Dell OptiPlex 5055 Small Form Factor

Owner's Manual

Regulatory Model: D11S
Regulatory Type: D11S003

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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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.

คำเตือน: 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.

คำเตือน: 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

ข้อควรระวัง: 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.

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

ข้อควรระวัง: 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.

ข้อควรระวัง: 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.

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

ข้อควรระวัง: System will shut down if side covers are removed while the system is running. The system will not power on if the side cover is removed.

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Turning off your computer

Turning off your computer — Windows 10

ข้อควรระวัง: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer or remove the side cover.

1 Click or tap  .

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

หมายเหตุ: **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.**

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 Ensure you follow the Turning off your computer.
4 Disconnect all network cables from the computer.

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

5 Disconnect your computer and all attached devices from their electrical outlets.
6 Press and hold the power button while the computer is unplugged to ground the system board.

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

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.

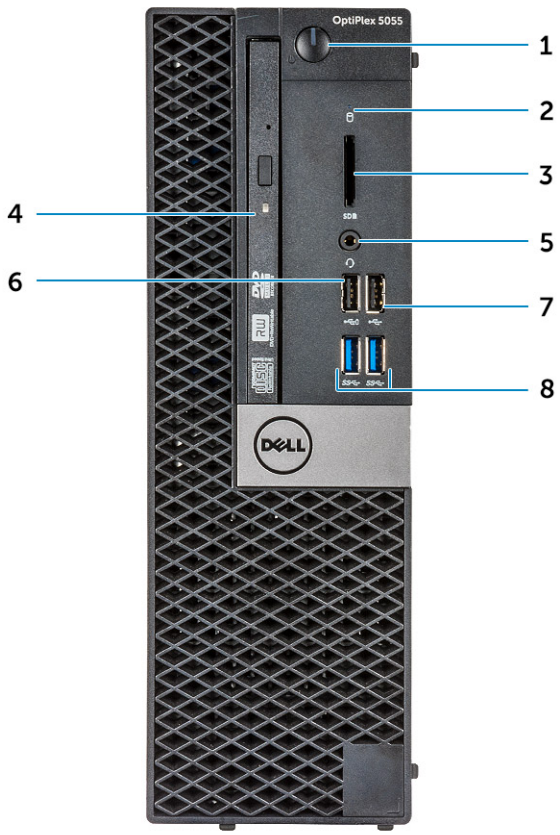
1 Connect any telephone or network cables to your computer.

ข้อควรระวัง: **To connect a network cable, first plug the cable into the network device and then plug it into the computer.**

2 Connect your computer and all attached devices to their electrical outlets.
3 Turn on your computer.
4 If required, verify that the computer works correctly by running **ePSA diagnostics**.

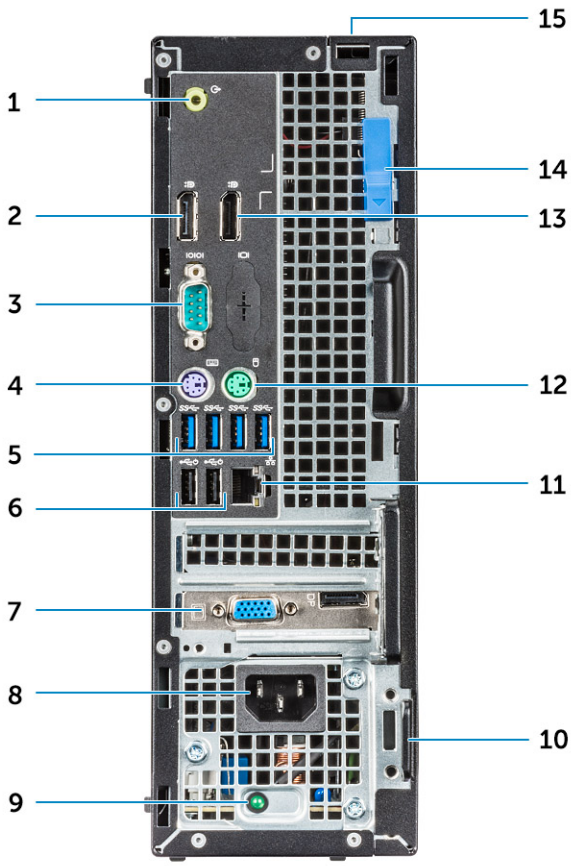
Chassis

Front chassis view



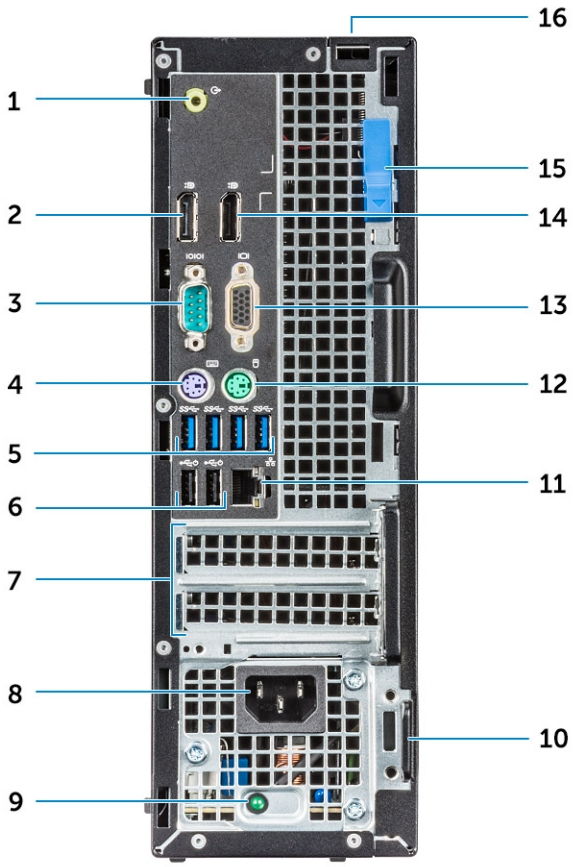
1	Power button and power light	2	Hard drive activity light
3	Memory card reader (optional)	4	Optical drive (optional)
5	Headset port	6	USB 2.0 port with PowerShare
7	USB 2.0 port	8	USB 3.1 Gen1 port

Back chassis view – Ryzen Pro CPU



1	Line-out port	2	DisplayPort
3	Serial port	4	PS/2 keyboard port
5	USB 3.0 ports	6	USB 2.0 ports (supports Smart Power On)
7	Expansion card slots	8	Power connector port
9	Power supply diagnostic light	10	Kensington security cable slot
11	Network port	12	PS/2 mouse port
13	DisplayPort	14	Release latch
15	Cable cover lock slot		

Back chassis view – Radeon R7 A series APU



1	Line-out port	2	DisplayPort
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7	Expansion card slots	8	Power connector port
9	Power supply diagnostic light	10	Kensington security cable slot
11	Network port	12	PS/2 mouse port
13	DisplayPort	14	VGA connector port (optional)
15	Release latch	16	Cable cover lock slot

3

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

Back cover

Removing cover

1 Follow the procedure in Before working inside your computer.

2 To release cover:

a Slide the blue retention tab to the right to unlock the cover [1].

b Slide the cover toward the back of the computer [2].

3 Lift the cover to remove it from the computer.

Installing cover

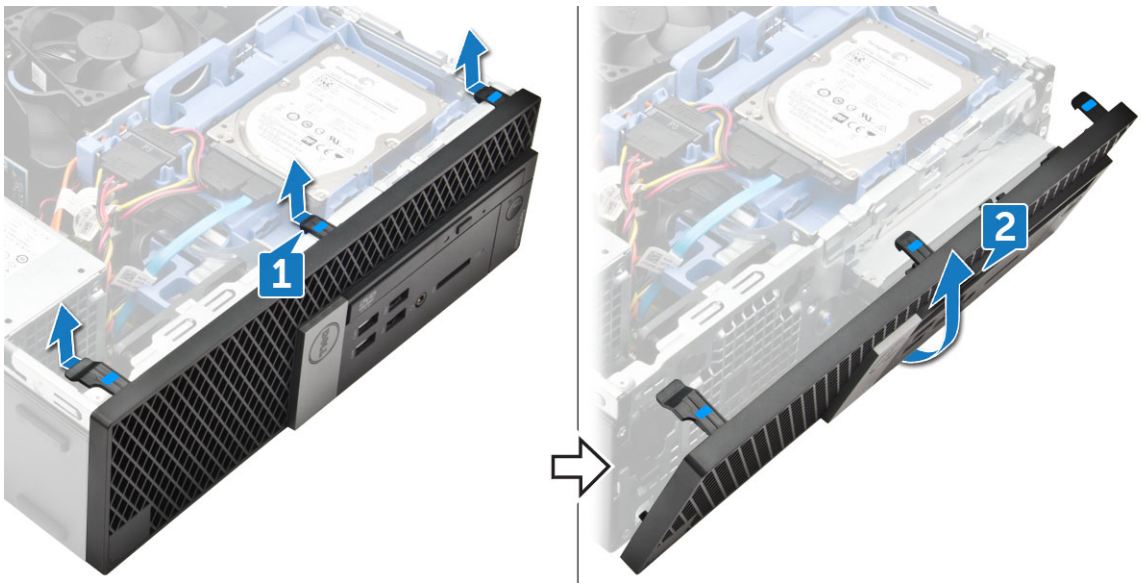
1 Place the cover on the computer and slide the cover forward until it clicks into place.
2 Follow the procedure in After working inside your computer.

Front Bezel

Removing the front bezel

1 Follow the procedure in Before working inside your computer.
2 Remove the cover.
3 To remove front bezel:
   a Lift the tabs to release the bezel from the chassis [1].
   b Remove the front bezel from the computer [2].

NOTE: Please ensure that the tabs at the bottom of the bezel is also released before lifting the bezel.



