Notes, cautions, and warnings

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

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

**WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.
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Before working inside your computer

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Topics:
- Before you begin
- Safety instructions
- Recommended tools
- Screw list

Before you begin

1. Save and close all open files and exit all open applications.
2. Shut down your computer. Click **Start** > **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 attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
5. Remove any media card and optical disc from your computer, if applicable.

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that you have read the safety information that shipped with your computer.

**NOTE:** Before working inside your computer, read the safety information that shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at [www.dell.com/regulatory_compliance](http://www.dell.com/regulatory_compliance).

**NOTE:** 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 electrical outlet.

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

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

**CAUTION:** You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that shipped with the product or at [www.dell.com/regulatory_compliance](http://www.dell.com/regulatory_compliance).

**CAUTION:** Before touching anything inside your computer, ground yourself by using a wrist grounding strap or by periodically 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 ports and connectors are correctly oriented and aligned.

**CAUTION:** Press and eject any installed card from the media-card reader.
NOTE: The color of your computer and certain components may appear differently than shown in this document.

**Recommended tools**

The procedures in this document require the following tools:

- Phillips screwdriver
- Torx #5 (T5) screwdriver
- Plastic scribe

**Screw list**

<table>
<thead>
<tr>
<th>Component</th>
<th>Secured to</th>
<th>Screw type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base cover</td>
<td>Palm-rest assembly</td>
<td>M1.6x4</td>
<td>1</td>
</tr>
<tr>
<td>Base cover</td>
<td>Palm-rest assembly</td>
<td>M2x3</td>
<td>8</td>
</tr>
<tr>
<td>Battery</td>
<td>Palm-rest assembly</td>
<td>M1.6x4</td>
<td>2</td>
</tr>
<tr>
<td>Battery</td>
<td>Palm-rest assembly</td>
<td>M2x3</td>
<td>6</td>
</tr>
<tr>
<td>CPU plate</td>
<td>System board</td>
<td>M1.6x2.5</td>
<td>2</td>
</tr>
<tr>
<td>Display-cable bracket</td>
<td>System board</td>
<td>M1.6x2.5</td>
<td>2</td>
</tr>
<tr>
<td>Display hinges</td>
<td>Palm-rest assembly</td>
<td>M2.5x3.5</td>
<td>6</td>
</tr>
<tr>
<td>Fingerprint reader bracket</td>
<td>Palm-rest assembly</td>
<td>M1.6x1.5</td>
<td>1</td>
</tr>
<tr>
<td>Hard drive plate</td>
<td>System board</td>
<td>M1.6x2.5</td>
<td>2</td>
</tr>
<tr>
<td>Hard-drive (SSD) bracket</td>
<td>Palm-rest assembly</td>
<td>M1.6x3</td>
<td>2</td>
</tr>
<tr>
<td>Keyboard</td>
<td>Palm-rest assembly</td>
<td>M2x2</td>
<td>6</td>
</tr>
<tr>
<td>Keyboard</td>
<td>Palm-rest assembly</td>
<td>M1.6x1.5</td>
<td>23</td>
</tr>
<tr>
<td>Middle bezel</td>
<td>LCD cover</td>
<td>M1.6x3</td>
<td>6</td>
</tr>
<tr>
<td>Security-cable slot</td>
<td>Palm-rest assembly</td>
<td>M2x3</td>
<td>2</td>
</tr>
<tr>
<td>Speakers</td>
<td>Palm-rest assembly</td>
<td>M2x2</td>
<td>4</td>
</tr>
<tr>
<td>System board</td>
<td>Palm-rest assembly</td>
<td>M1.6x3</td>
<td>1</td>
</tr>
<tr>
<td>System board</td>
<td>Palm-rest assembly</td>
<td>M1.6x2.5</td>
<td>7</td>
</tr>
<tr>
<td>Touch pad</td>
<td>Palm rest</td>
<td>M2x2</td>
<td>2</td>
</tr>
<tr>
<td>Wireless card bracket</td>
<td>System board</td>
<td>M1.6x2.5</td>
<td>1</td>
</tr>
</tbody>
</table>
After working inside your computer

CAUTION: Leaving stray or loose screws inside your computer may severely damage your computer.

1. Replace all screws and ensure that no stray screws remain inside your computer.
2. Connect any external devices, peripherals, or cables you removed before working on your computer.
3. Replace any media cards, discs, or any other parts that you removed before working on your computer.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.
Removing the base cover

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Procedure

Procedure

1. Remove the eight screws (M2x3) that secure the base cover to the palm-rest assembly.
2. Using your fingertips, open the system badge.
3. Remove the screw (M1.6x4) under the system badge that secures the base cover to the palm-rest assembly.
4. Starting from the front corner of the computer, pry up the base cover using a plastic scribe and lift the base cover off the palm-rest assembly.
Removing the base cover
Replacing the base cover

Topics:
- Procedure

Procedure

1. Align the screw holes on the base cover with the screw holes on the palm-rest assembly and snap the base cover into place.
2. Using your fingertips, open the system badge.
3. Replace the screw (M1.6x4) under the system badge that secures the base cover to the palm-rest assembly.
4. Replace the eight screws (M2x3, Torx) that secure the base cover to the palm-rest assembly.
Removing the battery

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:

- Lithium-ion battery precautions
- Prerequisites
- Procedure

Lithium-ion battery precautions

CAUTION:

- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery as much as possible before removing it from the system. This can be done by disconnecting the AC adapter from the system to allow the battery to drain.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.
- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any kind to pry on or against the battery.
- Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.
- If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.
- Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.

