the program documentation for installation instructions.

ALERT! AIR TEMPERATURE SENSOR NOT DETECTED — For any computer type except the ultra small form-factor computer, ensure that all cables are securely fastened to the I/O panel and to the system board and reboot your computer. If this does not resolve the problem or if you have an ultra small form-factor computer, contact Dell (see "Contacting Dell" on page 126).

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 floppy disk or CD.

NON-SYSTEM DISK ERROR — Remove the floppy disk from the drive and restart your computer.

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 might 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 126).

Keyboard Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

CHECK THE KEYBOARD CABLE —

• Ensure that the keyboard cable is firmly connected to the computer.

• Shut down the computer (see "Turning Off Your Computer" on page 65), reconnect the keyboard cable as shown on the setup diagram for your computer, and then restart the computer.

• Check the cable connector for bent or broken pins and for damaged or frayed cables. Straighten bent pins.

• Remove keyboard extension cables and connect the keyboard directly to the computer.

TEST THE KEYBOARD — Connect a properly working keyboard to the computer, and try using the keyboard.

ENSURE THAT THE USB PORTS ARE ENABLED IN THE SYSTEM SETUP PROGRAM — See "System Setup" on page 115)

RUN THE HARDWARE TROUBLESHOOTER — See "Resolving Software and Hardware Incompatibilities" on page 59.

Lockups and Software Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

The computer does not start up

CHECK THE DIAGNOSTIC LIGHTS — See "Diagnostic Lights" on page 53.

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

The computer stops responding

⬤ **NOTICE:** You might 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. Then restart your computer.

A program stops responding

END THE PROGRAM —
1 Press <Ctrl><Shift><Esc> simultaneously.
2 Click **Applications**.
3 Click the program that is no longer responding.
4 Click **End Task**.

A program crashes repeatedly

NOTE: Software usually includes installation instructions in its documentation or on a floppy disk or CD.

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

A program is designed for an earlier Microsoft® Windows® operating system

RUN THE PROGRAM COMPATIBILITY WIZARD —

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

   1 Click the **Start** button, point to **All Programs**→ **Accessories**, and then click **Program Compatibility Wizard**.

   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. 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, FLOPPY DISKS, OR CDS

Media Card Reader Problems

NO DRIVE LETTER IS ASSIGNED —

When Microsoft Windows XP detects the Media Card Reader, the device is automatically assigned a drive letter as the next logical drive after all other physical drives in the system. If the next logical drive after the physical drives is mapped to a network drive, Windows XP does not automatically assign a drive letter to the Media Card Reader.

To manually assign a drive for the Media Card Reader:

1 Right-click **My Computer** and select **Manage**.

2 Select the **Disk Management** option.

3 Right-click the corresponding drive letter in the right pane that needs to be changed.

4 Select **Drive Letter and Paths.**

5 From the drop-down list, select the new drive letter assignment for the Media Card Reader.

6 Click **OK** to confirm your selection.

NOTE: The Media Card Reader only appears as a mapped drive when it is connected. Each of the four Media Card Reader slots are mapped to a drive even if no media is installed. If you attempt to access the Media Card Reader when no media is inserted, you are prompted to insert media.

FLEXBAY DEVICE IS DISABLED —

There is a **FlexBay disable** option in the BIOS setup that appears only when the FlexBay device is installed. If the FlexBay device is physically installed, but it is not running, check to see if it is enabled in the BIOS setup.

Memory Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the** *Product Information Guide*.

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 "Installing Memory" on page 72).
- Reseat the memory modules (see "Installing Memory" on page 72) to ensure that your computer is successfully communicating with the memory.
- Run the Dell Diagnostics (see "Dell Diagnostics" on page 56).

IF YOU EXPERIENCE OTHER MEMORY PROBLEMS —
- Reseat the memory modules (see "Installing Memory" on page 72) to ensure that your computer is successfully communicating with the memory.
- Ensure that you are following the memory installation guidelines (see "Installing Memory" on page 72).
- Your computer supports DDR2 memory. For more information about the type of memory supported by your computer, see "Memory" on page 111.
- Run the Dell Diagnostics (see "Dell Diagnostics" on page 56).

Mouse Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the** *Product Information Guide*.

CLEAN THE MOUSE — See "Mouse" on page 124 for instructions on cleaning the mouse.

CHECK THE MOUSE CABLE —
1 Remove mouse extension cables, if used, and connect the mouse directly to the computer.
2 Reconnect the mouse cable as shown on the setup diagram for your computer.

RESTART THE COMPUTER —

1 Simultaneously press <Ctrl><Esc> to display the **Start** menu.

2 Type u, press the keyboard 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 on the setup diagram for your computer.

4 Start the computer.

ENSURE THAT THE USB PORTS ARE ENABLED IN THE SYSTEM SETUP PROGRAM — See "System Setup" on page 115)

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

CHECK THE MOUSE SETTINGS —

1 Click the **Start** button, click **Control Panel**, and then click **Printers and Other Hardware**.

2 Click **Mouse**.

3 Try adjusting the settings.

REINSTALL THE MOUSE DRIVER — See "Reinstalling Drivers" on page 58.

RUN THE HARDWARE TROUBLESHOOTER — See "Resolving Software and Hardware Incompatibilities" on page 59.

Network Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

CHECK THE NETWORK CABLE CONNECTOR — Ensure that the network cable is firmly inserted into both the network connector on the back of the computer and the network port or device.

CHECK THE NETWORK LIGHTS ON THE BACK OF THE COMPUTER — If the link integrity light is off, that indicates no network communication exists. Replace the network cable. For a description of network lights, see "Controls and Lights" on page 113.

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 "Resolving Software and Hardware Incompatibilities" on page 59.

Power Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

IF THE POWER LIGHT IS GREEN AND THE COMPUTER IS NOT RESPONDING — See "Diagnostic Lights" on page 53.

IF THE POWER LIGHT IS BLINKING GREEN — 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. Also 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 69).

IF THE POWER LIGHT IS STEADY AMBER — A device might be malfunctioning or incorrectly installed.
- Ensure that the 12-volt power connector (12V) is securely connected to the system board (see "System Board Components" on page 69).
- Remove and then reinstall the memory modules (see "Installing Memory" on page 72).
- Remove and then reinstall any cards (see "Cards" on page 74).
- Remove and then reinstall the graphics card, if applicable (see "PCI Express Cards" on page 80).

IF THE POWER LIGHT IS BLINKING AMBER — The computer is receiving electrical power, but an internal power problem might exist.

- Ensure that the voltage selection switch is set to match the AC power at your location (if applicable). See "Back View of the Computer" on page 15.
- Ensure that the 12-volt power connector (12V) is securely connected to the system board (see "System Board Components" on page 69).

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

Printer Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

🖉 **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 (see "Setting Up a Printer" on page 17).

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 —

1 Click the **Start** button, click **Control Panel**, and then click **Printers and Other Hardware**.

2 Click **View installed printers or fax printers**.

If the printer is listed, right-click the printer icon.

3 Click **Properties** and click the **Ports** tab. Ensure that the **Print to the following port(s):** setting is **USB**.

REINSTALL THE PRINTER DRIVER — See the printer documentation for instructions.

Scanner Problems

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

✎ **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 it has a locking tab or button.

RESTART THE COMPUTER AND TRY THE SCANNER AGAIN

CHECK THE CABLE CONNECTIONS —

• See the scanner documentation for cable connection information.

• Ensure that the scanner cables are securely connected to the scanner and the computer.

VERIFY THAT THE SCANNER IS RECOGNIZED BY MICROSOFT WINDOWS —

1 Click the **Start** button, click **Control Panel**, and then click **Printers and Other Hardware**.

2 Click **Scanners and Cameras**.

If your 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 in the** *Product Information Guide***.**

No sound from speakers

📝 **NOTE:** The volume control in some MP3 players overrides the Windows volume setting. If you have been listening to MP3 songs, ensure that you did not turn the player volume 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 CORRECT AUDIO SOLUTION IS ENABLED IN THE BIOS SETUP PROGRAM — See "System Setup" on page 115.

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.

REINSTALL THE SOUND DRIVER — See "Manually Reinstalling Drivers" on page 59.

RUN THE HARDWARE TROUBLESHOOTER — See "Resolving Software and Hardware Incompatibilities" on page 59.

No sound from headphones

CHECK THE HEADPHONE CABLE CONNECTION — Ensure that the headphone cable is securely inserted into the headphone connector (see "Front View of the Computer" on page 13).

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.

ENSURE THAT THE CORRECT AUDIO SOLUTION IS ENABLED IN THE BIOS SETUP PROGRAM — See "System Setup" on page 115.

Video and Monitor Problems

⚠ CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

✍ NOTE: See the monitor documentation for troubleshooting procedures.

If the screen is blank

CHECK THE MONITOR CABLE CONNECTION —
• Ensure that the graphics cable is connected as shown on the setup diagram for your computer.
   If an optional video card is installed, check that the monitor cable is connected to the card, rather than the video connector on the system board.
• If you are using a graphics extension cable and removing the cable solves the problem, the cable is defective.
• Swap the computer and monitor power cables to determine whether the power cable is defective.
• Check the connector 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 off, firmly press the button to ensure that the monitor is turned on. If the power light is lit or blinking, the monitor has power. If the power light is blinking, press a key on the keyboard or move the mouse.

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 "Diagnostic Lights" on page 53.

If the screen is difficult to read

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 at least 60 cm (2 ft) 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 —
  1 Click the **Start** button, click **Control Panel**, and then click **Appearance and Themes**.
  2 Click **Display** and click the **Settings** tab.
  3 Try different settings for **Screen resolution** and **Color quality**.

Troubleshooting Tools

Diagnostic Lights

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the** *Product Information Guide***.**

To help you troubleshoot a problem, your computer has four lights labeled "1," "2," "3," and "4" on the front panel (see "Front View of the Computer" on page 13). When the computer starts normally, the lights flash. If the computer malfunctions, the color and sequence of the lights identify the problem.

Light Pattern	Problem Description	Suggested Resolution
①②③④	The computer is in a normal "off" condition, or a possible pre-BIOS failure has occurred. The diagnostic lights are not lit after the computer successfully boots to the operating system.	Plug the computer into a working electrical outlet and press the power button.
①②③④	A possible processor failure has occurred.	Contact Dell (see "Contacting Dell" on page 126).
①②③④	Memory modules are detected, but a memory failure has occurred.	• If you have two or more memory modules installed, remove the modules, reinstall one module (see "Installing Memory" on page 72), and then restart the computer. If the computer starts normally, reinstall an additional module. Continue until you have identified a faulty module or reinstalled all modules without error. • If available, install properly working memory of the same type into your computer (see "Installing Memory" on page 72). • If the problem persists, contact Dell (see "Contacting Dell" on page 126).

Light Pattern	Problem Description	Suggested Resolution
①②③④	A possible graphics card failure has occurred.	• If the computer has a graphics card, remove the card, reinstall it (see "PCI Express Cards" on page 80), and then restart the computer. • If the problem still exists, install a graphics card that you know works and restart the computer. • If the problem persists or the computer has integrated graphics, contact Dell (see "Contacting Dell" on page 126).
①②③④	A possible floppy or hard drive failure has occurred.	Reseat all power and data cables and restart the computer.
①②③④	A possible USB failure has occurred.	Reinstall all USB devices, check cable connections, and then restart the computer.
①②③④	No memory modules are detected.	• If you have two or more memory modules installed, remove the modules, reinstall one module (see "Installing Memory" on page 72), and then restart the computer. If the computer starts normally, reinstall an additional module. Continue until you have identified a faulty module or reinstalled all modules without error. • If available, install properly working memory of the same type into your computer (see "Installing Memory" on page 72). • If the problem persists, contact Dell (see "Contacting Dell" on page 126).
①②③④	Memory modules are detected, but a memory configuration or compatibility error exists.	• Ensure that no special memory module/memory connector placement requirements exist (see "Memory Installation Guidelines" on page 71). • Verify that the memory modules that you are installing are compatible with your computer (see "Memory Installation Guidelines" on page 71). • If the problem persists, contact Dell (see "Contacting Dell" on page 126).

Light Pattern	Problem Description	Suggested Resolution
①②③④	Another failure has occurred.	• Ensure that the cables are properly connected to the system board from the hard drive, CD drive, and DVD drive (see "Drives" on page 90). • If there is an error message on your screen identifying a problem with a device (such as the floppy drive or hard drive), check the device to ensure that it is functioning properly. • If the problem persists, contact Dell (see "Contacting Dell" on page 126).
①②③④	After POST is complete, all four diagnostic lights turn green briefly before turning off to indicate normal operating condition.	None.

Dell Diagnostics

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the** *Product Information Guide*.

If you experience a problem with your computer, perform the checks in "Solving Problems" on page 37 and run the Dell Diagnostics before you contact Dell for technical assistance.

🖴 **NOTICE:** The Dell Diagnostics works only on Dell™ computers.

1 Turn on (or restart) your computer.

2 When the DELL™ logo appears, press <F12> immediately.

   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 65) and try again.

3 When the boot device list appears, highlight **Boot to Utility Partition** and press <Enter>.

4 When the Dell Diagnostics **Main Menu** appears, select the test you want to run.

Dell Diagnostics Main Menu

1 After the Dell Diagnostics loads and the **Main Menu** screen appears, click the button for the option you want.

Option	Function
Express Test	Performs a quick test of devices. This test typically takes 10 to 20 minutes and requires no interaction on your part. Run **Express Test** first to increase the possibility of tracing the problem quickly.
Extended Test	Performs a thorough check of devices. This test typically takes an hour or more and requires you to answer questions periodically.
Custom Test	Tests a specific device. You can customize the tests you want to run.
Symptom Tree	Lists the most common symptoms encountered and allows you to select a test based on the symptom of the problem you are having.

2 If a problem is 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 and follow the instructions on the screen.

   If you cannot resolve the error condition, contact Dell (see "Contacting Dell" on page 126).

📝 **NOTE:** The Service Tag for your computer is located at the top of each test screen. If you contact Dell, technical support will ask for your Service Tag.

3 If you run a test from the **Custom Test** or **Symptom Tree** option, click the applicable tab described in the following table for more information.

Tab	Function
Results	Displays the results of the test and any error conditions encountered.
Errors	Displays error conditions encountered, error codes, and the problem description.
Help	Describes the test and may indicate requirements for running the test.
Configuration	Displays your hardware configuration for the selected device.
	The Dell Diagnostics obtains configuration information for all devices from system setup, memory, and various internal tests, and it displays the information in the device list in the left pane of the screen. The device list may not display the names of all the components installed on your computer or all devices attached to your computer.
Parameters	Allows you to customize the test by changing the test settings.

4 Close the test screen to return to the **Main Menu** screen. To exit the Dell Diagnostics and restart the computer, close the **Main Menu** screen.

Drivers

What Is a Driver?

A driver is a program that controls a device such as a printer, mouse, or keyboard. All devices require a driver program.

A driver acts like a translator between the device and any other programs that use the device. Each device has its own set of specialized commands that only its driver recognizes.

Dell ships your computer to you with required drivers already installed—no further installation or configuration is needed.

Many drivers, such as the keyboard driver, come with your Microsoft® Windows® operating system. You may need to install drivers if you:

- Upgrade your operating system
- Reinstall your operating system
- Connect or install a new device

Identifying Drivers

If you experience a problem with any device, identify whether the driver is the source of your problem and, if necessary, update the driver.

Windows XP

1   Click the **Start** button and click **Control Panel**.

2   Under **Pick a Category**, click **Performance and Maintenance**.

3   Click **System**.

4   In the **System Properties** window, click the **Hardware** tab.

5   Click **Device Manager**.

6   Scroll down the list to see if any device has an exclamation point (a yellow circle with a [!]) on the device icon.

    If an exclamation point is next to the device name, you may need to reinstall the driver or install a new driver.

Reinstalling Drivers

NOTICE: The Dell Support website at support.dell.com provides approved drivers for Dell™ computers. If you install drivers obtained from other sources, your computer might not work correctly.

Using Windows XP Device Driver Rollback

If a problem occurs on your computer after you install or update a driver, use Windows XP Device Driver Rollback to replace the driver with the previously installed version.

1   Click the **Start** button and click **Control Panel**.

2   Under **Pick a Category**, click **Performance and Maintenance**.

3   Click **System**.

4   In the **System Properties** window, click the **Hardware** tab.

5   Click **Device Manager**.

6   Right-click the device for which the new driver was installed and click **Properties**.

7   Click the **Drivers** tab.

8   Click **Roll Back Driver**.

If Device Driver Rollback does not resolve the problem, then use System Restore to return your computer to the operating state that existed before you installed the new driver (see "Using Microsoft Windows XP System Restore" on page 60).

Manually Reinstalling Drivers

1 After copying the required driver files to your hard drive, click the **Start** button and right-click **My Computer**.

2 Click **Properties**.

3 Click the **Hardware** tab and click **Device Manager**.

4 Double-click the type of device for which you are installing the driver.

5 Double-click the name of the device for which you are installing the driver.

6 Click the **Driver** tab and click **Update Driver**.

7 Click **Install from a list or specific location (Advanced)** and click **Next**.

8 Click **Browse** and browse to the location to which you previously extracted the driver files.

9 When the name of the appropriate driver appears, click **Next**.

10 Click **Finish** and restart your computer.

Resolving Software and Hardware Incompatibilities

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.

To resolve incompatibilities using the Hardware Troubleshooter:

1 Click the **Start** button and click **Help and Support**.

2 Type `hardware troubleshooter` in the **Search** field and click the arrow to start the search.

3 Click **Hardware Troubleshooter** in the **Search Results** list.

4 In the **Hardware Troubleshooter** list, click **I need to resolve a hardware conflict on my computer**, and click **Next**.

Restoring Your Operating System

You can restore your operating system in the following ways:

• Microsoft® Windows® XP System Restore returns your computer to an earlier operating state without affecting data files. Use System Restore as the first solution for restoring your operating system and preserving data files.

• Dell PC Restore by Symantec restores your hard drive to the operating state it was in when you purchased the computer. Dell PC Restore permanently deletes all data on the hard drive and removes any applications installed after you received the computer. Use PC Restore only if System Restore did not resolve your operating system problem.

• *If you received* an *Operating System* CD with your computer, you can use it to restore your operating system. Use the CD *only* if System Restore did not resolve your operating system problem.

Using Microsoft Windows XP System Restore

The Microsoft Windows XP operating system provides System Restore to allow you to return your computer to an earlier operating state (without affecting data files) if changes to the hardware, software, or other system settings have left the computer in an undesirable operating state. See the Windows Help and Support Center for information on using System Restore. To access the Windows Help and Support Center, see "Finding Information" on page 9.

NOTICE: Make regular backups of your data files. System Restore does not monitor your data files or recover them.

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.

Creating a Restore Point

1 Click the **Start** button and click **Help and Support**.

2 Click the task for **System Restore**.

3 Follow the instructions on the screen.

Restoring the Computer to an Earlier Operating State

If problems occur after you install a device driver, use Device Driver Rollback (see "Using Windows XP Device Driver Rollback" on page 58) to resolve the problem. If that is unsuccessful, then use System Restore.

NOTICE: Before you restore the computer to an earlier operating state, save and close any open files and exit any open programs. Do not alter, open, or delete any files or programs until the system restoration is complete.

1 Click the **Start** button, point to **All Programs**→ **Accessories**→ **System Tools**, and then click **System Restore**.

2 Ensure that **Restore my computer to an earlier time** is selected and click **Next**.

3 Click a calendar date to which you want to restore your computer.

The **Select a Restore Point** screen provides a calendar that allows you to see and select restore points. All calendar dates with available restore points appear in boldface type.

4 Select a restore point and click **Next**.

If a calendar date has only one restore point, then that restore point is automatically selected. If two or more restore points are available, click the restore point that you prefer.

5 Click **Next**.

The **Restoration Complete** screen appears after System Restore finishes collecting data and then the computer restarts.

6 After the computer restarts, click **OK**.

To change the restore point, you can either repeat the steps using a different restore point, or you can undo the restoration.

Undoing the Last System Restore

⊘ **NOTICE:** Before you undo the last system restore, save and close all open files and exit any open programs. Do not alter, open, or delete any files or programs until the system restoration is complete.

1 Click the **Start** button, point to **All Programs**→ **Accessories**→ **System Tools**, and then click **System Restore**.

2 Click **Undo my last restoration** and click **Next**.

Enabling System Restore

If you reinstall Windows XP with less than 200 MB of free hard-disk space available, System Restore is automatically disabled. To see if System Restore is enabled:

1 Click the **Start** button and click **Control Panel**.

2 Click **Performance and Maintenance**.

3 Click **System**.

4 Click the **System Restore** tab.

5 Ensure that **Turn off System Restore** is unchecked.

Using Dell PC Restore

⊘ **NOTICE:** Using Dell PC Restore permanently deletes all data on the hard drive and removes any applications or drivers installed after you received your computer. If possible, back up the data before using PC Restore. Use PC Restore only if System Restore did not resolve your operating system problem.

✎ **NOTE:** Dell PC Restore is not available in all countries or on all computers.

Use Dell PC Restore by Symantec only as the last method to restore your operating system.
PC Restore restores your hard drive to the operating state it was in when you purchased the computer.
Any programs or files added since you received your computer—including data files—are permanently deleted from the hard drive. Data files include documents, spreadsheets, e-mail messages, digital photos, music files, and so on. If possible, back up all data before using PC Restore.

To use PC Restore:

1 Turn on the computer.

   During the boot process, a blue bar with **www.dell.com** appears at the top of the screen.

2 Immediately upon seeing the blue bar, press <Ctrl><F11>.

   If you do not press <Ctrl><F11> in time, let the computer finish starting, and then restart the computer again.

⊘ **NOTICE:** If you do *not* want to proceed with PC Restore, click **Reboot** in the following step.

3 On the next screen that appears, click **Restore**.

4 On the next screen, click **Confirm**.

   The restore process takes approximately 6–10 minutes to complete.

5 When prompted, click **Finish** to reboot the computer.

   ✏️ **NOTE:** Do not manually shut down the computer. Click **Finish** and let the computer completely reboot.

6 When prompted, click **Yes**.

   The computer restarts. Because the computer is restored to its original operating state, the screens that appear, such as the End User License Agreement, are the same ones that appeared the first time the computer was turned on.

7 Click **Next**.

   The **System Restore** screen appears and the computer restarts.

8 After the computer restarts, click **OK**.

Removing Dell PC Restore

   ⊘ **NOTICE:** Removing Dell PC Restore from the hard drive permanently deletes the PC Restore utility from your computer. After you have removed Dell PC Restore, you will not be able to use it to restore your computer's operating system.

Dell PC Restore enables you to restore your hard drive to the operating state it was in when you purchased your computer. It is recommended that you *do not* remove PC Restore from your computer, even to gain additional hard-drive space. If you remove PC Restore from the hard drive, you cannot ever recall it, and you will never be able to use PC Restore to return your computer's operating system to its original state.

To remove PC Restore:

1 Log on to the computer as a local administrator.

2 In Windows Explorer, go to **c:\dell\utilities\DSR**.

3 Double-click the filename **DSRIRRemv2.exe**.

   ✏️ **NOTE:** If you do not log on as a local administrator, a message appears stating that you must log on as administrator. Click **Quit**, and then log on as a local administrator.

   ✏️ **NOTE:** If the partition for PC Restore does not exist on your computer's hard drive, a message appears stating that the partition was not found. Click **Quit**; there is no partition to delete.

4 Click **OK** to remove the PC Restore partition on the hard drive.

5 Click **Yes** when a confirmation message appears.

   The PC Restore partition is deleted and the newly available disk space is added to the free space allocation on the hard drive.

6 Right-click **Local Disk (C)** in Windows Explorer, click **Properties**, and verify that the additional disk space is available as indicated by the increased value for **Free Space**.

7 Click **Finish** to close the **PC Restore Removal** window.

8 Restart the computer.

Using the Operating System CD

Before You Begin

If you are considering a reinstall of the Windows XP operating system to correct a problem with a newly installed driver, first try using Windows XP Device Driver Rollback (see "Using Windows XP Device Driver Rollback" on page 58). If Device Driver Rollback does not resolve the problem, then use System Restore to return your operating system to the operating state it was in before you installed the new device driver (see "Using Microsoft Windows XP System Restore" on page 60).

NOTICE: Before performing the installation, back up all data files on your primary hard drive. For conventional hard drive configurations, the primary hard drive is the first drive detected by the computer.

To reinstall Windows XP, you need the following items:

- Dell™ *Operating System* CD
- Dell ResourceCD

NOTE: The ResourceCD contains drivers that were installed during assembly of the computer. Use the ResourceCD to load any required drivers. Depending on the region from where you ordered your computer, or whether you requested the CDs, the *Drivers and Utilities* CD and *Operating System* CD may not ship with your system.

Reinstalling Windows XP

The reinstallation process can take 1 to 2 hours to complete. After you reinstall the operating system, you must also reinstall the device drivers, virus protection program, and other software.

NOTICE: The *Operating System* CD provides options for reinstalling Windows XP. The options can overwrite files and possibly affect programs installed on your hard drive. Therefore, do not reinstall Windows XP unless a Dell technical support representative instructs you to do so.

1 Save and close any open files and exit any open programs.

2 Insert the *Operating System* CD. Click **Exit** if the `Install Windows XP` message appears.

3 Restart the computer.

4 Press <F12> immediately after the DELL™ logo appears.

If the operating system logo appears, wait until you see the Windows desktop, and then shut down the computer and try again.

