Dell Precision 7520

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.**

Contents

Working on your computer

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or, if purchased separately, installed by performing the removal procedure in reverse order.

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

⚠ **WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance**

△ **CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.**

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

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

△ **CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.**

ⓘ **NOTE: The color of your computer and certain components may appear differently than shown in this document.**

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. Close the display and turn the computer upside-down on a flat work surface.

   ⓘ **NOTE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

7. Remove the base cover.
8. Remove the main battery.
9. Turn the computer top-side up.
10. Open the display.

11   Press and hold the power button for few seconds, to ground the system board.

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

⚠ **CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.**

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

Turning off your computer — Windows 10

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

1   Click or tap ⊞.

2   Click or tap ⏻ and then click or tap **Shut down**.

ⓘ **NOTE: Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.**

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   Replace the battery.
4   Connect your computer and all attached devices to their electrical outlets.
5   Turn on your computer.

Removing and installing components

This section provides detailed information on how to remove or install the components from your computer.

Recommended tools

The procedures in this document require the following tools:

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

Battery cover

Removing the battery cover

1   Follow the procedure in Before working inside your computer.
2   To remove the battery cover:
    a   Slide the release latch towards the unlock icon to release the battery cover [1].
    b   Slide and lift the battery cover to remove it from the computer [2].

Installing the battery cover

1   Slide the battery cover into its slot until it clicks into place.
2   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 the battery cover.
3   To remove battery:
    a   Slide the release latch towards from the unlock icon to unlock the battery[1].
    b   Lift and remove the battery from the computer [2].
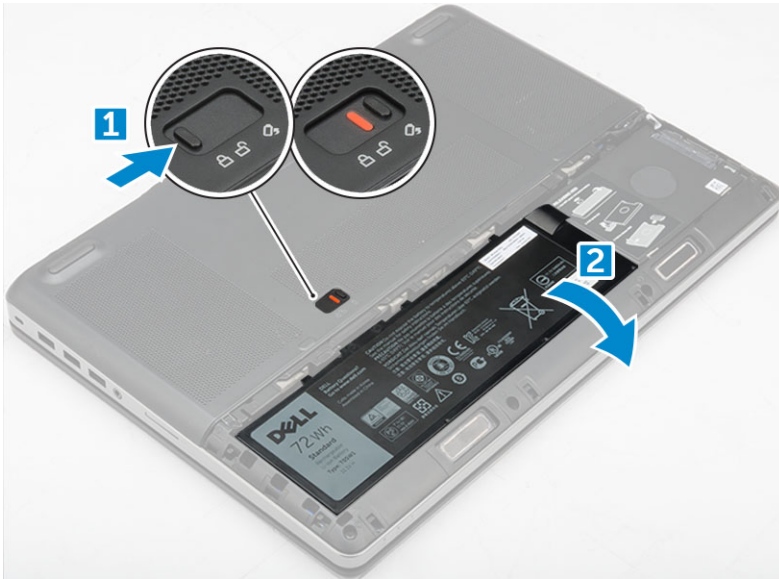
Installing the battery

1   Slide the battery into its slot until it clicks into place.
2   Install the battery cover.
3   Follow the procedure in After working inside your computer

Hard drive

Removing the hard drive

1   Follow the procedure in Before working inside your computer.
2   Remove the:
    a   battery cover
    b   battery
3   To remove hard drive:
    a   Remove the M3.0x3.0 screws that secure the hard drive to the computer [1].
    b   Lift the hard drive latch to release the hard drive [2].
    c   Slide and lift the hard drive from the computer [3].
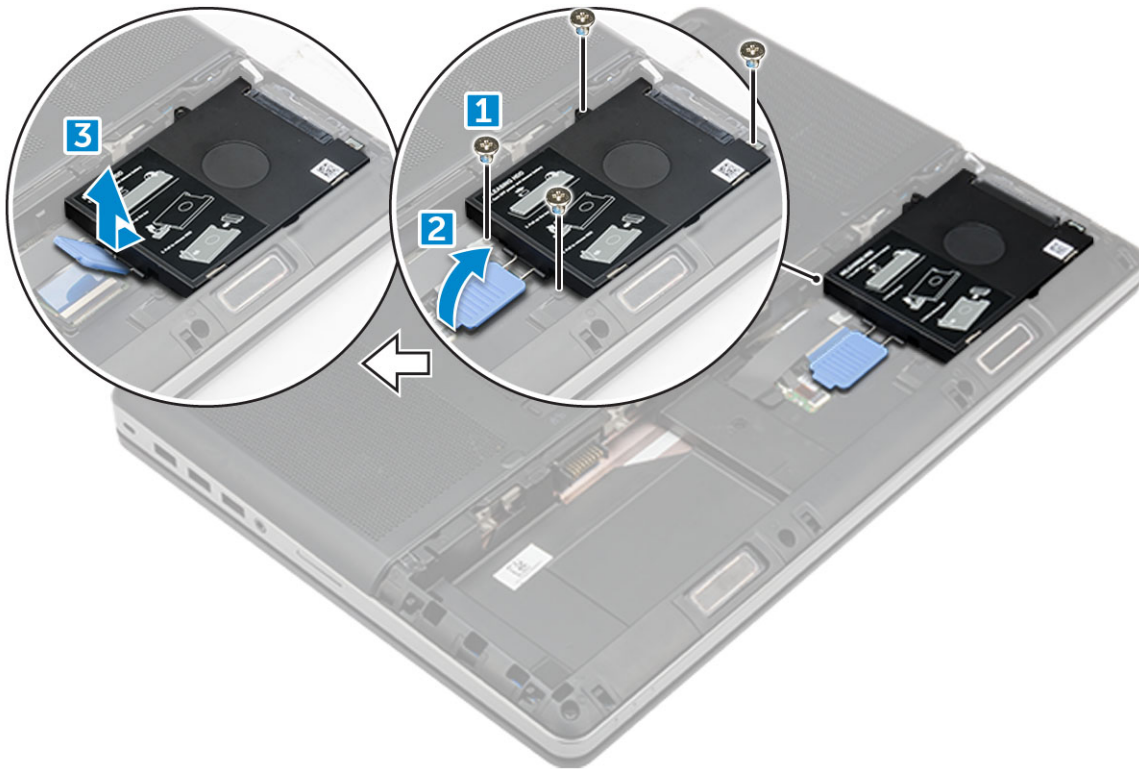
4   Remove the M3.0x3.0 screws that secure the hard drive. Lift the hard drive from the bracket.
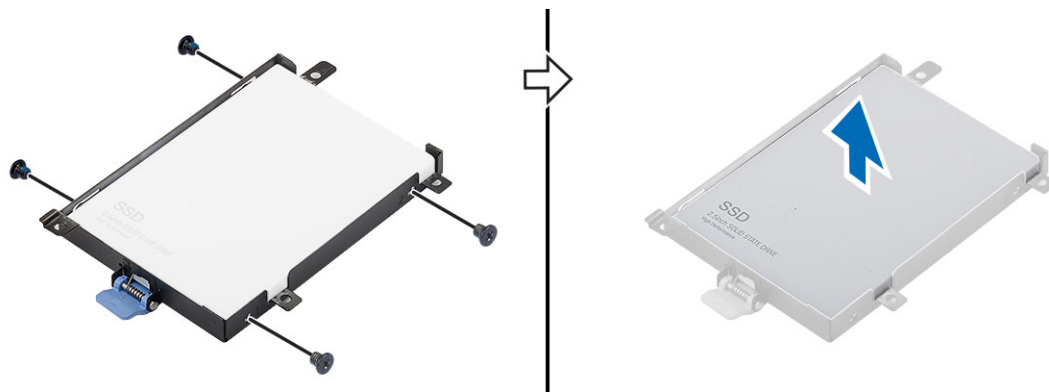
Installing the hard drive

1   Replace the M3.0x3.0 screws to secure the hard drive to the hard drive bracket.
2   Insert the hard drive into its slot in the computer.
3   Replace the M3.0x3.0 screws to secure the hard drive to the computer.
4   Install the:
    a   battery
    b   battery cover
5   Follow the procedure in After working inside your computer.

