Latitude 7390 2-in-1

Owner's Manual

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.**

Working on your computer

Topics:

- Safety precautions
- Before working inside your computer
- After working inside your computer

Safety precautions

The safety precautions chapter details the primary steps to be taken before performing any disassembly instructions.

Observe the following safety precautions before you perform any installation or break/fix procedures involving disassembly or reassembly:

- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power.
- Disconnect all network cables, telephone, and telecommunications lines from the system.
- Use an ESD field service kit when working inside any notebook to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

Standby power

Dell products with standby power must be unplugged before you open the case. Systems that incorporate standby power are essentially powered while turned off. The internal power enables the system to be remotely turned on (wake on LAN) and suspended into a sleep mode and has other advanced power management features.

Unplugging, pressing and holding the power button for 15 seconds should discharge residual power in the system board, notebooks

Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done through the use of a field service electrostatic discharge (ESD) kit. When connecting a bonding wire, ensure that it is connected to bare metal and never to a painted or non-metal surface. The wrist strap should be secure and in full contact with your skin, and ensure that you remove all jewelry such as watches, bracelets, or rings prior to bonding yourself and the equipment.

Electrostatic discharge — ESD protection

ESD is a major concern when you handle electronic components, especially sensitive components such as expansion cards, processors, memory DIMMs, and system boards. Very slight charges can damage circuits in ways that may not be obvious, such as intermittent problems or a shortened product life span. As the industry pushes for lower power requirements and increased density, ESD protection is an increasing concern.

Due to the increased density of semiconductors used in recent Dell products, the sensitivity to static damage is now higher than in previous Dell products. For this reason, some previously approved methods of handling parts are no longer applicable.

Two recognized types of ESD damage are catastrophic and intermittent failures.

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for missing or nonfunctional memory.
- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking wounded") failure.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

The unmonitored Field Service kit is the most commonly used service kit. Each Field Service kit includes three main components: anti-static mat, wrist strap, and bonding wire.

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should

never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.

- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

It is recommended that all field service technicians use the traditional wired ESD grounding wrist strap and protective anti-static mat at all times when servicing Dell products. In addition, it is critical that technicians keep sensitive parts separate from all insulator parts while performing service and that they use anti-static bags for transporting sensitive components.

Transporting sensitive components

When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

Before working inside your computer

1 Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2 Turn off your computer.
3 If the computer is connected to a docking device (docked), undock it.
4 Disconnect all network cables from the computer (if available).

> △ CAUTION: If your computer has an RJ45 port, disconnect the network cable by first unplugging the cable from your computer.

5 Disconnect your computer and all attached devices from their electrical outlets.
6 Open the display.
7 Press and hold the power button for few seconds, to ground the system board.

> △ CAUTION: To guard against electrical shock unplug your computer from the electrical outlet before performing Step # 8.

> △ CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

8 Remove any installed ExpressCards or Smart Cards from the appropriate slots.

After working inside your computer

After you complete any replacement procedure, ensure that you connect external devices, cards, and cables before turning on your computer.

> △ CAUTION: To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.

1 Connect any external devices, such as a port replicator or media base, and replace any cards, such as an ExpressCard.
2 Connect any telephone or network cables to your computer.

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

3 Connect your computer and all attached devices to their electrical outlets.
4 Turn on your computer.

Removing and installing components

Topics:

Recommended tools

The procedures in this document require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Plastic scribe

ⓘ **NOTE: The #0 screw driver is for screws 0-1 and the #1 screw driver is for screws 2-4**

Screw size list

Table 1. Latitude 7390- Screw size list

Component	M 2.5 x 2.5L	M 2.5 x 4.0L	M 2.0 x 3.0L	M 2 x 2L K3.6D	M 2.0 x 2L K7D	M 2 x 1.7L	M 1.98 x 4L	M 2.5 x 5
Hinge bracket to Cover	6							
G-sensor to Cover			1					
Lcm frame down to Cover			2					
Hinge bracket to Low		4						
Power Board			2					
LED Board			2					
Fingerprint bracket			1					
Touchpad button			2					
Smart Card					2			
K/B to K/B plate				6				
K/B plate			13					
Bottom Door Assy								8
System board			6					
Fan			1		1			
Thermal			4					
Battery							4	
WLAN			1					
WWAN			1					
EDP Bracket						2		
USB Type C							2	

Micro Secure Digital Card

Removing the Micro Secure Digital Card

1   Follow the procedure in Before working inside your computer.
2   Push the Micro Secure Digital (SD) card to release it from the computer.
3   Slide the Micro Secure Digital (SD) card out of the computer.

Installing the Micro Secure Digital Card

1   Slide the Micro SD into the slot until it clicks into place.
2   Follow the procedures in After working inside your computer.

Subscriber Identity Module SIM Card

Removing the micro SIM card or the micro SIM card tray

⚠ | **CAUTION: Removing the micro SIM card when the computer is on may cause data loss or damage the card.**

ⓘ | **NOTE: Micro SIM card tray is available only for systems that are shipped with WWAN card.**

1   Insert a pin or a micro SIM card removal tool into the pinhole on the micro SIM card tray.
2   Use a scribe to pull the micro SIM card tray.
3   If a micro SIM card is available, remove the micro SIM card from the micro SIM card tray.

Replacing SIM card

1   Insert a paperclip or a SIM card removal tool into the pinhole on the SIM card tray.
2   Use a scribe to pull the SIM card tray
3   Place on the SIM card on the tray.
4   Insert the SIM card tray into the slot.

Base cover

Removing the base cover

1   Follow the procedure in Before working inside your computer.
2   Loosen the 8 (M2.5 x 5.0) captive screws that secure the base cover to the computer.

3   Use a plastic scribe to pry the base cover starting from the hinges at the top edge of the base cover and lift it from the computer.

ⓘ NOTE: The recesses are located near the hinges at the rear side of the computer.

4   Remove the base cover

Installing the base cover

1   Align the base cover tabs to the slots on the edges of the computer.

2   Press the edges of the cover until it clicks into place.

3   Tighten the 8 (M2.5 x 5.0) captive screws to secure the base cover to the computer.

4   Follow the procedure in After working inside your computer.

Battery

Removing the battery

1   Follow the procedure in Before working inside your computer.

2   Remove:

    a   MicroSD card

    b   SIM card tray

       ⓘ NOTE: **To remove both cards if equipped and no need to remove the blank filler**

    c   Base cover

3   To remove the battery:

    a   Lift the ribbon, disconnect and remove the battery cable from the connector on the system board [1].

    b   Remove the 4 (M1.98 x 4 L) screws that secure the battery to the computer [2].

    c   Lift the battery from the computer [3].
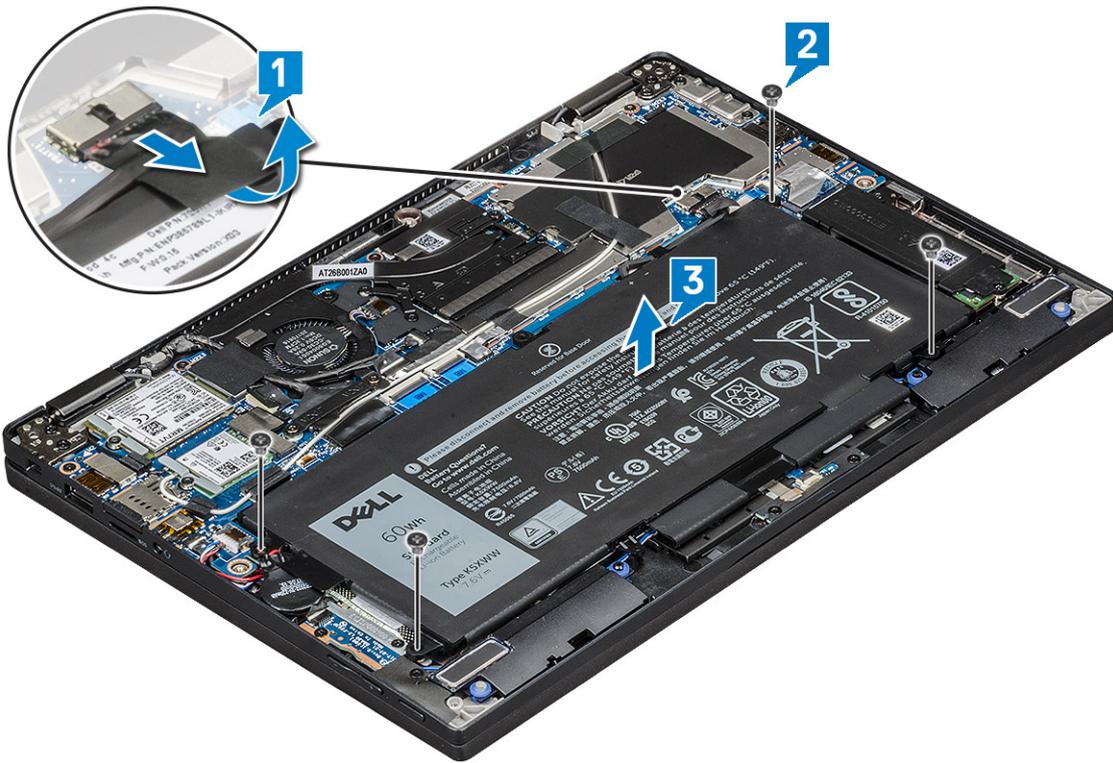
Installing battery

1. Insert the battery into the slot on the computer.
2. Connect the battery cable to the connector on the system board.
3. Replace the 4 (M1.98 x 4L) screws to secure the battery to the computer.
4. Install the:
   a. Base cover
   b. SIM card tray
   c. MicroSD card

   > ⓘ NOTE: To install both cards if equipped.

5. Follow the procedure in After working inside your computer.

PCIe Solid State Drive (SSD)

Removing the NVMe SSD card

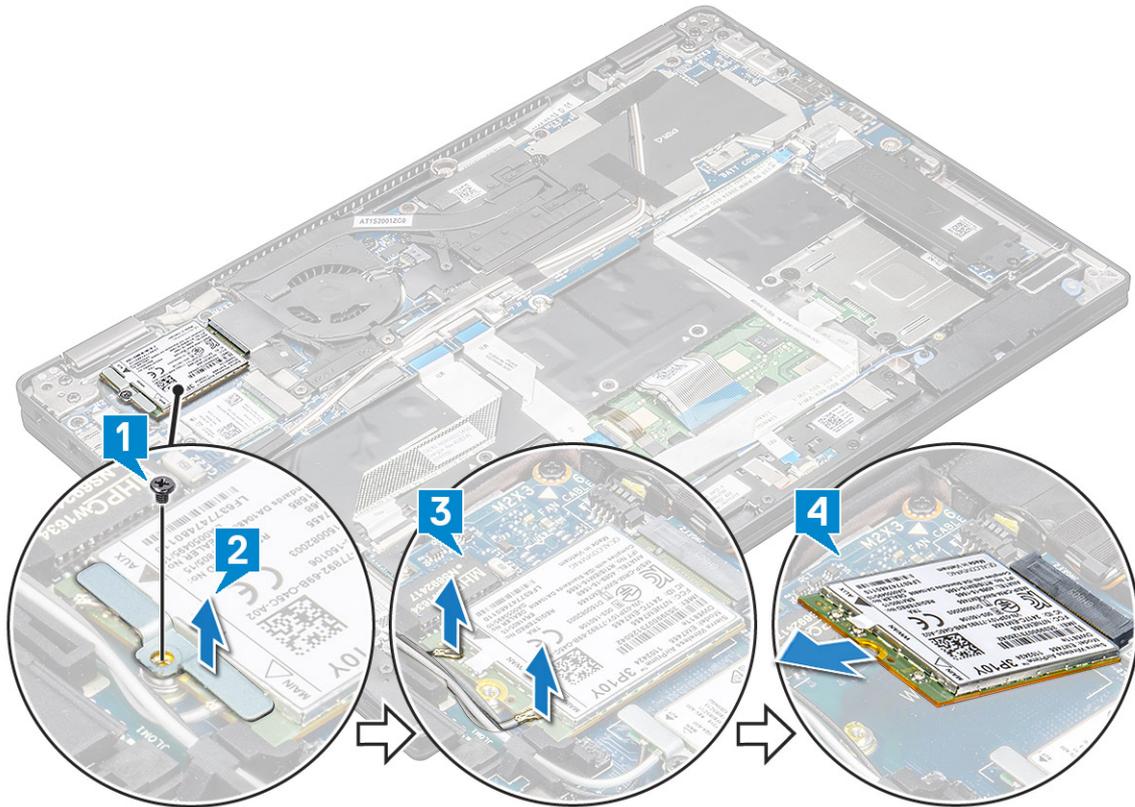1. Follow the procedure in Before working inside your computer.
2. Remove:
   a. MicroSD card
   b. SIM card tray

   > ⓘ NOTE: To remove both cards if equipped and no need to remove the blank filler

   c. Base cover
   d. Battery
3. To remove the NVMe SSD card:
   a. Loosen the 2 (M2.0 x 3.0) screws that secure SSD thermal plate in place [1].

b Lift the thermal plate from the SSD card [2].

c Remove the SSD card from the slot [3].
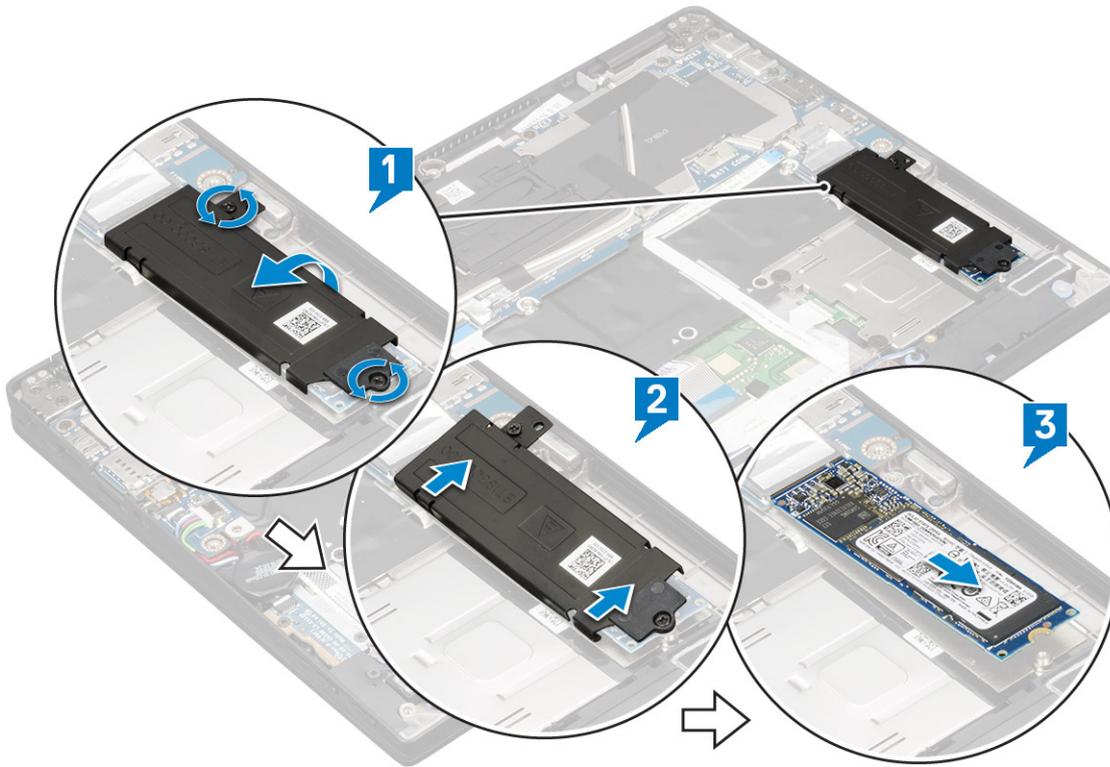
Installing the NVMe SSD

1 Insert the NVMe SSD card into the connector.

2 Install the thermal plate over the SSD card.

3 Tighten the 2 (M2.0 x 3.0) screws to secure the SSD thermal plate.

4 Install the:

    a Battery

    b Base cover

    c SIM card tray

    d MicroSD card

       ⓘ **NOTE: To install both cards if equipped.**

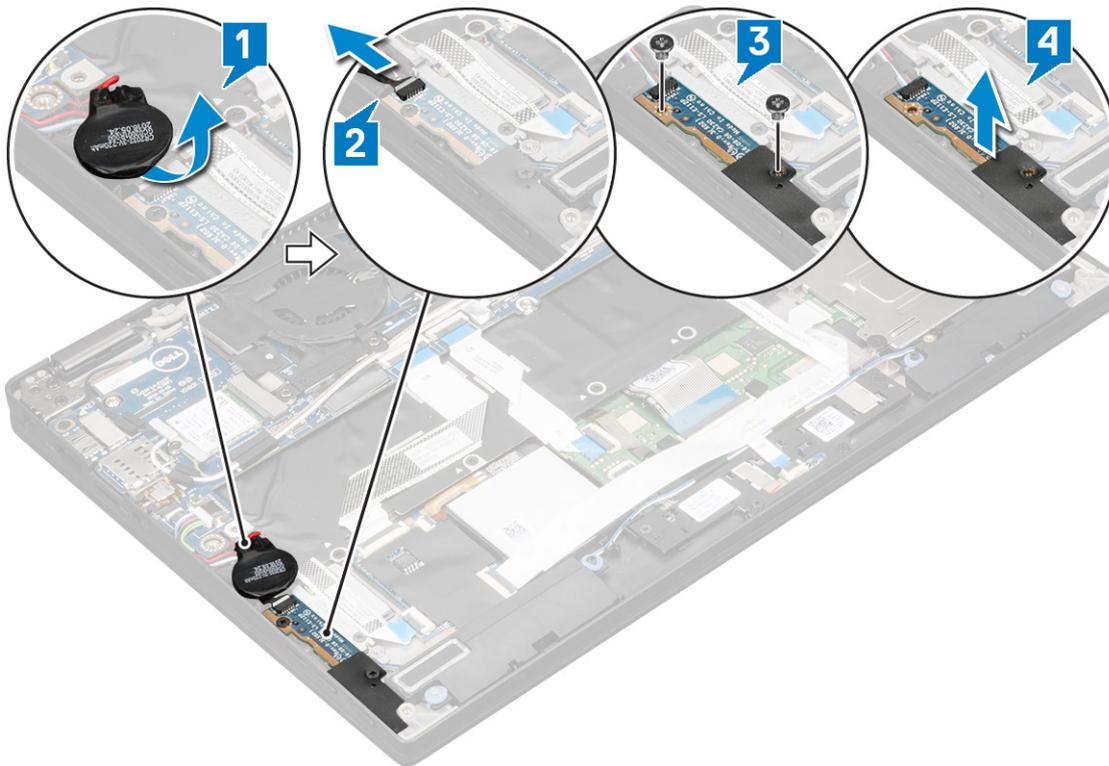5 Follow the procedure in After working inside your computer.