5 Follow the instructions on the screen to complete the installation.

4

Removing and Installing Parts

Before You Begin

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

- You have performed the steps in Turning Off Your Computer and Before Working Inside Your Computer.
- You have read the safety information in your Dell™ *Product Information Guide.*
- A component can be replaced or—if purchased separately—installed by performing the removal procedure in reverse order.

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Phillips screwdriver
- Flash BIOS executable update program on **support.dell.com**.

Turning Off Your Computer

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

1 Shut down the operating system:

   a Save and close any open files, exit any open programs, click the **Start** button, and then click **Turn Off Computer**.

   b In the **Turn off computer** window, click **Turn off**.

   The computer turns off after the operating system shutdown process finishes.

2 Ensure that the computer and any 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 4 seconds.

Before Working Inside 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 you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

⚠ **CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.**

➡ **NOTICE:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

➡ **NOTICE:** When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before 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 Turn off your computer (see "Turning Off Your Computer" on page 65).

➡ **NOTICE:** To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network device.

2 Disconnect any telephone or telecommunication lines from the computer.

3 Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

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

4 Remove the computer cover (see "Removing the Computer Cover" on page 66).

➡ **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 any static electricity that could harm internal components.

Removing the Computer Cover

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

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

1 Follow the procedures in "Before You Begin" on page 65.

➡ **NOTICE:** Ensure that sufficient space exists to support the removed cover.

NOTICE: Ensure that you are working on a level, protected surface to avoid scratching either the computer or the surface on which it is resting.

2 Lay your computer on its side with the computer cover facing up.

3 Pull back the cover latch release located on the top panel.
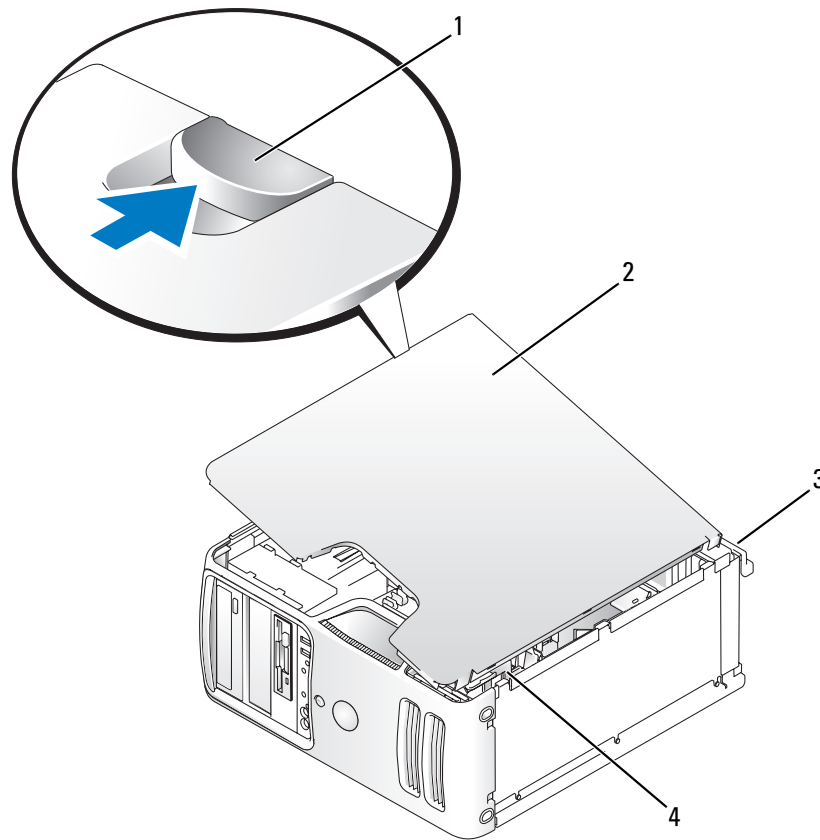
| 1 | cover latch release | 2 | computer cover | 3 | back of computer |
| 4 | bottom hinge tabs | | | | |

4 Grip the sides of the computer cover and pivot the cover up, using the bottom hinge tabs as leverage points.

5 Release the cover from the hinge tabs and set it aside in a secure location.

Inside View of Your Computer

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**
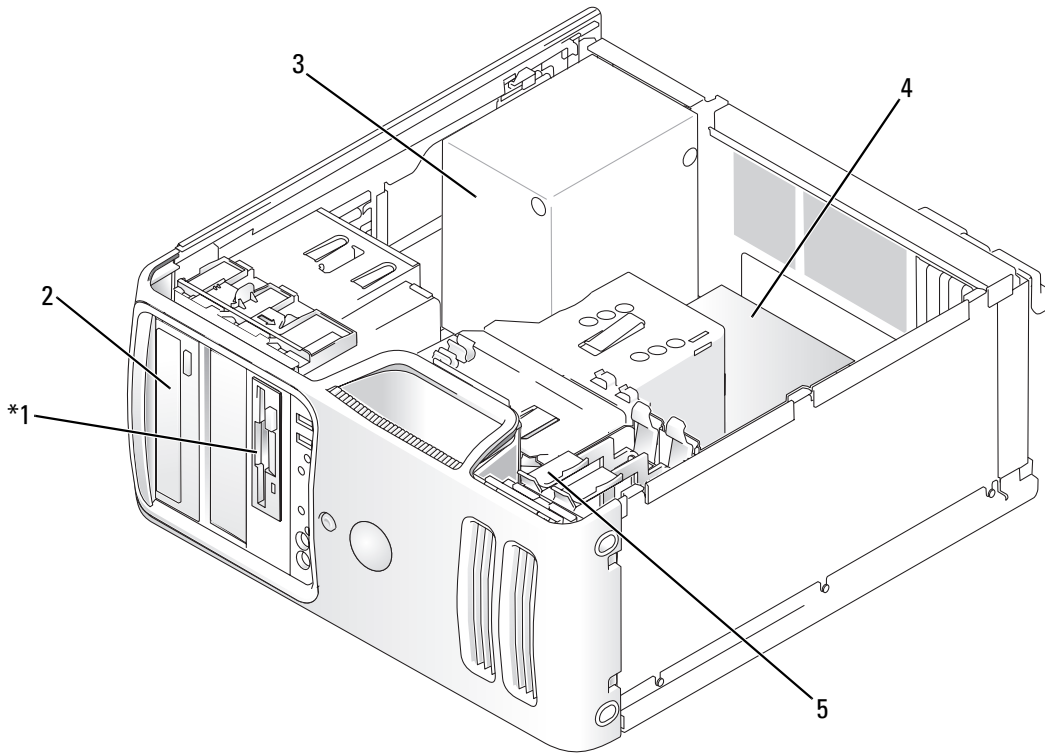
*May not be present on all computers.

1	floppy drive or Media Reader	2	CD or DVD drive	3	power supply
4	system board	5	hard drive		

System Board Components
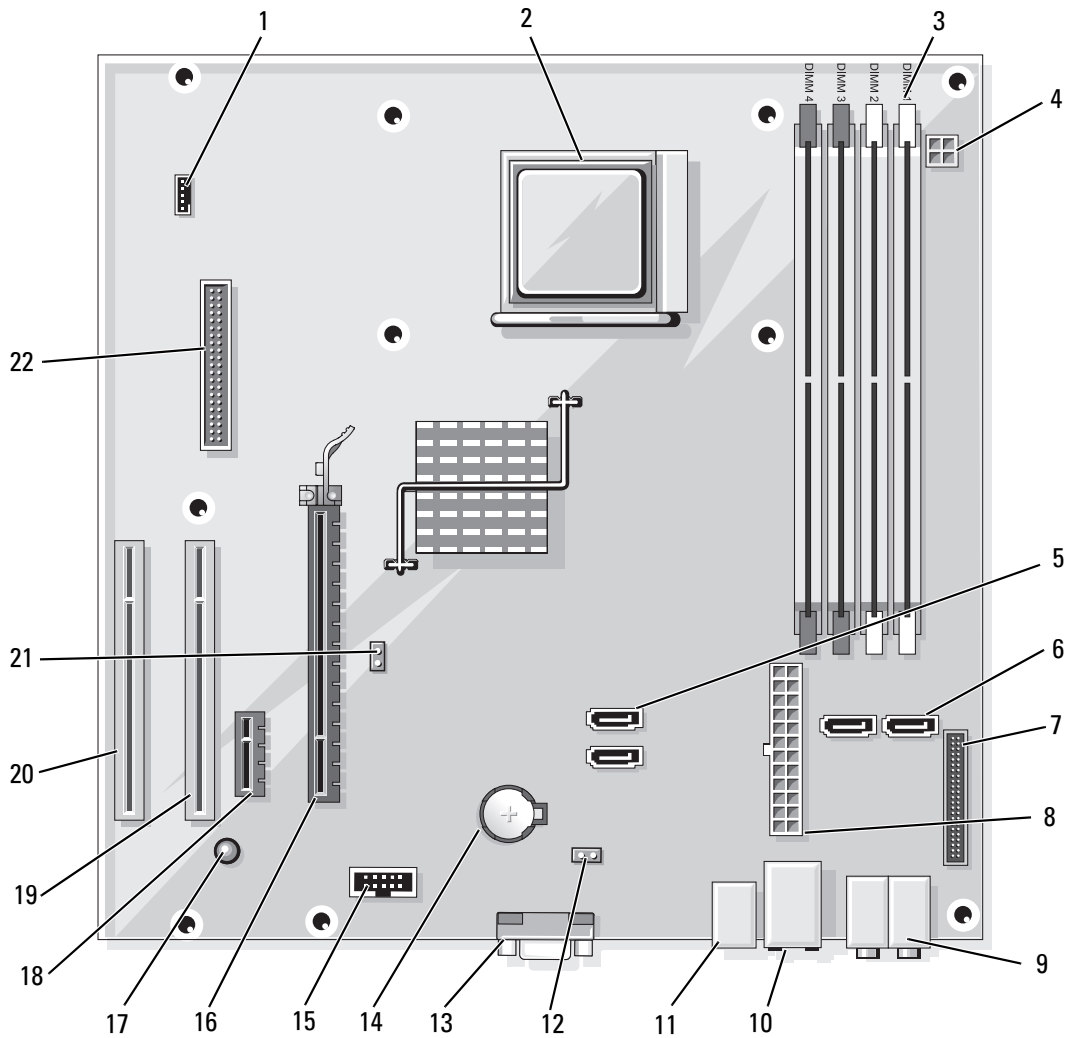
1	fan connector (FAN_CPU1)	2	processor socket (CPU)	3	memory module connectors (DIMM_1, DIMM_2, DIMM_3, DIMM_4)
4	power connector (PW_12V_A1)	5	serial ATA drive connectors (SATA2, SATA3)	6	serial ATA drive connectors (SATA0, SATA1)
7	front-panel connector (FRONTPANEL)	8	power connector (POWER1)	9	line-in, line-out, microphone, side surround, center, and LFE connectors (AUDIO_6_STACK)

10	USB connectors (2) (USB2_BACK1)	11	network connector and USB connectors (2) (NIC_USB1)	12	real-time clock reset jumper (RTCRST)
13	video connector (VIDEO1)	14	battery socket (BT1)	15	Internal USB connector (USB1)
16	PCI Express x16 connector (SLOT1)	17	standby power indicator (AUX_PWR_LED)	18	PCI Express x1 connector (SLOT2)
19	PCI connector (SLOT3)	20	PCI connector (SLOT4)	21	password jumper (PSWD)
22	floppy drive connector (FLOPPY1)				

Memory

You can increase your computer memory by installing memory modules on the system board. Your computer supports DDR2 memory. For additional information on the type of memory supported by your computer, see "Memory" on page 111.

🔷 **NOTICE:** Do not install ECC or buffered memory modules. Only unbuffered, non-ECC memory is supported.

256MB 2R XX XXX
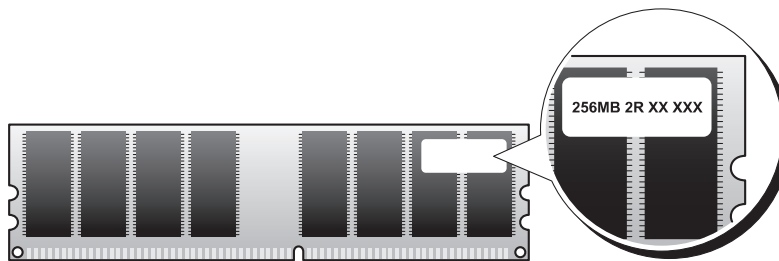
Memory Installation Guidelines

- DIMM connectors must be populated in numerical order beginning with connectors DIMM_1 and DIMM_2, then connectors DIMM_3 and DIMM_4.

  If a single DIMM is installed, you must install it in connector DIMM_1.

- For best performance, memory modules should be installed in *pairs of matched memory size, speed, and technology.* If the memory modules are not installed in matched pairs, the computer will operate, but with a slight reduction in performance. (See the label on the module to determine the module's capacity.) For example, if you install a mixed pair of DDR2 533-MHz and DDR2 667-MHz memory, the modules function at the slowest speed installed.
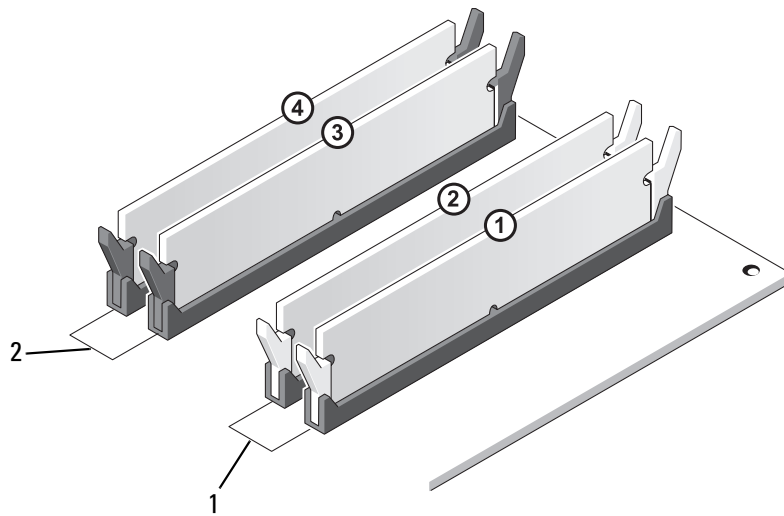
| 1 | Channel A: matched pair of memory modules in connectors DIMM_1 and DIMM_2 (white securing clips) | 2 | Channel B: matched pair of memory modules in connectors DIMM_3 and DIMM_4 (black securing clips) |

NOTICE: If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, 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. You should install your original memory modules in pairs either in DIMM connectors 1 and 2 or DIMM connectors 3 and 4.

NOTE: Memory purchased from Dell is covered under your computer warranty.

Addressing Memory With 4-GB Configurations

Your computer supports a maximum of 4 GB of memory when you use four 1-GB DIMMs. Current 32-bit operating systems, such as Microsoft® Windows® XP, can use a maximum of 4 GB of address space; however, the amount of memory available to the operating system is less than that installed. Certain components within the computer require address space in the 4-GB range. Any address space reserved for these components cannot be used by computer memory.

Installing Memory

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

⊘ **NOTICE:** To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before You Begin" on page 65.

2. Press the securing clip at each end of the memory module connector.
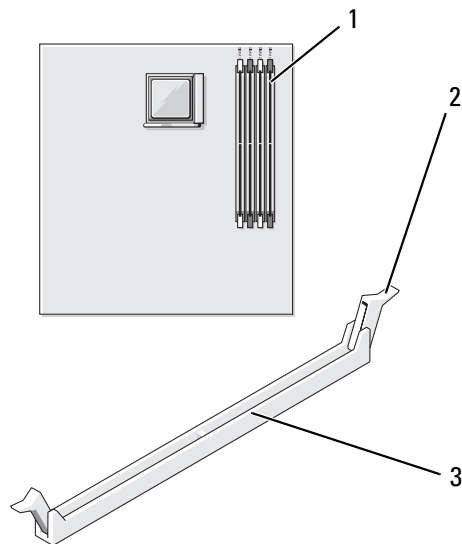
| 1 | memory connector farthest from processor (DIMM_1) | 2 | securing clips (2) | 3 | connector |

3 Align the notch on the bottom of the module with the crossbar in the connector.
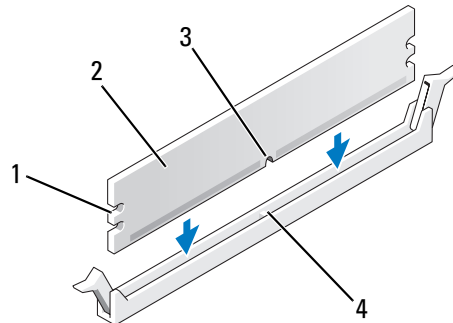
1	cutouts (2)	2	memory module	3	notch
4	crossbar				

⊘ **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.

4 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.
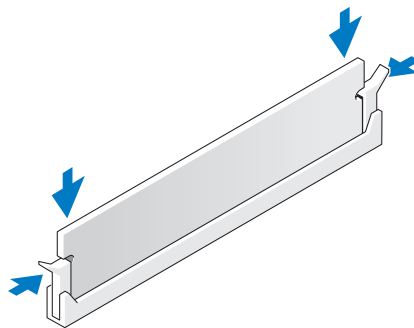
5 Replace the computer cover.

⊘ **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.

6 Connect your computer and devices to electrical outlets, and turn them on.

7 Right-click the **My Computer** icon and click **Properties**.

8 Click the **General** tab.

9 To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Removing Memory

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the** *Product Information Guide*.

⊘ **NOTICE:** To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1 Follow the procedures in "Before You Begin" on page 65.

2 Press out the securing clip at each end of the memory module connector.

3 Grasp the module at the end of the board and lift up.

Cards

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the** *Product Information Guide*.

⊘ **NOTICE:** To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

Your Dell™ computer provides the following slots for PCI and PCI Express cards:

• One PCI Express x16 card slot (SLOT1)

• One PCI Express x1 card slot (SLOT2)

• Two PCI card slots (SLOT3, SLOT4)

See "System Board Components" on page 69 for card slot location.

PCI Cards

Your computer supports two PCI cards.
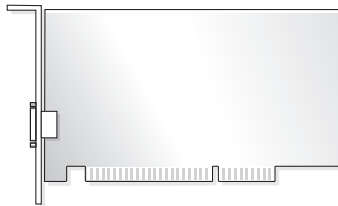
• If you are installing or replacing a card, follow the procedures in the next section.

• If you are removing but not replacing a PCI card, see "Removing a PCI Card" on page 79.

• If you are replacing a card, remove the current driver for the card from the operating system.

• If you are installing or replacing a PCI Express card, see "Installing a PCI Express Card" on page 80.

Installing a PCI Card

1 Follow the procedures in "Before You Begin" on page 65.
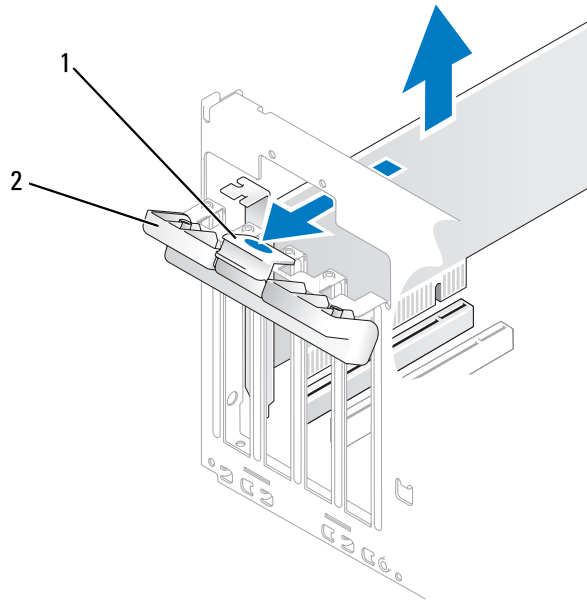
| 1 | release tab | 2 | card retention door |

2 Gently push the release tab on the card retention door from the inside to pivot the door open. Because the door is captive, it will remain in the open position.

3 If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 5.

4 If you are replacing a card that is already installed in the computer, remove the card.

If necessary, disconnect any cables connected to the card. Grasp the card by its top corners, and ease it out of its connector.

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.**

6 Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.
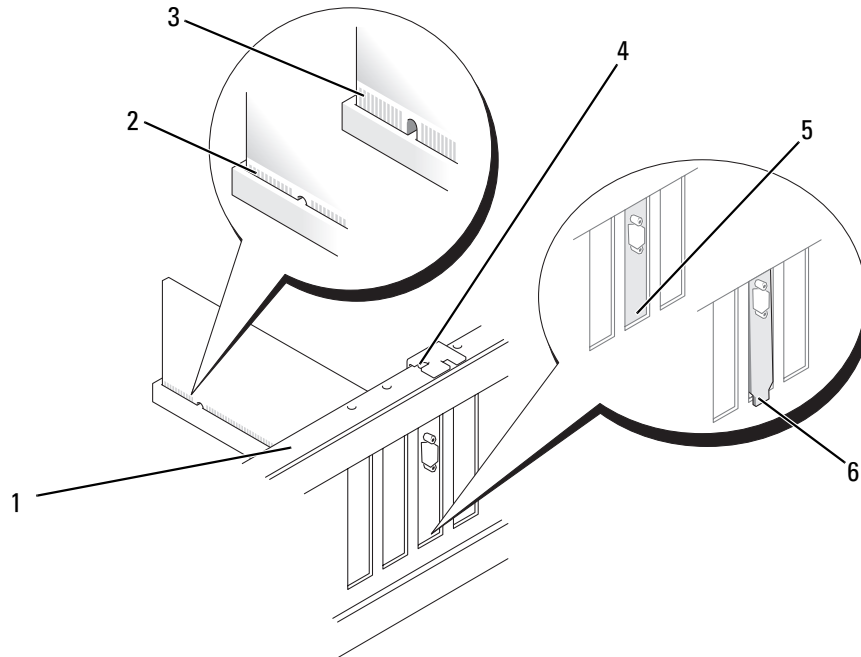
1	alignment bar	2	fully-seated card	3	not fully seated card
4	alignment guide	5	bracket within slot	6	bracket caught outside of slot

7 Before you close the card retention door, ensure that:

- The tops of all cards and filler brackets are flush with the alignment bar.
- The notch in the top of the card or filler bracket fits around the alignment guide.
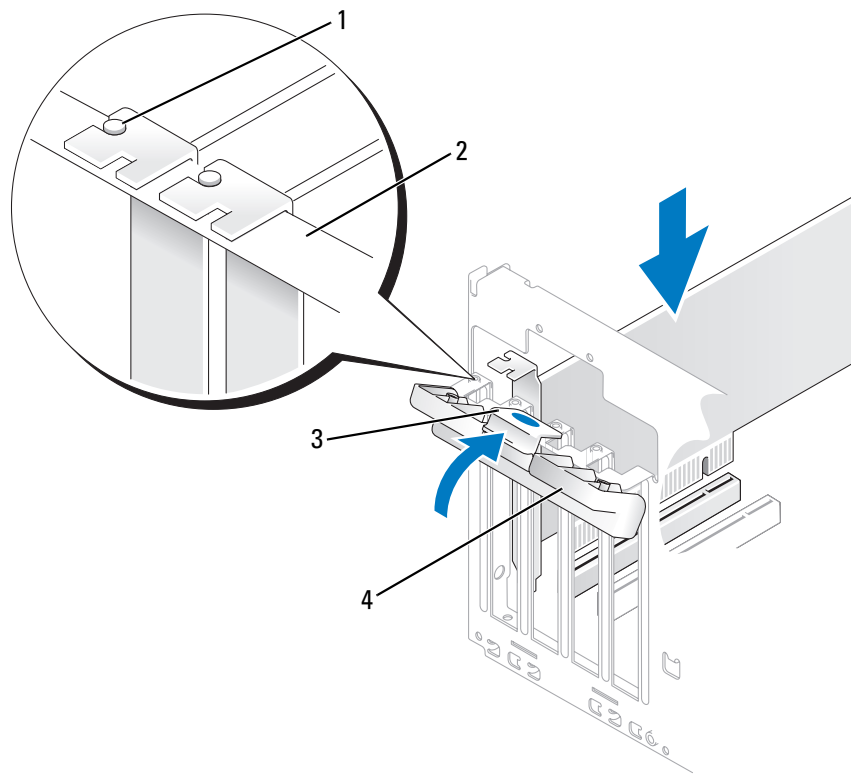
1	alignment guide	2	alignment bar	3	release tab
4	card retention door				

8 Close the card retention door by snapping it into place to secure the cards.

⊃ **NOTICE:** Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

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.
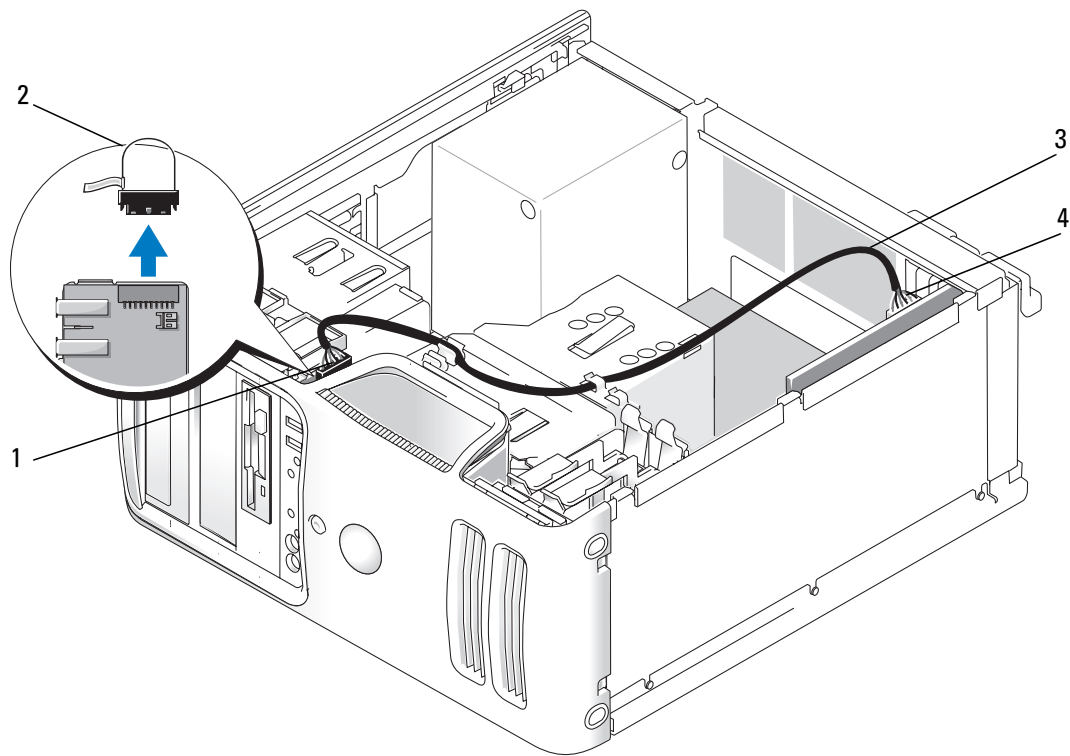
1	front I/O panel connector	2	jumper	3	sound card cable
4	sound card connector				

If you are installing a sound card, remove the jumper on the end of the front I/O panel. Then connect one end of the cable to the sound card and the other end of the cable to the connection on the front I/O panel from which you removed the jumper.