Keyboard

Removing the keyboard

1   Follow the procedures in Before working inside your computer.
2   Remove the:
    a   battery cover
    b   battery
    c   hard drive
3   To remove keyboard cable:
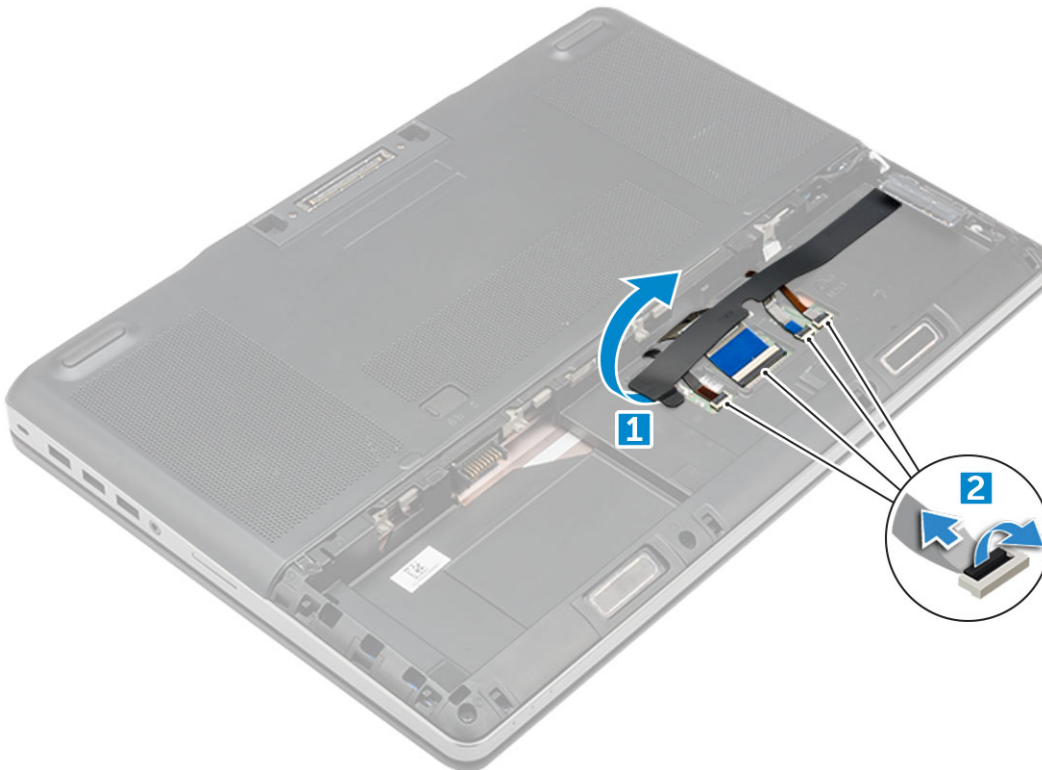
    a   Peel the tape to access the keyboard cable [1].
    b   Disconnect the keyboard cables from the system board [2, 3]
4   To remove the keyboard:
    a   Using plastic scribe pry the keyboard trim from the bottom and work along the top edge and remove it from the computer [1, 2, 3].
    b   Remove the M2.0x2.5 screws that secure the keyboard to the computer [4].
    c   Lift and slide the keyboard to remove it away from the computer [5].
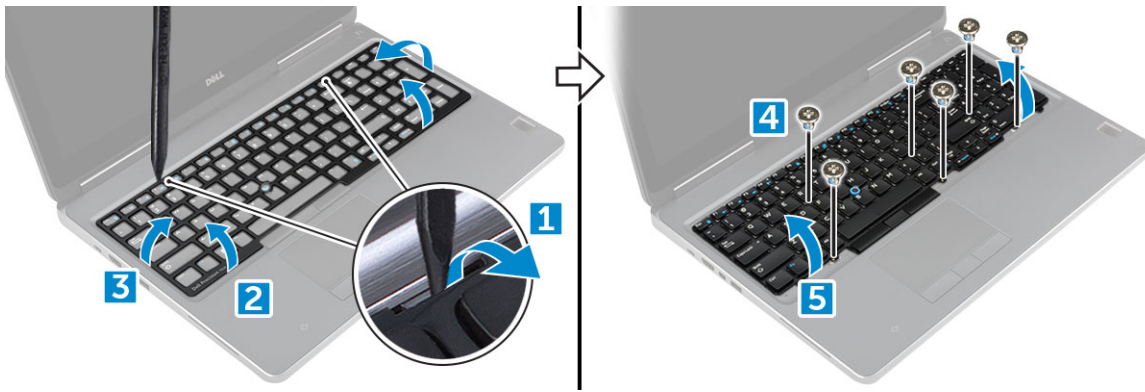
Installing the keyboard

1 Press and align the keyboard to its compartment.

2 Replace the screws to secure the keyboard to the computer.

3 Slide the keyboard trim and align it to its position on the computer. Ensure that the keyboard trim clicks into its place

4 Connect the keyboard data cables to the system board.

> ⓘ NOTE: **Ensure that you fold the keyboard data cable in perfect alignment.**

5 Affix the tape on the keyboard data cables.

6 Install the:

    a   hard drive

    b   battery

    c   battery cover

7 Follow the procedure in After working inside your computer.

Base cover

Removing the base cover

1 Follow the procedure in Before working inside your computer.

2 Remove the:

    a   battery cover

    b   battery

3 To remove base cover:

    a   Remove the M2.5X5.0 screws that secure the base cover to the computer [1].

    b   Slide and lift the base cover away from the computer [2].
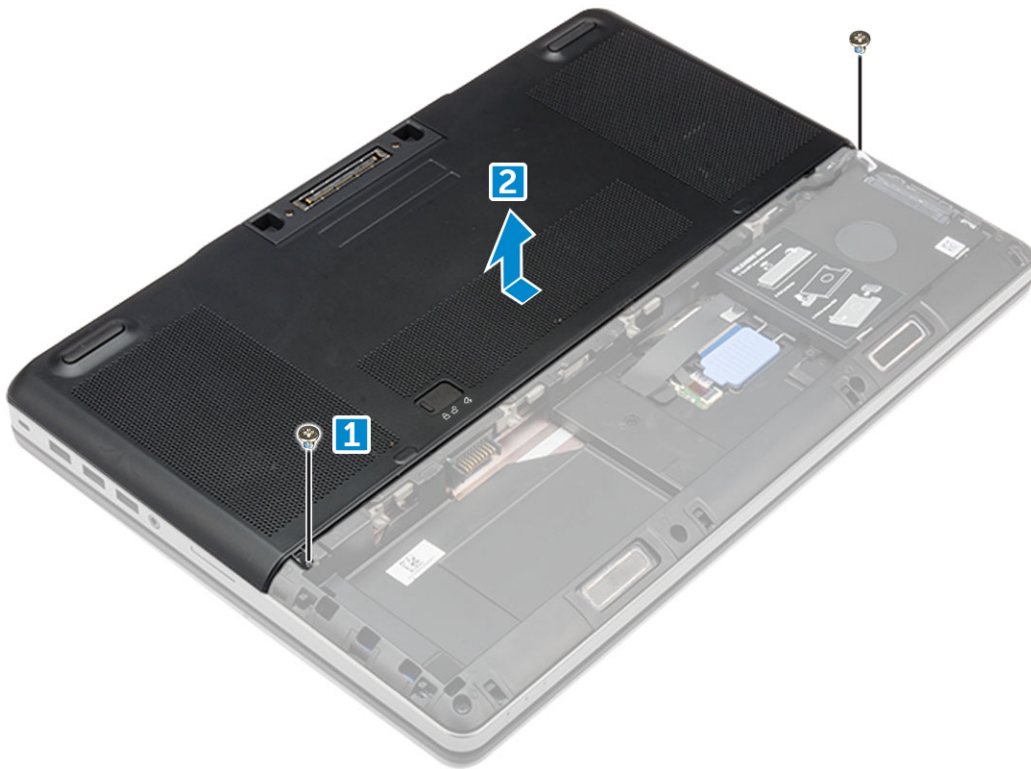
Installing the base cover

1   Slide the base cover to align with the screw holes on the computer.
2   Replace the M2.5X5.0 screws to secure the base cover to the computer.
3   Install the:
    a   battery
    b   battery cover
4   Follow the procedure in After working inside your computer.

Memory module

Removing the primary memory module

1   Follow the procedure in Before working inside your computer.
2   Remove the:
    a   battery cover
    b   battery
    c   base cover
3   To remove primary memory module:
    a   Pry the retention clips away from the memory module until it pops up.
    b   Lift the memory module and remove it from the computer.
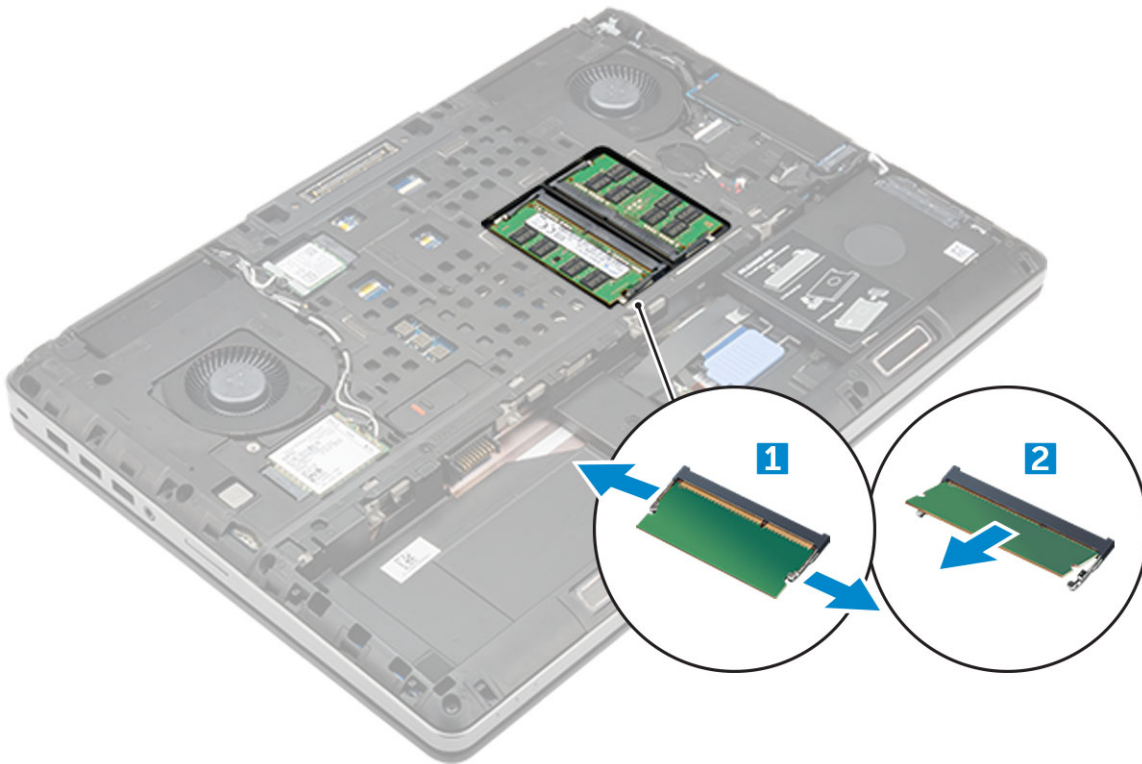
Installing the primary memory module