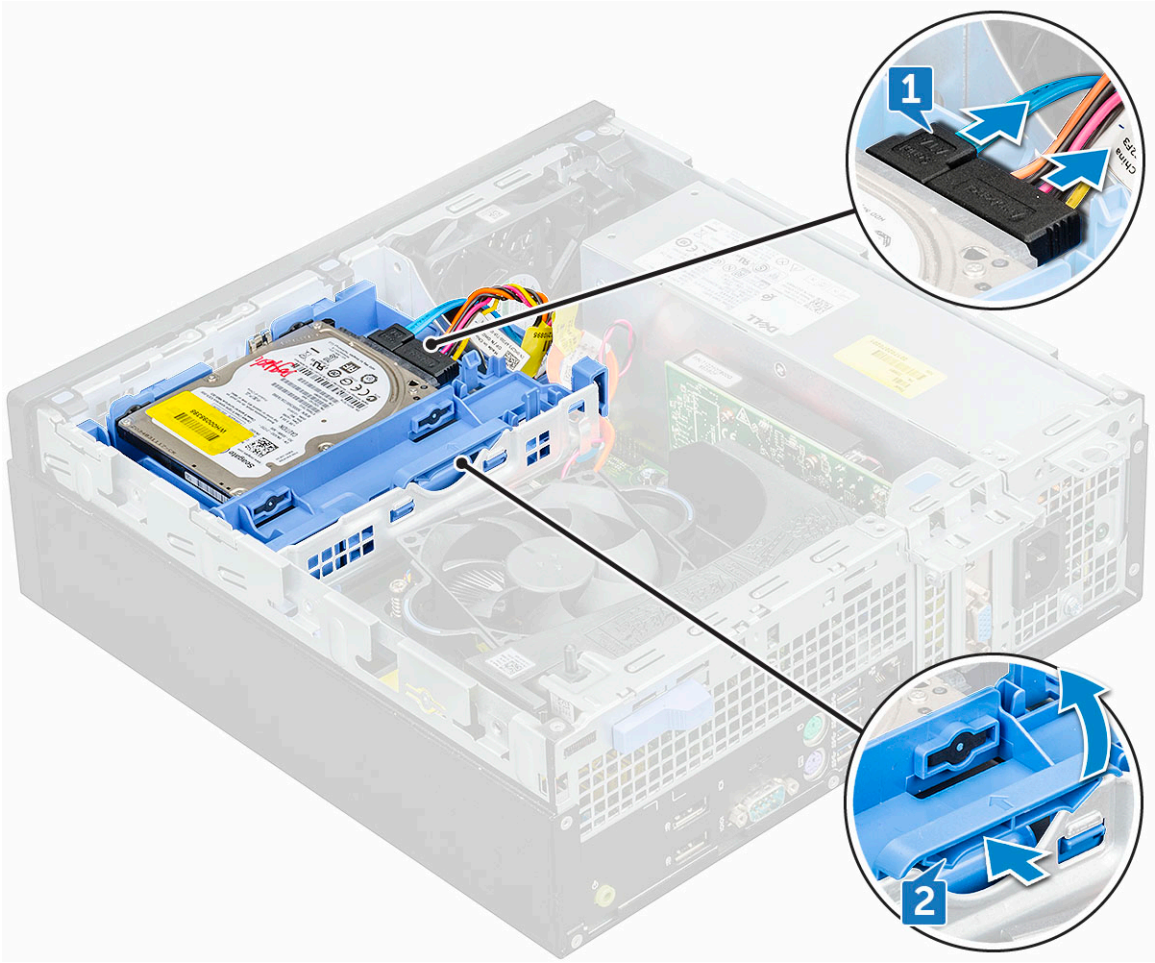
Installing front bezel

1 Insert the tabs of the bezel into the slots on the chassis.
2 Press the bezel until the tabs click into place.
3 Install the cover.
4 Follow the procedure in After working inside your computer.

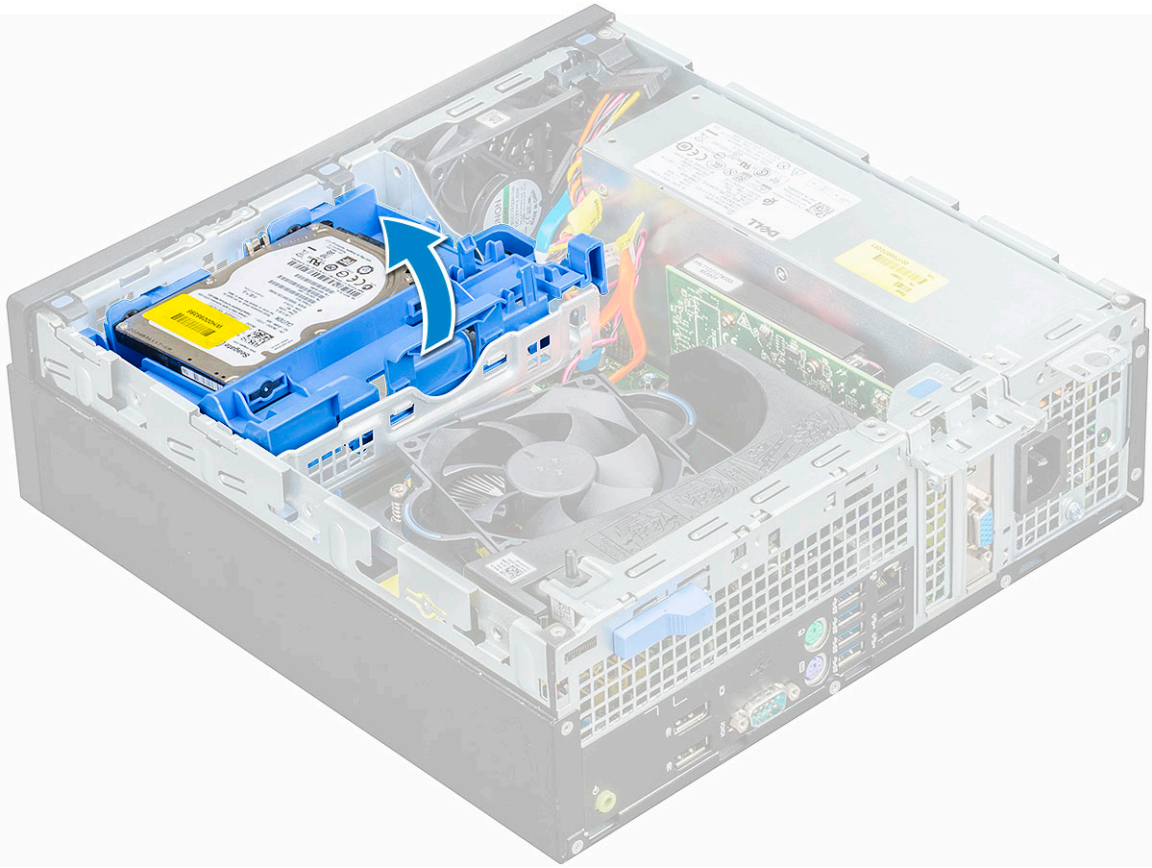
Storage device

Removing 2.5–inch hard drive assembly

1 Follow the procedure in Before working inside your computer.
2 Remove the cover.
3 To remove the 2.5-inch drive assembly:
   a Disconnect the SATA cable and power cable from the drive [1].
   b Push the tab to release drive assembly from the chassis [2].



4 Slide and lift the hard drive assembly from the computer.

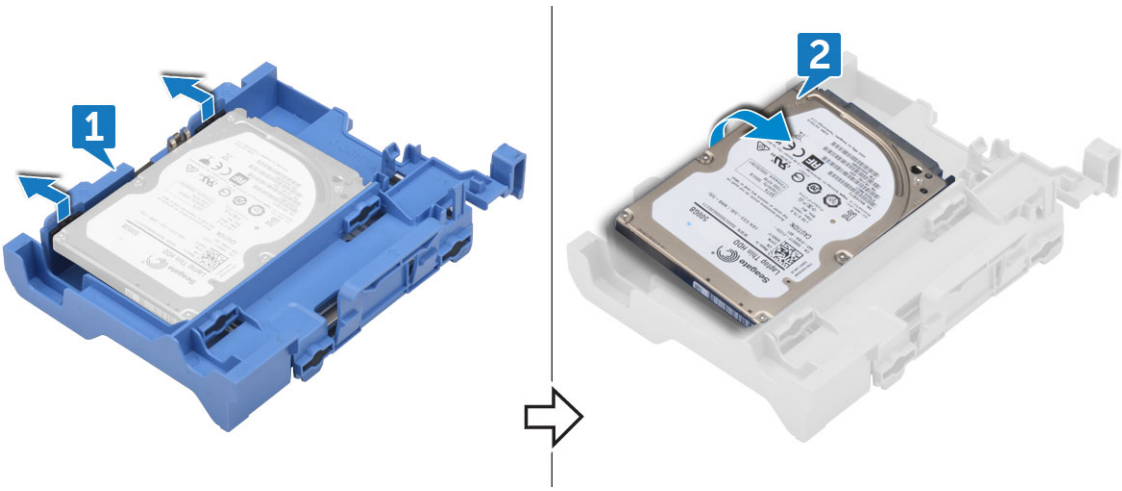


Removing 2.5–inch hard drive from the hard drive bracket

1 Follow the procedure in Before working inside your computer.

2 Remove the:
   a cover
   b 2.5 inch hard drive assembly

3 To remove hard drive bracket:
   a Pull one side of the hard drive bracket to disengage the pins on the bracket from the slots on the hard drive [1].
   b Lift the drive out of the 2.5-inch drive bracket [2].



Installing 2.5–inch hard drive into the hard drive bracket

1 Flex the side of the hard drive bracket, to align and insert the pins on the bracket into the hard drive.
2 Insert the hard drive into the hard drive bracket until it clicks into place.
3 Install the:
   a 2.5 inch hard drive assembly
   b cover
4 Follow the procedure in After working inside your computer.

