

# Alienware Aurora-R4

# Owner's Manual

**Regulatory model: D01M**  
**Regulatory type: D01M004**

# Notes, Cautions, and Warnings



**NOTE:** A NOTE indicates important information that helps you make better use of your product.



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



**WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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# Before You Begin

## Turn Off Your Computer and Connected Devices

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

- 1 Save and close all open files and exit all open programs.
- 2 Click Start  and click Shut Down.

Microsoft Windows shuts down and then the computer turns off.

 **NOTE:** If you are using a different operating system, see the documentation of your operating system for shut-down instructions.

- 3 Disconnect your computer and all attached devices from their electrical outlets.
- 4 Disconnect all telephone cables, network cables, and attached devices from your computer.
- 5 Press and hold the power button, while the computer is unplugged, to ground the system board.

## Safety Instructions

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

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

 **CAUTION:** To avoid damaging the computer, ensure that the work surface is flat and clean.

 **CAUTION:** To avoid damaging the components and cards, handle them by their edges and avoid touching pins and contacts.

 **WARNING:** Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

- △ CAUTION: Only a certified service technician is authorized to remove the computer cover and access any of the components inside the computer. See the safety instructions for complete information about safety precautions, working inside your computer, and protecting against electrostatic discharge.**
- △ CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.**
- △ CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs or thumb-screws that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending any connector pins. When connecting cables, ensure that the connectors and ports are correctly oriented and aligned.**
- △ CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.**

## Recommended Tools

The procedures in this document may require the following tools:

- Small Phillips screwdriver
- Hex nut driver
- Flash BIOS executable update program available at [support.dell.com](http://support.dell.com)

# After Working Inside Your Computer

After you complete replacement procedures, ensure the following:

- Replace all screws and ensure no stray screws remain inside your computer
- Connect any external devices, cables, cards, and any other part you removed before working on your computer
- Connect your computer and all attached devices to their electrical outlets



**CAUTION: Before turning on your computer, replace all screws and ensure that no stray screws remain in the computer. Failure to do so may damage your computer.**

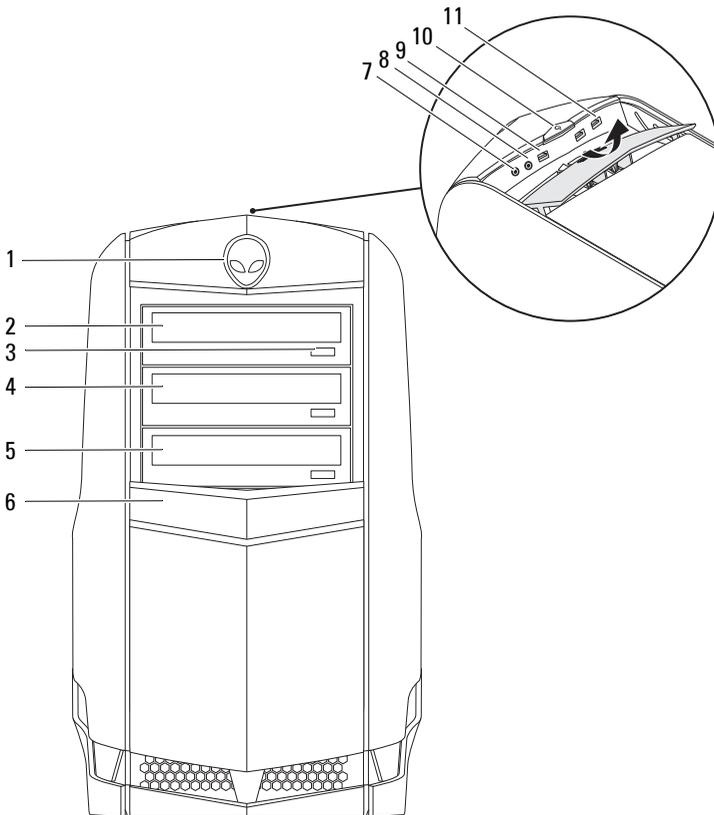
- Turn on your computer.



# Technical Overview

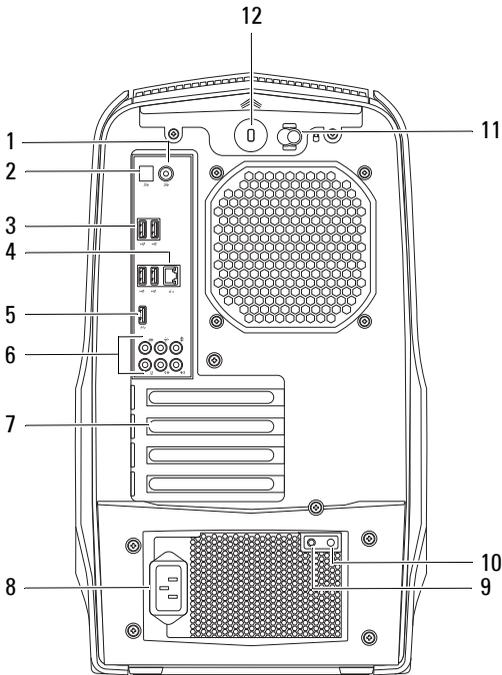
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Front View of Your Computer



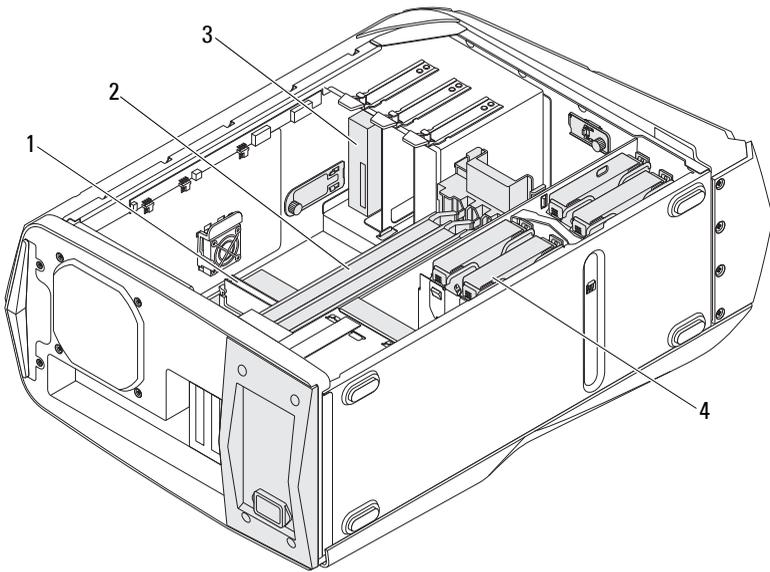
- |    |                                     |    |                      |
|----|-------------------------------------|----|----------------------|
| 1  | AlienHead/drive-panel open button   | 2  | optical drive        |
| 3  | optical-drive eject button          | 4  | optical-drive bay    |
| 5  | media-card reader/optical-drive bay | 6  | drive panel (open)   |
| 7  | headphone connector                 | 8  | microphone connector |
| 9  | USB 3.0 connector                   | 10 | power button         |
| 11 | USB 2.0 connectors (2)              |    |                      |

## Back View of Your Computer



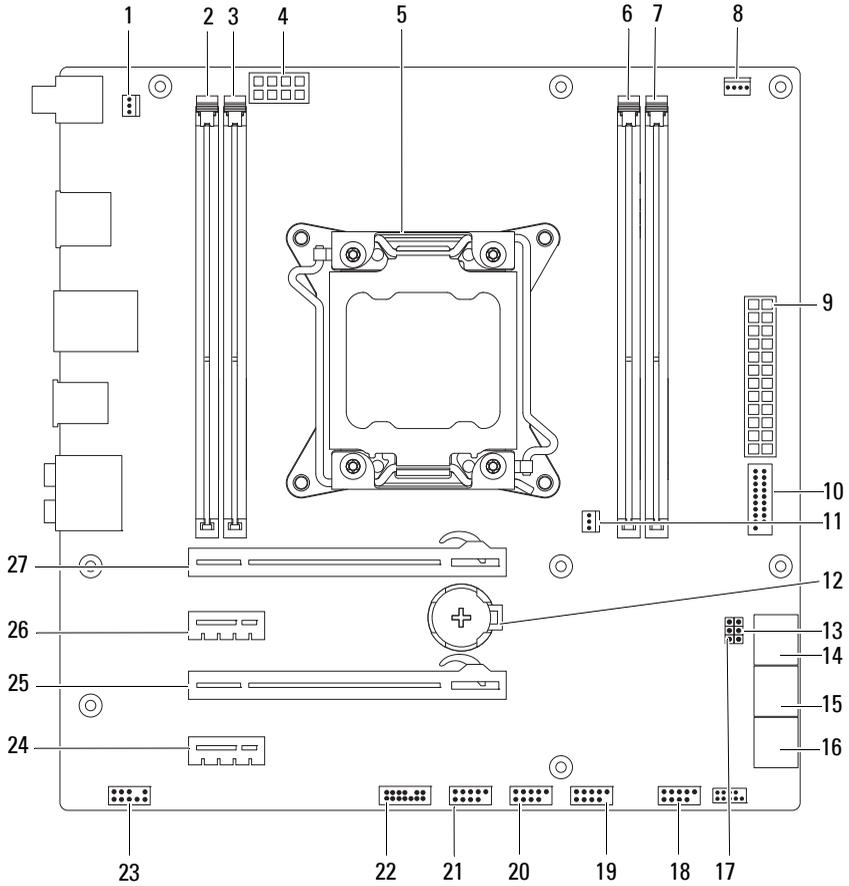
- |    |                                 |    |                                      |
|----|---------------------------------|----|--------------------------------------|
| 1  | coaxial S/PDIF connector        | 2  | optical S/PDIF connector             |
| 3  | USB 2.0 connectors (4)          | 4  | network connector and network lights |
| 5  | USB 3.0 connector               | 6  | audio connectors                     |
| 7  | expansion-card slots            | 8  | power connector                      |
| 9  | power-supply diagnostics button | 10 | power-supply diagnostics light       |
| 11 | security-cable slot latch       | 12 | security-cable slot                  |

## Inside View of Your Computer



- |   |                  |   |                     |
|---|------------------|---|---------------------|
| 1 | memory module(s) | 2 | PCI-Express card(s) |
| 3 | optical drive(s) | 4 | hard-drive(s)       |

# System-Board Components

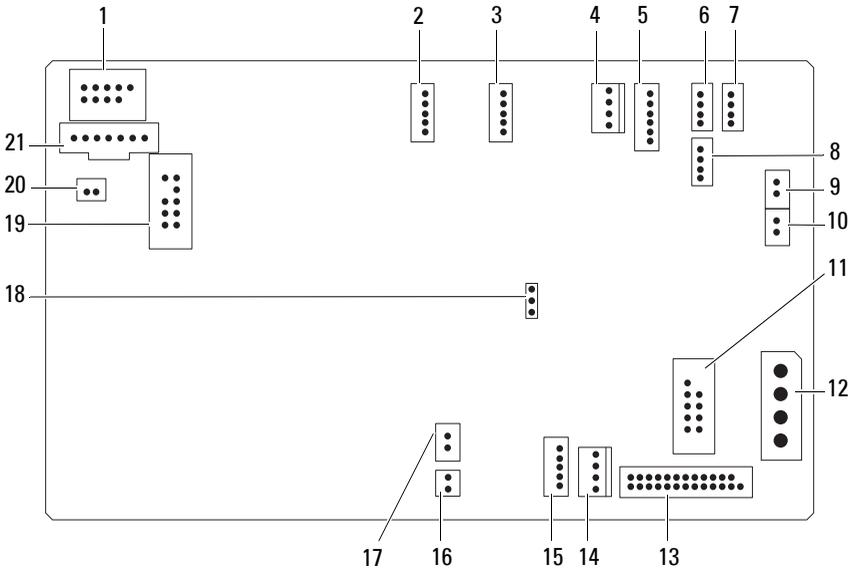


- |    |                                       |    |                                       |
|----|---------------------------------------|----|---------------------------------------|
| 1  | heat-sink fan connector (SYS_FAN1)    | 2  | memory-module connector (DIMM1)       |
| 3  | memory-module connector (DIMM2)       | 4  | processor power connector (PWR2)      |
| 5  | processor socket (CPU1)               | 6  | memory-module connector (DIMM4)       |
| 7  | memory-module connector (DIMM3)       | 8  | processor fan connector (CPU_FAN)     |
| 9  | main power connector (PWR1)           | 10 | front USB connector (FUSB3_0)         |
| 11 | heat-sink fan connector (SYS_FAN2)    | 12 | battery socket (BAT1)                 |
| 13 | CMOS jumper (CLEAR_CMOS)              | 14 | serial ATA drive connectors (SATA1_2) |
| 15 | serial ATA drive connectors (SATA3_4) | 16 | serial ATA drive connectors (SATA5_6) |
| 17 | password jumper (PASSWORD)            | 18 | front panel connector (FRONT_PANEL)   |
| 19 | USB connector (USB1)                  | 20 | USB connector (USB2)                  |
| 21 | USB connector (USB3)                  | 22 | Low pin count debug header (LPC)      |
| 23 | front audio connector (FRONT_AUDIO)   | 24 | PCI-Express x1 connector (SLOT4)      |
| 25 | PCI-Express x16 connector (SLOT3)     | 26 | PCI-Express x1 connector (SLOT2)      |
| 27 | PCI-Express x16 connector (SLOT1)     |    |                                       |

## Master I/O Board Components



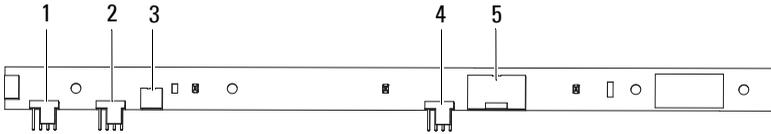
**NOTE:** The location of the connectors may vary based on the selections you made at the time of purchase.



- |   |  |   |  |
|---|--|---|--|
| 1 | FlexBay connector (FLEXBAY)                      | 2 | drive-bay shroud battery connector (FRONT_BEZEL) |
| 3 | AlienHead connector (HEAD1)                      | 4 | PCI-fan connector (FAN_PCI)                      |
| 5 | left side-panel contact board connector (SIDE_L) | 6 | WiFi/Bluetooth connector (BLUETOOTH)             |
| 7 | power-LED board connector (BLINK)                | 8 | wireless connector (WIRELESS)                    |

- |    |                                     |    |  |
|----|-------------------------------------|----|--|
| 9  | hard-drive LED connector (HDD_LED1) | 10 | hard-drive LED connector (HDD_LED2)              |
| 11 | USB connector (MB_USB)              | 12 | main-power connector (PWRI)                      |
| 13 | system-board lighting (MB_MIO)      | 14 | hard-drive fan connector (FAN_HDD)               |
| 15 | right side-panel connector (SIDE_R) | 16 | ODD sensors (ODD_SW)                             |
| 17 | ODD LED connector (ODD_LED)         | 18 | front-default connector (FACTORY_DEFAULT)        |
| 19 | Debug connector (DEBUG)             | 20 | graphics-temperature sensor connector (GFX_TEMP) |
| 21 | graphics-pump connector (GFX_PUMP)  |    |  |

## Top Lighting-Board Components



- |   |  |   |                                |
|---|--|---|--------------------------------|
| 1 | System fan connector (SYS FAN)             | 2 | CPU fan connector (CPU FAN)    |
| 3 | Temperature sensor connector (TEMP SENSOR) | 4 | Memory fan connector (MEM FAN) |
| 5 | CPU pump connector (CPU PUMP)              |   |                                |



## Left Side-Panel

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

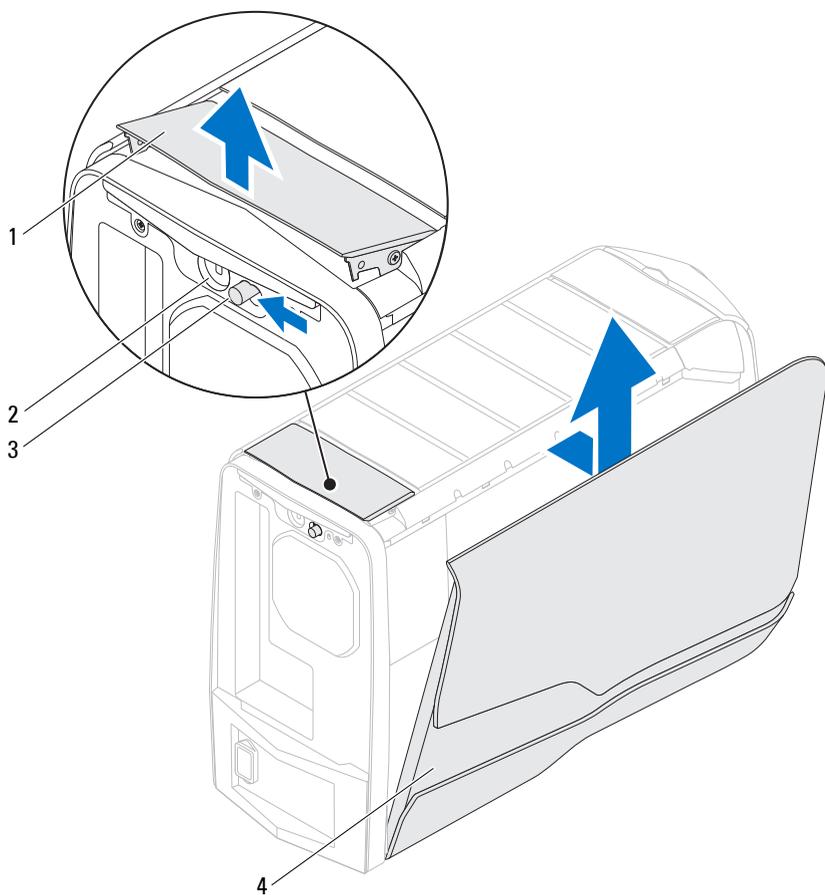
 **CAUTION:** Ensure that sufficient space exists to support the computer with the computer cover removed—at least 30 cm (1 ft.) of desk top space.