1 Insert the memory module into the memory socket.

> ⓘ **NOTE: Install either two or four memory modules in the memory module slots to ensure optimum system performance. Installing one or three memory modules lead to system performance issues.**

2 Press the clips to secure the memory module to the system board.

3 Install the:

    a   base cover

    b   battery

    c   battery cover

4 Follow the procedure in After working inside your computer.

Removing the secondary memory module

1 Follow the procedure in Before working inside your computer.

2 Remove the:

    a   battery cover

    b   battery

    c   hard drive

    d   keyboard

3 To remove the secondary memory module:

    a   Remove the screw that secures the memory shield [1].

    b   Lift and remove the memory shield from the computer [2].

    c   Pry the retention clips away from the memory module until it pops up [3].

    d   Lift the memory module and remove it from the computer [4].
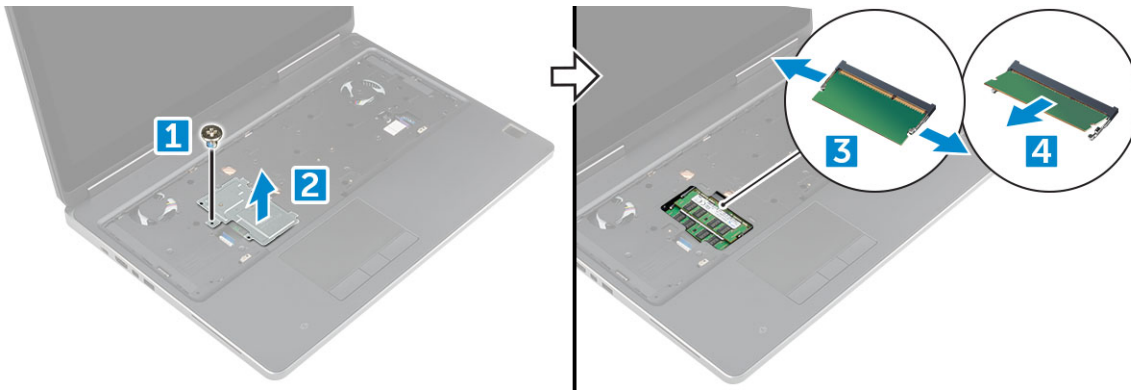
Installing the secondary memory module

1 Insert the memory module into the memory socket.

2 Press the clips to secure the memory module to the system board.

3 Place the memory shield in its original position on the memory module and tighten the screw to secure it to the computer.

4 Install the:

    a keyboard

    b hard drive

    c battery

    d battery cover

5 Follow the procedure in After working inside your computer.

WWAN card

Removing Wireless Wide Area Network (WWAN) card

(i) NOTE: **Depending on the configuration you choose, you may or may not have WWAN card.**

1 Follow the procedure in Before working inside your computer.

2 Remove the:

    a battery cover

    b battery

    c base cover

3 To remove the WWAN card:

    a Disconnect and unroute the antenna cables connected to the WWAN card [1].

    b Remove the M2.0x3.0 screw that secures the WWAN card to the computer [2].

    c Remove the WWAN card from the computer [3].
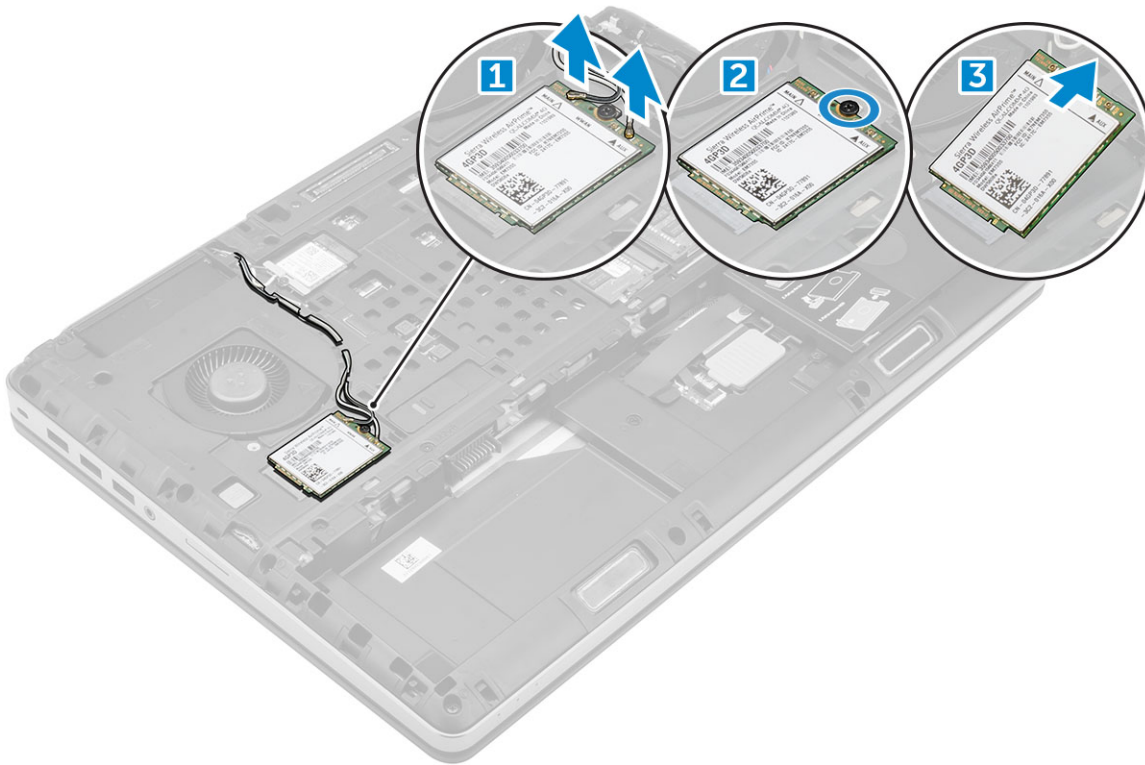
Installing the WWAN card

ⓘ **NOTE: Depending on the configuration you choose, you may or may not have WWAN card.**

1 Slide the WWAN card to the WWAN card slot.
2 Replace the M2.0x3.0 screw to secure the WWAN card to the computer.
3 Route the antenna cables through the routing channels and connect them to the WWAN card.
4 Install the:
    a   base cover
    b   battery
    c   battery cover
5 Follow the procedure in After working inside your computer.

WLAN card

Removing the Wireless Local Area Network (WLAN) card

1 Follow the procedure in Before working inside your computer.
2 Remove the:
    a   battery cover
    b   battery
    c   base cover
3 To remove the WLAN card from the computer:
    a   Remove the M2.0x3.0 screw that secures the WLAN card to the computer [1].
    b   Remove the shield that secures the antenna cables [2].
    c   Disconnect and un-route the antenna cables connected to the WLAN card and remove the WLAN card from the computer [3,4].
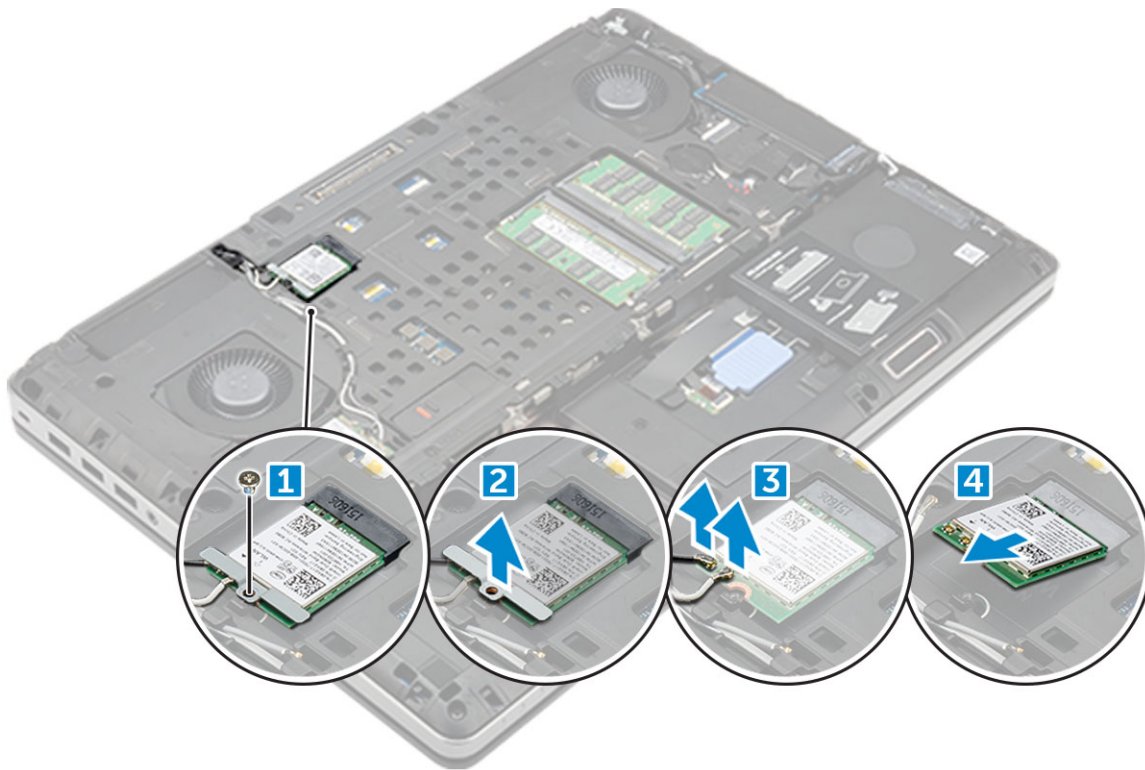
Installing the WLAN Card