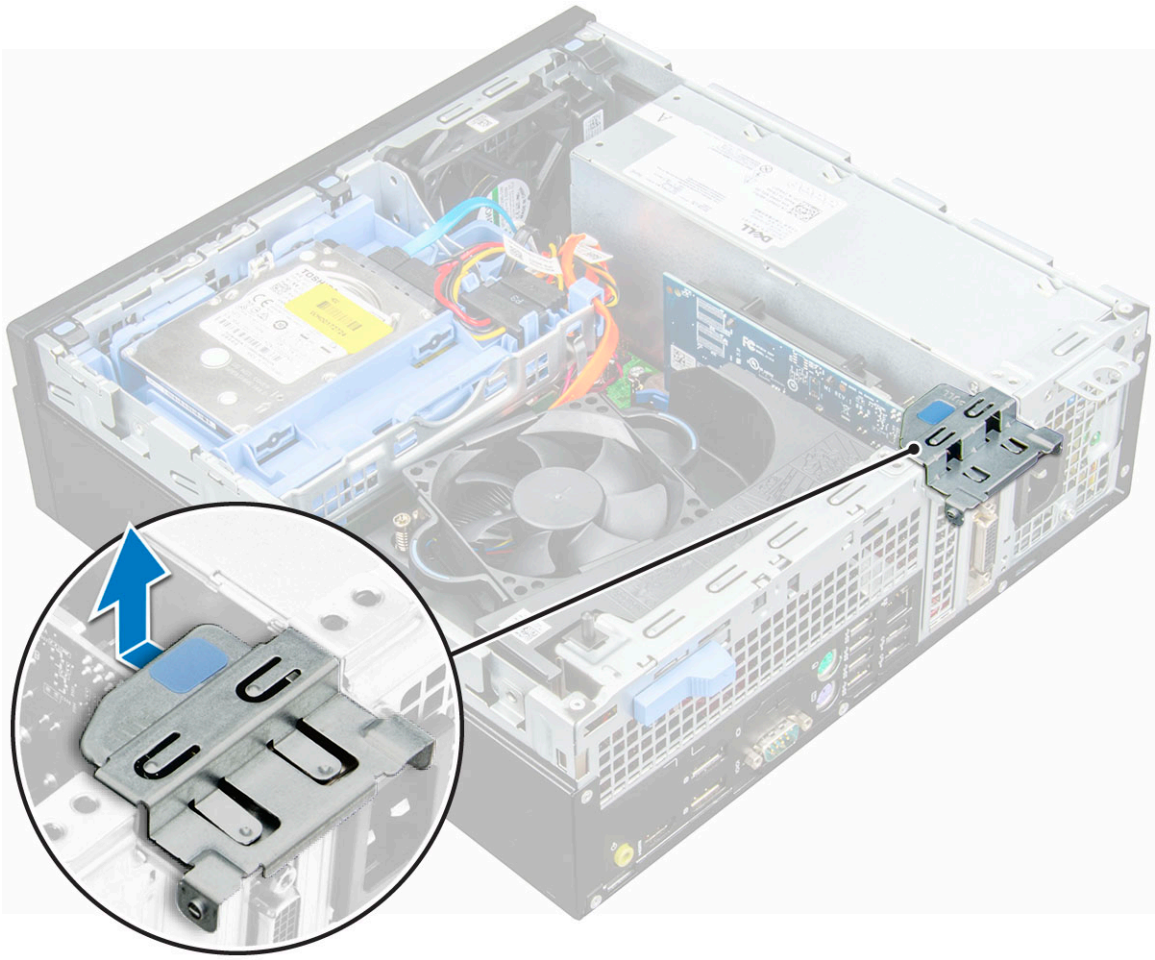
Installing 2.5–inch hard drive assembly

1 Insert the drive assembly into the slot on the computer until it clicks into place.
2 Connect the SATA cable and the power cable to the connectors on the hard drive.
3 Install the cover.
4 Follow the procedure in After working inside your computer.

Expansion card

Removing PCIe expansion card

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b front bezel
3 Pull the metal tab to open the expansion card latch.



4 To remove the PCIe expansion card:

a Pull the release latch to unlock the PCIe expansion card [1].

b Push the release tab [2] and lift the PCIe expansion card out of the computer [3].

NOTE: The release tab is at the base of the expansion card.

5 Repeat the steps to remove any additional PCIe expansion cards.

Installing PCIe expansion card

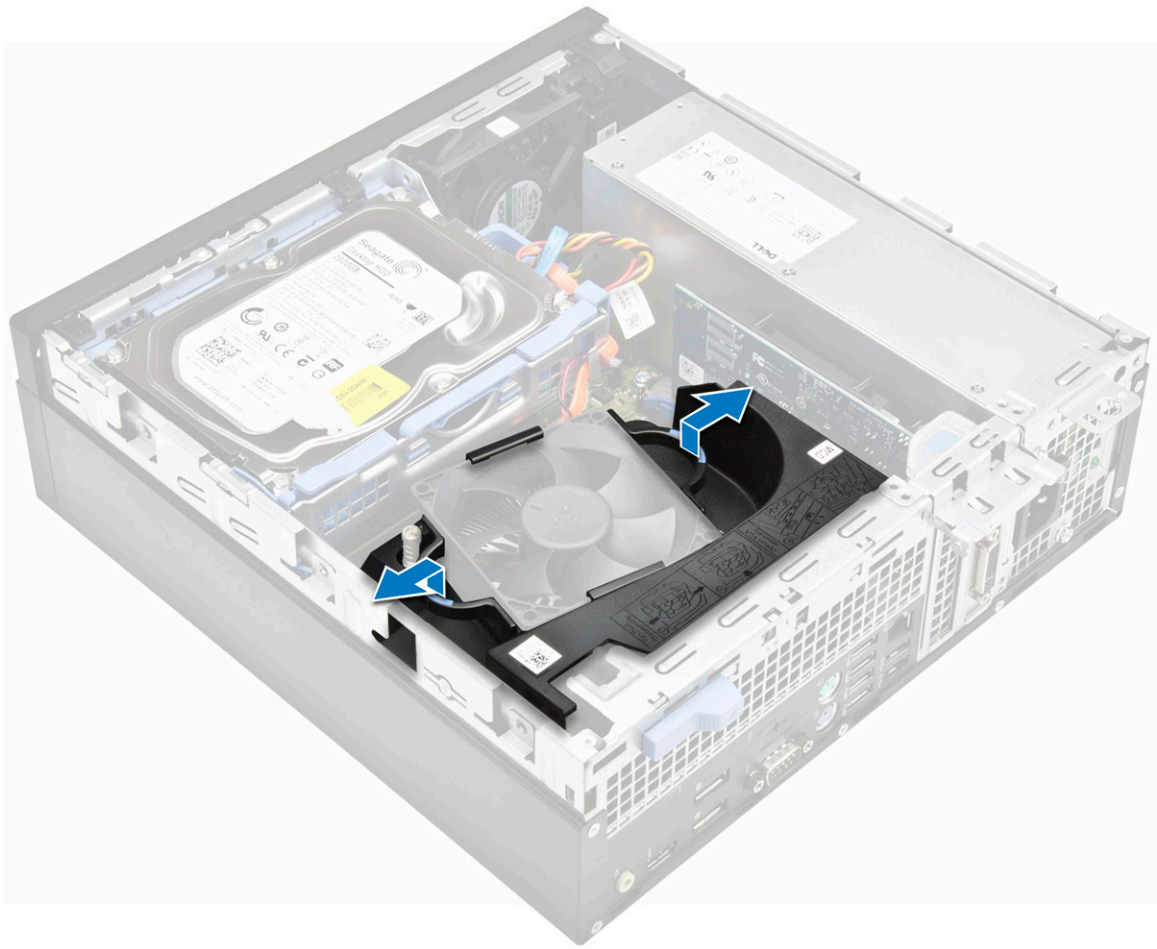
1 Insert the expansion card into the connector on the system board.
2 Press the expansion card until it clicks into place.
3 Close the expansion card latch and press it until it clicks into place.
4 Install the:
   a front bezel
   b cover
5 Follow the procedure in After working inside your computer.

Cooling shroud

Removing the cooling shroud

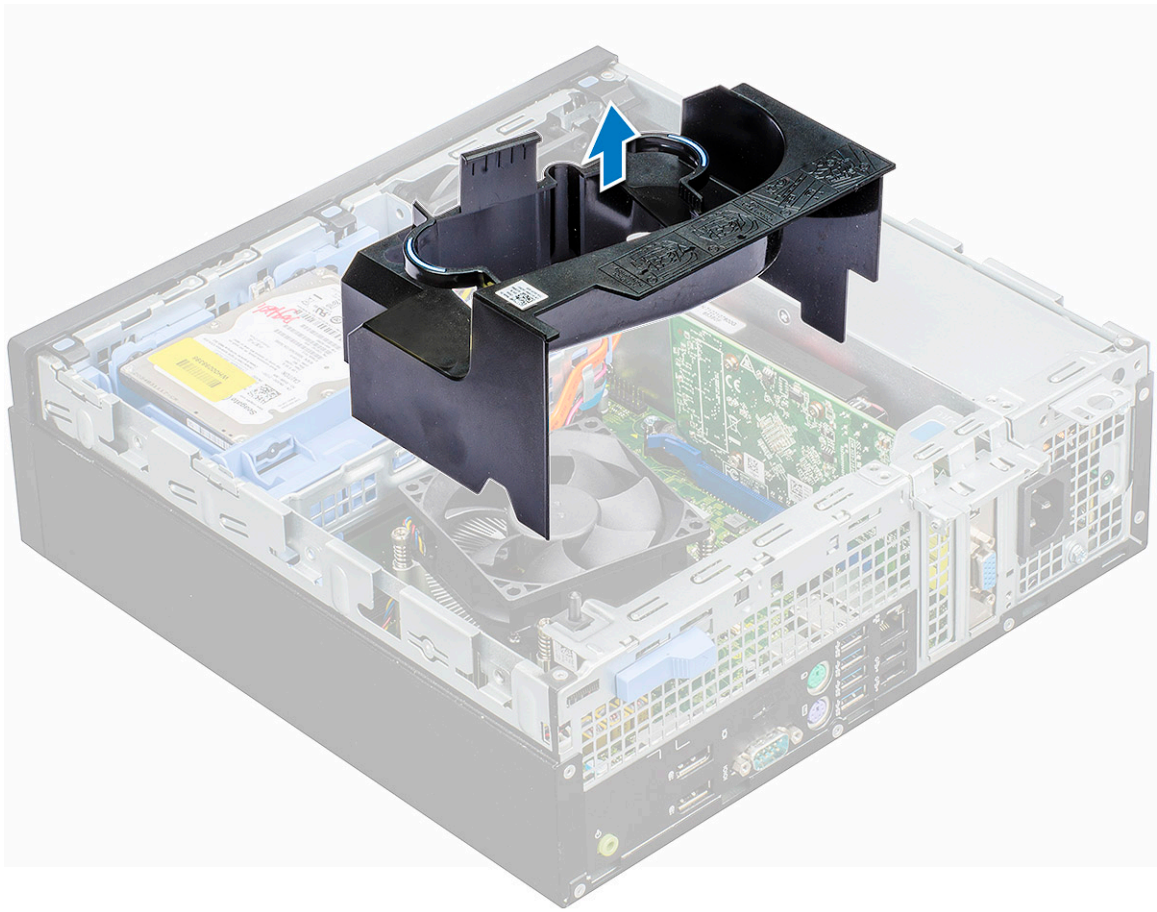
NOTE: Cooling shroud is encompasses the processor assembly and it must be removed to access the processor.

1 Follow the procedure in Before working inside your computer.
2 Remove the cover.
3 To remove cooling shroud:
   a Holding the touch points, pull the fan duct bracker outwards to release the cooling shroud.



NOTE: Illustration on how to remove the shroud is also given on the shroud.

b Lift the cooling shroud away from the chassis.



Installing cooling shroud

NOTE: When inserting the shroud on the processor assembly, please ensure that the data and power cables of the optical drive do not get caught inside the shroud.

