

# XPS 27

# Owner's Manual

**Computer model: XPS 2720**

**Regulatory model: W06C**

**Regulatory type: W06C002**



# Notes, Cautions, and Warnings



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



**CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.



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

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# Before You Begin

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## 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 Move your mouse pointer to the upper/lower-right corner of the screen to open the Charms sidebar, and then click **Settings**→**Power**→**Shut down**.



**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 for 5 seconds after 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).



**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:** 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.



**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.

△ **CAUTION:** Press and eject any installed card from the media-card reader.

## Recommended Tools

The procedures in this document may require the following tools:

- Phillips screwdriver
- Plastic scribe

# After Working Inside Your Computer

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After you complete the replacement procedures, ensure the following:

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



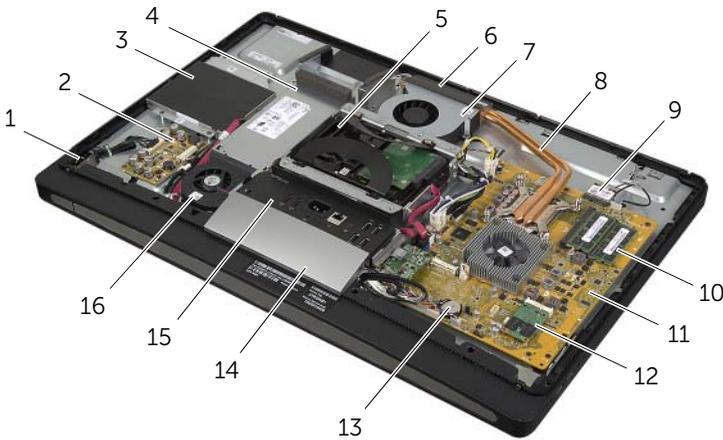
**CAUTION: Before turning on your computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may damage your computer.**

# Technical Overview

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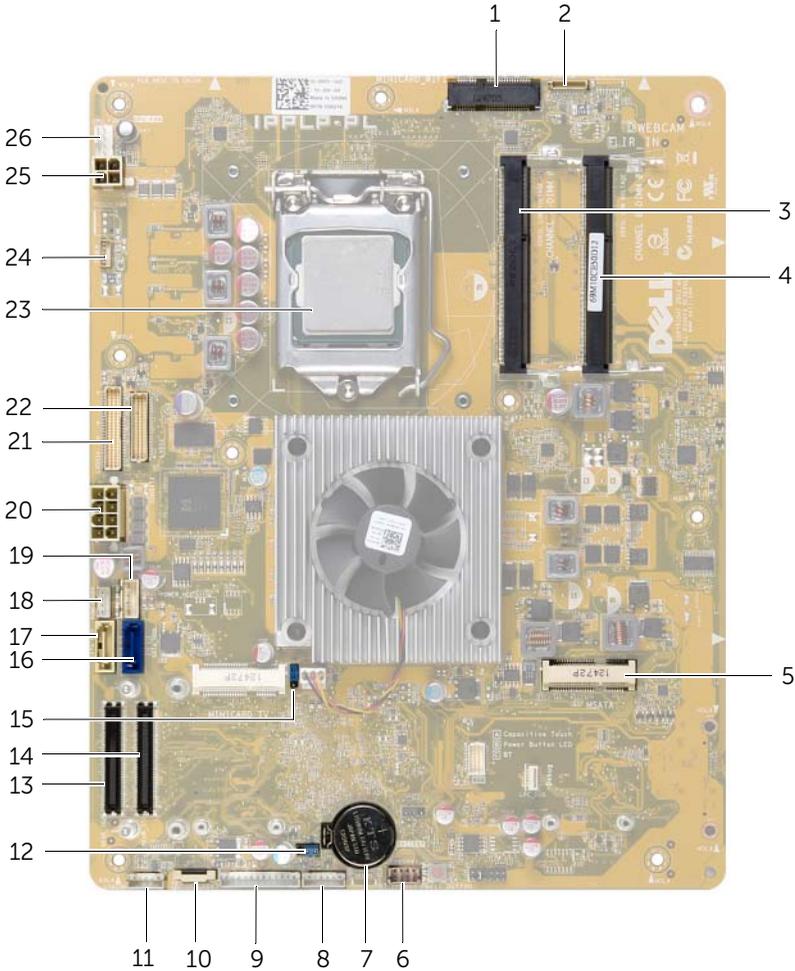
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## Inside View of Your Computer



1	power-button assembly	2	converter board
3	optical-drive assembly	4	power-supply unit
5	hard-drive assembly	6	cooling vents
7	processor heat-sink fan	8	processor heat-sink
9	wireless mini-card	10	memory module(s)
11	system board	12	mSATA mini-card
13	coin-cell battery	14	trim cover
15	I/O panel	16	power-supply fan

# System-Board Components



1	wireless mini-card connector	2	camera-cable connector
3	memory-module connector (CHANNEL A-DIMM)	4	memory-module connector (CHANNEL B-DIMM)
5	mSATA mini-card connector	6	speaker-cable connector
7	coin-cell battery socket	8	power-button cable connector
9	converter-board cable connector	10	input source/display-settings controls cable connector
11	wireless keyboard/mouse receiver cable connector	12	CMOS jumper

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13	I/O-board connector (REAR_IO1)	14	I/O-board connector (REAR_IO2)
15	password jumper	16	hard-drive data-cable connector
17	optical-drive data-cable connector	18	optical-drive power-cable connector
19	hard-drive power-cable connector	20	main (8-pin) power-cable connector
21	LVDS-cable connector (LVDS1)	22	LVDS-cable connector (LVDS2)
23	processor socket	24	touchscreen-cable connector
25	processor (4-pin) power-cable connector	26	processor heat-sink fan-cable connector

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# Removing the Back Cover

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**⚠ 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Place the computer face-down on a clean and flat surface.
- 2 Loosen the captive screws that secure the back cover to the inner frame.
- 3 Slide the back cover toward the top of the computer and lift the back cover off the inner frame.



---

1 captive screws (2)

2 back cover

---

3 inner frame

---

# Replacing the Back Cover

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Place the back cover over the inner frame and slide the back cover toward the bottom of the computer.
- 2 Tighten the captive screws that secure the back cover to the inner frame.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Trim Cover

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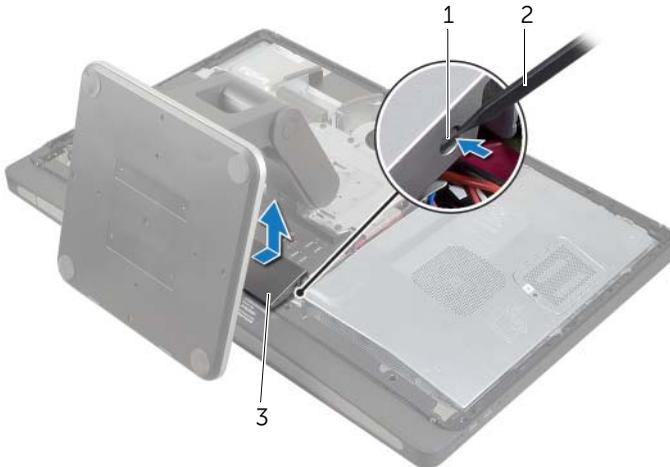
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

Remove the back cover. See "Removing the Back Cover" on page 17.

## Procedure

- 1 Using a plastic scribe, press-in on the tabs to release the trim cover from the inner frame.
- 2 Slide the trim cover toward the top of the computer and then lift the trim cover off the chassis.



---

1 tabs (2)

2 plastic scribe

3 trim cover

---

# Replacing the Trim Cover

---



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## Procedure

- 1 Insert the tabs at the bottom of the trim cover into the slots on the inner frame.
- 2 Press down on the trim cover until the tabs on the inner frame are secured in the slots on either side of the trim cover.

## Postrequisites

- 1 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 2 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Stand

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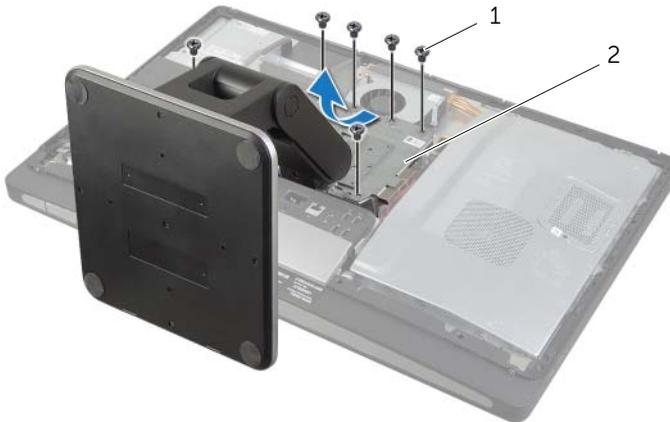
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## Prerequisites

Remove the Back Cover. See "Removing the Back Cover" on page 17.

## Procedure

- 1 Remove the screws that secure the stand to the hard-drive cage.
- 2 Lift and slide the stand off the hard-drive cage.



---

1 screws (6)

2 stand

---

# Replacing the Stand

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## Procedure

- 1 Insert the tab at the top of the stand into the slot on the hard-drive cage.
- 2 Align the screw holes on the stand with the screw holes on the hard-drive cage.
- 3 Replace the screws that secure the stand to the hard-drive cage.

## Postrequisites

- 1 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 2 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Converter Board

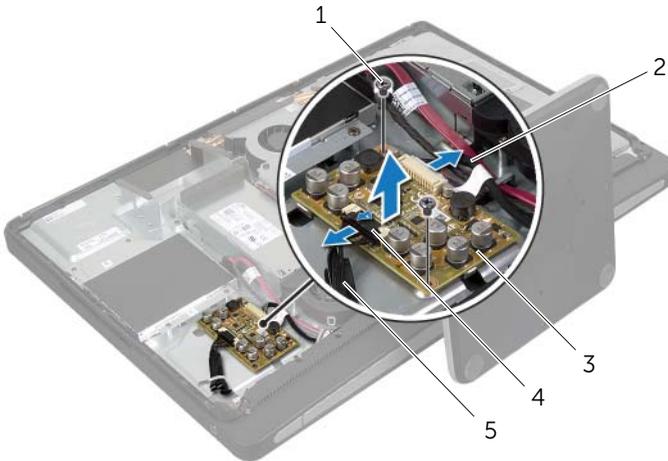
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

Remove the back cover. See "Removing the Back Cover" on page 17.

## Procedure

- 1 Lift the securing tab on the display-backlight cable connector and then disconnect the display-backlight cable from the converter board.
- 2 Disconnect the converter cable from the converter board.
- 3 Remove the screws that secure the converter board to the middle cover.
- 4 Lift the converter board off the middle cover.



---

1	screws (2)	2	converter cable
3	converter board	4	securing tab
5	display-backlight cable		

---

# Replacing the Converter Board

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## Procedure

- 1 Align the screw holes on the converter board with the screw holes on the middle cover.
- 2 Replace the screws that secure the converter board to the middle cover.
- 3 Connect the converter cable to the converter board.
- 4 Connect the display-backlight cable to the convertor board and secure the tab.

## Postrequisites

- 1 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 2 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Optical Drive

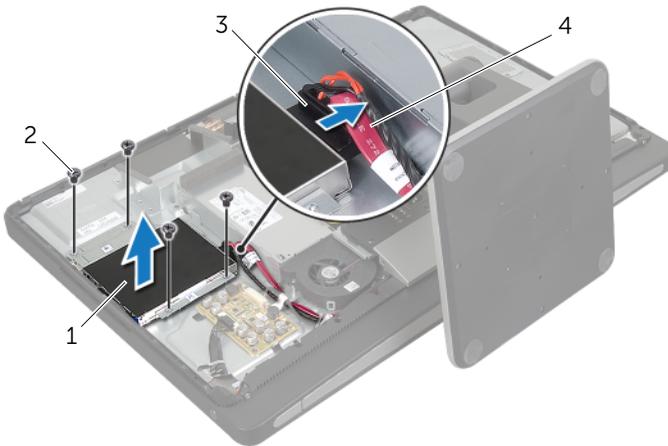
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

Remove the back cover. See "Removing the Back Cover" on page 17.