WLAN card

Removing the WLAN card

1 Follow the procedure in Before working inside your computer.

2 Remove:

    a MicroSD card

    b SIM card tray

       ⓘ **NOTE: To remove both cards if equipped and no need to remove the blank filler**

    c Base cover

d   Battery

3   To remove the WLAN card:

   a   Remove 1 (M2.0 x 3.0) screw that secures the wireless card bracket in place [1].
   b   Lift the wireless card bracket [2].
   c   Disconnect the WLAN cables from the connectors on the WLAN card [3].
   d   Remove the WLAN card [4].
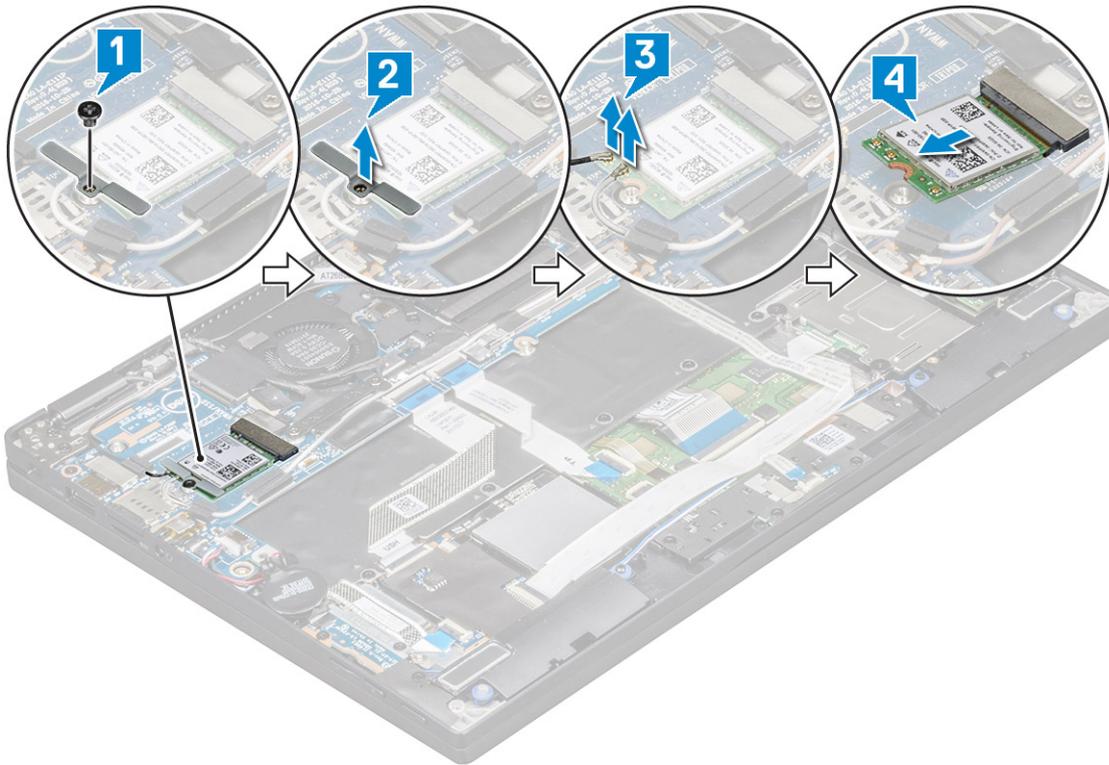
Installing the WLAN card

1   Insert the WLAN card into the connector on the system board.

2   Connect the WLAN cables to the connectors on the WLAN card.

3   Place the wireless card bracket and replace 1 (M2.0 x 3.0) screw to secure WLAN card to the computer.

4   Install the:

   a   Battery
   b   Base cover
   c   SIM card tray
   d   MicroSD card

   ⓘ NOTE: To install both cards if equipped.

5   Follow the procedure in After working inside your computer.

WWAN card

Removing the WWAN card

1   Follow the procedure in Before working inside your computer.

2   Remove:

a MicroSD card
b SIM card tray

> ⓘ NOTE: To remove both cards if equipped and no need to remove the blank filler

c Base cover
d Battery

3 To remove the WWAN card:

a Remove 1 (M2.0 x 3.0) screw that secures the WWAN card bracket in place [1].
b Lift the WWAN card bracket that secures the WWAN card [2].
c Disconnect the WWAN cables from the connectors on the WWAN card [3].
d Lift the WWAN card from the computer [4].

Installing the WWAN card

1 Insert the WWAN card into the connector on the system board.

2 Connect the WWAN cables to the connectors on the WWAN card.

3 Place the metal bracket and replace the M2.0 x 3.0 screw to secure the WLAN card to the computer.

4 Install the:

a Battery
b Base cover
c SIM card tray
d MicroSD card

> ⓘ NOTE: To install both cards if equipped.

5 Follow the procedure in After working inside your computer.

> ⓘ NOTE: The IMEI number can also be found on the WWAN card.

Power board

Removing the power board

1   Follow the procedure in Before working inside your computer.
2   Remove:
   a   MicroSD card
   b   SIM card tray

   ⓘ NOTE: **To remove both cards if equipped and no need to remove the blank filler**
   c   Base cover
   d   Battery
3   To remove the power board:
   a   Peel and flip over the coin cell battery [1].
   b   Disconnect the power daughter board cable from the system board [2].
   c   Remove the 2 (M2X3) screws securing the power board in place [3].
   d   Lift the power board from the computer [4].

Installing the power board

1   Place the power board by aligning it to the screw holes.
2   Replace the 2 (M2.0x3.0) screws to secure the power board to the computer.
3   Connect the power board cable to the connector on the system board.
4   Affix the coin cell battery on the computer.
5   Install the:

a   Battery
b   Base cover
c   SIM card tray
d   MicroSD card

> ⓘ **NOTE: To install both cards if equipped.**

6   Follow the procedure in After working inside your computer.

Speaker

Removing the speaker module

1   Follow the procedure in Before working inside your computer.
2   Remove:
    a   MicroSD card
    b   SIM card tray

> ⓘ **NOTE: To remove both cards if equipped and no need to remove the blank filler**

    c   Base cover
    d   Battery
    e   Power board
3   To disconnect the cables:
    a   Disconnect and fold back the smart card cable from the USH board [1].
    b   Disconnect and fold back the LED daughter board FFC from the LED daughter board for easy access in removing the speaker module [2].
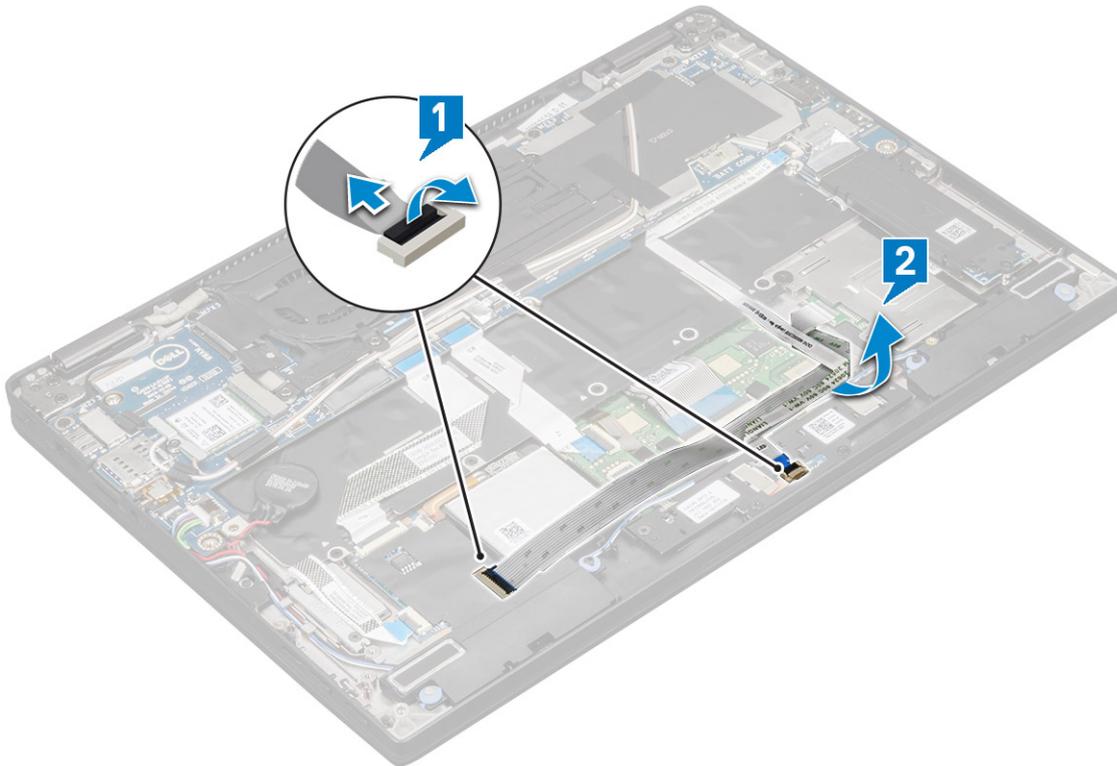
4   To release the speaker module:
    a   Disconnect the speaker cable from the connector on the system board [1].
    b   Un route the speaker cable from the retention clips and remove the tapes that secure the speaker cable [2].

5   To remove the speaker module:

    a   Un route the speaker cable by removing the tapes near the palm rest [1].

    b   Lift the speaker module from the computer.

> ⓘ | **NOTE: You can use a plastic scribe to lift the speaker module from the computer.**
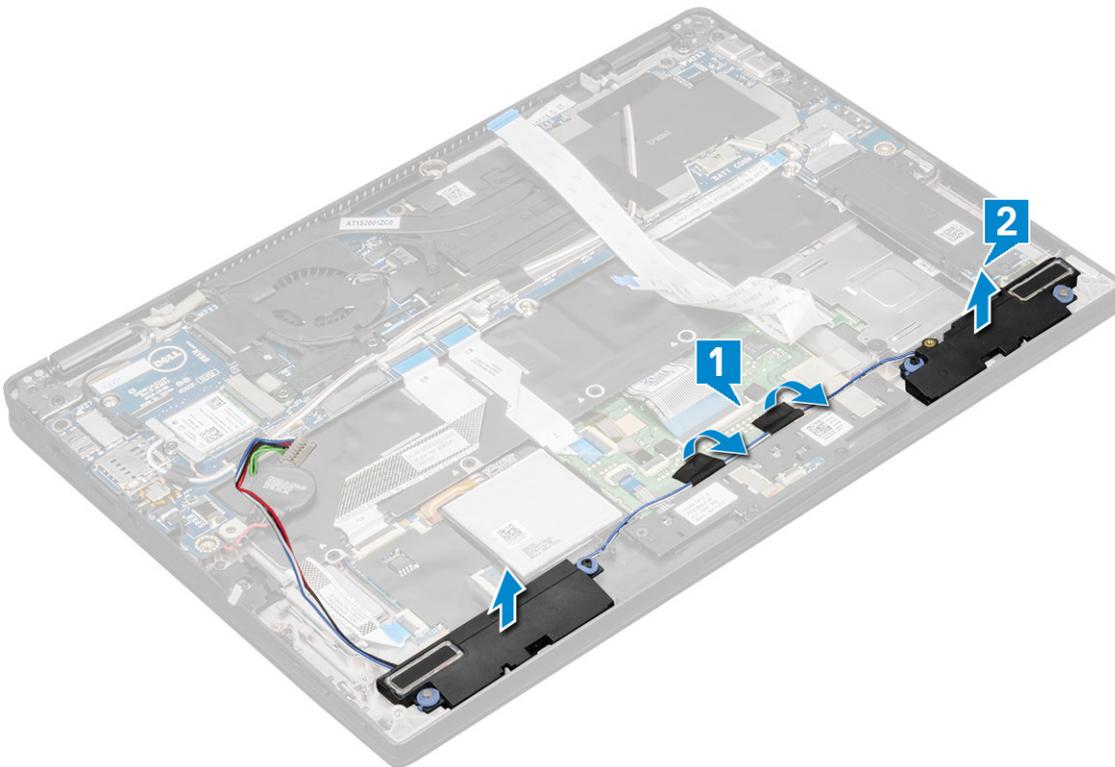
Installing the speaker module

1   Place the speaker module into the slots on the computer.

2   Route the speaker cable through the routing channel and secure it with the tapes.

3   Connect the speaker cable to the connector on the system board.

4   Connect the smart cable to the connector on the palm rest.

5   Install the:
    a   Power board
    b   Battery
    c   Base cover
    d   SIM card tray
    e   Micro SD

    ⓘ NOTE: To install both cards if equipped.

6   Follow the procedure in After working inside your computer.

Smart Card Cage

Removing the smart card cage

ⓘ NOTE: Always remove the smart card from the smart card reader.

1   Follow the procedure in Before working inside your computer.

2   Remove:
    a   Micro SD
    b   SIM card tray

    ⓘ NOTE: To remove both cards if equipped and no need to remove the blank filler
    c   Base cover
    d   Battery
    e   SSD card

3   To disconnect the cables:
    a   Disconnect the smart card cable [1].
    b   Disconnect the LED board cable [2].
    c   Peel the SSD thermal pad from the SSD slot [3].

    ⓘ NOTE: You may need to apply force to peel off the SSD thermal
    pad.
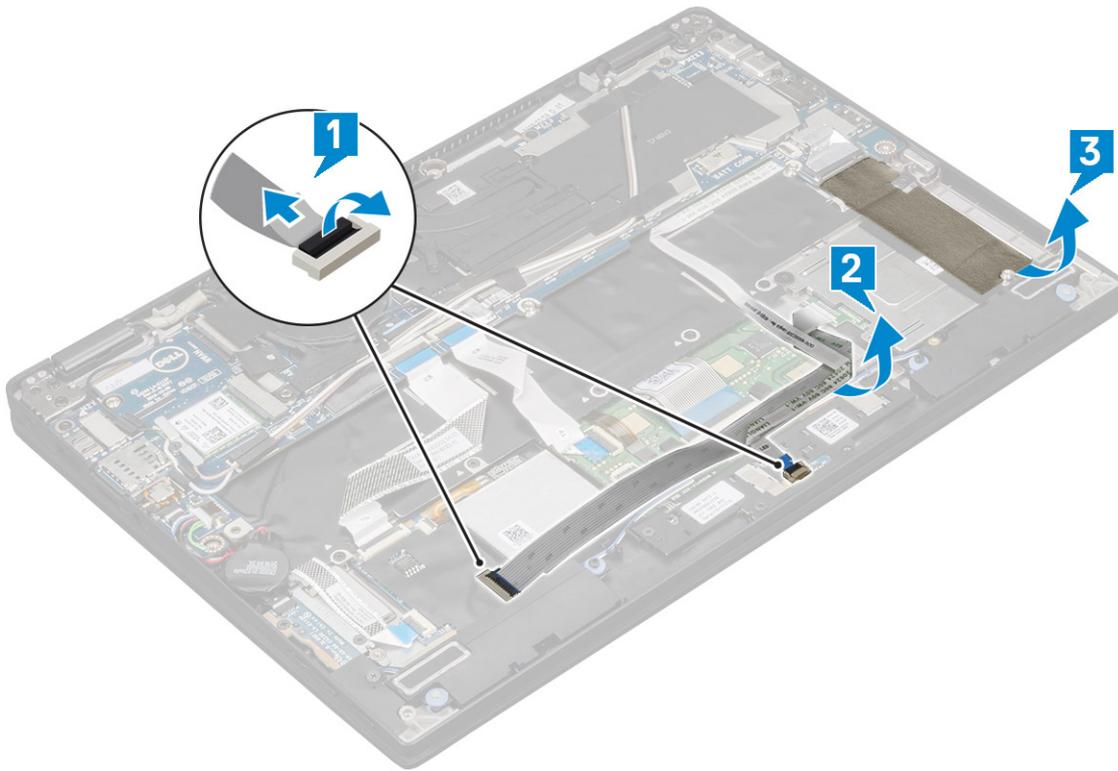
4   To remove the smart card cage:

   a   Remove the 2 (M2 x 2.0) screws that secure the smart card cage to the computer [1].
   b   Slide it out and lift the smart card cage from the computer [2].
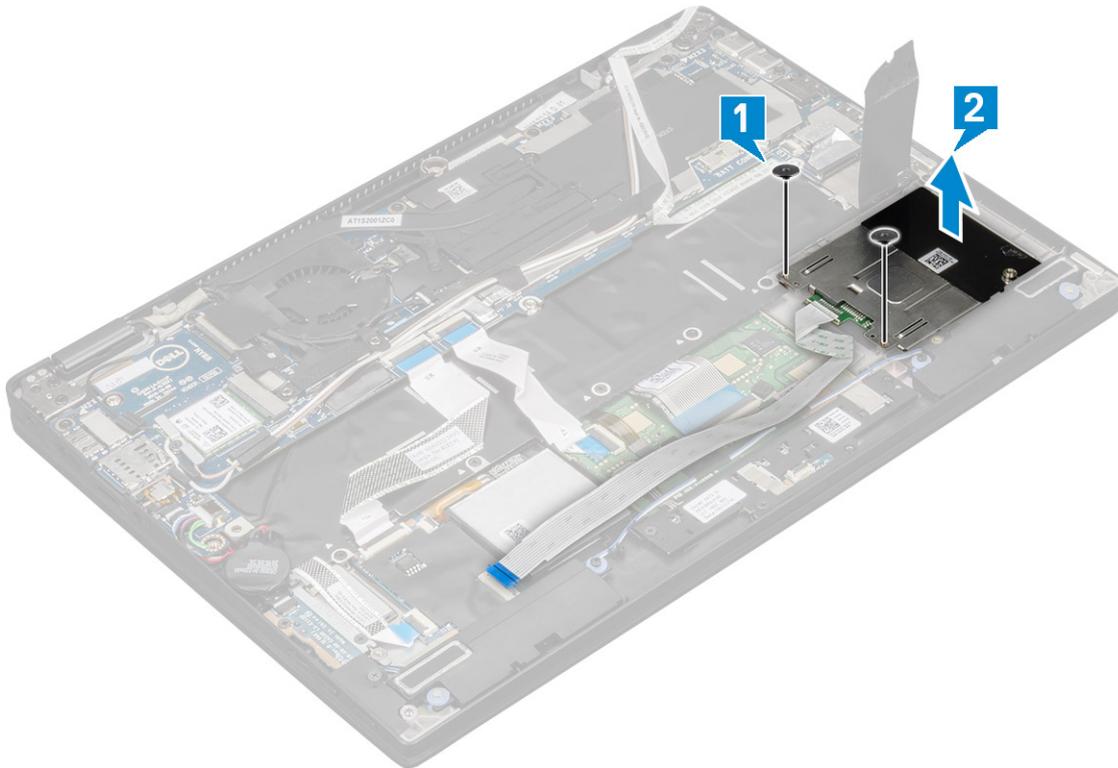
Installing the smart card cage

1 Slide the smart card cage into the slot to align with the screw holders on the computer.
2 Replace the 2 (M2 x 2.0) screws to secure the smart card cage to the computer.
3 Affix the thermal pad on the SSD module.
4 Affix the LED board cable and connect it to the LED board on the computer.
5 Affix the smart card cable and connect it to the USH board on the computer .
6 Install the:
    a SSD card
    b battery
    c base cover
    d SIM card tray
    e MicroSD card

> ⓘ NOTE: **To install both cards if equipped.**

7 Follow the procedure in After working inside your computer.

Fingerprint Board

Removing the fingerprint reader board

1 Follow the procedure in Before working inside your computer.
2 Remove:
    a Micro SD
    b SIM card tray

> ⓘ NOTE: **To remove both cards if equipped and no need to remove the blank filler**

    c Base cover
    d Battery
3 To remove the fingerprint reader board:
    a Lift the coin cell battery affixed to the speaker cables [1].
    b Disconnect the finger print reader cables from the fingerprint reader board and the USH board [2].