🚫 **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.

10 Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

11 If you installed a sound card:

a Enter system setup (see "System Setup" on page 115), go to **Onboard Devices** and select **Integrated Audio**, and then change the setting to **Off**.

b Connect external audio devices to the sound card's connectors. Do not connect external audio devices to the microphone, speaker/headphone, or line-in connectors on the back panel. See "Back Panel Connectors" on page 16.

12 If you installed an add-in network adapter and want to disable the integrated network adapter:

    a Enter system setup (see "System Setup" on page 115), go to **Onboard Devices** and select **Integrated NIC,** and then change the setting to **Off**.

    b Connect the network cable to the add-in network adapter's connectors. Do not connect the network cable to the integrated connector on the back panel. See "Back Panel Connectors" on page 16.

13 Install any drivers required for the card as described in the card documentation.

Removing a PCI Card

1 Follow the procedures in "Before You Begin" on page 65.

2 Gently push the release tab on the card retention door from the inside to pivot the door open. Because the door is captive, it will remain in the open position.

3 If necessary, disconnect any cables connected to the card. Grasp the card by its top corners and ease it out of its connector. If a sound card is removed, a jumper should be installed on the Front IO card audio connector.

4 If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

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.

5 Close the card retention door by snapping it into place to secure the cards.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

6 Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

7 Remove the card's driver from the operating system.

8 If you removed a sound card:

    a Enter system setup (see "System Setup" on page 115), go to **Onboard Devices** and select **Integrated Audio**, and then change the setting to **On**.

    b Connect external audio devices to the audio connectors on the back panel of the computer. See "Back Panel Connectors" on page 16.

9 If you removed an add-in network connector:

    a Enter system setup (see "System Setup" on page 115), go to **Onboard Devices** and select **Integrated NIC**, and then change the setting to **On**.

    b Connect the network cable to the integrated connector on the back panel of the computer. See "Back Panel Connectors" on page 16.

PCI Express Cards

Your computer supports one PCI Express x16 card and one PCI Express x1 card.

- If you are installing or replacing a PCI Express card, follow the procedures in the next section.
- If you are removing but not replacing a card, see "Removing a PCI Express Card" on page 85.
- If you are installing or replacing a PCI card, see "Installing a PCI Card" on page 75.
- If you are replacing a card, remove the current driver for the card from the operating system.

Installing a PCI Express Card

1 Follow the procedures in "Before You Begin" on page 65.

2 Remove the computer cover (see "Removing the Computer Cover" on page 66).
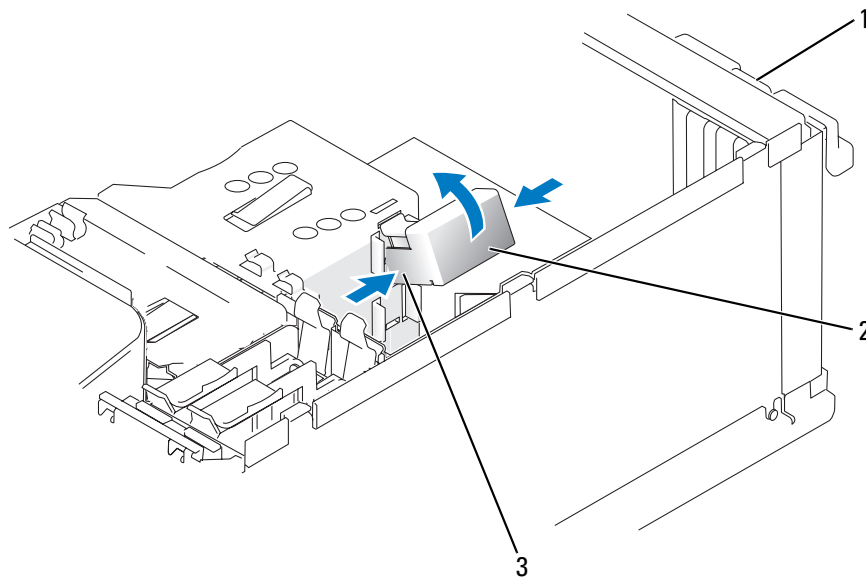
| 1 | card retention door | 2 | card retention mechanism | 3 | release tabs (2) |

3 Gently push the release tab on the card retention door from the inside to pivot the door open. The door is hinged and will remain in the open position (see "Installing a PCI Card" on page 75 for an illustration of the card retention door).

4 If your computer includes a card retention mechanism to secure the x16 card in place from the top:

   a Pivot the mechanism upward and gently squeeze in on the sides to release the mechanism from the two tab slots holding it in place.

   b Set the retention mechanism aside.

5 If you are installing a new card, remove the filler bracket to create a card-slot opening, then continue with step 7.

6 If you are replacing a card that is already installed in the computer, remove the card.

Disconnect any cables connected to the card. Gently pull the securing tab, grasp the card by its top corners, and then ease it out of its connector.
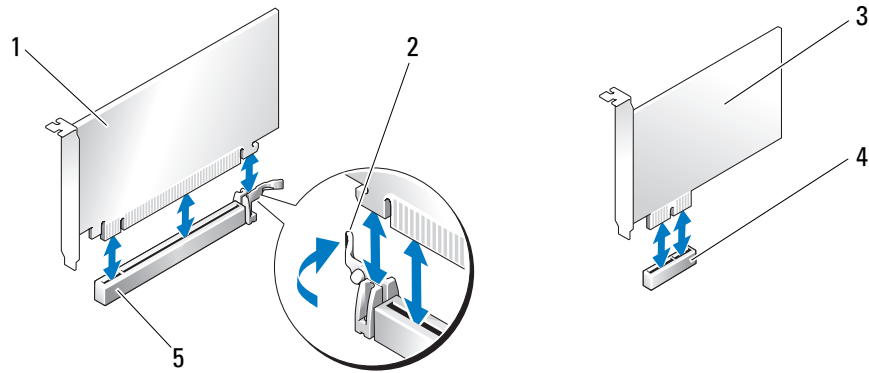
1	PCI Express x16 card	**2**	securing tab	**3**	PCI Express x1 card
4	PCI Express x1 card slot	**5**	PCI Express x16 card slot		

7 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.**

8 If you are installing the card into the x16 card connector, position the card so the securing slot is aligned with the securing tab.

9 Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.
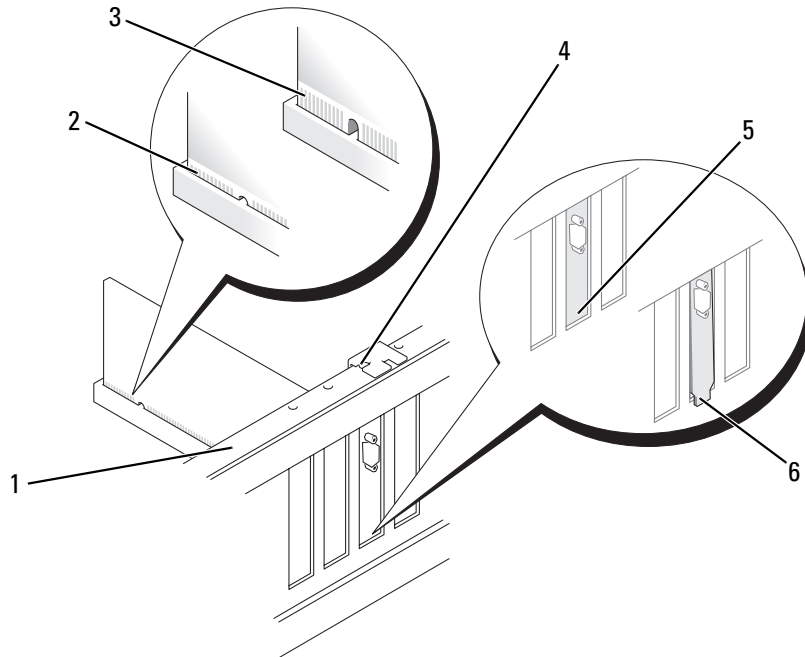
1	alignment bar	2	fully seated card	3	not fully seated card
4	alignment guide	5	bracket within slot	6	bracket caught outside of slot

10 If you replaced a card that was already installed in the computer and you removed the retention mechanism, reinstall the retention mechanism:

Before replacing the card retention mechanism, ensure that:

- The tops of all cards and filler brackets are flush with the alignment bar.
- The notch in the top of the card or filler bracket fits around the alignment guide.

Snap the card retention mechanism into place, securing the x16 PCI card.
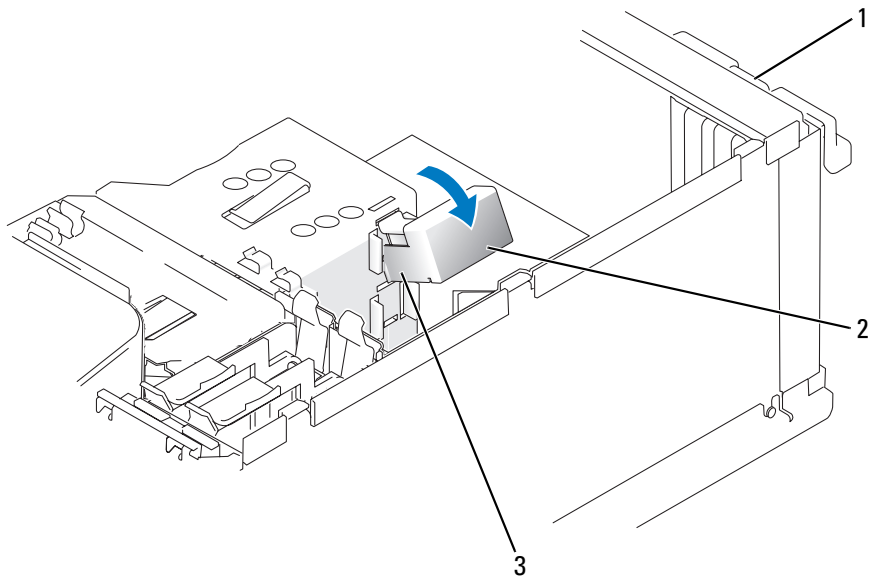
| 1 | card retention door | 2 | card retention mechanism | 3 | release tabs (2) |

⊘ **NOTICE:** Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

⊘ **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.

11 Before you close the card retention door, ensure that:

- The tops of all cards and filler brackets are flush with the alignment bar.
- The notch in the top of the card or filler bracket fits around the alignment guide.
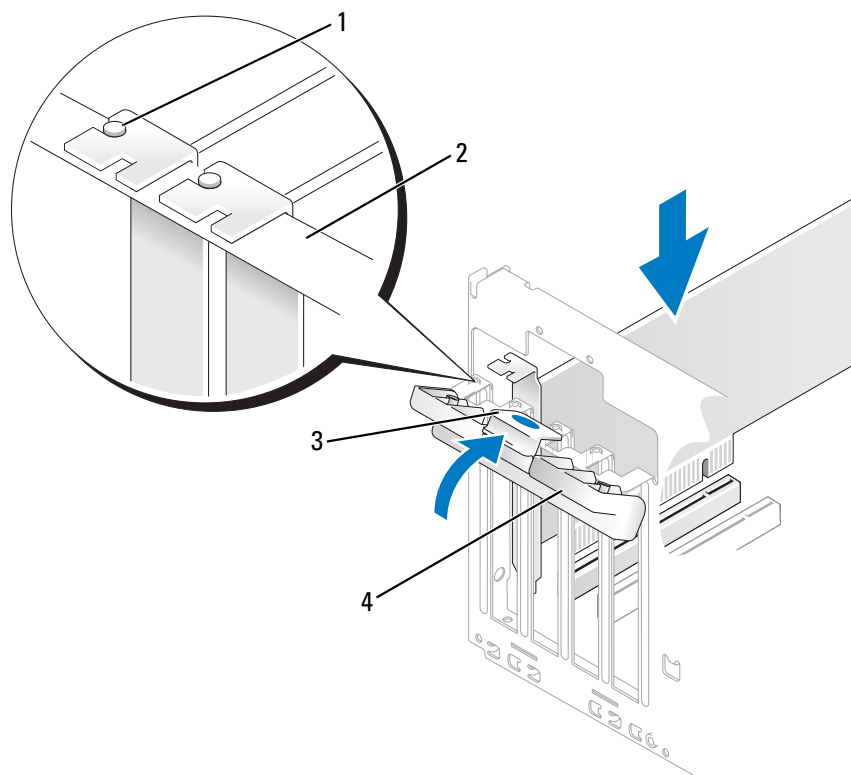
1	alignment guide	2	alignment bar	3	release tab
4	card retention door				

12 Close the card retention door by snapping it into place to secure the cards.

13 Connect any cables that should be attached to the card.

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

14 Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

15 If you installed a sound card:

    a Enter system setup (see "System Setup" on page 115), go to **Onboard Devices** and select **Integrated Audio**, and then change the setting to **Off**.

    b Connect external audio devices to the sound card's connectors. Do not connect external audio devices to the microphone, speaker/headphone, or line-in connectors on the back panel. See "Back Panel Connectors" on page 16.

16 If you installed an add-in network adapter and want to disable the integrated network adapter:

    a Enter system setup (see "System Setup" on page 115), go to **Onboard Devices** and select **Integrated NIC**, and then change the setting to **Off**.

b Connect the network cable to the add-in network adapter's connectors. Do not connect the network cable to the integrated connector on the back panel. See "Back Panel Connectors" on page 16.

17 Install any drivers required for the card as described in the card documentation.

Removing a PCI Express Card

1 Follow the procedures in "Before You Begin" on page 65.

2 Gently push the release tab on the card retention door from the inside to pivot the door open. Because the door is captive, it will remain in the open position (see "Installing a PCI Card" on page 75 for an illustration of the card retention door).

3 If your computer includes a card retention mechanism, to secure the x16 card in place from the top:

   a Pivot the mechanism upward and gently squeeze in on the sides to release the mechanism from the two tab slots holding it in place.

   b Set the retention mechanism aside in a secure location.

4 If necessary, disconnect any cables connected to the card. Gently pull the securing tab, grasp the card by its top corners, and then ease it out of its connectors.

5 If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

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.

6 Reseat the card retention mechanism in the tabs and pivot downward to snap it into place.

7 Close the card retention door to snap it into place, securing the cards.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

8 Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

9 Remove the card's driver from the operating system.

10 If you removed a sound card:

   a Enter system setup (see "System Setup" on page 115), go to **Onboard Devices** and select **Integrated Audio**, and then change the setting to **On**

   b Connect external audio devices to the audio connectors on the back panel of the computer. See "Back Panel Connectors" on page 16.

11 If you removed an add-in network connector:

   a Enter system setup (see "System Setup" on page 115), go to **Onboard Devices** and select **Integrated NIC**, and then change the setting to **On**.

   b Connect the network cable to the integrated connector on the back panel of the computer. See "Back Panel Connectors" on page 16.

Drive Panel

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

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

Removing the Drive Panel

1. Follow the procedures in "Before You Begin" on page 65.

2. Remove the computer cover (see "Removing the Computer Cover" on page 66).
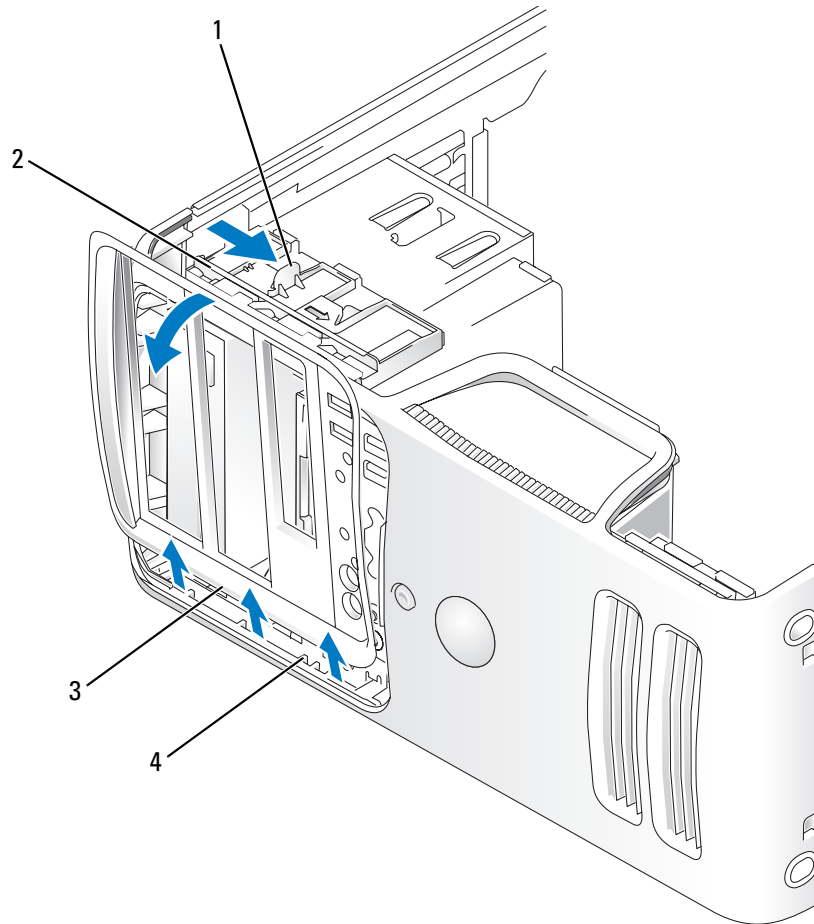
1	sliding plate lever	2	sliding plate	3	drive panel
4	side hinges				

3 Grasping the lever on the sliding plate, pull the sliding plate to the right until it snaps into the open position.

✍ NOTE: This sliding plate secures and releases the drive panel and helps to secure the drives.

4 By pushing from the inside and pivoting the drive panel to the left, you can release the drive panel from its side hinges.

5 Set the drive panel aside.

Removing the Drive-Panel Insert
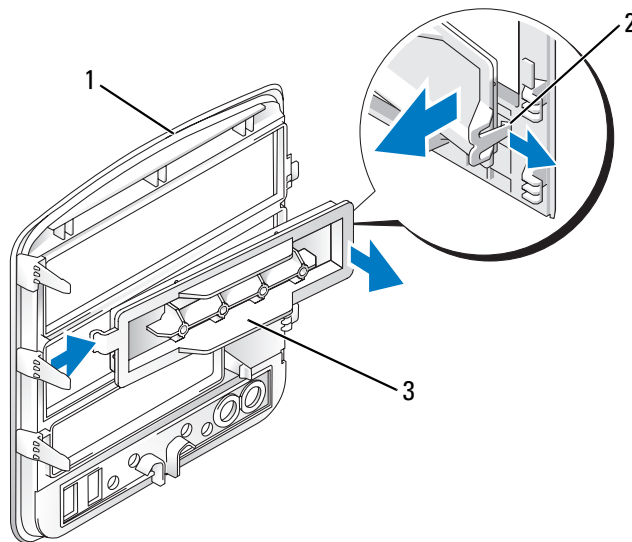
| 1 | drive panel | 2 | drive-panel insert tab | 3 | drive-panel insert |

1 Pull the drive-panel insert tab away from the drive panel insert to disengage the insert from the drive panel.

2 Without releasing the tab, pivot the drive-panel insert out and away from the drive panel.

3 Set the drive-panel insert aside in a secure location.

Replacing the Drive-Panel Insert
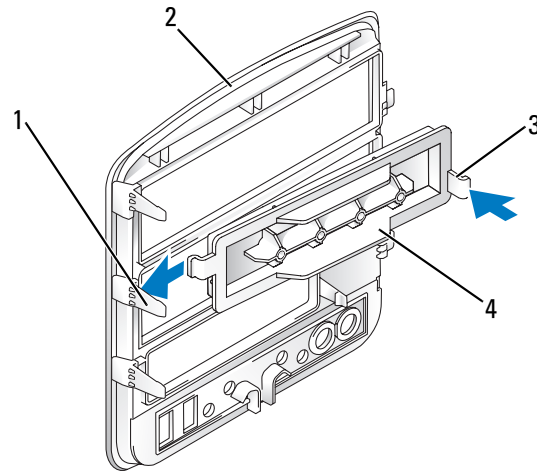
1	center drive-panel tab	2	drive panel	3	drive-panel insert tab
4	drive-panel insert				

1 Slide the tab on the left side of the drive-panel insert under the center drive-panel tab.

2 Rotate the drive-panel insert into place and snap the drive-panel insert tab over the corresponding tab on the drive panel.

Replacing the Drive Panel

1 Align the drive panel tabs with the side hinges.
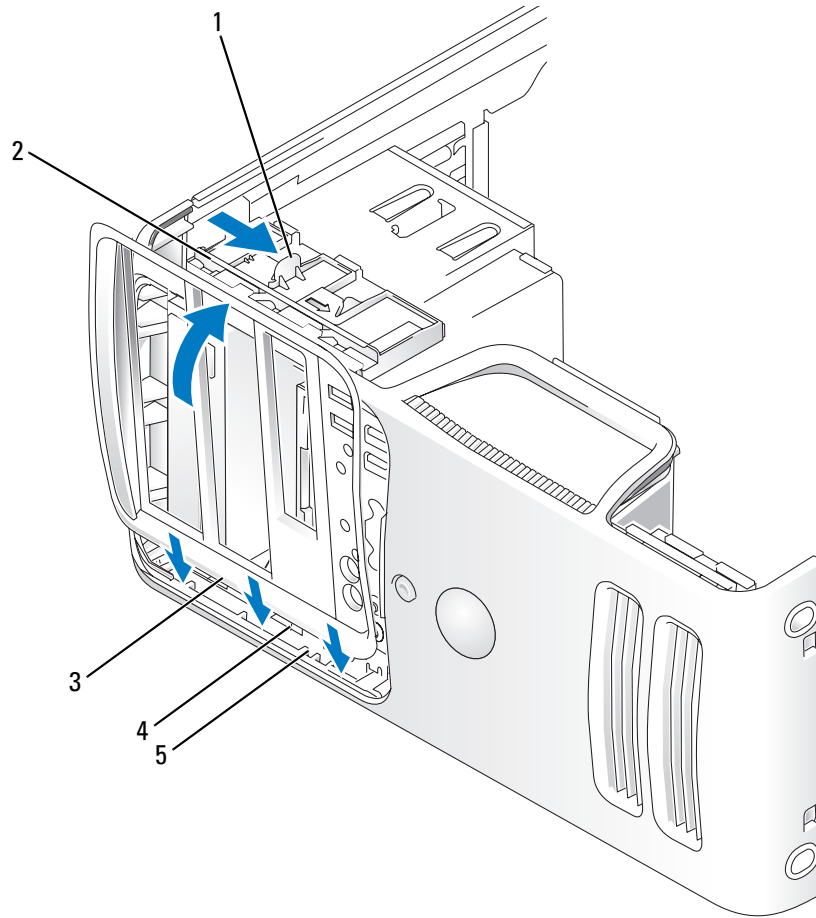
1	sliding plate lever	2	sliding plate	3	drive panel
4	drive panel tabs (3)	5	side hinges			

2 Rotate the drive panel toward the computer until it snaps into place on the front panel.

Drives

Your computer supports a combination of these devices:

- Up to two serial ATA hard drives
- One optional floppy drive or an optional Media Card Reader
- Up to two CD or DVD drives
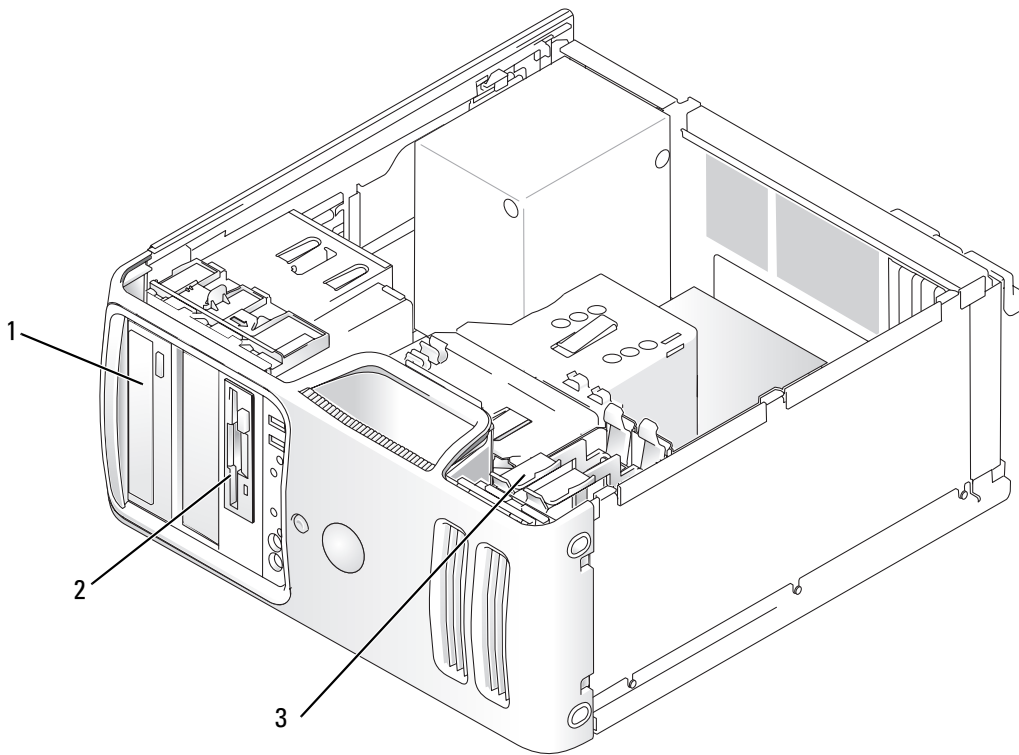
1	CD/DVD drive	2	FlexBay for optional floppy drive or Media Card Reader	3	hard drive

Recommended Drive Cable Connections

- Connect serial ATA hard drives to connectors labeled "SATA0" or "SATA1" on the system board.
- Connect serial ATA CD or DVD drives to connectors labeled "SATA2" or "SATA3" on the system board.