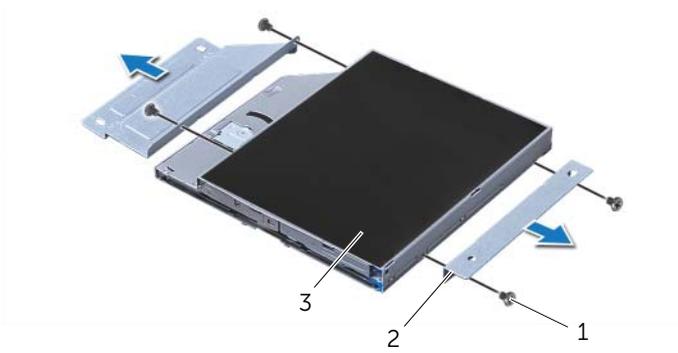
## Procedure

- 1 Remove the screws that secure the optical-drive assembly to the middle cover.
- 2 Gently lift the optical-drive assembly from the middle cover and disconnect the power and data-cable connector from the optical-drive assembly.



1	optical-drive assembly	2	screws (4)
3	power and data-cable connector	4	power and data cable

- 3 Remove the screws that secure the optical-drive brackets to the optical drive.
- 4 Remove the optical-drive brackets from the optical drive.



---

1	screws (4)	2	optical-drive brackets (2)
3	optical drive		

---

# Replacing the Optical Drive

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## Procedure

- 1 Align the screw holes on the optical-drive brackets with the screw holes on the optical drive and replace the screws that secure the optical-drive brackets to the optical drive.
- 2 Connect the power and data-cable connector to the optical-drive assembly.
- 3 Align the screw holes on the optical-drive assembly with the screw holes on the chassis.
- 4 Replace the screws that secure the optical-drive assembly to the chassis.

## Postrequisites

- 1 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 2 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" 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

Remove the Back Cover. See "Removing the Back Cover" on page 17.

## Procedure

- 1 Remove the screw that secures the memory-module shield to the system-board shield.
- 2 Slide the memory-module shield toward the bottom of the computer and lift it off the system-board shield.



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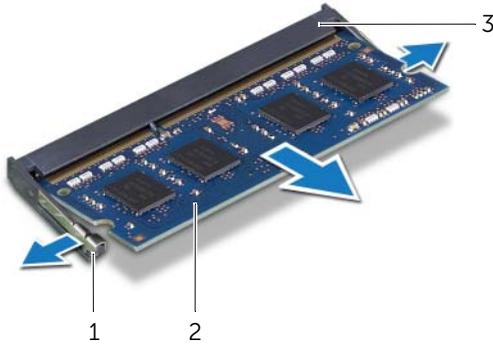
1 memory-module shield

2 screw

3 system-board shield

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- 3 Use your fingertips to spread apart the securing clips on each end of the memory module connector until the memory module pops up.
- 4 Remove the memory module from the memory-module connector.



---

1	securing-clips (2)	2	memory module
3	memory-module connector		

---

# Replacing the Memory Module(s)

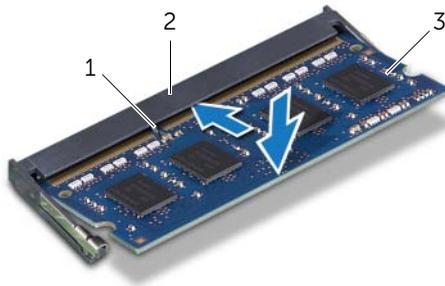
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**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the notch on the memory module with the tab on the memory-module connector.
- 2 Slide the memory module firmly into the connector at a 45-degree angle and press the memory module down until it clicks into place.

**🔧 NOTE:** If you do not hear the click, remove the memory module and reinstall it.



---

1	tab	2	memory-module connector
3	memory module		

---

- 3 Slide the tabs on the memory-module shield into the slots on the system-board shield and slide the memory-module toward the top of the computer.
- 4 Replace the screw that secures the memory-module shield to the system-board shield.

## Postrequisites

- 1 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 2 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the System-Board Shield

---

**⚠ 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" 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

Remove the back cover. See "Removing the Back Cover" on page 17.

## Procedure

- 1 Remove the screws that secure the system-board shield to the middle cover.
- 2 Lift the system-board shield off the middle cover.



---

1 screws (8)

2 system-board shield

---

# Replacing the System-Board Shield

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the system-board shield with the screw holes on the middle cover.
- 2 Replace the screws that secure the system-board shield to the middle cover.

## Postrequisites

- 1 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 2 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Power-Supply Fan

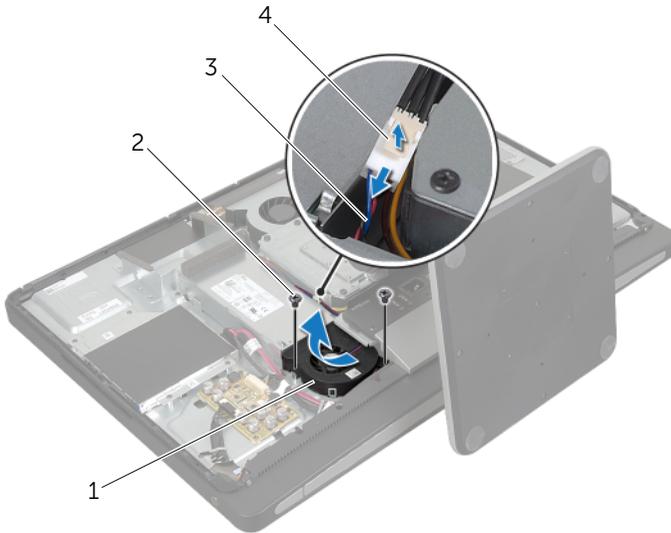
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

Remove the back cover. See "Removing the Back Cover" on page 17.

## Procedure

- 1 Lift the securing tab and disconnect the power-supply fan cable from the power-supply unit.
- 2 Remove the screws that secure the power-supply fan to the middle cover.
- 3 Gently lift the power-supply fan and ease the power-supply fan cable from under the I/O-board assembly.
- 4 Lift the power-supply fan and slide it off the tab on the I/O-board assembly.



1	power-supply fan	2	screws (2)
3	power-supply fan cable	4	securing tab

# Replacing the Power-Supply 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Route the power-supply fan cable under the I/O-board assembly and then connect the power-supply fan cable to the power-supply unit.
- 2 Slide the power-supply fan under the tab on the I/O-board assembly and align the screw holes on the power-supply fan with the screw holes on the middle cover.
- 3 Replace the screws that secure the power-supply fan to the middle cover.

## Postrequisites

- 1 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 2 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Hard Drive

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**⚠ 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" 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:** To avoid data loss, do not remove the hard drive while the computer is in Sleep or On state.

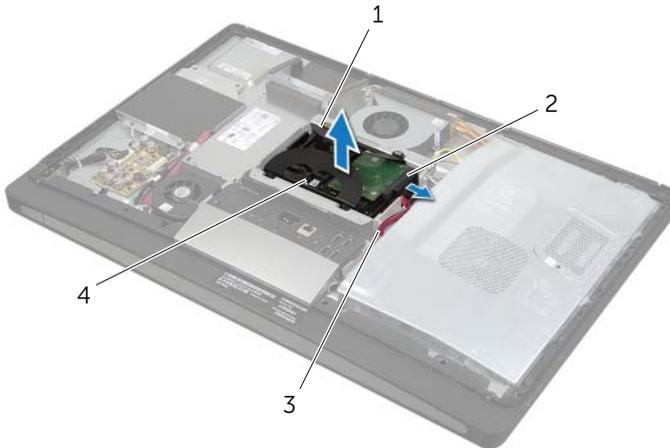
**⚠ CAUTION:** Hard drives are extremely fragile. Exercise care when handling the hard drive.

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the stand. See "Removing the Stand" on page 21.

## Procedure

- 1 Using the straps on the hard-drive assembly, gently lift the hard-drive assembly out of the hard-drive cage.
- 2 Disconnect the power and data-cable connector from the hard-drive assembly.

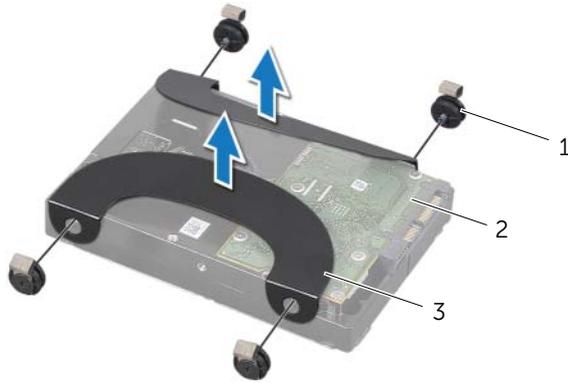


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1	straps (2)	2	power and data-cable connector
3	power and data cable	4	hard-drive assembly

---

- 3 Remove the screws that secure the straps to the hard drive and remove the straps from the hard drive.



1	screws (4)	2	hard drive
3	straps (2)		

# Replacing the Hard Drive

---

 **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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" 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:** Hard drives are extremely fragile. Exercise care when handling the hard drive.

## Procedure

- 1 Align the screw holes on the straps with the screw holes on the hard drive and replace the screws that secure the straps to the hard drive.
- 2 Connect the power and data-cable connector to the hard-drive assembly.
- 3 With the straps facing up, align the hard-drive assembly screws with the slots on the hard-drive cage, and then gently press down the hard-drive assembly.

## Postrequisites

- 1 Replace the stand. See "Replacing the Stand" on page 22.
- 2 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Hard-Drive Cage

---

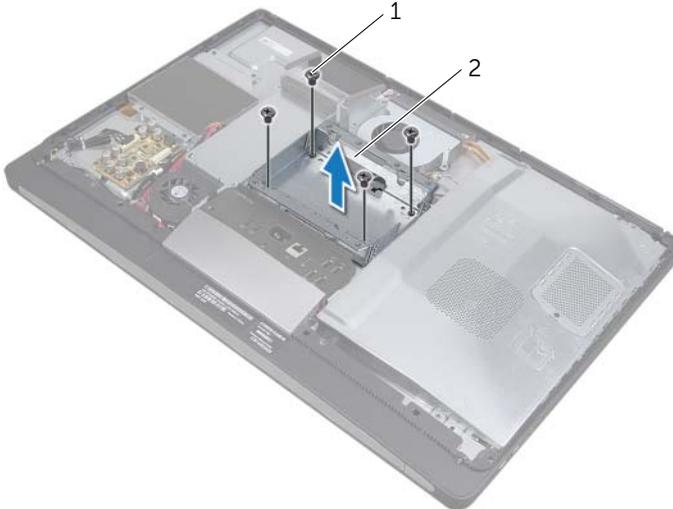
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the stand. See "Removing the Stand" on page 21.
- 3 Follow step 1 to step 2 in "Removing the Hard Drive" on page 35.

## Procedure

- 1 Remove the screws that secure the hard-drive cage to the middle cover.
- 2 Remove the power and data cable from the routing guides on the hard-drive cage.
- 3 Lift the hard-drive cage off the middle cover.



---

1 screws (4)

2 hard-drive cage

---

# Replacing the Hard-Drive Cage

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the hard-drive cage with the screw holes on the middle cover.
- 2 Replace the screws that secure the hard-drive cage to the middle cover.

