

ChengMing 3967

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.

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Working on your computer

Before working inside your computer

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

- 1 Ensure that you follow the [Safety instructions](#).
- 2 Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
- 3 Turn off your computer, see [Turning off your computer](#).

⚠ CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

- 4 Disconnect all the network cables from the computer.
- 5 Disconnect your computer and all attached devices from the electrical outlets.
- 6 Press and hold the power button while the computer is unplugged to ground the system board.
- 7 Remove the cover.

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

⚠ CAUTION: Make sure that you place the cooler outlet side of your system at least 5 cm away from wall to prevent system overheat.

⚠ CAUTION: Your system cannot be placed crosswise and make sure that there is no equipment on the side cover.

Safety instructions

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

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 any external devices, cards, and cables before turning on your computer.

- 1 Replace the cover.

CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.
- 2 Connect any telephone or network cables to your computer.
- 3 Connect your computer and all attached devices to their electrical outlets.
- 4 Turn on your computer.
- 5 If required, verify that the computer works correctly by running **Dell Diagnostics**.

Removing and installing components

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

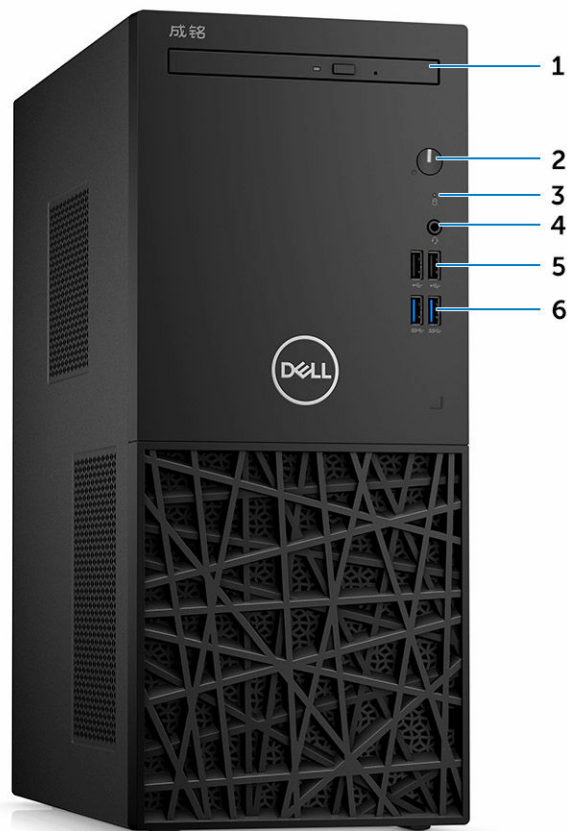
Recommended tools

The procedures in this document require the following tools:

- Small flat blade screwdriver
- Phillips # 1 screwdriver
- Small plastic scribe
- Hex screwdriver

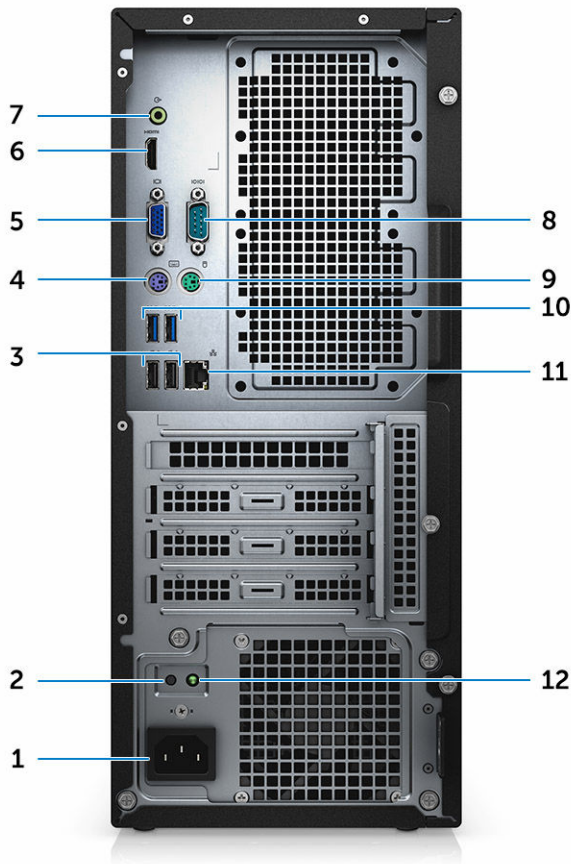
Chassis View

System front view



- 1 Optical drive
- 2 Power button and power status light
- 3 Hard drive activity light
- 4 Universal audio jack
- 5 USB 2.0 ports
- 6 USB 3.0 ports

System back view



- 1 Power connector port
- 2 Power supply diagnostic button
- 3 USB 2.0 port with USB wake support
- 4 PS2 port for keyboard
- 5 VGA port
- 6 HDMI port
- 7 Line out port
- 8 Serial port
- 9 PS2 port for mouse
- 10 USB 3.0 ports (2)
- 11 Network port
- 12 Power diagnostic light



Cover

Removing the cover

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 To remove the cover:
 - a Remove the screws that secure the cover to the computer [1].
 - b Slide and lift the cover to remove it from the computer [2].



Installing the cover

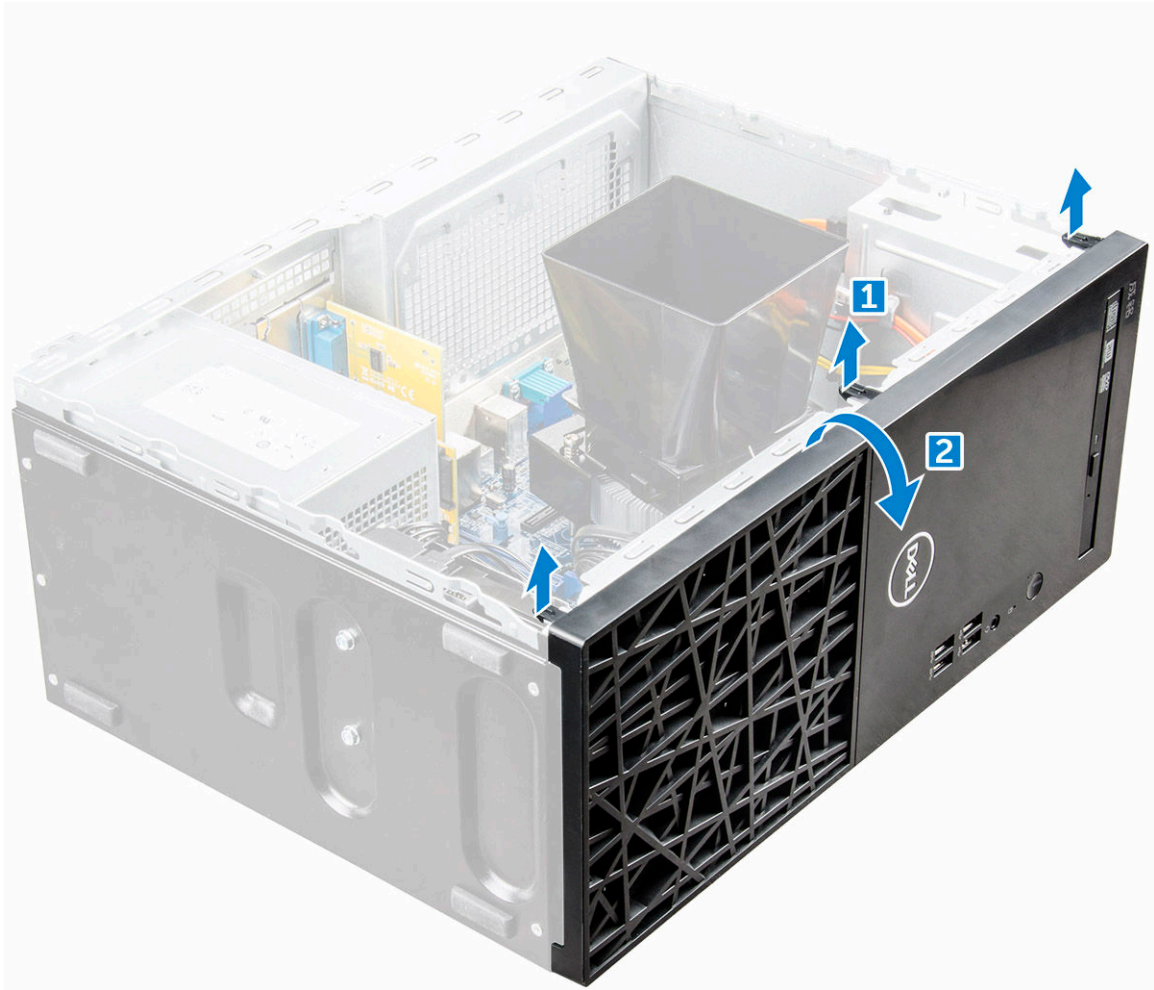
- 1 Place the cover on the computer.
- 2 Slide the computer cover towards the front of the chassis until it is fully engaged.
- 3 Tighten the screw in clockwise direction to secure the computer cover.
- 4 Follow the procedure in [After working inside your computer](#).



Front Bezel

Removing the front bezel

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the [cover](#).
- 3 To remove the front bezel:
 - a Pry the front bezel retention clips away from the chassis. [1].
 - b Rotate the bezel away from the computer to release the hooks on the opposite edge of the bezel from the chassis. Then, lift the chassis and remove the front bezel from the computer. [2].



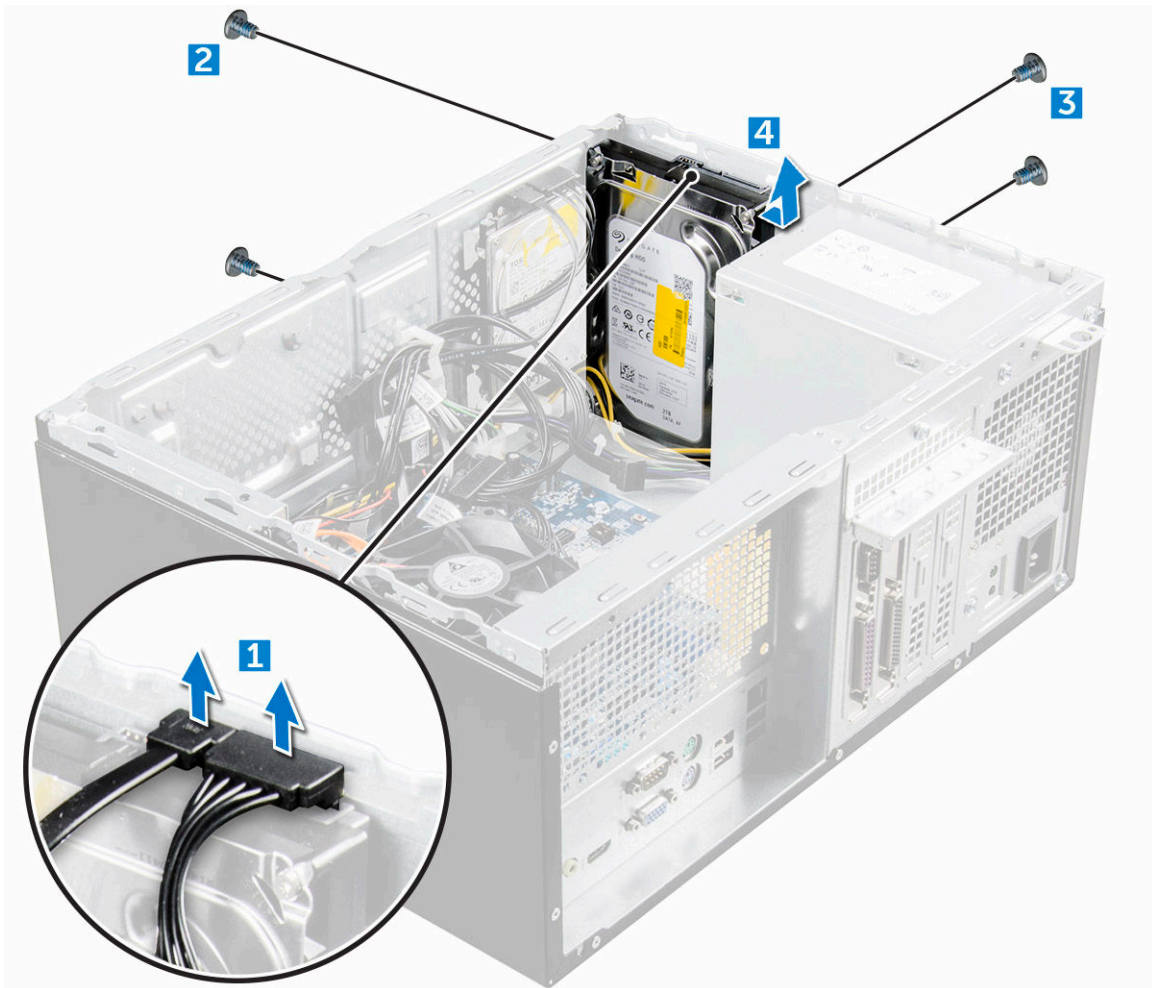
Installing the front bezel

- 1 Insert the hooks along the bottom edge of the front bezel into the slots on the chassis front.
- 2 Push the bezel toward the computer to engage the front bezel retention clips until they click into place.
- 3 Install the [cover](#).
- 4 Follow the procedure in [After working inside your computer](#).