> ⓘ NOTE: **The cable should be released so that it does not tear.**

    c Remove 1(M2 x 3) screw that secures the fingerprint reader bracket to the computer [3].
    d Lift the fingerprint reader bracket from the fingerprint reader board [4].
    e Lift the fingerprint reader board from the slot on the computer.

> ⓘ NOTE: **Fingerprint reader board is affixed to the palm rest and you may need a plastic scribe to lift the fingerprint reader board.**
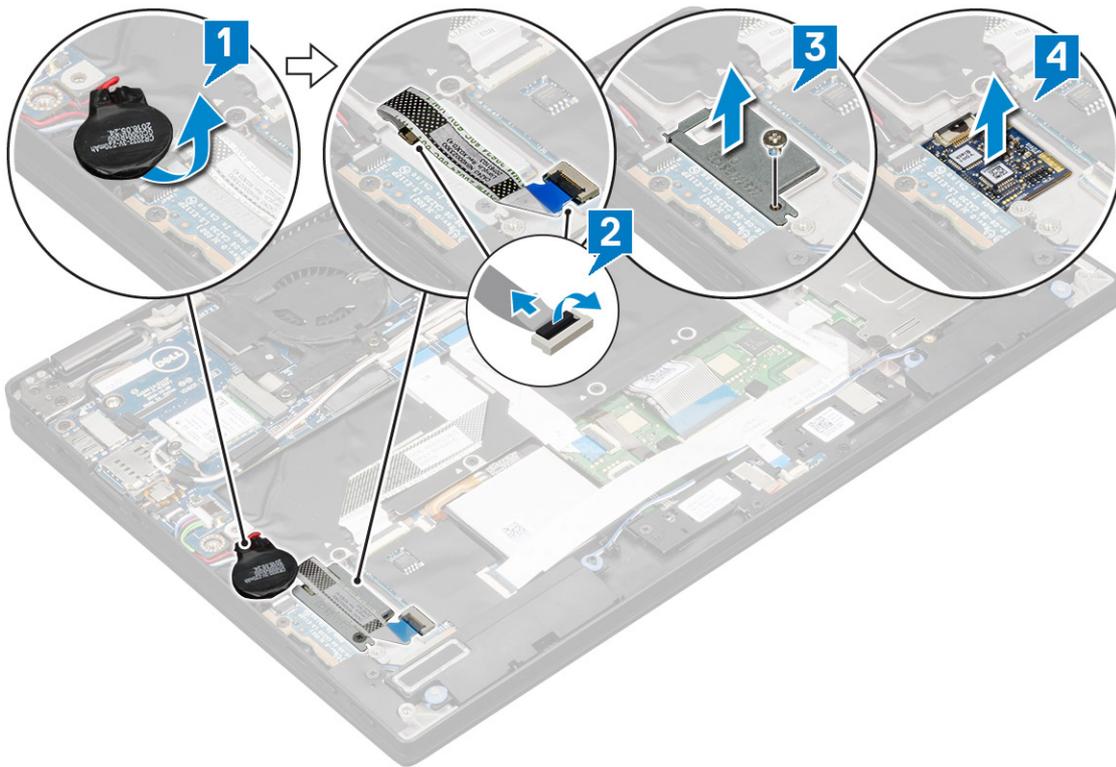
Installing the fingerprint reader board

1. Install the fingerprint reader board into the slot.
2. Place the fingerprint reader bracket on the board.
3. Replace 1(M2 x 3) screw to secure the bracket to the board.
4. Connect the fingerprint reader cable to the fingerprint reader board and the USH board.
5. Affix the coin cell battery on the speaker cable
6. Install the:
   a. Battery
   b. Base cover
   c. SIM card tray
   d. MicroSD card

   > (i) **NOTE: To install both cards if equipped.**

7. Follow the procedure in After working inside your computer.

LED Board

Removing the LED board

1. Follow the procedure in Before working inside your computer.
2. Remove:
   a. Micro SD
   b. SIM card tray

   > (i) **NOTE: To remove both cards if equipped and no need to remove the blank filler**

    c   Base cover

    d   Battery

3   To remove the LED board:

    a   Disconnect the LED board cable from the LED board [1].

    b   Remove the tape that secures the LED board to the touchpad panel [2].

    c   Remove the 2 (M2 x 3) screws that secure the LED board on the computer [3].

    d   Lift the LED board from the computer [4].
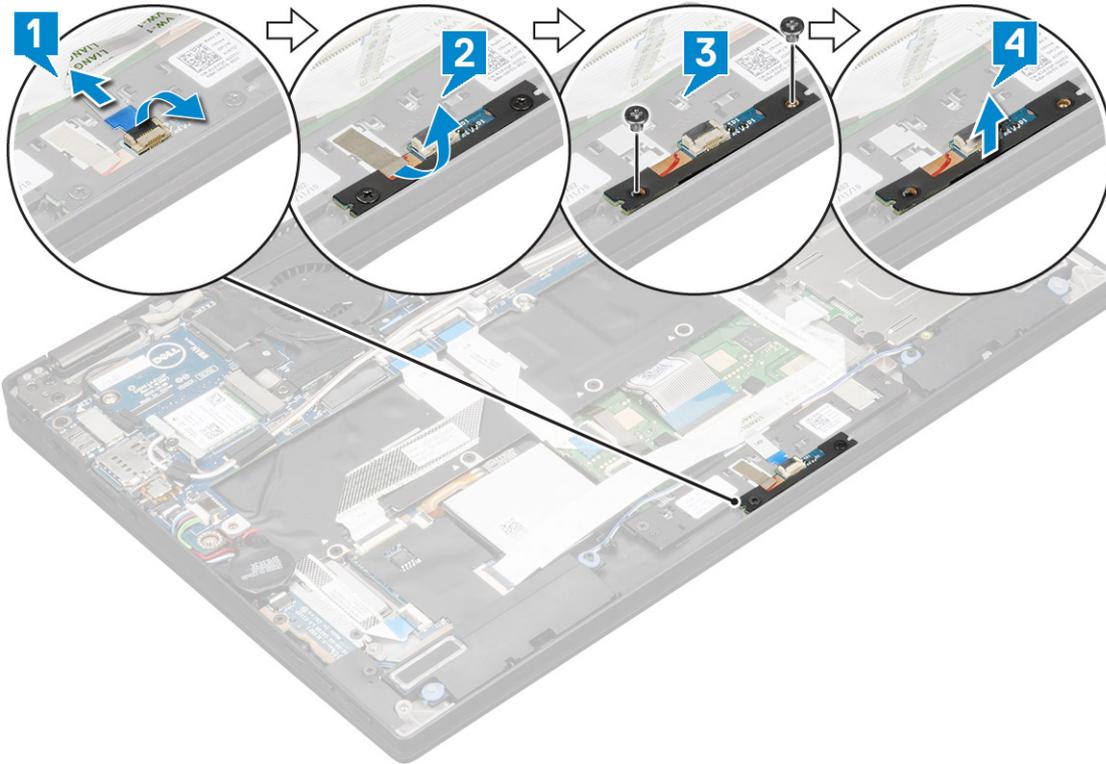
Installing the LED board

1   Install the LED board into the slot.

2   Replace the 2 (M2 x 3) screws to secure the LED board.

3   Affix the tape to secure the LED board.

4   Connect the LED board cable to the LED board.

5   Install the:

    a   Battery

    b   Base cover

    c   SIM card tray

    d   MicroSD card

       ⓘ NOTE: **To install both cards if equipped.**

6   Follow the procedure in After working inside your computer.

Heat Sink

Removing heat sink assembly

1   Follow the procedure in Before working inside your computer.
2   Remove the:
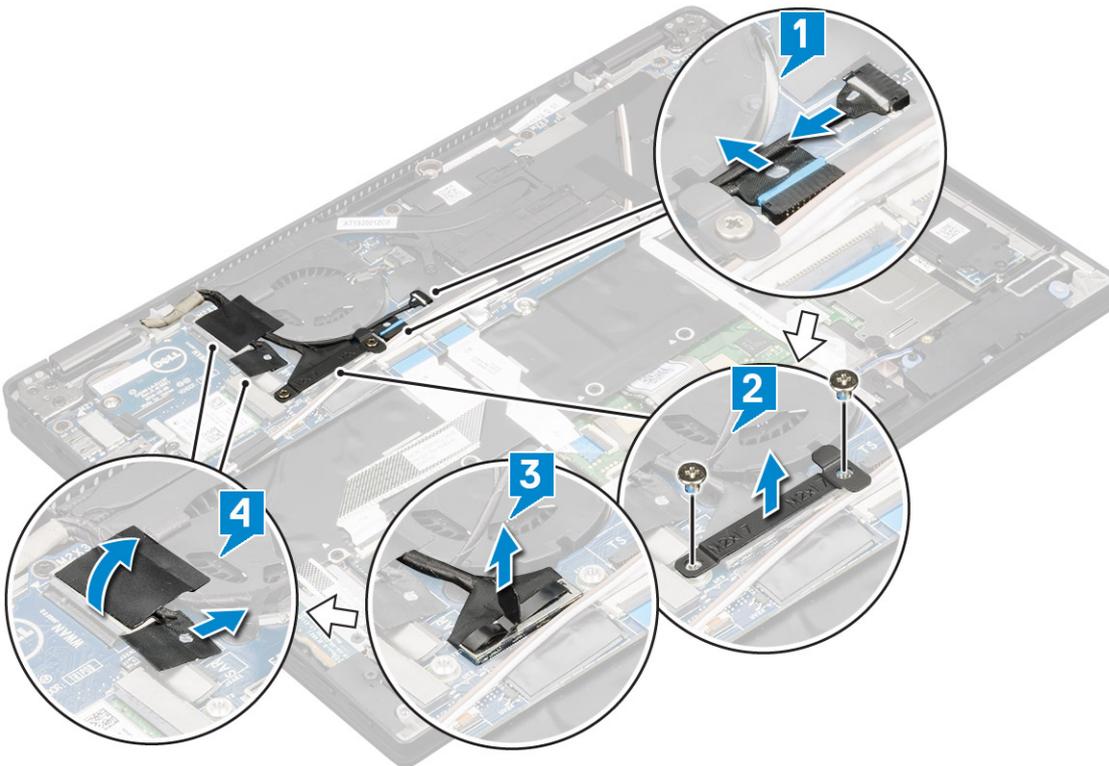   a   Micro SD
    b   SIM card tray

    ⓘ NOTE: **To remove both cards if equipped and no need to remove the blank filler**

    c   Base cover
    d   Battery
3   To remove the heat sink assembly:
    a   Disconnect the fan cable from the system board [1].
    b   Remove the 2 (M2.0 x 3.0) screws that secure the fan to the system board [2].
    c   Remove the 4 (M2.0 x 3.0) screws that secure the heat sink to the system board [3].
    d   Lift the heat sink assembly from the system board.
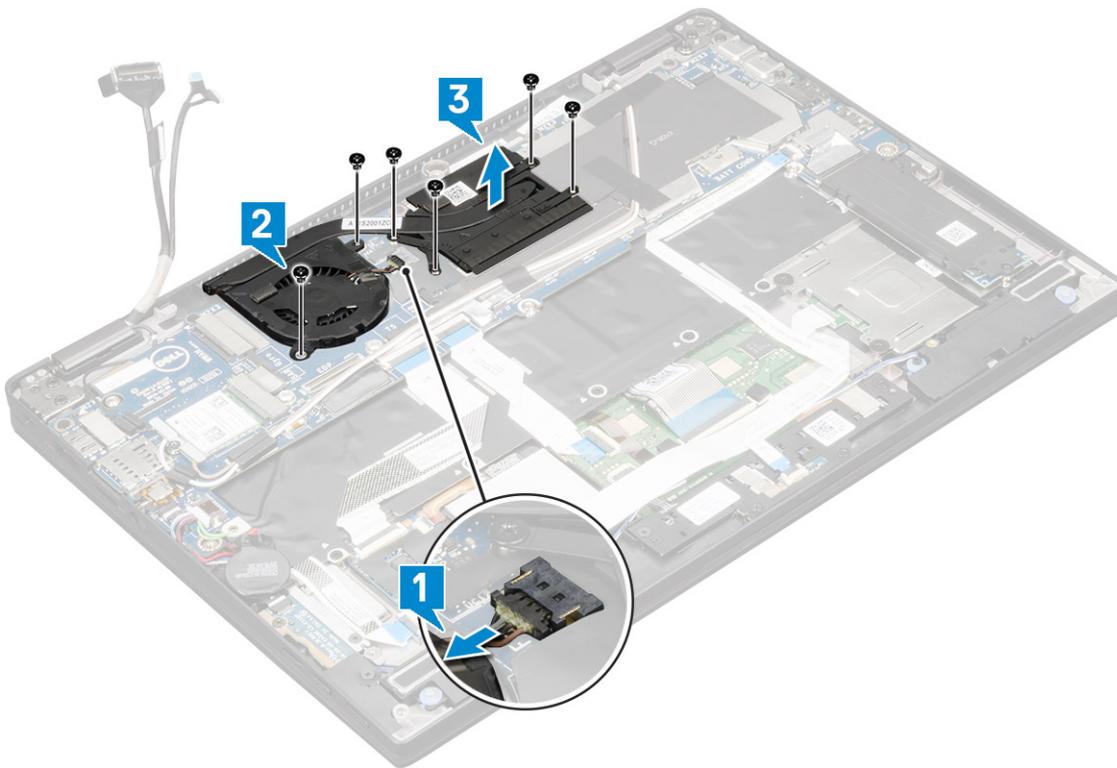
Installing heat sink assembly

1   Align the heat sink assembly with screw holders on the system board.
2   Replace the 4 (M2.0 x 3.0) screws to secure the heat sink to the system board.

    ⓘ NOTE: **Tighten the screws on the system board in the order of the callout numbers [1, 2, 3, 4] as indicated on the heat sink.**

3   Replace the 2 (M2.0 x 3.0) screws to secure the fan to the system board.
4   Connect the fan cable to the connector on the system board.
5   Install the:
    a   Battery
    b   Base cover

    c   SIM card tray

    d   MicroSD card

> ⓘ **NOTE:** **To install both cards if equipped.**

6   Follow the procedure in After working inside your computer.

Display Assembly

Removing the display assembly

1   Follow the procedure in Before working inside your computer.

2   Remove the:

    a   Micro SD

    b   SIM card tray

> ⓘ **NOTE:** **To remove both cards if equipped and no need to remove the blank filler**

    c   Base cover

    d   Battery

    e   WLAN card

    f   WWAN card

3   Peel the tapes that secure the antenna cables to the system board and remove the cables from the routing clips.
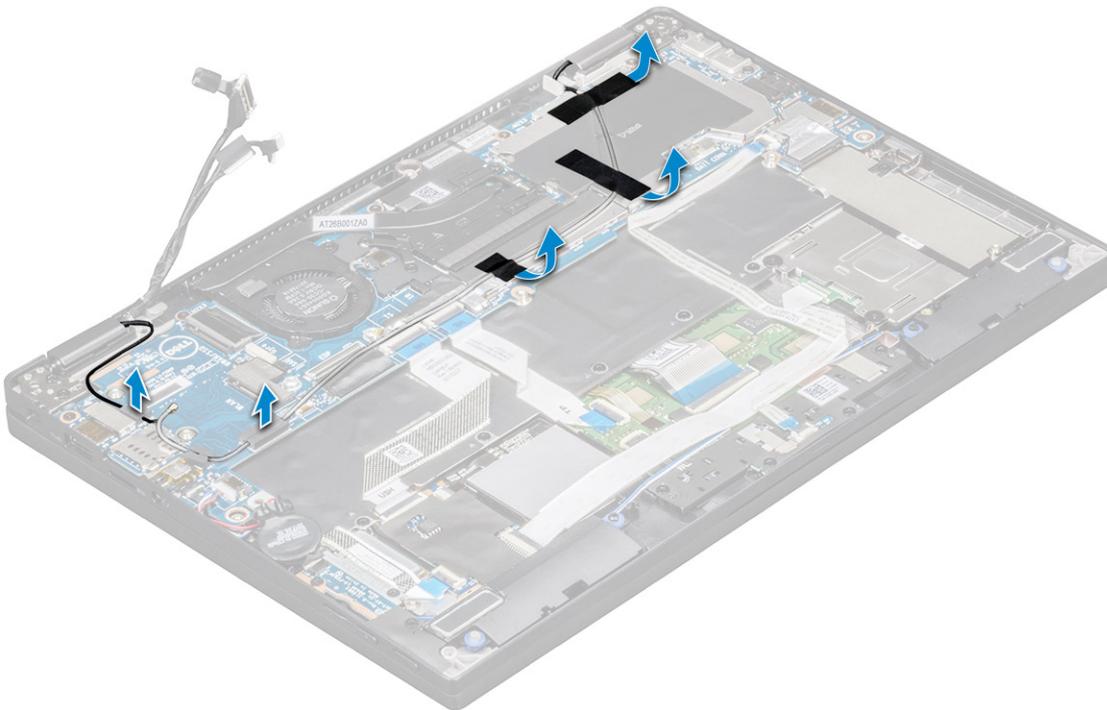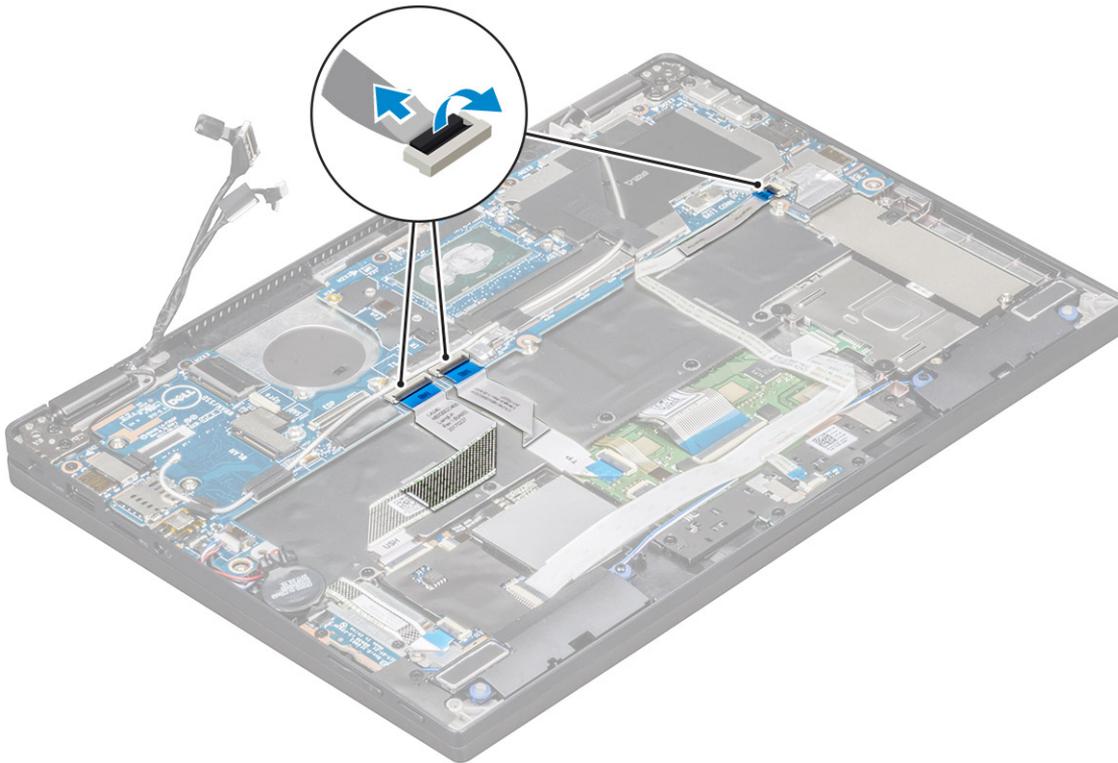