1   Insert the WLAN card in its slot on the computer.

2   Route the antenna cables through the routing channel and connect them to the WLAN card.

3   Align the shield and tighten the M2.0x3.0 screw to secure the WLAN card to the computer.

4   Install the:
    a   base cover
    b   battery
    c   battery cover

5   Follow the procedures in After working inside your computer.

Coin cell battery

Removing the coin cell battery

1   Follow the procedures in Before working inside your computer.

2   Remove the:
    a   battery cover
    b   battery
    c   base cover

3   To remove coin cell battery:
    a   Disconnect the coin cell battery cable from the computer [1].
    b   Pry and lift the coin cell battery from the computer [2].
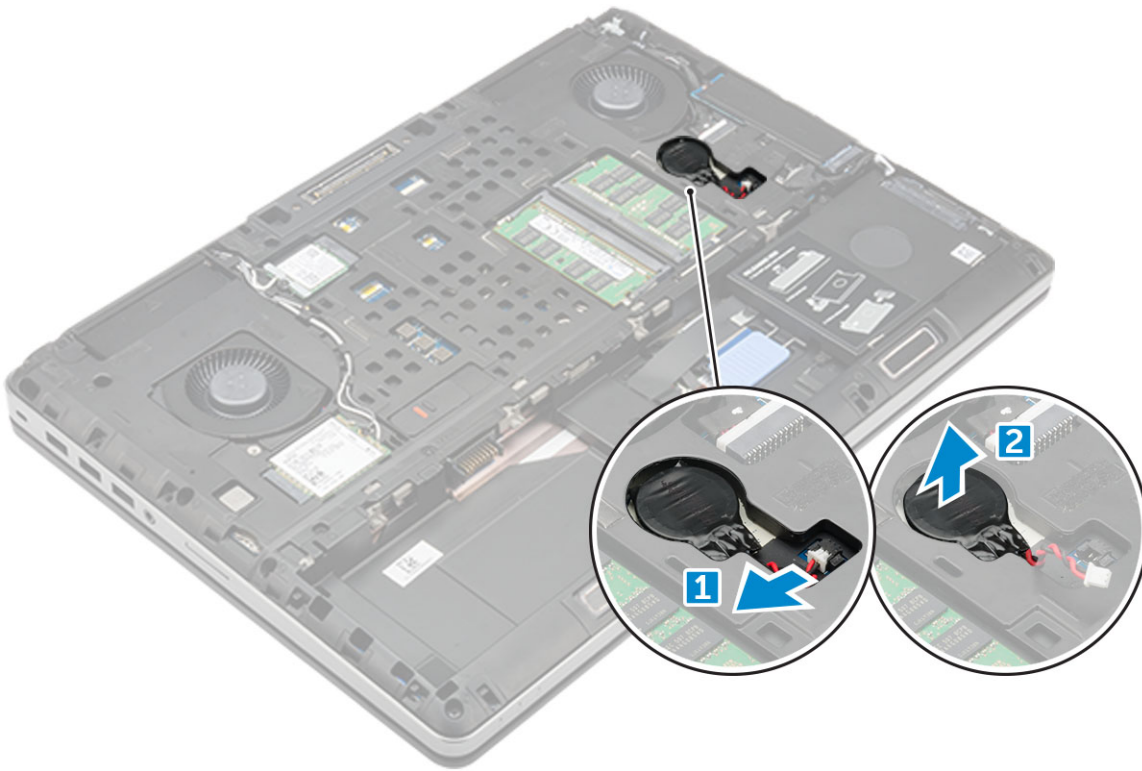
Installing the coin cell battery

1   Replace the coin cell battery in its slot on the computer.
2   Connect the coin cell battery cable to the comupter.

> ⓘ NOTE: **Ensure that the coin cell battery cable does not protrude outside its compartment.**

3   Install the:
    a   base cover
    b   battery
    c   battery cover
4   Follow the procedure in After working inside your computer.

Technology and components

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

Topics:

Power adapter

This laptop is shipped with 180 W power adapters.

⚠️ **WARNING: When you disconnect the power adapter cable from the laptop, grasp the connector, not the cable itself, and then pull firmly but gently to avoid damaging the cable.**

⚠️ **WARNING: The power adapter works with electrical outlets worldwide. However, power connectors and power strips vary among countries. Using an incompatible cable or improperly connecting the cable to the power strip or electrical outlet may cause fire or equipment damage.**

Processors

Latitude 7520 is shipped with any of the following processors:

7th generation processors (KabyLake)

- Intel Core Xeon E3-1535M v6 (Quad Core Xeon 3.10GHz, 4.20GHz Turbo, 8MB 45W)
- Intel Core Xeon E3-1505M v6 (Quad Core Xeon 3.00GHz, 4.00GHz Turbo, 8MB 45W)
- Intel Core i7-7920HQ (Quad Core 3.10GHz, 4.10GHz Turbo, 8MB 45W)
- Intel Core i7-7820HQ (Quad Core 2.90GHz, 3.90GHz Turbo, 8MB 45W)
- Intel Core i7-7700HQ (Quad Core 2.80GHz, 3.80GHz Turbo, 6MB 45W)- non vPro
- Intel Core i5-7440HQ (Quad Core 2.80GHz, 3.80GHz Turbo, 6MB 45W)
- Intel Core i5-7300HQ (Quad Core 2.50GHz, 3.50GHz Turbo, 6MB 45W)

6th generation processors (SkyLake)

- Intel Core Xeon E3-1575M v5 (Quad Core Xeon 3.00GHz, 3.90GHz Turbo, 8MB 45W)
- Intel Core Xeon E3-1545M v5 (Quad Core Xeon 2.90GHz, 3.80GHz Turbo, 8MB 45W)

- Intel Core i7-6920HQ (Quad Core 2.90GHz, 3.80GHz Turbo, 8MB 45W)
- Intel Core i7-6820HQ (Quad Core 2.70GHz, 3.60GHz Turbo, 8MB 45W)

ⓘ **NOTE: The clock speed and performance varies depending on the workload and other variables.**

Kaby Lake — 7th Generation Intel Core processors

The 7th Gen Intel Core processor (Kaby Lake) family is the successor of 6th generation processors (Skylake). It's main features include:

- Intel 14nm Manufacturing Process Technology
- Intel Turbo Boost Technology
- Intel Hyper Threading Technology
- Intel Built-in Visuals
    - Intel HD graphics - exceptional videos, editing smallest details in the videos
    - Intel Quick Sync Video - excellent video conferencing capability, quick video editing and authoring
    - Intel Clear Video HD - visual quality and color fidelity enhancements for HD playback and immersing web browsing
- Integrated memory controller
- Intel Smart Cache
- Optional Intel vPro technology (on i5/i7) with Active Management Technology 11.6
- Intel Rapid Storage Technology

ⓘ **NOTE: Windows 7 and 8 are not supported by systems with 7th generation processors**

Identifying processors in Windows 10

1 Type **Device Manager** in **Ask me anything** field.
   The i**Device Manager** window is displayed.
2 Click **Processor**.
   The processor information is displayed.

Figure 1.