Prerequisites

Remove the base cover.

Procedure

1. Disconnect the battery cable from the system board.
2. Remove the two screws (M1.6x4) that secure the battery to the palm-rest assembly.
3. Remove the six screws (M2x3) that secure the battery to the palm-rest assembly.
4. Lift the battery off the palm-rest assembly.
Replacing the battery

**Topics:**
- Lithium-ion battery precautions
- Procedure
- Post-requisites

### Lithium-ion battery precautions

**CAUTION:**
- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery as much as possible before removing it from the system. This can be done by disconnecting the AC adapter from the system to allow the battery to drain.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.
- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any kind to pry on or against the battery.
- Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.
- If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See [www.dell.com/contactdell](http://www.dell.com/contactdell).
- Always purchase genuine batteries from [www.dell.com](http://www.dell.com) or authorized Dell partners and resellers.

### Procedure

1. Align the screw holes on the battery with the screw holes on the palm-rest assembly.
2. Replace the six screws (M2x3) that secure the battery to the palm-rest assembly.
3. Replace the two screws (M1.6x4) that secure the battery to the palm-rest assembly.
4. Connect the battery cable to the system board.

### Post-requisites

Replace the base cover.
NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

CAUTION: Solid-state drives are fragile. Exercise care when handling the solid-state drive.

CAUTION: To avoid data loss, do not remove the solid-state drive while the computer is in sleep or on state.

Topics:
- Prerequisites
- Procedure

Prerequisites
1. Remove the base cover.
2. Remove the battery.

Procedure
1. Peel off the display cable tape from the hard-drive plate.
2. Remove the two screws (M1.6x2.5) that secure the hard-drive plate to the system board.
3. Remove the hard-drive plate.
4. Slide and remove the solid-state drive from the solid-state drive slot.
Replacing the solid-state drive

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

CAUTION: Solid-state drives are fragile. Exercise care when handling the solid-state drive.

Topics:
- Procedure
- Post-requisites

Procedure

1. Align the notches on the solid-state drive with the tabs in the solid-state drive slot, slide the solid-state drive at an angle into the solid-state drive slot, then press the other end of the solid-state drive down.
2. Align the screw holes on the hard disk plate with the screw holes on the system board.
3. Replace the two screws (M1.6x2.5) that secure the hard-disk plate to the system board.
4. Adhere the display-cable tape to the hard-disk plate.

Post-requisites

1. Replace the battery.
2. Replace the base cover.
Disconnecting the wireless antenna cables

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

NOTE: The wireless card is integrated into the system board and can not be removed.

Topics:
- Prerequisites
- Procedure

Prerequisites
1. Remove the base cover.
2. Remove the battery.

Procedure
1. Remove the screw (M1.6x2.5) that secures the wireless-card bracket to the system board.
2. Lift the wireless-card bracket off the wireless card.
3. Disconnect the antenna cables from the wireless card.
Reconnecting the wireless antenna cables

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Procedure
- Post-requisites

Procedure

1. Connect the antenna cables to the wireless card.
   The following table provides the antenna cable color schemes for the wireless card supported by your computer.

<table>
<thead>
<tr>
<th>Connectors on the wireless card</th>
<th>Antenna-cable color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main (white triangle)</td>
<td>White</td>
</tr>
<tr>
<td>Auxiliary (black triangle)</td>
<td>Black</td>
</tr>
</tbody>
</table>

2. Place the wireless-card bracket on the wireless card.
3. Replace the screw (M1.6x2.5) that secures the wireless-card bracket to the system board.
Post-requisites

1. Replace the battery.
2. Replace the base cover.
NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Prerequisites
- Procedure

Prerequisites
1. Remove the base cover.
2. Remove the battery.

Procedure
1. Peel off the tape securing the speaker cable to the system board.
2. Disconnect the speaker cable from the system board.
3. Note the speaker-cable routing and peel off the tape that secures the speaker cable to the system board.
4. Remove the four screws (M2x2) that secure the speakers to the palm-rest assembly.
5. Lift the speakers, along with its cables, off the palm-rest assembly.
Replacing the speakers

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Procedure
- Post-requisites

Procedure

1. Using the alignment posts on the palm-rest assembly, place the speakers on the palm-rest assembly.
2. Replace the four screws (M2x2) that secure the speakers to the palm-rest assembly.
3. Route the speaker cable on the system board and adhere the tape to the system board.
4. Connect the speaker cable to the system board.
5. Adhere the tape securing the speaker cable to the system board.

Post-requisites

1. Replace the battery.
2. Replace the base cover.
Removing the coin-cell battery

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

CAUTION: Removing the coin-cell battery resets the BIOS setup program’s settings to default. It is recommended that you note the BIOS setup program’s settings before removing the coin-cell battery.

Topics:
- Prerequisites
- Procedure

Prerequisites
1. Remove the base cover.
2. Remove the battery.