4   Disconnect the :

    a   IR camera and touchscreen cable [1].

    b   Remove the 2 (M 2 x 1.7L) screws that secure the eDP bracket and lift it away from the computer [2].

    c   Disconnect the eDP cable from the system board [3].

    d   Disconnect the G-sensor and eDP cables [4].
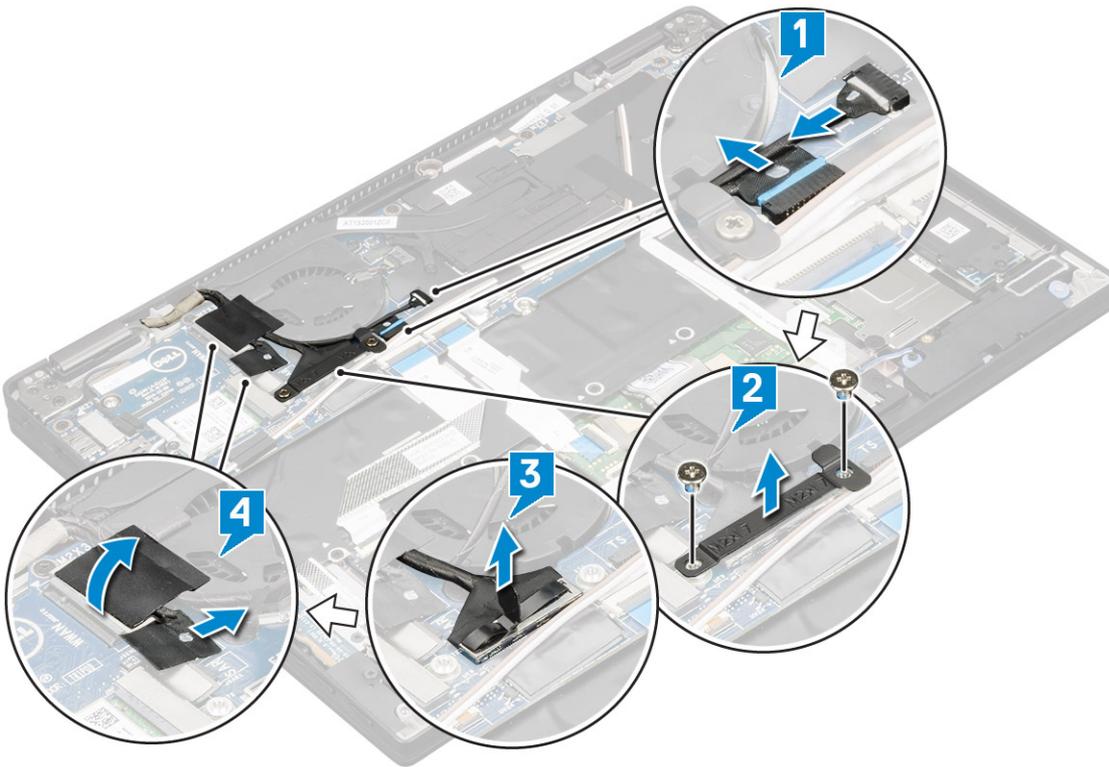
5   Lift the base of the computer away from the display assembly.
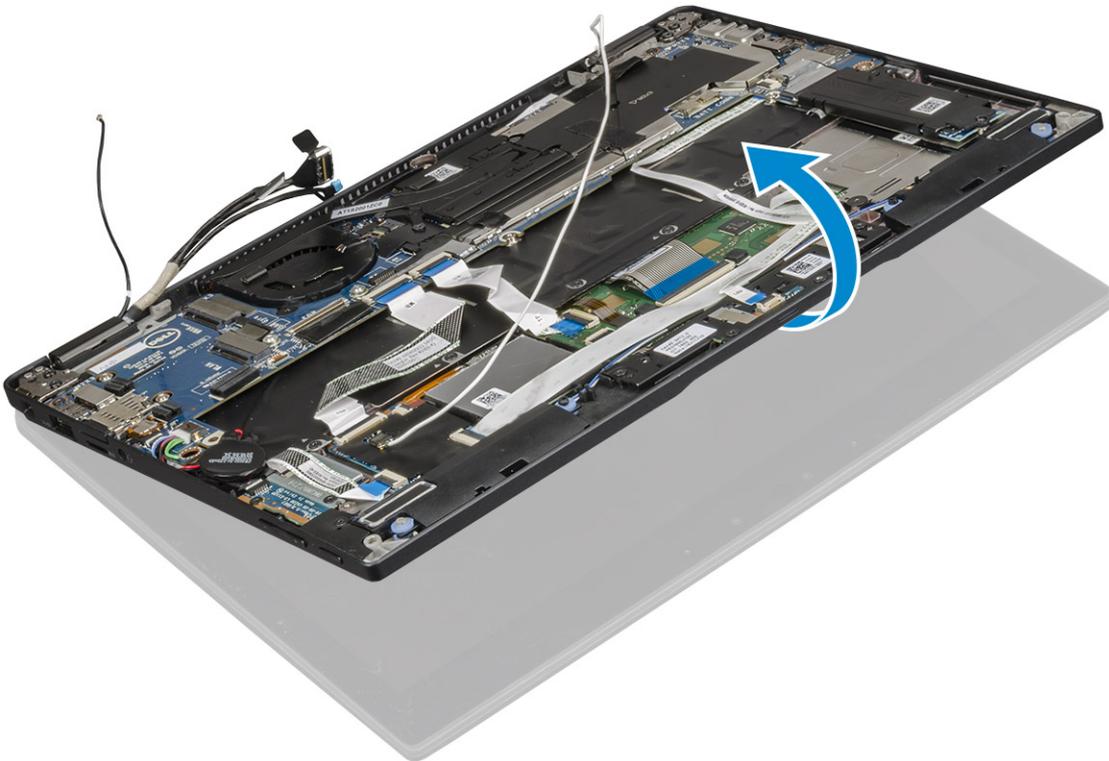
6   To remove the display assembly:

   a   Place the base of the computer with the display assembly.

   ⓘ | **NOTE: To open as shown in the illustration.**

   b   Remove the 4 (M2.5 x 4.0) screws that secure the display hinge brackets [1].

   c   Lift the display assembly away from the computer [2].

Installing the display assembly

1. Place the base of the computer on a flat surface.
2. Align the display assembly with the display hinge screw holders.
3. Replace the 4 (M2.5 x 4.0) screws to secure the display assembly.
4. Close the display assembly and flip the computer.
5. Connect the cables:
   a. G-sensor and eDP cable
   b. Place the eDP bracket on the eDP cable and replace the 2 (M2 x 2) screw on the bracket.
   c. IR camera and touch screen cables
6. Route the antenna cables through the routing clips
7. Affix the tapes to secure the antenna cables to the system board.
8. Install the:
   a. WWAN card
   b. WLAN card
   c. Battery
   d. Base cover
   e. SIM card tray
   f. MicroSD card

   (i) NOTE: To install both cards if equipped.
9. Follow the procedure in After working inside your computer.

System Board

Removing system board

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a Micro SD
   b SIM card tray

   > ⓘ NOTE: **To remove both cards if equipped and no need to remove the blank filler**

   c Base cover
   d Battery
   e SSD card
   f WLAN card
   g WWAN card
   h Heatsink assembly
3 Disconnect the :
   a IR camera and touchscreen cable [1].
   b Remove the 2 (M 2 x 1.7L) screws that secure the eDP bracket and lift it away from the computer [2].
   c Disconnect the eDP cable from the system board [3].
   d Disconnect th G-sensor and eDP cables [4].

4 Disconnect the following cables from the system board .
   a Touchpad cable
   b USH cable
   c LED board cable

5 To release the cables:
  a Flip the coin cell battery to reveal the speaker cable [1].
  b Disconnect the speaker cable from the system board [2].
  c Disconnect the power board cable from the system board [3].
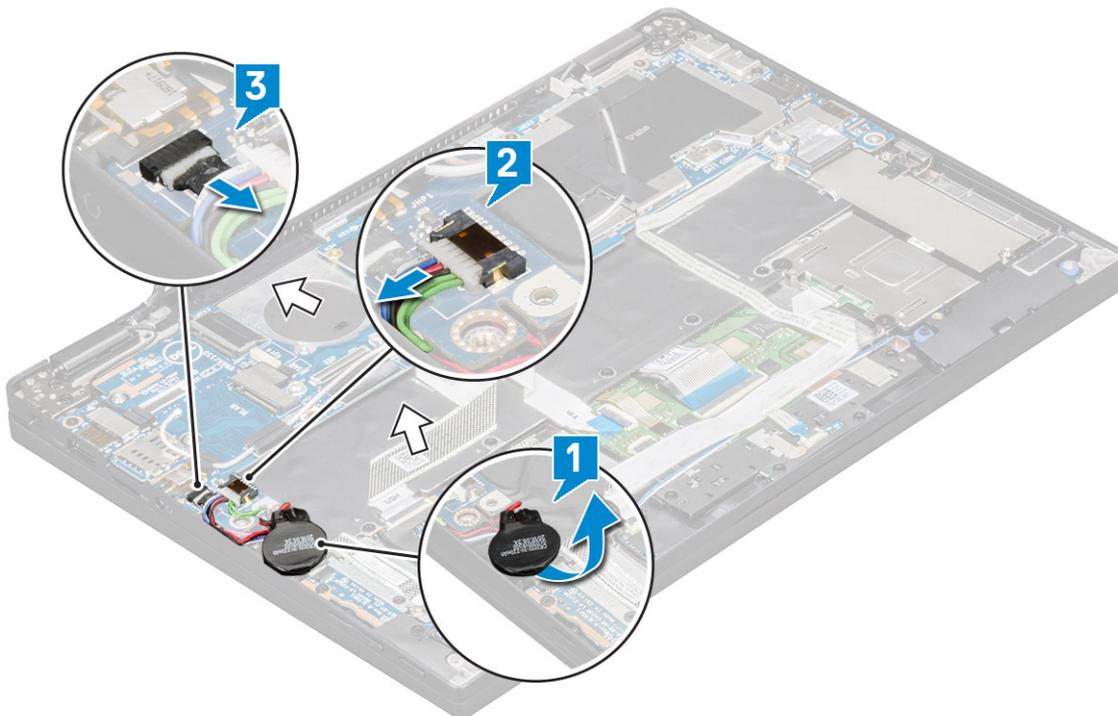
6 Peel the tapes that secure antenna cables and remove the cables from the routing clips.

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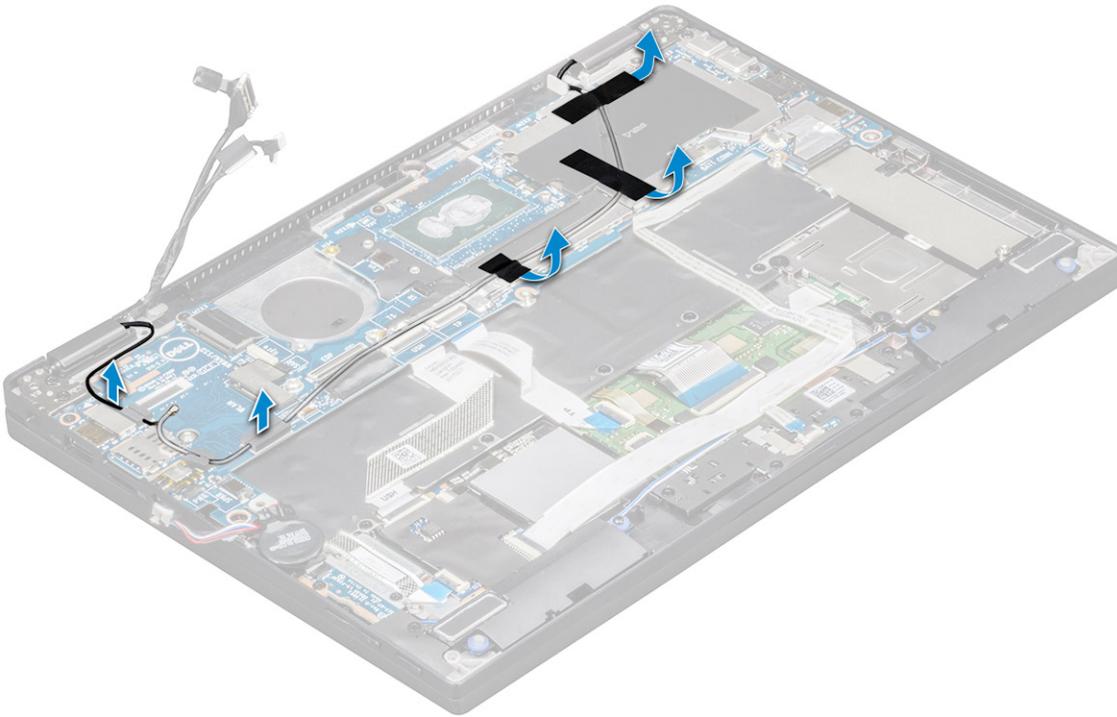
7   To remove the system board:

   a   Remove the 2 (M 1.98 x 4) screws securing the USB Type-C bracket [1].

   b   Lift the USB Type-C bracket from the Type-C module [2].

   c   Remove the 6 (M2.0 x 3.0) screws that secure the system board to the computer [3].

   d   Lift the system board away from the computer[4].
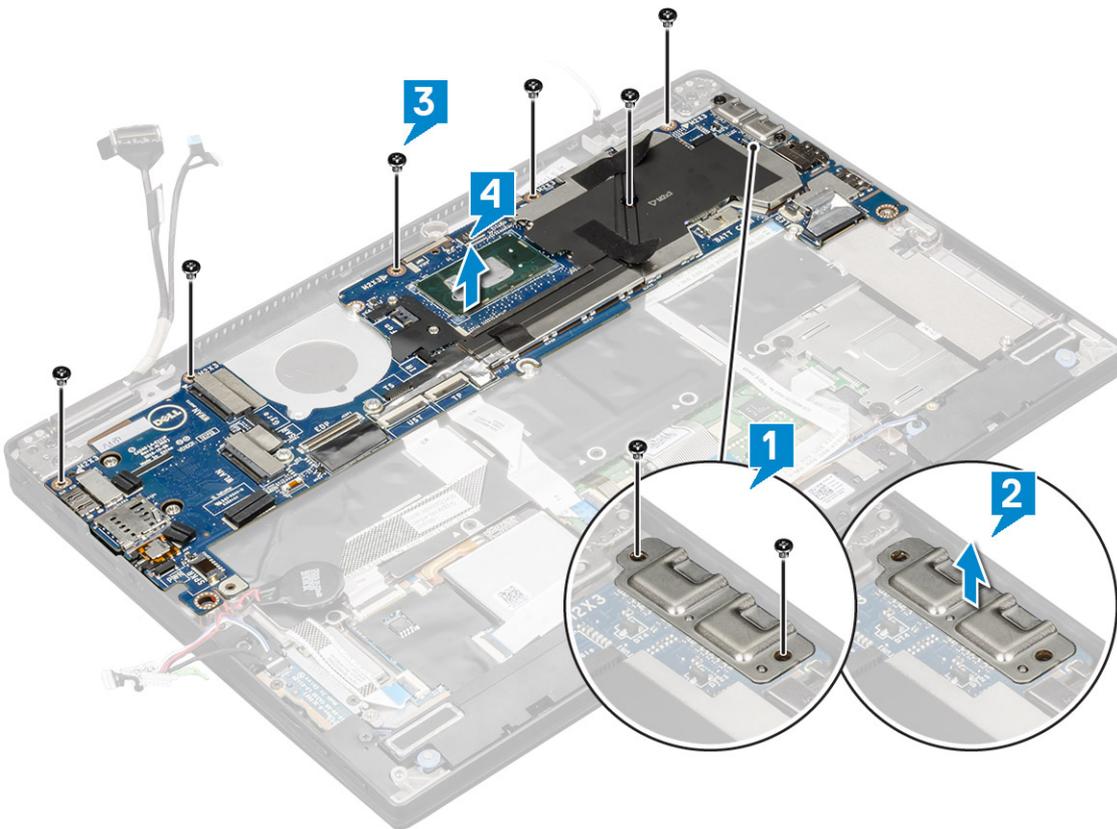
Installing system board

1   Align the system board with the screw holders on the computer.

2   Replace the 6 (M2.0 x 3.0) screws to secure the system board to the computer.

3   Place the USB Type-C bracket on the Type-C module.

4   Replace the 2 (M 1.98 x 4L) screws to secure the USB Type-C bracket to the Type-C module.

5   Route the antenna cable through the routing clips and affix the tapes to secure the antenna cables.

6   Connect the power board and the speaker cable to the system board.

7   Affix the coin cell battery on the speaker cable.

8   Connect the USH board, Touchpad board and LED board cables to the system board.

1   ⓘ NOTE: If your computer has a WWAN card, then SIM card tray installation is a requirement.

9   Install the:

    a   Heatsink module

       Connect the following cables from the system board

        1   LED board cable

        2   USH cable

        3   Touchpad cable

    b   Connect the G-sensor and eDP cable

    c   Place the eDP bracket on the eDP cable and replace the 2 (M2 x 1.7L) screw on the bracket.

    d   Connect the IR camera and touch screen cables

    e   WWAN card

    f   WLAN card

    g   SSD card

    h   Battery

    i   Base cover

    j   SIM card tray

    k   Micro SD

       ⓘ NOTE: To install both cards if equipped.