## Postrequisites

- 1 Follow step 2 to step 3 in "Replacing the Hard Drive" on page 37.
- 2 Replace the stand. See "Replacing the Stand" on page 22.
- 3 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 4 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the I/O Panel

---

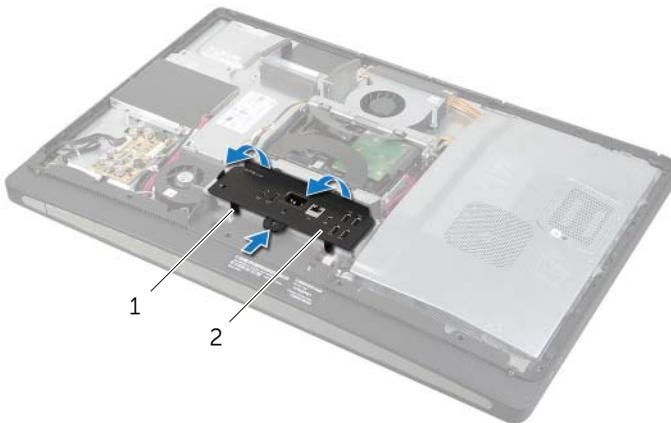
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the stand. See "Removing the Stand" on page 21.
- 3 Remove the trim cover. See "Removing the Trim Cover" on page 19.

## Procedure

- 1 Push the I/O panel towards the top of the computer and then pivot the I/O panel upward.
- 2 Ease the securing tabs on the I/O panel and lift the I/O panel off the I/O-board assembly.



---

1    securing tabs

2    I/O panel

---

# Replacing the I/O Panel

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**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the slots on the I/O panel with the ports on the I/O-board assembly.
- 2 Press down on the I/O panel until it snaps into place.

## Postrequisites

- 1 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 2 Replace the stand. See "Replacing the Stand" on page 22.
- 3 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 4 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Coin-Cell Battery

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**⚠ 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" 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:** 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.

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.

## Procedure

- 1 Locate the coin-cell battery socket. See "System-Board Components" on page 15.
- 2 Press the securing clip away from the coin-cell battery until the coin-cell battery pops out.



---

1 coin-cell battery

2 securing clip

---

- 3 Lift the coin-cell battery out of its socket.



# Replacing the 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" 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 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.

## Procedure

With the positive-side facing up, snap the coin-cell battery into the coin-cell battery socket on the system board.

## Postrequisites

- 1 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 2 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Wireless Mini-Card

---

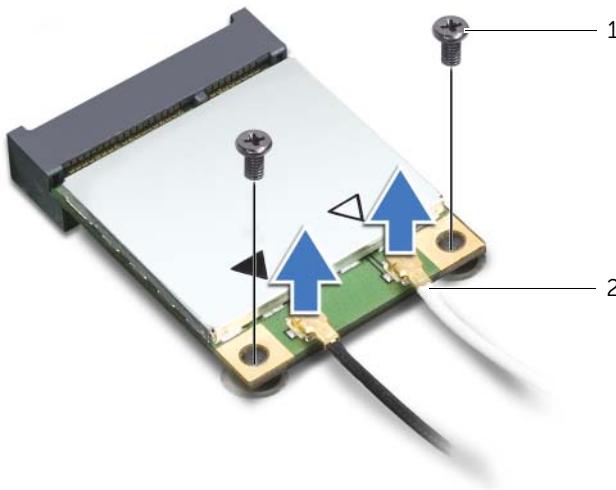
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.

## Procedure

- 1 Locate the wireless mini-card. See "System-Board Components" on page 15.
- 2 Disconnect the antenna cables from the wireless mini-card.
- 3 Remove the screws that secure the wireless mini-card to the system board.



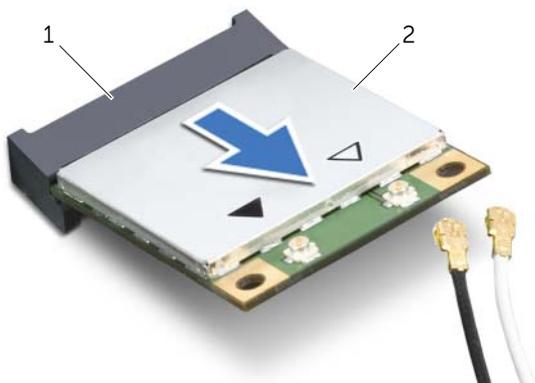
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1 screws (2)

2 antenna cables (2)

---

4 Slide and remove the wireless mini-card out of the wireless mini-card connector.



---

1 wireless mini-card connector

2 wireless mini-card

---

# Replacing the Wireless Mini-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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

 **CAUTION:** To avoid damage to the mini-card, ensure that no cables are placed under the wireless mini-card.

- 1 Align the notch on the wireless mini-card with the tab on the wireless mini-card connector.
- 2 Insert the wireless mini-card at a 45-degree angle into the wireless mini-card connector.
- 3 Press the outer end of the wireless mini-card down and replace the screws that secure the wireless mini-card to the system board.
- 4 Connect the antenna cables to the wireless mini-card.

The following table provides the wireless-antenna cable color schemes for the wireless mini-cards supported by your computer.

Connectors on the mini-card	Wireless-antenna cable color schemes
<b>WLAN + Bluetooth (2 cables)</b>	
Main WLAN + Bluetooth (white triangle)	white
Auxiliary WLAN + Bluetooth (black triangle)	black

## Postrequisites

- 1 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 2 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the mSATA Mini-Card

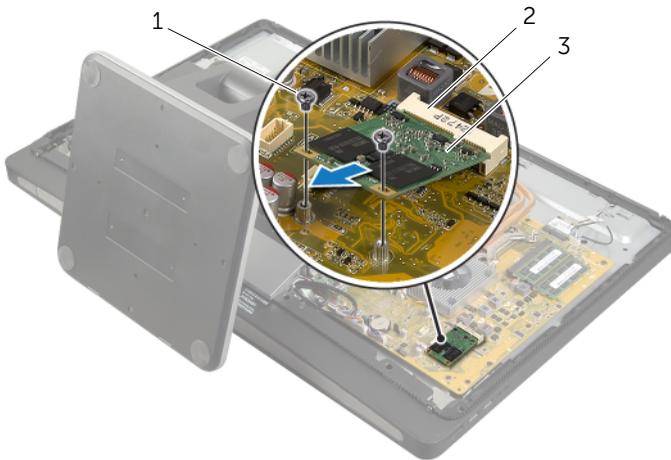
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.

## Procedure

- 1 Remove the screws that secure the mSATA mini-card to the system board.
- 2 Slide and remove the mSATA mini-card from the mSATA mini-card connector.



---

1 screws (2)

2 mSATA mini-card connector

---

3 mSATA mini-card

---

# Replacing the mSATA Mini-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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the notch on the mSATA mini-card with the tab on the mSATA mini-card connector.
- 2 Insert the mSATA mini-card at a 45-degree angle into the mSATA mini-card connector.
- 3 Replace the screws that secure the mSATA mini-card to the system board.

## Postrequisites

- 1 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 2 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Inner Frame

---

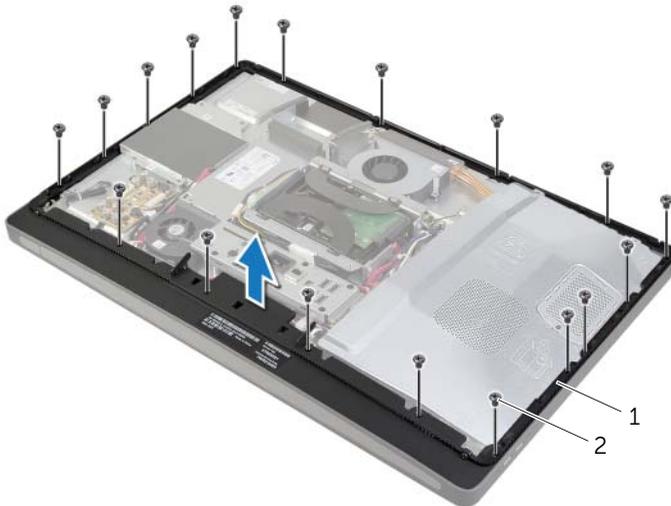
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.

## Procedure

- 1 Remove the screws that secure the inner frame to the display bezel.
- 2 Gently pry the inner frame from the sides and lift the inner frame off the display bezel.



---

1 inner frame

2 screws (18)

---

# Replacing the Inner Frame

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the inner frame with the screw holes on the display bezel.
  -  **NOTE:** Ensure that all cables are routed through their routing guides and no cables are placed between the inner frame and the display bezel.
- 2 Replace the screws that secure the inner frame to the display bezel.

## Postrequisites

- 1 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 2 Replace the stand. See "Replacing the Stand" on page 22.
- 3 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 4 Replace the back cover. "Replacing the Back Cover" on page 18.
- 5 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Processor Heat-Sink Fan

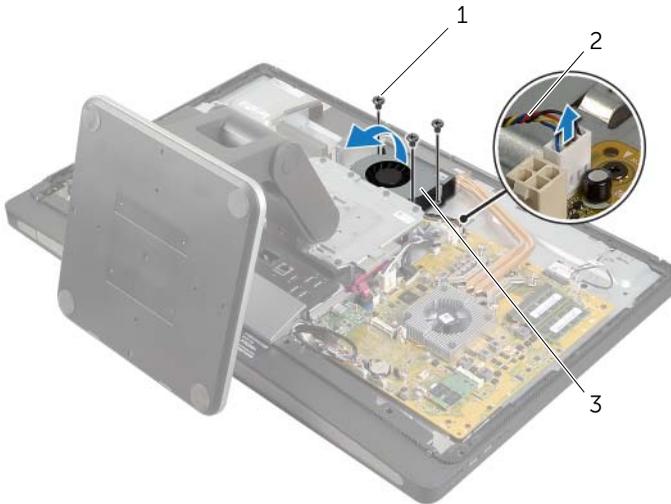
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## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.

## Procedure

- 1 Disconnect the processor heat-sink fan cable from the system board.
- 2 Remove the screws that secure the processor heat-sink fan to the middle cover.
- 3 Lift the processor heat-sink fan and slide it out off the tab on the hard-drive cage.



1 screw (3)

2 processor heat-sink fan cable

3 processor heat-sink fan

# Replacing the Processor Heat-Sink 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Slide the processor heat-sink fan under the tab on the hard-drive cage and align the screw holes on the processor heat-sink fan with the screw holes on the middle cover.
- 2 Replace the screws that secure the processor heat-sink fan to the middle cover.
- 3 Connect the processor heat-sink fan cable to the system board.

## Postrequisites

- 1 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 2 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Processor Heat-Sink

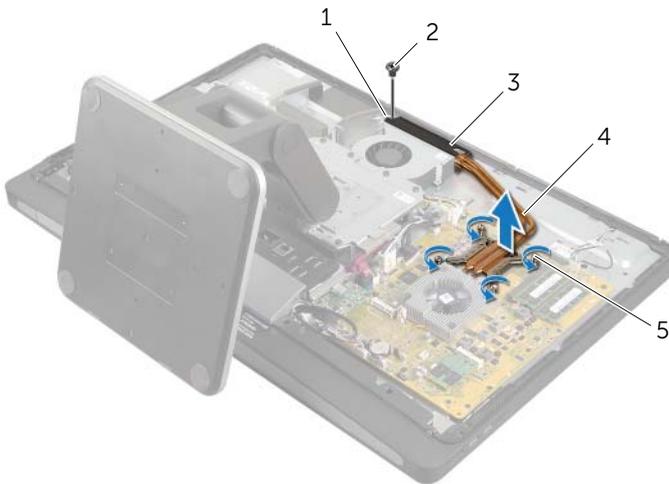
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.

## Procedure

- 1 Remove the screw that secures the cooling vents and the grounding cable to the middle cover.
- 2 In sequential order (indicated on the processor heat-sink), loosen the captive screws that secure the processor heat-sink to the system board.
- 3 Lift the processor heat-sink off the system board.



1 grounding cable

2 screw

3 cooling vents

4 processor heat-sink

5 captive screws (4)

# Replacing the Processor Heat-Sink

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure



**NOTE:** The original thermal grease can be reused if the original system board and heat sink are reinstalled together. If either the system board or the heat sink is replaced with a new one, use the thermal pad provided in the kit to ensure that thermal conductivity is achieved.

- 1 Clean the thermal grease from the bottom of the processor heat-sink and reapply the thermal grease.
- 2 Align the captive screws on the processor heat-sink with the screw holes on the system board.
- 3 In sequential order (indicated on the processor heat-sink), tighten the captive screws that secure the processor heat-sink to the system board.
- 4 Replace the screw that secures the cooling vents and the grounding cable to the middle cover.