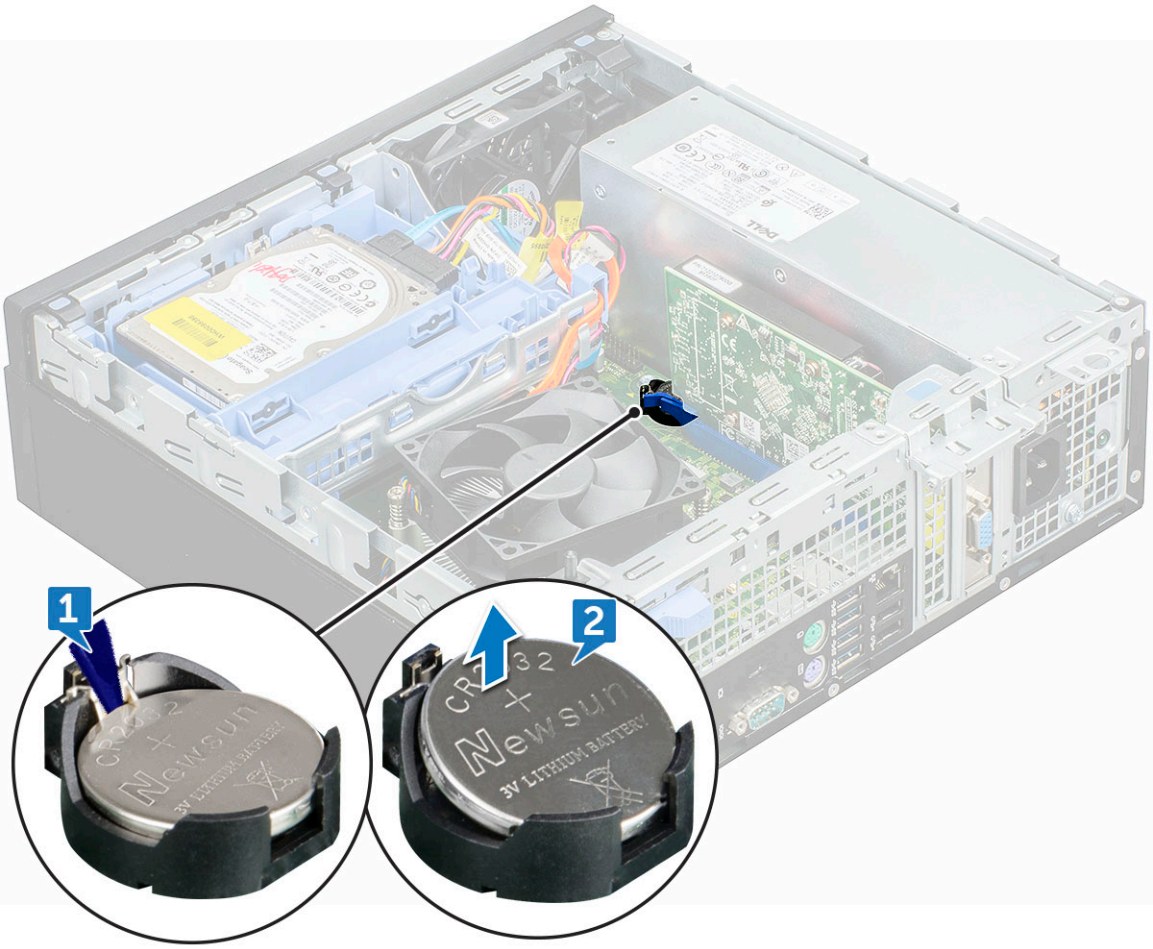
1 Align the slots on the cooling shroud, with the screws on the heat sink.
2 Insert the cooling shroud over the processor assembly.
3 Install the cover.
4 Follow the procedure in After working inside your computer.

Coin cell battery

Removing coin cell battery

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b cooling shroud
   c expansion card
3 To remove the coin cell battery:
   a Using a plastic scribe press the release latch until the coin cell battery pops out [1].

b Remove the coin cell battery from the connector on the system board [2].



Installing coin cell battery

1 Hold the coin cell battery with the "+" sign facing up and slide it under the securing tabs at the positive side of the connector.
2 Press the battery into the connector until it locks into place.
3 Install the:
   a expansion card
   b cooling shroud
   c cover
4 Follow the procedure in After working inside your computer.

Optical drive

Removing optical drive

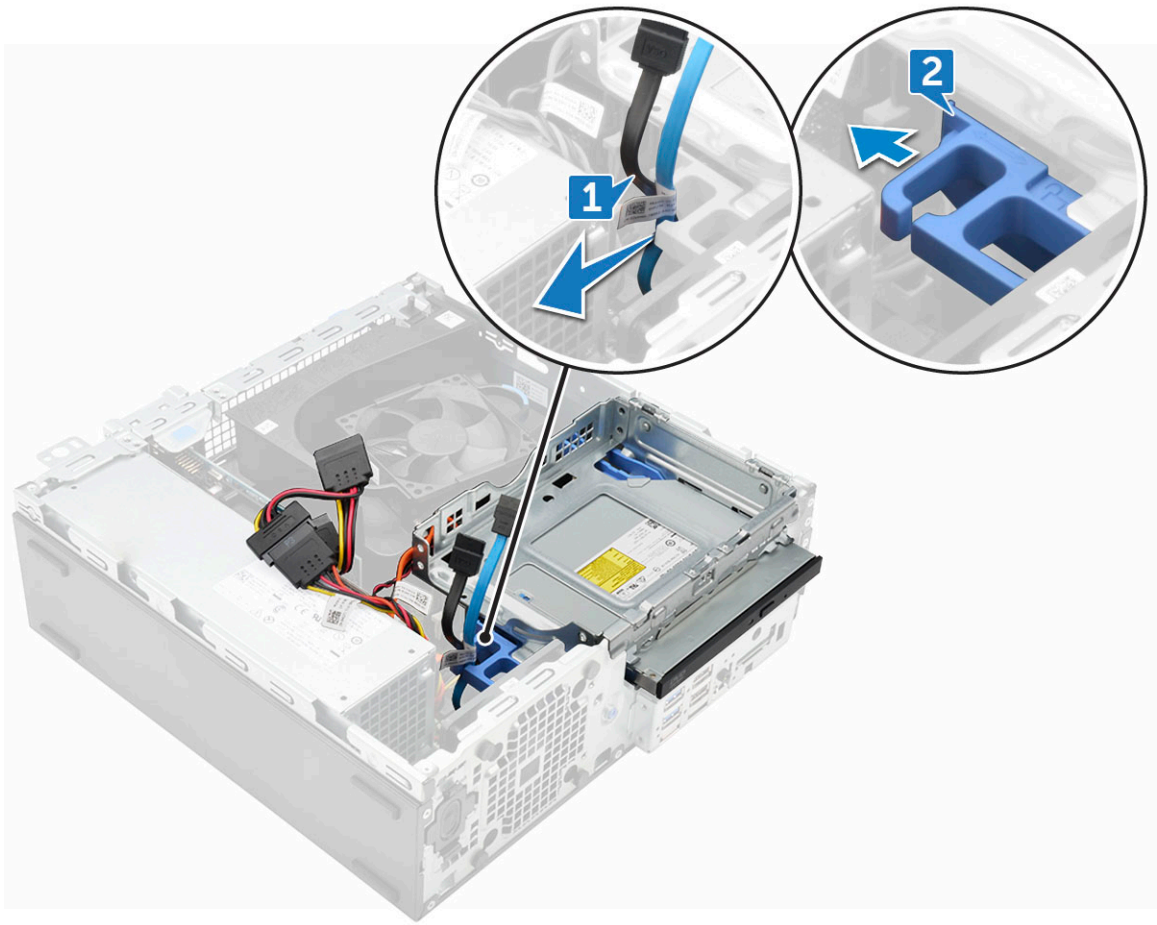
1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b front bezel
   c cooling shroud

d 2.5 inch hard drive assembly

3 To remove optical drive:

a Release the cables from the retention clip [1].

b Slide the blue tab to unlock the optical drive assembly [2].

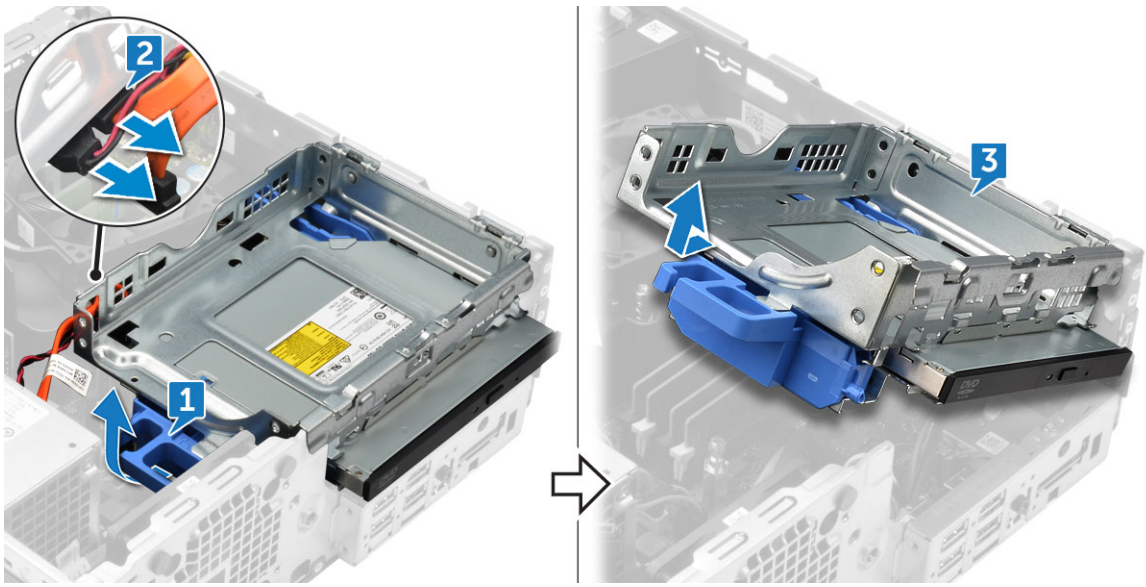


4 To remove the optical drive assembly:

a Pull the tab upward to release the assembly [1].

b Holding the tab, disconnect the optical drive cables [2].

c Slide and lift the optical drive assembly away from the computer [3].