Connecting Drive Cables

When you install a drive, you connect two cables—a DC power cable and a data cable—to the back of the drive.

Power Connector

| 1 | power cable | 2 | power input connector |
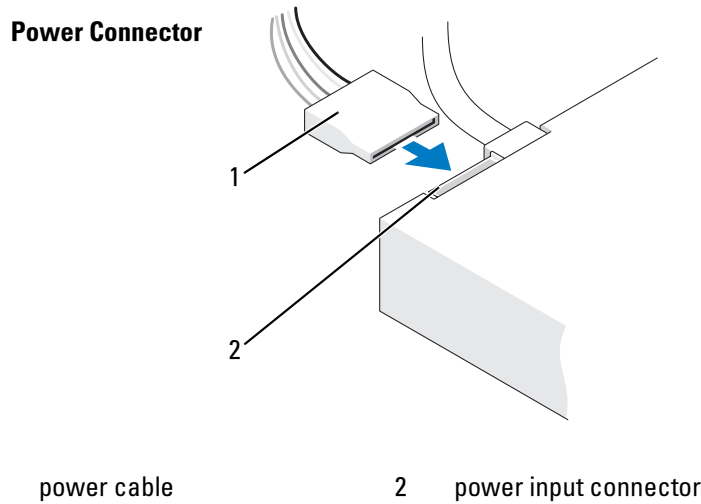
Drive Interface Connectors

The drive cable connectors are keyed for correct insertion. Properly align the cable connector key on the cable and the drive before connecting.

Serial ATA Connector

| 1 | interface cable | 2 | interface connector |
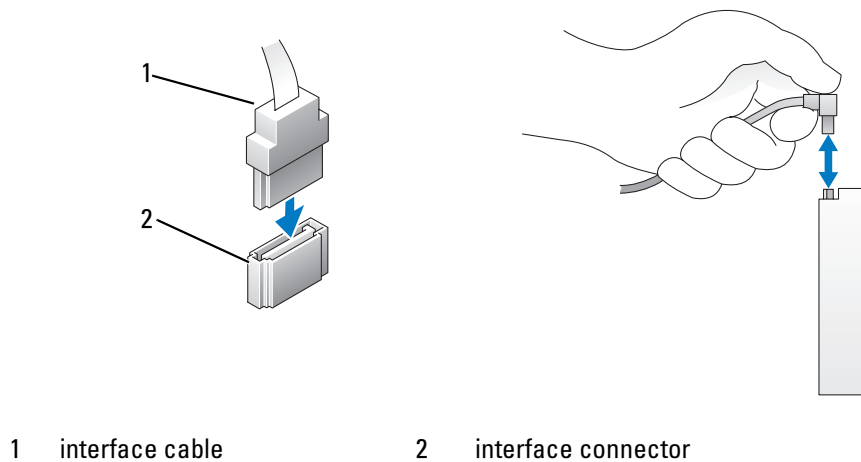
Connecting and Disconnecting Drive Cables

When connecting and disconnecting a serial ATA data cable, disconnect the cable using the pull-tab.

The serial ATA interface connectors are keyed for correct insertion; that is, a notch or a missing pin on one connector matches a tab or a filled-in hole on the other connector.

Hard Drives

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

⚠ **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 begin this procedure.

Check the documentation for the drive to verify that it is configured for your computer.

Removing a Hard Drive

1 Follow the procedures in "Before You Begin" on page 65.

2 Disconnect the power and data cables from the drive.

⊃ **NOTICE:** Use the pull-tab to remove the data cable from your hard drive.
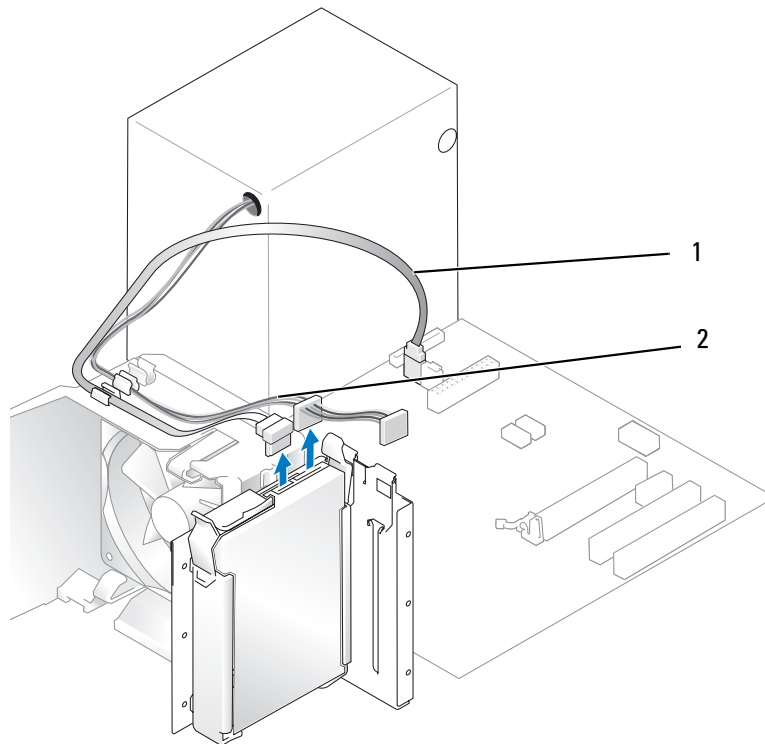
| 1 | power cable | 2 | serial ATA data cable |

3 Press in on the blue tabs on each side of the drive and slide the drive up and out of the computer.
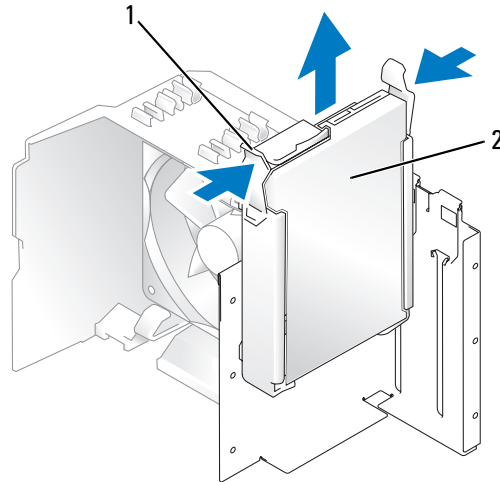
1	tabs (2)	2	hard drive

4 If removing this drive changes the drive configuration, then be sure to reflect these changes in system setup. When you restart your computer, enter system setup (see "System Setup" on page 115), then go to the "Drives" section of the System Setup and under **Drive 0 through 3**, set the Drive to the correct configuration.

5 Replace the computer cover (see "Replacing the Computer Cover" on page 110).

6 Connect computer and other devices to an electrical outlet.

Installing a Hard Drive

1 Follow the procedures in "Before You Begin" on page 65.

2 Remove the computer cover (see "Removing the Computer Cover" on page 66).

3 Check the documentation for the drive to verify that it is configured for your computer.

✍ **NOTE:** If your replacement hard drive does not have the hard drive bracket attached, remove the bracket from the old drive by unsnapping it from the drive. Snap the bracket onto the new drive.

1 drive	2 hard-drive bracket

4 Align the hard drive bracket with the guides in the hard drive bay.
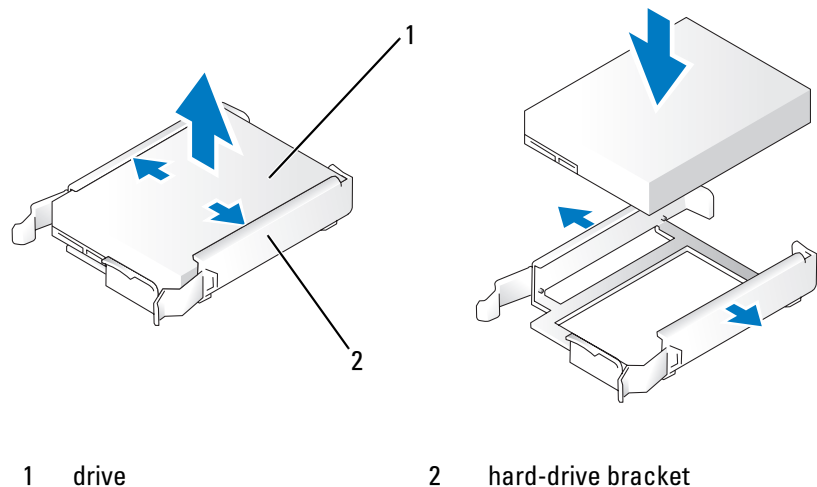
1 hard-drive bracket	2 hard drive	3 guide in hard-drive bay
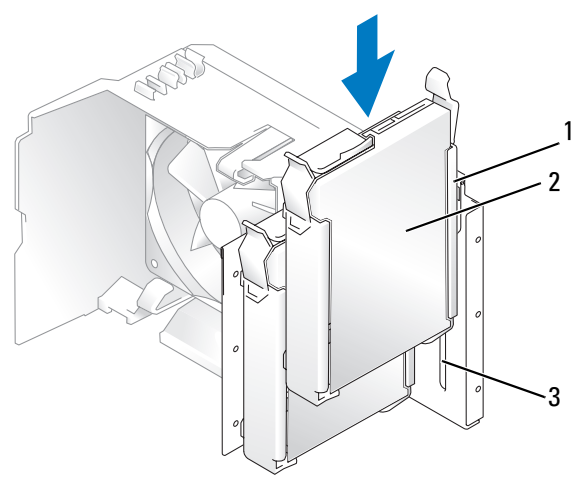
5 Gently slide the drive into place until you feel a click or the drive is securely installed. Take care not to let the drive free-fall into the drive bay.

6 Connect the power and data cables to the drive.
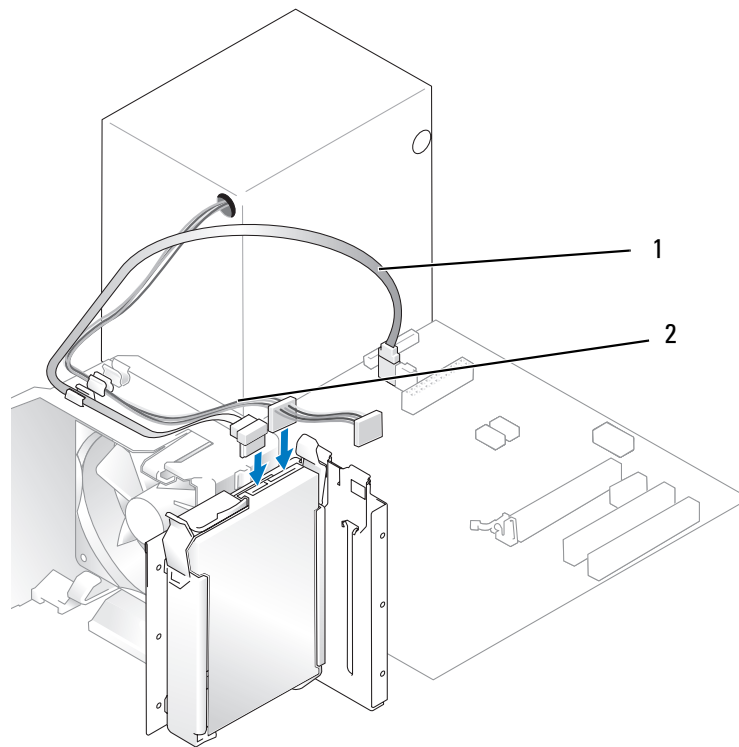
| 1 | serial ATA data cable | 2 | power cable |

7 Check all cables to be certain that they are properly connected and firmly seated.

8 Replace the computer cover (see "Replacing the Computer Cover" on page 110).

⬤ **NOTICE:** To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

9 Connect your computer and devices to electrical outlets, and then turn them on.

10 See the documentation that came with the drive for instructions on installing any software required for drive operation.

11 Check the System Setup for drive configuration changes (see "Entering System Setup" on page 115).

Adding a Second Hard Drive

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

⚠ **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.

1 Check the documentation for the drive to verify that it is configured for your computer.

2 Follow the procedures in "Before You Begin" on page 65.

3 Press in on the blue release tabs on each side of the hard drive bracket and slide it up and out of the computer.

4 Snap the bracket to the hard drive (see "Installing a Hard Drive" on page 93).

5 Align the hard drive bracket with the guides in the hard drive bay.

6 Gently slide the new drive (second hard drive) into place until you feel a click or feel the drive securely installed. Take care not to let the drive free-fall into the drive bay.
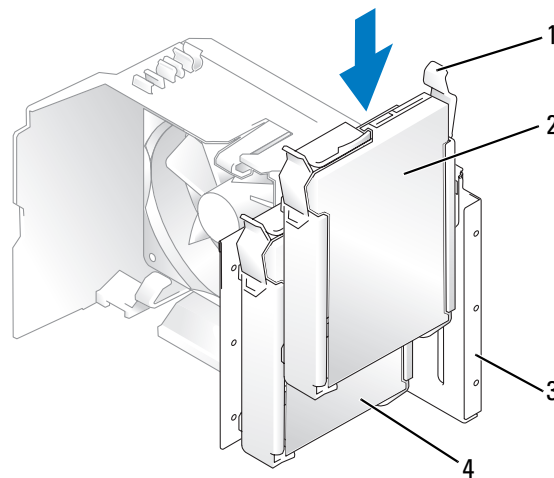
| 1 | release tabs (2) | 2 | second hard drive in lower bay | 3 | hard drive bay |
| 4 | primary hard drive in upper bay | | | | |

7 Connect the power and data cables to the drive (see "Connecting Drive Cables" on page 91).

8 Connect the other end of the data cable to the SATA connector on the system board labeled **SATA0** or **SATA1** (see "System Board Components" on page 69).

9 Check all cables to be certain that they are properly connected and firmly seated.

10 Replace the computer cover (see "Replacing the Computer Cover" on page 110).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

11 Connect your computer and devices to electrical outlets, and turn them on.

12 See the documentation that came with the drive for instructions on installing any software required for drive operation.

Floppy Drive

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

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

📝 **NOTE:** If you are adding a floppy drive, see "Installing a Floppy Drive" on page 99.

Removing a Floppy Drive

1 Follow the procedures in "Before You Begin" on page 65.

2 Remove the drive panel (see "Removing the Drive Panel" on page 86).
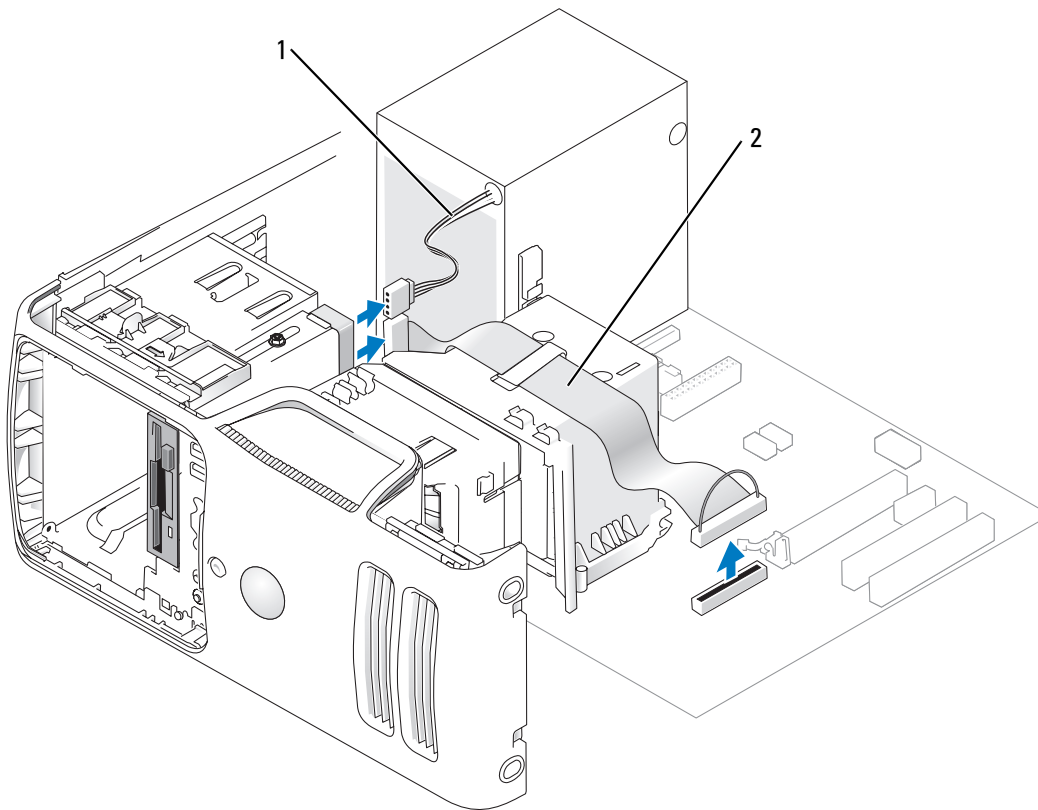
| 1 | power cable | 2 | data cable |

3 Disconnect the power and data cables from the back of the floppy drive.

📝 **NOTE:** If you have installed a PCI Express x16 card, this card may cover the floppy-drive connectors. Remove this card before disconnecting the floppy-drive cables (see "Removing a PCI Express Card" on page 85)

4 Slide the drive latch release toward the bottom of the computer and, without releasing the drive latch release, slide the floppy drive out through the front of the computer.
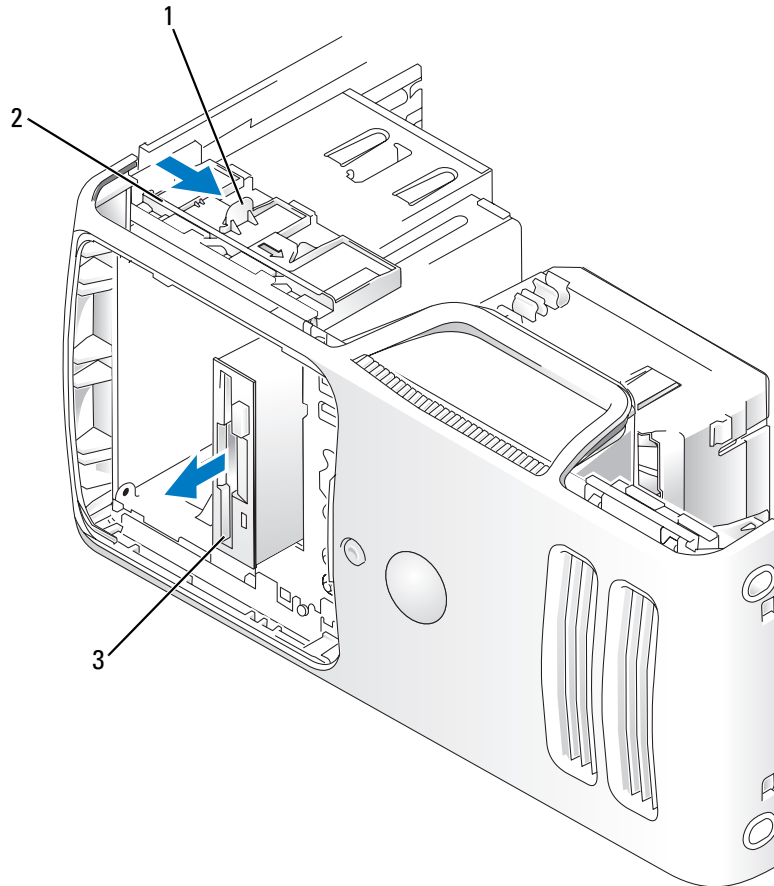
1	drive latch release	2	sliding plate	3	floppy drive

5 If you are not replacing the drive, reinstall the drive panel insert (see "Replacing the Drive-Panel Insert" on page 88).

6 Replace the computer cover (see "Replacing the Computer Cover" on page 110).

7 Connect your computer and devices to electrical outlets, and then turn them on.

8 Check the System Step for the appropriate diskette Drive Option changes (see "Entering System Setup" on page 115).

Installing a Floppy Drive
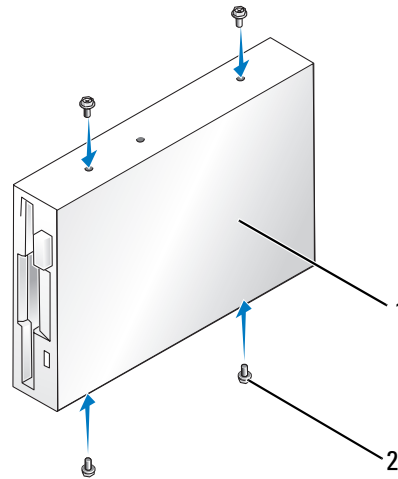
| 1 | drive | 2 | screws (4) |

1 Follow the procedures in "Before You Begin" on page 65.

2 Remove the drive panel (see "Removing the Drive Panel" on page 86).

3 Gently slide the drive into place until you feel a click or feel the drive securely installed.

✎ **NOTE:** If you are installing a new floppy drive rather than replacing a drive, remove the drive panel insert where you want the drive to be installed, insert the shoulder screws located in the back of the drive panel insert into the drive, and then slide the drive back into place.

4 Attach the power and data cables to the floppy drive.

5 Connect the other end of the data cable to the connector labeled "FLOPPY1" on the system board (see "System Board Components" on page 69) and route the cable through the clip on the shroud.
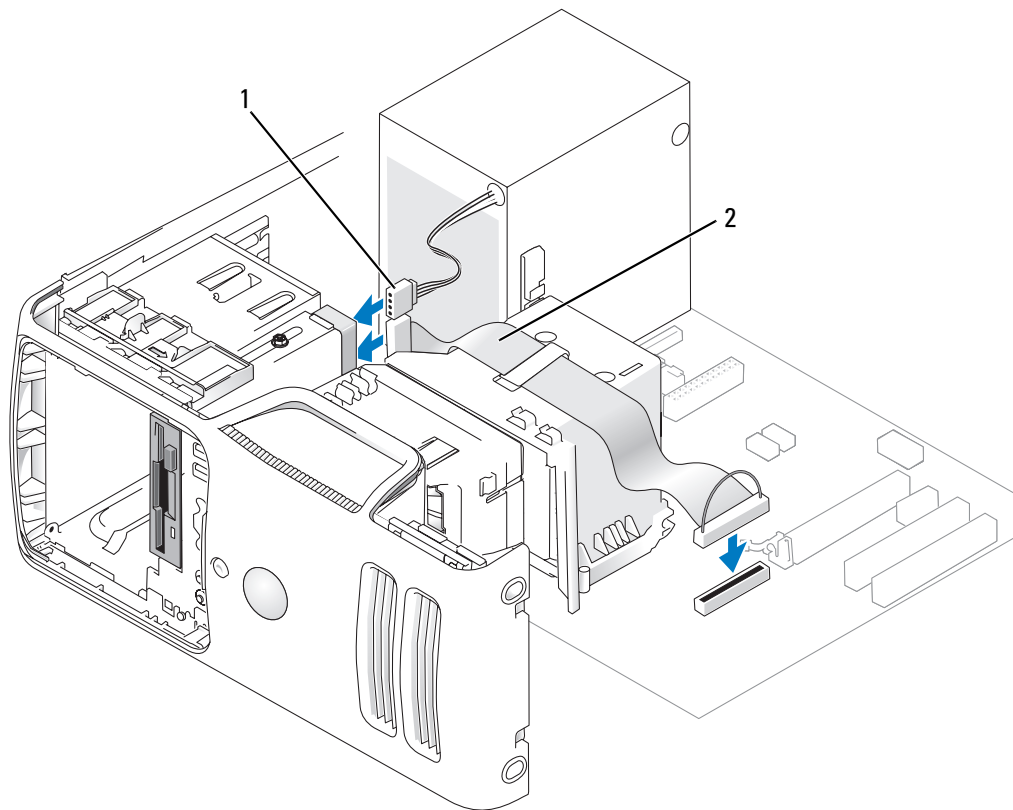
| 1 | power cable | 2 | data cable |

6 If you are installing a new floppy drive rather than replacing a drive, remove the appropriate drive-panel insert (see "Removing the Drive-Panel Insert" on page 87).