## Postrequisites

- 1 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 2 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Processor

**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

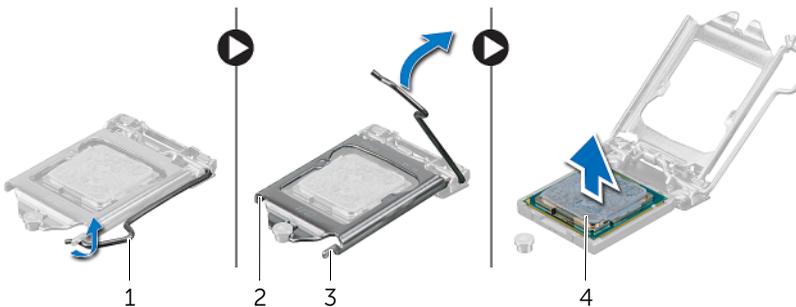
**CAUTION:** Processors are extremely fragile. Handle the processor only by the edges and do not touch the metal pins.

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 3 Remove the processor heat-sink. See "Removing the Processor Heat-Sink" on page 53.

## Procedure

- 1 Press the release-lever down and then pull it outwards to release it from the securing tab.
- 2 Extend the release-lever completely to open the processor cover.
- 3 Gently lift the processor and remove it from the processor socket.



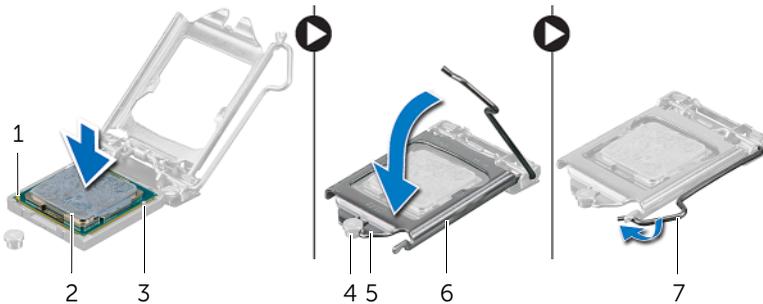
1	release lever	2	processor cover
3	securing tab	4	processor

# Replacing the Processor

**⚠ 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Ensure that the release lever on the processor socket is fully extended in the open position.
- ⚠ CAUTION:** You must position the processor correctly in the processor socket to avoid permanent damage to the processor.
- 2 Align the notches on the processor with the tabs on the processor socket.
- 3 Align the pin-1 corner on the processor with the pin-1 corner on the processor socket, and then place the processor in the processor socket.
- ⚠ CAUTION:** Ensure that the processor-cover notch is positioned underneath the alignment post.
- 4 When the processor is fully seated in the socket, close the processor cover.
- 5 Pivot the release-lever down and place it under the tab on the processor cover.



1	processor pin-1 indicator	2	processor
3	alignment tabs (2)	4	alignment post
5	processor-cover notch	6	processor cover
7	release lever		

## Postrequisites

- 1 Replace the processor heat-sink. See "Replacing the Processor Heat-Sink" on page 54.
- 2 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 3 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 4 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Power-Supply Unit

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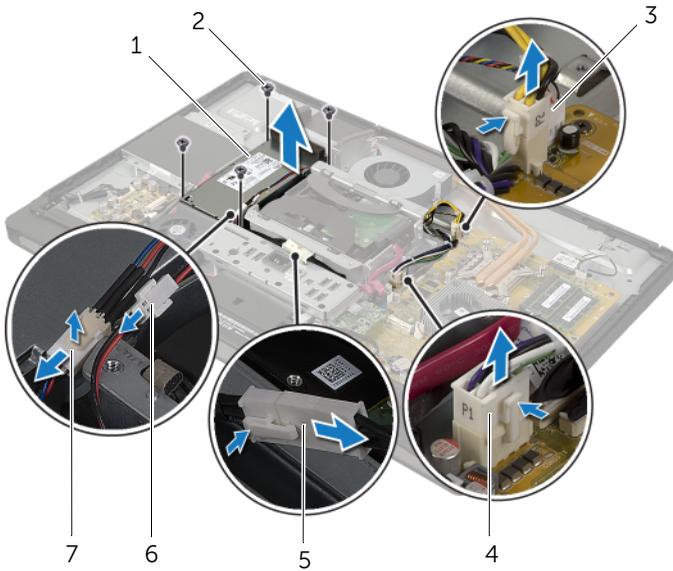
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.

# Procedure

- 1 Press the securing clips and disconnect the main power-supply cable and processor power-supply cable from the system board.
- 2 Remove the main power-supply cable and processor power-supply cable from their routing guides.
- 3 Press the securing clip on the power-port cable connector and disconnect the power-port cable from the power-supply unit.
- 4 Disconnect the power-supply indicator cable from the power-supply unit.
- 5 Lift the securing clip and disconnect the power-supply fan cable from the power-supply unit.
- 6 Remove the screws that secure the power-supply unit to the middle cover.
- 7 Lift the power-supply unit off the middle cover.



1	power-supply unit	2	screws (4)
3	processor power-supply cable connector	4	main power-supply cable connector
5	power-port cable	6	power-supply indicator cable connector
7	power-supply fan cable connector		

# Replacing the Power-Supply Unit

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**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the power-supply unit with the screw holes on the middle cover and replace the screws that secure the power-supply unit to the middle cover.
- 2 Connect the power-supply fan cable, power-supply indicator cable, and power-port cable to the power-supply unit.
- 3 Route the main power-supply cable and processor power-supply cable through their routing guides.
- 4 Connect the main power-supply cable and processor power-supply cable to the system board.

## Postrequisites

- 1 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 2 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 3 Replace the stand. See "Replacing the Stand" on page 22.
- 4 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 5 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 6 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Wireless Keyboard/Mouse Receiver

---



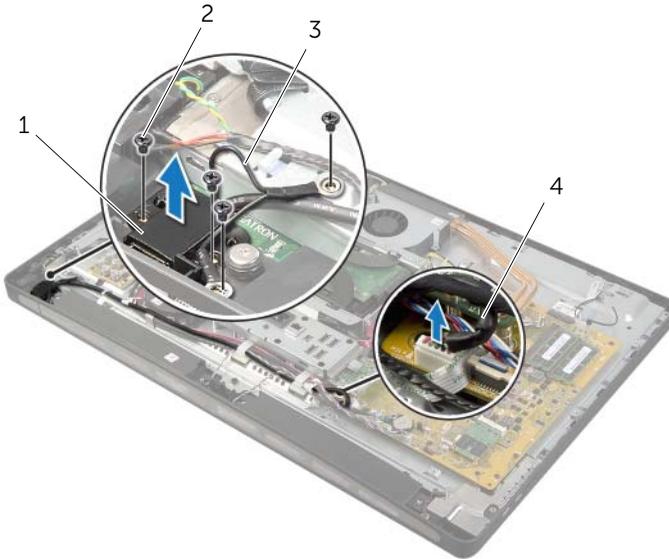
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the stand. See "Removing the Stand" on page 21.
- 3 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 6 Remove the inner frame. See "Removing the Inner Frame" on page 49.

# Procedure

- 1 Remove the screws that secure the wireless keyboard/mouse receiver to the display bezel.
- 2 Remove the screws that secure the grounding cables to the middle cover and display bezel.
- 3 Disconnect the wireless keyboard/mouse-receiver cable from the system board.
- 4 Note the routing of the wireless keyboard/mouse-receiver cable and remove the cable from its routing guides.
- 5 Lift the wireless keyboard/mouse receiver along with its cable off the computer.



---

1	wireless keyboard/mouse receiver	2	screws (4)
3	grounding cables (2)	4	wireless keyboard/mouse-receiver cable

---

# Replacing the Wireless Keyboard/Mouse Receiver

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the wireless keyboard/mouse receiver with the screw holes on the display bezel.
- 2 Replace the screws that secure the wireless keyboard/mouse receiver to the display bezel.
- 3 Align the screw holes on the grounding cables with the screw holes on the chassis and display bezel.
- 4 Replace the screws that secure the grounding cables to the middle cover and display bezel.
- 5 Route the wireless keyboard/mouse-receiver cable through its routing guides and connect the cable to the system board.

## Postrequisites

- 1 Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 2 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 3 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 4 Replace the stand. See "Replacing the Stand" on page 22.
- 5 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 6 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 7 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Speakers

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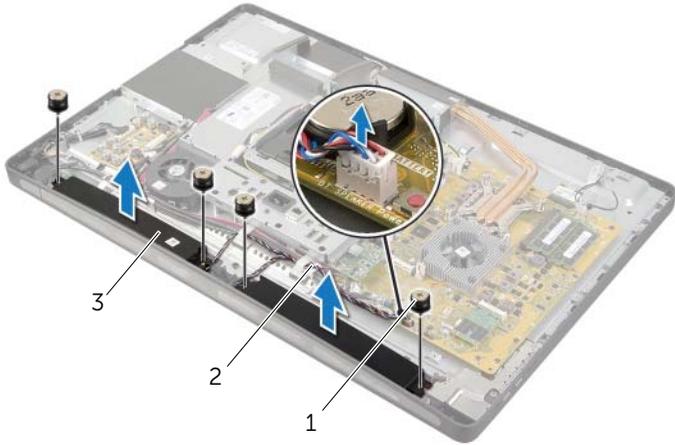
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 6 Remove the inner frame. See "Removing the Inner Frame" on page 49.

# Procedure

- 1 Disconnect the speakers cable from the system board.
- 2 Note the routing of the speakers cable and remove the speakers cable from its routing guides.
- 3 Remove the screws that secure the speakers to the display bezel.
- 4 Lift the speakers off the display bezel.



1	screws (4)	2	speakers cable
3	speakers (2)		

# Replacing the Speakers

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screws holes on the speakers with the screw holes on the display bezel.
- 2 Replace the screws that secure the speakers to the display bezel.
- 3 Route the speakers cable through the routing guides and connect the speakers cable to the system board.

## Postrequisites

- 1 Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 2 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 3 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 4 Replace the stand. See "Replacing the Stand" on page 22.
- 5 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 6 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 7 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the I/O-Board

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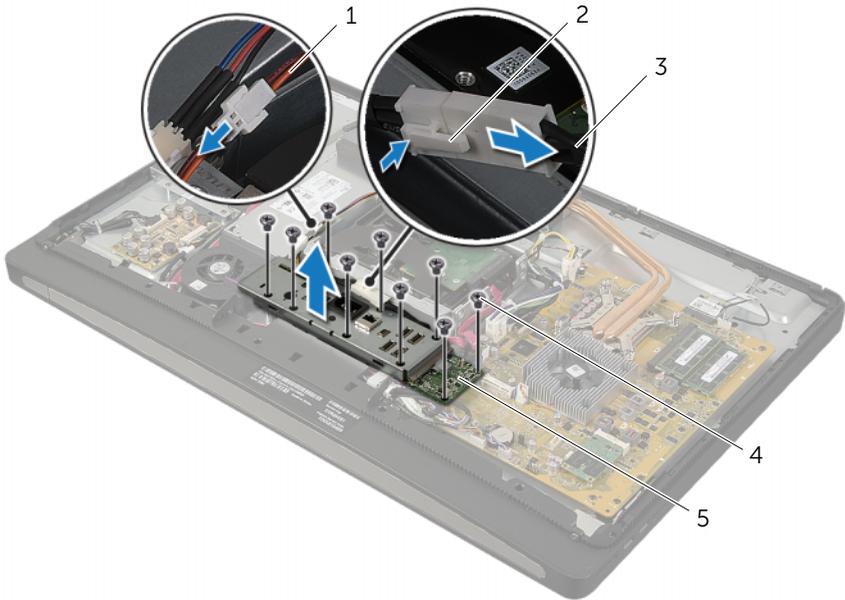
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.