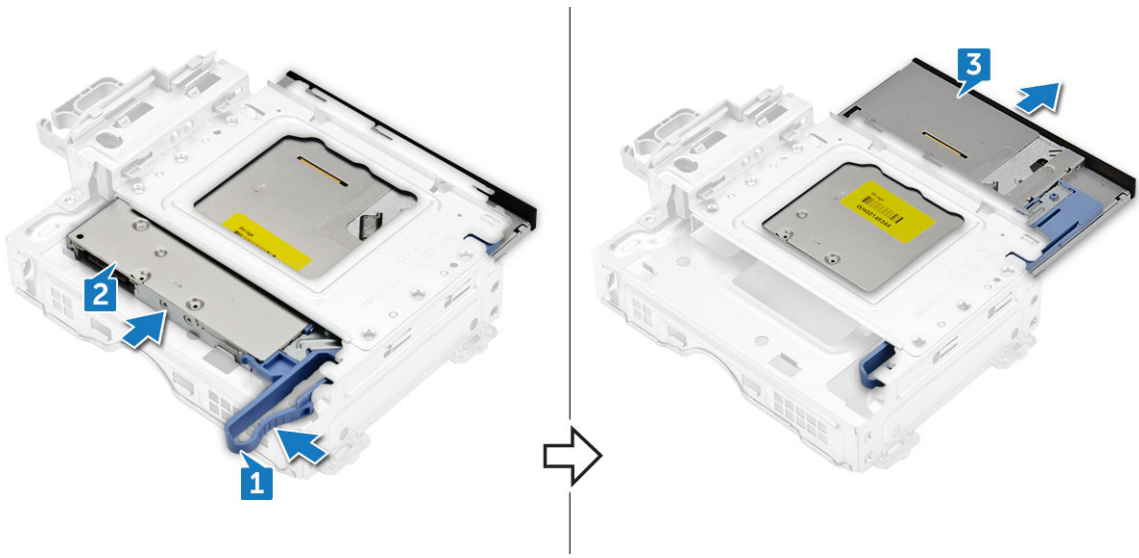
NOTE: After releasing the Optical drive, you can also flip the drive assembly for easy access to the drive cables.

NOTE: The Optical drive cables are available on side of the drive assembly.

5 To remove the optical drive:

a Slide the tab to release the optical drive [1].

b Push the optical drive away from the assembly [2][3].



Installing optical drive

1 Slide the optical drive into the optical drive assembly.

2 Align the tabs on the optical assembly with the slots on the computer.

3 Lower the optical drive assembly into the computer.

4 Lock the latch to secure the optical drive to the computer.

5 Connect the data and the power cables to the optical drive.

6 Install the:

a 2.5 inch hard drive assembly

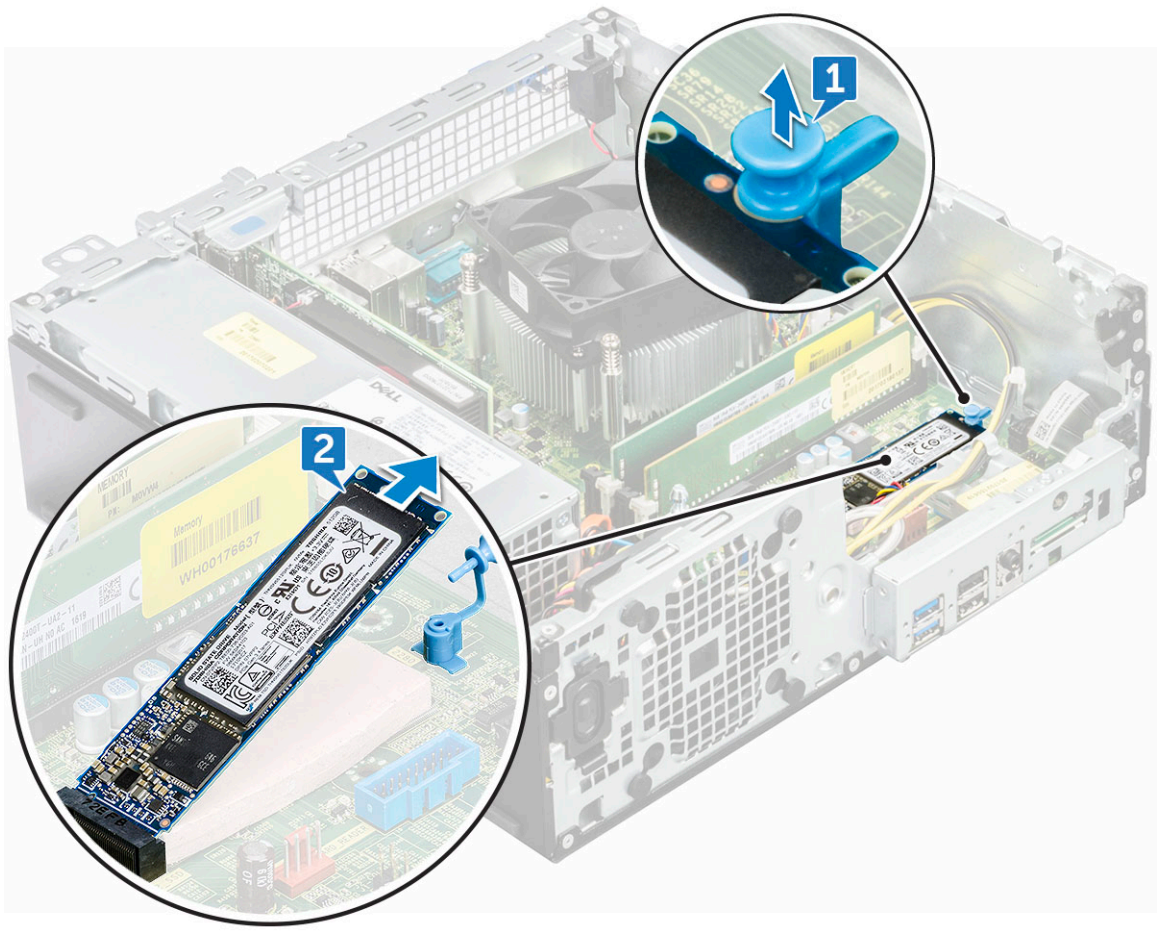
b cooling shroud
c front bezel
d cover

7 Follow the procedure in After working inside your computer.

M.2 PCIe SSD

Removing M.2 PCIe SSD

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b front bezel
   c 2.5 inch hard drive assembly
   d cooling shroud
   e optical drive
3 To remove the M.2 PCIe SSD:
   a Pull the blue plastic pin that secures the M.2 PCIe SSD to the system board [1].
   b Disconnect the M.2 PCIe SSD from the connector on the system board [2].



Installing M.2 PCIe SSD

1 Insert the M.2 PCIe SSD to the connector
2 Press the blue plastic tab to secure the M.2 PCIe SSD.
3 Install the:
   a optical drive
   b cooling shroud
   c 2.5 inch hard drive assembly
   d front bezel
   e cover
4 Follow the procedure in After working inside your computer.

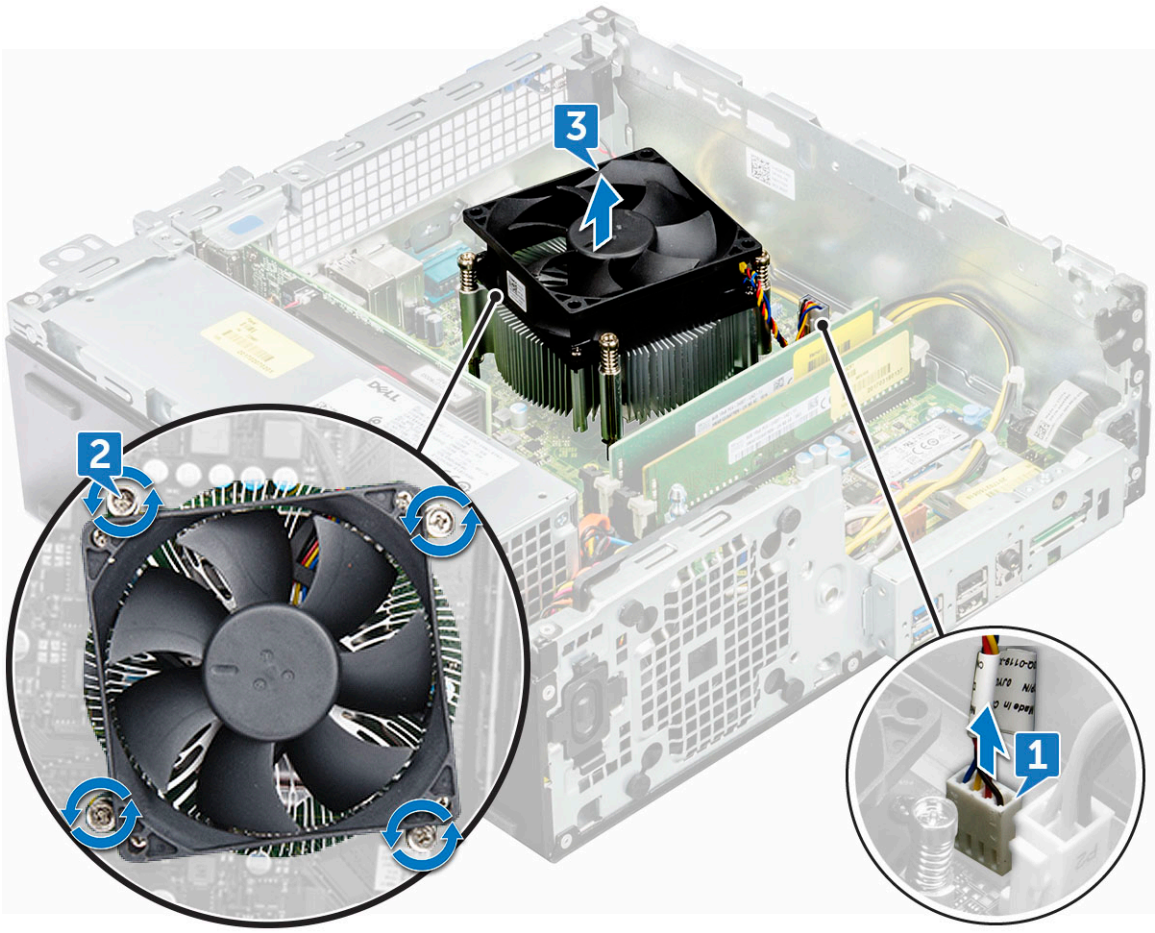
Heat sink assembly

Removing heat sink assembly

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b front bezel
   c 2.5 inch hard drive assembly
   d cooling shroud
   e optical drive
3 To remove the heat sink assembly:
   a Disconnect the heat sink assembly cable from the connector on the system board [1].
   b Loosen the captive screws(6 lbs) that secure the heat sink assembly to the system board [2].