### Removing the Left Side-Panel

 **NOTE:** Ensure that you remove the security cable from the security cable slot (if applicable).

- 1 Slide the security-cable slot latch to the unlocked position.
- 2 Lift the release panel to open the left side-panel.
- 3 Pull and lift the left side-panel away from the chassis.

 **NOTE:** Theater lighting (available only in ALX chassis) turns on automatically when the left side-panel is removed.



- 1 release panel
- 2 security-cable slot
- 3 security-cable slot latch
- 4 left side-panel

## Replacing the Left Side-Panel

- 1 Align the tabs on the left side-panel with the slots on the left side of the computer and push the panel to lock it in place.
- 2 Slide the security-cable slot latch to locked position.
- 3 Follow the steps in "After Working Inside Your Computer" on page 15.



## Hard Drive(s)

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).
-  **WARNING:** If you remove the hard drive from the computer when the drive is hot, *do not touch* the metal housing of the hard drive.
-  **CAUTION:** To avoid data loss, do not remove the hard drive while the computer is on or in Sleep state.
-  **CAUTION:** Hard drives are extremely fragile. Exercise care when handling the hard drive.

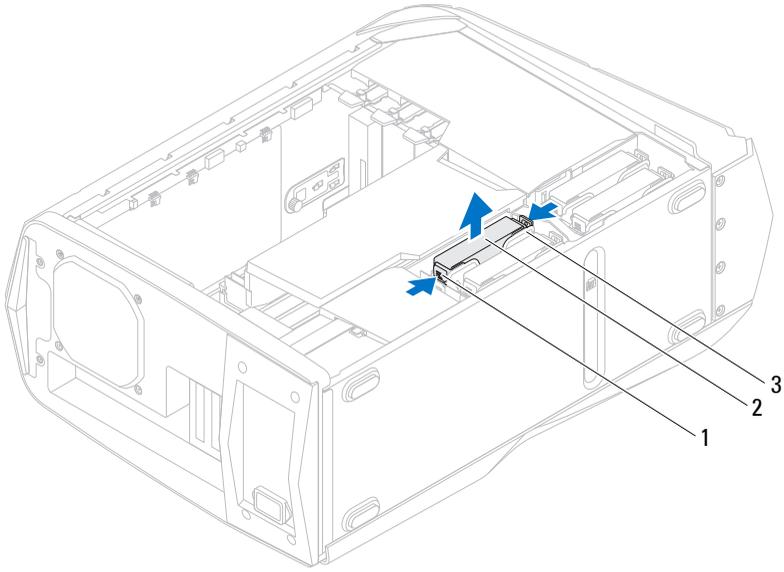
## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

## Removing the Hard Drive(s)

- 1 Press the release tabs to release the hard drive assembly from the computer.
- 2 Slide and remove the hard drive from the hard-drive cage.

 **NOTE:** Repeat steps 1 and 2 to remove any other installed hard drives.



- 1 release tabs (2)
- 2 hard-drive
- 3 hard-drive cage

## Replacing the Hard Drive(s)

- 1 Slide the hard drive into the hard-drive cage until the release tabs snap into place.

## Postrequisites

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.

- 2 Follow the steps in "After Working Inside Your Computer" on page 15.



## Hard-Drive Fan Assembly

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

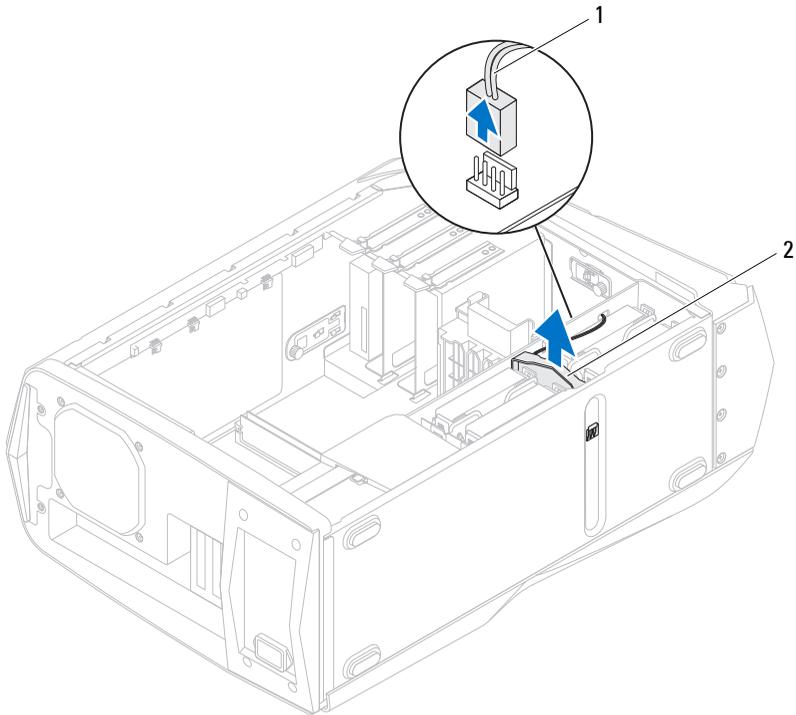
 **WARNING:** The heat sink may be very hot during normal operation. Provide sufficient time for the heat-sink to cool before you touch it.

### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

### Removing the Hard-Drive Fan Assembly

- 1 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 2 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.
  -  **NOTE:** Be careful not to damage the hard-drive fan cable while lifting the hard-drive fan assembly.
- 3 Carefully slide the hard-drive fan assembly out of the hard-drive fan assembly bay.
- 4 Note the routing of the hard-drive fan cable and then disconnect the hard-drive fan cable from the FAN\_HDD connector on the master I/O board.
- 5 Lift the hard-drive fan assembly out of the chassis.



1 hard-drive fan cable

2 hard-drive fan assembly

## Replacing the Hard-Drive Fan Assembly

- 1 Slide the hard-drive fan assembly into the hard-drive fan assembly bay.
- 2 Route the cable through the slot in the hard-drive bay and then connect the hard-drive fan assembly cable to the FAN\_HDD connector on the master I/O board.
- 3 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 4 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.

## Postrequisites

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 2 Follow the steps in "After Working Inside Your Computer" on page 15.



# Optical Drive(s)

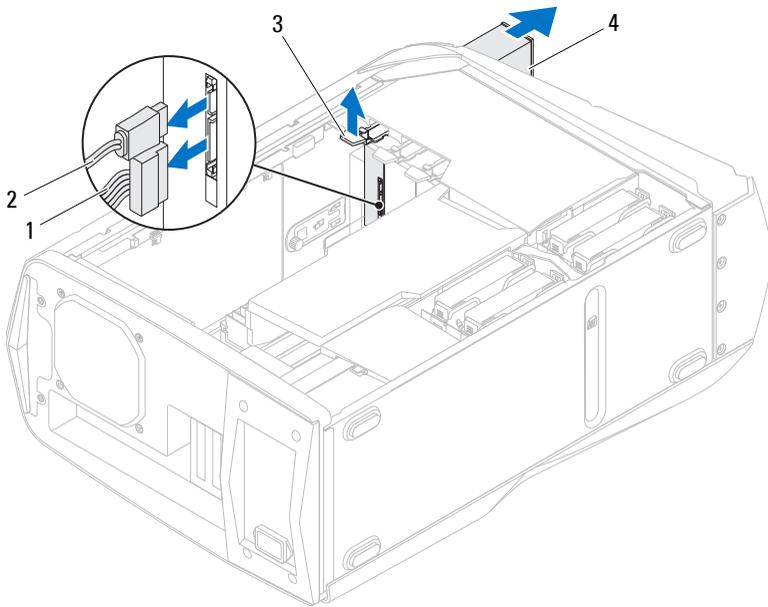
 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

## Removing the Optical Drive(s)

- 1 Press the AlienHead on the front of your computer to lower the drive panel.
- 2 Disconnect the data cable and power cable from the optical drive.
- 3 Lift the securing tab, and holding the tab in place, push and slide the optical drive out through the front of the computer.



- |   |              |   |               |
|---|--------------|---|---------------|
| 1 | power cable  | 2 | data cable    |
| 3 | securing tab | 4 | optical drive |

## Replacing the Optical Drive(s)

- 1 Lift and hold the securing tab, and then slide the optical drive through the front of the computer until the securing tab snaps into place.
- 2 Connect the power cable and the data cable to the optical drive.
- 3 Lift the drive panel towards the top of your computer until it snaps into place.

## Postrequisites

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.

- 2 Follow the steps in "After Working Inside Your Computer" on page 15.



# Media-Card Reader

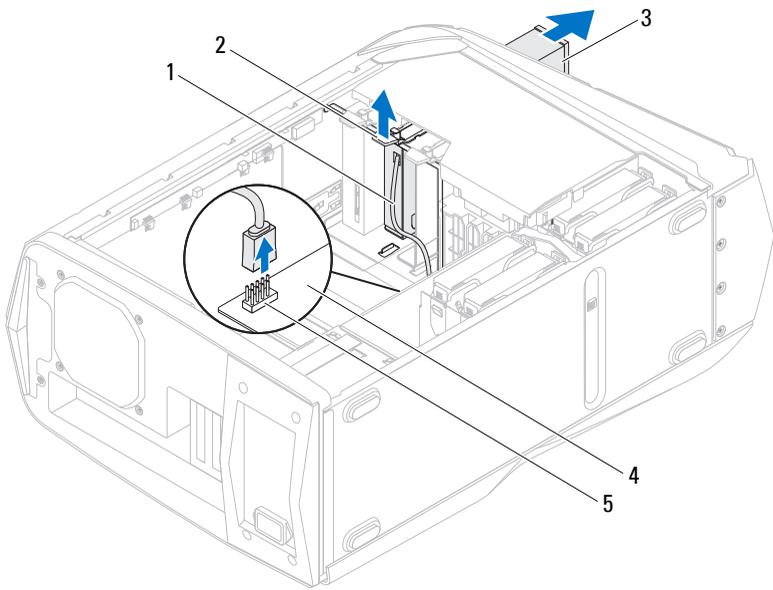
 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

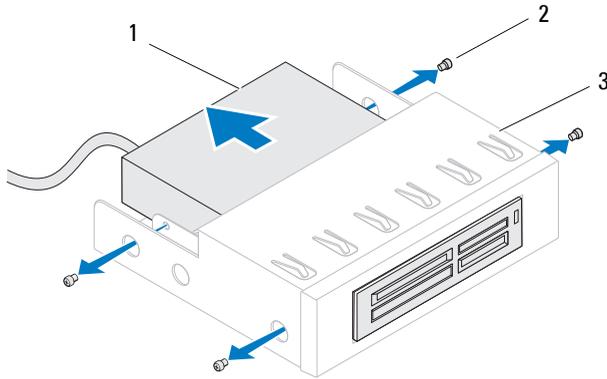
## Removing the Media-Card Reader

- 1 Press the AlienHead on the front of your computer to lower the drive panel.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Disconnect the FlexBay USB cable from the FLEXBAY connector on the master I/O board. For more information on the location of the connector, see "Master I/O Board Components" on page 21.
- 4 Lift and hold the securing tab and then push the FlexBay dock to slide it out through the front of the computer.



- 1 FlexBay USB cable
- 2 securing tab
- 3 FlexBay dock
- 4 Master I/O board
- 5 FlexBay USB cable-connector

- 5 Remove the screws that secure the media-card reader to the FlexBay dock.
- 6 Slide the media-card reader out of the FlexBay dock.



- 1 media-card reader
- 2 screws (4)
- 3 FlexBay dock

## Replacing the Media-Card Reader

- 1 Slide the media-card reader into the FlexBay dock.
- 2 Replace the screws that secure the media-card reader to the FlexBay dock.
- 3 Lift the securing tab and slide the FlexBay dock through the front of the computer until the securing tab snaps into place.
- 4 Connect the FlexBay USB cable to the FLEXBAY connector on the master I/O board. For more information on the location of the connector, see "Master I/O Board Components" on page 21.
- 5 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 6 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 7 Lift the drive panel towards the top of your computer until it snaps into place.

## Postrequisites

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 2 Follow the steps in "After Working Inside Your Computer" on page 15.

## PCI Shroud

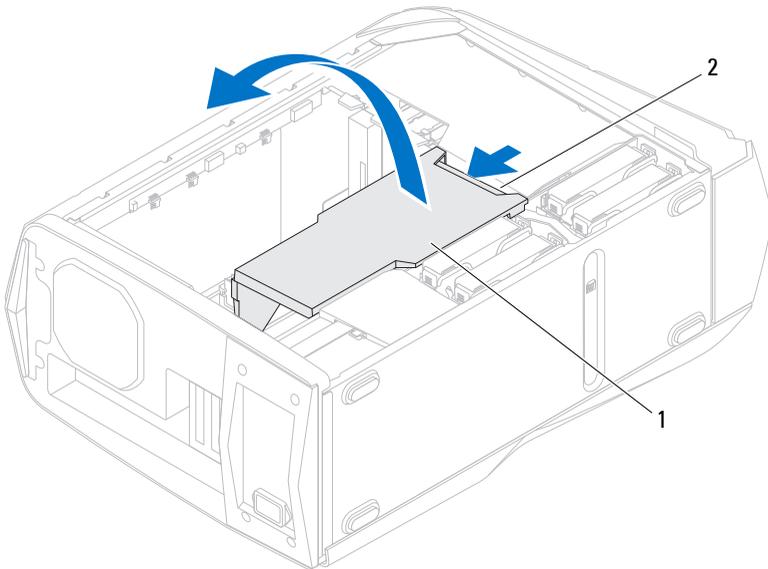
**!** **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

### Opening the PCI Shroud

- 1 Press the shroud-release button and rotate the PCI shroud away from the chassis.



1 PCI shroud

2 shroud-release button

## **Closing the PCI Shroud**

- 1 Lower the PCI shroud into the chassis and press down until it snaps into position.

## **Postrequisites**

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 2 Follow the steps in "After Working Inside Your Computer" on page 15.

# Drive-Bay Shroud

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

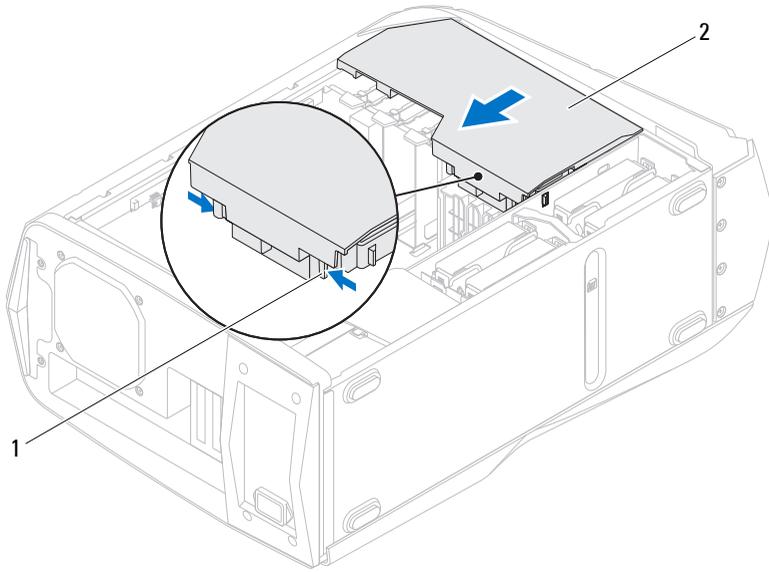
## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Removing the Drive-Bay Shroud" on page 47.

## Removing the Drive-Bay Shroud

 **NOTE:** Be careful not to damage the cable connected to the drive-bay shroud while sliding the drive-bay shroud.

- 1 Press the tabs and slide the drive-bay shroud towards the back of the chassis.
- 2 Gently turn the drive-bay shroud over and place it on the chassis.



1 tabs (2)

2 drive-bay shroud

## Replacing the Drive-Bay Shroud

- 1 Align the drive-bay shroud with the slots on the chassis.
- 2 Slide the drive-bay shroud toward the front of the chassis until it clicks into place.

## Postrequisites

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 2 Follow the steps in "After Working Inside Your Computer" on page 15.
- 3 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.

# PCI-Express x1 Card

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.