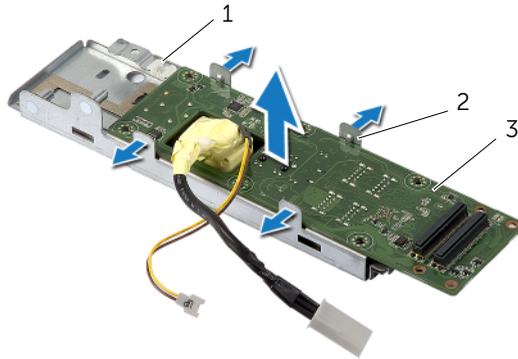
## Procedure

- 1 Remove the screws that secure the I/O-board assembly to the middle cover.
- 2 Gently lift the I/O-board assembly from the middle cover and turn the I/O-board assembly over.
- 3 Press the securing clip and disconnect the power-port cable.
- 4 Note the routing of the power-supply indicator cable and disconnect the cable from the power-supply unit.
- 5 Lift the I/O-board assembly off the chassis.



1	power-supply indicator cable	2	securing clip
3	power-port cable	4	screws (9)
5	I/O-board assembly		

- 6 Push the securing tabs outward to release the I/O board and then lift the I/O board away from the I/O-board bracket.



---

1 I/O-board bracket

2 securing tabs (4)

3 I/O board

---

# Replacing the I/O Board

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 **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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Slide the power-port cable and power-supply indicator cable through the slot on the I/O-board bracket.
- 2 Place the I/O board in the I/O-board bracket and press the securing tabs to secure the I/O board to the I/O-board bracket.
- 3 Route the power-supply indicator cable through the routing guides and connect the cable to the power-supply unit.
- 4 Connect the power-port cable to the power-supply unit.
- 5 Align the screw holes on the I/O-board assembly with the screw holes on the middle cover.
- 6 Press down on the I/O-board assembly to connect the I/O board to the system board.  
 **NOTE:** Ensure that no cables are placed under the I/O-board assembly.
- 7 Replace the screws that secure the I/O-board assembly to the middle cover.

## Postrequisites

- 1 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 2 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 3 Replace the stand. See "Replacing the Stand" on page 22.
- 4 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 5 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 6 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Antenna Modules

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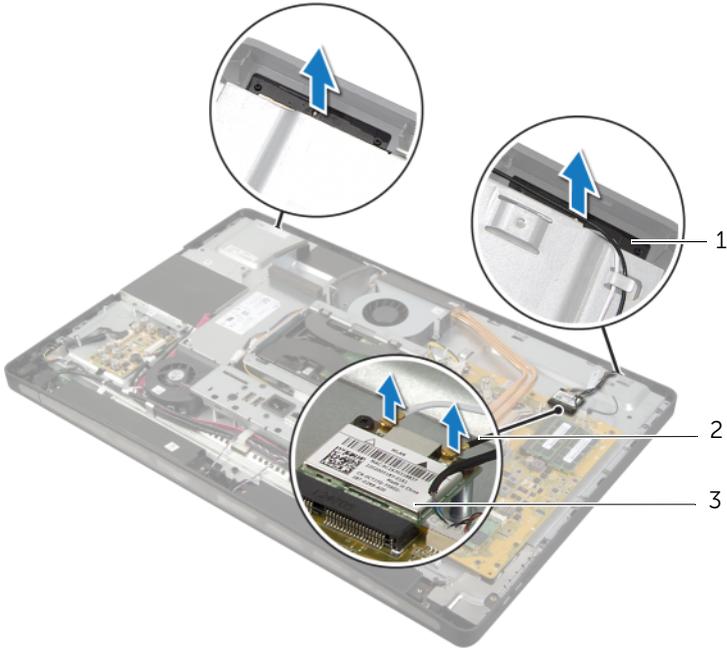
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 6 Remove the inner frame. See "Removing the Inner Frame" on page 49.

# Procedure

- 1 Disconnect the wireless-antenna cables from the wireless mini-card.
- 2 Note the routing of the antenna cables and remove the cables from the routing guides.
- 3 Peel the antennas modules off the display bezel.
- 4 Lift the antenna modules out of the display bezel.



---

1 antenna modules (2)

2 antenna cables (2)

---

3 wireless mini-card

---

# Replacing the Antenna Modules

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**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the antenna modules with the alignment posts on the display bezel and adhere the antenna modules to the display bezel.
- 2 Route the antenna cables through their routing guides and connect the antenna cables to the wireless mini-card.

## Postrequisites

- 1 Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 2 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 3 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 4 Replace the stand. See "Replacing the Stand" on page 22.
- 5 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 6 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 7 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Power-Button Assembly

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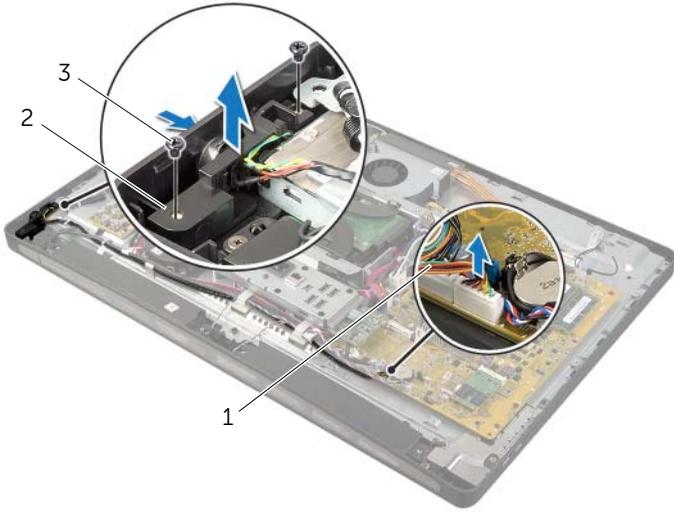
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 5 Remove the inner frame. See "Removing the Inner Frame" on page 49

# Procedure

- 1 Disconnect the power-button cable from the system board.
- 2 Note the routing of the power-button cable and remove the power-button cable from its routing guides.
- 3 Remove the screws that secure the power-button assembly to the display bezel.
- 4 Press the power button inward to release it from the slot on the display bezel and then gently lift the power-button assembly off the display bezel.



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1	power-button cable	2	power-button assembly
3	screws (2)		

---

# Replacing the Power-Button Assembly

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**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Slide the power button into the slot on the display bezel and place the power-button assembly on the display bezel.
- 2 Align the screw holes on the power-button assembly with the screws holes on the display bezel.
- 3 Replace the screws that secure the power-button assembly to the display bezel.
- 4 Route the power-button cable through the routing guides and connect the power-button cable to the system board.

## Postrequisites

- 1 Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 2 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 3 Replace the stand. See "Replacing the Stand" on page 22.
- 4 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 5 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 6 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the System Board

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**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).



**NOTE:** Your computer's Service Tag is stored in the system board. You must enter the Service Tag in system setup after you replace the system board.



**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.

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 6 Follow the instructions from step 1 to step 5 in "Removing the I/O-Board" on page 67.
- 7 Remove the memory module(s). See "Removing the Memory Module(s)" on page 28.
- 8 Remove the mSATA mini-card. See "Removing the mSATA Mini-Card" on page 47.
- 9 Remove the wireless mini-card. See "Removing the Wireless Mini-Card" on page 44.
- 10 Remove the processor heat-sink. See "Removing the Processor Heat-Sink" on page 53.
- 11 Remove the processor. See "Removing the Processor" on page 55.

# Procedure

1 Disconnect all the cables connected to the system board.

 **NOTE:** For information on the location of the connectors, see "System-Board Components" on page 15.

2 Remove the screws that secure the system board to the middle cover.

3 Lift the system board off the middle cover.



---

1 screws (11)

2 system board

---

# Replacing the System 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).



**NOTE:** Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the system setup after you replace the system board.

## Procedure

- 1 Align the screw holes on the system board with the screw holes on the middle cover.
- 2 Replace the screws that secure the system board to the middle cover.
- 3 Connect the disconnected cables to the system board.

## Postrequisites

- 1 Replace the processor. See "Replacing the Processor" on page 56.
- 2 Replace the processor heat-sink. See "Replacing the Processor Heat-Sink" on page 54.
- 3 Replace the wireless mini-card. See "Replacing the Wireless Mini-Card" on page 46.
- 4 Replace the mSATA mini-card. See "Replacing the mSATA Mini-Card" on page 48.
- 5 Replace the memory modules. See "Replacing the Memory Module(s)" on page 30.
- 6 Follow the instructions from step 3 to step 7 in "Replacing the I/O Board" on page 70.
- 7 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 8 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 9 Replace the stand. See "Replacing the Stand" on page 22.
- 10 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 11 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 12 Follow the instructions in "After Working Inside Your Computer" on page 13.

## Entering the Service Tag in system setup

- 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 Input** field. See "System Setup Options" on page 105.

# Removing the Side I/O-Board

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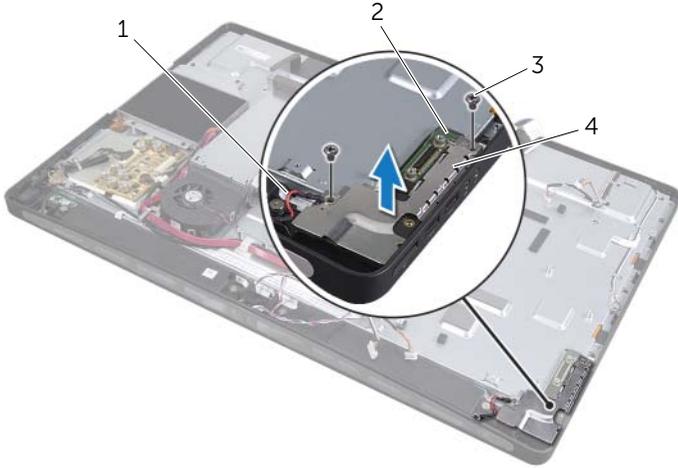
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 6 Remove the inner frame. See "Removing the Inner Frame" on page 49.
- 7 Follow the instructions from step 1 to step 5 in "Removing the I/O-Board" on page 67.
- 8 Disconnect the antenna cables from the wireless mini-card. See "Removing the Wireless Mini-Card" on page 44.
- 9 Remove the processor heat-sink. See "Removing the Processor Heat-Sink" on page 53.
- 10 Follow the instructions from step 1 to step 3 in "Removing the System Board" on page 77.

# Procedure

- 1 Remove the screws that secure the side I/O-board shield to the display bezel.
- 2 Lift the side I/O-board shield off the side I/O board.

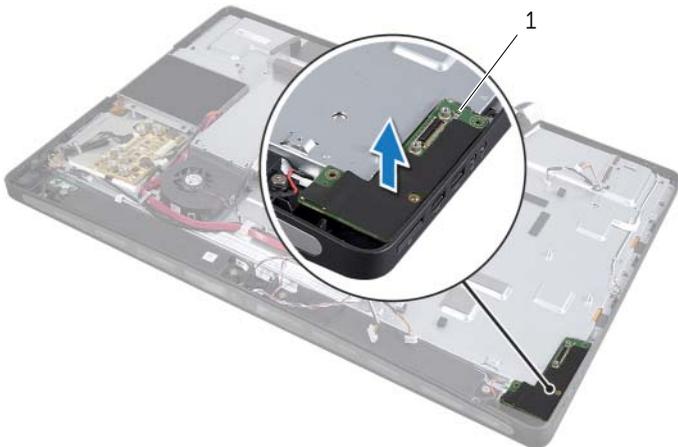


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1	grounding cable	2	side I/O-board
3	screws (2)	4	side-I/O-board shield

---

- 3 Gently lift the side I/O-board starting from the inner edge and then ease the ports on the side I/O-board out of the slots on the display bezel.



---

1	side I/O-board
---	----------------

---

# Replacing the Side-I/O Board

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**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Slide the ports on the side I/O-board into the slots on the display bezel and align the screw holes on the side I/O-board with the screw holes on the display bezel.
- 2 Align the screw holes on the side I/O-board shield with the screw holes on the display bezel and place the side I/O-board shield on the side-I/O board.
- 3 Replace the screws that secure the side I/O-board shield to display bezel.



**NOTE:** Ensure to secure the grounding cable with the same screw that secures the side I/O-shield to the display bezel.