10   Connect the cables:

11   Follow the procedure in After working inside your computer.

Real time clock

Removing the Coin cell battery

1   Follow the procedure in Before working inside your computer.

2   Remove the:

    a   Mircro SD card

    b   SIM card tray

       ⓘ NOTE: SIM Card tray is available only if your computer is shipped with a WWAN card.

    c   Base cover

    d   Battery

    e   SSD card

    f   WLAN card

   g   WWAN card

    h   Heat sink assembly

i   System board

3   Disconnect and remove the coin-cell battery cable from the system board.
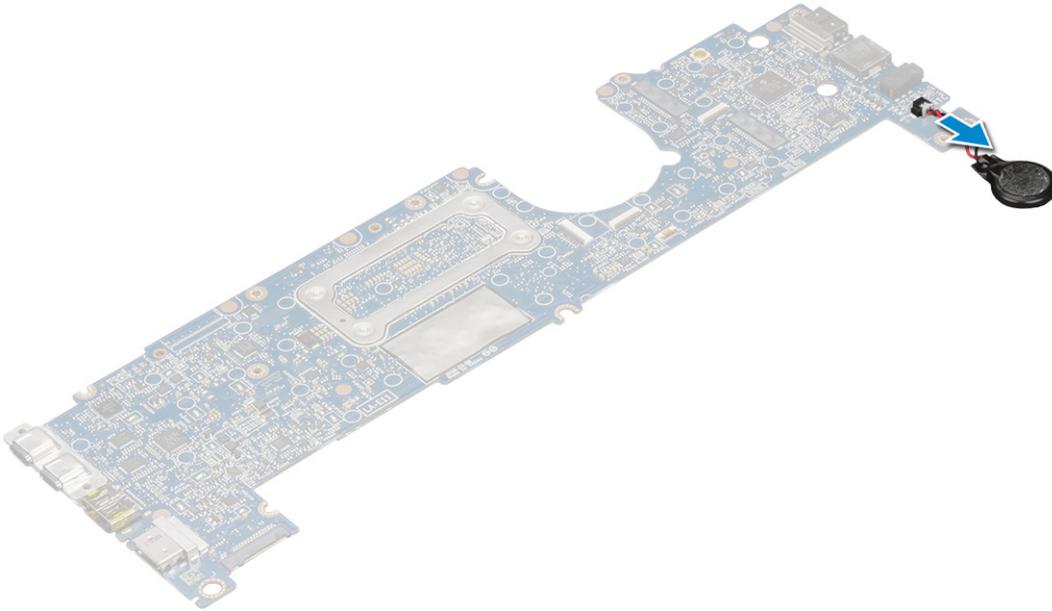
Installing real time clock

1   Connect the coin cell battery cable to the system board.
2   Install:
   a   System board
   b   Heat sink module
   c   WWAN card
   d   WLAN card
   e   SSD card
   f   Battery
   g   Base cover
   h   SIM card tray
   i   Micro SD

   (i) NOTE: To install both cards if equipped.

3   Follow the procedure in After working inside your computer.

RTC is located on the system board and hence system board must be installed after the installation of the RTC.

Keyboard

Removing keyboard assembly

(i) NOTE: The keyboard and the keyboard tray together are called the keyboard assembly.

1   Follow the procedure in Before working inside your computer.
2   Remove the:
   a   Micro SD
   b   SIM card tray

(i) **NOTE: SIM Card tray is available only if your computer is shipped with a WWAN card.**

    c   Base cover
    d   Battery
    e   SSD card
    f   WLAN card
    g   WWAN card
    h   Heatsink assembly
    i   System board

3   disconnect and peel back the cables and SSD thermal pad:

    a   Touchpad and USH board cable [1]
    b   LED board cable [2]
    c   SSD thermal pad [3]
    d   Keyboard and keyboard backlit cable [4]
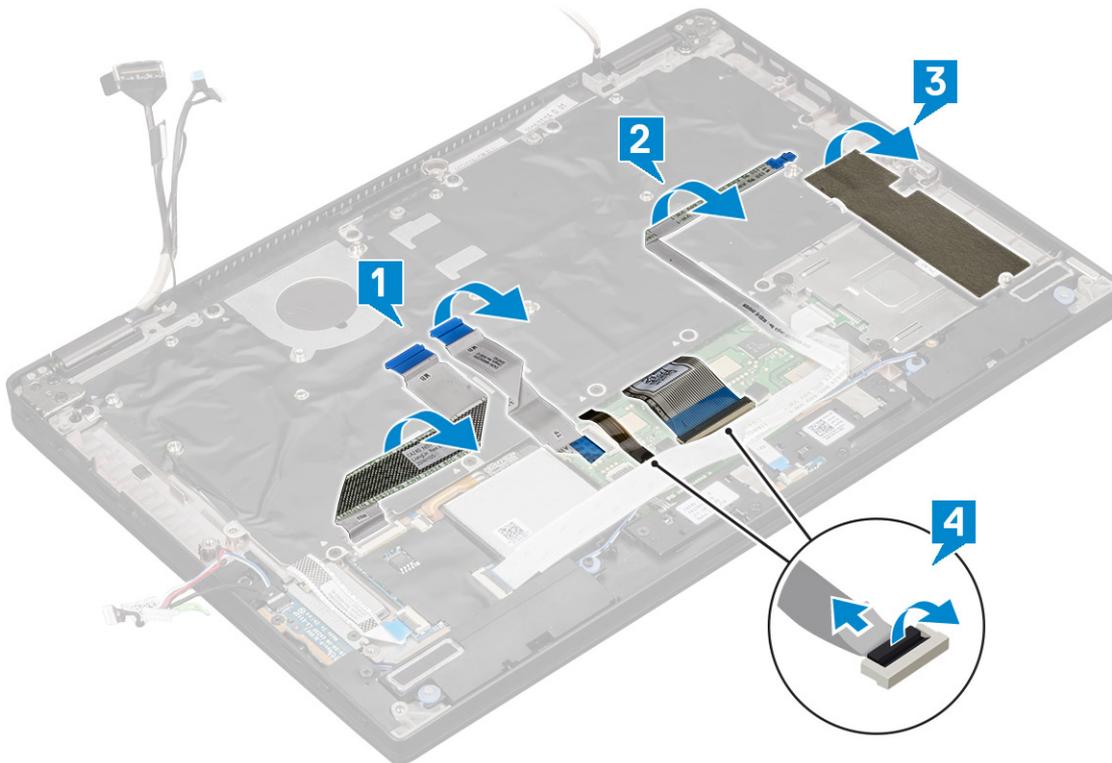
4   To remove the keyboard:

    a   Remove the 13 (M2.0 x 3.0) screws that secure the keyboard to the chassis [1].
    b   Lift the keyboard from the chassis [2].

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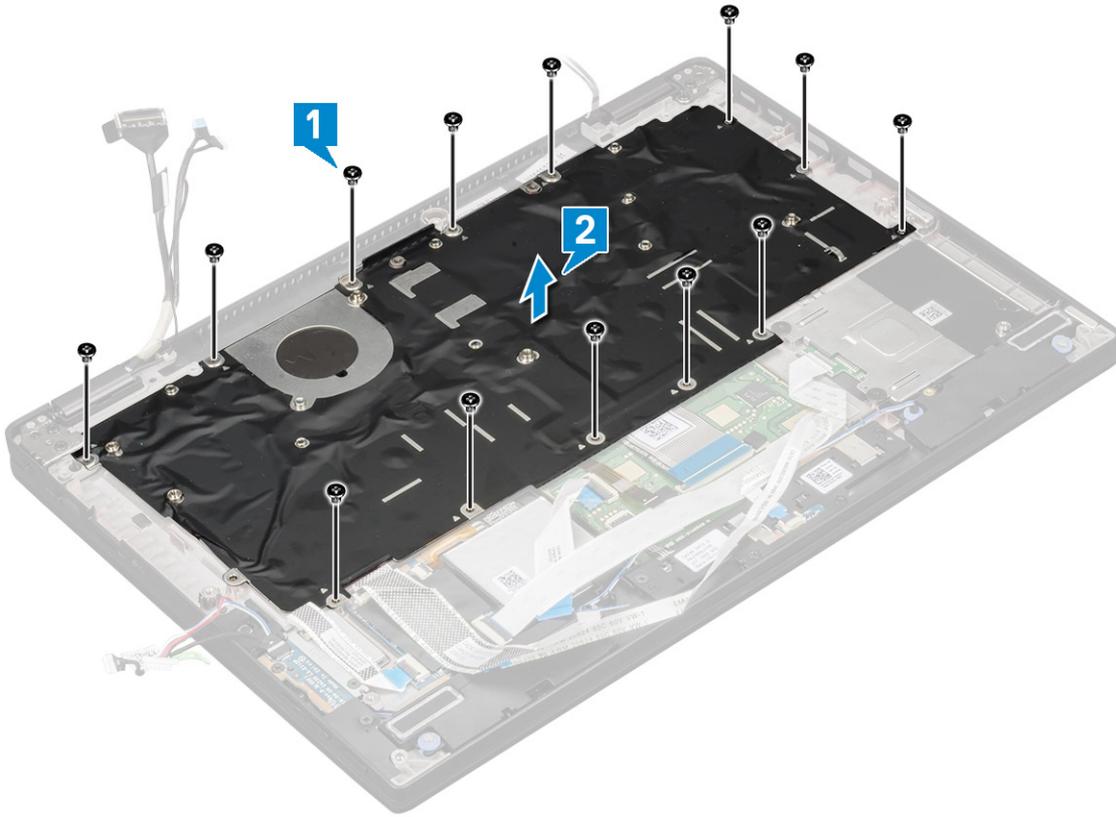
Removing keyboard from the keyboard tray

1 Follow the procedure in Before working inside your computer.
2 Remove the Keyboard
3 Remove the keyboard from the keyboard support tray:
   a Remove the 6 (M2.0 x 2.0) screws that secure the keyboard to the keyboard assembly [1].
   b Lift the keyboard away from the keyboard support tray [2].
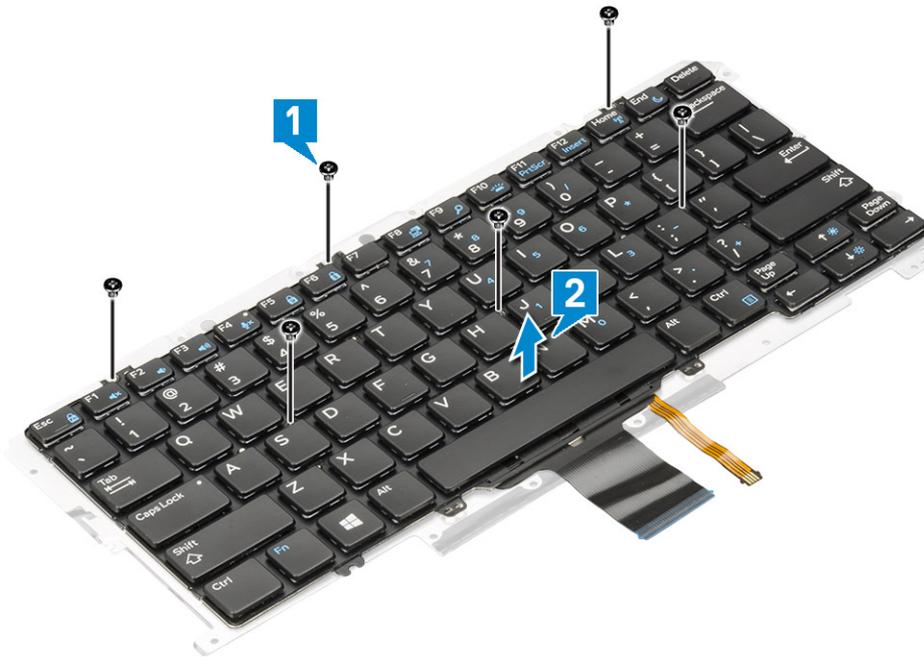
Installing keyboard to the keyboard tray

1   Align the keyboard with the screw holders on the keyboard tray.

2   Tighten the 6 (M2.0 x 2.0) screws to secure the keyboard to the keyboard tray.

3   Install the Keyboard.

Installing keyboard assembly

ⓘ | NOTE: The keyboard and the keyboard tray together are called the keyboard assembly.

1   Align the keyboard assembly with the screw holders on the chassis.

2   Replace the 13 (M2.0 x 3.0) screws that secure the keyboard to the chassis.

3   Affix and connect the keyboard and the backlit keyboard cables to the keyboard.

4   Affix the LED board cable on the keyboard.

5   Affix the SSD thermal pad on the SSD module.

ⓘ | NOTE: If your computer has a WWAN card, then SIM card tray installation is a requirement.

6   Install the:
   a   System baord
   b   Heatsink module
   c   WWAN card
   d   WLAN card
   e   SSD card
   f   Battery
   g   Base cover
   h   SIM card tray
   i   Micro SD

   ⓘ | NOTE: To install both cards if equipped.

7   Follow the procedure in After working inside your computer.

Touchpad Buttons

Removing the touchpad

1   Follow the procedure in Before working inside your computer.
2   Remove the:
   a   Base cover
   b   Battery
   c   SSD module
   d   WLAN card
   e   WWAN card
   f   Heat sink assembly
   g   Speaker
   h   Display assembly
   i   System board
   j   Keyboard
3   Removing the touchpad buttons.
   a   Disconnect the touchpad cable [1].
   b   Remove the tape that secures the touch buttons to the system board [2].
   c   Remove the 2 (M2 x 3) screws that secure the touchpad buttons [3].
   d   Lift the touchpad buttons from the computer [4].
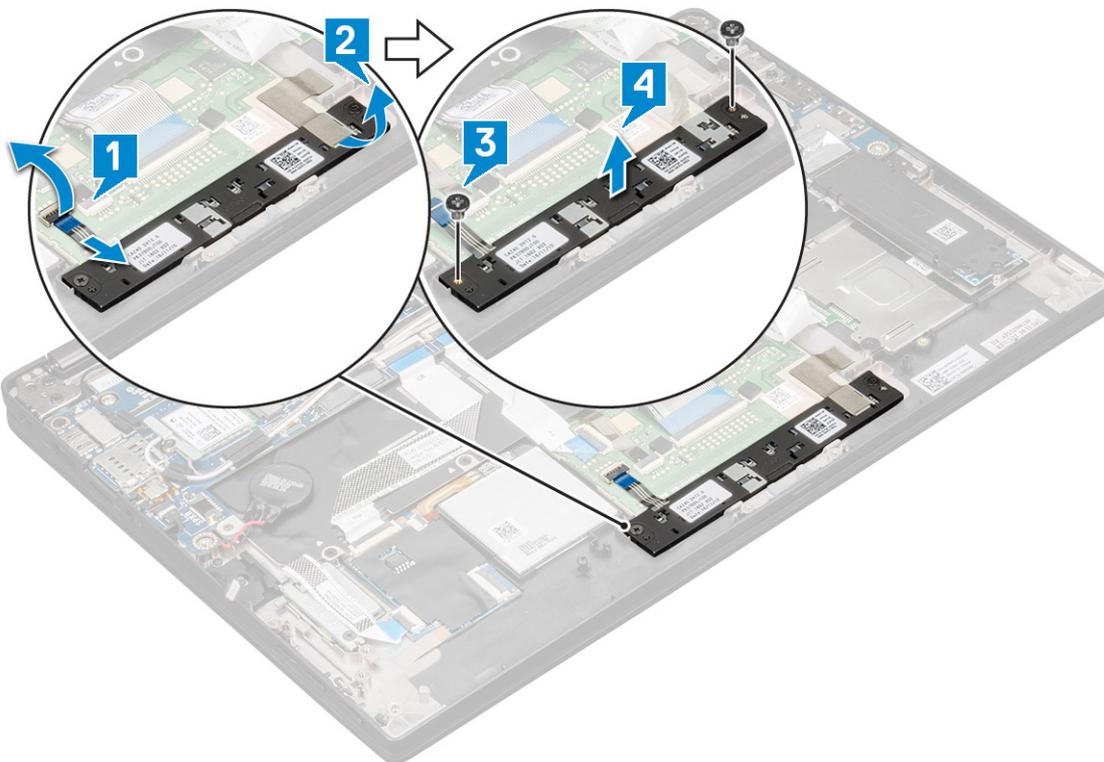
Installing the touchpad

1   Place the touchpad buttons into the slot.
2   Replace the 2 (M2xL3) screws that secure touchpad buttons.

3   Insert the touchpad cable.

4   Install the:
     a   Keyboard
     b   System board
     c   Display assembly
     d   Speaker
     e   Heat sink assembly
     f   WWAN card
     g   WLAN card
     h   SSD module
     i   Battery
     j   Base cover

5   Follow the procedure in After working inside your computer.

Palm rest

Replacing palm rest

1   Follow the procedure in Before working inside your computer.

2   Remove the:
     a   Base cover
     b   Battery
     c   SSD module
     d   WLAN card
     e   WWAN card
     f   Heat sink assembly
     g   Speaker
     h   LED board
     i   Display assembly
     j   System board
     k   Keyboard
     l   Touchpad buttons

The component you are left with is the palm rest.

3   Replace the palm rest.

4   Install the:
     a   Touchpad buttons
     b   Keyboard assembly
     c   System board
     d   Display assembly
     e   LED board
     f   Speaker
     g   Heat sink
     h   WLAN card
     i   WWAN card
     j   PCIe SSD
     k   Battery
     l   Base cover

5   Follow the procedure in After working inside your computer.

Technology and components

This chapter details the technology and components available in the system.

Topics:

HDMI 1.4

This topic explains the HDMI 1.4 and its features along with the advantages.

HDMI (High-Definition Multimedia Interface) is an industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any compatible digital audio/video source, such as a DVD player, or A/V receiver and a compatible digital audio and/or video monitor, such as a digital TV (DTV). The intended applications for HDMI TVs, and DVD players. The primary advantage is cable reduction and content protection provisions. HDMI supports standard, enhanced, or high-definition video, plus multichannel digital audio on a single cable.

> (i) **NOTE:** The HDMI 1.4 will provide 5.1 channel audio support.