Procedure
1. Disconnect the coin-cell battery cable from the system board.
2. Note the location of the coin-cell battery and pry it off the palm-rest assembly.
NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:

- Procedure
- Post-requisites

Procedure

1. Adhere the coin-cell battery to the palm-rest assembly.
2. Connect the coin-cell battery cable to the system board.

Post-requisites

1. Replace the battery.
2. Replace the base cover.
NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Prerequisites
- Procedure

Prerequisites
1. Remove the base cover.
2. Remove the battery.

Procedure
1. Open the cable latch on the touch pad.
2. Disconnect and remove the cable from the touch pad.
3. Remove the two screws (M2x2) that secure the touch pad to the palm-rest assembly, then lift the touch pad from the inner edge and remove it from the palm-rest assembly.
Replacing the touchpad

Topics:
- Procedure
- Post-requisites

Procedure

1. Align the screw holes on the touch pad with the screw holes on the palm-rest assembly, then slide the touch pad into the palm-rest assembly at an angle.
2. Replace the two screws (M2x2) that secure the touch pad to the palm-rest assembly.
3. Insert the touch pad cable into the connector on the touch pad, then close the latch to secure the cable.

Post-requisites

1. Replace the battery.
2. Replace the base cover.
Removing the display assembly

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Prerequisites
- Procedure

Prerequisites
1. Remove the base cover.
2. Remove the battery.
3. Disconnect the wireless card.

Procedure
1. Peel off the tape that secures the display cable to the hard-disk plate.
2. Remove the two screws (M1.6x2.5) securing the display cable bracket to the system board.
3. Lift the display cable bracket off the display cable.
4. Using the pull tab, disconnect the display cable from the system board.
5. Disconnect the touch-screen cable from the system board.
6. Disconnect the camera cable from the system board.
7. Open the palm-rest assembly fully and place the display assembly and palm-rest assembly face down and then remove the six screws (M2.5x3.5) that secure the display hinges to the palm-rest assembly.

**NOTE:** Ensure the surface is flat and free of objects when placing the display assembly face down.

8. Lift the display assembly off the palm-rest assembly.
Replacing the display assembly

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Procedure
- Post-requisites

Procedure

1. Slide the palm-rest assembly under the display hinges and align the screw holes on the palm-rest assembly with the screw holes on the display hinges.
2. Replace the six screws (M2.5x3.5) that secure the palm-rest assembly to the display hinges.
3. Close the palm-rest assembly.
4. Connect the display cable to the system board.
5. Align the screw holes on the display-cable bracket with the screw holes on the system board.
6. Replace the two screws (M1.6x2.5) that secure the display-cable bracket to the system board.
7. Adhere the display cable tape to the system board.
8. Connect the touch-screen cable and camera cable to the system board.

Post-requisites

1. Reconnect the wireless card.
2. Replace the battery.
3. Replace the base cover.
Removing the system board

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

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

NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again 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 the cables correctly after you replace the system board.

Topics:
- Prerequisites
- Procedure

Prerequisites
1. Remove the base cover.
2. Remove the battery.
3. Remove the solid-state drive.
4. Disconnect the wireless card.

Procedure
1. Remove the two screws (M1.6x2.5) that secure the display-cable bracket to the system board.
2. Lift the display-cable bracket off the display cable.
3. Using the pull tab, disconnect the display cable from the system board.
4. Disconnect the camera cable from the system board.
5. Disconnect the touch-screen cable from the system board.
6. Move the display cable to the side to facilitate system board removal.
7. Open the latch and disconnect the power-button cable from the system board.
8. Open the latch and disconnect the fingerprint-reader cable from the system board.
9. Open the latch and disconnect the battery-status light cable from the system board.
10. Open the latch and disconnect the touch-pad cable from the system board.
11. Open the latch and disconnect the keyboard-backlight cable from the system board.
12. Open the latch and disconnect the keyboard-controls board cable from the system board.
13. Peel off the tape that secures the speaker cable to the system board, then disconnect the speaker cable from the system board.
14. Disconnect the coin-cell battery from the system board.

15. Remove the screw (M1.6x3) that secures the system board to the palm-rest assembly.
16. Remove the seven screws (M1.6x2.5) that secure the system board to the palm-rest assembly.
17. Starting from the outer edge, lift the system board at an angle and remove it from under the tabs on the palm-rest assembly.
Replacing the system board

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

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

NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

Topics:
- Procedure
- Post-requisites
- Entering the Service Tag in the BIOS setup program

Procedure

1. Slide the system board under the tabs on the palm-rest assembly and align the screw holes on the system board with the screw holes on the palm-rest assembly.
2. Replace the seven screws (M1.6x2.5) that secure the system board to the palm-rest assembly.
3. Replace the screw (M1.6x3) that secures the system board to the palm-rest assembly.
4. Slide the power-button cable, fingerprint-reader cable, battery-status light cable, the touch-pad cable, the keyboard-backlight cable, and the keyboard-controls board cable into the system board and close the latches to secure the cables.
5. Connect the camera cable, the touch-screen cable, the coin-cell battery cable, the speaker cable, and the display cable to the system board.
6. Adhere the tape that secure the speaker cable to the system board.
7. Align the screw holes on the display-cable bracket with the screw holes on the system board.
8. Replace the two screws (M1.6x2.5) that secure the display-cable bracket to the system board.