      NOTE: Loosen the screws based on the numbers available on the system board.

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



Installing heat sink assembly

1 Align the screws of the heat sink assembly with the holders on the system board.
2 Place the heat sink assembly on the processor.
3 Replace the captive screws (6 lbs) to secure the heat sink assembly to the system board.

NOTE: Tighten the screws based on the order given in the system board.

4 Connect the heat sink assembly cable to the connector on the system board.
5 Install the:
   a optical drive
   b cooling shroud
   c 2.5 inch hard drive assembly
   d front bezel
   e cover
6 Follow the procedure in After working inside your computer.

Processor

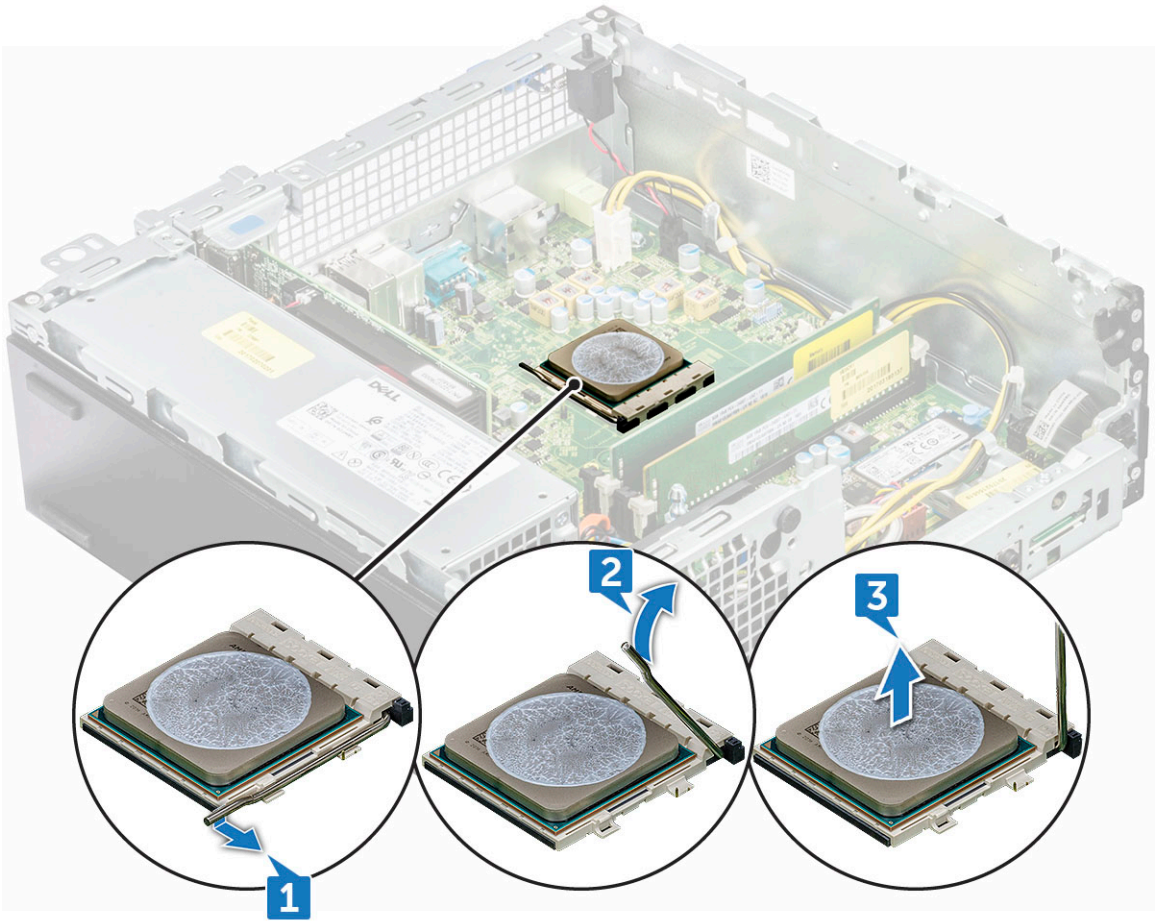
Removing the processor

1 Follow the procedure in Before working inside your computer.
2 Remove the:

a cover
b front bezel
c 2.5 hard drive assembly
d cooling shroud
e optical drive
f heat sink assembly

3 To remove the processor:
a Release the socket lever by pushing the lever down and out from under the tab on the processor shield [1].
b Lift the lever upward and lift the processor shield [2].
c Lift the processor out of the socket [3].

CAUTION: Do not touch the processor socket pins, they 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.



Installing the processor

1 Align the processor with the socket keys.

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

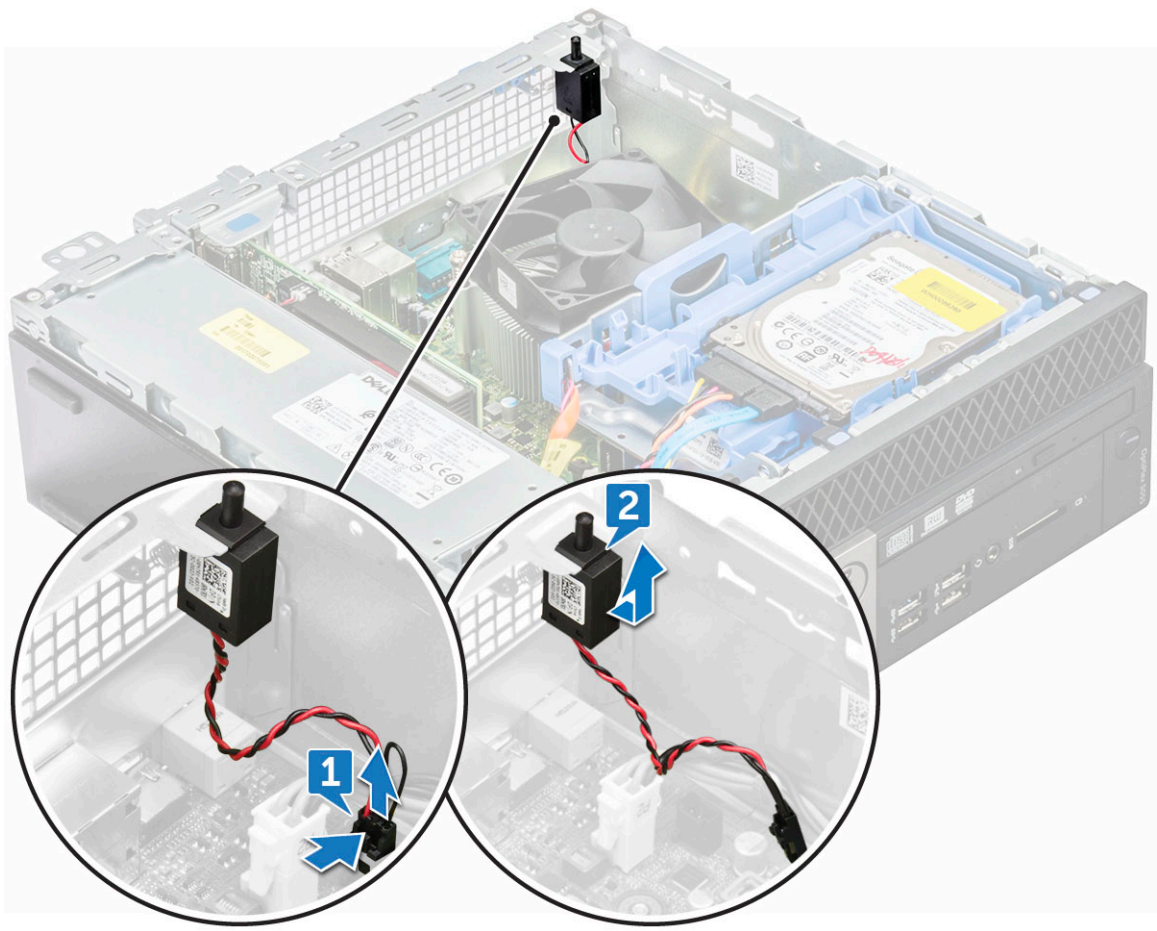
2 Align the pin-1 indicator of the processor with the triangle on the socket.
3 Place the processor on the socket such that the slots on the processor align with the socket keys.
4 Close the processor shield by sliding it under the retention screw.
5 Lower the socket lever and push it under the tab to lock it.

6 Install the:
   a heat sink assembly
   b optical drive
   c cooling shroud
   d 2.5 hard drive assembly
   e front bezel
   f cover
7 Follow the procedure in After working inside your computer.

Intrusion switch

Removing intrusion switch

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b front bezel
   c cooling shroud
3 To the intrusion switch:
   a Disconnect the intrusion switch cable from the connector on the system board [1].
   b Slide the intrusion switch and push it to remove from the chassis [2].



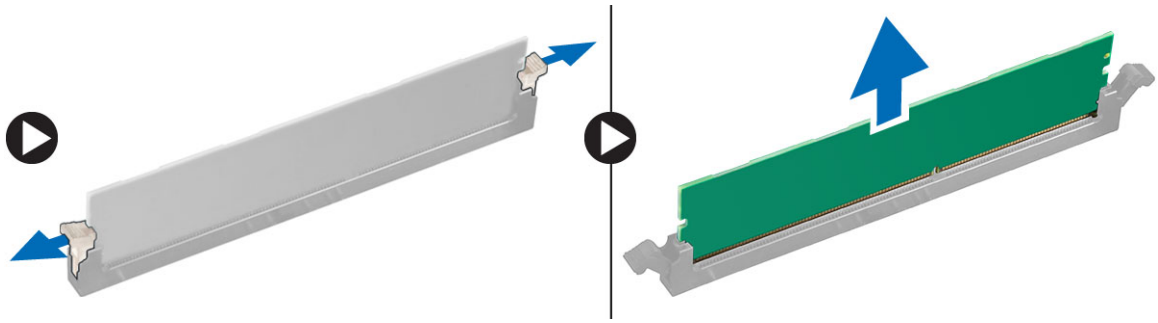
Installing intrusion switch

1 Insert the intrusion switch into the slot on the computer.
2 Connect the intrusion switch cable to the connector on the system board.
3 Install the:
   a cooling shroud
   b front bezel
   c cover
4 Follow the procedure in After working inside your computer.

Memory modules

Removing memory module

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b front bezel
   c 2.5 inch hard drive assembly
   d cooling shroud
   e optical drive
3 To remove the memory module:
   a Push the tabs on both sides of the memory module.
   b Lift the memory module from the connector on the system board.