HDMI 1.4 Features

- **HDMI Ethernet Channel** - Adds high-speed networking to an HDMI link, allowing users to take full advantage of their IP-enabled devices without a separate Ethernet cable
- **Audio Return Channel** - Allows an HDMI-connected TV with a built-in tuner to send audio data "upstream" to a surround audio system, eliminating the need for a separate audio cable
- **3D** - Defines input/output protocols for major 3D video formats, paving the way for true 3D gaming and 3D home theater applications
- **Content Type** - Real-time signaling of content types between display and source devices, enabling a TV to optimize picture settings based on content type
- **Additional Color Spaces** - Adds support for additional color models used in digital photography and computer graphics
- **4K Support** - Enables video resolutions far beyond 1080p, supporting next-generation displays that will rival the Digital Cinema systems used in many commercial movie theaters
- **HDMI Micro Connector** - A new, smaller connector for phones and other portable devices, supporting video resolutions up to 1080p
- **Automotive Connection System** - New cables and connectors for automotive video systems, designed to meet the unique demands of the motoring environment while delivering true HD quality

Advantages of HDMI

- Quality HDMI transfers uncompressed digital audio and video for the highest, crispest image quality.
- Low -cost HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner
- Audio HDMI supports multiple audio formats from standard stereo to multichannel surround sound
- HDMI combines video and multichannel audio into a single cable, eliminating the cost, complexity, and confusion of multiple cables currently used in A/V systems

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- HDMI supports communication between the video source (such as a DVD player) and the DTV, enabling new functionality

USB features

Universal Serial Bus, or USB, was introduced in 1996. It dramatically simplified the connection between host computers and peripheral devices like mice, keyboards, external drivers, and printers.

Let's take a quick look on the USB evolution referencing to the table below.

Table 2. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 3.0/USB 3.1 Gen 1	5 Gbps	Super Speed	2010
USB 2.0	480 Mbps	High Speed	2000

USB 3.0/USB 3.1 Gen 1 (SuperSpeed USB)

For years, the USB 2.0 has been firmly entrenched as the de facto interface standard in the PC world with about 6 billion devices sold, and yet the need for more speed grows by ever faster computing hardware and ever greater bandwidth demands. The USB 3.0/USB 3.1 Gen 1 finally has the answer to the consumers' demands with a theoretically 10 times faster than its predecessor. In a nutshell, USB 3.1 Gen 1 features are as follows:

- Higher transfer rates (up to 5 Gbps)
- Increased maximum bus power and increased device current draw to better accommodate power-hungry devices
- New power management features
- Full-duplex data transfers and support for new transfer types
- Backward USB 2.0 compatibility
- New connectors and cable

The topics below cover some of the most commonly asked questions regarding USB 3.0/USB 3.1 Gen 1.

Speed

Currently, there are 3 speed modes defined by the latest USB 3.0/USB 3.1 Gen 1 specification. They are Super-Speed, Hi-Speed and Full-Speed. The new SuperSpeed mode has a transfer rate of 4.8Gbps. While the specification retains Hi-Speed, and Full-Speed USB mode, commonly known as USB 2.0 and 1.1 respectively, the slower modes still operate at 480Mbps and 12Mbps respectively and are kept to maintain backward compatibility.

USB 3.0/USB 3.1 Gen 1 achieves the much higher performance by the technical changes below:

- An additional physical bus that is added in parallel with the existing USB 2.0 bus (refer to the picture below).
- USB 2.0 previously had four wires (power, ground, and a pair for differential data); USB 3.0/USB 3.1 Gen 1 adds four more for two pairs of differential signals (receive and transmit) for a combined total of eight connections in the connectors and cabling.
- USB 3.0/USB 3.1 Gen 1 utilizes the bidirectional data interface, rather than USB 2.0's half-duplex arrangement. This gives a 10-fold increase in theoretical bandwidth.
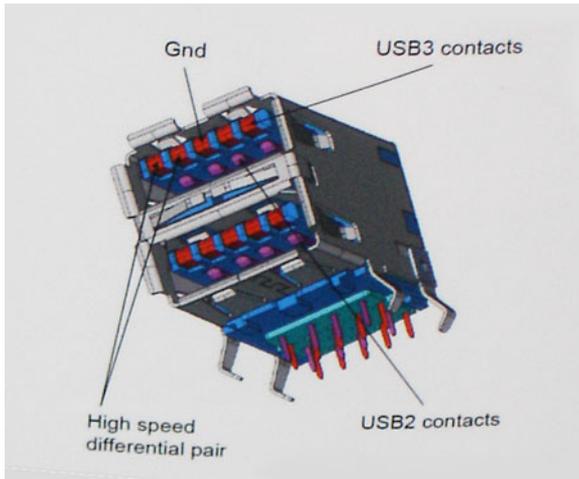
With today's ever increasing demands placed on data transfers with high-definition video content, terabyte storage devices, high megapixel count digital cameras etc., USB 2.0 may not be fast enough. Furthermore, no USB 2.0 connection could ever come close to the 480Mbps theoretical maximum throughput, making data transfer at around 320Mbps (40MB/s) — the actual real-world maximum. Similarly, USB 3.0/USB 3.1 Gen 1 connections will never achieve 4.8Gbps. We will likely see a real-world maximum rate of 400MB/s with overheads. At this speed, USB 3.0/USB 3.1 Gen 1 is a 10x improvement over USB 2.0.

Applications

USB 3.0/USB 3.1 Gen 1 opens up the laneways and provides more headroom for devices to deliver a better overall experience. Where USB video was barely tolerable previously (both from a maximum resolution, latency, and video compression perspective), it's easy to imagine that with 5-10 times the bandwidth available, USB video solutions should work that much better. Single-link DVI requires almost 2Gbps throughput. Where 480Mbps was limiting, 5Gbps is more than promising. With its promised 4.8Gbps speed, the standard will find its way into some products that previously weren't USB territory, like external RAID storage systems.

Listed below are some of the available SuperSpeed USB 3.0/USB 3.1 Gen 1 products:

· External Desktop USB 3.0/USB 3.1 Gen 1 Hard Drives
· Portable USB 3.0/USB 3.1 Gen 1 Hard Drives
· USB 3.0/USB 3.1 Gen 1 Drive Docks & Adapters
· USB 3.0/USB 3.1 Gen 1 Flash Drives & Readers
· USB 3.0/USB 3.1 Gen 1 Solid-state Drives
· USB 3.0/USB 3.1 Gen 1 RAIDs
· Optical Media Drives
· Multimedia Devices
· Networking
· USB 3.0/USB 3.1 Gen 1 Adapter Cards & Hubs

Compatibility

The good news is that USB 3.0/USB 3.1 Gen 1 has been carefully planned from the start to peacefully co-exist with USB 2.0. First of all, while USB 3.0/USB 3.1 Gen 1 specifies new physical connections and thus new cables to take advantage of the higher speed capability of the new protocol, the connector itself remains the same rectangular shape with the four USB 2.0 contacts in the exact same location as before. Five new connections to carry receive and transmitted data independently are present on USB 3.0/USB 3.1 Gen 1 cables and only come into contact when connected to a proper SuperSpeed USB connection.

Windows 8/10 will be bringing native support for USB 3.1 Gen 1 controllers. This is in contrast to previous versions of Windows, which continue to require separate drivers for USB 3.0/USB 3.1 Gen 1 controllers.

Microsoft announced that Windows 7 would have USB 3.1 Gen 1 support, perhaps not on its immediate release, but in a subsequent Service Pack or update. It is not out of the question to think that following a successful release of USB 3.0/USB 3.1 Gen 1 support in Windows 7, SuperSpeed support would trickle down to Vista. Microsoft has confirmed this by stating that most of their partners share the opinion that Vista should also support USB 3.0/USB 3.1 Gen 1.

Super-Speed support for Windows XP is unknown at this point. Given that XP is a seven-year-old operating system, the likelihood of this happening is remote.

USB Type-C

USB Type-C is a new, tiny physical connector. The connector itself can support various exciting new USB standard like USB 3.1 and USB power delivery (USB PD).

Alternate Mode

USB Type-C is a new connector standard that's very small. It's about a third the size of an old USB Type-A plug. This is a single connector standard that every device should be able to use. USB Type-C ports can support a variety of different protocols using "alternate modes," which allows you to have adapters that can output HDMI, VGA, DisplayPort, or other types of connections from that single USB port

USB Power Delivery

The USB PD specification is also closely intertwined with USB Type-C. Currently, smartphones, tablets, and other mobile devices often use a USB connection to charge. A USB 2.0 connection provides up to 2.5 watts of power — that'll charge your phone, but that's about it. A laptop might require up to 60 watts, for example. The USB Power Delivery specification ups this power delivery to 100 watts. It's bi-directional, so a device can either send or receive power. And this power can be transferred at the same time the device is transmitting data across the connection.

This could spell the end of all those proprietary laptop charging cables, with everything charging via a standard USB connection. You could charge your laptop from one of those portable battery packs you charge your smartphones and other portable devices from today. You could plug your laptop into an external display connected to a power cable, and that external display would charge your laptop as you used it as an external display — all via the one little USB Type-C connection. To use this, the device and the cable have to support USB Power Delivery. Just having a USB Type-C connection doesn't necessarily mean they do.

USB Type-C and USB 3.1

USB 3.1 is a new USB standard. USB 3's theoretical bandwidth is 5 Gbps, while USB 3.1 Gen2 is10Gbps . That's double the bandwidth, as fast as a first-generation Thunderbolt connector. USB Type-C isn't the same thing as USB 3.1. USB Type-C is just a connector shape, and the underlying technology could just be USB 2 or USB 3.0. In fact, Nokia's N1 Android tablet uses a USB Type-C connector, but underneath it's all USB 2.0 — not even USB 3.0. However, these technologies are closely related.

Thunderbolt over USB Type-C

Thunderbolt is a hardware interface that combines data, video, audio, and power in a single connection. Thunderbolt combines PCI Express (PCIe) and DisplayPort (DP) into one serial signal, and additionally provides DC power, all in one cable. Thunderbolt 1 and Thunderbolt 2 use the same connector [1] as miniDP (DisplayPort) to connect to peripherals, while Thunderbolt 3 uses a USB Type-C connector [2].
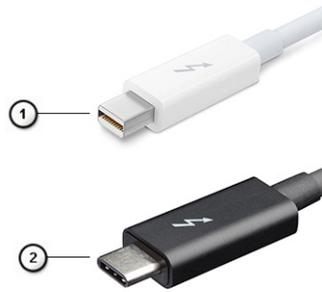
Figure 1. Thunderbolt 1 and Thunderbolt 3

1   Thunderbolt 1 and Thunderbolt 2 (using a miniDP connector)

2   Thunderbolt 3 (using a USB Type-C connector)

Thunderbolt 3 over USB Type-C

Thunderbolt 3 brings Thunderbolt to USB Type-C at speeds up to 40 Gbps, creating one compact port that does it all - delivering the fastest, most versatile connection to any dock, display or data device like an external hard drive. Thunderbolt 3 uses a USB Type-C connector/port to connect to supported peripherals.

1   Thunderbolt 3 uses USB Type-C connector and cables - It is compact and reversible

2   Thunderbolt 3 supports speed up to 40 Gbps

3   DisplayPort 1.2 – compatible with existing DisplayPort monitors, devices and cables

4   USB Power Delivery - Up to 130W on supported computers

Key Features of Thunderbolt 3 over USB Type-C

1   Thunderbolt, USB, DisplayPort and power on USB Type-C on a single cable (features vary between different products)

2   USB Type-C connector and cables which are compact and reversible

3   Supports Thunderbolt Networking (*varies between different products)

4   Supports up to 4K displays

5   Up to 40 Gbps

ⓘ │ NOTE: **Data transfer speed may vary between different devices.**

System specifications

Topics:

- Technical specifications
- Keyboards Hot Key Definitions

Technical specifications

This topic lists out the technical specifications.

Table 3. Specifications

Type	Feature
Model Number	Latitude 7390 2-in-1
Processor family	Intel Kaby Lake U and R (7th and 8th generation i3/i5/i7)
Operating System	• Microsoft Windows 10 Pro 64 bit • Microsoft Windows 10 Home 64 bit
Memory	• LPDDR3 SDRAM 1866 MHz; Up to 8 GB (on board) • LPDDR3 SDRAM 2133 MHz; 16 GB (on board)
Chipset	Intel Kaby Lake U and R (integrated with processor)
Graphics	• Intel Integrated HD Graphics 620 (7th generation Intel core) • Intel Integrated UHD Graphics 620 (8th generation Intel core)
Display	13.3 inches FHD 16:9 (1920 x 1080) WVA Touch with Corning Gorilla Glass 4, Active Pen Support, Anti-Reflective and Anti-Smudge, 255 nits
Storage options	Primary Storage: • 128 GB M.2 2280 SATA SSD • 256 GB M.2 2280 SATA SSD • 256 GB M.2 2280 PCIeSSD • 512 GB M.2 2280 PCIeSSD • 1 TB M.2 2280 PCIeSSD • 256 GB M.2 2280 SED PCIeSSD • 512 GB M.2 2280 SED PCIeSSD Secondary Storage: • 128 GB M.2 2230 PCIeSSD • 256 GB M.2 2230 PCIeSSD
Multimedia	• Microsoft Skype for Business Certified

	• Optional HD or IR Camera (User-Facing fixed focus) with LED • Stereo Speaker with Maxx Audio Pro • 4 x Noise reducing integrated array microphones • Headset/Mic combo jack
Battery options	• 45 Whr (3 Cell) Polymer Battery, with ExpressCharge • 60 Whr (4 Cell) Polymer Battery, with ExpressCharge • 60 Whr (4Cell) Long Life Cycle Polymer Battery
Power adapter	• 45 W adapter, USB Type-C • 65 W adapter, USB Type-C • 90 W adapter, USB Type-C
Connectivity	Microsoft Modern Standby compliant WiFi Display (Miracast) 14 Wireless LAN Options: • Qualcomm QCA61x4A 802.11ac Dual Band (2x2) Wireless Adapter + Bluetooth 4.1 (non vPro) • Qualcomm QCA6174A Extended Range 802.11 ac MU-MIMO Dual Band (2x2) Wi-Fi + Bluetooth 4.1 • Intel Dual-Band Wireless-AC 8265 Wi-Fi + BT 4.2 Wireless Card (2x2). Bluetooth Optional Optional Mobile Broadband Options: • Dell Wireless Qualcomm Snapdragon X7 LTE-A (DW5811e) for AT&T, Verzion&Sprint (US) • Dell Wireless Qualcomm Snapdragon X7 LTE-A (DW5811e) (EMEA/APJ/ROW) • Dell Wireless Qualcomm Snapdragon X7 LTE-A (DW5816e for Japan/ANZ/China • Dell Wireless Qualcomm Snapdragon X7 HSPA+ (DW5811e) (Indonesia)
Ports, Slots and Chassis	• 1x USB 3.1 Gen 1 • 1x USB 3.1 Gen 1 with PowerShare • 2 x DisplayPorts over USB Type-C with optional Thunderbolt 3 • HDMI 1.4 • microSIM card slot (WWAN only) • microSD 4.0 Memory card reader • Noble Wedge Lock slot
Security	TPM 2.0 FIPS 140-2 certified, TCG Certified* Optional Hardware Authentication Bundle 1: • Contacted Smart Card with Control Vault 2.0 Advanced authentication with FIPS 140-2 level 3 certification Optional Hardware Authentication Bundle 2: • Touch Fingerprint Reader, FIPS 201 Contacted Smart Card, Contactless Smart Card/NFC5, Control Vault 2.0 Advanced authentication with FIPS 140-2 level 3 certification • Optional face IR camera (Windows Hello compliant) • Dell Client Command Suite • Optional Dell Data Security and Management Software:

	• Dell Data Protection | Endpoint Security Suite Enterprise • Dell Data Protection | Encryption (Enterprise or Personal Edition) • MozyPro, MozyEnterprise • Dell Data Protection | Threat Defense • Dell Protected Workspace • Dell Data Guardian • RSA NetWitness Endpoint • VMware Airwatch • Absolute Data & Device Security • RSA SecurID Access
Input device	• 10-Finger Touch Display • 4 microphones available with standard bezel • Headset/Mic combo jack • Integrated ISO Keyboard • Active Pen (Optional, sold separately)
Docking option	• Dell Business Dock • Dell Business Dock with Monitor stand • Dell Business Thunderbolt Dock

* TCG certification (February 2018)

Keyboards Hot Key Definitions

Table 4. Hot key combinations

Fn Key Combination	Function
Fn+ESC	Fn Toggle
Fn+ F1	Speaker Mute
Fn + F2	Volume Down
Fn + F3	Volume Up
Fn + F4	Mic Mute
Fn + F5	Num Lock
Fn + F6	Scroll Lock
Fn + F8	Display Toggle (Win + P)
Fn + F9	Search
Fn + F10	Increase Keyboard Backlight Brightness (Pressing this function cycle keyboard backlight to the next level in the sequence: 50%, 100%, off)
Fn + F11	Print Screen
Fn + F12	Insert
Fn + Home	Toggle Radio On/Off

Fn + End	Sleep
Fn + Up arrow	Brightness up
Fn + down arrow	Brightness down

Fn Key Mode:

Standard = The F1-F12 keys behave as function keys. Holding <Fn> is required to access their secondary functions.

Secondary~14~= The F1-F12 keys control the secondary functions. <Fn> is required to access the standard functions

System setup

System setup enables you to manage your notebook hardware and specify BIOS level options. From the System setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage your computer security

Topics:

Boot menu

Press <F12> when the Dell logo appears to initiate a one-time boot menu with a list of the valid boot devices for the system. Diagnostics and BIOS Setup options are also included in this menu. The devices listed on the boot menu depend on the bootable devices in the system. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the system. Using the boot menu does not make any changes to the boot order stored in the BIOS.

The options are:

- UEFI Boot:
    - Windows Boot Manager

-

- Other Options:

- BIOS Setup
- BIOS Flash Update
- Diagnostics
- Change Boot Mode Settings

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.

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area. ⓘ NOTE: For the standard graphics browser only.
Esc	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.

System setup options

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

General screen options

This section lists the primary hardware features of your computer.

Option	Description
System Information	This section lists the primary hardware features of your computer. • System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Manufacture Date, Ownership Date, Express Service Code, the Signed Firmware update—enabled by default • Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology • Processor Information: Displays Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable, and 64-Bit Technology • Device Information: Displays M.2 SATA, M.2 PCIe SSD-0, M.2 PCIe SSD-1, Passthrough MAC address, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, Wi-Fi Device, Cellular Device, Bluetooth Device
Battery Information	Displays the battery status health and whether the AC adapter is installed.
Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. • Diskette Drive • USB Storage Device • CD/DVD/CD-RW Drive • Onboard NIC

Option	Description
Boot sequence options	• Windows boot manager • WindowsIns
Boot list options	• Legacy • UEFI—selected by default
Advanced Boot Options	This option allows you the legacy option ROMs to load. By default, the **Enable Legacy Option ROMs** is disabled. Enable Attempt Legacy Boot is disabled by default.
UEFI boot path security	• Always, except internal HDD • Always • Never
Date/Time	Allows you to change the date and time.