Post-requisites

1. Reconnect the wireless card.
2. Replace the solid-state drive.
3. Replace the battery.
4. Replace the base cover.

Entering the Service Tag in the BIOS setup program

1. Turn on or restart your computer.
2. Press F2 when the Dell logo is displayed to enter the BIOS setup program.
3. Navigate to the Main tab and enter the Service Tag in the Service Tag Input field.

NOTE: Service tag is the alphanumeric identifier located at the back side of your computer.
NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Prerequisites
- Procedure

Prerequisites
1. Remove the base cover.
2. Remove the battery.
3. Remove the solid-state drive.
4. Disconnect the wireless card.
5. Remove the speakers.
6. Remove the coin-cell battery.
7. Remove the system board.

Procedure
1. Remove the two screws (M1.6x3) that secure the SSD bracket to the palm-rest assembly.
2. Lift the SSD bracket off the keyboard and the palm-rest assembly.
3. Remove the 23 screws (M1.6x1.5) that secure the keyboard to the palm-rest assembly.
4. Remove the six (M2x2) screws that secure the keyboard to the palm-rest assembly.
5. Lift the keyboard off the palm-rest assembly.
Replacing the keyboard

NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Topics:
- Procedure
- Post-requisites

Procedure

1. Align the screw holes on the keyboard with the screw holes on the palm-rest assembly.
2. Replace the six (M2x2) screws that secure the keyboard to the palm-rest assembly.
3. Replace the 23 screws (M1.6x1.5) that secure the keyboard to the palm-rest assembly.
4. Align the screw holes on the SSD bracket to the screw holes on the keyboard and the palm-rest assembly.
5. Replace the two screws (M1.6x3) that secure the SSD bracket to the palm-rest assembly.

Post-requisites

1. Replace the system board.
2. Replace the coin-cell battery.
3. Replace the speakers.
4. Reconnect the wireless card.
5. Replace the solid-state drive.
6. Replace the battery.
7. Replace the base cover.
Removing the palm-rest assembly

Prerequisites

1. Remove the base cover.
2. Remove the battery.
3. Remove the solid-state drive.
4. Disconnect the wireless card.
5. Remove the speakers.
6. Remove the coin-cell battery.
7. Remove the touch pad.
8. Remove the display assembly.
9. Remove the system board.
10. Remove the keyboard.

Procedure

After performing all the prerequisites, we are left with the palm-rest assembly.
Replacing the palm-rest assembly

**NOTE:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

**Topics:**
- Procedure
- Post-requisites

**Procedure**

Place the palm-rest assembly on a flat surface.

**Post-requisites**

1. Replace the keyboard.
2. Replace the system board.
3. Replace the display assembly.
4. Replace the touch pad.
5. Replace the coin-cell battery.
6. Replace the speakers.
7. Reconnect the wireless card.
8. Replace the solid-state drive.
9. Replace the battery.
10. Replace the base cover.
CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:
- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Topics:
- BIOS overview
- Entering BIOS setup program
- Navigation keys
- Boot Sequence
- System setup options

**BIOS overview**

The BIOS manages data flow between the computer’s operating system and attached devices such as hard disk, video adapter, keyboard, mouse, and printer.

**Entering BIOS setup program**

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 is 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 desktop. Then, turn off your computer and try again.

**Navigation keys**

**NOTE:** For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

<table>
<thead>
<tr>
<th>Keys</th>
<th>Navigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up arrow</td>
<td>Moves to the previous field.</td>
</tr>
<tr>
<td>Down arrow</td>
<td>Moves to the next field.</td>
</tr>
<tr>
<td>Enter</td>
<td>Selects a value in the selected field (if applicable) or follow the link in the field.</td>
</tr>
<tr>
<td>Spacebar</td>
<td>Expands or collapses a drop-down list, if applicable.</td>
</tr>
<tr>
<td>Tab</td>
<td>Moves to the next focus area.</td>
</tr>
<tr>
<td>Esc</td>
<td>Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.</td>
</tr>
</tbody>
</table>
Boot Sequence

Boot Sequence allows you to bypass the System Setup–defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing F2 key
- Bring up the one-time boot menu by pressing F12 key

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

- Removable Drive (if available)
- STXXXX Drive (if available)

NOTE: XXX denotes the SATA drive number.

- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

NOTE: Choosing Diagnostics, will display the ePSA diagnostics screen.

The boot sequence screen also displays the option to access the System Setup screen.

System setup options

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

Table 3. System setup options—System information menu

<table>
<thead>
<tr>
<th>General-System Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Information</strong></td>
</tr>
<tr>
<td>BIOS Version</td>
</tr>
<tr>
<td>Service Tag</td>
</tr>
<tr>
<td>Asset Tag</td>
</tr>
<tr>
<td>Ownership Tag</td>
</tr>
<tr>
<td>Manufacture Date</td>
</tr>
<tr>
<td>Ownership Date</td>
</tr>
<tr>
<td>Express Service Code</td>
</tr>
<tr>
<td>Signed Firmware Update Status</td>
</tr>
</tbody>
</table>

**Processor Information**

| Processor Type               | Displays the processor type. |
| Core Count                   | Displays the number of cores on the processor. |
| Processor ID                 | Displays the processor identification code. |
| Microcode Version            | Displays the processor microcode version. |
| Current Clock Speed          | Displays the current processor clock speed. |
| Minimum Clock Speed          | Displays the minimum processor clock speed. |
| Maximum Clock Speed          | Displays the maximum processor clock speed. |
| Processor L2 Cache           | Displays the processor L2 cache size. |
| Processor L3 Cache           | Displays the processor L3 cache size. |
| Intel Hyper-Threading Capable| Displays whether the processor is HyperThreading (HT) capable. |
| 64-Bit Technology            | Displays whether 64-bit technology is used. |