## Removing the PCI-Express x1 Card

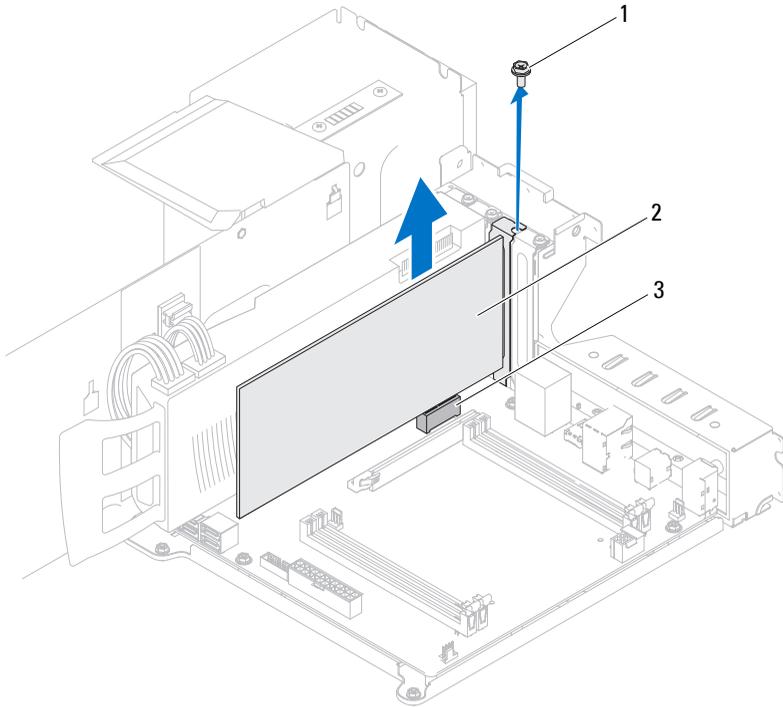
- 1 Locate the PCI-Express x1 card on the system board. See "System-Board Components" on page 20.
- 2 Disconnect any cables connected to the card (if applicable).
- 3 Remove the screw that secures the card to the chassis.
- 4 Grasp the card by its top corners and ease it out of the connector.



**NOTE:** For removing a PCI-Express x16 card, see "Removing the Graphics Card" on page 57.



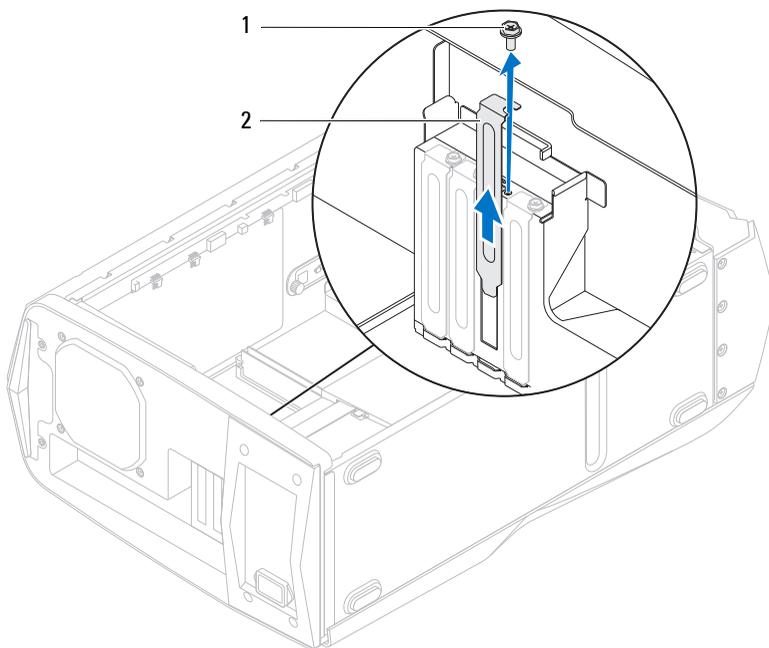
**NOTE:** If you are not replacing a card, install a filler bracket in the empty card-slot opening.



- 1 screw
- 2 PCI-Express x1 card
- 3 PCI-Express x1 connector

## Replacing the PCI-Express x1 Card

- 1 Remove the screw that secures the filler bracket and remove the filler bracket (if applicable).



1 screw

2 filler bracket

- 2 Align the PCI-Express x1 card with the PCI-Express x1 card connector on the system board.
- 3 Place the card in the connector and press down firmly. Ensure that the card is firmly seated.
- 4 Connect any required cables to the card. For information on the cables to be connected to the card, see the documentation that shipped with the card.
- 5 Replace the screw that secures the card to the chassis.

## Postrequisites

- 1 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.

- 2** Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 3** Follow the steps in "After Working Inside Your Computer" on page 15.

## PCI-Fan

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

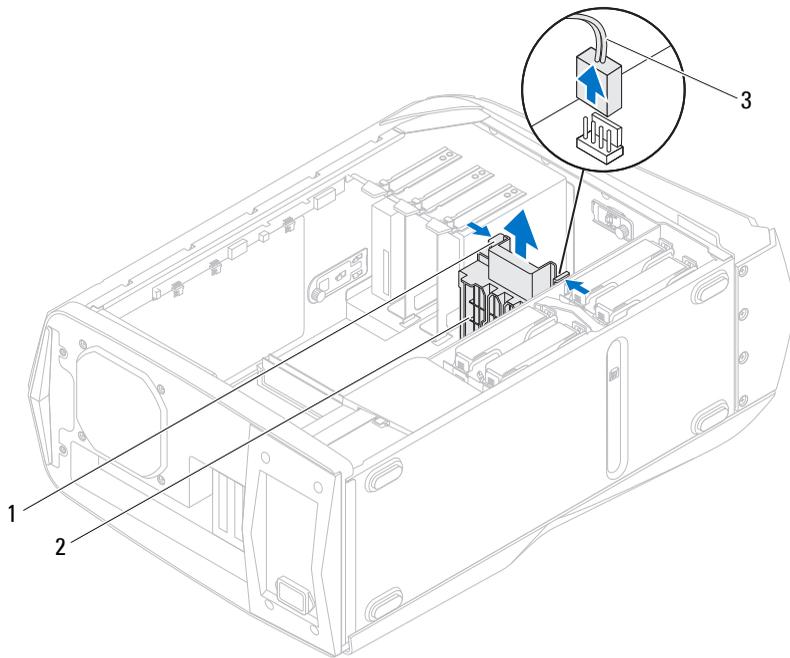
 **WARNING:** The heat sink may be very hot during normal operation. Provide sufficient time for the heat-sink to cool before you touch it.

### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

### Removing the PCI-Fan

- 1 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 2 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.
- 3 Disconnect the PCI-fan cable from the FAN\_PCI connector on the master I/O board.
- 4 Press the tabs and lift the PCI-fan out of the metal brackets on the chassis.



- 1 tabs (2)
- 2 PCI-fan
- 3 PCI-fan cable

## Replacing the PCI-Fan

- 1 Align the PCI-fan with the metal brackets on the chassis.
- 2 Slide the PCI-fan into the chassis.
- 3 Connect the PCI-fan cable to the FAN\_PCI connector on the master I/O board.
- 4 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 5 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.

## Postrequisites

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 2 Follow the steps in "After Working Inside Your Computer" on page 15.



# Graphics Card

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

The system board of your computer is equipped with two PCI-Express x16 connectors to install graphic card(s). To locate the PCI-Express x16 connectors on the system board, see "System-Board Components" on page 20.

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.

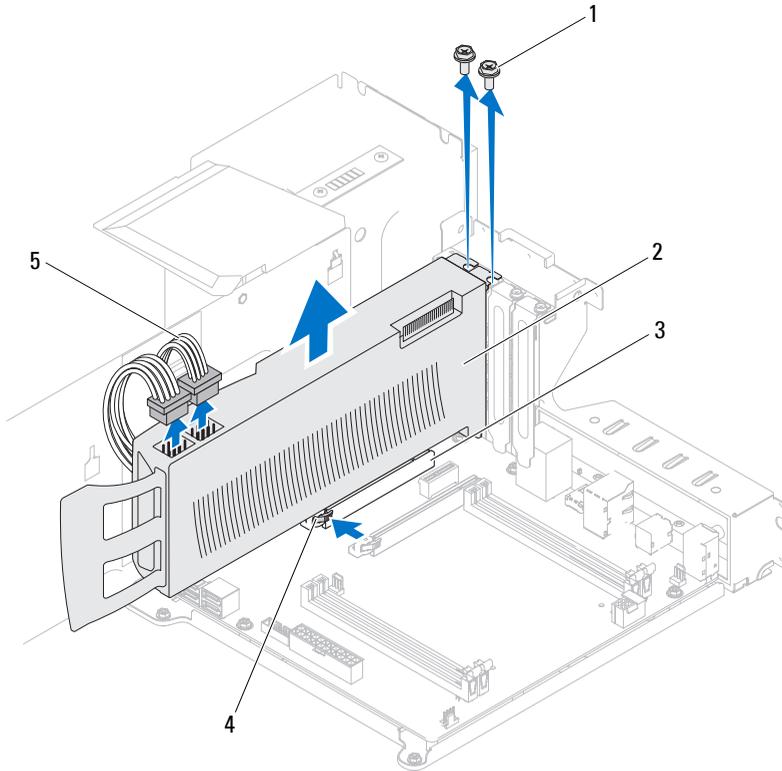
## Removing the Graphics Card

- 1 Locate the graphics card (PCI-Express x16 card) on the system board. See "System-Board Components" on page 20.



**NOTE:** The location of the power-cable connectors on your graphics card may vary.

- 2 Press the releasing clips on the power-cable connectors and disconnect the power cables from the graphics card.
- 3 Remove the screws that secure the graphics card to the chassis.
- 4 Press and hold the securing tab on the card connector, grasp the card by its top corners, and then ease the card out of the card connector.



- |   |                           |   |               |
|---|---------------------------|---|---------------|
| 1 | screws (2)                | 2 | graphics card |
| 3 | PCI-Express x16 connector | 4 | securing tab  |
| 5 | power cables (2)          |   |               |

## Replacing the Graphics Card

- 1 Align the graphics card with the PCI-Express x16 card connector on the system board.
- 2 Place the card in the connector and press down firmly. Ensure that the card is firmly seated.
- 3 Replace the screws that secure the graphics card to the chassis.

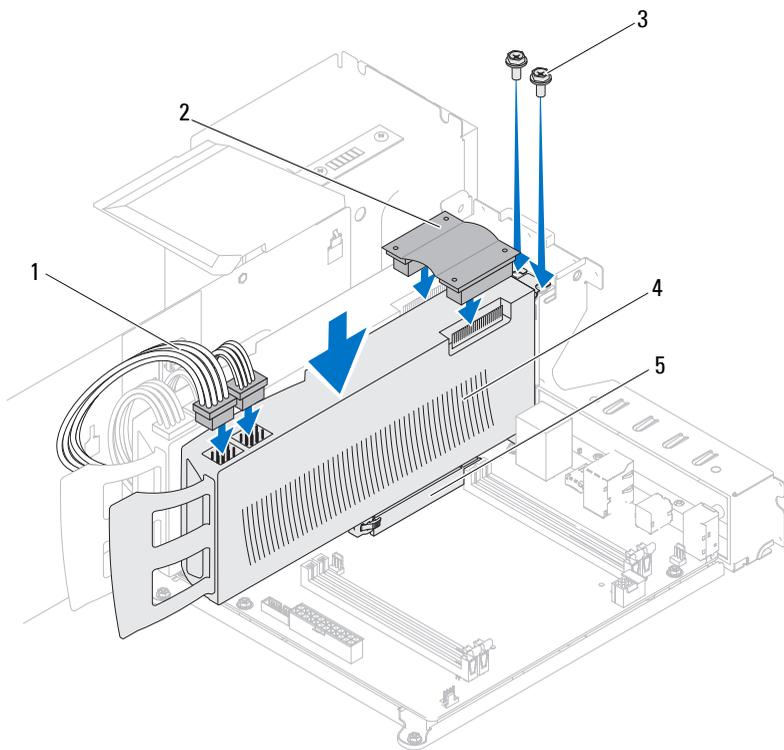
- 4 Connect the power cables to the graphics card.

## Postrequisites

- 1 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 2 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 3 Follow the steps in "After Working Inside Your Computer" on page 15.

## Installing Dual Graphic Cards

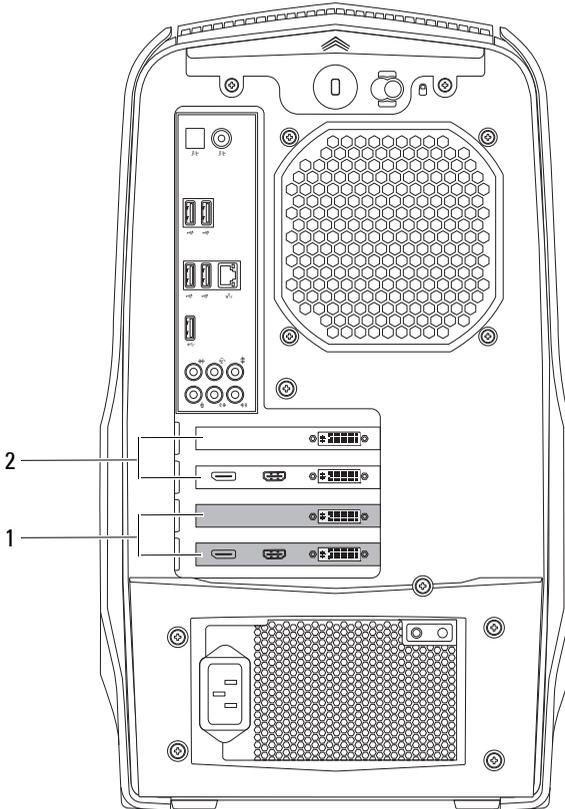
- 1 Locate the second PCI-Express x16 connector on the system board. See "System-Board Components" on page 20.
- 2 Align the second graphics card with the second PCI-Express x16 card connector on the system board.
- 3 Place the card in the connector and press down firmly. Ensure that the card is firmly seated in the slot.
- 4 Replace the screws that secure the second graphics card to the chassis.
- 5 Connect the dual graphics bridge connecting the two graphics card.
- 6 Connect the two power cables to the graphics card.



- 1 power cables (2)
  - 2 Dual graphics bridge
  - 3 screws (2)
  - 4 PCI-Express x16 card
  - 5 PCI-Express x16 connector
- 7 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 8 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 9 Follow the steps in "After Working Inside Your Computer" on page 15.

## Connect the Display

If your computer has dual graphics cards, connect the display to the connectors on the primary graphics card.



1 primary graphic-card connectors

2 secondary graphic-card connectors



## Memory Module(s)

**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

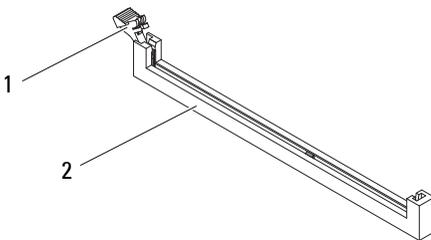
### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.

### Removing Memory Module(s)

**⚠ WARNING:** The memory module(s) may become very hot during normal operation. Allow the memory module(s) to cool before touching them.

- 1 Push the securing clip away from the memory module.
- 2 Grasp the memory module near the securing clip, and then gently ease the memory module out of the memory-module connector.



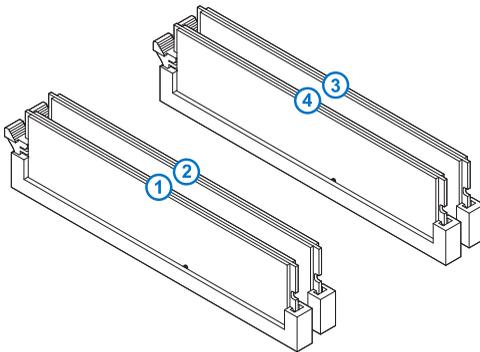
1 securing clip

2 memory-module connector

# Replacing Memory Module(s)

**CAUTION:** If the memory module is not installed correctly, your computer may not boot.

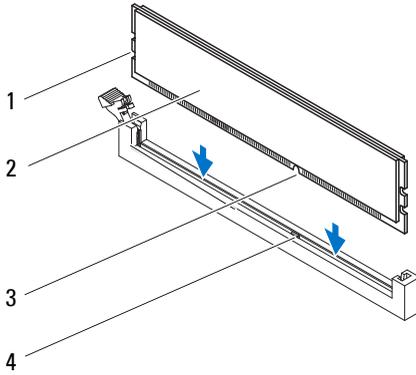
**CAUTION:** If you remove the original memory module(s) from your computer during a memory upgrade, keep them separate from any new module(s) that you may have, even if you purchased the new module(s) from Dell. If possible, do not pair an original memory module with a new memory module. Otherwise, your computer may not start properly. The recommended memory configurations are: matched memory modules installed in DIMM connectors 1 and 2 and another matched memory modules installed in DIMM connectors 3 and 4.



Recommended memory configuration:

Type	Slots
1333 MHz, 1600 MHz, and 1866 MHz DDR3	Slots 1 and 2 or slots 1 through 4

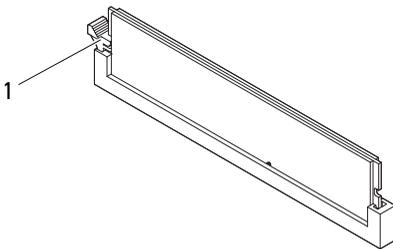
- 1 Align the notch on the bottom of the memory module with the tab on the memory-module connector.



- 1 cutouts (2)
- 2 memory module
- 3 notch
- 4 tab

**CAUTION:** To avoid damage to the memory module, first insert the end away from the securing clip and then insert the end near the securing clip.

- 2 Insert the memory module into the memory-module connector until the memory module snaps into position and the securing clip locks in place.



- 1 securing clip (snapped in position)

## Postrequisites

- 1 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 2 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 3 Follow the steps in "After Working Inside Your Computer" on page 15.