System Configuration screen options

Option	Description
SATA Operation	Allows you to configure the internal SATA hard-drive controller. The options are: • Disabled • AHCI • RAID On: This option is enabled by default.
Drives	Allows you to configure the SATA drives on board. All drives are enabled by default. The options are: • SATA-2 — enabled by default • M.2 PCIe SSD-0 — enabled by default • M.2 PCIe SSD-1 — enabled by default
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self-Monitoring Analysis and Reporting Technology) specification. This option is disabled by default. • Enable SMART Reporting
USB Configuration	This is an optional feature. 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—HDD, memory key, floppy. If USB port is enabled, device attached to this port is enabled and available for OS. If USB port is disabled, the OS cannot see any device attached to this port. The options are: • Enable USB Boot Support—enabled by default • Enable External USB Port—enabled by default

Option	Description
	ⓘ **NOTE: If the Fastboot option is set to "Minimal", the "Enable USB Boot support " setting is ignored and the system will not boot from any Pre-boot USB devices.**
	ⓘ **NOTE: A USB Keyboard and/or mouse connected to the platform's USB ports will continue to function within BIOS Setup if the "Enable External USB Port" option is disabled.**
Dell Type-C Dock Configuration	This section allows connection to the Dell WD and TB family of docks (Typr-C docks) independent of USB and Thunderbolt Adapter configuration settings. • Always Allow Dell Docks is disabled
Thunderbolt Adapter Configuration	This section allows Thunderbolt Adapter Configuration. • Enable Thunderbolt Technology Support—is enabled by default • Enable Thunderbolt Adapter Boot Support—is disabled • Enable Thunderbolt Adapter Pre-boot Modules—is disabled • Enable Thunderbolt (and PCIE behind TBT) Preboot • Security level-No security—is disabled • Security level-User configuration—enabled by default • Security level-Secure connect—is disabled • Security level- Display port only—is disabled
USB PowerShare	This field configures the USB PowerShare feature behavior. This option allows you to charge external devices using the stored system battery power through the USB PowerShare port. This option is disabled by default
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
Keyboard Backlight Timeout on AC	The Keyboard Backlight Timeout dims out with AC option. The main keyboard illumination feature is not affected. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled. The options are: • 5 sec • 10 sec—enabled by default • 15 sec • 30 sec • 1 min • 5 min • 15 min • Never

Option	Description
Keyboard Backlight Timeout on Battery	The Keyboard Backlight Timeout dims out with the Battery option. The main keyboard illumination feature is not affected. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled. The options are:

- 5 sec
- 10 sec—enabled by default
- 15 sec
- 30 sec
- 1 min
- 5 min
- 15 min
- Never

Option	Description
Touchscreen	It controls whether the screen is enabled or disabled. This option is enabled by default.
Unobtrusive Mode	This option, when enabled, pressing Fn+F7 turns off all light and sound emissions in the system. To resume normal operation, press Fn+F7 again. This option is disabled by default.
Miscellaneous Devices	Allows you to enable or disable the following devices:

- Enable Camera—enabled by default
- Enable Secure Digital (SD) Card—enabled by default
- Secure Digital (SD) Card Boot—disabled by default
- Secure Digital (SD) Card Read-Only-Mode—disabled by default

Video screen options

Option	Description
LCD Brightness	Allows you to set the display brightness depending up on the power source—On Battery and On AC. The LCD brightness is independent for battery and AC adapter. It can be set using the slider.

ⓘ NOTE: The video setting is visible only when a video card is installed into the system.

Secure Boot screen options

Option	Description
Secure Boot Enable	This option enables or disables the **Secure Boot Enable**

- Disabled - by default
- Enabled

Default setting: disabled.

Option	Description
Expert Key management	This option enables or disables the **Expert Key management**

- PK—enabled by default
- KEK
- db
- dbx

Intel software guard extensions screen options

Option	Description
Intel SGX Enable	This field specifies you to provide a secured environment for running code/storing sensitive information in the context of the main OS. The options are: • Disabled • Enabled • Software controlled Default setting: Software controlled
Enclave Memory Size	This option allows you to set the **SGX Enclave Reserve Memory Size**. The options are: • 32 MB • 64 MB • 128 MB—enabled by default

Performance screen options

Option	Description
Multi-Core Support	This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores. This option is enabled by default. Allows you to enable or disable multi-core support for the processor. The installed processor supports two cores. If you enable Multi-Core Support, two cores are enabled. If you disable Multi-Core Support, one core is enabled. • Enable Multi-Core Support Default setting: The option is enabled.
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep feature. • Enable Intel SpeedStep Default setting: The option is enabled.
C-States Control	Allows you to enable or disable the additional processor sleep states. • C states Default setting: The option is enabled.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. • Enable Intel TurboBoost Default setting: The option is enabled.
HyperThread Control	Allows you to enable or disable the Hyper-Threading in the processor. • Disabled • Enabled

Option	Description
	Default setting: Enabled is selected.

Power management screen options

Option	Description
AC Behavior	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.
Enable Intel Speed Shift Technology	• Enable Intel Speed Shift Technology Default setting: Enabled
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • Disabled • Every Day • Weekdays • Select Days Default setting: Disabled
USB Wake Support	Allows you to enable USB devices to wake the system from Standby. ⓘ **NOTE: This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup removes power from all the USB ports to conserve battery power.** • Enable USB Wake Support • Wake on Dell USB-C dock Default setting: The option is disabled.
Wake on WLAN	Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal. • Disabled • WLAN Default setting: Disabled
Block Sleep	This option lets you block entering to sleep (S3 state) in operating system environment. Block Sleep (S3 state) Default setting: This option is disabled
Peak Shift	This option enables you to minimize the AC power consumption during the peak power times of day. After you enable this option, your system runs only in battery even if the AC is attached. • Enable peak shift—is disabled • Set battery threshold (15% to 100%) - 15 % (enabled by default)

Option	Description
Advanced Battery Charge Configuration	This option enables you to maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non work hours to improve the battery health. Disabled Default setting: Disabled
Primary Battery Charge Configuration	Allows you to select the charging mode for the battery. The options are: • Adaptive—enabled by default • Standard—Fully charges your battery at a standard rate. • ExpressCharge—The battery charges over a shorter time using Dell's fast charging technology. • Primarily AC use • Custom If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop. ⓘ **NOTE: All charging mode may not be available for all the batteries. To enable this option, disable the Advanced Battery Charge Configuration option.**
Type-C connector power	• 7.5 Watts • 15 Watts—enabled by default

POST behavior screen options

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters. Default setting: Enable Adapter Warnings
Keypad (Embedded)	Allows you to choose one of two methods to enable the keypad that is embedded in the internal keyboard. • Fn Key Only—default. • By Numlock ⓘ **NOTE: When setup is running, this option has no effect. Setup works in Fn Key Only mode.**
Numlock Enable	Allows you to enable the Numlock option when the computer boots. Enable Network. This option is enabled by default.
Fn Key Emulation	Allows you to set the option where the Scroll Lock key is used to simulate the Fn key feature. Enable Fn Key Emulation (default)
Fn Lock Options	Allows you to let hot key combinations Fn + Esc toggle the primary behavior of F1–F12, between their standard and secondary functions. If you disable this option, you cannot toggle dynamically the primary behavior of these keys. The available options are: • Fn Lock—enabled by default • Lock Mode Disable/Standard—enabled by default • Lock Mode Enable/Secondary
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are:

Option	Description
	• Minimal—enabled by default
	• Thorough
	• Auto
Extended BIOS POST Time	Allows you to create an extra preboot delay. The options are:
	• 0 seconds—enabled by default.
	• 5 seconds
	• 10 seconds
Full Screen Log	• Enable Full Screen Logo—not enabled
Warnings and errors	• Prompt on warnings and errors—enabled by default
	• Continue on warnings
	• Continue on warnings and errors
Sign of Life Indication	• Enable Sign of Life Keyboard Backlight Indication—enabled by default

Manageability

Option	Description
USB provision	Enable USB provision is not selected by default
MEBX Hotkey — enabled by default	Allows you to specify whether the MEBx Hotkey function should enable, during the system boot.
	• Disabled
	• Enabled
	Default setting: Disabled

Virtualization support screen options

Option	Description
Virtualization	This field specifies whether a virtual Machine Monitor (VMM) can utilize the conditional hardware capabilities provided by Intel Virtualization Technology.
	Enable Intel Virtualization Technology—enabled by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O.
	Enable VT for Direct I/O - enabled by default.
Trusted Execution	This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. The TPM Virtualization Technology, and the Virtualization technology for direct I/O must be enabled to use this feature.
	Trusted Execution - disabled by default.

Wireless screen options

Option
Description

Wireless Switch	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: · WWAN · GPS (on WWAN Module) · WLAN · Bluetooth All the options are enabled by default. ⓘ **NOTE: For WLAN enable or disable controls are tied together and they cannot be enabled or disabled independently.**
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. · WWAN/GPS · WLAN · Bluetooth All the options are enabled by default.

ⓘ **NOTE: IMEI number for WWAN can be found ont the outer box or the WWAN card.**

Maintenance screen options

Option	Description
Service Tag	Displays the Service Tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
BIOS Downgrade	This controls flashing of the system firmware to previous revisions. Option 'Allow BIOS downgrade' is enabled by default.
Data Wipe	This field allows users to erase the data securely from all internal storage devices. Option 'Wipe on Next boot' is not enabled by default. The following is list of devices affected: · Internal SATA HDD/SSD · Internal M.2 SATA SDD · Internal M.2 PCIe SSD · Internal eMMC
BIOS Recovery	This field allows you to recover from certain corrupted BIOS conditions from a recover file on the user primary hard drive or an external USB key. · BIOS Recovery from Hard Drive—enabled by default · Always perform integrity check—disabled by default

System logs screen options

Option	Description
BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events.
Thermal Events	Allows you to view and clear the System Setup (Thermal) events.
Power Events	Allows you to view and clear the System Setup (Power) events.

Updating the BIOS in Windows

It is recommended to update your BIOS (System Setup), when you replace the system board or if an update is available. For laptops, ensure that your computer battery is fully charged and connected to a power outlet

> ⓘ **NOTE:** If BitLocker is enabled, it must be suspended prior to updating the system BIOS, and then re-enabled after the BIOS update is completed.

> ⓘ **NOTE:** AC adapter must be plugged in before attempting to update BIOS.

1. Restart the computer.
2. Go to **Dell.com/support**.
   - Enter the **Service Tag** or **Express Service Code** and click **Submit**.
   - Click **Detect Product** and follow the instructions on screen.
3. If you are unable to detect or find the Service Tag, click **Choose from all products**.
4. Choose the **Products** category from the list.

   > ⓘ **NOTE:** Choose the appropriate category to reach the product page

5. Select your computer model and the **Product Support** page of your computer appears.
6. Click **Get drivers** and click **Drivers and Downloads**.

   The Drivers and Downloads section opens.
7. Click **Find it myself**.
8. Click **BIOS** to view the BIOS versions.
9. Identify the latest BIOS file and click **Download**.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.

    The **File Download** window appears.
11. Click **Save** to save the file on your computer.
12. Click **Run** to install the updated BIOS settings on your computer.

    Follow the instructions on the screen.

> ⓘ **NOTE:** It is recommended not to update the BIOS version for more than three revisions. For example: If you want to update the BIOS from 1.0 to 7.0, then install version 4.0 first and then install version 7.0.

Updating BIOS on systems with bitlocker enabled

> △ **CAUTION:** If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: http://www.dell.com/support/article/us/en/19/SLN153694/updating-bios-on-systems-with-bitlocker-enabled

Updating your system BIOS using a USB flash drive

If the system cannot load into Windows but there is still a need to update the BIOS, download the BIOS file using another system and save it to a bootable USB Flash Drive.

> (i) **NOTE: You will need to use a bootable USB Flash drive. Please refer to the following article for further details: http://www.dell.com/support/article/us/en/19/SLN143196/how-to-create-a-bootable-usb-flash-drive-using-dell-diagnostic-deployment-package--dddp-**

1   Download the BIOS update .EXE file to another system.

2   Copy the file e.g. O9010A12.EXE onto the bootable USB Flash drive.

3   Insert the USB Flash drive into the system that requires the BIOS update.

4   Restart the system and press F12 when the Dell Splash logo appears to display the One Time Boot Menu.

5   Using arrow keys, select **USB Storage Device** and click Return.

6   The system will boot to a Diag C:\> prompt.

7   Run the file by typing the full filename e.g. O9010A12.exe and press Return.

8   The BIOS Update Utility will load, follow the instructions on screen.
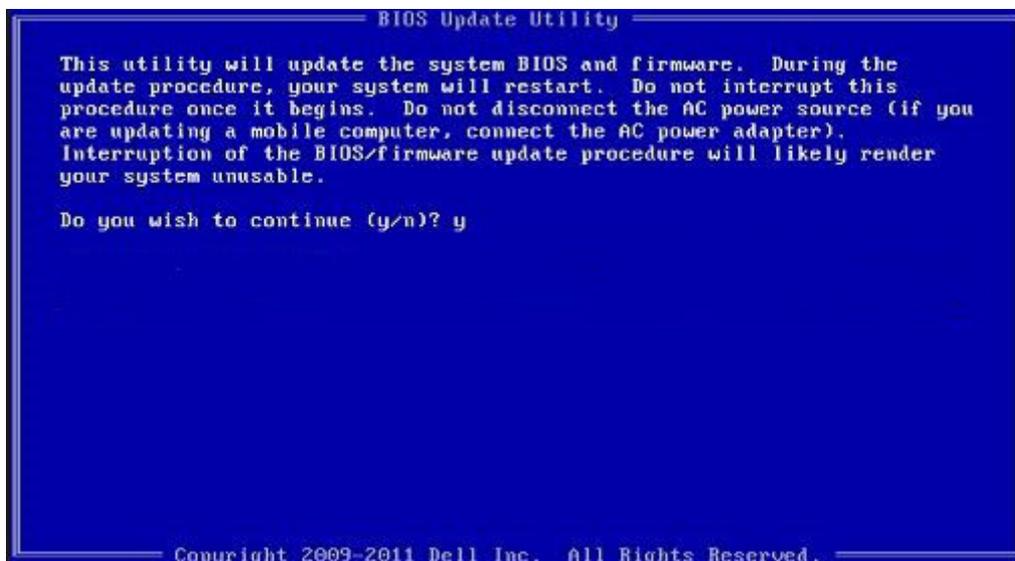
Figure 2. DOS BIOS Update Screen

Updating the Dell BIOS in Linux and Ubuntu environments

If you want to update the system BIOS in a Linux environment such as Ubuntu, see http://www.dell.com/support/article/us/en/19/SLN171755/updating-the-dell-bios-in-linux-and-ubuntu-environments.

Flashing the BIOS from the F12 One-Time boot menu

Updating your system BIOS using a BIOS update .exe file copied to a FAT32 USB key and booting from the F12 one time boot menu.

BIOS Update

You can run the BIOS update file from Windows using a bootable USB key or you can also update the BIOS from the F12 One-Time boot menu on the system.

Most Dell systems built after 2012 have this capability and you can confirm by booting your system to the F12 One-Time Boot Menu to see if BIOS FLASH UPDATE is listed as a boot option for your system. If the option is listed, then the BIOS supports this BIOS update option.

ⓘ | **NOTE: Only systems with BIOS Flash Update option in the F12 One-Time Boot Menu can use this function.**

Updating from the One-Time Boot Menu

To update your BIOS from the F12 One-Time boot menu, you will need:

- USB key formatted to the FAT32 file system (key does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB key
- AC power adapter connected to the system
- Functional system battery to flash the BIOS

Perform the following steps to execute the BIOS update flash process from the F12 menu:

⚠ | **CAUTION: Do not power off the system during the BIOS update process. Powering off the system could make the system fail to boot.**