**Memory Information**
Table 4. System setup options—System Configuration menu

**System Configuration**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SATA Operation</strong></td>
<td>Configure operating mode of the integrated SATA hard drive controller.</td>
</tr>
<tr>
<td><strong>Drives</strong></td>
<td>Enable or disable various drives on board.</td>
</tr>
<tr>
<td><strong>SMART Reporting</strong></td>
<td>Enable or disable SMART Reporting during system startup.</td>
</tr>
</tbody>
</table>
| **USB/Thunderbolt Configuration**| This field configures the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB mass storage devices. If the USB port is enabled, the device that is attached to this port is enabled and available in the operating system. If the USB port is disabled, the operating system does not have access to the USB port. The options are:  
  - Enable USB Boot Support (enabled by default)  
  - Enable External USB Port (enabled by default)  
  - Enable Thunderbolt Port (enabled by default)  
  - Enable Thunderbolt Boot Support. This is an optional feature.  
  - Always Allows Dell Docks. This is an optional feature.  
  - Enables Thunderbolt (and PCIe behind TBT) Pre-boot  
  
**NOTE:** USB keyboard and mouse always work in the BIOS setup irrespective of these settings.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USB PowerShare</strong></td>
<td>Enable or disable charging external devices through the USB PowerShare port.</td>
</tr>
<tr>
<td><strong>Touchscreen</strong></td>
<td>Enable or disable the touchscreen.</td>
</tr>
</tbody>
</table>
**System Configuration**

**Audio**  
This field enables or disables the integrated audio controller. By default, the **Enable Audio** option is selected. The options are:
- Enable microphone (enabled by default)
- Enable internal speaker (enabled by default)

**Keyboard Illumination**  
This field lets you choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 0% to 100%. The options are:
- Disabled
- Dim
- Bright (enabled by default)

**Unobtrusive Mode**  
Enable or disable the Fn+F7 key combination to turn off all lights and sound emissions in the system.
Default: Disabled.

**Miscellaneous Devices**  
Enable or disable various onboard devices.

**Table 5. System setup options—Video menu**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD Brightness</td>
<td>Set the panel brightness independently for battery or AC power.</td>
</tr>
<tr>
<td>EcoPower</td>
<td>Enable or disable EcoPower.</td>
</tr>
</tbody>
</table>

**Table 6. System setup options—Security menu**

**Security**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin Password</td>
<td>Set, change, or delete the administrator password.</td>
</tr>
<tr>
<td>System Password</td>
<td>Set, change, or delete the system password.</td>
</tr>
<tr>
<td>Strong Password</td>
<td>Enable or disable strong passwords.</td>
</tr>
<tr>
<td>Password Configuration</td>
<td>Control the minimum and maximum number of characters that are allowed for Admin and System passwords.</td>
</tr>
<tr>
<td>Master Password Lockout</td>
<td>Enable to prevent users from entering Setup when a Master Password is set.</td>
</tr>
<tr>
<td>Password Bypass</td>
<td>Bypass the System (Boot) Password and the internal hard disk password prompts during a system restart.</td>
</tr>
<tr>
<td>Password Changes</td>
<td>Enable or disable changes to the system and hard disk passwords when an administrator password is set.</td>
</tr>
<tr>
<td>UEFI Capsule Firmware Updates</td>
<td>Enable or disable BIOS updates through UEFI capsule update packages.</td>
</tr>
<tr>
<td>TPM 2 Security</td>
<td>This field lets you choose the Trusted Platform Module (TPM) 2.0 Security features. The options are:</td>
</tr>
<tr>
<td></td>
<td>- TPM On</td>
</tr>
<tr>
<td></td>
<td>- PPI Bypass for Enable Commands</td>
</tr>
<tr>
<td></td>
<td>- PPI Bypass for Disable Commands</td>
</tr>
<tr>
<td></td>
<td>- SHA-256</td>
</tr>
<tr>
<td></td>
<td>- Clear</td>
</tr>
<tr>
<td></td>
<td>- Attestation Enable</td>
</tr>
<tr>
<td></td>
<td>- Key Storage Enable</td>
</tr>
<tr>
<td></td>
<td>Enable or disable the TPM state.</td>
</tr>
<tr>
<td></td>
<td>Default: Enabled.</td>
</tr>
<tr>
<td>Computrace</td>
<td>Enable or disable the BIOS module interface of the optional Computrace Service from Absolute Software.</td>
</tr>
</tbody>
</table>

40  
**System setup**
Security

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OROM Keyboard Access</td>
<td>Enable or disable the Optional ROM configuration screens using hot-keys during boot.</td>
</tr>
<tr>
<td>Admin Setup Lockout</td>
<td>Enable to prevent users from entering the System Setup menu when an Admin Password is set.</td>
</tr>
<tr>
<td>Intel Software Guard Extensions</td>
<td>Enable or disable a secured environment for running code/storing sensitive information in the context of the operating system.</td>
</tr>
</tbody>
</table>