7 Check all cable connections, and fold cables out of the way to avoid blocking airflow between the fan and cooling vents.

8 Replace the drive panel (see "Replacing the Drive Panel" on page 89).

9 Replace the computer cover (see "Replacing the Computer Cover" on page 110).

○ **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.

10 Connect your computer and devices to their electrical outlets, and turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

11 Enter system setup (see "System Setup" on page 115) and select the appropriate **Diskette Drive** option.

12 Verify that your computer works correctly by running the Dell Diagnostics (see "Dell Diagnostics" on page 56).

Media Card Reader

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the** *Product Information Guide***.**

⚠️ **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 You Begin" on page 65.

2 Remove the drive panel (see "Removing the Drive Panel" on page 86).

*Not present on all computers.
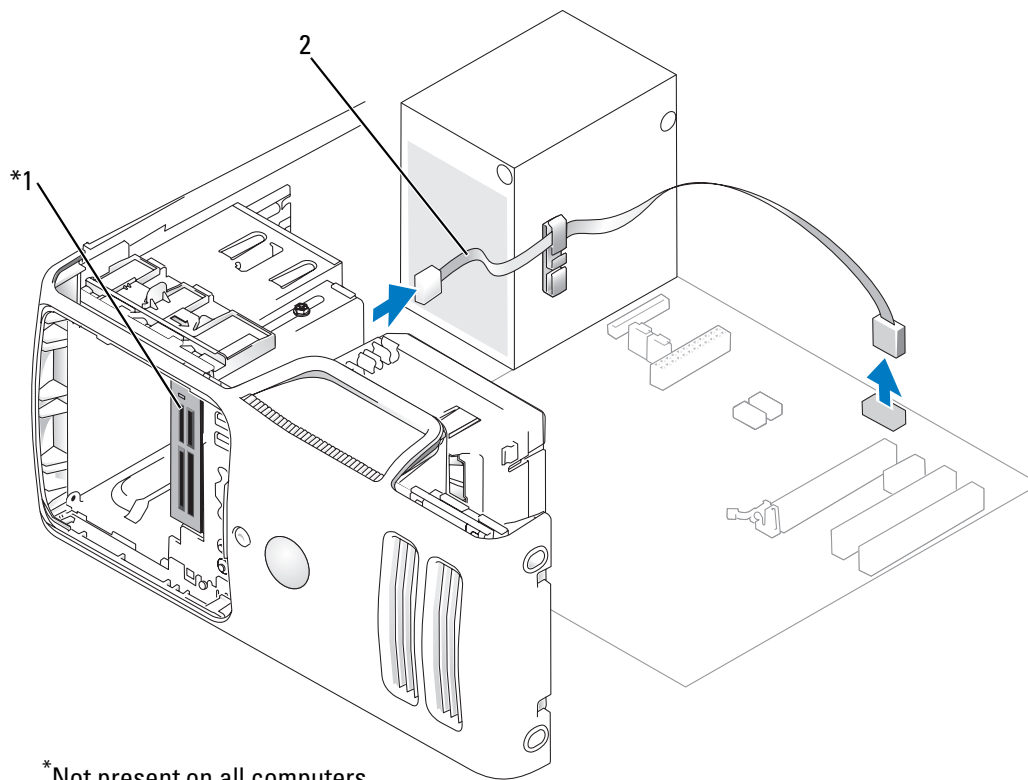
1	Media Card Reader	2	cable

3 Disconnect the FlexBay USB cable from the back of the Media Card Reader and from the internal USB connector on the system board (see "System Board Components" on page 69) and remove the cable from the cable routing clip.
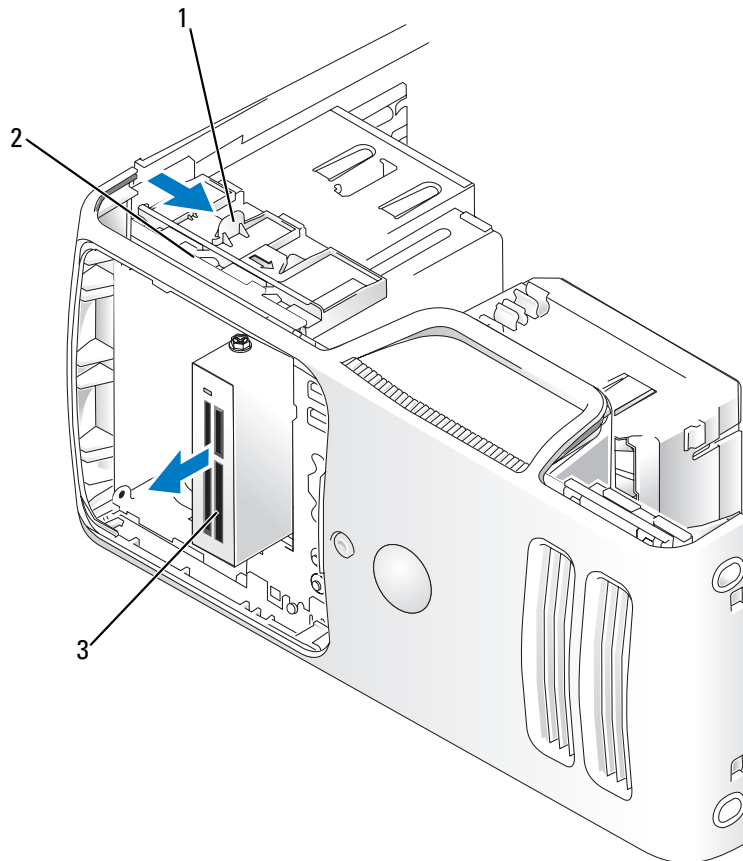
| 1 | drive latch release | 2 | sliding plate | 3 | Media Card Reader |

4 Slide the drive latch release toward the bottom of the computer and, without releasing the drive latch release, slide the Media Card Reader out through the front of the computer.

5 If you are not replacing the Media Card Reader, reinstall the drive panel insert, as needed (see "Replacing the Drive-Panel Insert" on page 88).

6 Replace the drive panel (see "Replacing the Drive Panel" on page 89).

7 Connect your computer and devices to electrical outlets, and then turn them on.

Installing a Media Card Reader

✍ **NOTE:** In the event that the replacement or new Media Card Reader does not have shoulder screws, use the screws located within the drive panel insert. Otherwise, reuse the screws attached to the card reader that you are replacing.
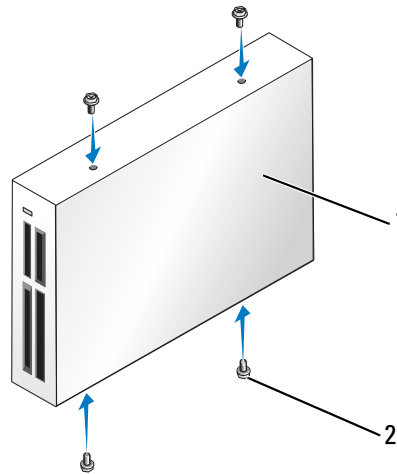
| 1 | Media Card Reader | 2 | screws (4) |

1 Follow the procedures in "Before You Begin" on page 65.

2 Remove the drive panel (see "Removing the Drive Panel" on page 86).

3 If this is a new card reader installation:

- Remove the drive panel insert (see "Removing the Drive-Panel Insert" on page 87). Remove the four shoulder screws from the drive panel insert.

- Remove the Media Card Reader from its packaging.

- Remove the shoulder screws from the inside of the drive-panel insert and attach the screws to the new Media Card Reader.

4 Gently slide the Media Card Reader into place until you feel a click or feel the drive securely installed.

Ensure that the Media Card Reader is installed before the FlexBay cable is connected.

5 Connect the USB cable to the back of the Media Card Reader and to the USB connector on the system board (see "System Board Components" on page 69).

6 Connect the FlexBay USB cable to the back of the Media Card Reader and to the internal USB connector on the system board (see "System Board Components" on page 69).
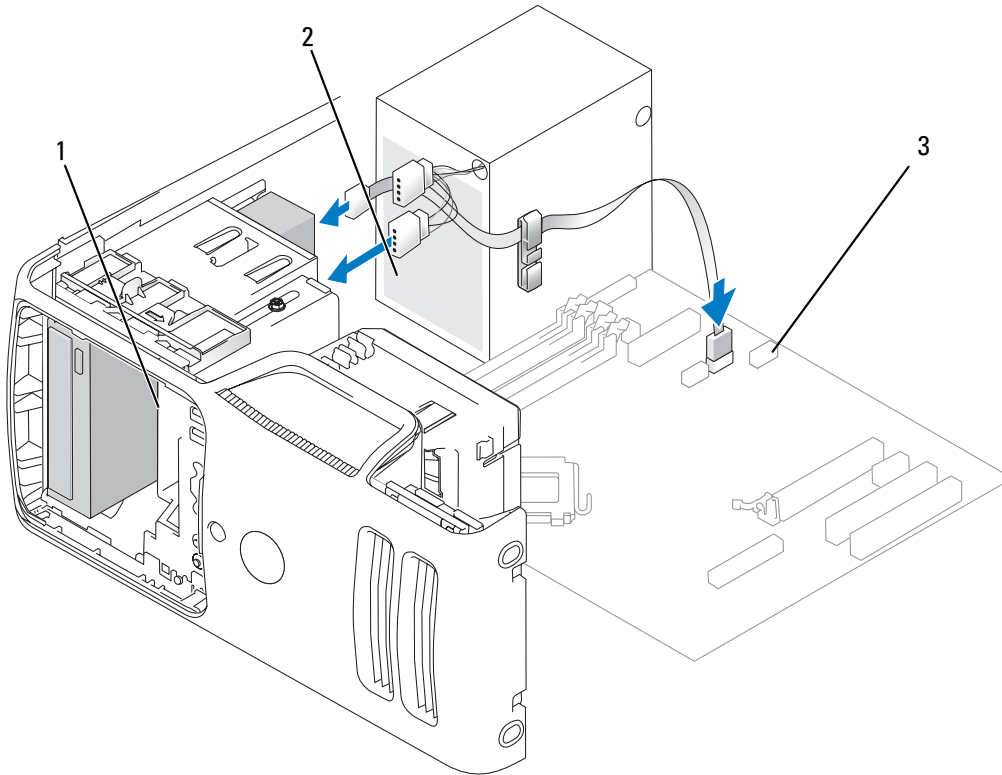
1	Media Card Reader	2	USB cable	3	USB connector

7 Route the FlexBay USB cable through the cable routing clip.

8 Replace the computer cover (see "Replacing the Computer Cover" on page 110).

**9** Connect your computer and devices to electrical outlets, and then turn them on.

CD/DVD Drive

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.**

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

Removing a CD/DVD Drive

1 Follow the procedures in "Before You Begin" on page 65.

2 Remove the drive panel (see "Removing the Drive Panel" on page 86).

3 Disconnect the power cable and the CD/DVD drive data cable from the back of the drive and the system board.
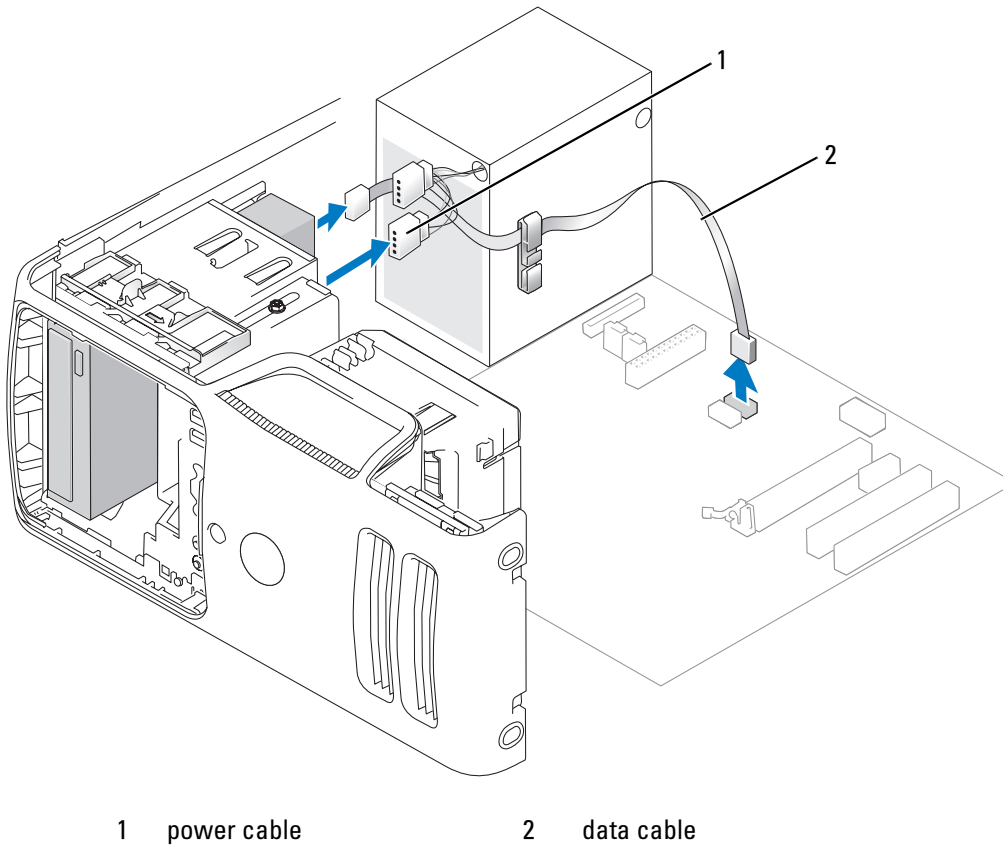
| 1 | power cable | 2 | data cable |

4 Slide the drive latch release toward the bottom of the computer and, without releasing the drive latch release, slide the CD/DVD drive out through the front of the computer.

5 If you are not replacing the drive, replace the drive panel insert (see "Replacing the Drive-Panel Insert" on page 88).

6 Replace the drive panel (see "Replacing the Drive Panel" on page 89).
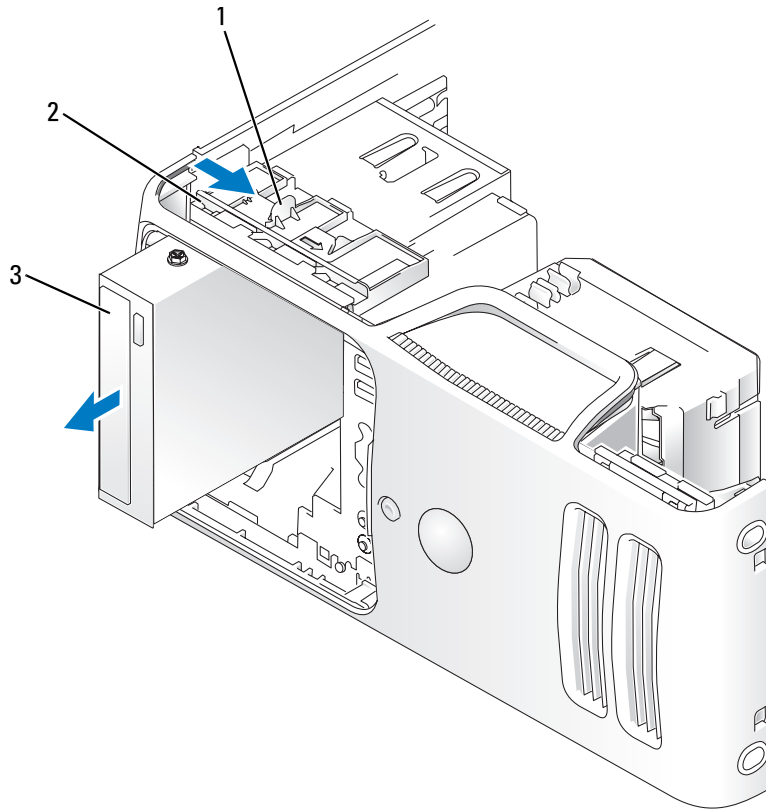
| 1 | drive release latch | 2 | sliding plate | 3 | CD/DVD drive |

7 Replace the computer cover (see "Replacing the Computer Cover" on page 110).

8 Connect your computer and devices to electrical outlets, and then turn them on.

9 Configure the drives in System Setup (see "Entering System Setup" on page 115).

Installing a CD/DVD Drive

✏ **NOTE:** In the event that the replacement or new CD/DVD drive does not have shoulder screws, check for the screws located within the drive panel insert or, if applicable, reuse screws attached to the drive that you are replacing.
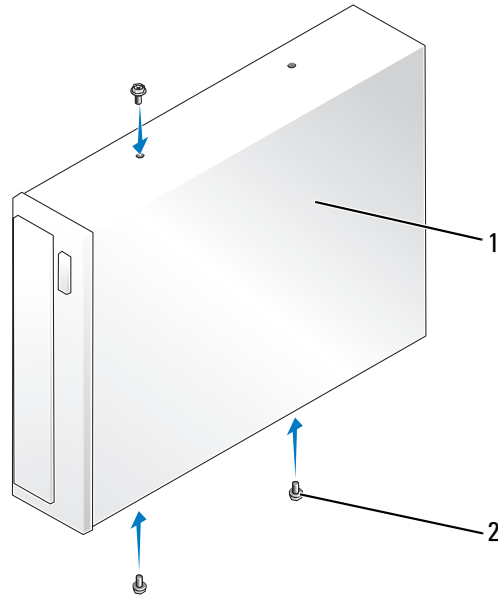
| 1 | CD/DVD drive | 2 | screws (3) |

1 Follow the procedures in "Before You Begin" on page 65.

2 If you are installing a new CD/DVD drive rather than replacing a drive, remove the appropriate drive-panel insert (see "Removing the Drive-Panel Insert" on page 87).

3 Gently slide the drive into place until you feel a click or feel the drive securely installed.

4 Connect the power and data cables to the drive.
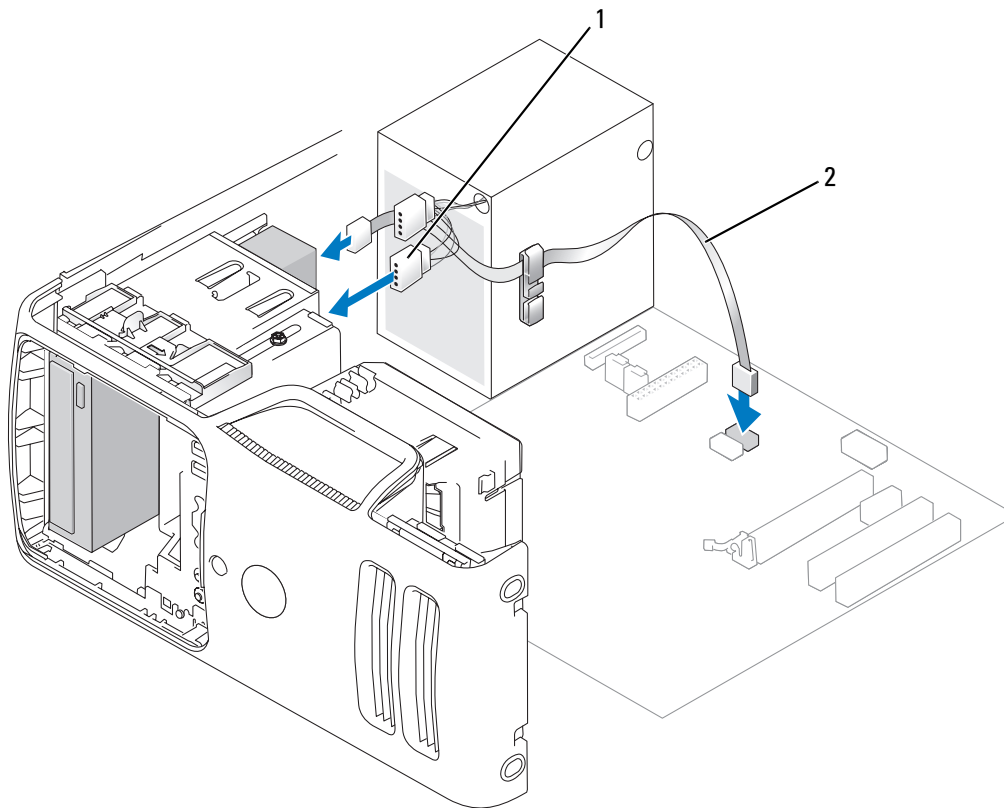
1   power cable   2   data cable

5   Check all cable connections, and fold cables out of the way to avoid blocking airflow between the fan and cooling vents.

6   Replace the drive panel (see "Replacing the Drive Panel" on page 89).

7   Replace the computer cover (see "Replacing the Computer Cover" on page 110).

🚫 **NOTICE:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.

8   Connect your computer and devices to their electrical outlets, and turn them on.

    See the documentation that came with the drive for instructions on installing any software required for drive operation.

9   Enter system setup (see "System Setup" on page 115) and select the appropriate **Drive** option.

10 Verify that your computer works correctly by running the Dell Diagnostics (see "Dell Diagnostics" on page 56).

Battery

Replacing the Battery

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

⊖ **NOTICE:** To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

A coin-cell battery maintains computer configuration, date, and time information. The battery can last several years.

If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

⚠ **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.**

To replace the battery:

1. Record all the screens in system setup (see "System Setup" on page 115) so that you can restore the correct settings in step 9.

2. Follow the procedures in "Before You Begin" on page 65.

3. Remove the computer cover (see "Removing the Computer Cover" on page 66).

4. Locate the battery socket (see "System Board Components" on page 69).

5. Carefully press the battery release lever away from the battery and the battery will pop out.

6. Insert the new battery into the socket with the side labeled "+" facing up, then snap the battery into place.
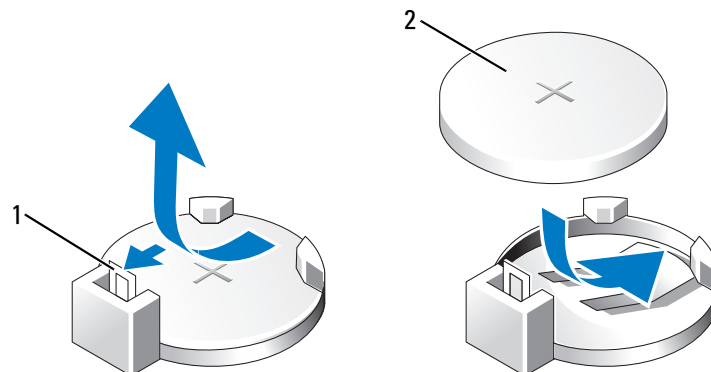
| 1 | battery release lever | 2 | battery (positive side) |

7. Replace the computer cover (see "Replacing the Computer Cover" on page 110).

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

8   Connect your computer and devices to electrical outlets, and then turn them on.

9   Enter system setup (see "System Setup" on page 115) and restore the settings you recorded in step 1. Then go to the **Maintenance** section and clear the low battery and other errors associated with the battery replacement in the **Event Log**.

10 Properly dispose of the old battery.

    See the *Product Information Guide* for battery disposal information.

Replacing the Computer Cover

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the** *Product Information Guide*.