## Memory Fan

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

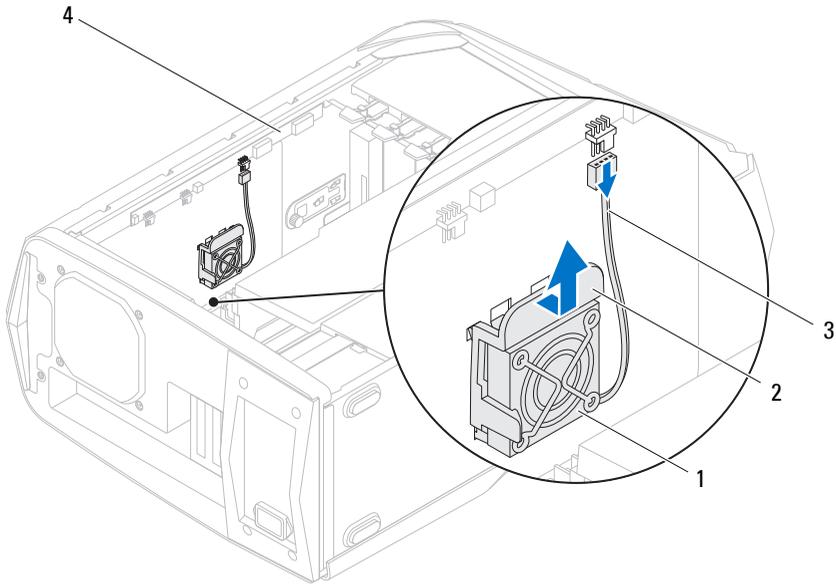
 **WARNING:** The heat sink may be very hot during normal operation. Provide sufficient time for the heat-sink to cool before you touch it.

### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

### Removing the Memory Fan

- 1 Disconnect the memory fan cable from the MEM\_FAN connector on the top lighting-board.
- 2 Pull the release tab towards the bottom of the computer and lift the memory fan out of the chassis.



- |   |                  |   |                    |
|---|------------------|---|--------------------|
| 1 | memory fan       | 2 | tab                |
| 3 | memory-fan cable | 4 | top lighting-board |

## Replacing the Memory Fan

- 1 Align the tabs on the memory fan with the slots on the computer chassis and slide the fan until it snaps into position.
- 2 Connect the memory fan cable to the MEM\_FAN connector on the top lighting-board.

## Postrequisites

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.

**2** Follow the steps in "After Working Inside Your Computer" on page 15.



# Processor Liquid-Cooling Assembly

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

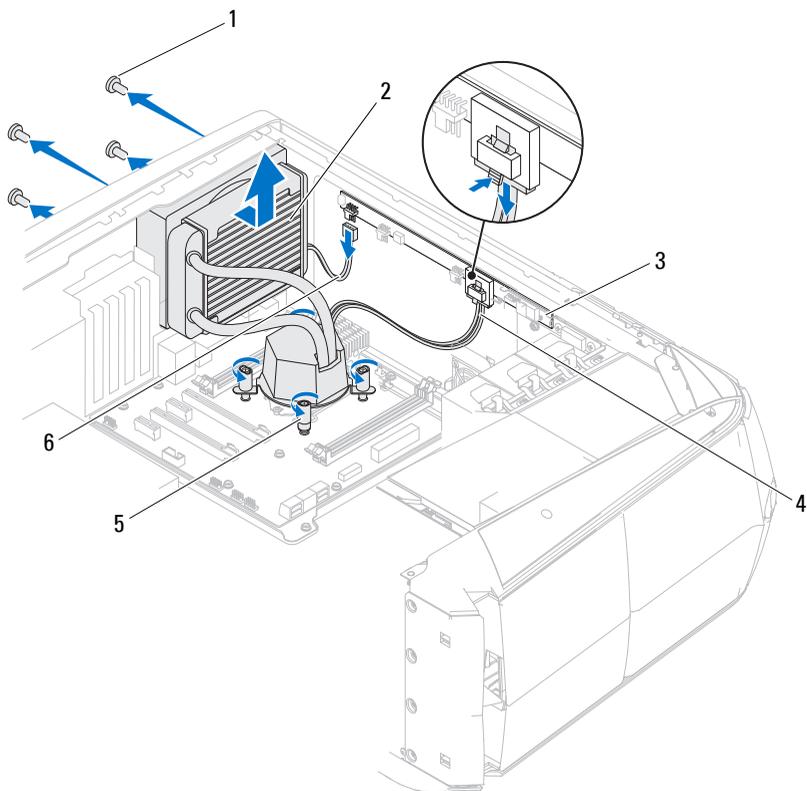
- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.

## Removing the Processor Liquid-Cooling Assembly

 **WARNING:** Despite having a plastic shield, the processor liquid-cooling assembly may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.

 **CAUTION:** To ensure maximum cooling for the processor, do not touch the heat transfer areas on the processor liquid-cooling assembly. The oils in your skin can reduce the heat transfer capability of the thermal grease.

- 1 Press the tab on the CPU pump cable and disconnect the cable from the top lighting-board.
- 2 Disconnect the system fan cable from the top lighting-board.
- 3 Loosen the captive screws that secure the processor liquid-cooling assembly to the system board.
- 4 Remove the screws that secure the processor liquid-cooling assembly to the chassis.
- 5 Slide and lift the processor liquid-cooling assembly out of the chassis.



- |   |                    |   |                                   |
|---|--------------------|---|-----------------------------------|
| 1 | screws (4)         | 2 | processor liquid-cooling assembly |
| 3 | top lighting-board | 4 | CPU-pump cable                    |
| 5 | captive screws (4) | 6 | system-fan cable                  |

## Replacing the Processor Liquid-Cooling Assembly

**CAUTION:** Incorrect alignment of the processor liquid-cooling assembly can damage the system board and processor.

- 1 Align the screw holes on the processor liquid-cooling assembly with the screw holes on the chassis.
- 2 Replace the screws that secure the processor liquid-cooling assembly to the chassis.
  -  **NOTE:** The original thermal grease can be reused if the original processor and processor liquid-cooling assembly are reinstalled together. If either the processor or the processor liquid-cooling assembly is replaced, use the thermal grease provided in the kit to ensure that thermal conductivity is achieved.
- 3 Apply thermal grease between the processor liquid-cooling assembly and the processor.
- 4 Tighten the captive screws that secure the processor liquid-cooling assembly to the system board.
- 5 Connect the system fan cable and the CPU pump cable to the connectors on the top lighting-board.

## Postrequisites

- 1 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 2 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 3 Follow the steps in "After Working Inside Your Computer" on page 15.



## Processor

 **CAUTION:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

### Prerequisites

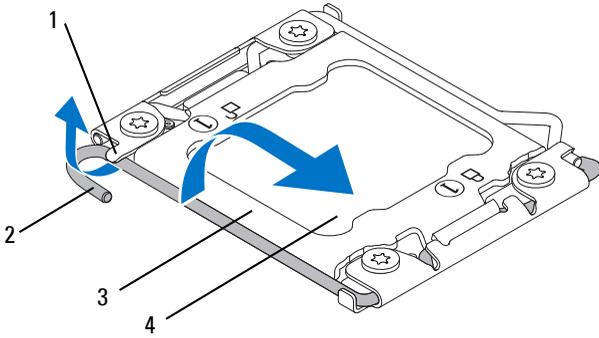
- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

 **WARNING:** Despite having a plastic shield, the processor liquid-cooling assembly may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.

- 2 Remove the processor liquid-cooling assembly. See "Removing the Processor Liquid-Cooling Assembly" on page 71.

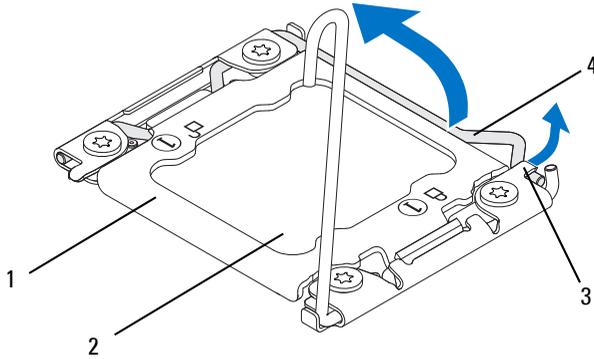
### Removing the Processor

- 1 Press down and push the release lever away from the processor to release it from the securing tab.



- |   |                 |   |               |
|---|-----------------|---|---------------|
| 1 | securing tab    | 2 | release lever |
| 3 | processor cover | 4 | processor     |

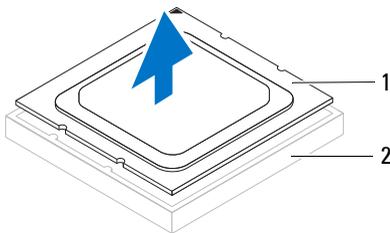
- 2 Press down and push the release lever away from the processor to release it from the securing tab.
- 3 Extend this release lever completely to open the processor cover.



- |   |                 |   |               |
|---|-----------------|---|---------------|
| 1 | processor cover | 2 | processor     |
| 3 | securing tab    | 4 | release lever |

**⚠ CAUTION:** When removing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

- 4 Open the processor cover and gently lift the processor from the processor socket.



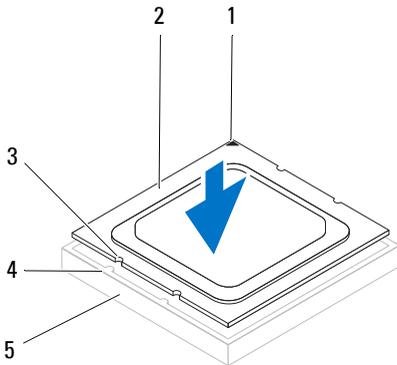
- |   |           |   |                  |
|---|-----------|---|------------------|
| 1 | processor | 2 | processor socket |
|---|-----------|---|------------------|

# Replacing the Processor

1 Ensure that the second release lever is fully extended in the open position.

**△ CAUTION: You must position the processor correctly in the processor socket to avoid damage to the processor.**

2 Align the pin-1 corner of the processor with the pin-1 corner of the processor socket, and then place the processor in the processor socket.



1 processor pin-1 indicator

2 processor

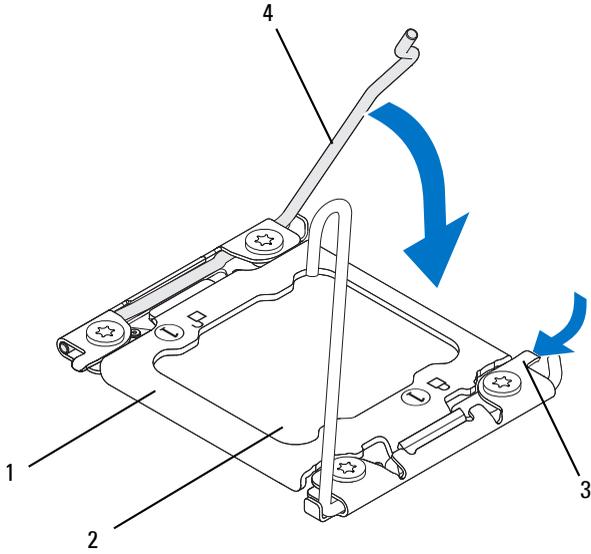
3 alignment notches (4)

4 alignment tabs (4)

5 processor socket

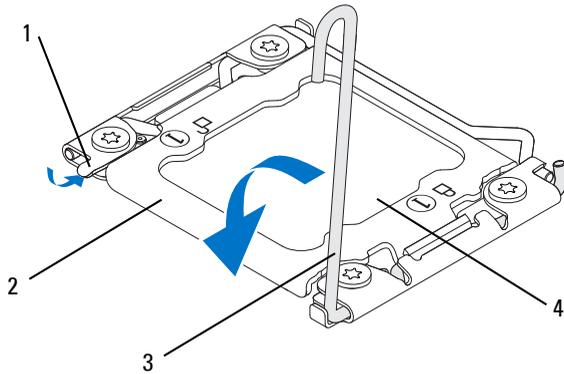
3 When the processor is fully seated in the socket, close the processor cover.

4 Pivot the release lever down and place it under the tab on the processor cover.



- |   |                 |   |                |
|---|-----------------|---|----------------|
| 1 | processor cover | 2 | processor      |
| 3 | securing tabs   | 4 | release levers |

- 5** Pivot the release lever down and place it under the tab on the processor cover.



- 1 securing tabs
- 3 release levers

- 2 processor cover
- 4 processor

## Postrequisites

- 1 Replace the processor liquid-cooling assembly. See "Replacing the Processor Liquid-Cooling Assembly" on page 72.
- 2 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 3 Follow the steps in "After Working Inside Your Computer" on page 15.





# Power-Supply Unit

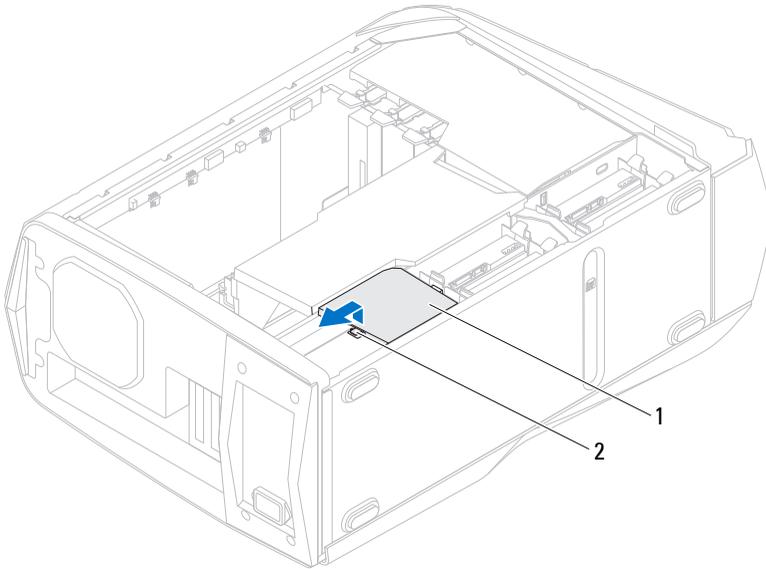
 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.

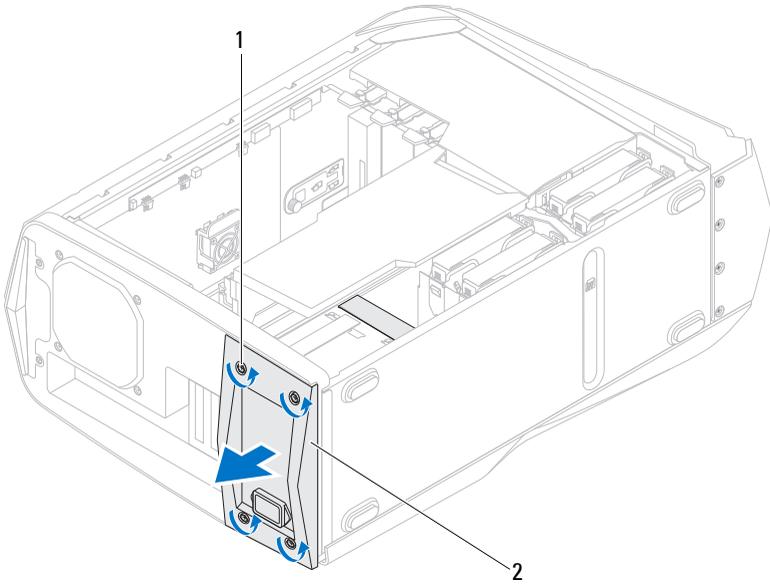
## Removing the Power-Supply Unit

- 1 Lift and hold the tab on the power-supply cover, slide the power-supply cover towards the back of the chassis, and remove the power-supply cover.
- 2 Lift the power-supply cover away from the chassis.



1 power-supply cover      2 tab

- 3 Press the securing clips on the DC-wire harness and disconnect the DC-wire harness from the power-supply unit.
- 4 Loosen the captive screws that secure the power-supply unit to the back of the chassis.
- 5 Slide the power-supply unit out through the back of the chassis.

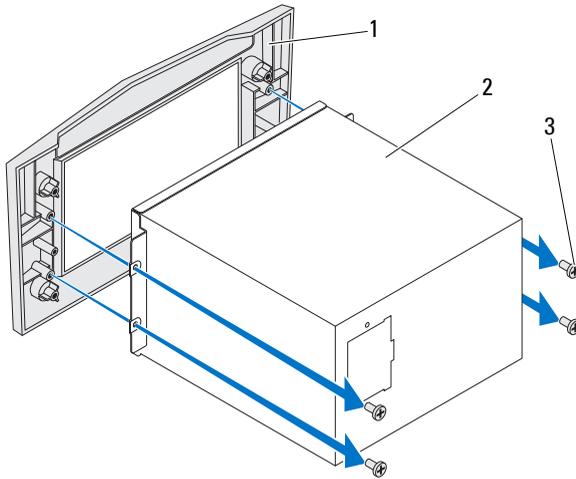


1 captive screws (4)

2 power-supply unit

**6** Remove the screws that secure the power-supply unit to the bezel.

**7** Remove the bezel from the power-supply unit.



- 1 bezel
- 2 power-supply unit
- 3 screws (4)

## Replacing the Power-Supply Unit

- 1 Align the screw holes on the power-supply unit with the screw holes on the bezel.
- 2 Replace the screws that secure the power-supply unit to the bezel.
- 3 Slide the power-supply unit into the chassis through the back of the computer.
- 4 Tighten the captive screws that secure the power-supply unit to the back of the chassis.
- 5 Connect the DC-wire harness to the power-supply unit.
- 6 Align the notch on the power-supply cover with the tab on the chassis.
- 7 Slide the power-supply cover towards the tabs until it locks in place.