Hard drive

Removing the 3.5 inch hard drive

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a cover
 - b front bezel
- 3 To remove the 3.5 inch hard drive:
 - a Disconnect the data cable and the power cable from the hard drive [1].
 - b Remove the screws (6-32xL3.6) that secure the hard drive to the computer [2, 3].
 - c Slide and lift the hard drive away from the computer [4].



Installing the 3.5 inch hard drive

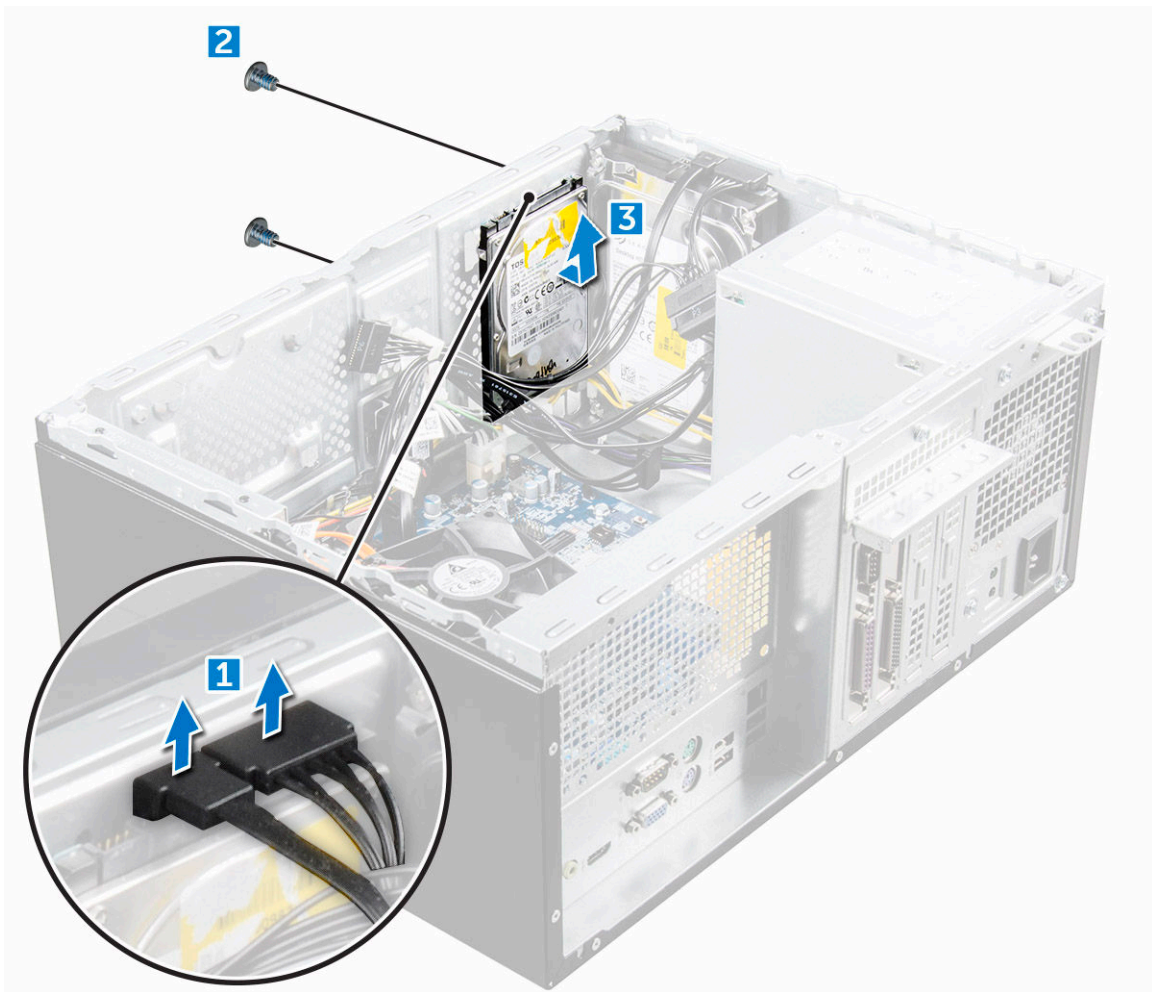
- 1 Insert the 3.5 inch hard drive into the slot on the computer.
- 2 Tighten the screws(6-32xL3.6) to secure the hard drive to the computer.
- 3 Connect the hard drive and power cable to the hard drive.
- 4 Install the:



- a front bezel
 - b cover
- 5 Follow the procedure in [After working inside your computer](#).

Removing the 2.5 inch hard drive

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a cover
 - b front bezel
- 3 To remove the 2.5 inch hard drive:
 - a Disconnect the data cable and the power cable from the hard drive [1].
 - b Remove the screws (M3L3.5) that secure the hard drive to the computer [2].
 - c Slide and lift the hard drive away from the computer [3].



Installing the 2.5 inch hard drive

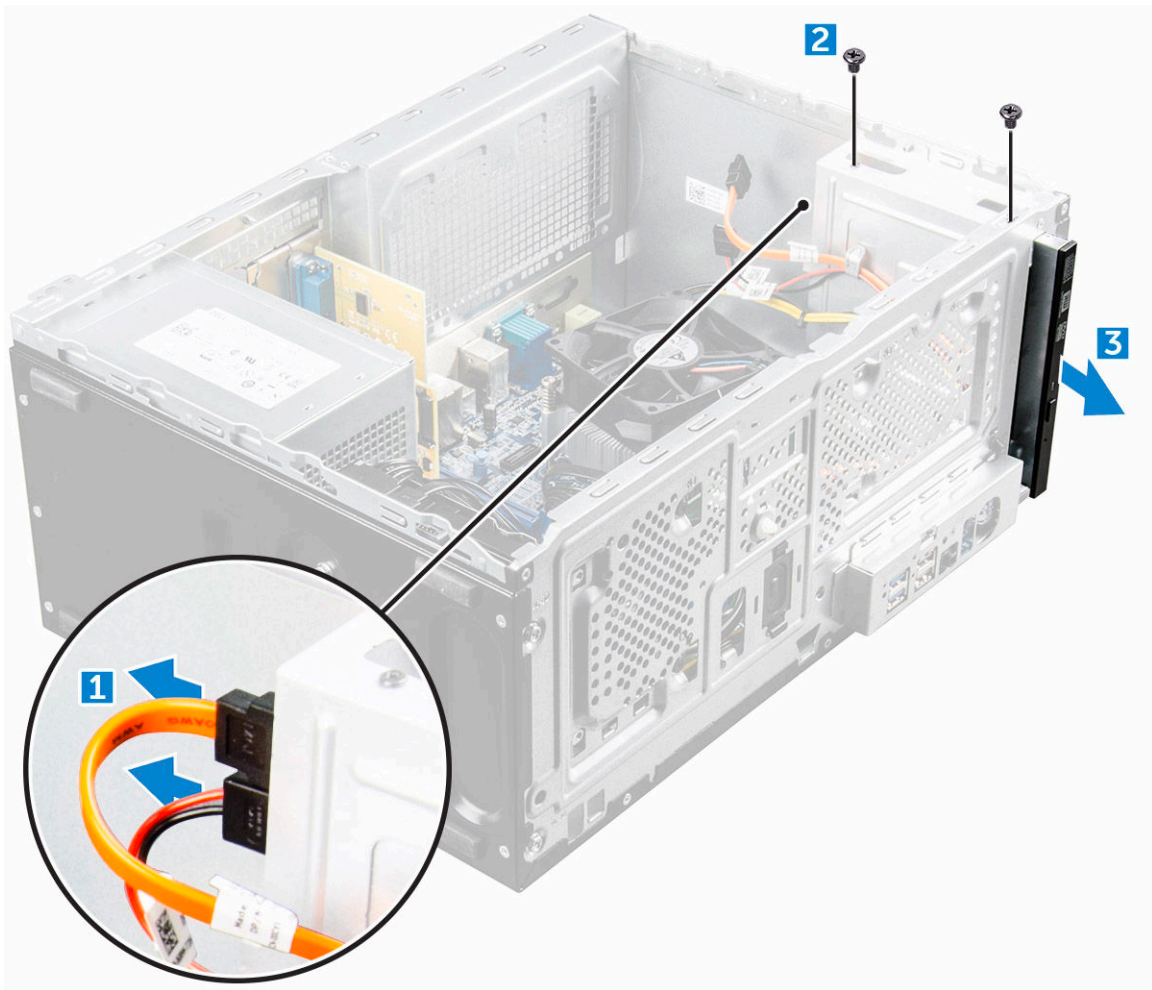
- 1 Insert the 2.5 inch hard drive into the slot on the computer.
- 2 Tighten the screws(M3L3.5) to secure the hard drive to the computer.
- 3 Connect the hard drive and power cable to the hard drive.
- 4 Install the:

- a front bezel
 - b cover
- 5 Follow the procedure in [After working inside your computer](#).

Optical drive

Removing the optical drive

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a cover
 - b front bezel
- 3 To remove the optical drive:
 - a Disconnect the data cable and the power cable from the optical drive [1].
 - b Remove the screws (M2L2(04)) that secure the optical drive to the computer [2].
 - c Pull the optical drive out of the computer [3].



Installing the optical drive

- 1 Insert the optical drive into the slot on the computer.
- 2 Tighten the screws(M2L2Ø4)) to secure the optical drive o the computer.