Verifying processor usage in task manager

1 Right click on the desktop.
2 Select **Start Task Manager**.
   The **Windows Task Manager** window is displayed.
3 Click the **Performance** tab in the **Windows Task Manager** window.
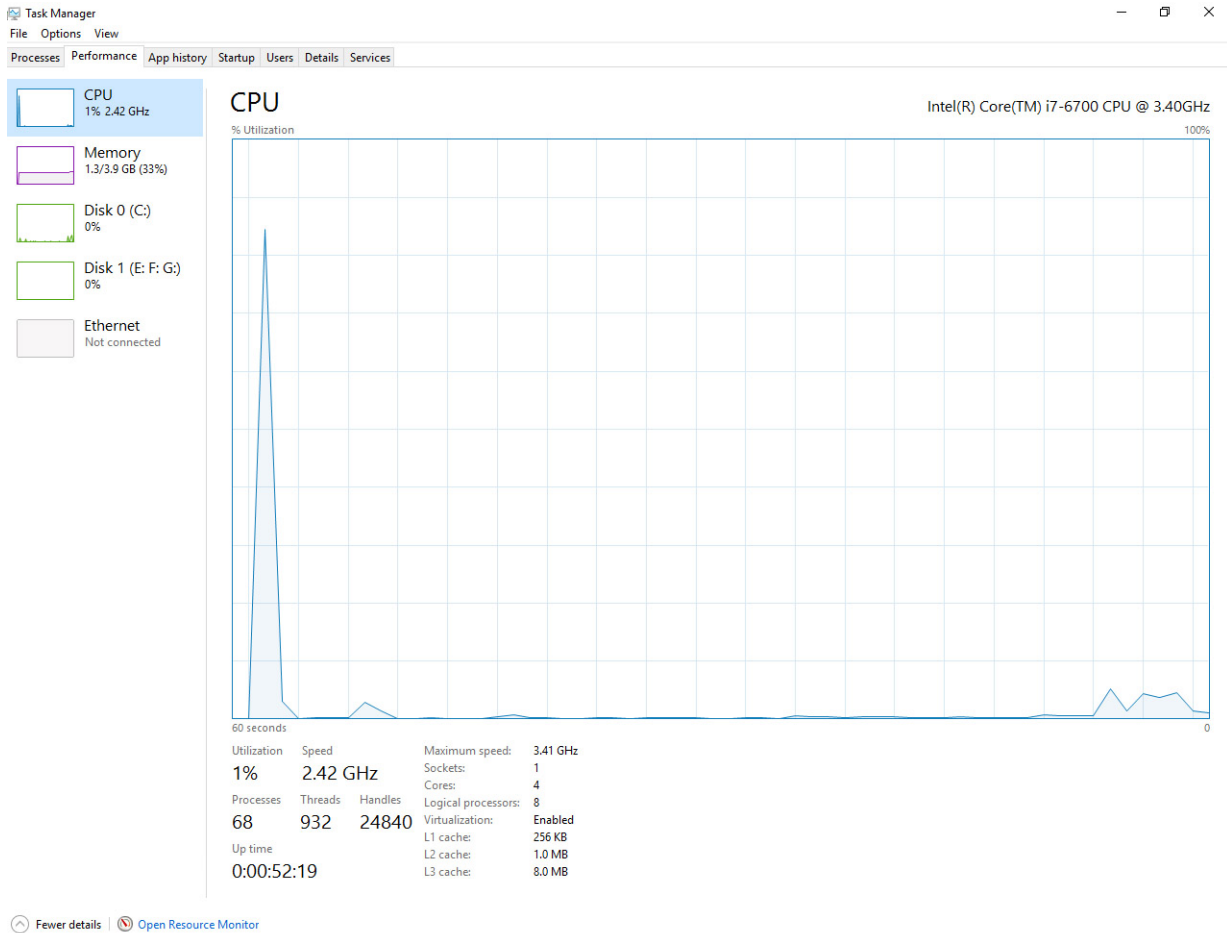
Verifying processor usage in resource monitor

1. Right click the desktop.
2. Select **Start Task Manager**.
   The **Windows Task Manager** window is displayed.
3. Click the **Performance** tab in the **Windows Task Manager** window.
   The processor performance details are displayed.
4. Click **Open Resource Monitor**.
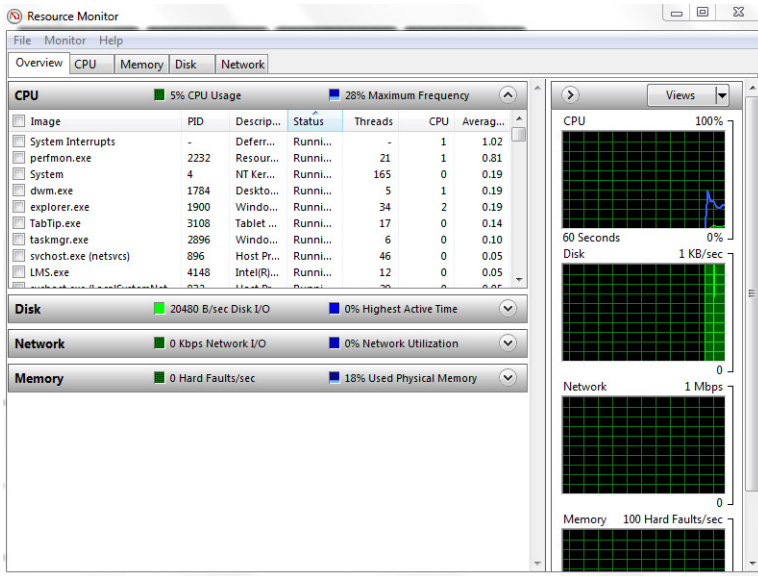
Chipset

The chipset is integrated on the processor.

Identifying chipset in device manager on Windows 10

ⓘ NOTE: The Chipset information displayed is a generic image and may be different from what is displayed.

1   Click **All Settings** ⚙ on the Windows 10 Charms Bar.
2   From the **Control Panel**, select **Device Manager**.
3   Expand **System Devices** and search for the chipset.

System devices
- ACPI Fan
- ACPI Fan
- ACPI Fan
- ACPI Fan
- ACPI Fan
- ACPI Fixed Feature Button
- ACPI Power Button
- ACPI Processor Aggregator
- ACPI Thermal Zone
- ACPI Thermal Zone
- Composite Bus Enumerator
- High Definition Audio Controller
- High precision event timer
- Intel(R) 100 Series/C230 Series Chipset Family LPC Controller - A143
- Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #7 - A116
- Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #6 - A115
- Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #5 - A114
- Intel(R) 100 Series/C230 Series Chipset Family PMC - A121
- Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123
- Intel(R) 100 Series/C230 Series Chipset Family Thermal subsystem - A131
- Intel(R) Management Engine Interface
- Intel(R) Power Engine Plug-in
- Intel(R) Xeon(R) E3 - 1200/1500 v5/6th Gen Intel(R) Core(TM) PCIe Controller (x16) - 1901
- IWD Bus Enumerator
- Legacy device
- Microsoft ACPI-Compliant System
- Microsoft System Management BIOS Driver
- Microsoft UEFI-Compliant System
- Microsoft Virtual Drive Enumerator
- Microsoft Windows Management Interface for ACPI
- NDIS Virtual Network Adapter Enumerator
- Numeric data processor
- PCI Express Root Complex
- PCI Express to PCI/PCI-X Bridge
- PCI standard host CPU bridge
- Plug and Play Software Device Enumerator
- Programmable interrupt controller
- Remote Desktop Device Redirector Bus
- System CMOS/real time clock
- System timer
- UMBus Root Bus Enumerator

Memory features

Memory is integrated on the system board and it cannot be replaced as a module:

- DDR4 2400 MHz
- DDR4 2667 MHz (Non-ECC only)

Verifying system memory in setup

1   Turn on or restart your notebook.
2   Perform one of the following actions after the Dell logo is displayed:
    - With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.
3   On the left pane, select **Settings** > **General** > **System Information**,
    The memory information is displayed on the right pane.

Verifying system memory

Windows 10

1   Click the **Windows** button and select **All Settings** ⚙ > **System** .
2   Under **System**, click **About**.

Testing memory using ePSA

1   Turn on or restart your computer.
2   Perform one of the following actions after the Dell logo is displayed:
    - With keyboard — Press F2.

The PreBoot System Assessment (PSA) starts on your computer.

> ⓘ **NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Turn off the computer and try again.**

Display

Display section details on identifying the display adapter from the display manager along with steps on how change the screen resolution. It also contains information about connection multiple monitors.

Display options

- This laptop is shipped with 15.6-inch FHD Touch with Corning Gorilla Glass 4 (1920 x 1080) display.
- This laptop is shipped with 15.6-inch UHD Touch with Corning Gorilla Glass 4 (3840x2160) display.

Identifying display adapter

1 Type **Device manager** in the **Ask me anything** field.
   The **Display Manager** window is displayed.
2 Expand the **Display adapters**.
   The display adapter information is displayed.
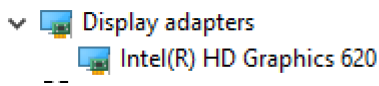
Figure 2. display adapter

Changing the screen resolution

1 Right click on the desktop and select **Display Settings**.
2 Tap or click the **Advanced display settings**.
3 Select the required resolution from the drop-down list and tap **Apply**.
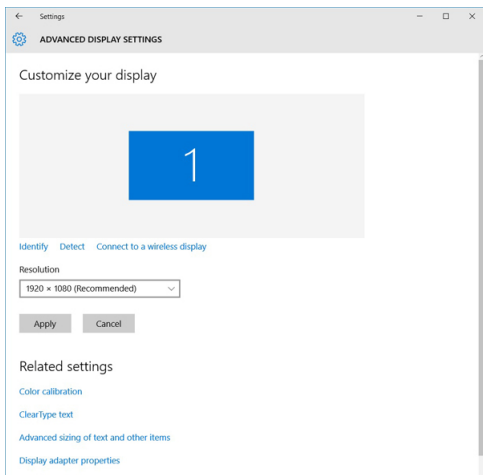
Connecting to external display devices

Follow these steps to connect your computer to an external display device:

1 Ensure that the projector is turned on and plug the projector cable into a video port on your computer.
2 Press the Windows logo+P key.
3 Select one of the following modes:
   - PC screen only
   - Duplicate
   - Extend
   - Second Screen only

   ⓘ NOTE: For more information, see the document that is shipped with your display device.