1   Ensure that all cables are connected, and fold cables out of the way.

2   Ensure that no tools or extra parts are left inside the computer.

3   Align the bottom of the cover with the tabs located along the bottom edge of the computer.

4   Using the tabs as leverage, rotate the cover downward and press down to close it.
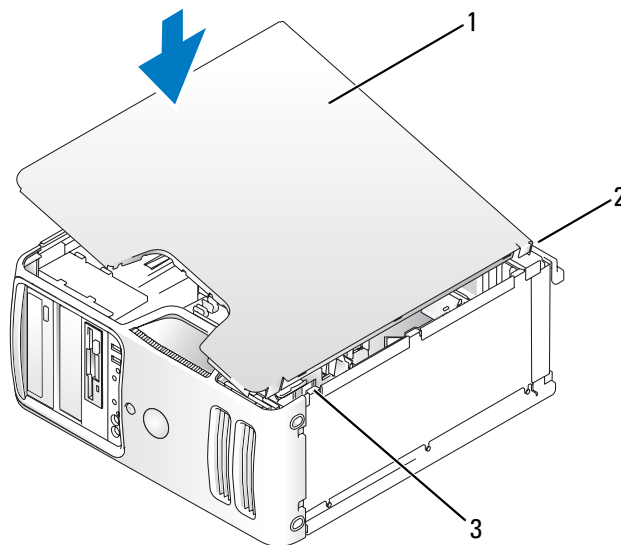
| 1 | computer cover | 2 | back of computer | 3 | bottom hinge tabs |

5   Ensure that the cover is seated correctly before moving it to the upright position.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

6   Connect your computer and devices to electrical outlets, and turn them on.

Appendix

Specifications

Processor	
Processor type	AMD Athlon 64 X2 dual-core processor AMD Athlon 64 processor AMD Sempron processor
Level 2 (L2) cache	Up to 1 MB per core Up to 256 KB for Sempron processors

Memory	
Type	533-MHz, 667-MHz, 800-MHz (when available) DDR2 SDRAM
Memory connectors	four
Memory capacities	256 MB, 512 MB, or 1 GB non-ECC
Minimum memory	256 MB
Maximum memory	4 GB **NOTE:** See "Addressing Memory With 4-GB Configurations" on page 72 to verify the amount of memory available to the operating system.

Computer Information	
Chipset	Nvidia GeForce 6150LE
RAID Support	RAID 1 (Mirroring)
DMA channels	eight
Interrupt levels	24
BIOS chip (NVRAM)	4 Mb
NIC	Integrated network interface capable of 10/100 communication

Video	
Type	Nvidia integrated video (DirectX 9.0 Shader Model 3.0 Graphics Processing Unit) or optional PCI Express x16 graphics card

Audio

Type	Sigmatel 9227 CODEC (7.1 Channel audio)

Expansion Bus

Bus type	PCI 2.3 PCI Express 1.0A SATA 1.0 and 2.0 USB 2.0
Bus speed	PCI: 133 MB/s

	PCI Express:
	   x1 slot bidirectional speed - 500 MB/s
	   x16 slot bidirectional speed - 8GB/s

	SATA: 1.5 Gbps and 3.0 Gbps USB: 480 Mbps high speed, 12 Mbps full speed, 1.2 Mbps low speed
PCI	
connectors	two
connector size	124 pins
connector data width (maximum)	32 bits
PCI Express	
connector	one x1
connector size	36 pins
connector data width (maximum)	1 PCI Express lane
PCI Express	
connector	one x16
connector size	164 pins
connector data width (maximum)	16 PCI Express lanes

Drives

Externally accessible:	
Bays	one 3.5-inch drive bay (FlexBay)
	two 5.25-inch drive bays
Available devices	Serial ATA drives (4), floppy drive, USB memory devices, CD/DVD drive, and Media Card Reader
Internally accessible:	two bays for 1-inch high serial ATA hard drives

Connectors

External connectors:

Video	15-hole connector
Network adapter	RJ-45 connector
USB	two front-panel and four back-panel USB 2.0-compliant connectors
Audio	six connectors for 7.1 support

System board connectors:

Serial ATA	four 7-pin connectors
Internal USB device	one 10-pin connector (supports two USB ports)
Floppy drive	one 34-pin connector
Fan	one 5-pin connectors
PCI 2.3	two 124-pin connectors
PCI Express x1	one 36-pin connector
PCI Express x16	one 164-pin connector
Front panel	one 40-pin connector
Processor	one 940-pin connector
Memory	four 240-pin connectors
Power 12V	one 4-pin connector
Power	one 24-pin connector

Controls and Lights

Front of computer:

Power button	push button
Power light	green light — Blinking green in sleep state; solid green for power-on state.
	amber light — Blinking amber indicates a problem with the power supply inside the computer. If the system cannot boot and there is a solid amber light, this indicates a problem with the system board (see "Power Problems" on page 47).
Diagnostic lights	four lights on the front panel (see "Diagnostic Lights" on page 53.)
Standby power light	AUX_PWR_LED on the system board
Hard-drive activity light	green light — When the computer is reading data from or writing data to the hard drive.

Controls and Lights *(continued)*

Rear of computer:

Link integrity light (on integrated network adapter)	green light — A good connection exists between a 10 Mbps network and the computer.
	orange light — A good connection exists between a 100 Mbps network and the computer.
	off (no light) — The computer is not detecting a physical connection to the network.
Network activity light (on integrated network adapter)	yellow blinking light

Power

DC power supply:

Wattage	305 W
Maximum heat dissipation	1041 BTU/hr **NOTE:** Heat dissipation is calculated by using the power supply wattage rating.
Voltage (see the safety instructions located in the *Product Information Guide* for important voltage setting information)	90 to 135 V and 180 to 265 V at 50/60 Hz
Backup battery	3-V CR2032 lithium coin cell

Physical

Height	41.4 cm (16.3 inches)
Width	18.8 cm (7.4 inches)
Depth	45.7 cm (18.0 inches)
Weight	12.7 kg (28.0 lb)

Environmental

Temperature:

Operating	10° to 35°C (50° to 95°F)
Storage	–40° to 65°C (–40° to 149°F)
Relative humidity	20% to 80% (noncondensing)

Environmental *(continued)*

Maximum vibration:

Operating	5 to 350 Hz at 0.0002 G^2/Hz
Storage	5 to 500 Hz at 0.001 to 0.01 G^2/Hz

Maximum shock:

Operating	40 G +/- 5% with pulse duration of 2 msec +/- 10% (equivalent to 20 in/sec [51 cm/sec])
Storage	105 G +/- 5% with pulse duration of 2 msec +/- 10% (equivalent to 50 in/sec [127 cm/sec])

Altitude:

Operating	–15.2 to 3048 m (–50 to 10,000 ft)
Storage	–15.2 to 10,668 m (–50 to 35,000 ft)

System Setup

Overview

Use system setup 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 system setup, 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 System Setup

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, this keystroke will be lost.

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 65) and try again.

System Setup 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	
System Info	Displays the **System** name, **BIOS Version**, **Service Tag**, **Express Service Code**, and **Asset Tag**. **NOTE:** The system name listed in the BIOS may not appear exactly as the name that appears on the computer or in the computer's documentation.
Processor Info	Displays the following information for the processor installed in the system: **Processor Type**, **Processor Clock Speed**, **Processor Bus Speed**, **Processor L2 Cache**, **Processor ID**, and if the processor has **64-bit technology**.
Memory Info	Displays the amount of **Installed Memory**, **Memory Speed**, **Memory Channel Mode**, and a description of the **Memory Technology**.
PCI Info	Displays the contents of each PCI slot.
Date/Time	Controls the system's internal calendar and clock.
Boot Sequence	Determines the order in which the system searches for boot devices during system startup. **NOTE:** If you insert a boot device and restart the computer, this option appears in the system setup menu. To boot from a USB memory device, select the USB device and move it so it becomes the first device in the list.
HDD Boot Sequence	Lists the order that the BIOS will search the available hard drives in the system.

Drives	
Diskette Drive (**Internal** default)	Enables and disables the floppy drives and sets read permission for the internal floppy drive. • **Off** — disables all floppy drives • **USB** — enables the USB floppy drive • **Internal** — enables the internal floppy drive • **Read Only** — enables the internal drive controller and allows the internal floppy drive read-only permission **NOTE:** Operating systems with USB support will recognize USB floppy drives regardless of this setting.
Drives 0 through 3 (**On** default)	Enables or disables an ATA or SATA device (such as hard-drive, CD drive, or DVD drive). **On** enables the interface so that the device can be used. Displays the **Controller** type (**ATA** or **SATA**), **Port** number the drive is using, **Drive ID** number, **Capacity**, and whether the drive is controlled by the **BIOS**.

SATA Operation (**Off** default)	The field configures the operating mode of the integrated hard drive controller. • **RAID Off** — No RAID support • **RAID On** — SATA is configured for RAID on every boot.
SMART Reporting (**Off** default)	This setting determines whether integrated drive errors are reported or not during system startup.

Onboard Devices	
Integrated NIC (**On** default)	Enables or disables the integrated NIC controller. Settings are **Off**, **On**, **On w/ PXE, or On w/RPL**. When the **On w/ PXE** or the **On w/RPL** setting is active, if a boot routine is not available from the network server, the computer attempts to boot from the next device in the boot sequence list.
Integrated Audio (**On** default)	Enables or disables the onboard audio controller.
USB Controller (**On** default)	Enables or disables the internal USB controller. **No Boot** enables the controller but disables the ability to boot from a USB device. **NOTE:** Operating systems with USB support will recognize USB floppy drives regardless of the **No Boot** setting.
Rear Dual USB0 (**On** default)	Enables or disables the indicated group of USB ports on the back of the computer.
Rear Dual USB1 (**On** default)	Enables or disables the indicated group of USB ports on the back of the computer.
Front USB (**On** default)	Enables or disables the indicated group of USB ports on the front of the computer.

Video	
Primary Video (**Auto** default)	Specifies which video controller is primary when two video controllers are present on the computer. **Auto** enables the add-in video controller. **Onboard** enables the integrated video controller.
Video Memory Size (**64MB** default)	This setting configures the amount of system memory that is reserved for the integrated video controller. The settings are Auto, 16MB, 32MB, 64MB, 128MB, or Off.

Performance	
HDD Acoustic Mode **Bypass** default	• **Bypass** — Your computer does not test or change the current acoustics mode setting. • **Quiet** — The hard drive operates at its most quiet setting. • **Suggested** — The hard drive operates at the level suggested by the drive manufacturer. • **Performance** — The hard drive operates at its maximum speed. **NOTE:** Switching to performance mode will cause the drive heads to move faster, causing the hard drive to be noisier. However, some drives may not see an increase in data transfer rates. **NOTE:** Changing the acoustics setting does not alter your hard drive image.

Security	
Unlock Setup	When an administrator password is being used, allows the user access to modify system setup settings. Enter the administrator password at the prompt to unlock system setup. If the correct password is not entered here, the user can view but not modify system setup fields.
Admin Password (**Not Set** default)	Displays the current status of your system setup program's password security feature and allows you to verify and assign a new admin password.
System Password (**Not Set** default)	Displays the current status of the system's password security feature and allows a new system password to be assigned and verified.
Password Changes (**Unlocked** default)	Determines the interaction between the **System** password and the **Admin** password. **Locked** prevents a user without a valid **Admin** password from being able to modify the **System** password. **Unlocked** allows a user with a valid **System** password to modify the system password.
Non-Execute Func (**On** default)	Enables or disables Execute Disable memory protection technology.

Power Management	
AC Recovery (**Off** default)	Determines how the system responds when AC power is re-applied after a power loss. • **Off** — The system remains off when power is re-applied. You must press the front-panel power button before the system turns on. • **On** — The system turns on when power is re-applied. • **Last** — The system returns to the last power state the system was in just before it was turned off.

Auto Power On (**Off** default)	Sets the computer to automatically turn on. • **Off** — disables the Auto Power On feature • **Everyday** — turns the computer on every day at the time set in **Auto Power Time** • **Weekdays** — turns the computer on every day from Monday through Friday at the time set in **Auto Power Time** **NOTE:** This feature does not work if you turn off your computer using a power strip or surge protector.
Auto Power Time	Sets time to automatically turn on the computer. Time is kept in the standard 12-hour format (*hours:minutes*). Change the startup time by pressing the right- or left-arrow key to increase or decrease the numbers, or type numbers in both the date and time fields.
Low Power Mode (**Off** default)	When **Low Power Mode** is selected, remote wakeup events will no longer power up the computer from **Hibernate** or **Off** via the onboard network controller.
Cool and Quiet (**On** default)	This option enables or disables the Cool 'n' Quiet technology for all supported processors
Suspend Mode (**S3** default)	Sets the computer's suspend mode. • **S1** — sets the computer to a suspend state where the computer is running in a low-power mode • **S3** — sets the computer to a standby state where the power is reduced or turned off for most components; however, system memory remains active for both settings

Maintenance	
Service Tag	Displays the service tag for your computer.
Load Defaults	Restores system setup options to their factory defaults.
Event Log	Allows you to view the **Event Log**. Entries are marked **R** for **Read** and **U** for **Unread**. **Mark All Entries Read** puts an R to the left of all entries. **Clear Log** clears the **Event Log**.

POST Behavior	
Fastboot (**On** default)	When enabled, this feature reduces computer startup time by bypassing some compatibility steps. • **Off** — does not skip any steps during computer startup • **On** — starts the system more quickly

`Numlock Key` (**On** default)	Determines the functionality of the numeric keys on the right side of your keyboard. • **Off** — commands the right keypad keys to function as arrows • **On** — commands the right keypad keys to function as numbers
`POST Hotkeys` (**Setup & Boot Menu** default)	Determines whether the sign-on screen displays a message stating the keystroke sequence that is required to enter the **Setup** program or the **Quickboot** feature. • **Setup & Boot Menu** — displays both messages (F2=Setup and F12=Boot Menu) • **Setup** — displays the setup message only (F2=Setup) • **Boot Menu** — displays the **Quickboot** message only (F12=Boot Menu) • **None** — displays no message
`Keyboard Errors` (**Report** default)	When set to **Report** and an error is detected during POST, the BIOS will display the error message and prompt you to press <F1> to continue or press <F2> to enter system setup. When set to **Do Not Report** (disabled) and an error is detected during POST, the BIOS will display the error message and continue booting the system.

Boot Sequence

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

Option Settings

- **Bootable 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.

- **Onboard Floppy Drive** — The computer attempts to boot from the floppy drive. 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.

- **Onboard CD-ROM 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.

- **Integrated NIC** — The computer attempts to boot using the integrated NIC. If integrated NIC is not connected, the computer generates an error message.

- **USB-Device, USB-Floppy, USB-CDROM** — Attach the device to a USB port and restart the computer before selecting the option from the Boot Menu. The computer will attempt to boot from the appropriate USB device. If no operating system is on the appropriate drive or disk, the computer will generate an error message.

NOTE: To boot to a USB device, the device must be bootable. To ensure that a device is bootable, check the device documentation.

Changing Boot Sequence for the Current Boot

You can use this feature, for example, to restart your computer to a USB device, such as a floppy drive, memory key, or CD-RW drive.

> ✍ **NOTE:** If you are booting to a USB floppy drive, you must first set **Diskette Interface** to **Disabled** in system setup (see "System Setup" on page 115).

1 If you are booting to a USB device, connect the USB device to a USB connector.

2 Turn on (or restart) your computer.

3 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 (see "Turning Off Your Computer" on page 65) and try again.

4 Press <F1> to continue.

 The **Boot Menu** appears, listing all available boot devices.

5 Use the arrow keys to select the appropriate device (for the current boot only).

> ✍ **NOTE:** To boot to a USB device, the device must be bootable. To ensure that a device is bootable, check the device documentation.

Changing Boot Sequence for Future Boots

1 Enter system setup, select **Boot Sequence** from the **System** group (see "Entering System Setup" on page 115).

2 Press <Enter> to access the menu.

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

3 Press the up- and down-arrow keys to highlight the appropriate **Boot Sequence** option.

4 Press the **U** or **D** keys to move the option **up** or **down** in the boot sequence.

5 Press <Enter> to **Save** the changes or <Esc> to **Cancel**.

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

Clearing Forgotten Passwords

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.**

1 Follow the procedures in "Before You Begin" on page 65.
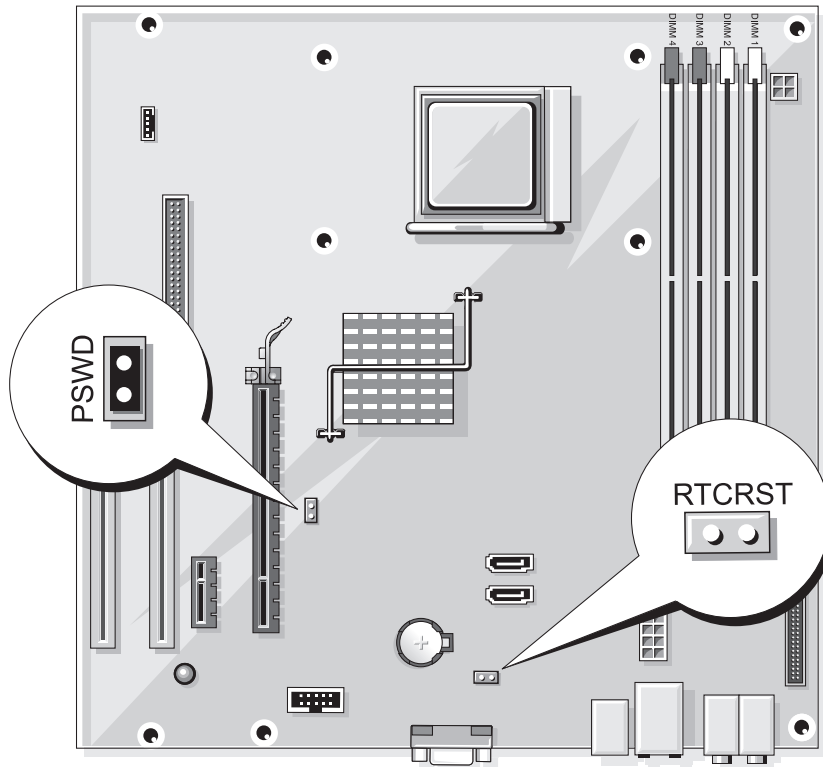
2 Locate the 2-pin password jumper (PSWD) on the system board and remove the jumper plug from pins 1 and 2 to clear the password.

3 Close the computer cover (see "Replacing the Computer Cover" on page 110).

4 Connect your computer and monitor to electrical outlets, and turn them on.

5 After the Microsoft® Windows® desktop appears on your computer, shut down the computer (see "Turning Off Your Computer" on page 65).

6 Turn off the monitor and disconnect it from the electrical outlet.

7 Disconnect the computer power cable from the electrical outlet, and press the power button to ground the system board.

8 Open the computer cover (see "Removing the Computer Cover" on page 66).

9 Locate the 2-pin password jumper (PSWD) on the system board (see "System Board Components" on page 69) and attach the jumper to pins 1 and 2 to reenable the password feature.

10 Close the computer cover (see "Replacing the Computer Cover" on page 110).

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

11 Connect your computer and devices to electrical outlets, and turn them on.

Clearing CMOS Settings

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the** *Product Information Guide.*

1 Follow the procedures in "Before You Begin" on page 65.

✎ **NOTE:** The computer must be disconnected from the electrical outlet to clear the CMOS setting.

2 Reset the current CMOS settings:

a Locate the 2-pin CMOS jumper (RTCRST) on the system board (see "System Board Components" on page 69).

✎ **NOTE:** When you receive your computer, there is no jumper plug on the CMOS jumper.

b Remove the jumper plug from the password jumper (PSWD) pins 1 and 2.

c Place the jumper plug on the CMOS jumper (RTCRST) pins 1 and 2 and wait approximately five seconds.

d Remove the jumper plug and replace it on the password jumper (PSWD) pins 1 and 2.

3 Replace the computer cover (see "Replacing the Computer Cover" on page 110).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

4 Connect your computer and devices to electrical outlets, and turn them on.

Cleaning Your Computer

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the** *Product Information Guide.*

Computer, Keyboard, and Monitor

⚠ **CAUTION: Before you clean your computer, disconnect the computer from the electrical outlet. Clean your computer with a soft cloth dampened with water. Do not use liquid or aerosol cleaners, which may contain flammable substances.**

• Use a vacuum cleaner with a brush attachment to gently remove dust from the slots and holes on your computer and from between the keys on the keyboard.

NOTICE: Do not wipe the display screen with any soap or alcohol solution. Doing so may damage the antiglare coating.

- To clean your monitor screen, lightly dampen a soft, clean cloth with water. If possible, use a special screen-cleaning tissue or solution suitable for the monitor's antistatic coating.

- Wipe the keyboard, computer, and plastic part of the monitor with a soft cleaning cloth moistened with a solution of three parts water and one part dishwashing detergent.

  Do not soak the cloth or let water drip inside your computer or keyboard.

Mouse

If your screen cursor skips or moves abnormally, clean the mouse. To clean a non-optical mouse:

1 Turn the retainer ring on the underside of your mouse counterclockwise, and then remove the ball.

2 Wipe the ball with a clean, lint-free cloth.

3 Blow carefully into the ball cage to dislodge dust and lint.

4 If the rollers inside the ball cage are dirty, clean the rollers with a cotton swab moistened lightly with isopropyl alcohol.

5 Recenter the rollers in their channels if they are misaligned. Ensure that fluff from the swab is not left on the rollers.

6 Replace the ball and retainer ring, and turn the retainer ring clockwise until it clicks into place.

Floppy Drive

NOTICE: Do not attempt to clean drive heads with a swab. You might accidentally misalign the heads, which prevents the drive from operating.

Clean your floppy drive using a commercially available cleaning kit. These kits contain pretreated floppy disks to remove contaminants that accumulate during normal operation.

CDs and DVDs

NOTICE: Always use compressed air to clean the lens in the CD/DVD drive, and follow the instructions that come with the compressed air. Never touch the lens in the drive.

If you notice problems, such as skipping, with the playback quality of your CDs or DVDs, try cleaning the discs.

1 Hold the disc by its outer edge. You can also touch the inside edge of the center hole.

NOTICE: To prevent damaging the surface, do not wipe in a circular motion around the disc.

2 With a soft, lint-free cloth, gently wipe the bottom of the disc (the unlabeled side) in a straight line from the center to the outer edge of the disc.

  For stubborn dirt, try using water or a diluted solution of water and mild soap. You can also purchase commercial products that clean discs and provide some protection from dust, fingerprints, and scratches. Cleaning products for CDs are safe to use on DVDs.

Dell Technical Support Policy (U.S. Only)

Technician-assisted technical support requires the cooperation and participation of the customer in the troubleshooting process and provides for restoration of the operating system, software programs, and hardware drivers to the original default configuration as shipped from Dell, as well as the verification of appropriate functionality of the computer and all Dell-installed hardware. In addition to this technician-assisted technical support, online technical support is available at **support.dell.com**. Additional technical support options may be available for purchase.

Dell provides limited technical support for the computer and any "Dell-installed" software and peripherals[1]. Support for third-party software and peripherals is provided by the original manufacturer, including those purchased and/or installed through Dell Software and Peripherals, Readyware, and Custom Factory Integration[2].

> [1] Repair services are provided pursuant to the terms and conditions of your limited warranty and any optional support service contract purchased with the computer.
>
> [2] All Dell-standard components included in a Custom Factory Integration (CFI) project are covered by the standard Dell limited warranty for your computer. However, Dell also extends a parts replacement program to cover all nonstandard, third-party hardware components integrated through CFI for the duration of the computer's service contract.

Definition of "Dell-Installed" Software and Peripherals

Dell-installed software includes the operating system and some of the software programs that are installed on the computer during the manufacturing process (Microsoft® Office, Norton Antivirus, and so on).

Dell-installed peripherals include any internal expansion cards, or Dell-branded module bay or PC Card accessories. In addition, any Dell-branded monitors, keyboards, mice, speakers, microphones for telephonic modems, docking stations/port replicators, networking products, and all associated cabling are included.

Definition of "Third-Party" Software and Peripherals

Third-party software and peripherals include any peripheral, accessory, or software program sold by Dell not under the Dell brand (printers, scanners, cameras, games, and so on). Support for all third-party software and peripherals is provided by the original manufacturer of the product.

FCC Notice (U.S. Only)

FCC Class B

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1 This device may not cause harmful interference.

2 This device must accept any interference received, including interference that may cause undesired operation.

◯➜ **NOTICE:** The FCC regulations provide that changes or modifications not expressly approved by Dell Inc. could void your authority to operate this equipment.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference with radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

• Reorient the receiving antenna.

• Relocate the system with respect to the receiver.

• Move the system away from the receiver.

• Plug the system into a different outlet so that the system and the receiver are on different branch circuits.

If necessary, consult a representative of Dell Inc. or an experienced radio/television technician for additional suggestions.

The following information is provided on the device or devices covered in this document in compliance with the FCC regulations:

Product name:	Dell™ Dimension™ E521
Model number:	DCSM
Company name:	Dell Inc. Worldwide Regulatory Compliance & Environmental Affairs One Dell Way Round Rock, TX 78682 USA 512-338-4400

✍ **NOTE:** For Further regulatory information, see your *Product Information Guide*.

Contacting Dell

You can contact Dell through the Internet and by phone:

• For support through the web, go to **support.dell.com**.

• For worldwide support through the web, use the **Choose A Country/Region** menu near the bottom of the page, or see the web addresses listed in the following table.

- For support by e-mail, see the e-mail addresses listed in the following table.

✎ **NOTE:** Toll-free numbers are for use within the country for which they are listed.

- For support by phone, use the phone numbers and codes provided in the following table. If you need assistance in determining which codes to use, contact a local or an international operator.

✎ **NOTE:** The contact information provided was deemed correct at the time that this document went to print and is subject to change.