## Postrequisites

- 1 Follow the instructions from step 1 to step 3 in "Replacing the System Board" on page 79.
- 2 Replace the processor heat-sink. See "Replacing the Processor Heat-Sink" on page 54.
- 3 Connect the antenna cables to the wireless mini-card. See "Replacing the Wireless Mini-Card" on page 46.
- 4 Follow the instructions from step 3 to step 7 in "Replacing the I/O Board" on page 70.
- 5 Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 6 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 7 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 8 Replace the stand. See "Replacing the Stand" on page 22.
- 9 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 10 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 11 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Middle Cover

---

 **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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

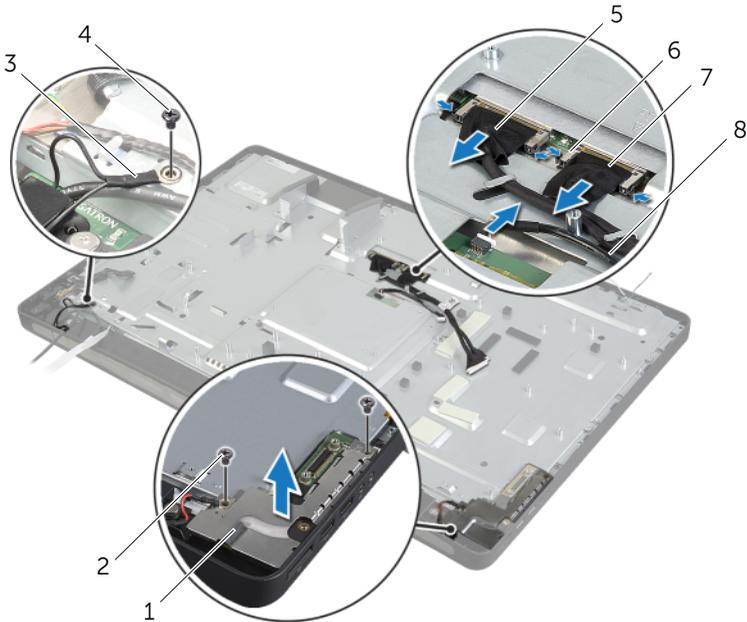
 **WARNING:** The middle cover is heavy when the components are attached to it. It is recommended that two people remove and replace the middle cover while the components are attached to it.

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Follow the instructions from step 1 to step 2 in "Removing the Hard Drive" on page 35.
- 5 Remove the hard-drive cage. See "Removing the Hard-Drive Cage" on page 38.
- 6 Follow the instructions from step 1 to step 2 in "Removing the Optical Drive" on page 25.
- 7 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 8 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 9 Remove the inner frame. See "Removing the Inner Frame" on page 49.
- 10 Follow the instructions from step 1 to step 5 in "Removing the I/O-Board" on page 67.
- 11 Remove the processor heat-sink fan. See "Removing the Processor Heat-Sink Fan" on page 51.
- 12 Remove the processor heat-sink. See "Removing the Processor Heat-Sink" on page 53.
- 13 Remove the power-supply fan. See "Removing the Power-Supply Fan" on page 33.
- 14 Remove the power-supply unit. See "Removing the Power-Supply Unit" on page 58.
- 15 Remove the converter board. See "Removing the Converter Board" on page 23.
- 16 Follow the instructions from step 1 to step 3 in "Removing the System Board" on page 77.

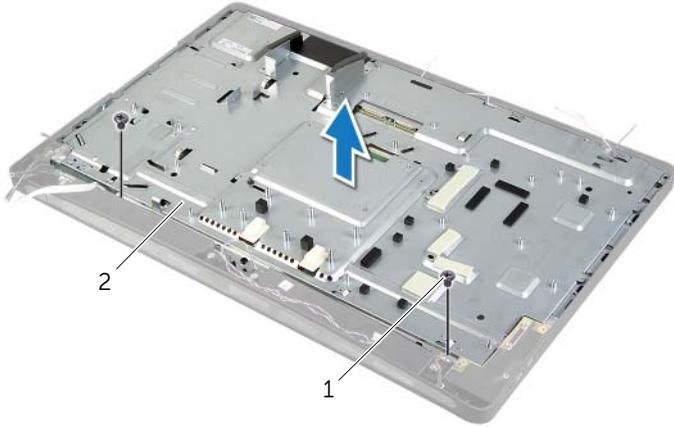
# Procedure

- 1 Remove the screws that secure the side I/O-board shield to the chassis.
- 2 Lift the side I/O-board shield off the side I/O-board.
- 3 Remove the screw that secures the grounding cable to the middle cover.
- 4 Press the securing clips and disconnect the LVDS cables from the display assembly.
- 5 Disconnect the touchscreen cable from the display assembly.



1	I/O-board shield	2	screws (2)
3	grounding cable	4	grounding-cable screw
5	LVDS cable (LVDS1)	6	securing clips (4)
7	LVDS cable (LVDS2)	8	touchscreen cable

- 6 Remove the screws that secure the middle frame to the display bezel.
- 7 Remove all the cables from their routing guides on the middle cover.
- 8 Lift the middle cover off the display.



---

1	screws (2)	2	middle cover
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---

# Replacing the Middle Cover

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**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the middle cover with the screw holes on the display bezel.
- 2 Replace the screws that secure the middle cover to the display bezel.
- 3 Route all the cables through their routing guides on the middle frame.
- 4 Connect the LVDS and touchscreen cables to the display assembly.
- 5 Replace the screw that secures the grounding cable to the middle cover.
- 6 Align the screw holes on the side I/O-board shield with the screw holes on the display bezel and place the side I/O-board shield on the side-I/O board.
- 7 Replace the screws that secure the side I/O-board shield to display bezel.

## Postrequisites

- 1** Follow the instructions from step 1 to step 3 in "Replacing the System Board" on page 79.
- 2** Replace the converter board. See "Replacing the Converter Board" on page 24.
- 3** Replace the power-supply unit. See "Replacing the Power-Supply Unit" on page 60.
- 4** Replace the power-supply fan. See "Replacing the Power-Supply Fan" on page 34.
- 5** Replace the processor heat-sink. See "Replacing the Processor Heat-Sink" on page 54.
- 6** Replace the processor heat-sink fan. See "Replacing the Processor Heat-Sink Fan" on page 52.
- 7** Follow the instructions from step 3 to step 7 in "Replacing the I/O Board" on page 70.
- 8** Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 9** Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 10** Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 11** Follow the instructions from step 2 to step 4 in "Replacing the Optical Drive" on page 27.
- 12** Replace the hard-drive cage. See "Replacing the Hard-Drive Cage" on page 39.
- 13** Follow the instructions from step 2 to step 3 in "Replacing the Hard Drive" on page 37.
- 14** Replace the stand. See "Replacing the Stand" on page 22.
- 15** Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 16** Replace the back cover. See "Replacing the Back Cover" on page 18.
- 17** Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Display Panel

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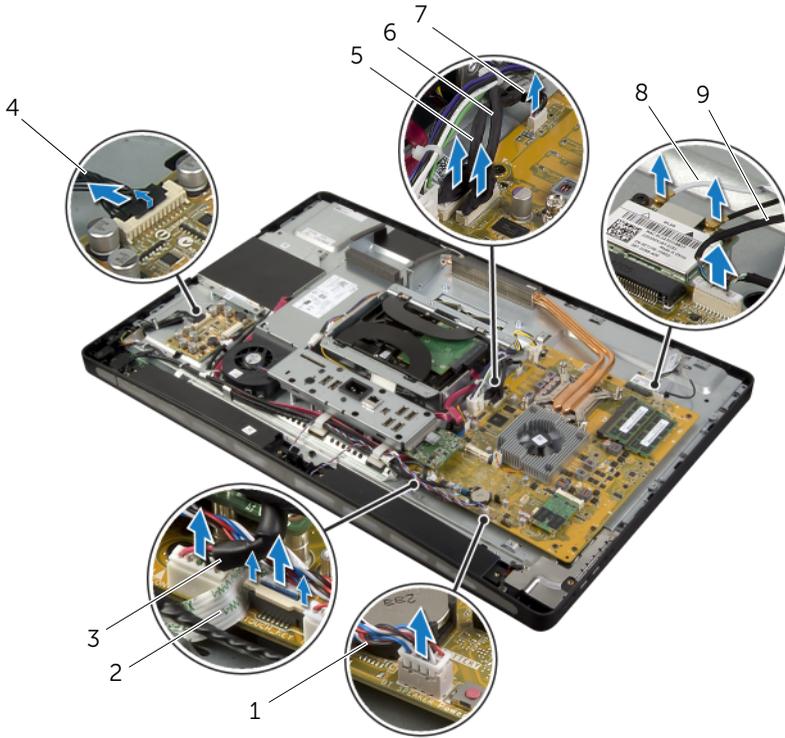
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 6 Remove the inner frame. See "Removing the Inner Frame" on page 49.
- 7 Remove the processor heat-sink fan. See "Removing the Processor Heat-Sink Fan" on page 51.

# Procedure

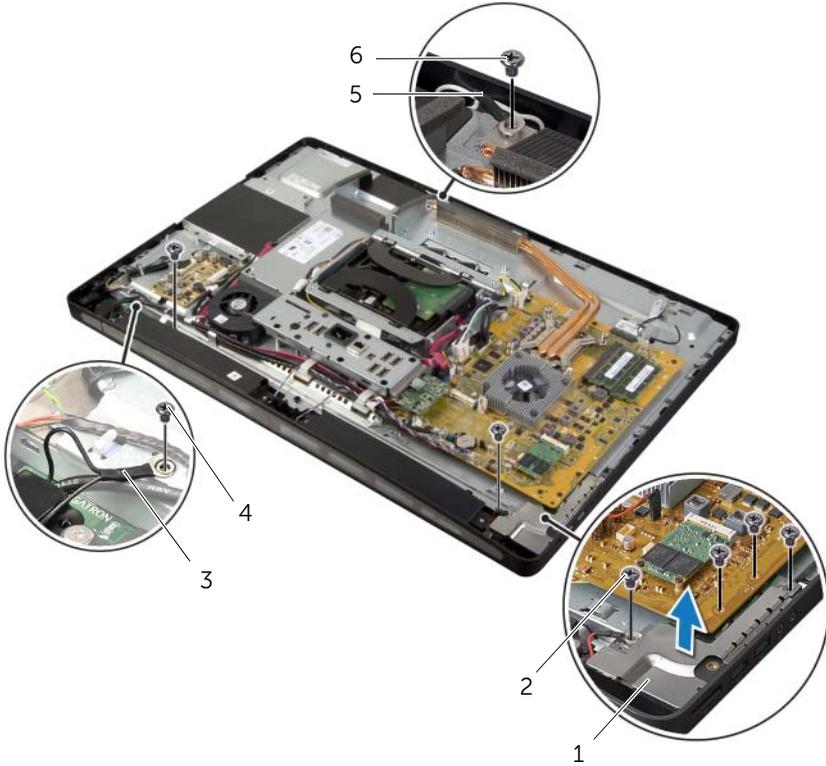
- 1 Disconnect the power-button cable, speakers cable, camera cable, input source/display-settings controls cable, wireless keyboard/mouse receiver cable, LVDS cables, and touchscreen cable from the system board and remove the cables from their routing guides.
- 2 Disconnect the antenna cables from the wireless mini-card and remove the antenna cables from their routing guides.



1	speakers cable	2	input source/display-settings controls cable
3	wireless keyboard/mouse receiver cable	4	power-button cable
5	LVDS cable (LVDS1)	6	LVDS cable (LVDS2)
7	touchscreen cable	8	antenna cables (2)
9	camera cable		

- 3 Remove the screw that secures the grounding cable to the processor cooling vents.