Camera features

This laptop is shipped with front-facing camera with the image resolution of 1280 x 720 (maximum). Front facing IR camera is also available. The camera is at the top center of the display.

Identifying the camera in Device Manager on Windows 10

1 In the **Search** box, type `device manager`, and tap to start it.
2 Under **Device Manager**, expand **Imaging devices**.
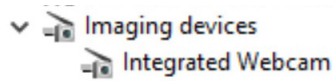
Starting the camera

To start the camera, open an application that uses the camera. For instance, if you tap the Dell webcam central software or the Skype software that is shipped with the laptop, the camera turns on. Similarly, if you are chatting on the internet and the application requests to access the webcam, the webcam turns on.

Starting the camera application

1 Tap or click the **Windows** button and select **All apps**.
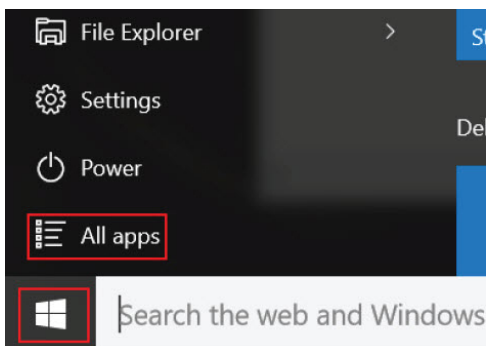
2 Select **Camera** from the apps list.
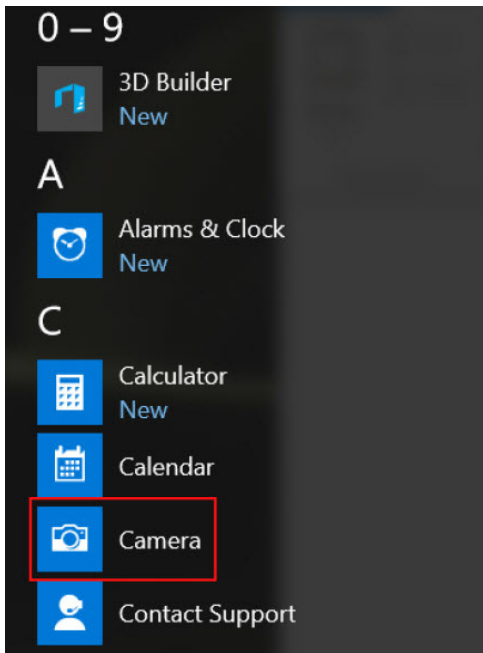
3   If the **Camera** App is not available in the apps list, search for it.
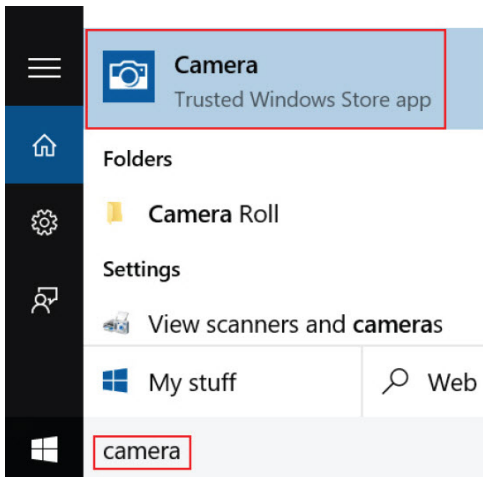
Hard drive

This section explains how to identify the hard drive type installed in the system.

Storage options

This laptop supports M.2 SATA SSD and M.2 PCIe NVMe SSDs.

Identifying the storage device in the BIOS

1   Turn on or restart your laptop.
2   When the Dell logo appears, perform one of the following actions to enter the BIOS setup program:
     · With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.
     · Without keyboard — When the **F12 boot selection** menu is displayed, use the arrow keys to choose the option to enter BIOS setup.

Storage device (HDD or SSD type) is listed under the **System Information** under the **General** group.

Identifying storage device in Windows 10

1   Type **Device Manager** in **I'm Cortana, Ask me anything** field.

The **Device Manager** window is displayed.

2   Click **Disk Drives**.

The storage devices installed in the system are displayed.

USB features

The Universal Serial Bus, or well known as USB was introduced to the PC world in 1996 which dramatically simplified the connection between host computer and peripheral devices such as mice and keyboards, external hard drive or optical devices, Bluetooth and many more peripheral devices in the market.

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

Table 1. 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 1.1	12 Mbps	Full Speed	1998
USB 1.0	1.5 Mbps	Low Speed	1996

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.
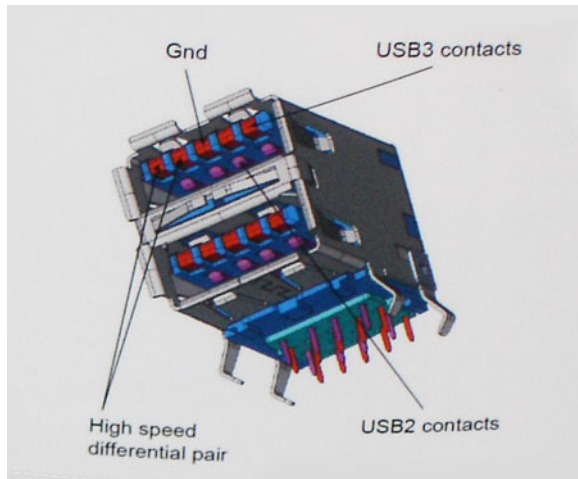
With today's ever increasing demands placed on data transfers with high-definition video content, terabyte storage devices, high megapixel count digital cameras etc., USB 2.0 may not be fast enough. Furthermore, no USB 2.0 connection could ever come close to the 480Mbps theoretical maximum throughput, 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.

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.

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

Technical specifications

> (i) **NOTE:** Offerings may vary by region. The following specifications are only those required by law to ship with your computer. For more information about the configuration of your computer, go to Help and Support in your Windows operating system and select the option to view information about your computer.

Topics:

System information

Feature	Specification
System Chipset	Intel CM238 Chipset
Interrupt Levels	Interrupt Controller • Supports up to eight legacy interrupt pins • Supports PCI 2.3 Message Signaled Interrupts • Integrated IO APIC capability with 24 interrupts • Supports Processor System Bus interrupt delivery
BIOS Chip (NVRAM)	64Mbit (8MB) & 32Mbit (4MB)

Processor

Feature	Specification
Processor type	• 6th generation Intel i7, Xeon processors (SkyLake) • 7th generation Intel Core i5, i7 and Xeon processors (KabyLake)
L1 cache	Up to 32 KB cache depending on processor type
L2 cache	Up to 256 KB cache depending on processor type
L3 cache	Up to 8 MB cache depending on processor type
Intel Smart cache with Last Level Cache	Up to 8 MB cache depending on processor type

Memory

Feature	Specification
Type	DDR4 SDRAM
Speed	• 2400 MHz • 2667 MHz (Non-ECC only)
Connectors	4
Capacity	8GB, 16 GB
Minimum Memory	8 GB (1 x 8 GB)
Maximum memory	64 GB

Video

Feature	Specification
Type	MXM type-A add-in card
Data bus	PCIE x16, Gen3
Video controller and memory:	• NVIDIA Quadro M1200 • NVIDIA Quadro M2200

Audio

Features	Specification
Integrated	dual-channel High-Definition audio

Communication

Feature	Specification
Ethernet adapter	network interface card capable of 10/100/1000 mb/s communication
Wireless	WLAN options:

WLAN options:

- Intel WiFi Link 8265 2x2 802.11ac+BT 4.2 (vPro)
- Intel WiFi Link 8265 2x2 802.11ac NBT (vPro)
- Dell DW 1820 2x2 802.11ac+BT 4.2 US

Optional Mobile broadband and GPS

- DW5811e (Gobi 4G/LTE - FMC)
- DW5814e (Gobi 4G/LTE)

Expansion bus

Feature	Specification
Bus Type	PCI Express 1.0, 2.0 and 3.0, SATA 1.0A, 2.0 and 3.0, USB 2.0 and 3.0
Bus Width	PCIe X16
BIOS Chip (NVRAM)	128 Mb (16 MB)

Ports and connectors

Feature	Specification
Audio	Universal audio jack connector
Network Adapter	one RJ45 connector
USB C connector with Thunderbolt	one (optional)
USB 3.1 with Gen 1 (with PowerShare)	four
Video	HDMI 1.4, mDP 1.4
Memory card reader	SD 4.0
Docking port	one
Micro Subscriber Identity Module (Micro SIM) port	one
Smart card (optional)	one