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Anguilla	Online Support	www.dell.com/ai
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 800-335-0031
Antigua and Barbuda	Online Support	www.dell.com.ag
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	1-800-805-5924
Aomen	Technical Support	toll-free: 0800-105
Country Code: **853**	Customer Service (Xiamen, China)	34 160 910
	Transaction Sales (Xiamen, China)	29 693 115
Argentina (Buenos Aires)	Online Support	www.dell.com.ar
International Access Code: **00**	E-mail for Desktops and Portables	la-techsupport@dell.com
Country Code: **54**	E-mail for Servers and EMC® Storage Products	la_enterprise@dell.com
City Code: **11**	Customer Service	toll-free: 0-800-444-0730
	Technical Support – Dell PowerApp™, Dell PowerEdge™, Dell PowerConnect™, and Dell PowerVault™	toll-free: 0-800-222-0154
	Technical Support Services	toll-free: 0-800-444-0724
	Sales	0-810-444-3355
Aruba	Online Support	www.dell.com.aw
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 800-1578

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Australia (Sydney)	Online Support	support.ap.dell.com
International Access Code: 0011		support.ap.dell.com/contactus
Country Code: **61**	**Technical Support**	
City Code: **2**	Home and Home Office	toll-free: 1300-655-533
	Medium and Large Business	toll-free: 1800-633-559
	Small Business, Education, Local Government	toll-free: 1800-060-889
	Customer Service	toll-free: 1300-662-196
Austria (Vienna)	Online Support	support.euro.dell.com
International Access Code: 900		tech_support_central_europe@dell.com
Country Code: **43**		
City Code: **1**	Home/Small Business Sales	08 20 24 05 30 00
	Home/Small Business Fax	08 20 24 05 30 49
	Home/Small Business Customer Service	08 20 24 05 30 14
	Home/Small Business Support	08 20 24 05 30 17
	Preferred Accounts/Corporate Customer Service	08 20 24 05 30 16
	Preferred Accounts/Corporate Support	08 20 24 05 30 17
	Switchboard	08 20 24 05 30 00
Bahamas	Online Support	www.dell.com/bs
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-874-3038
Barbados	Online Support	www.dell.com/bb
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	1-800-534-3142
Belgium (Brussels)	Online Support	support.euro.dell.com
International Access Code: 00	General Support	02 481 92 88
Country Code: **32**	General Support Fax	02 481 92 95
City Code: **2**	Customer Service	02 713 15 65
	Corporate Sales	02 481 91 00
	Fax	02 481 92 99
	Switchboard	02 481 91 00

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Bermuda	Online Support	www.dell.com/bm
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	1-877-890-0751
Bolivia	Online Support	www.dell.com/bo
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 800-10-0238
Brazil	Online Support	www.dell.com/br
International Access Code: **00**		BR_TechSupport@dell.com
Country Code: **55**	Customer Service and Tech Support	0800 970 3355
City Code: **51**	Technical Support Fax	51 2104 5470
	Customer Service Fax	51 2104 5480
	Sales	0800 970 3390
British Virgin Islands	Technical Support, Customer Service, Sales	toll-free: 1-866-278-6820
Brunei	Technical Support (Penang, Malaysia)	604 633 4966
Country Code: **673**	Customer Service (Penang, Malaysia)	604 633 3101
		or toll-free: 801 1012
	Transaction Sales (Penang, Malaysia)	604 633 3101
		or toll-free: 801 1012

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Canada (North York, Ontario)	Online Order Status	www.dell.ca/ostatus
International Access Code: 011	Online Support	support.ca.dell.com
	AutoTech (automated Hardware and Warranty Support)	toll-free: 1-800-247-9362
	Customer Service	
	Home/Home Office	toll-free: 1-800-847-4096
	Small Business	toll-free: 1-800-906-3355
	Medium/Large Business, Government, Education	toll-free: 1-800-387-5757
	Hardware Warranty Phone Support	
	Computers for Home/Home Office	toll-free: 1-800-847-4096
	Computers for Small/Medium/Large Business, Government	toll-free: 1-800-387-5757
	Printers, Projectors, Televisions, Handheld, Digital Jukebox, and Wireless	1-877-335-5767
	Sales	
	Home and Home Office Sales	toll-free: 1-800-999-3355
	Small Business	toll-free: 1-800-387-5752
	Medium/Large Business, Government	toll-free: 1-800-387-5755
	Spare Parts and Extended Service	1 866 440 3355
Cayman Islands	Online Support	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	1-877-262-5415
Chile (Santiago)	Online Support	www.dell.com/cl
Country Code: 56		la-techsupport@dell.com
City Code: 2	Sales and Customer Support	toll-free: 1230-020-3397 or 800-20-1385

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
China (Xiamen)	Online Support	support.dell.com.cn
Country Code: 86	Technical Support E-mail	support.dell.com.cn/email
City Code: 592	Customer Service E-mail	customer_cn@dell.com
	Technical Support Fax	592 818 1350
	Technical Support – Dell™ Dimension™ and Dell Inspiron™	toll-free: 800 858 2969
	Technical Support – Dell OptiPlex™, Dell Latitude™, and Dell Precision™	toll-free: 800 858 0950
	Technical Support – Servers and Storage	toll-free: 800 858 0960
	Technical Support – Projectors, PDAs, Switches, Routers, etc.	toll-free: 800 858 2920
	Technical Support – Printers	toll-free: 800 858 2311
	Customer Service	toll-free: 800 858 2060
	Customer Service Fax	592 818 1308
	Home and Small Business	toll-free: 800 858 2222
	Preferred Accounts Division	toll-free: 800 858 2557
	Large Corporate Accounts GCP	toll-free: 800 858 2055
	Large Corporate Accounts Key Accounts	toll-free: 800 858 2628
	Large Corporate Accounts North	toll-free: 800 858 2999
	Large Corporate Accounts North Government and Education	toll-free: 800 858 2955
	Large Corporate Accounts East	toll-free: 800 858 2020
	Large Corporate Accounts East Government and Education	toll-free: 800 858 2669
	Large Corporate Accounts Queue Team	toll-free: 800 858 2572
	Large Corporate Accounts South	toll-free: 800 858 2355
	Large Corporate Accounts West	toll-free: 800 858 2811
	Large Corporate Accounts Spare Parts	toll-free: 800 858 2621
Colombia	Online Support	www.dell.com/co la-techsupport@dell.com
	Technical Support, Customer Service, Sales	01-800-915-4755

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Costa Rica	Online Support	www.dell.com/cr
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	0800-012-0231
Czech Republic (Prague)	Online Support	support.euro.dell.com
International Access Code: 00		czech_dell@dell.com
Country Code: 420	Technical Support	22537 2727
	Customer Service	22537 2707
	Fax	22537 2714
	Technical Fax	22537 2728
	Switchboard	22537 2711
Denmark (Copenhagen)	Online Support	support.euro.dell.com
International Access Code: 00	Technical Support	7023 0182
Country Code: 45	Customer Service – Relational	7023 0184
	Home/Small Business Customer Service	3287 5505
	Switchboard – Relational	3287 1200
	Switchboard Fax – Relational	3287 1201
	Switchboard – Home/Small Business	3287 5000
	Switchboard Fax – Home/Small Business	3287 5001
Dominica	Online Support	www.dell.com/dm
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-278-6821
Dominican Republic	Online Support	www.dell.com/do
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	1-800-156-1588
Ecuador	Online Support	www.dell.com/ec
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales (calling from Quito)	toll-free: 999-119-877-655-3355
	Technical Support, Customer Service, Sales (calling from Guayaquil)	toll-free: 1800-999-119-877-655-3355

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
El Salvador	Online Support	www.dell.com/sv
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	800-6132
Finland (Helsinki)	Online Support	support.euro.dell.com
International Access Code: 990		fi_support@dell.com
Country Code: 358	Technical Support	0207 533 555
City Code: 9	Customer Service	0207 533 538
	Switchboard	0207 533 533
	Fax	0207 533 530
	Sales under 500 employees	0207 533 540
	Sales over 500 employees	0207 533 533
France (Paris) (Montpellier)	Online Support	support.euro.dell.com
International Access Code: 00	**Home and Small Business**	
Country Code: 33	Technical Support	0825 387 270
City Codes: (1) (4)	Customer Service	0825 823 833
	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Service	0825 338 339
	Switchboard	01 55 94 71 00
	Sales	01 55 94 71 00
	Fax	01 55 94 71 01

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Germany (Frankfurt) International Access Code: 00 Country Code: 49 City Code: 69	Online Support	support.euro.dell.com tech_support_central_europe@dell.com
	Technical Support	069 9792-7200
	Home/Small Business Customer Service	0180-5-224400
	Global Segment Customer Service	069 9792-7320
	Preferred Accounts Customer Service	069 9792-7320
	Large Accounts Customer Service	069 9792-7320
	Public Accounts Customer Service	069 9792-7320
	Switchboard	069 9792-7000
Greece International Access Code: 00 Country Code: 30	Online Support	support.euro.dell.com
	Technical Support	00800-44 14 95 18
	Gold Service Technical Support	00800-44 14 00 83
	Switchboard	2108129810
	Gold Service Switchboard	2108129811
	Sales	2108129800
	Fax	2108129812
Grenada	Online Support	www.dell.com/gd la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-540-3355
Guatemala	Online Support	www.dell.com/gt la-techsupport@dell.com
	Technical Support, Customer Service, Sales	1-800-999-0136
Guyana	Online Support	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-877-270-4609

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Hong Kong	Online Support	support.ap.dell.com
International Access Code: **001**		support.dell.com.cn/email
Country Code: **852**	Technical Support – Dimension and Inspiron	00852-2969 3188
	Technical Support – OptiPlex, Latitude, and Dell Precision	00852-2969 3191
	Technical Support – Servers and Storage	00852-2969 3196
	Technical Support – Projectors, PDAs, Switches, Routers, etc.	00852-3416 0906
	Customer Service	00852-3416 0910
	Large Corporate Accounts	00852-3416 0907
	Global Customer Programs	00852-3416 0908
	Medium Business Division	00852-3416 0912
	Home and Small Business Division	00852-2969 3105

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
India	Online Support	support.ap.dell.com
	Portable and Desktop Support	
	Desktop Support E-mail	india_support_desktop@dell.com
	Portable Support E-mail	india_support_notebook@dell.com
	Phone Numbers	080-25068032 or 080-25068034 or your city STD code + 60003355 or toll-free: 1-800-425-8045
	Server Support	
	E-mail	india_support_Server@dell.com
	Phone Numbers	080-25068032 or 080-25068034 or your city STD code + 60003355 or toll-free: 1800 425 8045
	Gold Support Only	
	E-mail	eec_ap@dell.com
	Phone Numbers	080-25068033 or your city STD code + 60003355 or toll-free: 1-800-425-9045
	Customer Service	
	Home and Small Business	India_care_HSB@dell.com toll-free: 1800-4254051
	Large Corporate Accounts	India_care_REL@dell.com toll-free: 1800-4252067
	Sales	
	Large Corporate Accounts	1600 33 8044
	Home and Small Business	1600 33 8046

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Ireland (Cherrywood)	Online Support	support.euro.dell.com
International Access Code: 00		dell_direct_support@dell.com
Country Code: **353**	**Technical Support**	
City Code: **1**	Business computers	1850 543 543
	Home computers	1850 543 543
	At Home Support	1850 200 889
	Sales	
	Home	1850 333 200
	Small Business	1850 664 656
	Medium Business	1850 200 646
	Large Business	1850 200 646
	Sales E-mail	Dell_IRL_Outlet@dell.com
	Customer Service	
	Home and Small Business	01 204 4014
	Business (greater than 200 employees)	1850 200 982
	General	
	Fax/Sales Fax	01 204 0103
	Switchboard	01 204 4444
	U.K. Customer Service (dial within U.K. only)	0870 906 0010
	Corporate Customer Service (dial within U.K. only)	0870 907 4499
	U.K. Sales (dial within U.K. only)	0870 907 4000

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Italy (Milan)	Online Support	support.euro.dell.com
International Access Code: 00	**Home and Small Business**	
Country Code: 39	Technical Support	02 577 826 90
City Code: 02	Customer Service	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Service	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
Jamaica	Online Support	la-techsupport@dell.com
	Technical Support, Customer Service, Sales (dial from within Jamaica only)	1-800-440-9205

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Japan (Kawasaki)	Online Support	support.jp.dell.com
International Access Code: 001	Technical Support – Dimension and Inspiron	toll-free: 0120-198-226
Country Code: 81		
City Code: 44	Technical Support outside of Japan – Dimension and Inspiron	81-44-520-1435
	Technical Support – Dell Precision, OptiPlex, and Latitude	toll-free: 0120-198-433
	Technical Support outside of Japan – Dell Precision, OptiPlex, and Latitude	81-44-556-3894
	Technical Support – Dell PowerApp, Dell PowerEdge, Dell PowerConnect, and Dell PowerVault	toll-free: 0120-198-498
	Technical Support outside of Japan – PowerApp, PowerEdge, PowerConnect, and PowerVault	81-44-556-4162
	Technical Support – Projectors, PDAs, Printers, Routers	toll-free: 0120-981-690
	Technical Support outside of Japan – Projectors, PDAs, Printers, Routers	81-44-556-3468
	Faxbox Service	044-556-3490
	24-Hour Automated Order Status Service	044-556-3801
	Customer Service	044-556-4240
	Business Sales Division – up to 400 employees	044-556-1465
	Preferred Accounts Division Sales – over 400 employees	044-556-3433
	Public Sales – government agencies, educational institutions, and medical institutions	044-556-5963
	Global Segment Japan	044-556-3469
	Individual User	044-556-1657
	Individual User Online Sales	044-556-2203
	Individual User Real Site Sales	044-556-4649
	Switchboard	044-556-4300

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Korea (Seoul)	Online Support	support.ap.dell.com
International Access Code: **001**	Technical Support, Customer Service	toll-free: 080-200-3800
Country Code: **82**	Technical Support – Dimension, PDA, Electronics, and Accessories	toll-free: 080-200-3801
City Code: **2**	Sales	toll-free: 080-200-3600
	Fax	2194-6202
	Switchboard	2194-6000
Latin America	Customer Technical Support (Austin, Texas, U.S.A.)	512 728-4093
	Customer Service (Austin, Texas, U.S.A.)	512 728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512 728-3883
	Sales (Austin, Texas, U.S.A.)	512 728-4397
	Sales Fax (Austin, Texas, U.S.A.)	512 728-4600
		or 512 728-3772
Luxembourg	Online Support	support.euro.dell.com
International Access Code: **00**	Support	342 08 08 075
Country Code: **352**	Home/Small Business Sales	+32 (0)2 713 15 96
	Corporate Sales	26 25 77 81
	Customer Service	+32 (0)2 481 91 19
	Fax	26 25 77 82
Malaysia (Penang)	Online Support	support.ap.dell.com
International Access Code: **00**	Technical Support – Dell Precision, OptiPlex, and Latitude	toll-free: 1 800 880 193
Country Code: **60**	Technical Support – Dimension, Inspiron, and Electronics and Accessories	toll-free: 1 800 881 306
City Code: **4**	Technical Support – PowerApp, PowerEdge, PowerConnect, and PowerVault	toll-free: 1800 881 386
	Customer Service	toll-free: 1800 881 306 (option 6)
	Transaction Sales	toll-free: 1 800 888 202
	Corporate Sales	toll-free: 1 800 888 213

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Mexico International Access Code: **00** Country Code: **52**	Online Support	www.dell.com/mx la-techsupport@dell.com
	Technical Support	001-866-563-4425
	Sales	50-81-8800 or 001-800-888-3355
	Customer Service	001-877-384-8979 or 001-877-269-3383
	Main	50-81-8800 or 001-800-888-3355 or 001-866-851-1754
Montserrat	Online Support	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-278-6822
Netherlands Antilles	Online Support	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	001-800-882-1519
Netherlands (Amsterdam) International Access Code: **00** Country Code: **31** City Code: **20**	Online Support	support.euro.dell.com
	Technical Support	020 674 45 00
	Technical Support Fax	020 674 47 66
	Home/Small Business Customer Service	020 674 42 00
	Relational Customer Service	020 674 4325
	Home/Small Business Sales	020 674 55 00
	Relational Sales	020 674 50 00
	Home/Small Business Sales Fax	020 674 47 75
	Relational Sales Fax	020 674 47 50
	Switchboard	020 674 50 00
	Switchboard Fax	020 674 47 50
New Zealand International Access Code: **00** Country Code: **64**	Online Support	support.ap.dell.com support.ap.dell.com/contactus
	Technical Support, Customer Service, Sales	0800 441 567
Nicaragua	Online Support	www.dell.com/ni la-techsupport@dell.com
	Technical Support, Customer Service, Sales	001-800-220-1377

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Norway (Lysaker)	Online Support	support.euro.dell.com
International Access Code: 00	Technical Support	671 16882
Country Code: 47	Relational Customer Service	671 17575
	Home/Small Business Customer Service	23162298
	Switchboard	671 16800
	Fax Switchboard	671 16865
Panama	Online Support	www.dell.com/pa
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	011-800-507-1264
Peru	Online Support	www.dell.com/pe
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	0800-50-669
Poland (Warsaw)	Online Support	support.euro.dell.com
International Access Code: 011		pl_support_tech@dell.com
Country Code: 48	Customer Service Phone	57 95 700
City Code: 22	Customer Service	57 95 999
	Sales	57 95 999
	Customer Service Fax	57 95 806
	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
Portugal	Online Support	support.euro.dell.com
International Access Code: 00	Technical Support	707200149
Country Code: 351	Customer Service	800 300 413
	Sales	800 300 410 or 800 300 411 or 800 300 412 or 21 422 07 10
	Fax	21 424 01 12
Puerto Rico	Online Support	www.dell.com/pr
		la-techsupport@dell.com
	Technical Support	toll-free: 1-866-390-4695
		or 1-866-851-1760
	Customer Service and Sales	1-877-537-3355

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
St. Kitts and Nevis	Online Support	www.dell.com/kn
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-540-3355
St. Lucia	Online Support	www.dell.com/lc
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-464-4352
St. Vincent and the Grenadines	Online Support	www.dell.com/vc
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-464-4353
Singapore (Singapore) International Access Code: 005 Country Code: 65	**NOTE:** The phone numbers in this section should be called from within Singapore or Malaysia only.	
	Online Support	support.ap.dell.com
	Technical Support – Dimension, Inspiron, and Electronics and Accessories	toll-free: 1 800 394 7430
	Technical Support – OptiPlex, Latitude, and Dell Precision	toll-free: 1 800 394 7488
	Technical Support – PowerApp, PowerEdge, PowerConnect, and PowerVault	toll-free: 1 800 394 7478
	Customer Service	toll-free: 1 800 394 7430 (option 6)
	Transaction Sales	toll-free: 1 800 394 7412
	Corporate Sales	toll-free: 1 800 394 7419
Slovakia (Prague) International Access Code: 00 Country Code: 421	Online Support	support.euro.dell.com
		czech_dell@dell.com
	Technical Support	02 5441 5727
	Customer Service	420 22537 2707
	Fax	02 5441 8328
	Tech Fax	02 5441 8328
	Switchboard (Sales)	02 5441 7585

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
South Africa (Johannesburg)	Online Support	support.euro.dell.com
International Access Code:		dell_za_support@dell.com
09/091	Gold Queue	011 709 7713
Country Code: **27**	Technical Support	011 709 7710
City Code: **11**	Customer Service	011 709 7707
	Sales	011 709 7700
	Fax	011 706 0495
	Switchboard	011 709 7700
Southeast Asian and Pacific Countries	Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
Spain (Madrid)	Online Support	support.euro.dell.com
International Access Code: **00**	**Home and Small Business**	
Country Code: **34**	Technical Support	902 100 130
City Code: **91**	Customer Service	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	Corporate	
	Technical Support	902 100 130
	Customer Service	902 115 236
	Switchboard	91 722 92 00
	Fax	91 722 95 83
Sweden (Upplands Vasby)	Online Support	support.euro.dell.com
International Access Code: **00**	Technical Support	08 590 05 199
Country Code: **46**	Relational Customer Service	08 590 05 642
City Code: **8**	Home/Small Business Customer Service	08 587 70 527
	Employee Purchase Program (EPP) Support	020 140 14 44
	Technical Support Fax	08 590 05 594
	Sales	08 587 705 81

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Switzerland (Geneva) International Access Code: **00** Country Code: **41** City Code: **22**	Online Support	support.euro.dell.com Tech_support_central_Europe@dell.com
	Technical Support – Home and Small Business	0844 811 411
	Technical Support – Corporate	0844 822 844
	Customer Service – Home and Small Business	0848 802 202
	Customer Service – Corporate	0848 821 721
	Main	0848 335 599
	Fax	022 799 01 90
	Sales	022 799 01 01
Taiwan International Access Code: **002** Country Code: **886**	Online Support	support.ap.dell.com support.dell.com.cn/email
	Technical Support – OptiPlex, Latitude, Inspiron, Dimension, and Electronics and Accessories	toll-free: 0080 186 1011
	Technical Support – Servers and Storage	toll-free: 0080 160 1256
	Customer Service	toll-free: 0080 160 1250 (option 5)
	Transaction Sales	toll-free: 0080 165 1228
	Corporate Sales	toll-free: 0080 165 1227
Thailand International Access Code: **001** Country Code: **66**	Online Support	support.ap.dell.com
	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-free: 1800 0060 07
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-free: 1800 0600 09
	Customer Service	toll-free: 1800 006 007 (option 7)
	Corporate Sales	toll-free: 1800 006 009
	Transaction Sales	toll-free: 1800 006 006
Trinidad/Tobago	Online Support	www.dell.com/tt la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-888-799-5908

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
Turks and Caicos Islands	Online Support	www.dell.com/tc
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-877-441-4735
U.K. (Bracknell)	Online Support	support.euro.dell.com
International Access Code: **00**		dell_direct_support@dell.com
Country Code: **44**	Customer Service Online	support.euro.dell.com/uk/en/ECare/form/home.asp
City Code: **1344**	**Sales**	
	Home and Small Business Sales	0870 907 4000
	Corporate/Public Sector Sales	01344 860 456
	Customer Service	
	Home and Small Business	0870 906 0010
	Corporate	01344 373 185
	Preferred Accounts (500–5000 employees)	0870 906 0010
	Global Accounts	01344 373 186
	Central Government	01344 373 193
	Local Government & Education	01344 373 199
	Health	01344 373 194
	Technical Support	
	Corporate/Preferred Accounts/PCA (1000+ employees)	0870 908 0500
	Other Dell Products	0870 353 0800
	General	
	Home and Small Business Fax	0870 907 4006
Uruguay	Online Support	www.dell.com/uy
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 000-413-598-2521

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
U.S.A. (Austin, Texas) International Access Code: 011 Country Code: 1	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-free: 1-877-DELLTTY (1-877-335-5889)
	Fax	toll-free: 1-800-727-8320
	Technical Support	support.dell.com
	Home and Home Office	toll-free: 1-800-624-9896
	Portable and Desktop AutoTech	toll-free: 1-800-247-9362
	Small Business	toll-free: 1-800-456-3355
	Medium and Large Business	toll-free: 1-877-671-3355
	State and Local Government	toll-free: 1-800-981-3355
	Federal Government	toll-free: 1-800-727-1100
	Healthcare	toll-free: 1-800-274-1550
	K-12 Education	toll-free: 1-888-977-3355
	Higher Education	toll-free: 1-800-274-7799
	Printers, Projectors, PDAs, and MP3 Players	toll-free: 1-877-459-7298
	Customer Service	toll-free: 1-800-624-9897
	Automated Order Status	toll-free: 1-800-433-9014
	Small Business	toll-free: 1-800-456-3355
	Medium and Large Business	toll-free: 1-877-671-3355
	State and Local Government	toll-free: 1-800-981-3355
	Federal Government	toll-free: 1-800-727-1100
	Healthcare	toll-free: 1-800-274-1550
	K-12 Education	toll-free: 1-888-977-3355
	Higher Education	toll-free: 1-800-274-7799
	Employee Purchase Program (EPP)	toll-free: 1-800-695-8133
	Financial Services	www.dellfinancialservices.com
	Leases and Loans	toll-free: 1-877-577-3355
	Dell Preferred Accounts (DPA)	toll-free: 1-800-283-2210
	Sales	1-800-289-3355 or 1-800-879-3355
	Dell Outlet Store	toll-free: 1-888-798-7561
	Software and Peripherals Sales	toll-free: 1-800-671-3355

Country (City) International Access Code Country Code City Code	Service Type	Area Codes, Local Numbers, and Toll-Free Numbers Web and E-mail Address
U.S. Virgin Islands	Online Support	www.dell.com/vi
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-877-702-4360
Venezuela	Online Support	www.dell.com/ve
		la-techsupport@dell.com
	Technical Support, Customer Service, Sales	0800-100-4752

Glossary

Terms in this Glossary are provided for informational purposes only and may or may not describe features included with your particular computer.

A

AC — alternating current — The form of electricity that powers your computer when you plug the AC adapter power cable in to an electrical outlet.

ACPI — advanced configuration and power interface — A power management specification that enables Microsoft® Windows® operating systems to put a computer in standby or hibernate mode to conserve the amount of electrical power allocated to each device attached to the computer.

AGP — accelerated graphics port — A dedicated graphics port that allows system memory to be used for video-related tasks. AGP delivers a smooth, true-color video image because of the faster interface between the video circuitry and the computer memory.

AHCI — Advanced Host Controller Interface — An interface for a SATA hard drive Host Controller which allows the storage driver to enable technologies such as Native Command Queuing (NCQ) and hot plug.

ALS — ambient light sensor — A feature that helps to control display brightness.

antivirus software — A program designed to identify, quarantine, and/or delete viruses from your computer.