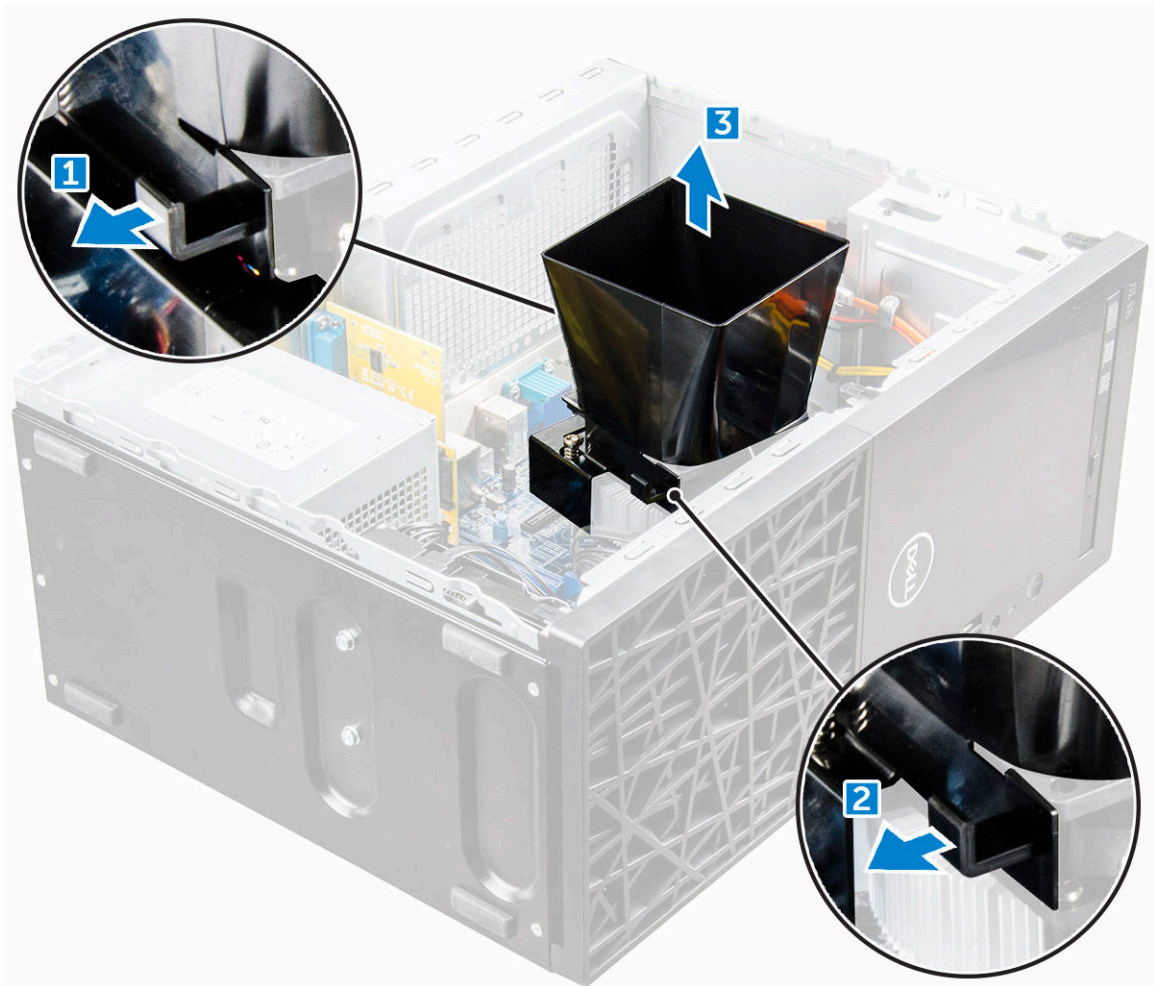


- 3 Connect the optical drive and power cable to the optical drive.
- 4 Install the:
 - a front bezel
 - b cover
- 5 Follow the procedure in [After working inside your computer](#).

Cooling shroud

Removing the cooling shroud

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a cover
 - b front bezel
- 3 To remove the cooling shroud:
 - a Hold the touch points and pry the edges [1, 2].
 - b Lift the cooling shroud away from the computer [3].



Installing the cooling shroud

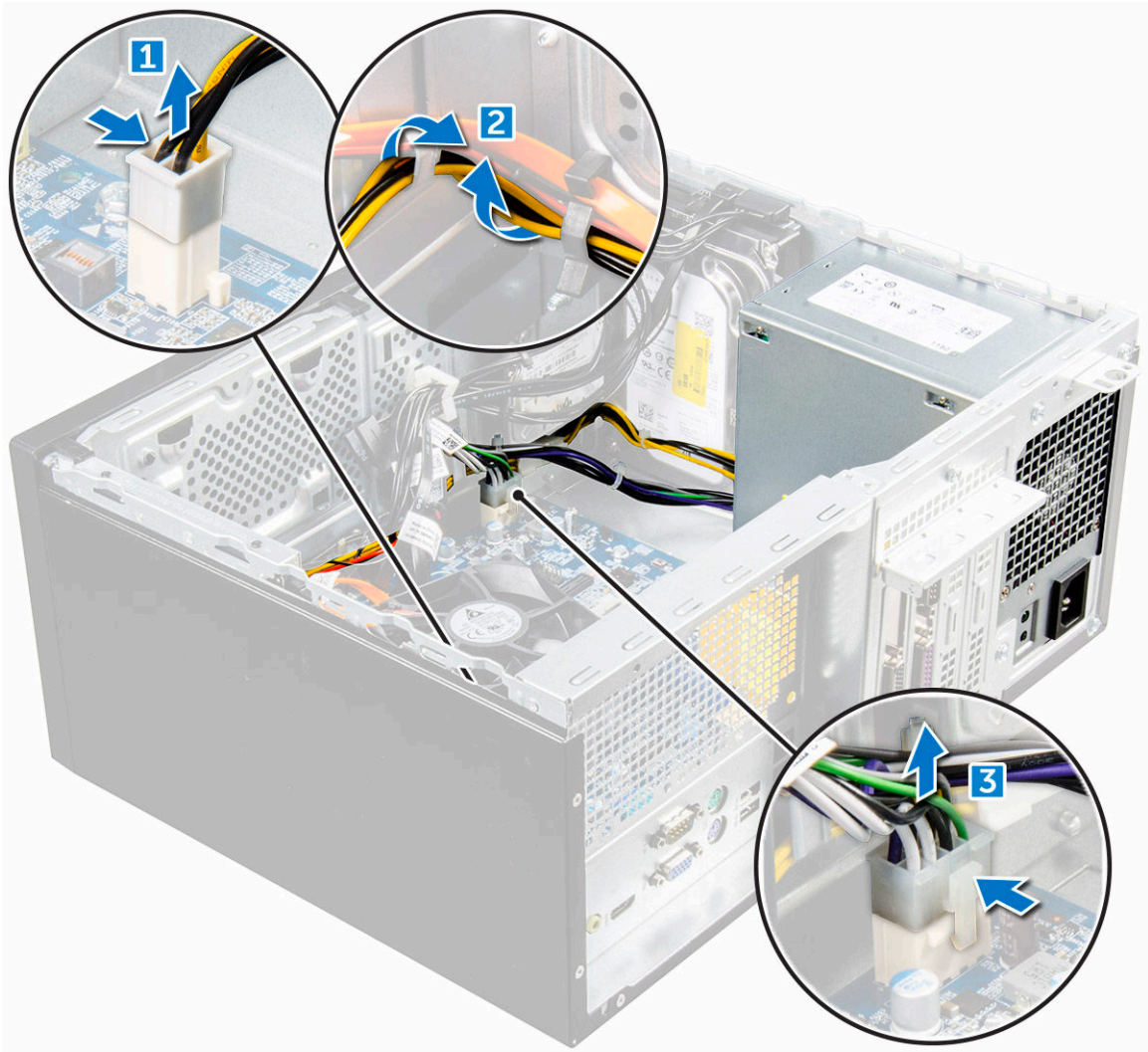
- 1 Align the tabs on the cooling shroud with the securing slots on the computer.
- 2 Lower the cooling shroud into the chassis until it is firmly seated.
- 3 Install the:
 - a front bezel
 - b cover
- 4 Follow the procedure in [After working inside your computer](#).

Power supply unit

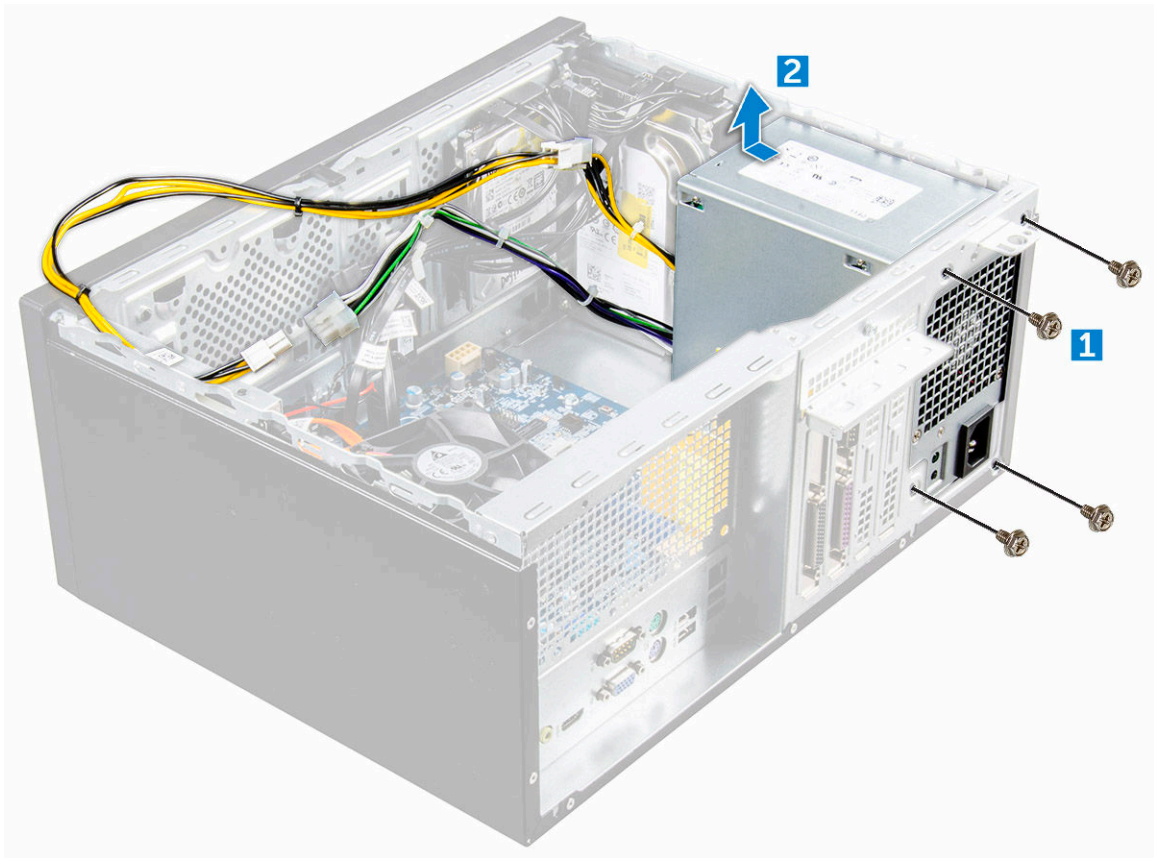
Removing the power supply unit (PSU)

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a cover
 - b front bezel
 - c cooling shroud
- 3 To disconnect the cables:
 - a Press the tab of the 4-pin power cables and disconnect it from the system board [1].
 - b Release the cables from the clip [2].
 - c Press the tab of the 8-pin power cables and disconnect it from the system board [1].





- 4 To remove the power supply unit (PSU):
 - a Remove the screws (6-32xL6.35) that secure the PSU to the computer [1].
 - b Slide and lift the PSU from the computer [2].



Installing the power supply unit (PSU)

- 1 Place the power supply in the chassis and slide towards the back of the system to secure it.
- 2 Tighten the screws (6-32xL6.35) at the back of the computer to secure power supply.
- 3 Connect the 8-pin power cable to the system board.
- 4 Thread the power cables through the chassis clip.
- 5 Connect the 4-pin power cable to the system board.
- 6 Install the:
 - a [cooling shroud](#)
 - b [front bezel](#)
 - c [cover](#)
- 7 Follow the procedure in [After working inside your computer](#).