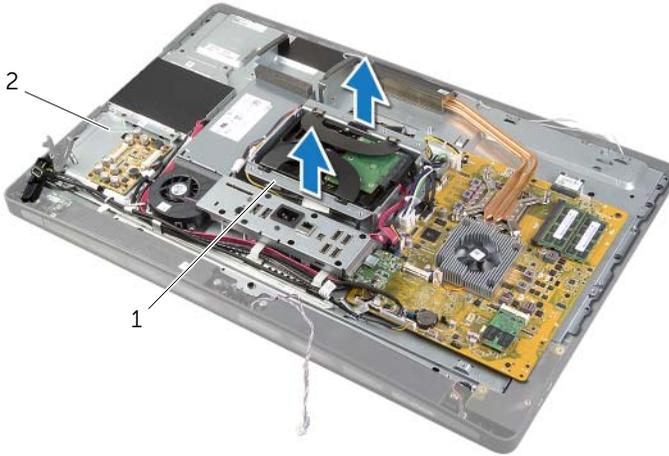
- 4 Remove the screw that secures the grounding cable from the right-speaker mesh to the middle cover.
- 5 Remove the screws that secure the system board to the side I/O-board.
- 6 Remove the screws that secure the side I/O-board shield to the display bezel and remove the side I/O-board shield.



1	side I/O-board shield	2	screw (4)
3	grounding cable	4	grounding-cable screw
5	processor cooling-vents grounding cable	6	grounding-cable screw

**⚠ WARNING:** The middle cover is heavy when the components are attached to it. It is recommended that two people remove and replace the middle cover while the components are attached to it.

- 7 Using the hard-drive cage, gently lift the middle-cover assembly along with the components and ease the cables out of the slots.



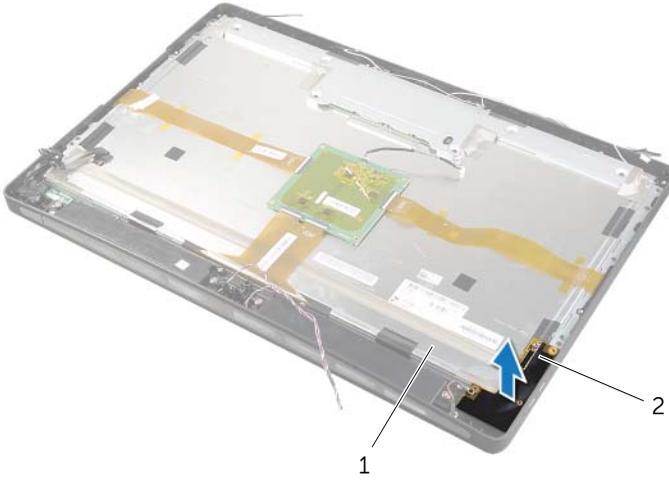
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1 hard-drive cage

2 middle-cover assembly

---

- 8 Gently lift the side I/O-board starting from the inner edge and then ease the ports on the side I/O-board out of the slots on the display bezel.



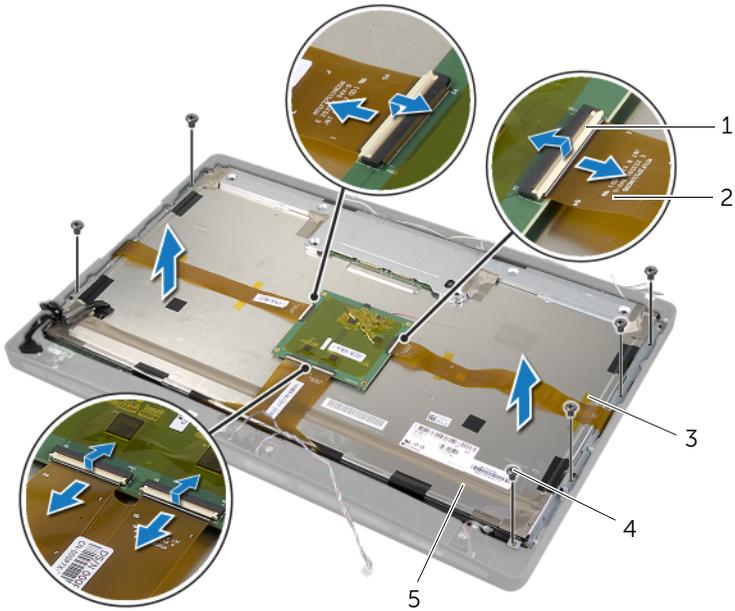
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1 display assembly

2 side I/O-board

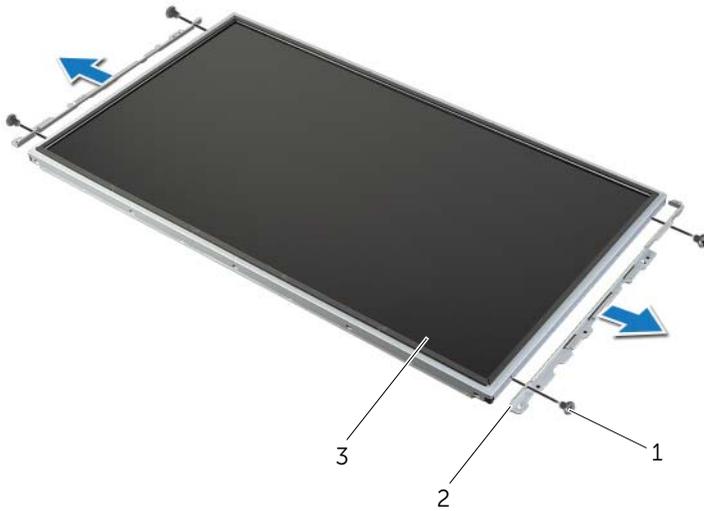
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- 9 Pull the tab and disconnect the ribbon cables from the display assembly.
- 10 Peel off the tapes securing the ribbon cables to the display assembly.
- 11 Remove the screws that secure the display assembly to the display bezel.
- 12 Lift the display assembly from the chassis.



1	tabs (4)	2	ribbon cables (4)
3	tape	4	screws (6)
5	display assembly		

- 13** Remove the screws that secure the display brackets to the display panel and remove the display brackets.



---

1	screws (4)	2	display brackets (2)
3	display panel		

---

# Replacing the Display Panel

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 **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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" 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 middle cover is heavy when the components are attached to it. It is recommended that two people remove and replace the middle cover while the components are attached to it.

## Procedure

- 1 Align the screw holes on the display brackets with the screw holes on the display panel.
- 2 Replace the screws that secure the display brackets to the display panel.
- 3 Align the screw holes on the display assembly with the screw holes on the display bezel and gently place the display assembly over the display bezel.



**NOTE:** Ensure that no cables are placed under the display assembly.

- 4 Replace the screws that secure the display assembly to the display bezel.
- 5 Insert the ribbon cables into their connectors and press the tab to secure the cables.
- 6 Adhere the tapes that secure the ribbon cables to the display assembly.
- 7 Slide the ports on the side-I/O board into the slot on the display bezel and align the screw holes on the side-I/O board with the screw holes on the display bezel.

 **WARNING:** The middle cover is heavy when the components are attached to it. It is recommended that two people remove and replace the middle cover while the components are attached to it.

- 8 Using the hard-drive cage, align the bottom of the middle-cover assembly with the display bezel and lower the middle-cover assembly into the display bezel.
- 9 Route the LVDS and touchscreen cables through the slots in the middle cover.
- 10 Place the middle-cover assembly into the display bezel.



**NOTE:** Ensure that all cables are routed through their routing guides and no cables are placed under the middle cover.

- 11 Align the screw holes on the middle cover with the screw holes on the display bezel.
- 12 Replace the screws that secure the middle-cover assembly to the display bezel.

- 13 Align the screw holes on the side I/O-board shield with the screw holes on the chassis and replace the screws that secure the side I/O-board shield to the display bezel.  
 **NOTE:** Ensure that you also secure the grounding cable with the same screw that secures the side I/O-board shield to the display bezel.
- 14 Route the power-button, speakers, camera, input source/display-settings controls, wireless keyboard/mouse receiver, and touchscreen cables through their routing guides and connect the cables to the system board.
- 15 Route the wireless-antenna cables through their routing guides and connect the antenna cables to the wireless mini-card.
- 16 Replace the screw that secures the grounding cable to the processor cooling-vents.
- 17 Replace the screw that secures the grounding cable from the right-speaker mesh to the middle cover.

## Postrequisites

- 1 Replace the processor heat-sink fan. See "Replacing the Processor Heat-Sink Fan" on page 52.
- 2 Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 3 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 4 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 5 Replace the stand. See "Replacing the Stand" on page 22.
- 6 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 7 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 8 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Camera Module

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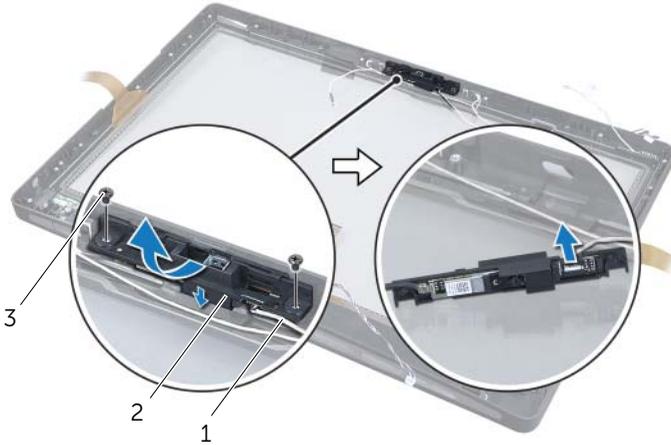
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 6 Remove the inner frame. See "Removing the Inner Frame" on page 49.
- 7 Remove the processor heat-sink fan. See "Removing the Processor Heat-Sink Fan" on page 51.
- 8 Follow the instructions from step 1 to step 12 in "Removing the Display Panel" on page 89.

# Procedure

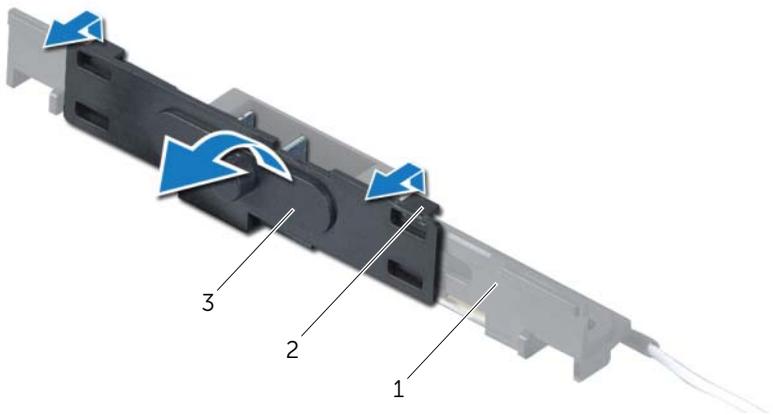
- 1 Remove the screws that secure the camera assembly to the chassis.
- 2 Gently lift the camera assembly and disconnect the camera cable from the camera assembly.



- 
- |   |              |
|---|--------------|
| 1 | camera cable |
| 3 | screws (2)   |
- 

- 
- |   |                 |
|---|-----------------|
| 2 | camera assembly |
|---|-----------------|
- 

- 3 Release the tabs that secure the camera module to the camera bracket and remove the camera module.



- 
- |   |                |
|---|----------------|
| 1 | camera bracket |
| 3 | camera module  |
- 

- 
- |   |          |
|---|----------|
| 2 | tabs (2) |
|---|----------|
-

# Replacing the Camera Module

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the tabs on the camera module with the slots on the camera assembly and snap the camera module into place.
- 2 Connect the camera cable to the camera assembly and place the camera on the display bezel.
- 3 Replace the screws that secure the camera assembly to the display bezel.

## Postrequisites

- 1 Follow the instructions from step 3 to step 17 in "Replacing the Display Panel" on page 96.
- 2 Replace the processor heat-sink fan. See "Replacing the Processor Heat-Sink Fan" on page 52.
- 3 Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 4 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 5 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 6 Replace the stand. See "Replacing the Stand" on page 22.
- 7 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 8 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Removing the Microphone Modules

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**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" 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 back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the trim cover. See "Removing the Trim Cover" on page 19.
- 3 Remove the stand. See "Removing the Stand" on page 21.
- 4 Remove the I/O panel. See "Removing the I/O Panel" on page 40.
- 5 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 6 Remove the inner frame. See "Removing the Inner Frame" on page 49.
- 7 Remove the processor heat-sink fan. See "Removing the Processor Heat-Sink Fan" on page 51.
- 8 Follow the instructions from step 1 to step 12 in "Removing the Display Panel" on page 89.