Installing memory module

1 Align the notch on the memory module with the tab on the memory module connector.
2 Insert the memory module into the memory module socket.
3 Press the memory module until the memory module retention tabs click into place.
4 Close the front panel door.
5 Install the:
   a optical drive
   b cooling shroud
   c 2.5 inch hard drive assembly
   d front bezel
   e cover
6 Follow the procedure in After working inside your computer.

SD card

Removing SD card reader

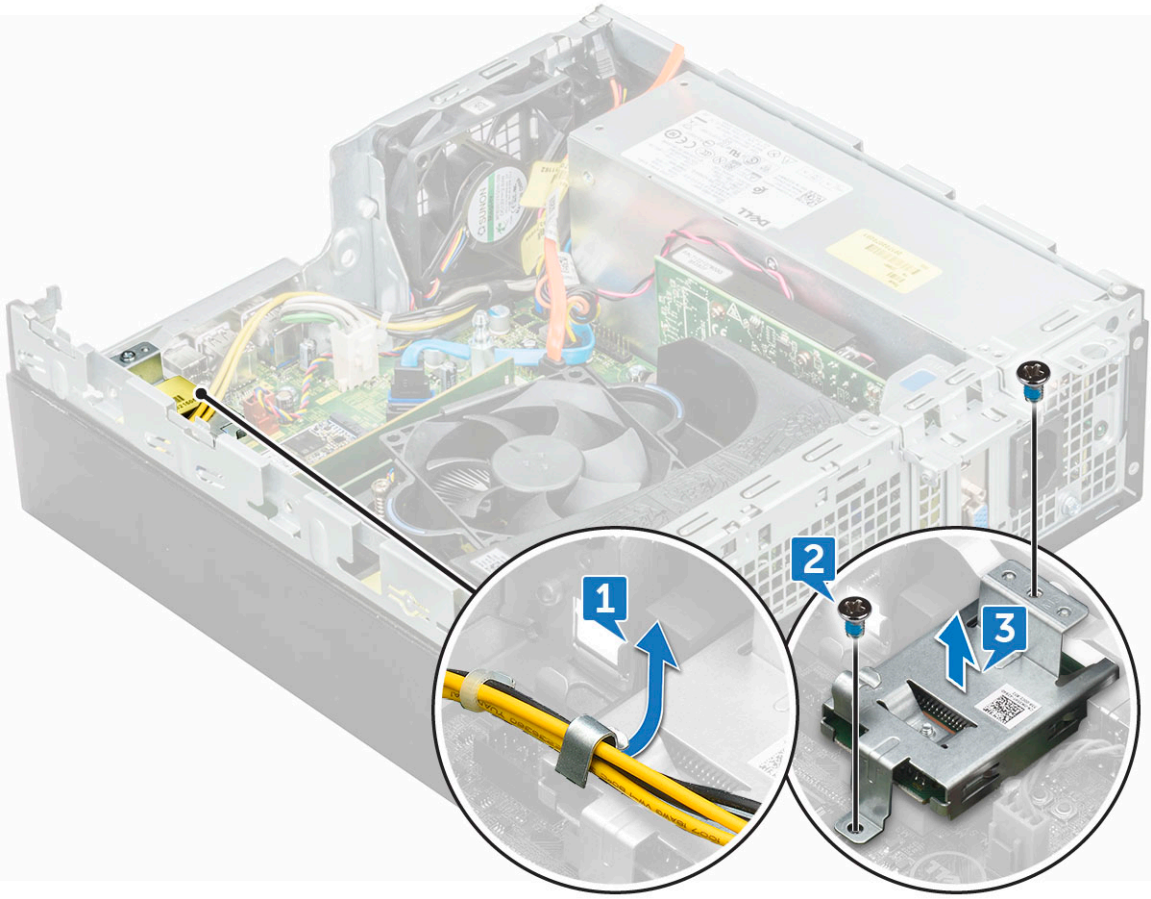
1 Follow the procedure in Before working inside your computer.

2 Remove the:

- a cover
- b front bezel
- c 2.5 inch hard drive assembly
- d cooling shroud
- e optical drive
- f M.2 PCIe SSD

3 To remove the SD card reader:

- a Release the power cables from the retention clips on the SD card reader enclosure [1].
- b Remove the screws(6lbs) that secure the SD card reader [2].
- c Lift the SD card reader away from the computer [3].



Installing SD card reader

1 Place the SD card in the slot on the system board.

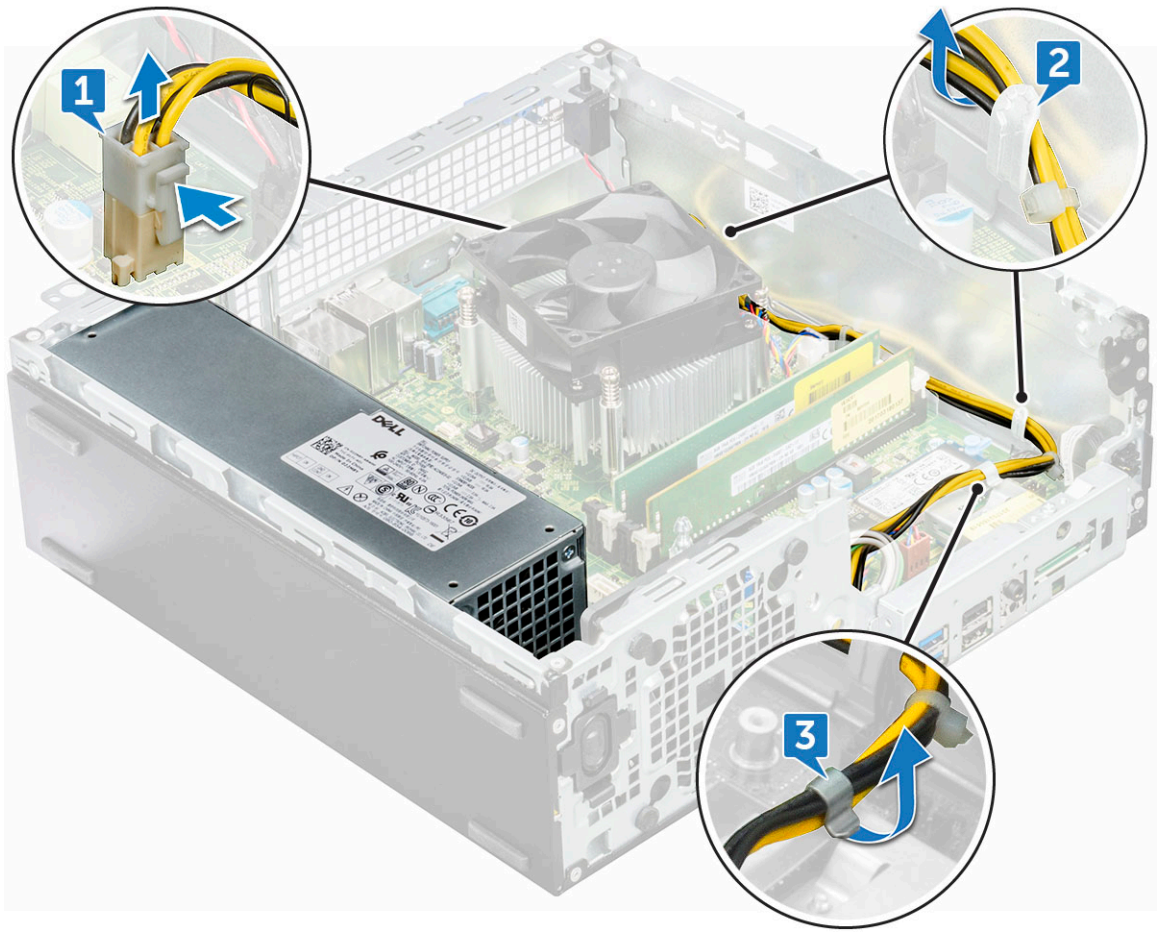
2 Tighten the screw(6 lbs) to secure the SD card reader to the front panel door.

3 Install the:
   a M.2 PCIe SSD
   b optical drive
   c cooling shroud
   d 2.5 inch hard drive assembly
   e front bezel
   f cover
4 Follow the procedure in After working inside your computer.

Power supply unit

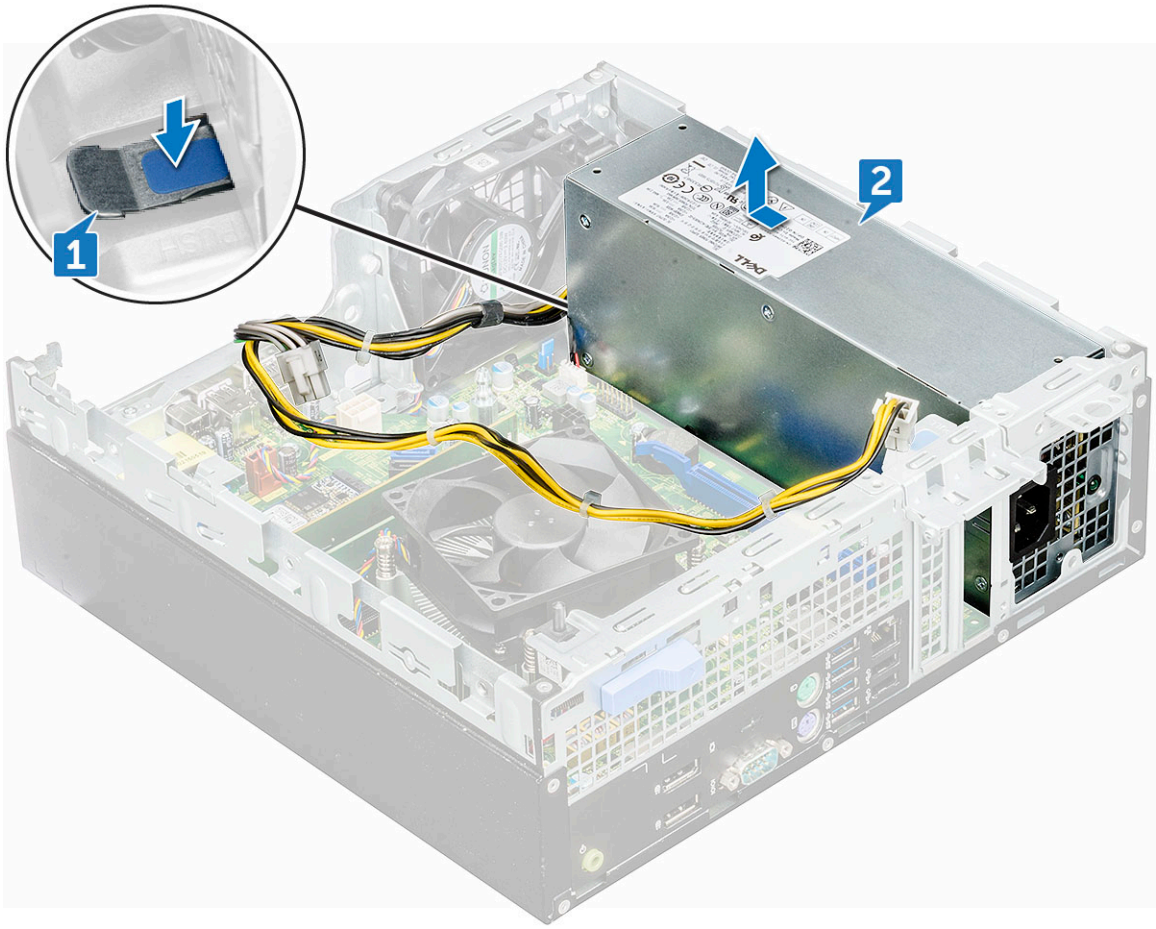
Removing power supply unit — PSU

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b front bezel
   c 2.5 inch hard drive assembly
   d cooling shroud
   e optical drive
3 To release the PSU:
   a Disconnect the PSU cables from the connectors on the system board [1].
   b Unroute the PSU cables from the retention clips [2, 3].