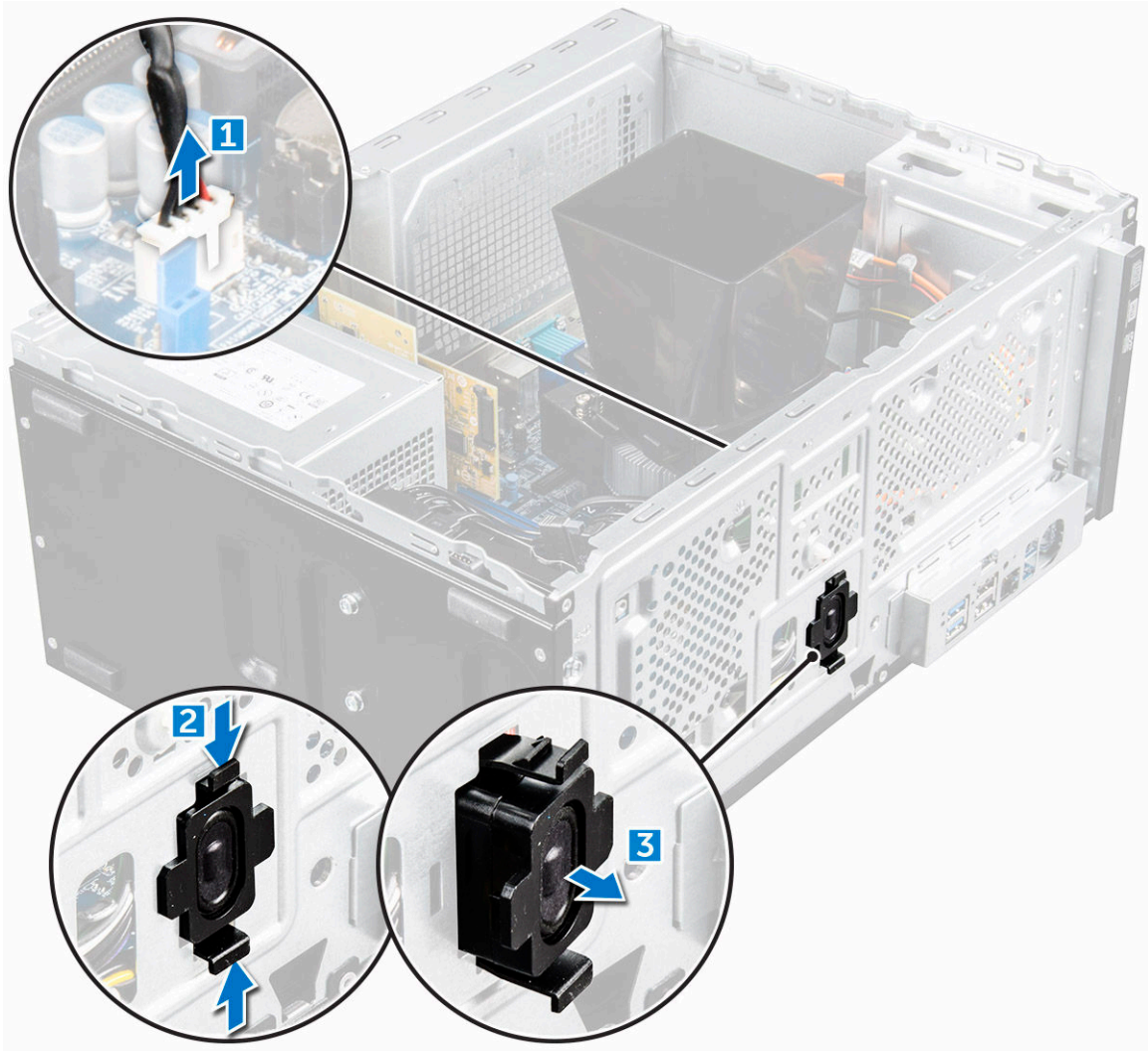
Speaker

Removing the speaker

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [cover](#)
 - b [front bezel](#)
- 3 To remove the speaker:
 - a Disconnect the speaker cable from system board [1].



- b Press the securing tab on the speaker and remove the speaker from the chassis [2, 3].



Installing the speaker

- 1 Slide the speaker module into the slot.
- 2 Connect the speaker cable to the system board.
- 3 Install the:
 - a front bezel
 - b cover
- 4 Follow the procedure in [After working inside your computer](#).

Heat sink

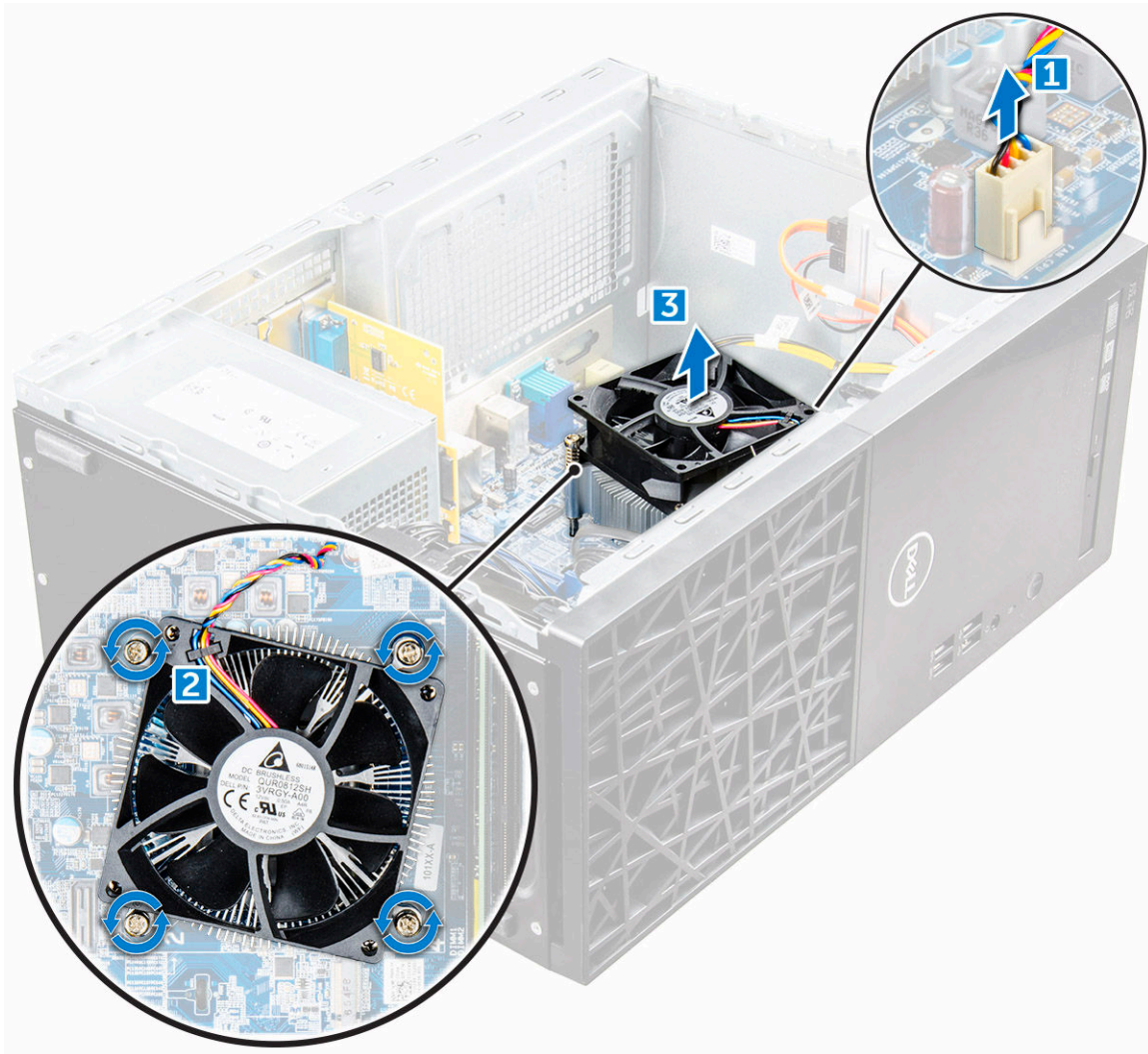
Removing the heat sink assembly

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a cover
 - b cooling shroud

- 3 To remove the heat sink assembly:
 - a Disconnect the heat sink cable from the system board [1].
 - b Loosen the captive screws(6-32xL6.35) in diagonal order [2].

NOTE: Remove the screws that secure the heat sink to the system board in the order of the callouts shown [1, 2, 3, 4].

- c Lift the heat sink assembly away from the computer [3].



Installing the heat sink assembly

- 1 Align the heat sink assembly with screw holders on the system board.
- 2 Tighten the screws(6-32xL6.35) to secure the heat sink assembly to the computer and system board.

NOTE: Tighten the screws on the system board in the order of the callout numbers [1, 2, 3, 4].

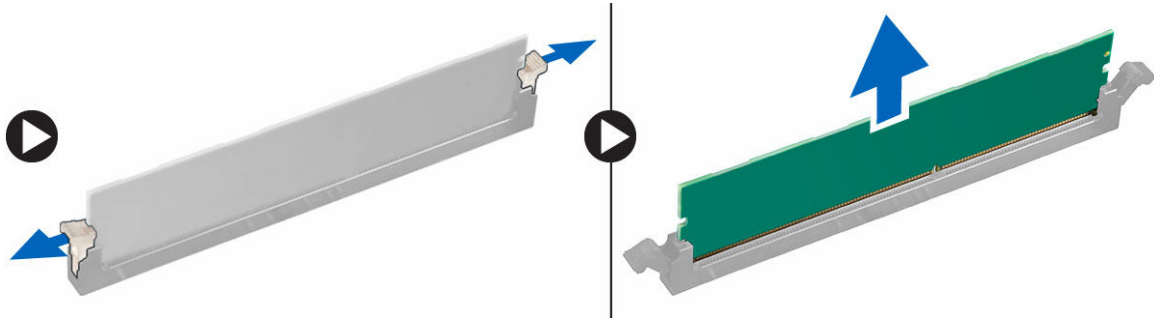
- 3 Connect the heat sink cable to the connector on the system board.
- 4 Install the:
 - a cooling shroud
 - b cover
- 5 Follow the procedure in [After working inside your computer](#).



Memory module

Removing the memory module

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the [cover](#).
- 3 To remove the memory module:
 - a Pull the clips securing the memory module until the memory module pops up.
 - b Remove the memory module from the system board.