## Postrequisites

- 1 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 2 Follow the steps in "After Working Inside Your Computer" on page 15.



## Coin-Cell Battery

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

 **WARNING:** A battery may explode if installed incorrectly. Replace the battery only with the same or equivalent type. Discard used batteries according to the manufacturer's instructions.

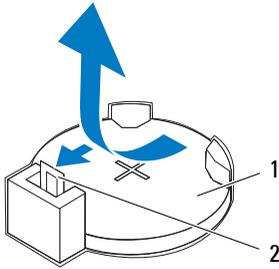
### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the PCI-Express x1 card. See "Removing the PCI-Express x1 Card" on page 49.
- 4 Remove the graphics card. See "Removing the Graphics Card" on page 57.

### Removing the Coin-Cell Battery

 **CAUTION:** Removing the coin-cell battery resets the BIOS settings to default. It is recommended that you note the BIOS settings before removing the coin-cell battery. See "System Setup" on page 145 for instructions on entering the system setup program.

- 1 Locate the battery socket. See "System-Board Components" on page 20.
- 2 Press the battery-release lever to remove the battery.

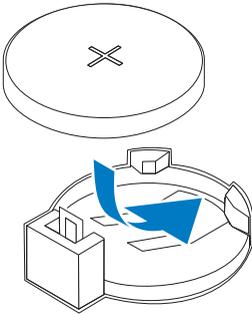


1 coin-cell battery

2 battery-release lever

## Replacing the Coin-Cell Battery

- 1 Insert the battery into the socket with the side labeled + facing up and press down the battery in the socket.



## Postrequisites

- 1 Replace the PCI-Express x1 card. See "Replacing the PCI-Express x1 Card" on page 50.
- 2 Replace the graphics card. See "Replacing the Graphics Card" on page 58.
- 3 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 4 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 5 Follow the steps in "After Working Inside Your Computer" on page 15.

- 6** Enter the system setup program and set the time and date. See "Entering System Setup" on page 145.
- 7** Update the BIOS settings with values you may have noted before replacing the coin-cell battery. See "System Setup" on page 145.



# Theater-Lighting Batteries (ALX Chassis Only)

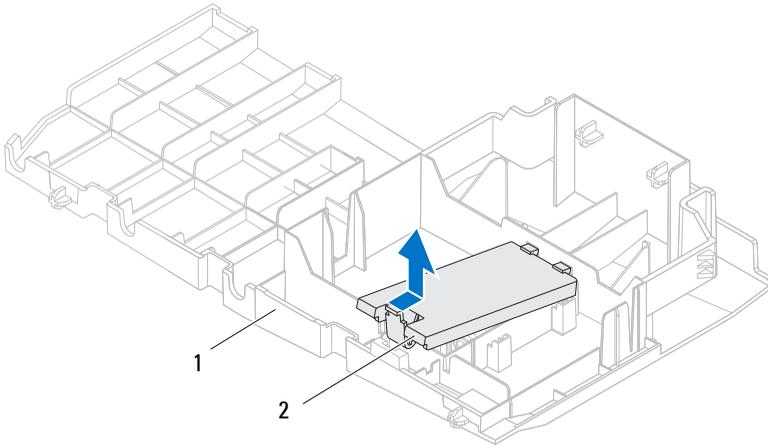
 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.

## Removing the Theater-Lighting Batteries

- 1 Turn the drive-bay shroud over.
- 2 Open the theater-lighting battery compartment door.  
 **NOTE:** Your computer ships with two AA rechargeable batteries.
- 3 Remove the two batteries from the theater-lighting battery compartment.



- 1 drive-bay shroud    2 theater-lighting battery-compartment door

## Replacing the Theater-Lighting Batteries

- 1 Insert the two batteries in the theater-lighting battery compartment.
- 2 Close the theater-lighting battery-compartment door.

## Postrequisites

- 1 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 2 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 3 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 4 Follow the steps in "After Working Inside Your Computer" on page 15.

# System-Board Assembly

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 1 Remove the memory fan. See "Removing the Memory Fan" on page 67.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the graphics card. See "Removing the Graphics Card" on page 57.
- 4 Remove the PCI-Express x1 card. See "Removing the PCI-Express x1 Card" on page 49.
- 5 Remove the coin-cell battery. See "Removing the Coin-Cell Battery" on page 89.
- 6 Remove the memory module(s). See "Memory Module(s)" on page 63.
- 7 Remove the processor liquid-cooling assembly. See "Removing the Processor Liquid-Cooling Assembly" on page 71.
- 8 Remove the processor. See "Removing the Processor" on page 75.

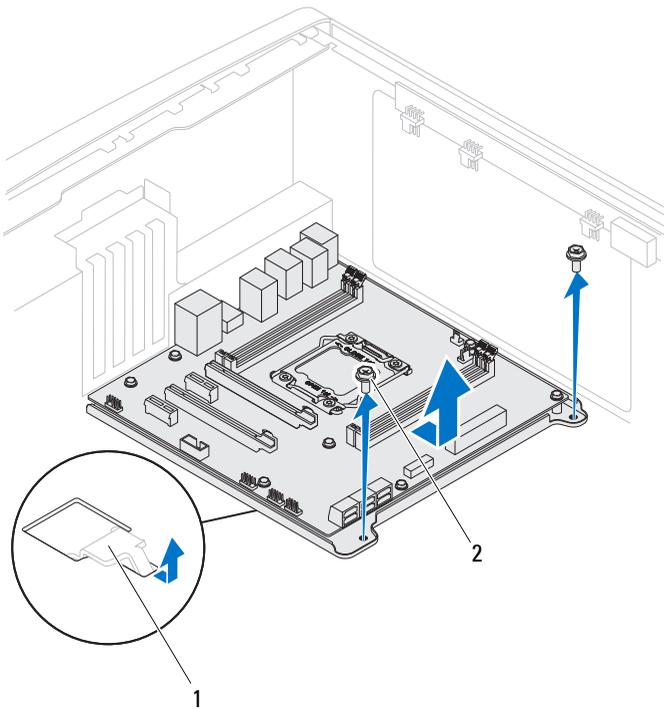
## Removing the System-Board Assembly

 **NOTE:** Your computer's service tag is stored in the system board. You must enter the service tag in the BIOS after you replace the system-board assembly.

 **NOTE:** Before disconnecting the cables from the system board, note the location of the connectors, so that you can reconnect them correctly after you replace the system-board assembly.

- 1 Disconnect all the cables connected to the system-board assembly.
- 2 Remove the screws that secure the system-board assembly to the chassis.

- 3 Slide the system-board assembly towards the front of the chassis to disengage it from the latches that secure it to the chassis.
- 4 Lift the system-board assembly out of the chassis.



1 latch      2 screws (2)

## Replacing the System-Board Assembly

- 1 Align the connectors on the system-board assembly with the slots on the chassis and place the system-board assembly in position.
- 2 Slide the system-board assembly towards the back of the chassis and engage the latches that secure it to the chassis.
- 3 Replace the screws that secure the system-board assembly to the chassis.

- 4 Route and connect the cables that you disconnected from the system-board assembly.



**NOTE:** For information on system board connectors, see "System-Board Components" on page 20.

## Postrequisites

- 1 Replace the processor. See "Replacing the Processor" on page 78.
- 2 Replace the processor liquid-cooling assembly. See "Replacing the Processor Liquid-Cooling Assembly" on page 72.
- 3 Replace the memory module(s). See "Replacing Memory Module(s)" on page 64.
- 4 Replace the coin-cell battery. See "Replacing the Coin-Cell Battery" on page 90.
- 5 Replace the PCI-Express x1 card. See "Replacing the PCI-Express x1 Card" on page 50.
- 6 Replace the graphics card. See "Replacing the Graphics Card" on page 58.
- 7 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 8 Replace the memory fan. See "Replacing the Memory Fan" on page 68.
- 9 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 10 Follow the steps in "After Working Inside Your Computer" on page 15.

## Entering the Service Tag in BIOS

- 1 Turn on the computer.
- 2 Press <F2> during POST to enter the system setup program.
- 3 Navigate to the main tab and enter the service tag in the **Service Tag Setting** field.



# Master I/O Board

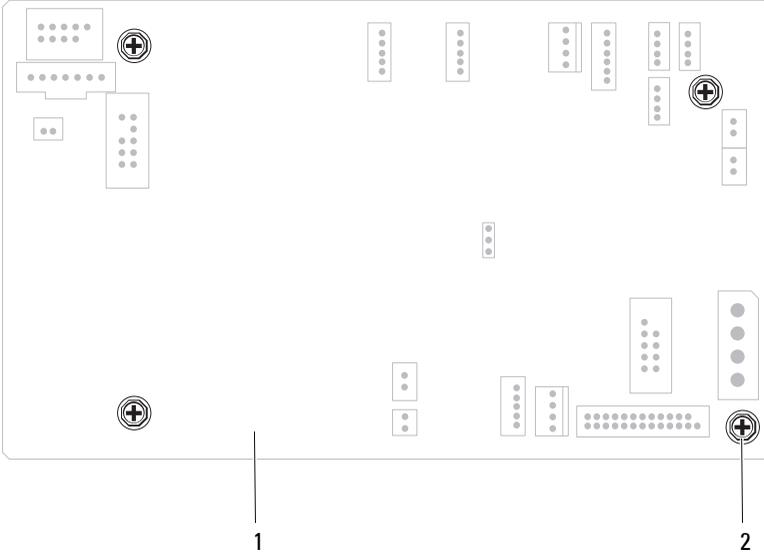
 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.
- 4 Remove the PCI-fan. See "Removing the PCI-Fan" on page 53.

## Removing the Master I/O Board

- 1 Disconnect all cables from the connectors on the master I/O board.
  -  **NOTE:** Note the routing of all cables as you remove them so that you can re-route them correctly after you replace the master I/O board.
- 2 Remove the screws that secure the master I/O board to the chassis.
- 3 Remove the master I/O board out of the chassis.



- 1 master I/O board      2 screws (4)

## Replacing the Master I/O Board

- 1 Align the screw holes on the master I/O board to the screw holes on the chassis and place the master I/O board in the chassis.
- 2 Replace the screws that secure the master I/O board to the chassis.
- 3 Route and connect the cables that you removed from the connectors on the master I/O board.

 **NOTE:** For information on master I/O board connectors, see "Master I/O Board Components" on page 21.

## Postrequisites

- 1 Replace the PCI-fan. See "Replacing the PCI-Fan" on page 54.
- 2 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.

- 3** Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 4** Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 5** Follow the steps in "After Working Inside Your Computer" on page 15.



## Top Lighting-Board



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

### Prerequisites

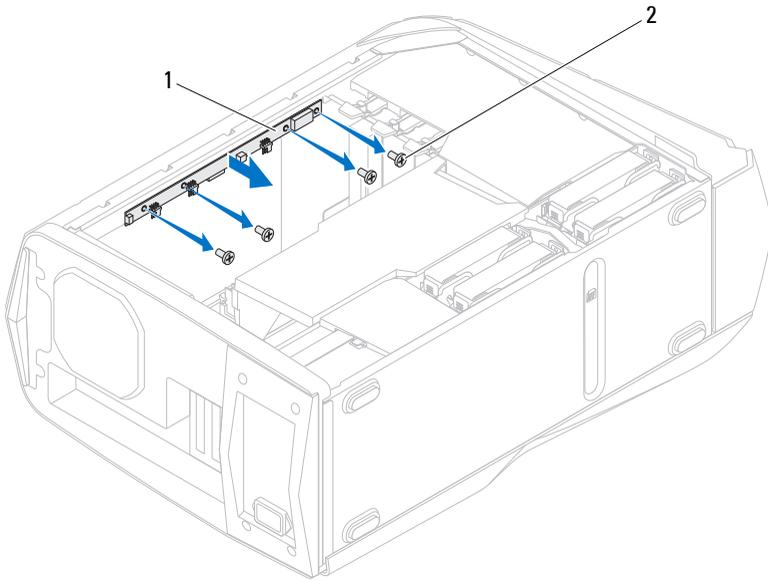
- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Remove the optical drive(s). See "Removing the Optical Drive(s)" on page 37.
- 3 Remove the media-card reader, if installed. See "Removing the Media-Card Reader" on page 41.

### Removing the Top Lighting-Board



**NOTE:** Before disconnecting the cables from the top lighting-board, note the location of the connectors, so that you can reconnect them correctly after you replace the top lighting-board.

- 1 Disconnect all cables from the connectors on the top lighting-board.
- 2 Remove the screws that secure the top lighting-board to the chassis and remove the top lighting-board.



- 1 top lighting-board    2 screws (4)

## Replacing the Top Lighting-Board

- 1 Align the screw holes on the top lighting-board with the screw holes on the chassis.
- 2 Replace the screws that secure the top lighting-board to the chassis.
- 3 Connect the cables to the connectors on the top lighting-board.

## Postrequisites

- 1 Replace the media-card reader, if installed. See "Replacing the Media-Card Reader" on page 43.
- 2 Replace the optical drive(s). See "Replacing the Optical Drive(s)" on page 38.

- 3** Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 4** Follow the steps in "After Working Inside Your Computer" on page 15.



## Right-Side Top Panel

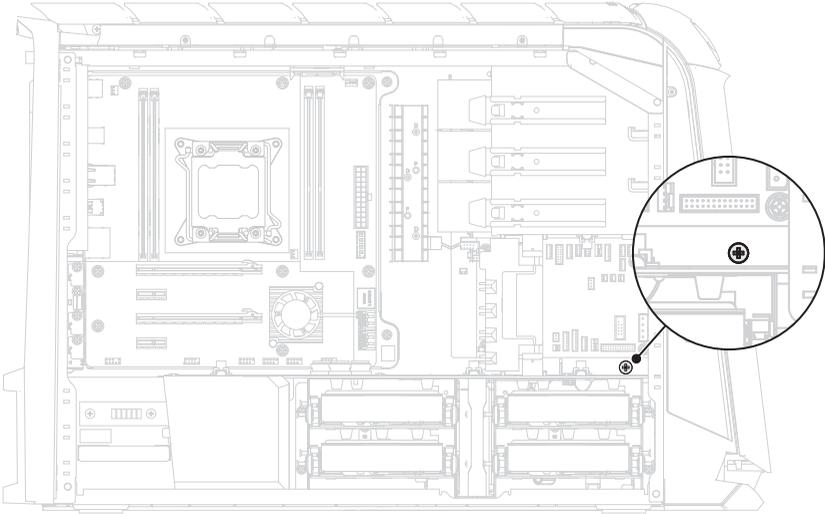
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### Prerequisites

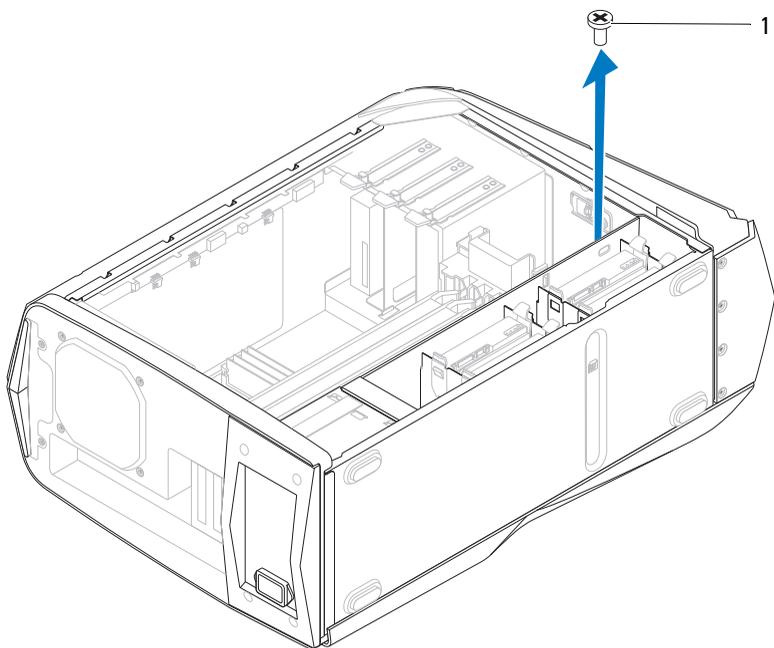
- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.

### Removing the Right-Side Top Panel

- 1 Locate the screw that secures the right-side top panel to the chassis.