1 From a power off state, insert the USB key where you copied the flash into a USB port of the system .
2 Power on the system and press the F12 key to access the One-Time Boot Menu, Highlight BIOS Flash Update using the arrow keys then press **Enter**.
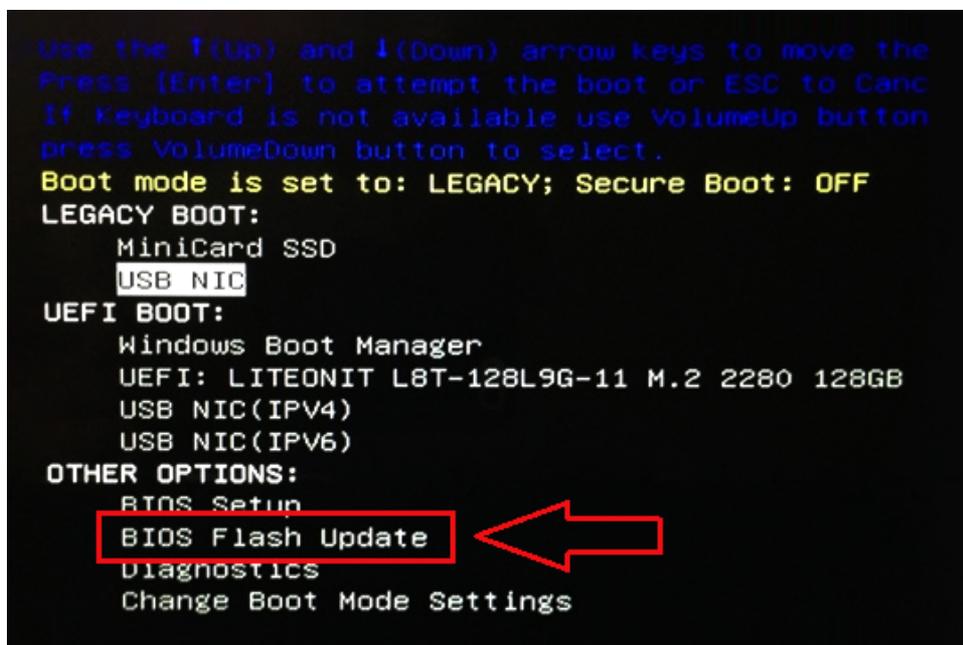
3 The Bios flash menu will open then click the browse button.
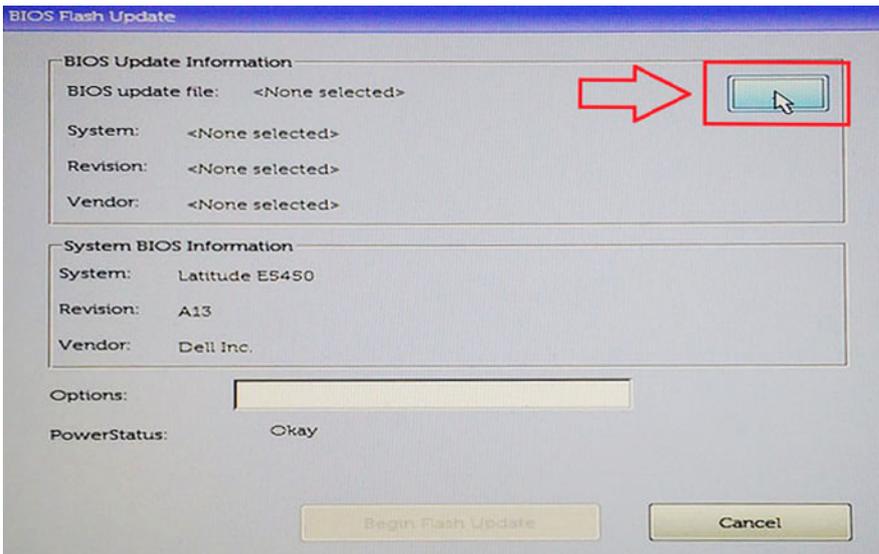
4   The E5450A14.exe file is shown as an example in the following screenshot. The actual file name may vary.
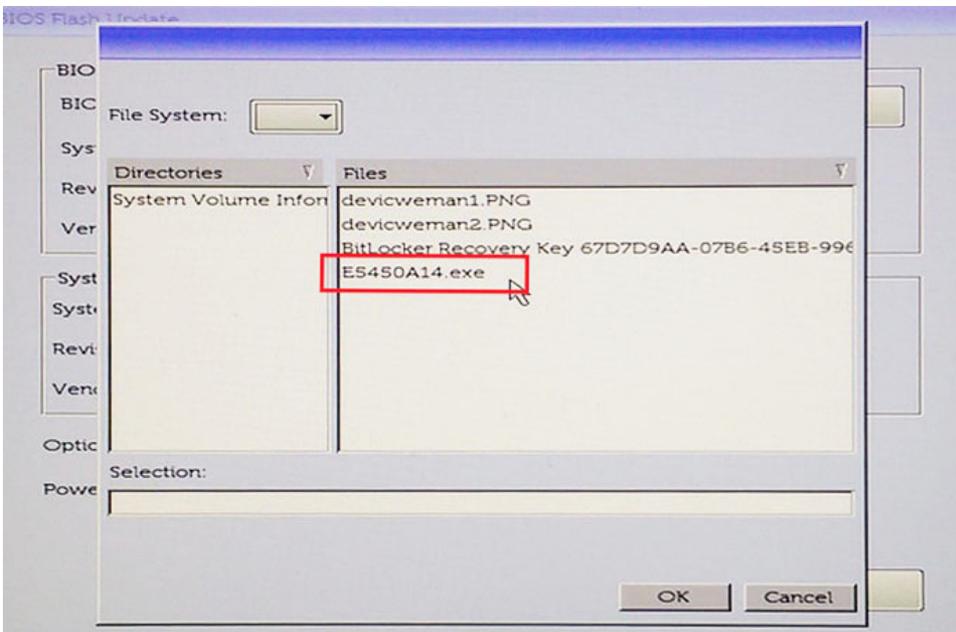
5   Once the file is selected, it will show in the file selection box and you can click the OK button to continue.
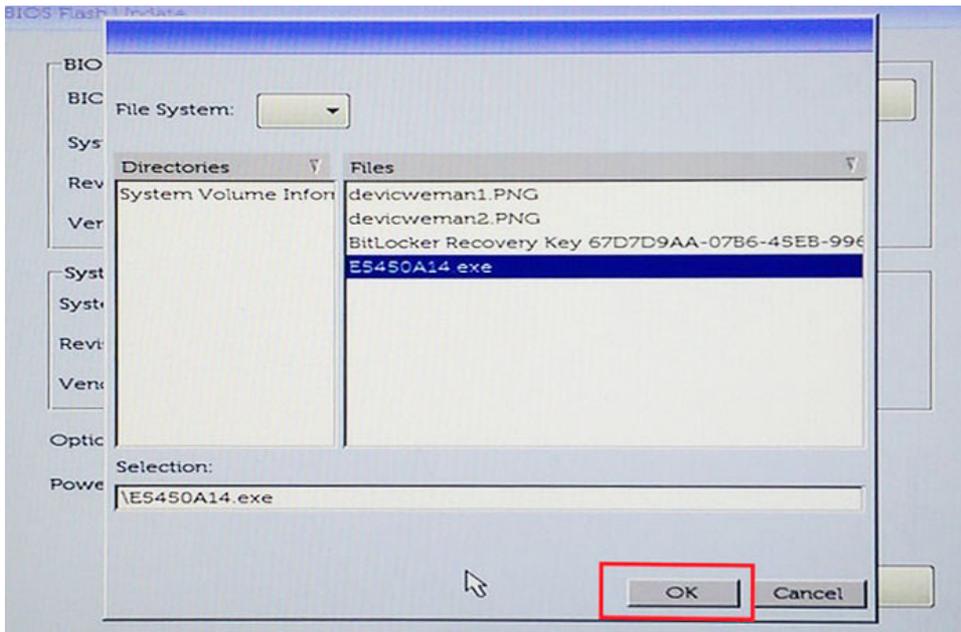
6   Click the **Begin Flash Update** button.
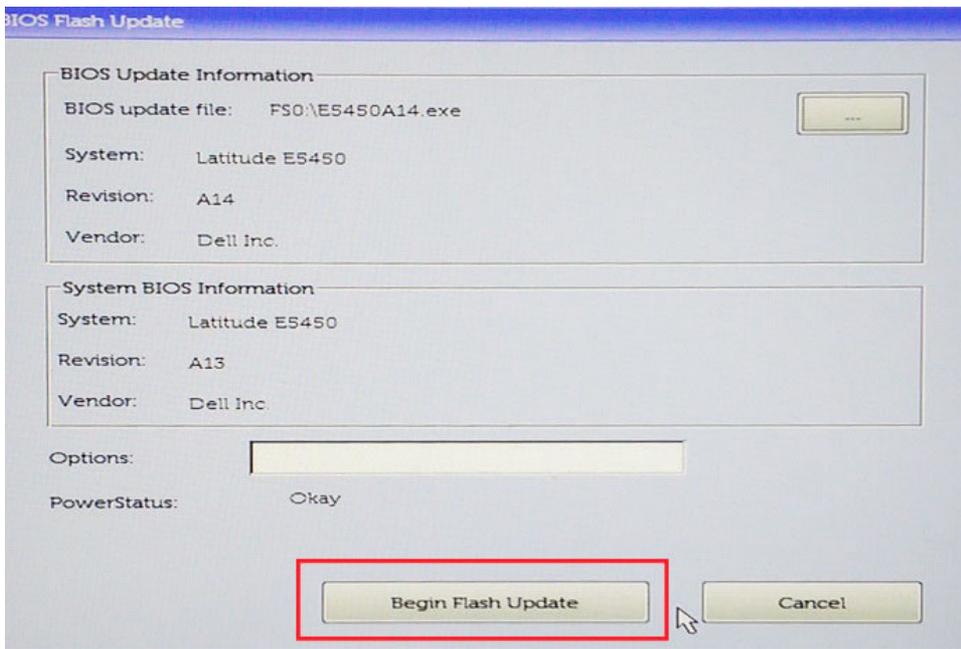
7   A warning box is displayed asking you if you want to proceed. Click the Yes button to begin the flash.
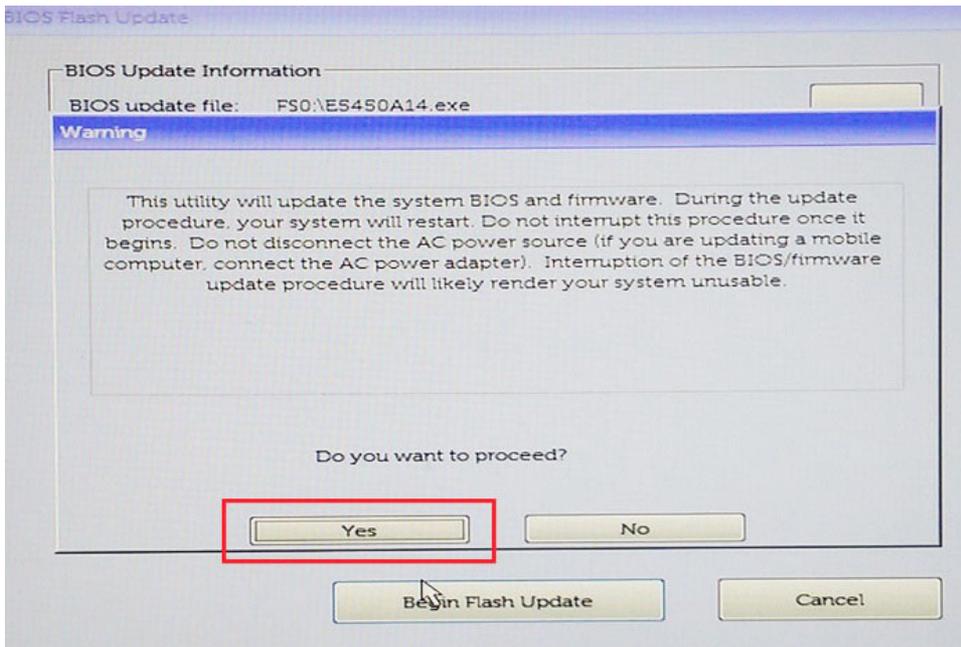
8   At this point the BIOS flash will execute, the system will reboot and then the BIOS flash will start and a progress bar will show the progress of the flash. Depending on the changes included in the update, the progress bar may go from zero to 100 multiple times and the flash process could take as long as 10 minutes. Generally this process takes two to three minutes.
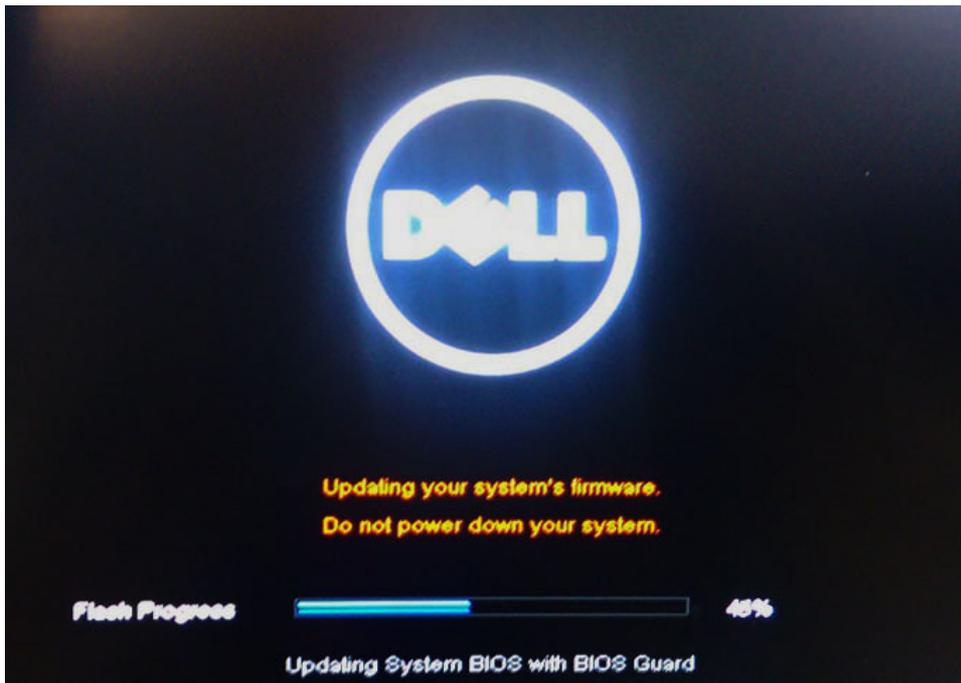
9   Once complete, the system will reboot and the BIOS update process is completed.

System and setup password

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

Password type	Description
System password	Password that you must enter to log on to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of 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.**

ⓘ | **NOTE: System and setup password feature is disabled.**

Assigning a system password and setup password

You can assign a new **System 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 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 and or 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 promoted. If you delete the System and/or Setup password, confirm the deletion when promoted.**
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 reboots.

Software

This chapter details the supported operating systems along with instructions on how to install the drivers.

Topics:

- Supported operating systems
- Downloading drivers
- Intel chipset drivers
- Video driver
- Audio driver
- Network drivers
- USB driver
- Storage drivers
- Battery drivers
- Intel HID Event Filter
- Intel Dynamic Platform and Thermal Framework
- Intel Management engine
- Disk drivers
- Bluetooth drivers
- Security drivers

Supported operating systems

The topic lists the operating systems supported for .

Table 5. Supported operating systems

Supported operating systems	Description
Windows 10	• Microsoft Windows 10 Pro 64-bit • Microsoft Windows 10 Home 64-bit
Other	• Ubuntu 16.04 LTS SP1 64-bit • NeoKylin v6.0 64-bit

Downloading drivers

1 Turn on the notebook.
2 Go to **Dell.com/support**.
3 Click **Product Support**, enter the Service Tag of your notebook, and then click **Submit**.

   ⓘ **NOTE: If you do not have the Service Tag, use the auto detect feature or manually browse for your notebook model.**
4 Click **Drivers and Downloads**.
5 Select the operating system installed on your notebook.

6   Scroll down the page and select the driver to install.

7   Click **Download File** to download the driver for your notebook.

8   After the download is complete, navigate to the folder where you saved the driver file.

9   Double-click the driver file icon and follow the instructions on the screen.

Intel chipset drivers

Verify if the Intel chipset drivers are already installed in the system.

Table 6. Intel chipset drivers

Before Installation	After Installation

Video driver

Verify if the video driver is already installed in the system.
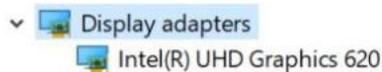
Audio driver

Verify if audio drivers are already installed in the system.

Table 7. Audio driver

Before Installation	After Installation

Network drivers

Install the WLAN and Bluetooth drivers from the Dell support site.

Table 8. Network drivers

Before installation	After installation

USB driver

Verify if the USB drivers are already installed in the system.

Table 9. USB driver

Before Installation	After Installation

Storage drivers

Verify if the storage controller drivers are installed in the system.

Table 10. Storage drivers

Before Installation	After Installation
None	∨ 🖴 Storage controllers 　　🖴 Intel(R) Chipset SATA/PCIe RST Premium Controller 　　🖴 Microsoft Storage Spaces Controller

Battery drivers

The latest battery drivers are installed in the computer.

Table 11. Battery drivers

Before Installation	After Installation
∨ 🔋 Batteries 　　🔋 Microsoft AC Adapter	∨ 🔋 Batteries 　　🔋 Microsoft AC Adapter 　　🔋 Microsoft ACPI-Compliant Control Method Battery
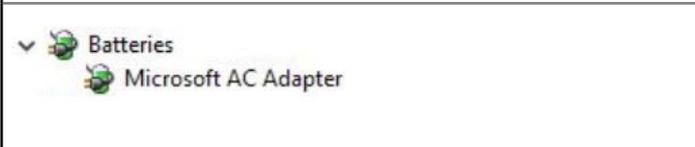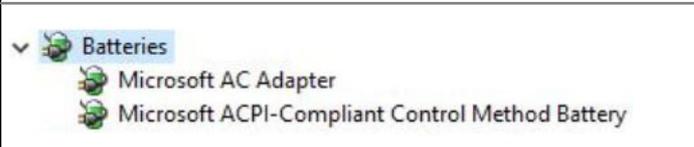
Intel HID Event Filter

Verify if the Intel HID event filter is already installed in the computer.

Table 12. Intel HID Event Filter

Before Installation	After Installation
∨ Human Interface Devices 　　HID PCI Minidriver for ISS 　　HID-compliant vendor-defined device 　　I2C HID Device	∨ Human Interface Devices 　　Converted Portable Device Control device 　　Dell Touchpad 　　GPIO Dock Mode Indicator Driver 　　GPIO Laptop or Slate Indicator Driver 　　HID PCI Minidriver for ISS 　　HID PCI Minidriver for ISS 　　HID PCI Minidriver for ISS 　　HID PCI Minidriver for ISS 　　HID PCI Minidriver for ISS 　　HID-compliant consumer control device 　　HID-compliant consumer control device 　　HID-compliant pen 　　HID-compliant system controller 　　HID-compliant system controller 　　HID-compliant touch pad 　　HID-compliant touch screen 　　HID-compliant vendor-defined device 　　HID-compliant vendor-defined device 　　HID-compliant vendor-defined device 　　HID-compliant wireless radio controls 　　I2C HID Device 　　I2C HID Device 　　Intel(R) HID Event Filter 　　Microsoft Input Configuration Device 　　Microsoft Input Configuration Device 　　Portable Device Control device 　　Sideband GPIO Buttons Injection Device

Intel Dynamic Platform and Thermal Framework

Verify if the Intel dynamic platform and thermal framework is already installed in the computer.

Table 13. Intel Dynamic Platform and Thermal Framework

After Installation	
∨ Intel(R) Dynamic Platform and Thermal Framework 　　Intel(R) Dynamic Platform and Thermal Framework Generic Participant 　　Intel(R) Dynamic Platform and Thermal Framework Generic Participant 　　Intel(R) Dynamic Platform and Thermal Framework Generic Participant 　　Intel(R) Dynamic Platform and Thermal Framework Manager 　　Intel(R) Dynamic Platform and Thermal Framework Processor Participant	

Intel Management engine

Verify if the Intel dynamic platform and thermal framework is already installed in the computer.

Table 14. Intel management engine interface

Before Installation	After Installation

Disk drivers

Disk drivers installed in the system
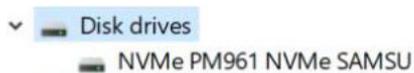
Bluetooth drivers

This platform supports a variety of Bluetooth drivers. The following is an example

Table 15. Bluetooth drivers

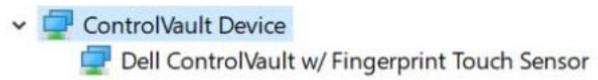| Before Installation	After Installation

Security drivers

This section lists the security devices in the Device Manager.

Security device drivers

Verify if the security device drivers are installed in the computer.

Fingerprint sensor drivers

Verify if the Fingerprint sensor drivers are installed in the computer.

Troubleshooting

Dell Enhanced Pre-Boot System Assessment — ePSA diagnostic 3.0

You can invoke the ePSA diagnostics by performing either of the following steps:

- Press the F12 key when the system boots and choosing **Diagnostics** option.
- Press Fn+PWR when the system boots.

For more details, see Dell EPSA Diagnostic 3.0.

Real Time Clock reset

The Real Time Clock (RTC) reset function allows you or the service technician to recover the recently launched model Dell Latitude and Precision systems from select **No POST/No Boot/No Power** situations. You can initiate the RTC reset on the system from a power off state only if it is connected to AC power. Press and hold the power button for 25 seconds. The system RTC reset occurs after you release the power button.

ⓘ **NOTE: If AC power is disconnected from the system during the process or the power button is held longer than 40 seconds, the RTC reset process is aborted.**

The RTC reset will reset the BIOS to Defaults, un-provision Intel vPro and reset the system date and time. The following items are unaffected by the RTC reset:

- Service Tag
- Asset Tag
- Ownership Tag
- Admin Password
- System Password
- HDD Password
- Key Databases
- System Logs

The following items may or may not reset based on your custom BIOS setting selections:

- The Boot List
- Enable Legacy OROMs
- Secure Boot Enable
- Allow BIOS Downgrade

Contacting Dell

> (i) **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.**

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1 Go to **Dell.com/support.**
2 Select your support category.
3 Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4 Select the appropriate service or support link based on your need.