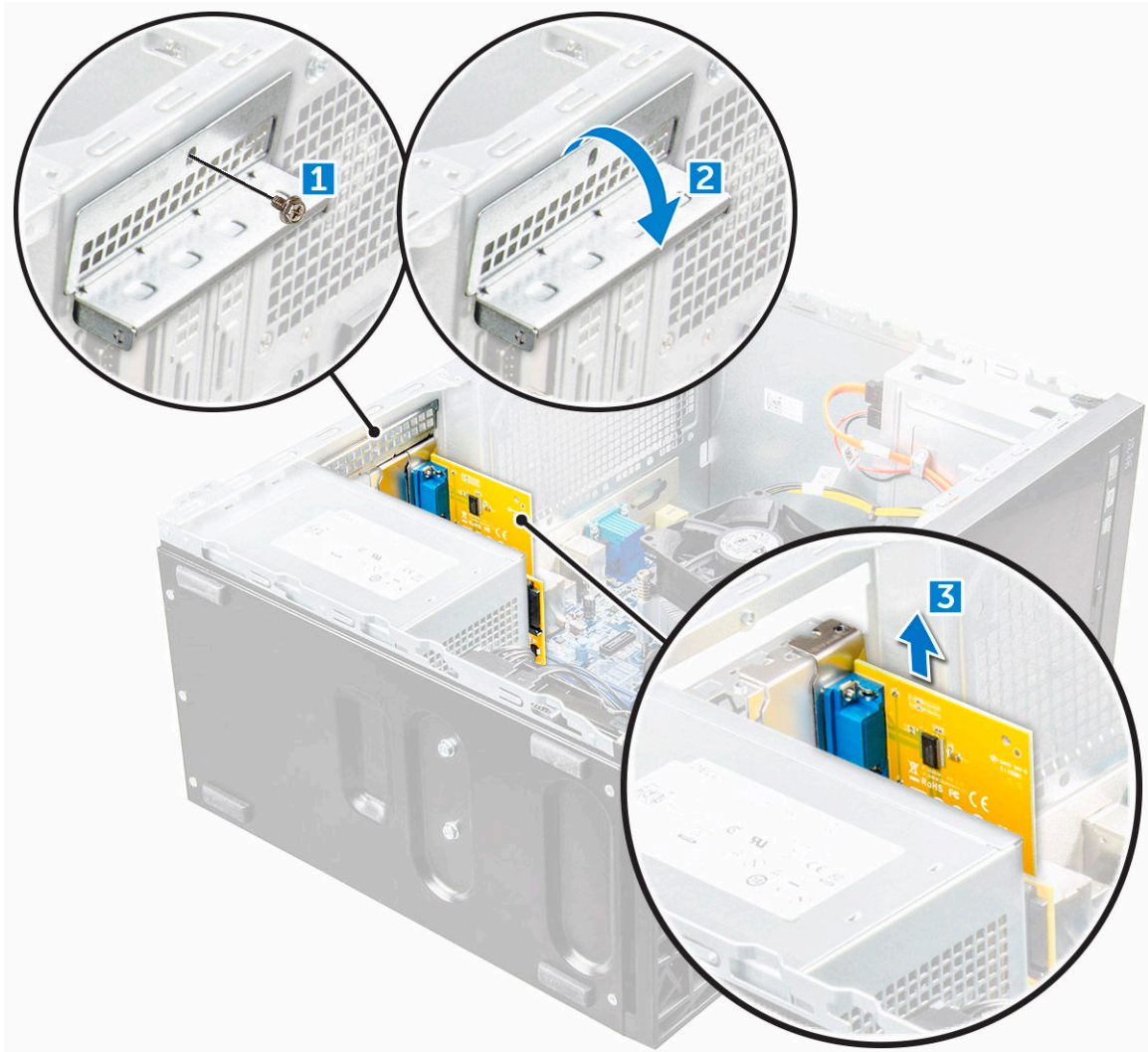
Installing the memory module

- 1 Insert the memory module into the memory module socket until the clips secure the memory module.
- 2 Install the [cover](#).
- 3 Follow the procedure in [After working inside your computer](#).

Expansion card

Removing the expansion card

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the [cover](#).
- 3 To remove the expansion card:
 - a Remove the screw (6-32xL6.35) that secures the metal card-retention latch to the computer [1].
 - b Pull the metal card-retention latch downward [2].
 - c Push the release tab and lift the expansion card from the system board [3].



Installing the expansion card

- 1 Insert the expansion card in the connector on the system board and press down until secured.
- 2 Push the metal card-retention latch back to its position.
- 3 Tighten the screw (6-32xL6.35) that secures the metal card-retention latch to the computer.
- 4 Install the [cover](#).
- 5 Follow the procedure in [After working inside your computer](#).

Coin cell battery

Removing the coin cell battery

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the [cover](#).
- 3 To remove the coin cell battery:
 - a Press the release latch away from the battery to allow the battery to pop-up from the socket.
 - b Lift the coin-cell battery out of the computer.





Installing the coin cell battery

- 1 Place the coin cell battery in its slot on the system board.
- 2 Press until the release latch springs back into place and secures it.
- 3 Install the [cover](#).
- 4 Follow the procedure in [After working inside your computer](#).

Processor

Removing the processor

- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a [cover](#)
 - b [cooling shroud](#)
 - c [heat sink](#)
- 3 To remove the processor:
 - a Press the release lever down and then move it outward to release it from the retention hook [1].

⚠ CAUTION: The processor socket pins are fragile and can be permanently damaged. Be careful not to bend the pins in the processor socket when removing the processor out of the socket.

 - b Lift the processor cover and remove the processor from the socket. Place it in an antistatic bag [2, 3].



Installing the processor

- 1 Insert the processor in the processor socket. Ensure the processor is properly seated.

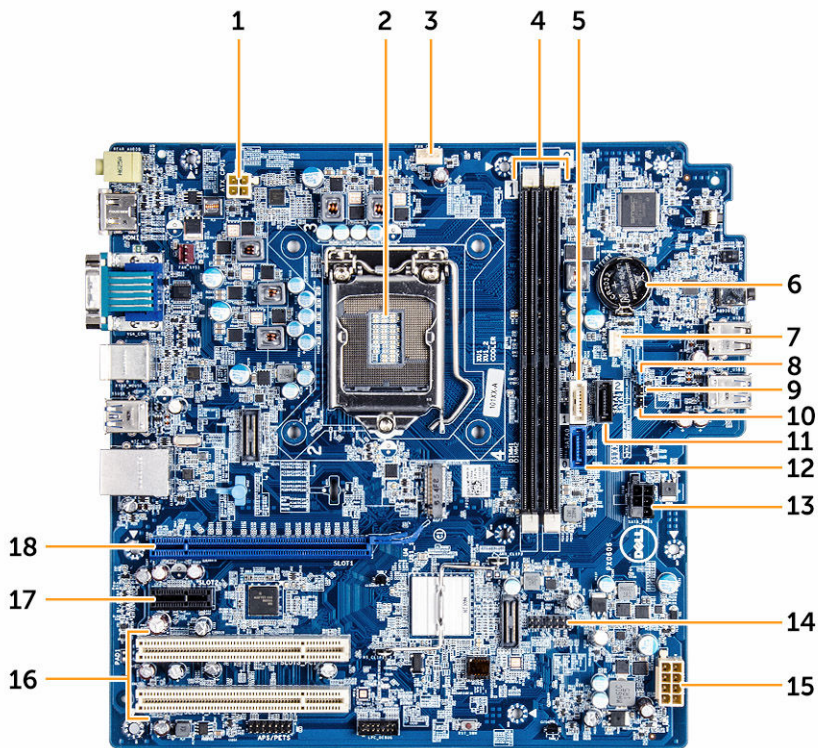
⚠ CAUTION: Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.
- 2 Lower the processor cover.

- 3 Press the release lever down and then move it inward to secure it with the retention hook.
- 4 Install the:
 - a [heat sink](#)
 - b [cooling shroud](#)
 - c [cover](#)
- 5 Follow the procedure in [After working inside your computer](#).

System board

System board layout

The following image displays the system board layout of the computer.

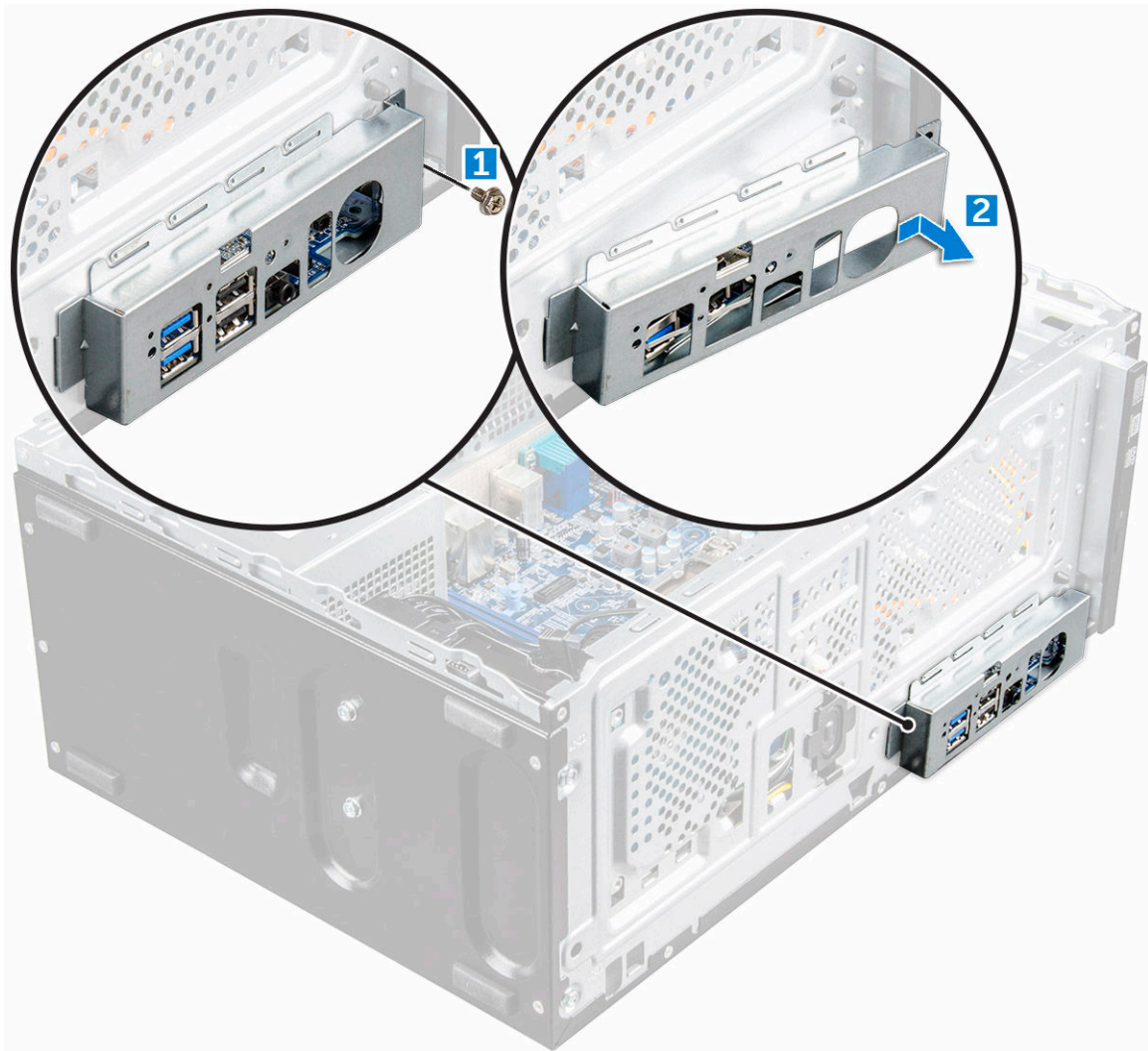


- | | | | |
|----|---|----|------------------------------------|
| 1 | CPU Power Connector (ATX_CPU) | 2 | Processor Socket (CPU) |
| 3 | CPU Fan Connector (FAN_CPU) | 4 | Memory Connectors (DIMM1/DIMM2) |
| 5 | SATA 1 connector (White color) | 6 | Battery Connector (BATTERY) |
| 7 | Internal Speaker Connector (INT_SPKR) | 8 | Password Clear Jumper (P1) |
| 9 | Service Mode Jumper (P3) | 10 | CMOS Clear Jumper (P2) |
| 11 | SATA 2 connector (Black color) | 12 | SATA 0 connector (Blue color) |
| 13 | HDD_ODD_PowerCable Connector (SATA_PWR) | 14 | Internal USB connector (WF_BT_USB) |
| 15 | ATX Power Connector (ATX_SYS) | 16 | PCI Connector (SLOT3 and SLOT4) |