Table 7. System setup options—Secure Boot menu

**Secure Boot**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure Boot Enable</td>
<td>Enable or disable the secure boot feature.</td>
</tr>
<tr>
<td><strong>Expert Key Management</strong></td>
<td></td>
</tr>
<tr>
<td>Enable Custom Mode</td>
<td>Enable or disable custom values for expert key management.</td>
</tr>
<tr>
<td>Custom Mode Key Management</td>
<td>Select the custom values for expert key management.</td>
</tr>
</tbody>
</table>

Table 8. System setup options—Performance

**Performance**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel Hyper-Threading</td>
<td>Enable or disable Hyper-Threading in the processor. Default: Enabled.</td>
</tr>
<tr>
<td>Intel SpeedStep Technology</td>
<td>Enable or disable Intel Speedstep Technology. Default: Enabled.</td>
</tr>
<tr>
<td>Intel TurboBoost</td>
<td>Enable or disable Intel Turbo Boost mode of the processor. Default: Enabled.</td>
</tr>
<tr>
<td>Multi Core Support</td>
<td>Enable multiple cores. Default: Enabled.</td>
</tr>
<tr>
<td>C-States Support</td>
<td>Enable or disable additional processor sleep states. Default: Enabled.</td>
</tr>
</tbody>
</table>

**NOTE:** If enabled, the processor clock speed and core voltage are adjusted dynamically based on the processor load.

Table 9. System setup options—Power Management

**Power Management**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Behavior</td>
<td>Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. Default setting: Wake on AC is not selected.</td>
</tr>
<tr>
<td>Auto on Time</td>
<td>Enable to set the computer to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days. Default: Disabled.</td>
</tr>
<tr>
<td>Peak Shift</td>
<td>Enables minimization of the AC power consumption during the peak power times of day. When this option is enabled the system runs only on battery even when the AC is plugged in.</td>
</tr>
<tr>
<td>Advanced Battery Charge Configuration</td>
<td>Enable Advanced Battery Charge Configuration from the beginning of the day to a specified work period.</td>
</tr>
<tr>
<td>Primary Battery Charge Configuration</td>
<td>Set the primary battery charge settings with a pre-selected custom charge start and stop.</td>
</tr>
</tbody>
</table>
Table 10. System setup options—Wireless menu

<table>
<thead>
<tr>
<th>Wireless</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless Switch</td>
<td>Determine which wireless devices can be controlled by the Wireless Switch.</td>
</tr>
<tr>
<td>Wireless Device Enable</td>
<td>Enable or disable internal wireless devices.</td>
</tr>
</tbody>
</table>

Table 11. System setup options—POST Behavior

<table>
<thead>
<tr>
<th>POST Behavior</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numlock LED</td>
<td>Enable or disable Numlock. Default: Enable Numlock.</td>
</tr>
<tr>
<td>Adapter Warnings</td>
<td>Enable adapter warnings. Default: Enabled.</td>
</tr>
<tr>
<td>Keypad (Embedded)</td>
<td>Allows you to select one of two methods to enable the keypad that is embedded in the internal keyboard.</td>
</tr>
<tr>
<td></td>
<td>• Fn Key Only — The keypad is only enabled when you hold down the &lt;Fn&gt; key.</td>
</tr>
<tr>
<td></td>
<td>• By Num Lk — The keypad is enabled when (1) the Num Lock LED is on and (2) no external keyboard is attached.</td>
</tr>
<tr>
<td></td>
<td>Note that the system might not notice immediately when an external keyboard is detached.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> When system setup is running, this field has no effect—system setup works in the Fn Key Only mode.</td>
</tr>
<tr>
<td>Extend BIOS POST Time</td>
<td>This option creates an additional pre-boot delay. This allows the user to see POST status messages. 0 seconds (Default Setting)</td>
</tr>
<tr>
<td>Fastboot</td>
<td>Enable to set the speed of the boot process. Default: Thorough.</td>
</tr>
<tr>
<td>Fn Lock Options</td>
<td>Enable or disable the Fn lock mode.</td>
</tr>
<tr>
<td>Mouse/Touchpad</td>
<td>Define the mouse and touchpad input. Default: Touchpad/PS-2 Mouse.</td>
</tr>
</tbody>
</table>

Table 12. System setup options—Virtualization menu

<table>
<thead>
<tr>
<th>Virtualization</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel Virtualization Technology (VT)</td>
<td>Specify whether a Virtual Machine Monitor (VMM) can use the additional hardware capabilities that are provided by Intel Virtualization Technology.</td>
</tr>
<tr>
<td>Intel VT for Direct I/O</td>
<td>Specify whether a Virtual Machine Monitor (VMM) can use the additional hardware capabilities that are provided by Intel Virtualization Technology for Direct I/O.</td>
</tr>
<tr>
<td>Intel Trusted Execution Technology (TXT)</td>
<td>Specify whether a Virtual Machine Monitor (VMM) can use the additional hardware capabilities that are provided by Intel Trusted Execution Technology.</td>
</tr>
</tbody>
</table>

Table 13. System setup options—Maintenance menu

<table>
<thead>
<tr>
<th>Maintenance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Tag</td>
<td>Create a system Asset Tag.</td>
</tr>
<tr>
<td>Service Tag</td>
<td>Display the system’s Service Tag.</td>
</tr>
</tbody>
</table>
### Maintenance