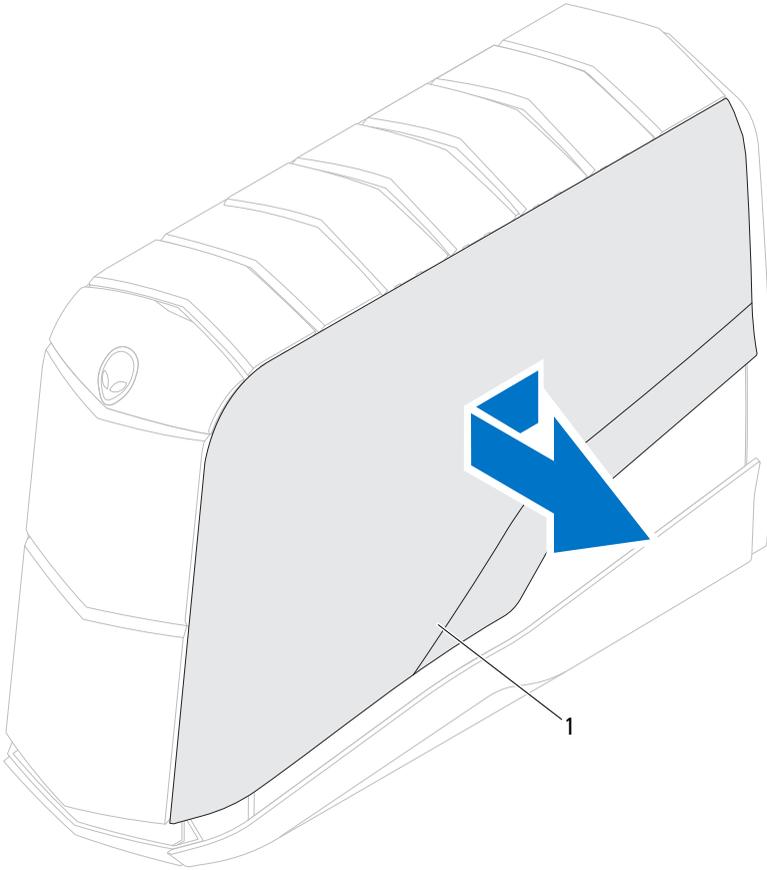
**2** Remove the screw that secures the right-side top panel.



**1** screw

**3** Place the computer in an upright position.

**4** Slide the right-side top panel towards the front of the computer and pull it away from the chassis.



- 1 right-side top panel

## Replacing the Right-Side Top Panel

- 1 Align the tabs on the right-side top panel with the slots on the chassis and slide the panel into position.
- 2 Place the computer on its side with the right side facing up.

- 3 Replace the screw that secures the right-side top panel to the chassis.

## **Postrequisites**

- 1 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 2 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 3 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 4 Follow the steps in "After Working Inside Your Computer" on page 15.



## Right-Side Middle Panel

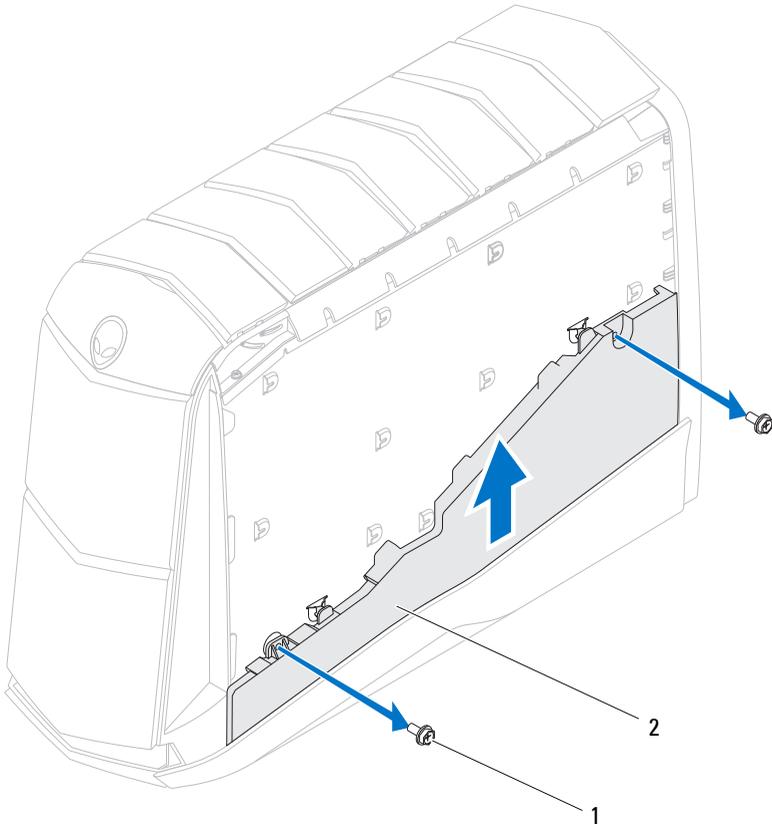
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### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Follow the steps in "After Working Inside Your Computer" on page 15." on page 46.
- 4 Remove the right-side top panel. See "Removing the Right-Side Middle Panel" on page 113.
- 5 Remove the right lighting-board. See "Removing the Right Lighting-Board" on page 117.

### Removing the Right-Side Middle Panel

- 1 Remove the screws that secure the right-side middle panel to the chassis.
- 2 Lift the right-side middle panel up and away from the chassis.



- 1 screws (2)      2 right-side middle panel

## Replacing the Right-Side Middle Panel

- 1 Align the right-side middle panel on top of the right-side bottom panel.
- 2 Replace the screws that secure the right-side middle panel to the chassis.

## Postrequisites

- 1** Replace the right lighting-board. See "Replacing the Right Lighting-Board" on page 118.
- 2** Replace the right-side top panel. See "Replacing the Right-Side Top Panel" on page 110.
- 3** Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 4** Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 5** Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 6** Follow the steps in "After Working Inside Your Computer" on page 15.



## Right Lighting-Board

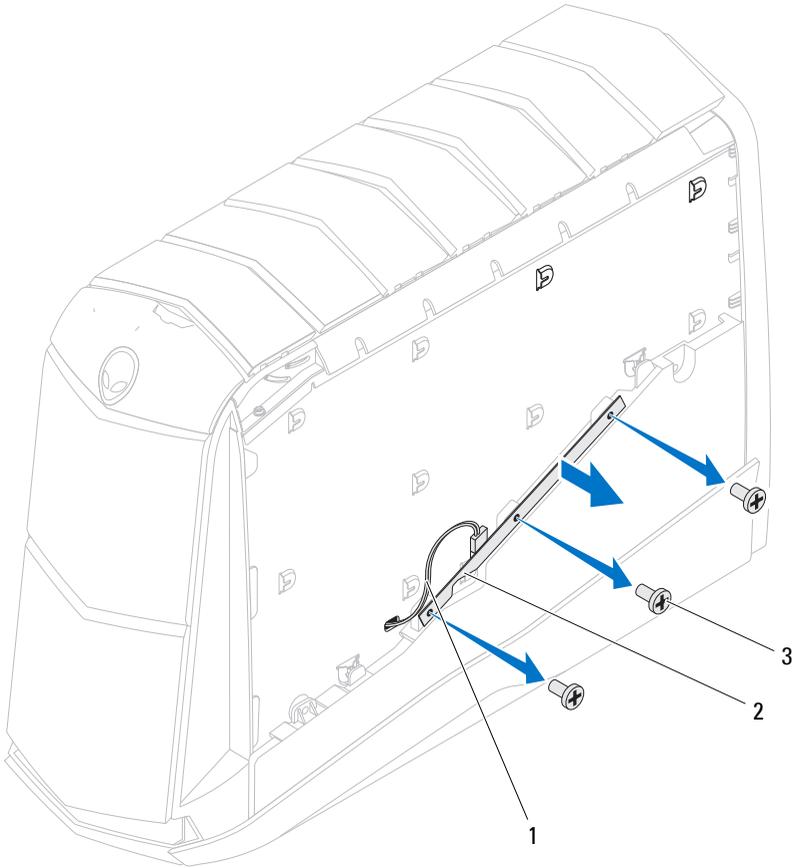
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### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.
- 4 Remove the right-side top panel. See "Removing the Right Lighting-Board" on page 117.

### Removing the Right Lighting-Board

- 1 Disconnect the right lighting-board cable from the SIDE\_R connector on the master I/O board.
- 2 Note the right lighting-board cable routing and remove it from the slot on the computer.
- 3 Remove the screws that secure the right lighting-board to the right-side middle panel.
- 4 Lift the right lighting-board along with its cable away from the right-side middle panel.



- 1 right lighting-board cable
- 2 right lighting-board
- 3 screws (3)

## Replacing the Right Lighting-Board

- 1 Route the right lighting-board cable through the slot on the computer.
- 2 Align the screw holes on the right lighting-board with the screw holes on the right-side middle panel.

- 3 Replace the screws that secure the right lighting-board to the right-side middle panel.
- 4 Connect the right lighting-board cable to the connector on the master I/O board.

## Postrequisites

- 1 Replace the right-side top panel. See "Replacing the Right-Side Top Panel" on page 110.
- 2 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 3 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 4 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 5 Follow the steps in "After Working Inside Your Computer" on page 15.



## Right-Side Bottom Panel

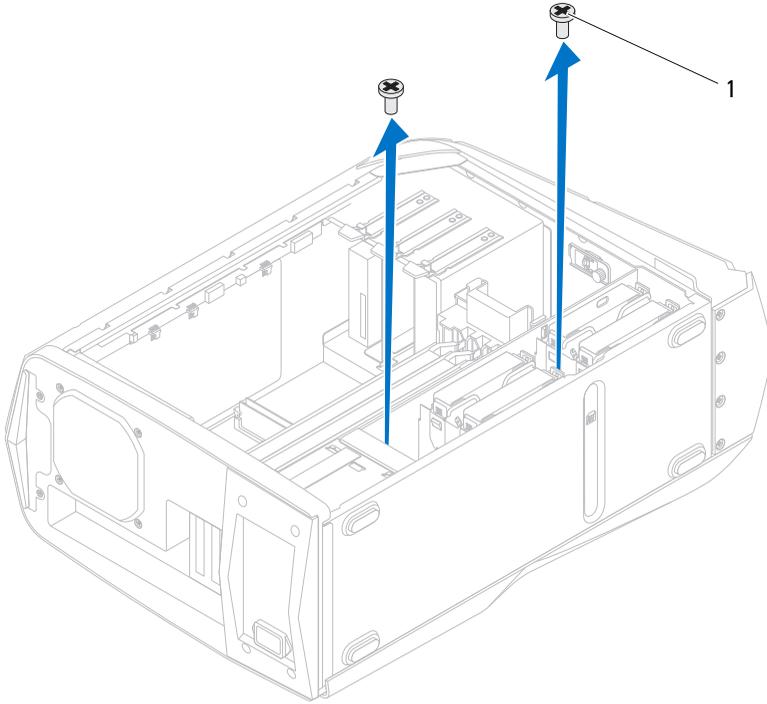
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### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.
- 4 Remove the hard-drive fan assembly. See "Follow the steps in "After Working Inside Your Computer" on page 15." on page 69.
- 5 Remove the power-supply unit. See "Removing the Power-Supply Unit" on page 83.
- 6 Remove the right-side top panel. See "Removing the Right-Side Bottom Panel" on page 121.
- 7 Remove the right lighting-board. See "Removing the Right Lighting-Board" on page 117.
- 8 Remove the right-side middle panel. See "Removing the Right-Side Middle Panel" on page 113.

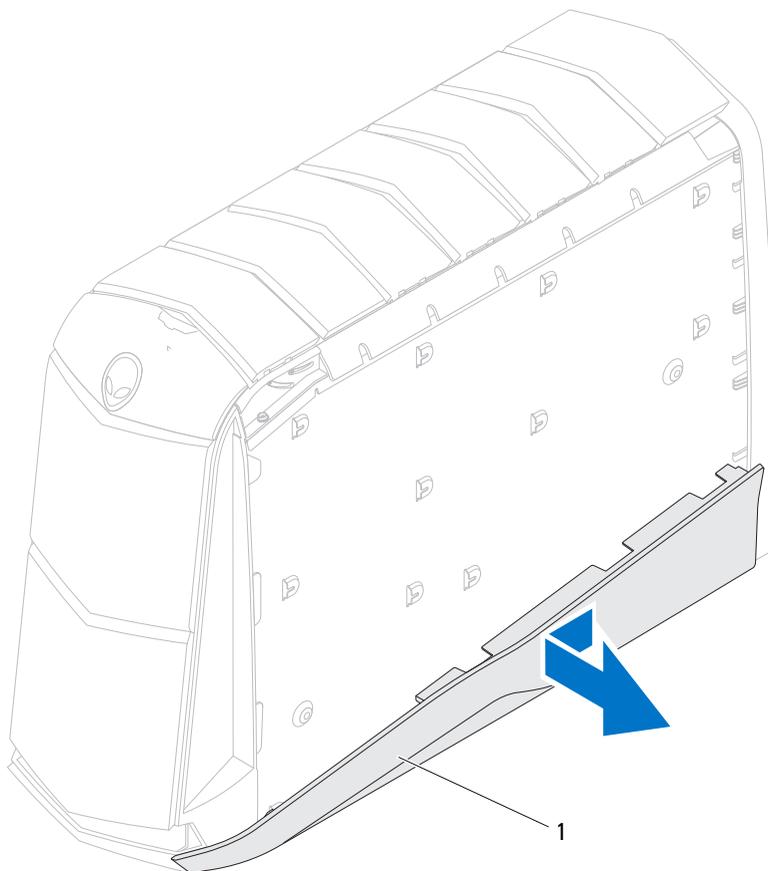
### Removing the Right-Side Bottom Panel

- 1 Remove the screws that secure the right-side bottom panel to the chassis.



1 screws (2)

2 Slide and remove the right-side bottom panel from the chassis.



- 1 right-side bottom panel

## Replacing the Right-Side Bottom Panel

- 1 Align the tabs on the right-side bottom panel with the slots on the chassis and slide the panel into position.
- 2 Replace the screws that secure the right-side bottom panel to the chassis.

## Postrequisites

- 1** Replace the right-side middle panel. See "Replacing the Right-Side Middle Panel" on page 114.
- 2** Replace the right lighting-board. See "Replacing the Right Lighting-Board" on page 118.
- 3** Replace the right-side top panel. See "Replacing the Right-Side Top Panel" on page 110.
- 4** Replace the power-supply unit. See "Replacing the Power-Supply Unit" on page 86.
- 5** Replace the hard-drive fan assembly. See "Replacing the Hard-Drive Fan Assembly" on page 34.
- 6** Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 7** Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 8** Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 9** Follow the steps in "After Working Inside Your Computer" on page 15.

## Top Vent



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

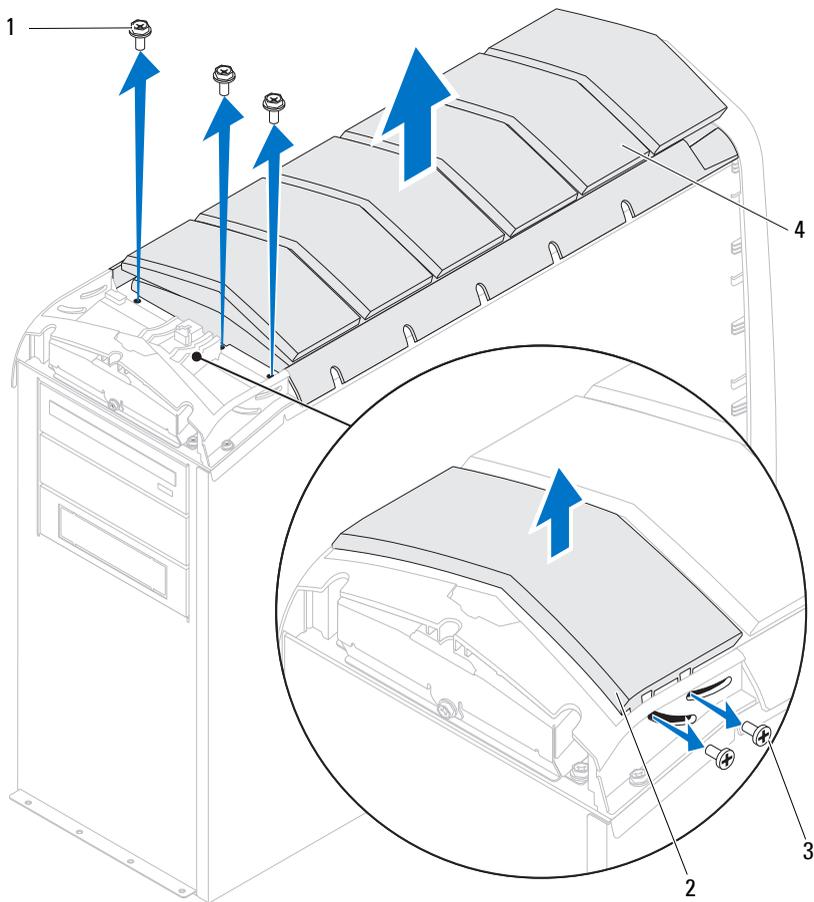
### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Remove the memory fan. See "Removing the Memory Fan" on page 67.
- 3 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 4 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.
- 5 Remove the top lighting-board. See "Removing the Top Lighting-Board" on page 103.
- 6 Remove the system board. See "Removing the System-Board Assembly" on page 95.
- 7 Remove the right-side top panel. See "Removing the Right-Side Top Panel" on page 107.

### Removing the Top Vent

- 1 Remove the screws that secure the top vent to the chassis.





- |   |                      |   |                     |
|---|----------------------|---|---------------------|
| 1 | top-vent screws (3)  | 2 | top I/O panel cover |
| 3 | top-panel screws (2) | 4 | top vent            |

## Replacing the Top Vent

- 1 Align the screw holes on the top vent with the screw holes on the chassis.
- 2 Replace the screws that secure the top vent to the chassis.

- 3 Align the top panel with the slots in the chassis and replace the screws that secure the top panel to the chassis.
- 4 Place the computer on its side with the left side facing up.
- 5 Replace the screws that secure the top vent to the top of the chassis.