# Procedure

- 1 Disconnect the microphone cables from the microphone modules.
- 2 Using a plastic scribe, pull the securing tabs and slide the microphone module upward.
- 3 Remove the microphone module out of the microphone-module socket.



---

1	securing tabs (2)	2	microphone cable
3	microphone modules (2)		

---

# Replacing the Microphone Modules

---



**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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the microphone modules with the microphone-module socket and insert the microphone modules into the microphone-module socket. Ensure that the microphone modules are secured by the tabs on the microphone-module socket.
- 2 Connect the microphone cables to the microphone modules.

## Postrequisites

- 1 Follow the instructions from step 3 to step 17 in "Replacing the Display Panel" on page 96.
- 2 Replace the processor heat-sink fan. See "Replacing the Processor Heat-Sink Fan" on page 52.
- 3 Replace the inner frame. See "Replacing the Inner Frame" on page 50.
- 4 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 5 Replace the I/O panel. See "Replacing the I/O Panel" on page 41.
- 6 Replace the stand. See "Replacing the Stand" on page 22.
- 7 Replace the trim cover. See "Replacing the Trim Cover" on page 20.
- 8 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 13.

# System Setup

---

## Overview

Use 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 setup configurations.
- 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.

## Entering System Setup



**CAUTION:** Unless you are an expert computer user, do not change the settings in the system setup program. Certain changes can make your computer work incorrectly.



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

- 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 operating system's desktop. Then, turn off your computer and try again.

## 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. This 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- 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→ System Information

---

BIOS Revision	Display the BIOS revision.
BIOS Build Date	Displays the BIOS release date.
System Name	Displays the system name.
System Time (hh:mm:ss)	Displays the current date.
System Date (mm:dd:yy)	Displays the current time.
Service Tag	Displays the Service Tag of your computer.
Service Tag Input	Allows you to enter the Service Tag of your computer only if the Service Tag is not present.
Asset Tag	Displays the Asset Tag of the computer.

---

**Main→ Processor Information**

---

Processor Type	Displays the processor type.
Processor ID	Displays the processor identification code.
Processor Core Count	Displays the number of processor cores in your computer.
Processor L1 Cache	Displays the processor's total L1 cache size.
Processor L2 Cache	Displays the processor's total L2 cache size.
Processor L3 Cache	Displays the processor's total L3 cache size.

---

**Main→ Memory Information**

---

Memory Installed	Displays the total memory (RAM) installed in your computer.
Memory Available	Displays the amount of memory (RAM) available on your computer.
Memory Running Speed	Displays the running speed of the memory (RAM) in your computer.
Memory Technology	Displays the type of memory (RAM) technology used in your computer.

---

**Main→ SATA Information**

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## SATA 1

Device Type	Displays the type of device connected.
Device ID	Displays the device identification code.
Device Size	Displays the size of the SATA device present in your computer.

## SATA 2

Device Type	Displays the type of device connected.
Device ID	Displays the device identification code.
Device Size	Displays the size of the SATA device present in your computer.

## mSATA Device

Device Type	Displays the type of device connected.
Device ID	Displays the device identification code.
Device Size	Displays the size of the mSATA device present in your computer.

---

## Advanced→ Processor Configuration

---

Intel(R) Hyper-Threading Technology	If enabled, each physical processor core appears as two logical processor cores.
Intel(R) SpeedStep Technology	If enabled, the processor clock speed and core voltage are adjusted dynamically based on the processor load.
Intel(R) Virtualization Technology	If enabled, a Virtual Machine Monitor (VMM) can access your computer.
CPU XD Support	If enabled, allows your computer to use Executive Display (XD) to hinder software that exploits buffer overflows. <b>NOTE:</b> Windows 8 enables this feature even if this feature is set to disabled.
Limit CPUID Value	If enabled, limits the maximum value the processor's CPUID function supports.
Multi Core Support	If enabled, allows your computer to use all cores available in the processor.
Intel(R) Turbo Boost Technology	If enabled, allows your computer to use turbo boost when required.

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## Advanced→ USB Configuration

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Rear USB Ports	Allows you to enable or disable the USB ports at the back of your computer.
Side USB Ports	Allows you to enable or disable the USB ports at the side of your computer.

---

## Advanced→ Onboard Device Configuration

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Onboard Audio Controller	Allows you to enable or disable the onboard audio controller.
SATA Mode	Allows you to configure the integrated hard drive controller to ATA or AHCI.
Onboard LAN Controller	Allows you to enable or disable the onboard LAN controller.
Onboard LAN Boot ROM	Allows you to enable or disable the ROM of the onboard LAN controller.

---

## Boot→ Boot Settings Configuration

---

Numlock Key	Select power-on state for numlock.
Keyboard Errors	Displays keyboard-related errors during boot.
USB Boot Support	Allows you to enable or disable booting from USB mass-storage devices.
Boot Mode	Allows you to select the type of boot.
Secure Boot Control	Allows you to enable or disable the secure boot control. <b>NOTE:</b> To enable this feature, the computer must be in the UEFI boot mode and the Load Legacy OPROM must be set to never.
Secure Boot Mode	Allows you to select custom (clear secure boot database) or standard (fixed secure boot policy) secure boot mode.

---

## Boot→ Clear Secure Boot Database

---

Manage All Keys (PK, KEK, db, dbx)	Displays the keys in the database.
Delete All Keys	Allows you to delete all the keys.
Reset All Keys	Allows you to reset all the keys.
Load Legacy OPROM	Allows you to load the legacy OPROM when in the UEFI boot mode.
1st Boot	Displays the first boot device.
2nd Boot	Displays the second boot device.
3rd Boot	Displays the third boot device.
4th Boot	Displays the fourth boot device.
5th Boot	Displays the fifth boot device.

---

## Power

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Wake Up by Integrated LAN/WLAN	If enabled, will wake the system using a network message.
AC Recovery	Allows you to select the action the computer takes when power is restored.
DeepSx Power Policies	Allows you to configure the DeepSx mode.

Auto Power On	Allows the computer to start up automatically at a pre-configured time.
Auto Power On Mode	Allows you to set the auto power-on mode.
Auto Power On Date	Allows you to set the auto power-on date.
Auto Power On Time	Allows you to set the auto power-on time.
Intel Smart Connect Technology	Allows you to disable or enable the Intel Smart Connect Technology.

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## Security

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Unlock Setup	If the supervisor password is set, enter the password to display the setup options.
Supervisor Password	Displays the status of the supervisor password.
User Password	Displays the status of the user password.
Set Supervisor Password	Allows you to set a supervisor password.
User Access Level	Allows you to set the user-access level.
Set User Password	Allows you to set a user password.
Password Check	Allows you to configure when the computer prompts for passwords. (When entering system setup or at every boot.)

---

## Security → TPM Security

---

TPM Security Support	Allows you to enable or disable the TPM (Trusted Platform Module) security.
TPM Status	Allows you to activate or deactivate the TPM security support.
Clear TPM	If enabled, clears the TPM module settings.
TPM ACPI Support	Allows you to enable or disable the TPM ACPI support.
TPM PPI Provision Override	Allows you to enable or disable TPM PPI provision override.
TPM PPI Deprovision Override	Allows you to enable or disable TPM PPI deprovision override.

---

## Exit

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Save Changes and Reset	Allows you to save the changes.
Discard Changes and Reset	Allows you to discard the changes.
Load Default	Allows you to load the default BIOS settings.

---

# Changing Boot Sequence

## 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 port.
- 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 operating system's 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 104.
- 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

**⚠ 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 3 Locate the password jumper on the system board. See "System-Board Components" on page 15.
- 4 Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.



- 5 Wait for approximately five seconds to clear the password setting.
- 6 Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3.
- 7 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 8 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Clearing CMOS Settings

**⚠ 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 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

- 1 Remove the back cover. See "Removing the Back Cover" on page 17.
- 2 Remove the system-board shield. See "Removing the System-Board Shield" on page 31.
- 3 Locate the CMOS jumper on the system board. See "System-Board Components" on page 15.
- 4 Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.



- 5 Wait for approximately five seconds to clear the CMOS setting.
- 6 Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3.
- 7 Replace the system-board shield. See "Replacing the System-Board Shield" on page 32.
- 8 Replace the back cover. See "Replacing the Back Cover" on page 18.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 13.

# Flashing the BIOS

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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 **dell.com/support**.
- 3 Click **Start Here** under **Support for Home Users**.
- 4 If you have your computer's Service Tag, type your computer's Service Tag and click **Submit**.

If you do not have your computer's Service Tag, click **Detect Service Tag** to allow automatic detection of your computer's Service Tag.



**NOTE:** If the Service Tag cannot be detected automatically, select your product under the product categories.

- 5 Click **Drivers & Downloads** tab.
- 6 In the **Operating System** drop-down, select the operating system installed on your computer.
- 7 Click **BIOS**.
- 8 Click **Download File** to download the latest version of the BIOS for your computer.
- 9 On the next page, select **Single-file download** and click **Continue**.
- 10 Save the file and once the download is complete, navigate to the folder where you saved the BIOS update file.
- 11 Double-click the BIOS update file icon and follow the instructions on the screen.

# Display-Settings Controls

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Use the display settings controls to:

- adjust volume
- adjust screen brightness
- select video source
- turn off the screen

The functions of the controls vary when:

- your computer is not connected to any video input or video output devices
- your computer is connected to an external video input device such as an another computer, gaming console, camera, Blu-ray player, and so on
- your computer is connected to an external video output device such as a TV, monitor, projector, and so on



	<b>No external input or output connected</b>	<b>External input connected</b>	<b>External output connected</b>
1	decrease display brightness	decrease display brightness	decrease display brightness/volume
2	increase display brightness	increase display brightness	increase display brightness/volume
3	screen off	input source select	input source select

The display settings controls functions as describe below:

- **Decrease display brightness:** Touch to decrease the display brightness.
- **Increase display brightness:** Touch to increase the display brightness.
- **Screen off:** Touch to turn off the screen.
- **Input source select:** Touch to switch between video input source.
- **Decrease display brightness/volume:** Touch once to select volume controls and touch again to decrease the volume.  
When in display brightness controls, touch to decrease the display brightness.
- **Increase display brightness/volume:** Touch once to select display brightness controls and touch again to increase the display brightness.  
When in volume controls, touch to increase the volume.

The display settings controls provide an on-screen display (OSD) when your computer is connected to an external video output device.



**NOTE:** OSD may not be supported on some computers.

The following table describes the OSD for each display settings control:

OSD	Display settings control	Description
	Volume	Touch to access the volume controls menu.
	Brightness	Touch to access the brightness controls menu.
	Input source select	Touch to switch between video input source.
	Left	Touch to decrease volume or brightness levels.
	Right	Touch to increase volume or brightness levels.
	Close	Touch to close the OSD controls.

# Before You Call

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Have your Express Service Code ready when you call Dell customer service. The Express Service Code helps Dell's automated-support telephone system direct your call more efficiently. You may also be asked for your Service Tag.

## Locating your Service Tag or Express Service Code

The Service Tag or Express Service Code can be found on a label at the bottom of your computer.



# More Information

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## To learn about Windows 8:

- 1 Turn on the computer.
- 2 Go to **dell.com/support**.
- 3 Type `Windows 8` in the search box and click **Search**.
- 4 Click the links to learn about the Windows 8 features.

## To learn about your computer features:

- 1 Follow the instructions from step 1 to step 4 in "Flashing the BIOS" on page 113.
- 2 Click **Manuals & Documentation** tab.
- 3 **View** or **Download** the following documents to learn about your computer features:
  - **Quick Start Guide:** provides information about setting up your computer.
  - **Specifications:** provides information about your computer specifications.
  - **Me and My Dell:** provides information about your computer features.