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Downgrade</td>
<td>Control flashing of the system firmware to previous revisions.</td>
</tr>
<tr>
<td>BIOS Recovery</td>
<td>Enable the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB drive.</td>
</tr>
<tr>
<td>Data Wipe</td>
<td>Enable to securely erase data from all internal storage devices.</td>
</tr>
</tbody>
</table>

### Table 14. System setup options—Manageability

#### Manageability

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB Provision</td>
<td>Enable or disable USB provisioning.</td>
</tr>
<tr>
<td>MEBx Hotkey</td>
<td>Enable or disable the MEBx Hotkey function when the system boots.</td>
</tr>
</tbody>
</table>

### Table 15. System setup options—System Logs menu

#### System Logs

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Events</td>
<td>Display Power events.</td>
</tr>
<tr>
<td>BIOS Events</td>
<td>Display BIOS events.</td>
</tr>
<tr>
<td>Thermal Events</td>
<td>Display Thermal events.</td>
</tr>
</tbody>
</table>

### Table 16. System setup options—SupportAssist System Resolution menu

#### SupportAssist System Resolution

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Auto OS Recovery Threshold</td>
<td>Control the automatic boot flow for SupportAssist System Resolution Console and for Dell OS Recovery tool.</td>
</tr>
<tr>
<td>SupportAssist OS Recovery</td>
<td>Enable or disable the boot flow for SupportAssist OS Recovery tool in the even of certain system errors.</td>
</tr>
<tr>
<td>MPM Configuration</td>
<td>Configures the Multi-Processing Modules.</td>
</tr>
</tbody>
</table>
## System and setup password

### Table 17. System and setup password

<table>
<thead>
<tr>
<th>Password type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System password</td>
<td>Password that you must enter to log on to your system.</td>
</tr>
<tr>
<td>Setup password</td>
<td>Password that you must enter to access and make changes to the BIOS settings of your computer.</td>
</tr>
</tbody>
</table>

You can create a system password and a setup password to secure your computer.

⚠️ **CAUTION:** The password features provide a basic level of security for the data on your computer. ⚠️

⚠️ **CAUTION:** Anyone can access the data stored on your computer if it is not locked and left unattended. ⚠️

ℹ️ **NOTE:** System and setup password feature is disabled.

### Topics:
- Assigning a system setup password
- Deleting or changing an existing system setup password
- Clearing CMOS settings
- Clearing BIOS (System Setup) and System passwords

### Assigning a system setup password

You can assign a new **System or Admin Password** only when the status is in **Not Set**.

To enter the system setup, press F2 immediately after a power-on or re-boot.

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter. The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - The password can contain the numbers 0 through 9.
   - Only lower case letters are valid, upper case letters are not allowed.
   - Only the following special characters are allowed: space, (*), (+), (.), (-), (/), (\), ([), (]), (\), (').
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and a message prompts you to save the changes.
5. Press Y to save the changes. The computer reboots.

### Deleting or changing an existing system setup password

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

To enter the System Setup, press F2 immediately after a power-on or reboot.

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
The **System Security** screen is displayed.

2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.

3. Select **System Password**, alter or delete the existing system password and press Enter or Tab.

4. Select **Setup Password**, alter or delete the existing setup password and press Enter or Tab.

   **NOTE:** If you change the **System** and/or **Setup** password, re-enter the new password when prompted. If you delete the **System** and/or **Setup** password, confirm the deletion when prompted.

5. Press Esc and a message prompts you to save the changes.

6. Press Y to save the changes and exit from **System Setup**.
   
   The computer reboot.

### Clearing CMOS settings

1. Remove the **base cover**.
2. Remove the **battery**.
3. Remove the **coin-cell battery**.
4. Wait for one minute.
5. Replace the **coin-cell battery**.
6. Replace the **battery**.
7. Replace the **base cover**.

### Clearing BIOS (System Setup) and System passwords

Contact Dell technical support to clear the forgotten passwords. For more information, see [www.dell.com/contactdell](http://www.dell.com/contactdell).
### Enhanced Pre-Boot System Assessment (ePSA) diagnostics

The ePSA diagnostics (also known as system diagnostics) performs a complete check of your hardware. The ePSA is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

**NOTE:** Some tests for specific devices require user interaction. Always ensure that you are present at the computer terminal when the diagnostic tests are performed.

For more information, see Dell EPSA Diagnostic 3.0.

### Running the ePSA diagnostics

1. Turn on your computer.
2. As the computer boots, press the F12 key as the Dell logo appears.
3. On the boot menu screen, select the Diagnostics option.
4. Click the arrow at the bottom left corner. Diagnostics front page is displayed.
5. Click the arrow in the lower-right corner to go to the page listing. The items detected are listed.
6. To run a diagnostic test on a specific device, press Esc and click Yes to stop the diagnostic test.
7. Select the device from the left pane and click Run Tests.
8. If there are any issues, error codes are displayed. Note the error code and validation number and contact Dell.

### Flashing BIOS (USB key)

1. Follow the procedure from step 1 to step 7 in "Flashing the BIOS* to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information see the knowledge base article SLN143196 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press F12 when the Dell logo is displayed on the screen.
6. Boot to the USB drive from the One Time Boot Menu.
7. Type the BIOS setup program filename and press Enter.
8. The BIOS Update Utility appears. Follow the instructions on the screen to complete the BIOS update.