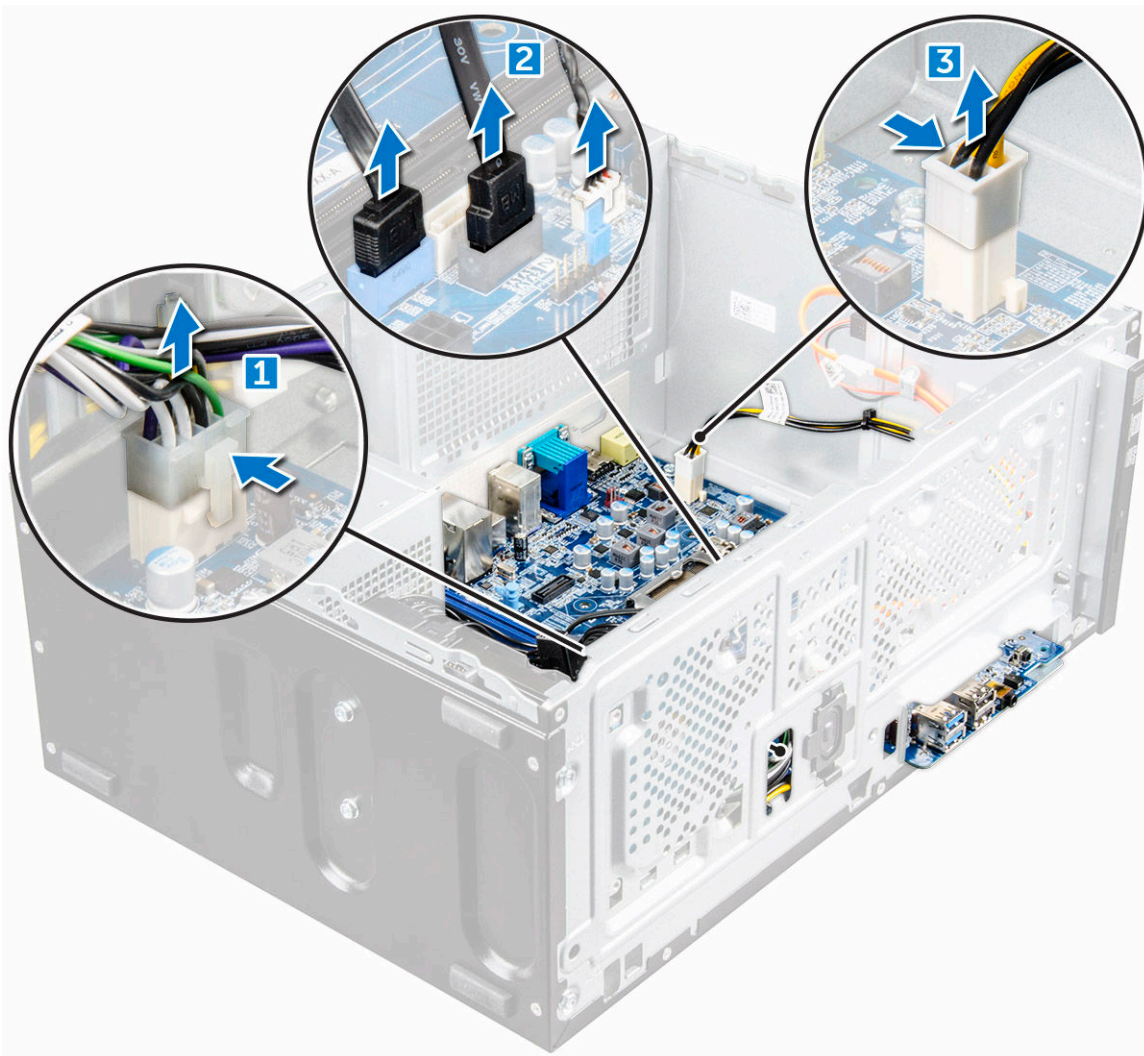


Removing the system board

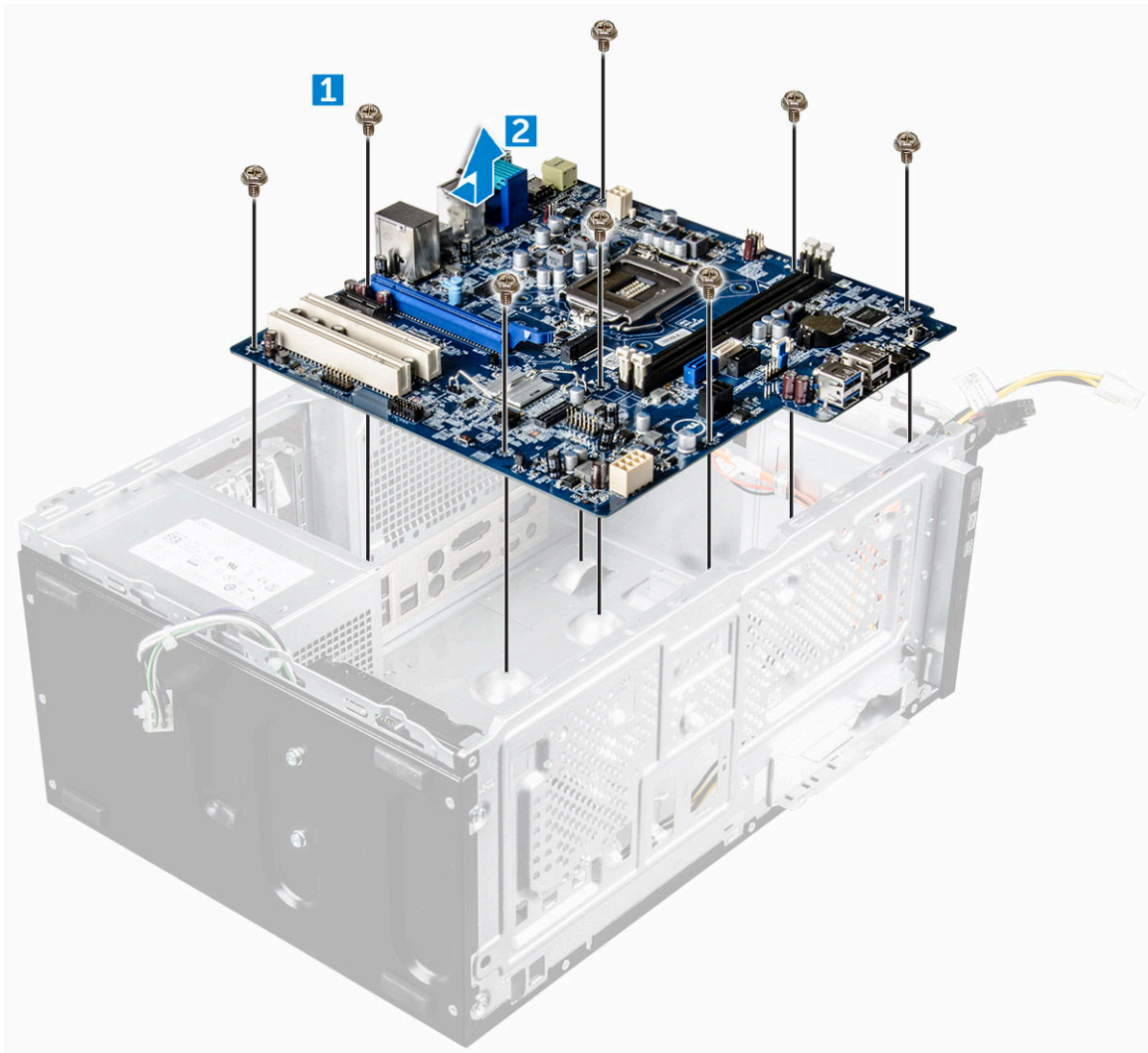
- 1 Follow the procedure in [Before working inside your computer](#).
- 2 Remove the:
 - a cover
 - b front bezel
 - c 3.5 inch hard drive
 - d 2.5 inch hard drive
 - e optical drive
 - f cooling shroud
 - g power supply unit
 - h speaker
 - i heat sink
 - j memory module
 - k expansion card
 - l coin cell battery
 - m processor
- 3 To remove I/O panel cover:
 - a Remove the screw (6-32xL6.35) that secures the I/O panel cover to the computer [1].
 - b Slide the I/O panel cover [2].



- 4 Disconnect the hard drive power cable, optical drive power cable, speaker cable, power supply unit cable [1, 2, 3].



- 5 To remove the system board:
 - a Remove the screws (6-32xL6.35) that secure the system board to the computer [1].
 - b Tilt the system board at 45-degrees, and then lift the system board out of the computer [2].



Installing the system board

- 1 Align the system board to the port connectors on the rear of the chassis and place the system board in the chassis.
- 2 Tighten the screws (6-32xL6.35) that secure the system board to the chassis.
- 3 Connect the hard drive, optical drive, power supply unit cable and speaker cables to the system board.
- 4 Place the I/O port bracket and tighten the screw (6-32xL6.35).
- 5 Install the:
 - a processor
 - b coin cell battery
 - c memory module
 - d expansion card
 - e heat sink
 - f speaker
 - g power supply unit
 - h cooling shroud
 - i optical drive
 - j 2.5 inch hard drive
 - k 3.5 inch hard drive
 - l front bezel
 - m cover

6 Follow the procedure in [After working inside your computer.](#)



Technology and components

Processors

This system is shipped with Intel 6th generation processor:

- Intel Celeron
- 6th Generation Intel Core i3/i5/i7
- Intel Pentium Dual-Core

NOTE: The clock speed and performance varies depending on the workload and other variables. Total cache upto 8 MB cache depending on processor type.

Identifying processors in Windows 10

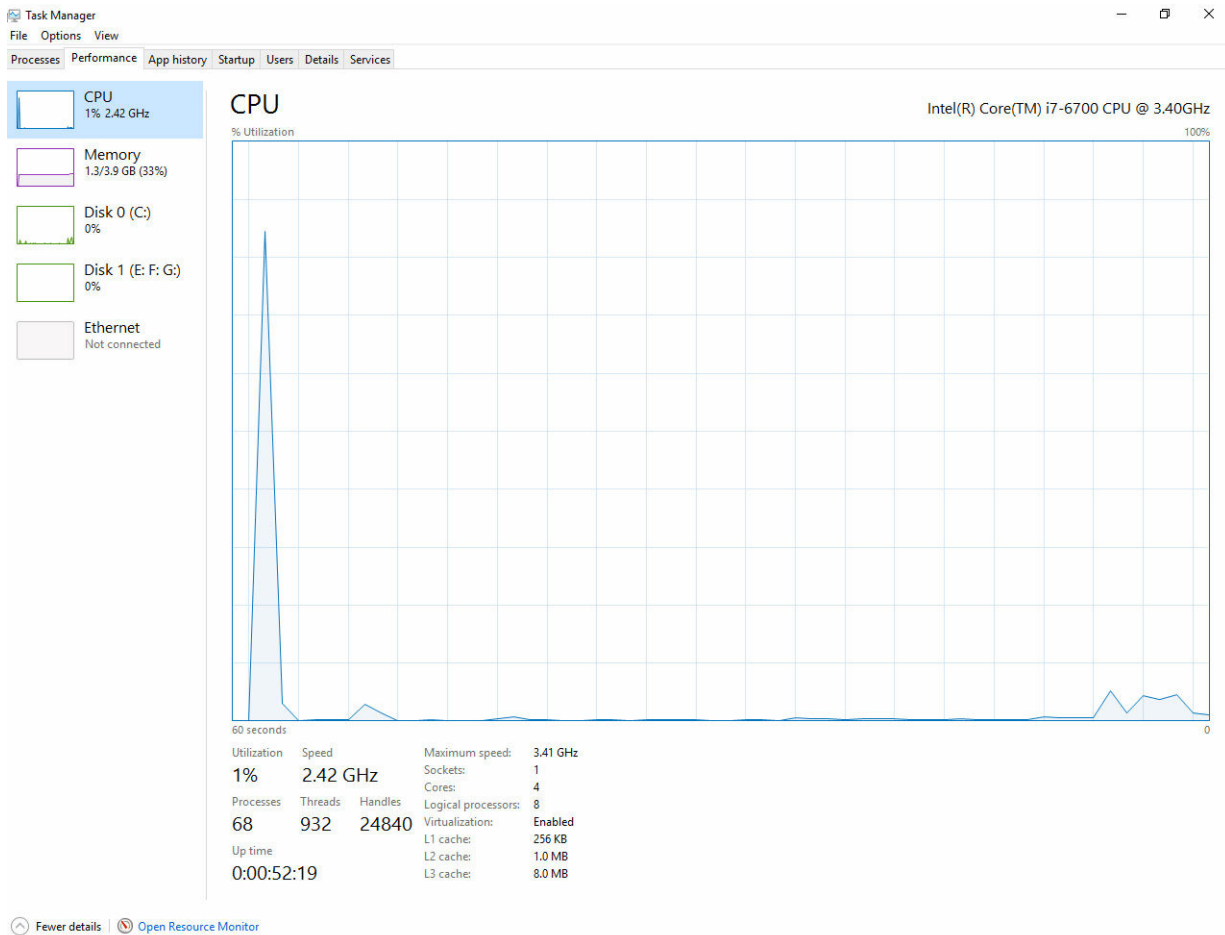
- 1 Tap **Search the Web and Windows**.
- 2 Type **Device Manager**.
- 3 Tap **Processor**.