## Postrequisites

- 1 Replace the right-side top panel. See "Replacing the Right-Side Top Panel" on page 110.
- 2 Replace the system board. See "Replacing the System-Board Assembly" on page 96.
- 3 Replace the top lighting-board. See "Replacing the Top Lighting-Board" on page 104.
- 4 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 5 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 6 Replace the memory fan. See "Replacing the Memory Fan" on page 68.
- 7 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 8 Follow the steps in "After Working Inside Your Computer" on page 15.

## Front Bezel

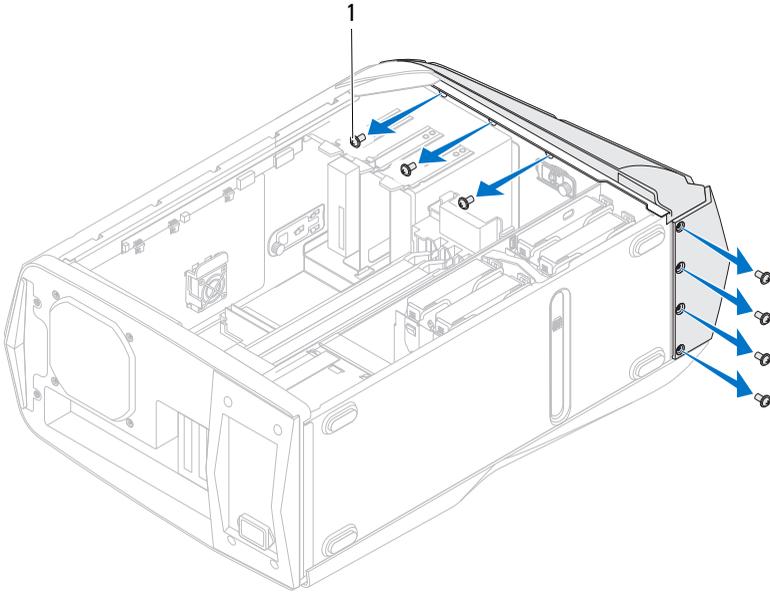
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### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.
- 4 Remove the right-side top panel. See "Removing the Right-Side Top Panel" on page 107.
- 5 Remove the right lighting-board. See "Removing the Right Lighting-Board" on page 117.
- 6 Remove the right-side middle panel. See "Removing the Right-Side Middle Panel" on page 113.
- 7 Remove the right-side bottom panel. See "Removing the Right-Side Bottom Panel" on page 121.

### Removing the Front Bezel

- 1 Remove the screws that secure the front bezel to the chassis.
- 2 Note the routing of the front-bezel cables and disconnect the front bezel cables from the connectors on the master I/O board.

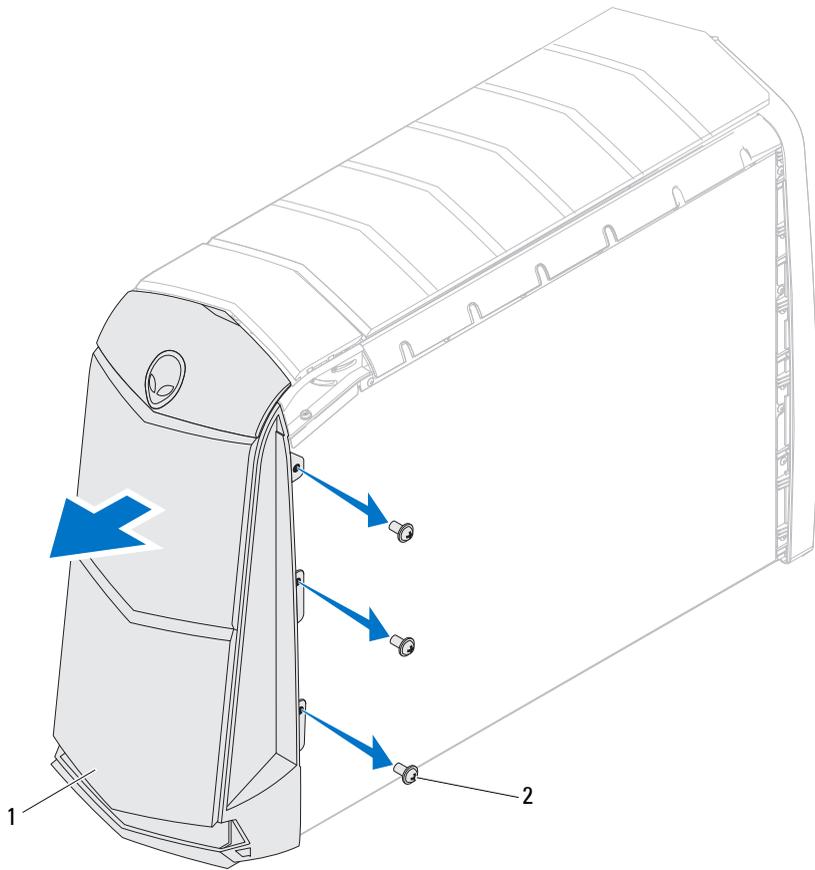


**1** screws (7)

**3** Place the computer in an upright position.

**4** Remove the screws that secure the front bezel to the chassis.

**5** Pull the front bezel away from the chassis.



- 1 front bezel      2 screws (3)

## Replacing the Front Bezel

- 1 Align the front bezel with the front of the chassis.
- 2 Replace the screws on the right side that secure the front bezel to the chassis.
- 3 Place the computer on its side with the left side facing up.

- 4 Route and connect the front-bezel cables to the connectors on the master I/O board.
- 5 Replace the screws that secure the front bezel to the chassis.

## Postrequisites

- 1 Replace the right-side bottom panel. See "Replacing the Right-Side Bottom Panel" on page 123.
- 2 Replace the right-side middle panel. See "Replacing the Right-Side Middle Panel" on page 114.
- 3 Replace the right lighting-board. See "Replacing the Right Lighting-Board" on page 118.
- 4 Replace the right-side top panel. See "Replacing the Right-Side Top Panel" on page 110.
- 5 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 6 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 7 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 8 Follow the steps in "After Working Inside Your Computer" on page 15.

# Back Bezel

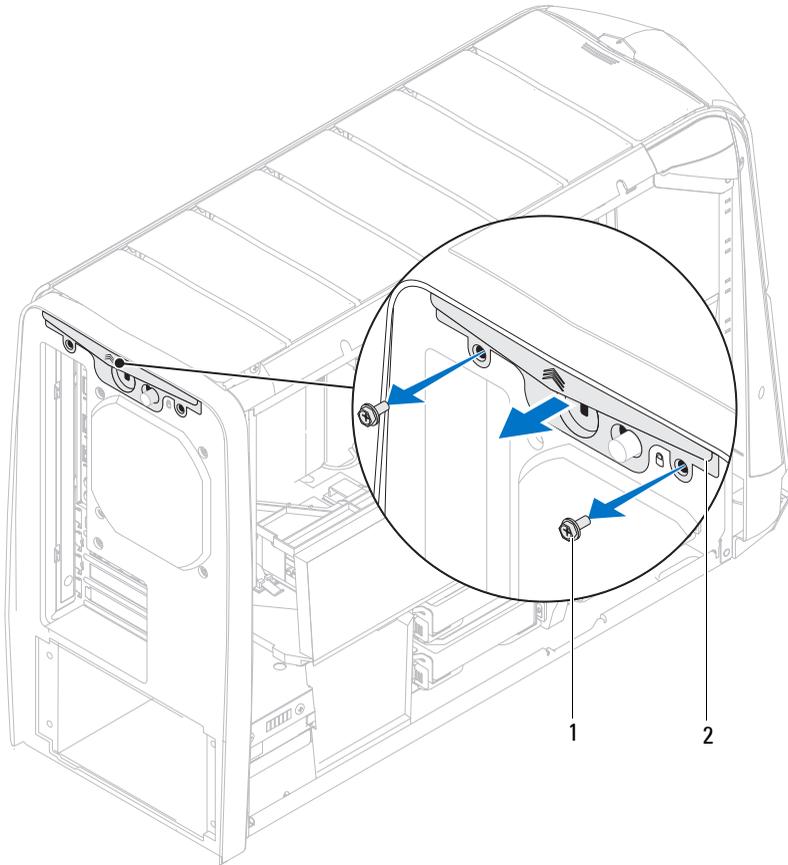
 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Remove the power-supply unit. See "Removing the Power-Supply Unit" on page 83.
- 3 Remove the processor liquid-cooling assembly. See "Removing the Processor Liquid-Cooling Assembly" on page 71.

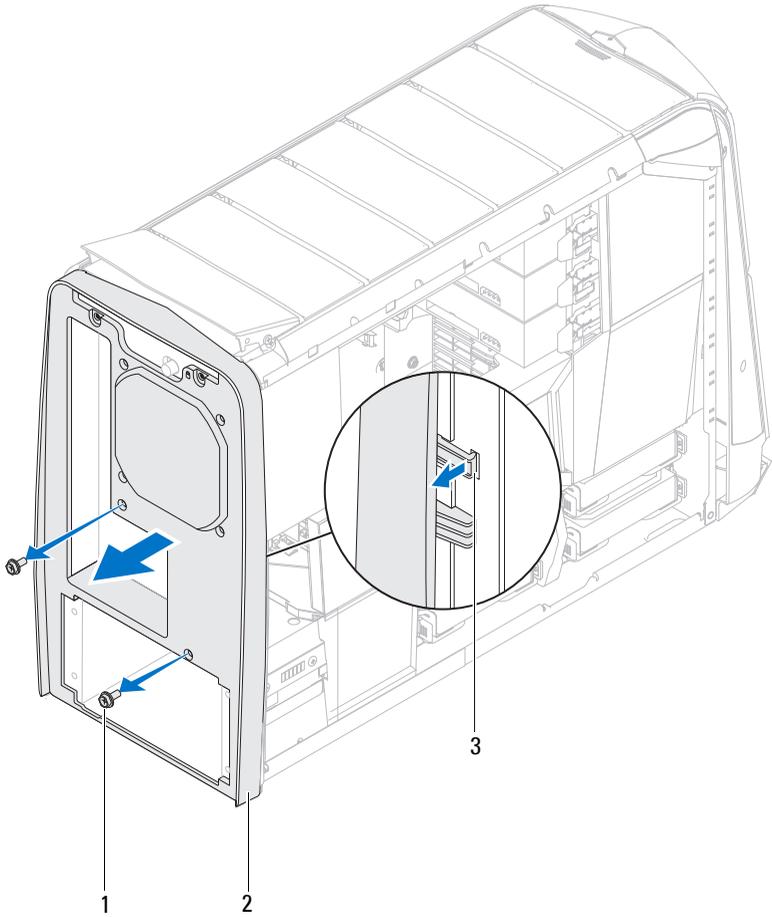
## Removing the Back Bezel

- 1 Remove the screws that secure the security-lock panel to the chassis.
- 2 Pull the security-lock panel away from the chassis.



1 screws (2)      2 security-lock panel

- 3 Remove the screws that secure the back bezel to the chassis.
- 4 Release the tabs that secure the back bezel to the chassis.
- 5 Pull the back bezel away from the chassis.



- 1 screws (2)
- 2 back bezel
- 3 tabs

## Replacing the Back Bezel

- 1 Align the tabs on the back bezel with the slots on the chassis.
- 2 Push the back bezel into place.
- 3 Replace the screws that secure the back bezel to the chassis.
- 4 Replace the screws that secure the security-lock panel to the chassis.

## Postrequisites

- 1 Replace the processor liquid-cooling assembly. See "Replacing the Processor Liquid-Cooling Assembly" on page 72.
- 2 Replace the power-supply unit. See "Replacing the Power-Supply Unit" on page 86.
- 3 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 4 Follow the steps in "After Working Inside Your Computer" on page 15.

# WiFi/Bluetooth Assembly



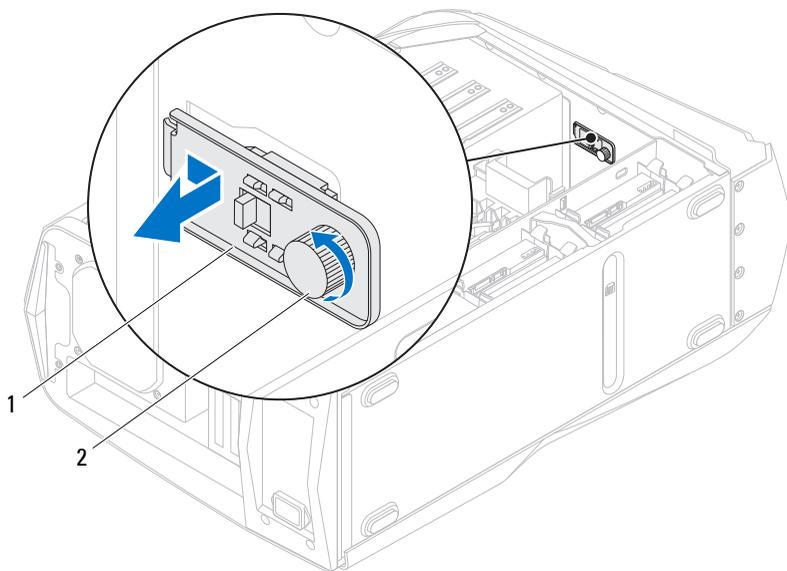
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.

## Removing the WiFi/Bluetooth Card

- 1 Disconnect the WiFi/Bluetooth assembly cable from the connector on the master I/O board.
- 2 Loosen the thumbscrew that secures the WiFi/Bluetooth assembly to the chassis.
- 3 Slide and pull the WiFi/Bluetooth assembly away from the chassis.



- 1 WiFi/Bluetooth assembly      2 thumbscrew

## Replacing the WiFi/Bluetooth Card

- 1 Align the tab on the WiFi/Bluetooth assembly with the slot on the chassis and slide it into position.
- 2 Tighten the thumbscrew that secures the WiFi/Bluetooth assembly to the chassis.
- 3 Connect the WiFi/Bluetooth assembly cable to the connector on the master I/O board.

## Postrequisites

- 1 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 2 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.

- 3** Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 4** Follow the steps in "After Working Inside Your Computer" on page 15.



## Top I/O Panel



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

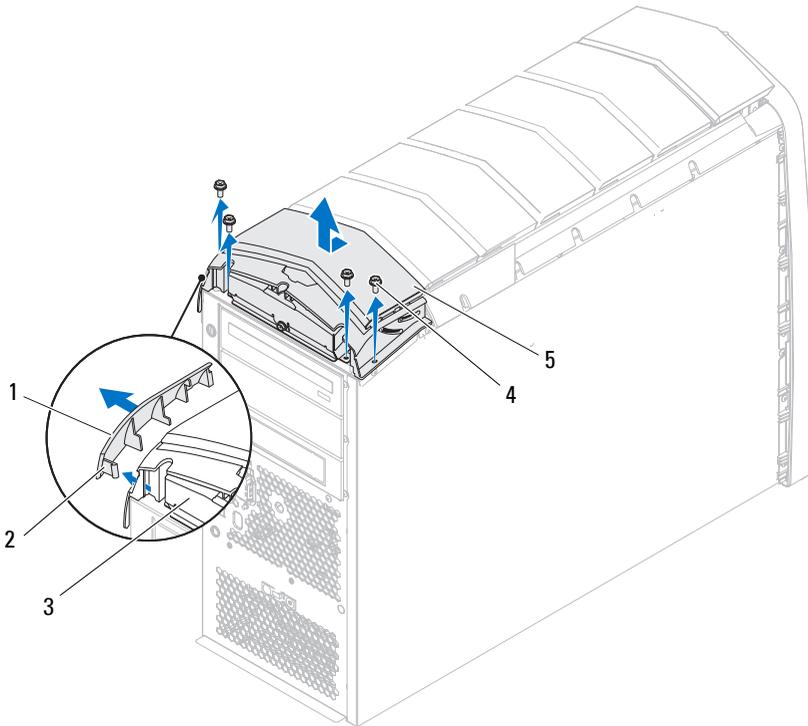
### Prerequisites

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Open the PCI shroud. See "Opening the PCI Shroud" on page 45.
- 3 Remove the drive-bay shroud. See "Removing the Drive-Bay Shroud" on page 47.
- 4 Remove the PCI-Express x1 card. See "Removing the PCI-Express x1 Card" on page 49.
- 5 Remove the graphics card. See "Removing the Graphics Card" on page 57.
- 6 Remove the PCI-fan. See "Removing the PCI-Fan" on page 53.
- 7 Remove the right-side top panel. See "Removing the Right-Side Top Panel" on page 107.
- 8 Remove the right lighting-board. See "Removing the Right Lighting-Board" on page 117.
- 9 Remove the right-side middle panel. See "Removing the Right-Side Middle Panel" on page 113.
- 10 Remove the right-side bottom panel. See "Removing the Right-Side Bottom Panel" on page 121.
- 11 Remove the front bezel. See "Removing the Front Bezel" on page 129.

### Removing the Top I/O Panel

- 1 Push the tab on the panel insert to release the panel insert from the slot on the chassis.
- 2 Pull the panel insert away from the chassis.

- 3 Remove the screws that secure the top I/O panel to the chassis.
- 4 Disconnect the top I/O panel cables from the connectors on the system board and master I/O board.
- 5 Slide and remove the top I/O panel out of the chassis.



- |   |               |   |            |
|---|---------------|---|------------|
| 1 | panel insert  | 2 | tab        |
| 3 | top I/O panel | 4 | screws (4) |
| 5 | top panel     |   |            |

## Replacing the Top I/O Panel

- 1 Slide the tabs on the top I/O panel into the slots on the chassis.