### Flashing the BIOS

You may need to flash (update) the BIOS when an update is available or when you replace the system board.
Follow these steps to flash the BIOS:

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click Product support, enter the Service Tag of your computer, and then click Submit.

   **NOTE:** If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.

4. Click Drivers & downloads > Find it myself.
5. Select the operating system installed on your computer.
6. Scroll down the page and expand BIOS.
7. Click Download to download the latest version of the BIOS for your computer.
8. After the download is complete, navigate to the folder where you saved the BIOS update file.
9. Double-click the BIOS update file icon and follow the instructions on the screen.

**Backup media and recovery options**

It is recommended to create a recovery drive to troubleshoot and fix problems that may occur with Windows. Dell proposes multiple options for recovering Windows operating system on your Dell PC. For more information, see Dell Windows Backup Media and Recovery Options.

**WiFi power cycle**

If your computer is unable to access the internet due to WiFi connectivity issues a WiFi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a WiFi power cycle:

   **NOTE:** Some ISPs (Internet Service Providers) provide a modem/router combo device.

1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

**Flea power release**

Flea power is the residual static electricity that remains on the computer even after it has been powered off and the battery has been removed. The following procedure provides the instructions on how to conduct flea power release:

1. Turn off your computer.
2. Remove the base cover.
3. Press and hold the power button for 15 seconds to drain the flea power.
4. Replace the base cover.
5. Turn on your computer.

**System diagnostic lights**

**Battery-status light**

Indicates the power and battery-charge status.

**Solid white** — Power adapter is connected and the battery has more than 5 percent charge.

**Amber** — Computer is running on battery and the battery has less than 5 percent charge.

**Off**

- Power adapter is connected and the battery is fully charged.
- Computer is running on battery and the battery has more than 5 percent charge.
Computer is in sleep state, hibernation, or turned off.
The power and battery-status light blinks amber along with beep codes indicating failures.

For example, the power and battery-status light blinks amber two times followed by a pause, and then blinks white three times followed by a pause. This 2,3 pattern continues until the computer is turned off indicating no memory or RAM is detected.

The following table shows different power and battery-status light patterns and associated problems.

### Table 18. LED codes

<table>
<thead>
<tr>
<th>Diagnostic light codes</th>
<th>Problem description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,1</td>
<td>Processor failure</td>
</tr>
<tr>
<td>2,2</td>
<td>System board: BIOS or ROM (Read-Only Memory) failure</td>
</tr>
<tr>
<td>2,3</td>
<td>No memory or RAM (Random-Access Memory) detected</td>
</tr>
<tr>
<td>2,4</td>
<td>Memory or RAM (Random-Access Memory) failure</td>
</tr>
<tr>
<td>2,5</td>
<td>Invalid memory installed</td>
</tr>
<tr>
<td>2,6</td>
<td>System-board or chipset error</td>
</tr>
<tr>
<td>2,7</td>
<td>Display failure</td>
</tr>
<tr>
<td>3,1</td>
<td>Coin-cell battery failure</td>
</tr>
<tr>
<td>3,2</td>
<td>PCI, video card/chip failure</td>
</tr>
<tr>
<td>3,3</td>
<td>Recovery image not found</td>
</tr>
<tr>
<td>3,4</td>
<td>Recovery image found but invalid</td>
</tr>
<tr>
<td>3,5</td>
<td>Power-rail failure</td>
</tr>
<tr>
<td>3,6</td>
<td>System BIOS Flash incomplete</td>
</tr>
<tr>
<td>3,7</td>
<td>Management Engine (ME) error</td>
</tr>
</tbody>
</table>

**Camera status light:** Indicates whether the camera is in use.
- Solid white — Camera is in use.
- Off — Camera is not in use.

**Caps Lock status light:** Indicates whether Caps Lock is enabled or disabled.
- Solid white — Caps Lock enabled.
- Off — Caps Lock disabled.
Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

**Table 19. Self-help resources**

<table>
<thead>
<tr>
<th>Self-help resources</th>
<th>Resource location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about Dell products and services</td>
<td><a href="http://www.dell.com">www.dell.com</a></td>
</tr>
<tr>
<td>Dell Help &amp; Support app</td>
<td></td>
</tr>
<tr>
<td>Accessing help</td>
<td></td>
</tr>
<tr>
<td>Online help for operating system</td>
<td></td>
</tr>
<tr>
<td>Troubleshooting information, user manuals, setup instructions, product specifications, technical help blogs, drivers, software updates, and so on.</td>
<td></td>
</tr>
<tr>
<td>Dell knowledge base articles for a variety of computer concerns.</td>
<td></td>
</tr>
</tbody>
</table>

Learn and know the following information about your product:

- Product specifications
- Operating system
- Setting up and using your product
- Data backup
- Troubleshooting and diagnostics
- Factory and system restore
- BIOS information


To locate the [Me and My Dell](http://www.dell.com/support/manuals) relevant to your product, identify your product through one of the following:

1. Select **Detect Product**.
2. Locate your product through the drop-down menu under **View Products**.
3. Enter the **Service Tag number** or **Product ID** in the search bar.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see [www.dell.com/contactdell](http://www.dell.com/contactdell).

**NOTE:** Availability varies by country and product, and some services may not be available in your country.

**NOTE:** If you do not have an active internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.