The basic information of the processor is displayed.

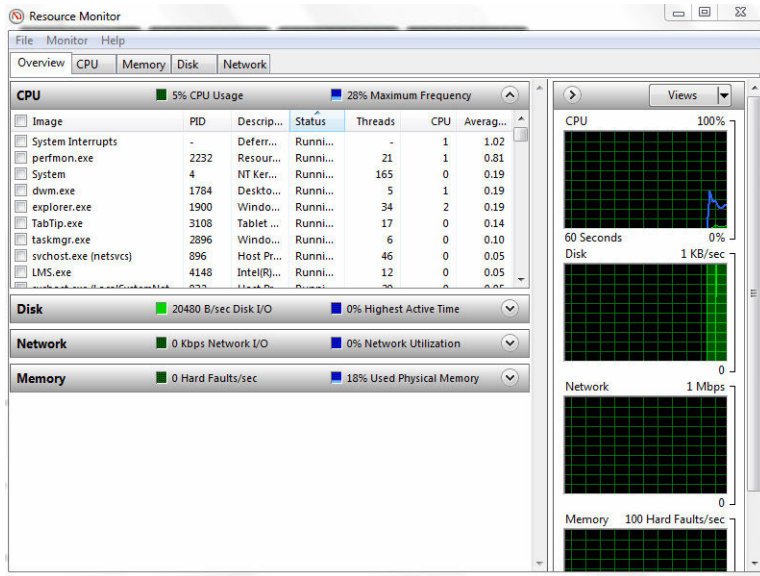
Verifying the processor usage in Task Manager

- 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 the 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**.



Chipsets

All Desktops communicate with the CPU through the chipset. This system is shipped with the Intel 100 Series chipset.


Downloading the chipset driver

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

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

- 4 Click **Drivers and Downloads**.
- 5 Select the operating system installed in your computer.
- 6 Scroll down the page, expand **Chipset**, and select your chipset driver.
- 7 Click **Download File** to download the latest version of the chipset driver for your computer.
- 8 After the download is complete, navigate to the folder where you saved the driver file.
- 9 Double-click the chipset driver file icon and follow the instructions on the screen.

Identifying the chipset in Device Manager on Windows 10

- 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 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

Intel chipset drivers

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

Table 1. Intel chipset drivers

Before installation

- Other devices
 - PCI Data Acquisition and Signal Processing Controller
 - PCI Device
 - PCI Memory Controller
 - PCI Simple Communications Controller
 - SM Bus Controller
 - Unknown device
- 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) Power Engine Plug-in
 - Legacy device
 - Microsoft ACPI-Compliant Embedded Controller
 - Microsoft ACPI-Compliant System
 - Microsoft System Management BIOS Driver
 - Microsoft UEFI-Compliant System
 - Microsoft Virtual Drive Enumerator
 - Microsoft Windows Management Interface for ACPI
 - Microsoft Windows Management Interface for ACPI
 - NDIS Virtual Network Adapter Enumerator
 - Numeric data processor
 - PCI Express Root Complex
 - PCI Express Root Port
 - PCI Express Root Port
 - PCI Express Root Port
 - PCI Express Root Port
 - PCI standard host CPU bridge
 - PCI standard ISA 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

After installation

- 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



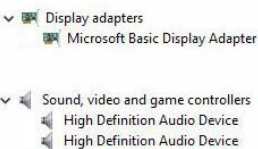
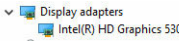
Intel HD Graphics

This computer is shipped with the Intel HD Graphics graphics chipset.

Intel HD Graphics drivers

Verify if the Intel HD Graphics drivers are already installed in the computer.

Table 2. Intel HD Graphics drivers

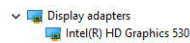
Before installation	After installation
	

Display options

Identifying the display adapter

- 1 Start the **Search Charm** and select **Settings**.
- 2 Type **Device Manager** in the search box and tap **Device Manager** from the left pane.
- 3 Expand **Display adapters**.

The display adapters are displayed.



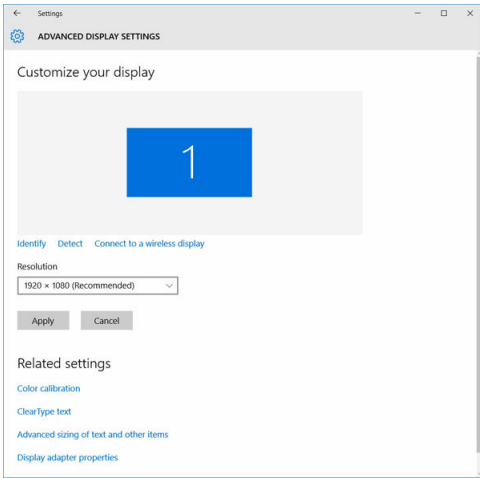
Downloading drivers

- 1 Turn on the computer.
 - 2 Go to **Dell.com/support**.
 - 3 Click **Product Support**, enter the Service Tag of your computer, and then click **Submit**.
- NOTE:** If you do not have the Service Tag, use the auto detect feature or manually browse for your computer model.
- 4 Click **Drivers and Downloads**.
 - 5 Select the operating system installed on your computer.
 - 6 Scroll down the page and select the graphic driver to install.
 - 7 Click **Download File** to download the graphic driver for your computer.
 - 8 After the download is complete, navigate to the folder where you saved the graphic driver file.
 - 9 Double-click the graphic driver file icon and follow the instructions on the screen.

Changing the screen resolution

- 1 Right click on the desktop and select **Display Settings**.
- 2 Tap or click **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

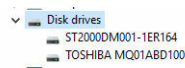
 **NOTE:** For more information, see the document that shipped with your display device.

Hard drive options

This computer supports HDD.

Identifying the hard drive in Windows 10

- 1 Click **All Settings**  on the Windows 10 Charms Bar.
- 2 Click **Control Panel**, select **Device Manager**, and expand **Disk drives**.

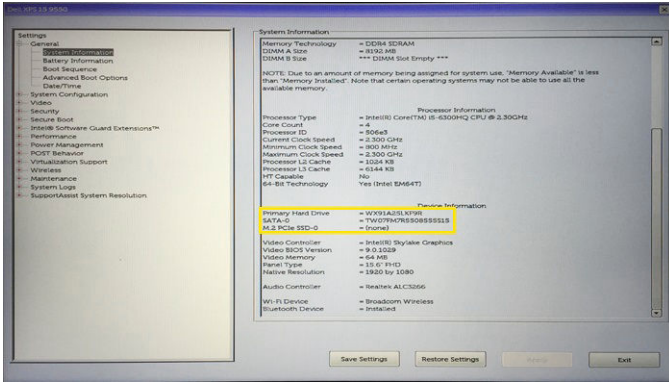


The hard drive is listed under **Disk drives**.

Entering BIOS setup

- 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.

Hard drive is listed under the **System Information** under the **General** group.



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 3. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 3.0	4.8 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 (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 finally has the answer to the consumers' demands with a theoretically 10 times faster than its predecessor. In a nutshell, USB 3.0 features are as follows:

- Higher transfer rates (up to 4.8 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.

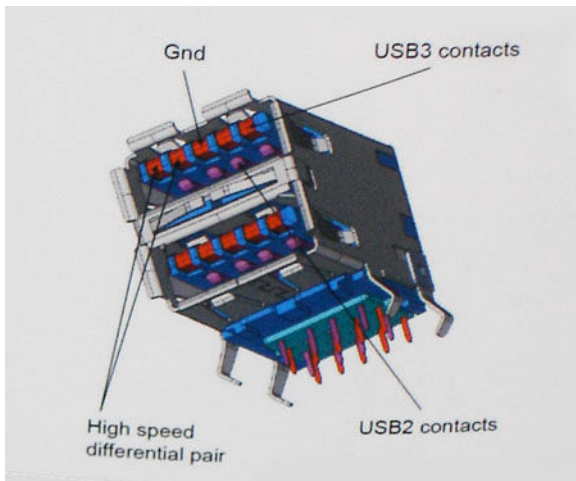


Speed

Currently, there are 3 speed modes defined by the latest USB 3.0 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 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 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 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 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 is a 10x improvement over USB 2.0.

Applications

USB 3.0 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 products:

- External Desktop USB 3.0 Hard Drives
- Portable USB 3.0 Hard Drives
- USB 3.0 Drive Docks & Adapters
- USB 3.0 Flash Drives & Readers
- USB 3.0 Solid-state Drives



- USB 3.0 RAIDs
- Optical Media Drives
- Multimedia Devices
- Networking
- USB 3.0 Adapter Cards & Hubs

Compatibility

The good news is that USB 3.0 has been carefully planned from the start to peacefully co-exist with USB 2.0. First of all, while USB 3.0 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 cables and only come into contact when connected to a proper SuperSpeed USB connection.

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

Microsoft announced that Windows 7 would have USB 3.0 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 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.

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 set-top box, 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 are set-top boxes, 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

Memory features

In this computer, the memory (RAM) is a part of the system board. This computer supports 4–32 GB DDR4 SDRAM memory, up to 2133 MHz.

Verifying system memory

Windows 10

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

Verifying system memory in setup

- 1 Turn on or restart your computer..
- 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.

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.







Realtek HD audio drivers

Verify if the Realtek audio drivers are already installed in the computer.







Table 4. Realtek HD audio drivers

Before installation

- ▼  Audio inputs and outputs
 -  Microphone (High Definition Audio Device)
 -  Speakers (High Definition Audio Device)
- ▼  Sound, video and game controllers
 -  High Definition Audio Device
 -  Intel(R) Display Audio

After installation

- ▲  Sound, video and game controllers
 -  Bluetooth Hands-free Audio
 -  Intel(R) Display Audio
 -  Realtek High Definition Audio



System Setup

System Setup enables you to manage your computer 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 Sequence](#)
- [Navigation Keys](#)
- [System Setup options](#)
- [Updating the BIOS](#)
- [System and setup password](#)

Boot Sequence

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

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

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

- Removable Drive (if available)
- STXXXX Drive

 **NOTE: XXX denotes the SATA drive number.**

- Optical Drive
- Diagnostics

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

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


Navigation Keys

The following table displays the system setup navigation keys.

 **NOTE: For most of the system setup options, changes that you make are recorded but do not take effect until you re-start the system.**



Table 5. Navigation Keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
<Enter>	Allows you to select 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 till 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 computer and its installed devices, the items listed in this section may or may not appear.**

Table 6. General

Option	Description
System Information	Displays the following information: <ul style="list-style-type: none"> System Information: Displays BIOS Version, Service Tag, Asset 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 1 Size, and DIMM 2 Size. PCI Information: Displays SLOT1, SLOT2 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 SATA-0, LOM MAC Address, Video Controller, Audio Controller, Wi-Fi Device, and Bluetooth Device.
Boot Sequence	Allows you to specify the order in which the computer attempts to find an operating system from the devices specified in this list. <ul style="list-style-type: none"> Legacy UEFI
Advanced Boot Options	Allows you to select the Enable Legacy Option ROMs option, when in UEFI boot mode. By default, this option is enabled.
Date/Time	Allows you to set the date and time settings. Changes to the system date and time take effect immediately.