ASF — alert standards format — A standard to define a mechanism for reporting hardware and software alerts to a management console. ASF is designed to be platform- and operating system-independent.

B

battery life span — The length of time (years) during which a portable computer battery is able to be depleted and recharged.

battery operating time — The length of time (minutes or hours) that a portable computer battery powers the computer.

BIOS — basic input/output system — A program (or utility) that serves as an interface between the computer hardware and the operating system. Unless you understand what effect these settings have on the computer, do not change them. Also referred to as *system setup*.

bit — The smallest unit of data interpreted by your computer.

Bluetooth® wireless technology — A wireless technology standard for short-range (9 m [29 feet]) networking devices that allows for enabled devices to automatically recognize each other.

boot sequence — Specifies the order of the devices from which the computer attempts to boot.

bootable CD — A CD that you can use to start your computer. In case your hard drive is damaged or your computer has a virus, ensure that you always have a bootable CD or floppy disk available. Your *Drivers and Utilities* (or *ResourceCD*) is a bootable CD.

bootable disk — A disk that you can use to start your computer. In case your hard drive is damaged or your computer has a virus, ensure that you always have a bootable CD or floppy disk available.

bps — bits per second — The standard unit for measuring data transmission speed.

BTU — British thermal unit — A measurement of heat output.

bus — A communication pathway between the components in your computer.

bus speed — The speed, given in MHz, that indicates how fast a bus can transfer information.

byte — The basic data unit used by your computer. A byte is usually equal to 8 bits.

C

C — Celsius — A temperature measurement scale where 0° is the freezing point and 100° is the boiling point of water.

cache — A special high-speed storage mechanism which can be either a reserved section of main memory or an independent high-speed storage device. The cache enhances the efficiency of many processor operations.

L1 cache — Primary cache stored inside the processor.

L2 cache — Secondary cache which can either be external to the processor or incorporated into the processor architecture.

carnet — An international customs document that facilitates temporary imports into foreign countries. Also known as a *merchandise passport*.

CD-R — CD recordable — A recordable version of a CD. Data can be recorded only once onto a CD-R. Once recorded, the data cannot be erased or written over.

CD-RW — CD rewritable — A rewritable version of a CD. Data can be written to a CD-RW disc, and then erased and written over (rewritten).

CD-RW drive — A drive that can read CDs and write to CD-RW (rewritable CDs) and CD-R (recordable CDs) discs. You can write to CD-RW discs multiple times, but you can write to CD-R discs only once.

CD-RW/DVD drive — A drive, sometimes referred to as a combo drive, that can read CDs and DVDs and write to CD-RW (rewritable CDs) and CD-R (recordable CDs) discs. You can write to CD-RW discs multiple times, but you can write to CD-R discs only once.

clock speed — The speed, given in MHz, that indicates how fast computer components that are connected to the system bus operate.

COA — Certificate of Authenticity — The Windows alpha-numeric code located on a sticker on your computer. Also referred to as the *Product Key* or *Product ID*.

Control Panel — A Windows utility that allows you to modify operating system and hardware settings, such as display settings.

controller — A chip that controls the transfer of data between the processor and memory or between the processor and devices.

CRIMM — continuity rambus in-line memory module — A special module that has no memory chips and is used to fill unused RIMM slots.

cursor — The marker on a display or screen that shows where the next keyboard, touch pad, or mouse action will occur. It often is a blinking solid line, an underline character, or a small arrow.

D

DDR SDRAM — double-data-rate SDRAM — A type of SDRAM that doubles the data burst cycle, improving system performance.

DDR2 SDRAM — double-data-rate 2 SDRAM — A type of DDR SDRAM that uses a 4-bit prefetch and other architectural changes to boost memory speed to over 400 MHz.

device — Hardware such as a disk drive, printer, or keyboard that is installed in or connected to your computer.

device driver — See *driver*.

DIMM — dual in-line memory module — A circuit board with memory chips that connects to a memory module on the system board.

DIN connector — A round, six-pin connector that conforms to DIN (Deutsche Industrie-Norm) standards; it is typically used to connect PS/2 keyboard or mouse cable connectors.

disk striping — A technique for spreading data over multiple disk drives. Disk striping can speed up operations that retrieve data from disk storage. Computers that use

disk striping generally allow the user to select the data unit size or stripe width.

DMA — direct memory access — A channel that allows certain types of data transfer between RAM and a device to bypass the processor.

docking device — See *APR*.

DMTF — Distributed Management Task Force — A consortium of hardware and software companies who develop management standards for distributed desktop, network, enterprise, and Internet environments.

domain — A group of computers, programs, and devices on a network that are administered as a unit with common rules and procedures for use by a specific group of users. A user logs on to the domain to gain access to the resources.

DRAM — dynamic random-access memory — Memory that stores information in integrated circuits containing capacitors.

driver — Software that allows the operating system to control a device such as a printer. Many devices do not work properly if the correct driver is not installed in the computer.

DSL — Digital Subscriber Line — A technology that provides a constant, high-speed Internet connection through an analog telephone line.

dual-core — A technology in which two physical computational units exist inside a single processor package, thereby increasing computing efficiency and multi-tasking ability.

dual display mode — A display setting that allows you to use a second monitor as an extension of your display. Also referred to as *extended display mode*.

DVD-R — DVD recordable — A recordable version of a DVD. Data can be recorded only once onto a DVD-R. Once recorded, the data cannot be erased or written over.

DVD+RW — DVD rewritable — A rewritable version of a DVD. Data can be written to a DVD+RW disc, and then erased and written over (rewritten). (DVD+RW technology is different from DVD-RW technology.)

DVD+RW drive — drive that can read DVDs and most CD media and write to DVD+RW (rewritable DVDs) discs.

DVI — digital video interface — A standard for digital transmission between a computer and a digital video display.

E

ECC — error checking and correction — A type of memory that includes special circuitry for testing the accuracy of data as it passes in and out of memory.

ECP — extended capabilities port — A parallel connector design that provides improved bidirectional data transmission. Similar to EPP, ECP uses direct memory access to transfer data and often improves performance.

EIDE — enhanced integrated device electronics — An improved version of the IDE interface for hard drives and CD drives.

EMI — electromagnetic interference — Electrical interference caused by electromagnetic radiation.

ENERGY STAR® — Environmental Protection Agency requirements that decrease the overall consumption of electricity.

EPP — enhanced parallel port — A parallel connector design that provides bidirectional data transmission.

ESD — electrostatic discharge — A rapid discharge of static electricity. ESD can damage integrated circuits found in computer and communications equipment.

expansion card — A circuit board that installs in an expansion slot on the system board in some computers, expanding the capabilities of the computer. Examples include video, modem, and sound cards.

expansion slot — A connector on the system board (in some computers) where you insert an expansion card, connecting it to the system bus.

ExpressCard — A removable I/O card adhering to the PCMCIA standard. Modems and network adapters are common types of ExpressCards. ExpressCards support both the PCI Express and USB 2.0 standard.

Express Service Code — A numeric code located on a sticker on your Dell™ computer. Use the Express Service Code when contacting Dell for assistance. Express Service Code service may not be available in some countries.

extended display mode — A display setting that allows you to use a second monitor as an extension of your display. Also referred to as *dual display mode*.

extended PC Card — A PC Card that extends beyond the edge of the PC Card slot when installed.

F

Fahrenheit — A temperature measurement scale where 32° is the freezing point and 212° is the boiling point of water.

FBD — fully-buffered DIMM — A DIMM with DDR2 DRAM chips and an Advanced Memory Buffer (AMB) that speeds communication between the DDR2 SDRAM chips and the system.

FCC — Federal Communications Commission — A U.S. agency responsible for enforcing communications-related regulations that state how much radiation computers and other electronic equipment can emit.

fingerprint reader — A strip sensor that uses your unique fingerprint to authenticate your user identity to help secure your computer.

folder — A term used to describe space on a disk or drive where files are organized and grouped. Files in a folder can be viewed and ordered in various ways, such as alphabetically, by date, and by size.

format — The process that prepares a drive or disk for file storage. When a drive or disk is formatted, the existing information on it is lost.

FSB — front side bus — The data path and physical interface between the processor and RAM.

FTP — file transfer protocol — A standard Internet protocol used to exchange files between computers connected to the Internet.

G

G — gravity — A measurement of weight and force.

GB — gigabyte — A measurement of data storage that equals 1024 MB (1,073,741,824 bytes). When used to refer to hard drive storage, the term is often rounded to 1,000,000,000 bytes.

GHz — gigahertz — A measurement of frequency that equals one thousand million Hz, or one thousand MHz. The speeds for computer processors, buses, and interfaces are often measured in GHz.

graphics mode — A video mode that can be defined as *x* horizontal pixels by *y* vertical pixels by *z* colors. Graphics modes can display an unlimited variety of shapes and fonts.

GUI — graphical user interface — Software that interacts with the user by means of menus, windows, and icons. Most programs that operate on the Windows operating systems are GUIs.

H

hard drive — A drive that reads and writes data on a hard disk. The terms hard drive and hard disk are often used interchangeably.

heat sink — A metal plate on some processors that helps dissipate heat.

hibernate mode — A power management mode that saves everything in memory to a reserved space on the hard drive and then turns off the computer. When you restart the computer, the memory information that was saved to the hard drive is automatically restored.

HTTP — hypertext transfer protocol — A protocol for exchanging files between computers connected to the Internet.

Hz — hertz — A unit of frequency measurement that equals 1 cycle per second. Computers and electronic devices are often measured in kilohertz (kHz), megahertz (MHz), gigahertz (GHz), or terahertz (THz).

I

IC — integrated circuit — A semiconductor wafer, or chip, on which thousands or millions of tiny electronic components are fabricated for use in computer, audio, and video equipment.

IDE — integrated device electronics — An interface for mass storage devices in which the controller is integrated into the hard drive or CD drive.

IEEE 1394 — Institute of Electrical and Electronics Engineers, Inc. — A high-performance serial bus used to connect IEEE 1394-compatible devices, such as digital cameras and DVD players, to the computer.

infrared sensor — A port that allows you to transfer data between the computer and infrared-compatible devices without using a cable connection.

integrated — Usually refers to components that are physically located on the computer's system board. Also referred to as *built-in*.

I/O — input/output — An operation or device that enters and extracts data from your computer. Keyboards and printers are I/O devices.

I/O address — An address in RAM that is associated with a specific device (such as a serial connector, parallel connector, or expansion slot) and allows the processor to communicate with that device.

IrDA — Infrared Data Association — The organization that creates international standards for infrared communications.

IRQ — interrupt request — An electronic pathway assigned to a specific device so that the device can communicate with the processor. Each device connection must be assigned an IRQ. Although two devices can share the same IRQ assignment, you cannot operate both devices simultaneously.

ISP — Internet service provider — A company that allows you to access its host server to connect directly to the Internet, send and receive e-mail, and access websites. The ISP typically provides you with a software package, user name, and access phone numbers for a fee.

K

Kb — kilobit — A unit of data that equals 1024 bits. A measurement of the capacity of memory integrated circuits.

KB — kilobyte — A unit of data that equals 1024 bytes but is often referred to as 1000 bytes.

key combination — A command requiring you to press multiple keys at the same time.

kHz — kilohertz — A measurement of frequency that equals 1000 Hz.

L

LAN — local area network — A computer network covering a small area. A LAN usually is confined to a building or a few nearby buildings. A LAN can be connected to another LAN over any distance through telephone lines and radio waves to form a wide area network (WAN).

LCD — liquid crystal display — The technology used by portable computer and flat-panel displays.

LED — light-emitting diode — An electronic component that emits light to indicate the status of the computer.

local bus — A data bus that provides a fast throughput for devices to the processor.

LPT — line print terminal — The designation for a parallel connection to a printer or other parallel device.

M

Mb — megabit — A measurement of memory chip capacity that equals 1024 Kb.

Mbps — megabits per second — One million bits per second. This measurement is typically used for transmission speeds for networks and modems.

MB — megabyte — A measurement of data storage that equals 1,048,576 bytes. 1 MB equals 1024 KB. When used to refer to hard drive storage, the term is often rounded to 1,000,000 bytes.

MB/sec — megabytes per second — One million bytes per second. This measurement is typically used for data transfer ratings.

media bay — A bay that supports devices such as optical drives, a second battery, or a Dell TravelLite™ module.

memory — A temporary data storage area inside your computer. Because the data in memory is not permanent, it is recommended that you frequently save your files

while you are working on them, and always save your files before you shut down the computer. Your computer can contain several different forms of memory, such as RAM, ROM, and video memory. Frequently, the word memory is used as a synonym for RAM.

memory address — A specific location where data is temporarily stored in RAM.

memory mapping — The process by which the computer assigns memory addresses to physical locations at start-up. Devices and software can then identify information that the processor can access.

memory module — A small circuit board containing memory chips, which connects to the system board.

MHz — megahertz — A measure of frequency that equals 1 million cycles per second. The speeds for computer processors, buses, and interfaces are often measured in MHz.

Mini PCI — A standard for integrated peripheral devices with an emphasis on communications such as modems and NICs. A Mini PCI card is a small external card that is functionally equivalent to a standard PCI expansion card.

Mini-Card — A small card designed for integrated peripherals, such as communication NICs. The Mini-Card is functionally equivalent to a standard PCI expansion card.

modem — A device that allows your computer to communicate with other computers over analog telephone lines. Three types of modems include: external, PC Card, and internal. You typically use your modem to connect to the Internet and exchange e-mail.

module bay — See *media bay*.

MP — megapixel — A measure of image resolution used for digital cameras.

ms — millisecond — A measure of time that equals one thousandth of a second. Access times of storage devices are often measured in ms.

N

network adapter — A chip that provides network capabilities. A computer may include a network adapter on its system board, or it may contain a PC Card with an adapter on it. A network adapter is also referred to as a *NIC* (network interface controller).

NIC — See *network adapter*.

notification area — The section of the Windows taskbar that contains icons for providing quick access to programs and computer functions, such as the clock, volume control, and print status. Also referred to as *system tray*.

ns — nanosecond — A measure of time that equals one billionth of a second.

NVRAM — nonvolatile random access memory — A type of memory that stores data when the computer is turned off or loses its external power source. NVRAM is used for maintaining computer configuration information such as date, time, and other system setup options that you can set.

O

optical drive — A drive that uses optical technology to read or write data from CDs, DVDs, or DVD+RWs. Example of optical drives include CD drives, DVD drives, CD-RW drives, and CD-RW/DVD combo drives.

P

partition — A physical storage area on a hard drive that is assigned to one or more logical storage areas known as logical drives. Each partition can contain multiple logical drives.

PC Card — A removable I/O card adhering to the PCMCIA standard. Modems and network adapters are common types of PC Cards.

PCI — peripheral component interconnect — PCI is a local bus that supports 32-and 64-bit data paths, providing a high-speed data path between the processor and devices such as video, drives, and networks.

PCI Express — A modification to the PCI interface that boosts the data transfer rate between the processor and the devices attached to it. PCI Express can transfer data at speeds from 250 MB/sec to 4 GB/sec. If the PCI Express chip set and the device are capable of different speeds, they will operate at the slower speed.

PCMCIA — Personal Computer Memory Card International Association — The organization that establishes standards for PC Cards.

PIO — programmed input/output — A method of transferring data between two devices through the processor as part of the data path.

pixel — A single point on a display screen. Pixels are arranged in rows and columns to create an image. A video resolution, such as 800 x 600, is expressed as the number of pixels across by the number of pixels up and down.

Plug-and-Play — The ability of the computer to automatically configure devices. Plug and Play provides automatic installation, configuration, and compatibility with existing hardware if the BIOS, operating system, and all devices are Plug and Play compliant.

POST — power-on self-test — Diagnostics programs, loaded automatically by the BIOS, that perform basic tests on the major computer components, such as memory, hard drives, and video. If no problems are detected during POST, the computer continues the start-up.

processor — A computer chip that interprets and executes program instructions. Sometimes the processor is referred to as the CPU (central processing unit).

PS/2 — personal system/2 — A type of connector for attaching a PS/2-compatible keyboard, mouse, or keypad.

PXE — pre-boot execution environment — A WfM (Wired for Management) standard that allows networked computers that do not have an operating system to be configured and started remotely.

R

RAID — redundant array of independent disks — A method of providing data redundancy. Some common implementations of RAID include RAID 0, RAID 1, RAID 5, RAID 10, and RAID 50.

RAM — random-access memory — The primary temporary storage area for program instructions and data. Any information stored in RAM is lost when you shut down your computer.

readme file — A text file included with a software package or hardware product. Typically, readme files provide installation information and describe new product enhancements or corrections that have not yet been documented.

read-only — Data and/or files you can view but cannot edit or delete. A file can have read-only status if:

- It resides on a physically write-protected floppy disk, CD, or DVD.
- It is located on a network in a directory and the system administrator has assigned rights only to specific individuals.

refresh rate — The frequency, measured in Hz, at which your screen's horizontal lines are recharged (sometimes also referred to as its *vertical frequency*). The higher the refresh rate, the less video flicker can be seen by the human eye.

resolution — The sharpness and clarity of an image produced by a printer or displayed on a monitor. The higher the resolution, the sharper the image.

RFI — radio frequency interference — Interference that is generated at typical radio frequencies, in the range of 10 kHz to 100,000 MHz. Radio frequencies are at the lower end of the electromagnetic frequency spectrum and are more likely to have interference than the higher frequency radiations, such as infrared and light.

ROM — read-only memory — Memory that stores data and programs that cannot be deleted or written to by the computer. ROM, unlike RAM, retains its contents after you shut down your computer. Some programs essential to the operation of your computer reside in ROM.

RPM — revolutions per minute — The number of rotations that occur per minute. Hard drive speed is often measured in rpm.

RTC — real time clock — Battery-powered clock on the system board that keeps the date and time after you shut down the computer.

RTCRST — real-time clock reset — A jumper on the system board of some computers that can often be used for troubleshooting problems.

S

SAS — serial attached SCSI — A faster, serial version of the SCSI interface (as opposed to the original SCSI parallel architecture).

SATA — serial ATA — A faster, serial version of the ATA (IDE) interface.

ScanDisk — A Microsoft utility that checks files, folders, and the hard disk's surface for errors. ScanDisk often runs when you restart the computer after it has stopped responding.

SCSI — small computer system interface — A high-speed interface used to connect devices to a computer, such as hard drives, CD drives, printers, and scanners. The SCSI can connect many devices using a single controller. Each device is accessed by an individual identification number on the SCSI controller bus.

SDRAM — synchronous dynamic random-access memory — A type of DRAM that is synchronized with the optimal clock speed of the processor.

serial connector — An I/O port often used to connect devices such as a handheld digital device or digital camera to your computer.

Service Tag — A bar code label on your computer that identifies your computer when you access Dell Support at **support.dell.com** or when you call Dell for customer service or technical support.

setup program — A program that is used to install and configure hardware and software. The **setup.exe** or **install.exe** program comes with most Windows software packages. *Setup program* differs from *system setup*.

shortcut — An icon that provides quick access to frequently used programs, files, folders, and drives. When you place a shortcut on your Windows desktop and double-click the icon, you can open its corresponding folder or file without having to find it first. Shortcut icons do not change the location of files. If you delete a shortcut, the original file is not affected. Also, you can rename a shortcut icon.

SIM — Subscriber Identity Module — A SIM card contains a microchip that encrypts voice and data transmissions. SIM cards can be used in phones or portable computers.

smart card — A card that is embedded with a processor and a memory chip. Smart cards can be used to authenticate a user on computers equipped for smart cards.

S/PDIF — Sony/Philips Digital Interface — An audio transfer file format that allows the transfer of audio from one file to another without converting it to and from an analog format, which could degrade the quality of the file.

standby mode — A power management mode that shuts down all unnecessary computer operations to save energy.

Strike Zone™ — Reinforced area of the platform base that protects the hard drive by acting as a dampening device when a computer experiences resonating shock or is dropped (whether the computer is on or off).

surge protectors — Prevent voltage spikes, such as those that may occur during an electrical storm, from entering the computer through the electrical outlet. Surge protectors do not protect against lightning strikes or against brownouts, which occur when the voltage drops more than 20 percent below the normal AC-line voltage level.

Network connections cannot be protected by surge protectors. Always disconnect the network cable from the network connector during electrical storms.

SVGA — super-video graphics array — A video standard for video cards and controllers. Typical SVGA resolutions are 800 x 600 and 1024 x 768.

The number of colors and resolution that a program displays depends on the capabilities of the monitor, the video controller and its drivers, and the amount of video memory installed in the computer.

S-video TV-out — A connector used to attach a TV or digital audio device to the computer.

SXGA — super-extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1280 x 1024.

SXGA+ — super-extended graphics array plus — A video standard for video cards and controllers that supports resolutions up to 1400 x 1050.

system board — The main circuit board in your computer. Also known as the *motherboard*.

system setup — A utility that serves as an interface between the computer hardware and the operating system. System setup allows you to configure user-selectable options in the BIOS, such as date and time or system password. Unless you understand what effect the settings have on the computer, do not change the settings for this program.

T

TAPI — telephony application programming interface — Enables Windows programs to operate with a wide variety of telephony devices, including voice, data, fax, and video.

text editor — A program used to create and edit files that contain only text; for example, Windows Notepad uses a text editor. Text editors do not usually provide word wrap or formatting functionality (the option to underline, change fonts, and so on).

TPM — trusted platform module — A hardware-based security feature that when combined with security software enhances network and computer security by enabling features such as file and e-mail protection.

travel module — A plastic device designed to fit inside the module bay of a portable computer to reduce the weight of the computer.

U

UMA — unified memory allocation — System memory dynamically allocated to video.

UPS — uninterruptible power supply — A backup power source used when the electrical power fails or drops to an unacceptable voltage level. A UPS keeps a computer running for a limited amount of time when there is no electrical power. UPS systems typically provide surge suppression and may also provide voltage regulation. Small UPS systems provide battery power for a few minutes to enable you to shut down your computer.

USB — universal serial bus — A hardware interface for a low-speed device such as a USB-compatible keyboard, mouse, joystick, scanner, set of speakers, printer, broadband devices (DSL and cable modems), imaging devices, or storage devices. Devices are plugged directly in to a 4-pin socket on your computer or in to a multi-port hub that plugs in to your computer. USB devices can be connected and disconnected while the computer is turned on, and they can also be daisy-chained together.

UTP — unshielded twisted pair — Describes a type of cable used in most telephone networks and some computer networks. Pairs of unshielded wires are twisted to protect against electromagnetic interference, rather than relying on a metal sheath around each pair of wires to protect against interference.

UXGA — ultra extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1600 x 1200.

V

video controller — The circuitry on a video card or on the system board (in computers with an integrated video controller) that provides the video capabilities—in combination with the monitor—for your computer.

video memory — Memory that consists of memory chips dedicated to video functions. Video memory is usually faster than system memory. The amount of video memory installed primarily influences the number of colors that a program can display.

video mode — A mode that describes how text and graphics are displayed on a monitor. Graphics-based software, such as Windows operating systems, displays in video modes that can be defined as *x* horizontal pixels by *y* vertical pixels by *z* colors. Character-based software, such as text editors, displays in video modes that can be defined as *x* columns by *y* rows of characters.

video resolution — See *resolution*.

virus — A program that is designed to inconvenience you or to destroy data stored on your computer. A virus program moves from one computer to another through an infected disk, software downloaded from the Internet, or e-mail attachments. When an infected program starts, its embedded virus also starts.

A common type of virus is a boot virus, which is stored in the boot sectors of a floppy disk. If the floppy disk is left in the drive when the computer is shut down and then turned on, the computer is infected when it reads the boot sectors of the floppy disk expecting to find the operating system. If the computer is infected, the boot virus may replicate itself onto all the floppy disks that are read or written in that computer until the virus is eradicated.

V — volt — The measurement of electric potential or electromotive force. One V appears across a resistance of 1 ohm when a current of 1 ampere flows through that resistance.

W

W — watt — The measurement of electrical power. One W is 1 ampere of current flowing at 1 volt.

WHr — watt-hour — A unit of measure commonly used to indicate the approximate capacity of a battery. For example, a 66-WHr battery can supply 66 W of power for 1 hour or 33 W for 2 hours.

wallpaper — The background pattern or picture on the Windows desktop. Change your wallpaper through the Windows Control Panel. You can also scan in your favorite picture and make it wallpaper.

WLAN — wireless local area network. A series of interconnected computers that communicate with each other over the air waves using access points or wireless routers to provide Internet access.

write-protected — Files or media that cannot be changed. Use write-protection when you want to protect data from being changed or destroyed. To write-protect a 3.5-inch floppy disk, slide its write-protect tab to the open position.

WWAN — wireless wide area network. A wireless high-speed data network using cellular technology and covering a much larger geographic area than WLAN.

WXGA — wide-aspect extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1280 x 800.

X

XGA — extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1024 x 768.

Z

ZIF — zero insertion force — A type of socket or connector that allows a computer chip to be installed or removed with no stress applied to either the chip or its socket.

Zip — A popular data compression format. Files that have been compressed with the Zip format are called Zip files and usually have a filename extension of **.zip**. A special kind of zipped file is a self-extracting file, which has a filename extension of **.exe**. You can unzip a self-extracting file by double-clicking it.

Zip drive — A high-capacity floppy drive developed by Iomega Corporation that uses 3.5-inch removable disks called Zip disks. Zip disks are slightly larger than regular floppy disks, about twice as thick, and hold up to 100 MB of data.

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