Display

Features	Specification
Type	• FHD (1920 x 1080) • UHD (3840 x 2160)
Size	15.6 inches
Dimensions:	
Height	193.59 mm (7.62 inches)
Width	344.16 mm (13.54 inches)
Diagonal	396.24 mm (15.60 inches)
Active area (X/Y)	• FHD (1920 x 1080) • UHD (3840 x 2160)
Maximum resolution	• FHD (1920 x 1080) • UHD (3840 x 2160)
Maximum Brightness	• FHD (350 nits) • UHD (300 nits)
Operating angle	0° (closed) to 135°
Refresh rate	60 Hz
Minimum viewing angles:	
Horizontal	• FHD (40/80/80) • UHD (80)
Vertical	• FHD (10/80/80) • UHD (80)

Keyboard

Features	Specification
Number of keys	• United States: 103 keys • United Kingdom: 104 keys • Brazil: 106 keys • Japan: 107 keys
Layout	QWERTY/AZERTY/Kanji

Touchpad

Features	Specification
X/Y position resolution	• X: 41.27+-4.13 counts/mm • Y: 38.75+-3.88 counts/mm • 1048/984 cpi
Size	Sensor-active area: • Width: 99.5mm (3.92 inches) • Height: 53mm (2.09 inches)
Multi-Touch	Configurable single finger and multi-finger gestures

Camera

Features	Specification
Type	CMOS Sensor
Still Resolution	1280 x 720 Pixels (Maximum)
Video Resolution	1280 x 720 Pixels (Maximum)
Diagonal	74 degrees

Storage

Features	Specification
Storage:	• SATA 1 (1.5 Gb/s) • SATA 2 (3.0 Gb/s) • SATA 3 (6 Gb/s) • PCIe express
Size	1 TB 5400 RPM, 128/256/512 GB SATA 3 SSD, 256 GB SATA 3 SSD, 1 TB M.2 SSD, 1 TB SATA 3 SSD

Battery

Features	Specification
Wattage	72Whr/ 91Whr/ 88Whr
Type	lithium ion
Dimensions (6-cell entry/ 6-cell upsell/ 6-cell long cycle life (LCL)):	1280 x 720 Pixels (Maximum)
Length	243.89 mm (9.6inches)

Height	18.45 mm (0.73inches)
Width	71.30 mm (2.81inches)
Weight	18.45 mm (0.73inches)
Voltage	400.00 g (0.88 lb)
Life span	· 300 discharge/charge cycles · 1000 discharge/charge cycles (LCL)
Temperature range:	
Operating	· Charge: 0°C to 50°C (32°F to 158°F) · Discharge: 0°C to 70°C (32°F to 122°F)
Non-Operating	-20°C to 65°C (4°F to 149°F)
Coin-cell battery	3 V CR2032 lithium ion cell

AC adpter

Features	Specification
Input voltage	100 VAC to 240 VAC
Input current (maximum)	2.34 A
Input frequency	50 Hz to 60 Hz
Output power	180 W
Output current	9.23 A
Rated output voltage	19.50 VDC
Dimensions:	180 W
Height	30 mm (1.18 inches)
Width	155 mm (6.10 inches)
Depth	76.2 mm (3.0 inches)
Weight	0.58 kg (1.28 lb)
Temperature range:	
Operating	0°C to 40°C (32°F to 104°F)
Non-Operating	−40°C to 70°C (−40°F to 158°F)

Contactless smart card

Features	Specification
Supported Smart Cards and technologies	· ISO14443A — 160 kbps, 212 kbps, 424 kbps, and 848 kbps · ISO14443B — 160 kbps, 212 kbps, 424 kbps, and 848 kbps · ISO15693

- HID iClass
- FIPS201
- NXP Desfire

Physical dimension

Feature	Specification
Weight (pounds/ kilograms)	6.17 lbs (2.80 kgs)
Dimensions	
Height (inches/mm)	
Front (non-touch)	1.09 inches (27.7 mm)
Rear (non-touch)	1.30 inches (33.0mm)
Front (touch)	1.12 inches (28.4 mm)
Rear (touch)	1.33 inches (33.7mm)
Width (inches/mm)	14.88 inches (378 mm)
Depth (inches/mm)	10.28 inches (261 mm)

Environmental

Feature	Specification
Temperature range:	
Operating	0°C to 40°C (32°F to 104°F)
Storage	−40°C to 65 °C (−40°F to 149°F)
Relative humidity (maximum):	
Operating	10 % to 90 % (non-condensing)
Storage	5 % to 95 % (non-condensing)
Maximum vibration:	
Operating	0.66 GRMS, 2 Hz — 600 Hz
Storage	0.66 GRMS, 2 Hz — 600 Hz
Maximum shock:	
Operating	140 G, 2 MS
Storage	163 G, 2 MS
Altitude:	
Storage	0 -m to 10,668 -m (0 ft to 35,000 ft)
Airborne contaminant level	G1 or lower as defined by ANSI/ISA-S71.04-1985

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:

- Legacy Boot:
    - Internal HDD
    - Onboard NIC
    - USB optical drive (if available)
- UEFI Boot:
    - Windows Boot Manager
- Other Options:
    - BIOS Setup
    - BIOS Flash Update
    - Diagnostics
    - Change Boot Mode Settings

Navigation keys

(i) 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.

Keys	Navigation
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.**

Keys	Navigation
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.
F1	Displays the System Setup help file.

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, Ownership Date, Manufacture Date, and the Express Service Code.
	• Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM ASize, DIMM B Size, DIMM CSize, DIMM D Size,
	• 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 Primary Hard Drive, SATA-0, M.2 PCIe SSD-0, Dock eSATA Device, LOM MAC Address, Passthrough MAc address, Video Controller, dGPU 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 and the type of AC adapter connected to the computer.
Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system.
	• Windows Boot Manager
	• Boot list options:
	• Legacy
	• Diskette Drive
	• Internal HDD
	• USB Storage Device
	• CD/DVD/CD-RW Drive
	• Onboard NIC
	• 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 enabled.
	• Enable Attempt Legacy Boot

Option	Description
UEFI boot path security	- Always, except internal HDD (selected by default) - Always - Never
Date/Time	Allows you to change the date and time.

System Configuration screen options

Option	Description
Integrated NIC	Allows you to configure the integrated network controller. The options are: - Disabled - Enabled - Enabled w/PXE: This option is enabled by default.
Parallel Port	Allows you to configure the parallel port on the docking station. The options are: - Disabled - AT: This option is enabled by default. - PS2 - ECP
Serial Port	Allows you to configure the integrated serial port. The options are: - Disabled - COM1: This option is selected by default. - COM2 - COM3 - COM4
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-0 - SATA-1 - M.2 PCI-e SSD-0 - SATA-3
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

Option	Description
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 Boot support (by default enable) · Enable Thunderbolt ports (by default enable) · Always Allow dell docks · Enable external USB ports Others: · Enable Thubderbolt Boot Support · Enable Thunderbolt (and PCIE behind TBT) Pre-boot · Security level-no security · Security level-user configuration (selected by default) · Security level-secure connect · Security level- Display port only ⓘ **NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.**
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 (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 (by default enable) · Enable Internal Speaker (by default enable)
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 (selected by default) · Dim · Bright
Keyboard Backlight with AC	The Keyboard Backlight with AC option does not affect the main keyboard illumination feature. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled (selected by default).
Keyboard Backlight Timeout on AC	The Keyboard Backlight Time-out 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. · 5 sec · 10 sec (selected by default) · 15 sec · 30 sec

Option	Description
	· 1 min
	· 5 min
	· 15 min
	· never
Touchscreen	Controls whether the touch screen is enabled or disabled (enabled by default).
Keyboard Backlight Timeout on Battery	The Keyboard Backlight Time-out dims out with 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.
	· 5 sec
	· 10 sec (selected by default)
	· 15 sec
	· 30 sec
	· 1 min
	· 5 min
	· 15 min
	· never
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 Expresscard (selected by default)
	· Enable HardDrive Free Fall Protection (selected by default)
	· WiFI Radio (selected by default)
	· Enable Secure Digital (SD) Card (selected by default)
	· Secure Digital (SD) Card Read-Only Mode
	· Secure Digital (SD) Card Boot

Video screen options

Option	Description
LCD Brightness	Allows you to set the display brightness depending upon the power source. On Battery(50% is default) and On AC (100 % default).
Switchable Graphics	· Enable Switchable Graphics (selected by default)
	· Enable Dock Display Port(selected by default)
	· Graphics Spec Mode

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

Security screen options

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password. ⓘ **NOTE: You must set the admin password before you set the system or hard drive password. Deleting the admin password automatically deletes the system password and the hard drive password.** ⓘ **NOTE: Successful password changes take effect immediately.** Default setting: Not set
System Password	Allows you to set, change or delete the system password. ⓘ **NOTE: Successful password changes take effect immediately.** Default setting: Not set
Internal HDD-2 Password	Allows you to set, change, or delete the administrator password. ⓘ **NOTE: Successful password changes take effect immediately.** Default setting: Not set
Strong Password	Allows you to enforce the option to always set strong passwords. Default Setting: Enable Strong Password is not selected. ⓘ **NOTE: If Strong Password is enabled, Admin and System passwords must contain at least one uppercase character, one lowercase character and be at least 8 characters long.**
Password Configuration	Allows you to specify the minimum and max password lengths of Administrator and System passwords. • minimum -4(by default, if you want to change you can increase the number) • maximum -32 (you can decrease the number)
Password Bypass	Allows you to enable or disable the permission to bypass the System and the Internal HDD password, when they are set. The options are: • Disabled • Reboot bypass Default setting: Disabled
Password Change	Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set. Default setting: **Allow Non-Admin Password Changes** is selected.
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password. • allow wireless switch changes
UEFI Capsule Firmware Updates	Allows you to enable or disable. This option controls whether this system allows BIOS updated via UEFI capsule update packages. The options are:

Option	Description
	• Enable UEFI Capsule Firmware—enabled by default
TPM 1.2/2.0 Security	Allows you to enable the Trusted Platform Module (TPM) during POST. The options are: • TPM On (selected by default) • Clear (option is disabled) • PPI Bypass for Enabled Commands (selected by default) • PPI Bypass for Disabled Commands • Disabled • Enabled • Attestation enable (selected by default) • Key storage enable (selected by default) • SHA-256 (selected by default) ⓘ **NOTE: To upgrade or downgrade TPM1.2/2.0, download the TPM wrapper tool (software).**
Computrace	Allows you to activate or disable the optional Computrace software The options are: • Deactivate • Disable • Activate (selected by default) ⓘ **NOTE: The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed**
CPU XD Support	Allows you to enable the Execute Disable mode of the processor. Enable CPU XD Support (default)
OROM Keyboard Access	Allows you to set an option to enter the Option ROM Configuration screens using hotkeys during boot. The options are: • Enable • One Time Enable • Disable Default setting: Enable
Admin Setup Lockout	Allows you to prevent users from entering Setup when an Administrator password is set. Default Setting: **Disabled**
Master password lockout	This option is not selected by default

Secure Boot screen options

Option	Description
Secure Boot Enable	This option enables or disables the **Secure Boot** feature. • Disabled • Enabled

Option	Description
	Default setting: Enabled.
Expert Key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The Enable Custom Mode option is disabled by default. The options are:

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

If you enable the Custom Mode, the relevant options for PK, KEK, db, and dbx appear. The options are:

- Save to File—Saves the key to a user-selected file
- Replace from File—Replaces the current key with a key from a user-selected file
- Append from File—Adds a key to the current database from a user-selected file
- Delete—Deletes the selected key
- Reset All Keys—Resets to default setting
- Delete All Keys—Deletes all the keys

ⓘ **NOTE: If you disable the Custom Mode, all the changes made are erased and the keys restore to default settings.**

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)

Option	Description
Enclave Memory Size	This option sets **SGX Enclave Reserve Memory Size**. The options are:

- 32 MB
- 64 MB
- 128 MB (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.

- All (selected by default)
- 1

Option	Description
	· 2
	· 3
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.
Hyper-Thread Control	Allows you to enable or disable the Hyper-Threading in the processor.
	· Disabled
	· Enabled
	Default setting: Enabled.

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.
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
Deep Sleep Control	· Disabled (selected by default)
	· Enabled in S5 only
	· Enabled in S4 and S5
USB Wake Support	Allows you to enable USB devices to wake the system from Standby.

Option	Description

Option | **Description**

> ① **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

Wireless Radio Control | Allows you to enable or disable the feature that automatically switches from wired or wireless networks without depending on the physical connection.

- Control WLAN Radio
- Control WWAN Radio

Wake on LAN/ 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
- LAN Only
- WLAN Only
- LAN or WLAN

Default setting: 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 (disabled)
- Set battery threshold

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.

Primary Battery Charge Configuration | Allows you to select the charging mode for the battery. The options are:

- Adaptive (default)
- Standard — Fully charges your battery at a standard rate.
- ExpressCharge — The battery charges over a shorter period of time using Dell's fast charging technology. This option is enabled by default.
- Primarily AC use
- Custom

If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop.

> ① **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(selected by default)
- 15 Watts

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: This option is enabled by default. • By Numlock ⓘ NOTE: When setup is running, this option has no effect. Setup works in Fn Key Only mode.
Mouse/Touchpad	Allows you to define how the system handles mouse and touch pad input. The options are: • Serial Mouse • PS2 Mouse • Touchpad/PS-2 Mouse: This option is enabled by default.
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. This option is selected by default. • Lock Mode Disable/Standard (selected by default.) • Lock Mode Enable/Secondary

Manageability screen options

Option	Description
MEBx Hotkey	Allows you to specify whether the MEBx Hotkey function should enable, during the system boot. Default Setting: Enable MEBx Hotkey
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are: • Minimal (default) • Thorough • Auto

Option	Description
Extended BIOS POST Time	Allows you to create an additional preboot delay. The options are: • 0 seconds. This option is enabled by default. • 5 seconds • 10 seconds
Full Screen Log	Allows you to specify whether the Full Screen Log (disabled by default).
Warnings and errors option	• Prompt on warnings and errors (selected by default) • Continue on warnings • Continue on warnings and errors

Virtualization support screen options

Option	Description
Virtualization	Allows you to enable or disable the Intel Virtualization Technology. Enable Intel Virtualization Technology (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 Virtualization technology for direct I/O must be enabled to use this feature. Trusted Execution

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 and WiGig 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

Option	Description
	• Bluetooth
	All the options are enabled by default.

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.
Data Wipe	This field allows users to erase the data securely from all internal storage devices. The following is list of devices affected: • Wwipe on next boot (disabled) • 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) • BIOS Auto-Recovery • Always perform integrity check (disabled by default)

System Log 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

It is recommended to update your BIOS (System Setup), on replacing 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

1   Restart the computer.
2   Go to **Dell.com/support**.
3   Enter the **Service Tag** or **Express Service Code** and click **Submit**.

> ⓘ NOTE: To locate the Service Tag, click Where is my Service Tag?

> ⓘ NOTE: If you cannot find your Service Tag, click Detect My Product. Proceed with the instructions on screen.

4   If you are unable to locate or find the Service Tag, click the Product Category of your computer.

5   Choose the **Product Type** from the list.

6   Select your computer model and the **Product Support** page of your computer appears.

7   Click **Get drivers** and click **View All Drivers**.

The Drivers and Downloads page opens.

8   On the Drivers and Downloads screen, under the **Operating System** drop-down list, select **BIOS**.

9   Identify the latest BIOS file and click **Download File**.

You can also analyze which drivers need an update. To do this for your product, click **Analyze System for Updates** and follow the instructions on the screen.

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 3 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.**

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: **Your computer is shipped with the system and setup password feature disabled.**

Assigning a system password and setup password

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

ⓘ NOTE: **If the password jumper is disabled, the existing System Password and Setup Password are deleted and you need not provide the system password to log on to the notebook.**

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.

Troubleshooting

Enhanced Pre-Boot System Assessment (ePSA) diagnostics

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

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

⚠ **CAUTION: Use the system diagnostics to test only your computer. Using this program with other computers may cause invalid results or error messages.**

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

Running the ePSA diagnostics

1   Power-on the computer.
2   As the computer boots, press the F12 key as the Dell logo appears.
3   On the boot menu screen, select the **Diagnostics** option.
    The **Enhanced Pre-boot System Assessment** window is displayed, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.
4   To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
5   Select the device from the left pane and click **Run Tests**.
6   If there are any issues, error codes are displayed.
    Note the error code and contact Dell.

Device status lights

⏻	Turns on when you turn on the computer and blinks when the computer is in a power management mode.
🗄	Turns on when the computer reads or writes data.
🔋	Turns on steadily or blinks to indicate battery charge status.
((•))	Turns on when wireless networking is enabled.

The device status LEDs are usually located either on the top or left side of the keyboard. They are used to display the storage, battery and wireless devices connectivity and activity. Apart from that they can be useful as a diagnostic tool when there's a possible failure to the system.

The following table lists how to read the LED codes when possible errors occur.

Table 3. LED lights

Storage LED	Power LED	Wireless LED	Fault Description
Blinking	Solid	Solid	A possible processor failure has occurred.
Solid	Blinking	Solid	The memory modules are detected but has encountered an error.
Blinking	Blinking	Blinking	A system board failure has occurred.
Blinking	Blinking	Solid	A possible graphics card/video failure has occurred.
Blinking	Blinking	Off	System failed on hard drive initialization OR System failed in Option ROM initialization.
Blinking	Off	Blinking	The USB controller encountered a problem during initialization.
Solid	Blinking	Blinking	No memory modules are installed/detected.
Blinking	Solid	Blinking	The display encountered a problem during initialization.
Off	Blinking	Blinking	The modem is preventing the system from completing POST.
Off	Blinking	Off	Memory failed to initialize or memory is unsupported.

Battery status lights

If the computer is connected to an electrical outlet, the battery light operates as follows:

Alternately blinking amber light and white light	An unauthenticated or unsupported non-Dell AC adapter is attached to your laptop.
Alternately blinking amber light with steady white light	Temporary battery failure with AC adapter present.
Constantly blinking amber light	Fatal battery failure with AC adapter present.
Light off	Battery in full charge mode with AC adapter present.
White light on	Battery in charge mode with AC adapter present.

Real Time Clock (RTC) 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.

(i) **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

ⓘ 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.