Table 7. System Configuration

Option	Description
Integrated NIC	Allows you to control the on-board LAN controller. The options are: <ul style="list-style-type: none"> Enable UEFI Network stack Disabled Enabled

Option	Description
	<ul style="list-style-type: none"> Enabled w/PXE (default) <p>i NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not appear.</p>
Serial Port	<p>Identifies and defines the serial port settings. You can set the serial port to:</p> <ul style="list-style-type: none"> Disabled COM1 (default) COM2 COM3 COM4
SATA Operation	<p>Allows you to configure the operating mode of the integrated hard drive controller.</p> <ul style="list-style-type: none"> Disabled = The SATA controllers are hidden AHCI (default)
Drives	<p>Allows you to enable or disable the various drives on-board:</p> <ul style="list-style-type: none"> SATA-0 (enabled by default) SATA-1 SATA-2 SATA-3 SATA-4 <p>Default Setting: All drives are enabled.</p>
Smart Reporting	<p>This field controls whether hard drive errors for integrated drives are reported during system startup. This option is disabled by default.</p>
USB Configuration	<p>Allows you to enable or disable the integrated USB controller for:</p> <ul style="list-style-type: none"> Enable Boot Support Enable Front USB Ports Enable Rear USB Ports <p>All the options are enabled by default.</p>
Front USB Configuration	<p>Allows you to enable or disable the Front USB configuration. The options are:</p> <ul style="list-style-type: none"> Front Port 1 (Bottom Right) Front Port 1 (Top Right) Front Port 2 (Bottom Left) Front Port 2 (Top Left) <p>All the options are enabled by default.</p>
Rear USB Configuration	<p>Allows you to enable or disable the rear USB configuration. The options are:</p> <ul style="list-style-type: none"> Rear Port 1 (Top Left) Rear Port 1 (Bottom Left) Rear Port 2 (Top Right) Rear Port 2 (Bottom Right)
Audio	<p>Allows you to enable or disable the integrated audio controller.</p> <ul style="list-style-type: none"> Enable Microphone Enable Internal Speaker



Option	Description
	Both the options are enabled by default.
Miscellaneous Devices	Allows you to enable or disable the various on-board devices. <ul style="list-style-type: none"> • Enable PCI Slot (default option) •

Table 8. Video

Option	Description
Primary Display	Allows you to select the primary display when multiple controllers are available in the system. <ul style="list-style-type: none"> • Auto • Intel HD Graphics <p>i NOTE: If you do not select Auto, the on-board graphics device will be present and enabled.</p>

Table 9. Security

Option	Description
Admin Password	This option lets you enable or disable Admin passwords for the system. <p>i 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.</p> <p>i NOTE: Successful password changes take effect immediately.</p> <p>Default Setting: Not set</p>
System Password	Allows you to set, change or delete the system password. <p>i NOTE: Successful password changes take effect immediately.</p> <p>Default Setting: Not set</p>
Internal HDD-0 Password	Allows you to set, change or delete the password on the system's internal hard-disk drive. <p>i NOTE: Successful password changes take effect immediately.</p> <p>Default Setting: Not set</p>
Internal HDD-2 Password	Allows you to set, change or delete the password on the system's internal hard-disk drive. <p>i NOTE: Successful password changes take effect immediately.</p> <p>Default Setting: Not set</p>
Password Change	Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set. <p>Default Setting: Allow Non-Admin Password Changes is selected.</p>
UEFI Capsule Firmware Updates	Allows you to controls whether the system allows BIOS update via UEFI capsule update packages. <p>Default setting: Enable</p>
PTT Security	Allows you to control the Platform Trust Technology feature (PTT) is visible to the operating system. The options are: <ul style="list-style-type: none"> • PTT On (default)



Option	Description
	<ul style="list-style-type: none"> · Clear <p>NOTE: Disabling this option does not change any setting you have made to the PTT nor does it delete or change any information or keys you may have stored in the PTT. Changes to this settings take effect immediately</p>
CPU XD Support	Allows you to enable or disable the Execute Disable mode of the processor. This option is enabled by default.

Table 10. Secure Boot

Option	Description
Secure Boot Enable	<p>Allows you to enable or disable Secure Boot feature</p> <ul style="list-style-type: none"> · Disable (default) · Enable
Expert key Management	<p>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:</p> <ul style="list-style-type: none"> · PK · KEK · db · dbx <p>If you enable the Custom Mode, the relevant options for PK, KEK, db, and dbx appear. The options are:</p> <ul style="list-style-type: none"> · 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 <p>NOTE: If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.</p>

Table 11. Intel Software Guard Extensions

Option	Description
Intel SGX Enable	<p>Allows you to enable or disable the Intel Software Guard Extensions to provide a secured environment for running code/storing sensitive information in the context of the main operating system.</p> <ul style="list-style-type: none"> · Disabled (default) · Enabled
Enclave Memory Size	<p>Allows you to set the Intel SGX Enclave Reserve Memory Size.</p> <ul style="list-style-type: none"> · 32 MB · 64 MB · 128 MB



Table 12. Performance

Option	Description
Multi Core Support	This field specifies whether the process will have one or all cores enabled. This option is enabled by default.
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of the processor. This option is disabled by default.
C States Control	Allows you to enable or disable additional processor sleep states. This option is disabled by default.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. This option is enabled by default.
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. <ul style="list-style-type: none">• Disabled• Enabled (default)

Table 13. Power Management

Option	Description
AC Recovery	Determines how the system responds when AC power is re-applied after a power loss. You can set the AC Recovery to: <ul style="list-style-type: none">• Power Off• Power On• Last Power State This option is Power Off by default.
Auto On Time	Sets time to automatically turn on the computer. Time is kept in standard 12-hour format (hour:minutes:seconds). Change the startup time by typing the values in the time and AM/PM fields. i NOTE: This feature does not work if you turn off your computer using the switch on a power strip or surge protector or if Auto Power is set to disabled.
Deep Sleep Control	Allows you to define the controls when Deep Sleep is enabled. <ul style="list-style-type: none">• Disabled• Enabled in S5 only• Enabled in S4 and S5 This option is Disabled by default.
USB Wake Support	Allows you to enable the USB devices to wake the computer from standby mode.
Block Sleep	Allows you to block entering to sleep (S3 state) in OS environment. This option is disabled by default.

Table 14. POST Behavior

Option	Description
Numlock LED	Allows you to enable or disable the Numlock feature when your computer starts. This option is enabled by default.
Keyboard Errors	Allows you to enable or disable the keyboard error reporting when the computer starts. This option is enabled by default.
Fast Boot	This option can speed up the boot process by bypassing some compatibility steps: <ul style="list-style-type: none">• Minimal — The system boots quickly, unless the BIOS has been updated, memory changed, or the previous POST did not complete.• Thorough — The system does not skip any steps in the boot process.



Option	Description
	<ul style="list-style-type: none"> Auto — This allows the operating system to control this setting (this works only when the operating system supports Simple Boot Flag). <p>This option is set to Thorough by default.</p>

Table 15. Virtualization Support

Option	Description
Virtualization	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel® Virtualization Technology. Enable Intel Virtualization Technology - This option is disabled by default.

Table 16. Maintenance

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	Allows you to control flashing of the system firmware to the previous versions. This option is enabled by default. <p>NOTE: If this option is not selected, the flashing of the system firmware to the previous versions is blocked.</p>
BIOS recovery	Allows you to recover the corrupted BIOS conditions from the recovery files on the primary hard drive or an external USB key.

Table 17. System Logs

Option	Description
BIOS Events	Displays the system event log and allows you to: <ul style="list-style-type: none"> Clear Log Mark all Entries

Table 18. SupportAssist System Resolution

Option	Description
Auto OS Recovery Threshold	Allows you to control the automatic boot flow for SupportAssist System. Options are: <ul style="list-style-type: none"> Off 1 2 (default) 3
SupportAssist OS Recovery	Allows you to recover the SupportAssist OS Recovery (Disabled by default)



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 computer.

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.



Technical Specifications

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 specifications](#)
- [Memory specifications](#)
- [Video specifications](#)
- [Audio specifications](#)
- [Communication specifications](#)
- [Drives specifications](#)
- [Ports and connectors specifications](#)
- [Power supply specifications](#)
- [Physical dimension specifications](#)
- [Controls and lights specifications](#)
- [Environmental specifications](#)

System specifications

Feature	Specification
Processor type	<ul style="list-style-type: none"> • Intel Celeron • 6th Generation Intel Core i3/i5/i7 • Intel PDC
Total cache	Up to 8 MB cache depending on processor type

Memory specifications

Feature	Specification
Type	Up to 2133 MHz
Connectors	Two DDR4 UDIMM slots
Capacity	2 GB, 4 GB, 8 GB, and 16 GB
Minimum Memory	2 GB
Maximum Memory	32 GB

Video specifications

Feature — ChengMing 3967	Specification
Video Controller - Integrated	iGPU
Video Controller - Discrete	nVIDIA GeForce GT 710 AMD Radeon™ R5 430
Video Memory	independent card offering

Audio specifications

Feature	Specification
Controller	ALC3234-CG (Realtek)
Speaker	single 4-ohms, AVG speakers
Internal speaker amplifier	Codec Build-in Class D

Communication specifications

Feature	Specification
Network adapter	Realtek 10/100/1000 Mbps Ethernet LAN

Drives specifications

Feature	Specification
Hard drive	Two 2.5-inch SATA drive, one 3.5-inch SATA drive
Optical drive (optional)	One DVD RW

Ports and connectors specifications

Feature	Specification
Front port audio	one universal audio jack
Front port USB 2.0	two
Front port USB 2.0	two
Rear port audio	one audio line out
Rear port display	one VGA, one HDMI
Rear port USB 2.0	two
Rear port USB 3.0	two



Feature	Specification
Rear port serial port	one
Rear port PS/2	keyboard and mouse
Rear port RJ45	one

Power supply specifications

Feature	Specification
Type	290 W (UMA)
Frequency	47 Hz - 63 Hz
Voltage	90 VAC - 264 VAC
Input current	2.7 A / 5.4 A (290 W)
Physical Dimension height	86.00 mm (3.38 inches)
Physical Dimension weight	150.00 mm (5.90 inches)
Physical Dimension height	140.00 mm (5.51 inches)
Coin cell battery	3 V CR2032 lithium coin cell

Physical dimension specifications

Feature	Specification
Width	160 mm (6.29 inches)
Height	373.7 mm (14.7 inches)
Depth	289.4 mm (11.39 inches)
Weight	6.5 kg (14.33 lbs)

Controls and lights specifications

Feature	Specification
Power button light	White light — Solid white light indicates power-on state; blinking white light indicates sleep state of the computer.
Hard Drive activity light	White light — Blinking white light indicates that the computer is reading data from or writing data to the hard drive.
Back panel:	
Link integrity light on integrated network adapter :	Green — a good 10 Mbps connection exists between the network and the computer. Orange — a good 1000 Mbps connection exists between the network and the computer. Off (no light) — the computer is not detecting a physical connection to the network.
Network activity light on integrated network adapter	Yellow light — A blinking yellow light indicates that network activity is present.

Feature	Specification
Power supply diagnostic light	Green light — The power supply is turned on and is functional. The power cable must be connected to the power connector (at the back of the computer) and the electrical outlet.

Environmental specifications

Temperature	Specifications
Operating	0°C to 35°C (32°F to 95°F)
Storage	-40°C to 65°C (-40°F to 149°F)

Relative humidity (maximum)	Specifications
Operating	10 % to 90 % (non condensing)
Storage	5 % to 95 % (non condensing)

Maximum vibration:	Specifications
Operating	0.66 GRMS
Storage	1.30 GRMS

Maximum shock:	Specifications
Operating	110 G
Storage	160 G

Altitude (maximum)	Specifications
Operating	-15.2 m to 3048 m (-50 to 10,000 ft)
Storage	-15.20 m to 10,668 m (-50 ft to 35,000 ft)

Airborne contaminant level	G2 or lower as defined by ANSI/ISA-S71.04-1985
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Contacting Dell

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.