- 2 Connect the top I/O panel cables to the connectors on the system board and master I/O board.
- 3 Replace the screws that secure the top I/O panel to the chassis.
- 4 Align the tabs on the panel insert with the slots on the computer chassis.

## Postrequisites

- 1 Replace the front bezel. See "Replacing the Front Bezel" on page 131.
- 2 Replace the right-side bottom panel. See "Replacing the Right-Side Bottom Panel" on page 123.
- 3 Replace the right-side middle panel. See "Replacing the Right-Side Middle Panel" on page 114.
- 4 Replace the right lighting-board. See "Replacing the Right Lighting-Board" on page 118.
- 5 Replace the right-side top panel. See "Replacing the Right-Side Top Panel" on page 110.
- 6 Replace the PCI-fan. See "Replacing the PCI-Fan" on page 54.
- 7 Replace the PCI-Express x1 card. See "Replacing the PCI-Express x1 Card" on page 50.
- 8 Replace the drive-bay shroud. See "Replacing the Drive-Bay Shroud" on page 48.
- 9 Close the PCI shroud. See "Closing the PCI Shroud" on page 46.
- 10 Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 11 Follow the steps in "After Working Inside Your Computer" on page 15.



# System Setup

## Overview

Use the system setup to:

- get information about the hardware installed in your computer, such as the amount of RAM, the size of the hard drive, and so on
- change the system configuration information
- set or change a user-selectable option, such as the user password, type of hard drive installed, enabling or disabling base devices, and so on



**NOTE:** Before you change system setup, it is recommended that you note the system-setup screen information for future reference.

## Entering System Setup

- 1 Turn on (or restart) your computer.
- 2 During POST, when the DELL logo is displayed, watch for the F2 prompt to appear and then 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, and then press <F2>. If you press <F2> before the F2 prompt, this keystroke is lost. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then, turn off your computer and try again. See "Turn Off Your Computer and Connected Devices" on page 13.

## System Setup Screens

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

<p><b>Setup Item</b> — This field appears on the left side of the system setup window. The field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features.</p> <p>Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the <b>Help Screen</b> displays more information about that option and available settings.</p>	<p><b>Help Screen</b> — This field appears on the right side of the system setup window and contains information about each option listed in the <b>Setup Item</b>. In this field you can view information about your computer and make changes to your current settings.</p> <p>Press the up-arrow and down-arrow keys to highlight an option. Press &lt;Enter&gt; to make that selection active and return to the <b>Setup Item</b>.</p> <p><b>NOTE:</b> Not all settings listed in the <b>Setup Item</b> are changeable.</p>
<p><b>Key Functions</b> — This field appears below the <b>Help Screen</b> and lists keys and their functions within the active system setup field.</p>	

### System Setup Options

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

---

**Main**

---

BIOS Information	
Product Information	
Build Date	Displays the BIOS release date.
Product Name	Displays the product name.
BIOS Version	Displays the BIOS version number.
Set Service Tag	Allows you to enter the service tag of your computer.
Asset Tag	Displays the asset tag of the computer.
Memory Information	
Total Memory	Displays the total memory of the computer.
Memory Available	Displays the amount of memory available on the computer.

Memory Technology	Displays the type of memory technology used.
Memory Speed	Displays the memory speed.
CPU Information	
Processor ID	Displays the processor identification code.
CPU Speed	Displays the processor speed.
Cache L2	Displays the processor L2 cache size.
Cache L3	Displays the processor L3 cache size.

---

### Advanced — Standard CMOS Features

---

System Date (mm:dd:yy)	Displays current date.
System Time (hh:mm:ss)	Displays the current time.
Device Information	
SATA Port1	Displays the SATA 1 drive integrated in the computer.
SATA Port2	Displays the SATA 2 drive integrated in the computer.
SATA Port3	Displays the SATA 3 drive integrated in the computer.
SATA Port4	Displays the SATA 4 drive integrated in the computer.
SATA Port5	Displays the SATA 5 drive integrated in the computer.
SATA Port6	Displays the SATA 6 drive integrated in the computer.
Wait for 'F1' If Errors	If enabled, the system will HALT during boot to display system errors.

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### Advanced — Advanced BIOS Features

---

Bootup Num-Lock	Select power-on state for num-lock.
-----------------	-------------------------------------

OptionROM Display Screen	Allows you to display or hide the RAID Option ROM screen during POST.
--------------------------	---

---

**Advanced — CPU Configuration**

---

Hyper-threading Technology	If disabled only one thread per enabled core is active.
----------------------------	---

XD Bit Capability	Enable XD Bit Capability to allow the processor to distinguish between the bits of code that can be executed and the ones that cannot be executed.
-------------------	--

Intel(R) Speedstep tech	If enabled, the processor clock speed and core voltage are adjusted dynamically based on the processor load.
-------------------------	--

Active Processor Cores	Allows you to enable the number of cores in each processor package. Options 1-5.
------------------------	--

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**Advanced — Integrated Devices**

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USB Controller	Allows you to enable or disable the integrated USB controller.
----------------	--

HD Audio	Allows you to enable or disable the integrated audio controller.
----------	--

Onboard LAN Controller	Allows you to enable or disable the onboard LAN controller.
------------------------	---

Launch PXE OpROM	Allows you to enable or disable the boot option for legacy network devices.
------------------	---

PCH SATA Configuration	
SATA Mode	Allows you to configure the integrated hard drive controller to AHCI or RAID.

---

**Advanced — Power Management Setup**

---

Suspend Mode	Sets the energy-saving mode of the ACPI function.
--------------	---

AC Recovery	Sets what action the computer takes when power is restored.
-------------	---

Auto Power On	Allows the computer to start up at a certain time.
---------------	--

Auto Power On Date	Allows you to set RTC Wake Up Date.
--------------------	-------------------------------------

Auto Power On Hour	Allows you to set RTC Wake Up Hour.
Auto Power On Minute	Allows you to set RTC Wake Up Minute.
Auto Power On Second	Allows you to set RTC Wake Up Second

---

### **Advanced — Frequency/Voltage Control**

---

Current CPU Frequency	Displays the current processor speed.
Current DRAM Frequency	Displays the current memory speed.
Spread Spectrum	Enabling this option could reduce the EMI.
Internal PLL Overvoltage	Enable Internal PLL Overvoltage for K-SKU CPUs to get better over clocking capability.
DMI Base Clock	Base clock for DMI
CPU Gear Ratio	Base clock for CPU and DRAM only
Adjust CPU Ratio	Allows you to adjust the CPU ratio.
DRAM Frequency	Allows you to adjust the DRAM frequency.
Extreme Memory Profile (X.M.P)	Allows you to change the extreme memory profile value.
DRAM Timing Mode	Allows you to change the memory timing mode.
Advance DRAM Configuration	Allows you to change the Advance DRAM Configuration.
CPU Power Management Configuration	Allows you to access the CPU Power Management Configuration submenu.
Overvoltage Configuration	Allows you to access the Overvoltage Configuration submenu.

---

### **Advance DRAM Configuration Submenu**

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Command Rate	Displays the Command Rate (editable in Manual Mode).
tCL	Displays the Column Address Strobe Latency (editable in Manual Mode).

tRCD	Displays timing of RAS to CAS delay (editable in Manual Mode).
tRP	Displays timing of RAS Precharge (editable in Manual Mode).
tRAS	Displays timing of Row Address Strobe (editable in Manual Mode).
tRFC	Displays timing of Refresh to Archive/Refresh cycle time (editable in Manual Mode).
tWR	Displays timing of Write Recover (editable in Manual Mode).
tWTR	Displays Write to Read Delay (editable in Manual Mode).
tRRD	Displays RAS to RAS delay (editable in Manual Mode).
tRTP	Displays Read to Precharge Command Delay (editable in Manual Mode).
tFAW	Displays the Four Activate Window (editable in Manual Mode).
tWCL	Displays the Write CAS Latency (editable in Manual Mode).
tCKE	Displays the Minimum CKE High and Low Pulse Width (editable in Manual Mode).
tRTL	Displays the Round Trip Latency (editable in Manual Mode).
tXP	Displays the XP value (editable in Manual Mode).

---

### **CPU Power Management Configuration**

---

Intel Turbo Boost	If enabled, allows processor to run at faster frequencies than marked.
Long duration power limit	Allows you to change the long duration power limit.

Long duration maintained	Allows you to change the long duration time limit.
Short duration power limit	Allows you to change the short duration power limit.
1-Core Ratio Limit	Allows you to change the ratio limit of the processor's first core.
2-Core Ratio Limit	Allows you to change the ratio limit of the processor's second core.
3-Core Ratio Limit	Allows you to change the ratio limit of the processor's third core.
4-Core Ratio Limit	Allows you to change the ratio limit of the processor's fourth core.
5-Core Ratio Limit	Allows you to change the ratio limit of the processor's fifth core.
6-Core Ratio Limit	Allows you to change the ratio limit of the processor's sixth core.
VID for Max Turbo Ratio	Allows you to change the VID override for max turbo ration value.

---

### **Overvoltage Configuration Submenu**

---

Dynamic CPU VCore Offset	Allows you to change the Processor Core Voltage Offset value.
DDR3 Memory Voltage	Adjusts the DDR3 Memory Voltage.
DDR3 Memory Voltage	Adjusts the DDR3 Memory Voltage.
DMI and Uncore Voltage (2AH OUT1)	2AH OUT1.
CPU PLL 1.8V	2AH OUT2.
Load Level 1 OC Setting	Allows you to select OC Level Profile 1
Load Level 2 OC Setting	Allows you to select OC Level Profile 2

---

### **Security**

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Supervisor Password:	Allows you to change the supervisor password.
----------------------	---

User Password:	Allows you to change the user password. You cannot use the user password to enter the BIOS setup, during POST.
Set Supervisor Password	Allows you to set a supervisor password.

---

## Boot

---

### Set Boot Priority

1st Boot Device	Displays the first boot device.
2nd Boot Device	Displays the second boot device.
3rd Boot Device	Displays the third boot device.
4th Boot Device	Displays the fourth boot device.
5th Boot Device	Displays the fifth boot device.
6th Boot Device	Displays the sixth boot device.
7th Boot Device	Displays the seventh boot device.

Hard Disk Drive BBS Priorities      Sets the hard drive boot priority. The items displayed are dynamically updated according to the hard drives detected.

CD/DVD ROM Drive BBS Priorities      Sets the CD/DVD drive boot priority.

---

## Exit

---

Provides options to Save Changes and Reset, Discard Changes and Reset, and Restore Defaults.

---

## Boot Sequence

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

### Boot Options

- **Diskette Drive** — The computer attempts to boot from the floppy disk drive. If no operating system is on the drive, the computer generates an error message.
- **Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.

- **CD/DVD/CD-RW Drive** — The computer attempts to boot from the optical drive. If no disc is in the drive, or if the disc is not bootable, the computer generates an error message.
- **USB Storage Device** — Insert the memory device into a USB connector and restart the computer. When **F12 Boot Options** appears in the lower-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu.
  - ✎ **NOTE:** To boot to a USB device, the device must be bootable. To ensure that your device is bootable, check the device documentation.
- **Network** — The computer attempts to boot from the network. If no operating system is found on the network, the computer generates an error message.

### Changing Boot Sequence for the Current Boot

You can use this feature to change the current boot sequence, for example, to boot from the optical drive to run Dell Diagnostics from the *Drivers and Utilities* disc. The previous boot sequence is restored at the next boot.

- 1 If you are booting from a USB device, connect the USB device to a USB connector.
- 2 Turn on (or restart) your computer.
- 3 When **F2 Setup**, **F12 Boot Options** appears in the lower-right corner of the screen, press <F12>.

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

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

- 4 On the **Boot Device Menu** choose the device you want to boot from. For example, if you are booting to a USB memory key, highlight **USB Storage Device** and press <Enter>.

### Changing Boot Sequence for Future Boots

- 1 Enter system setup. See "Entering System Setup" on page 145.
- 2 Use the arrow keys to highlight the **Boot** menu option and 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 move through the list of devices.
- 4 Press plus (+) or minus (-) to change the boot priority of the device.

## Clearing Forgotten Passwords



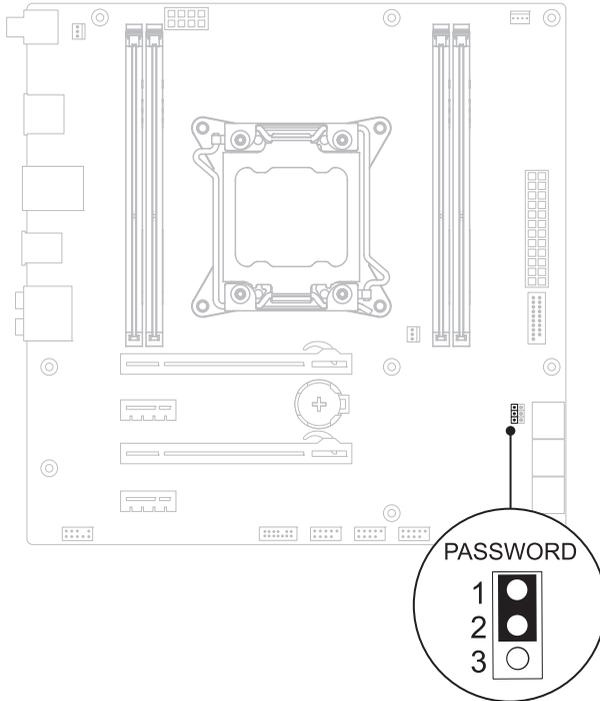
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**WARNING:** The computer must be disconnected from the electrical outlet to clear the CMOS setting.

- 1 Remove the left side-panel. See "Removing the Left Side-Panel" on page 25.
- 2 Locate the 3-pin password reset jumper (PASSWORD\_CLEAR) on the system board. See "System-Board Components" on page 20.
- 3 Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.

## Password:



- 4** Wait for approximately five seconds to clear the password setting.
- 5** Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3.
- 6** Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 7** Follow the steps in "After Working Inside Your Computer" on page 15.

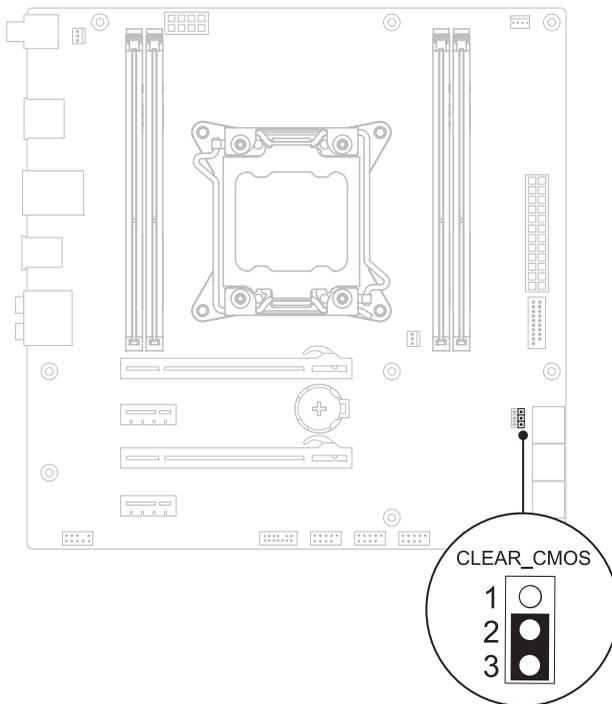
# Clearing CMOS Passwords

**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

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

- 1 Remove the left side-panel. See "Left Side-Panel" on page 25.
- 2 Locate the 3-pin CMOS reset jumper (CMOS\_CLEAR) on the system board. See "System-Board Components" on page 20.
- 3 Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.

## CMOS:



- 4** Wait for approximately five seconds to clear the CMOS setting.
- 5** Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3.
- 6** Replace the left side-panel. See "Replacing the Left Side-Panel" on page 27.
- 7** Follow the steps in "After Working Inside Your Computer" on page 15.



## Flashing the BIOS

The BIOS may require flashing when an update is available or when replacing the system board. To flash the BIOS:

- 1 Turn on the computer.
- 2 Go to [support.dell.com/support/downloads](http://support.dell.com/support/downloads).
- 3 Locate the BIOS update file for your computer:



**NOTE:** The Service Tag for your computer is located on a label at the back of your computer.

If you have your computer's Service Tag:

- a Click **Enter a Tag**.
- b Enter your computer's Service Tag in the **Enter a service tag:** field, click **Go**, and proceed to step 4.

If you do not have your computer's Service Tag:

- a Click **Select Model**.
- b Select the type of product in the **Select Your Product Family** list.
- c Select the product brand in the **Select Your Product Line** list.
- d Select the product model number in the **Select Your Product Model** list.



**NOTE:** If you have selected a different model and want to start over again, click **Start Over** on the top right of the menu.

- e Click **Confirm**.
- 4 A list of results appears on the screen. Click **BIOS**.
- 5 Click **Download Now** to download the latest BIOS file. The **File Download** window appears.
- 6 Click **Save** to save the file on your desktop. The file downloads to your desktop.
- 7 Click **Close** if the **Download Complete** window appears. The file icon appears on your desktop and is titled the same as the downloaded BIOS update file.

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

# Specifications

To learn about the features and advanced options available on your desktop, see **Specifications** at [support.dell.com/manuals](https://support.dell.com/manuals)