4 To disconnect the cables:
   a Disconnect the power cable from the system board [1] [2].
   b Lift the cables away from the computer [3, 4].
   c Remove the screws(6lbs) that secure the PSU to the computer [5].

5 To remove the PSU:
   a Press the blue release tab [1]
   b Slide the PSU and lift it away from the computer [2].



Installing power supply unit — PSU

1 Insert the PSU into the slot.
2 Slide the PSU towards the back of the computer until it clicks into place.
3 Replace the screws(6lbs) to secure the PSU to the computer.
4 Route the PSU cables through the retention clips.
5 Connect the PSU cables to the connectors on the system board.
6 Install the:
   a optical drive
   b cooling shroud
   c 2.5 inch hard drive assembly
   d front bezel
   e cover
7 Follow the procedure in After working inside your computer.

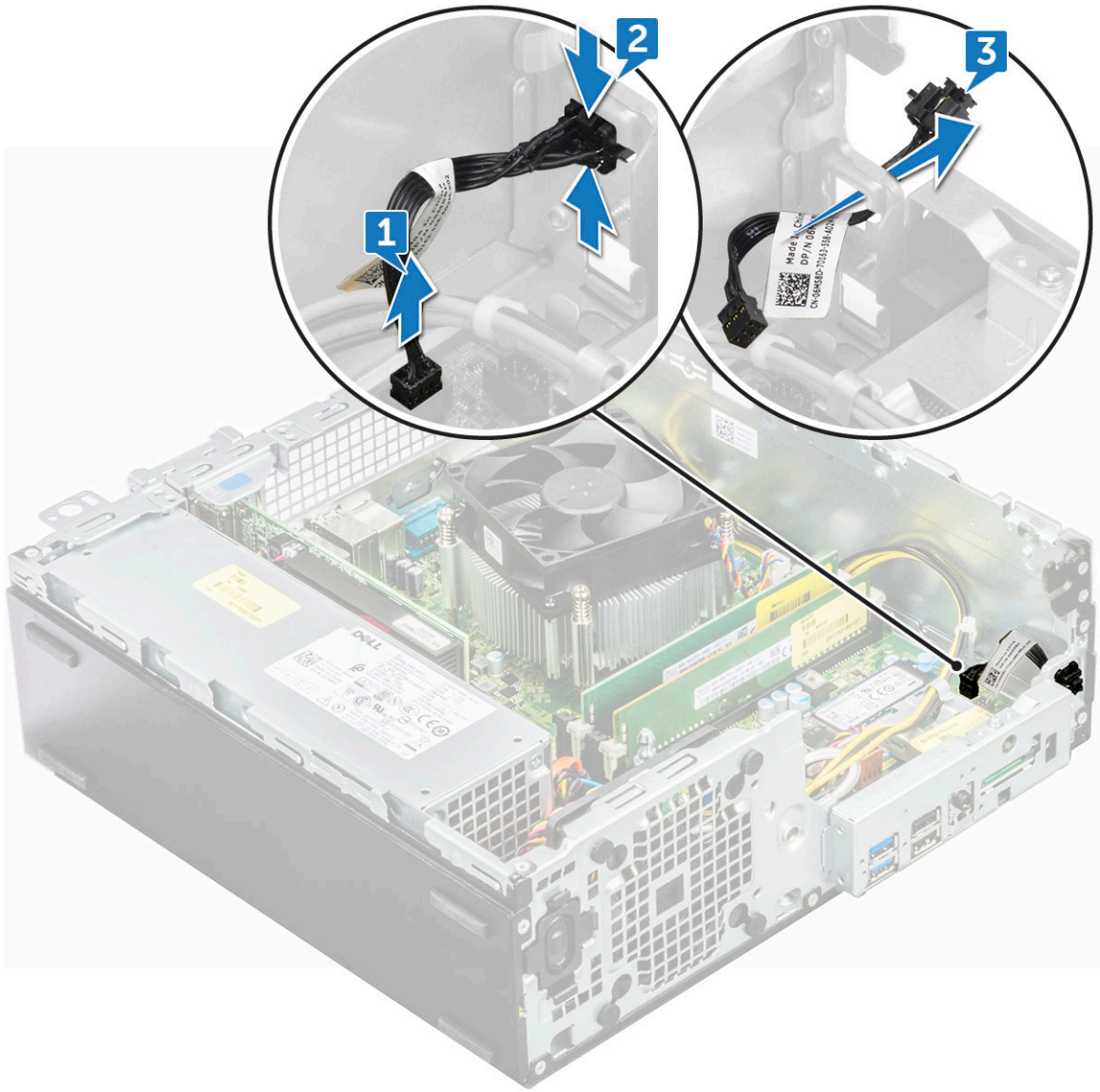
Power switch

Removing power switch

1 Follow the procedure in Before working inside your computer.
2 Remove the:

a cover
b front bezel
c 2.5 inch hard drive assembly
d cooling shroud
e optical drive

3 To release the power switch:
a Disconnect the power switch cable from the system board [1].
b Press the power switch retention tabs and pull out from the computer [2, 3].



Installing power switch

1 Slide the power switch module into the slot on the chassis until it clicks into place.
2 Connect the power switch cable to the connector on the system board.
3 Install the:
a optical drive
b cooling shroud
c 2.5 inch hard drive assembly
d front bezel

e cover

4 Follow the procedure in After working inside your computer.

Speaker

Removing speaker

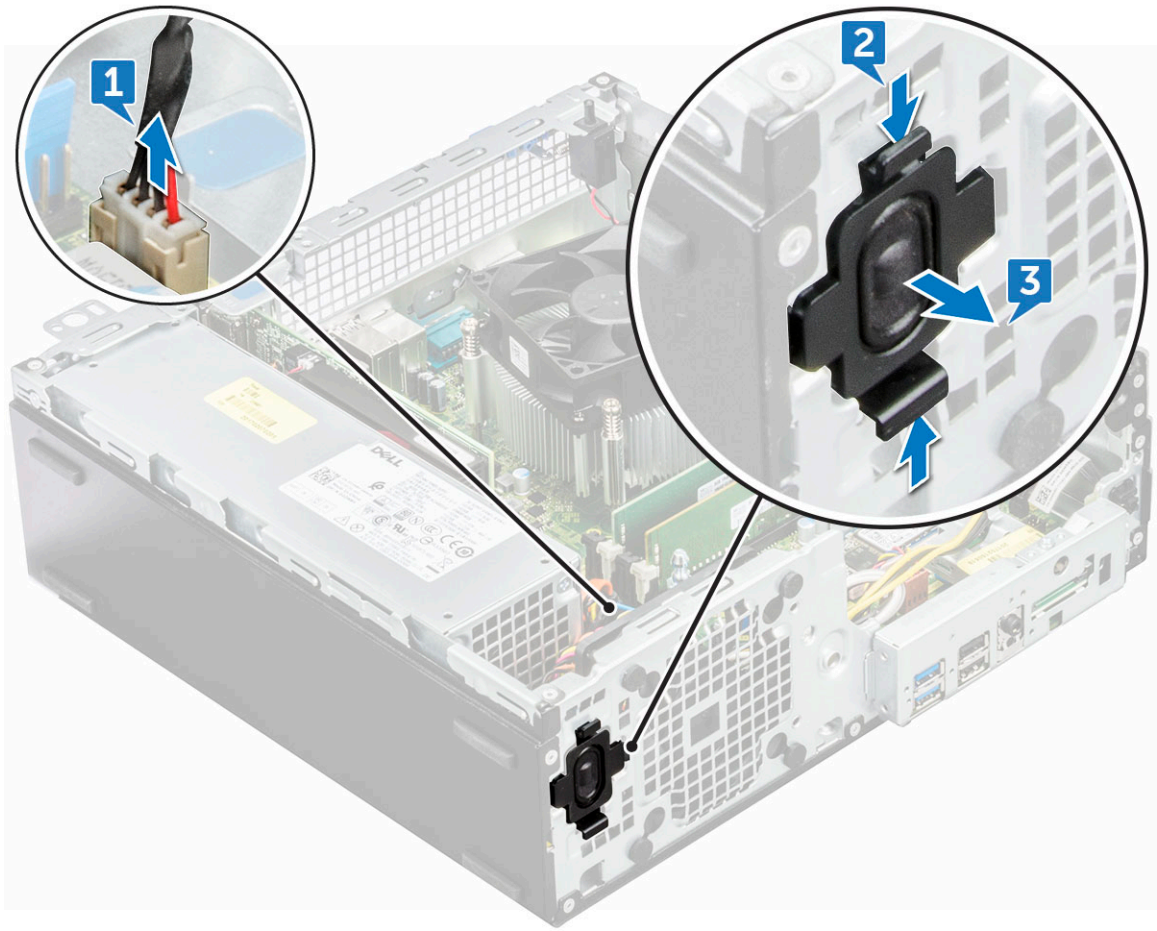
1 Follow the procedure in Before working inside your computer.

2 Remove the:

a cover
b front bezel
c 2.5 inch hard drive assembly
d cooling shroud
e optical drive

3 To remove the speaker:

a Disconnect the speaker cable from the connector on the system board [1].
b Press the release tabs [2], and slide the speaker module [3] out of the slot.



Installing speaker

1 Insert the speaker into the slot and press it until it clicks into place.

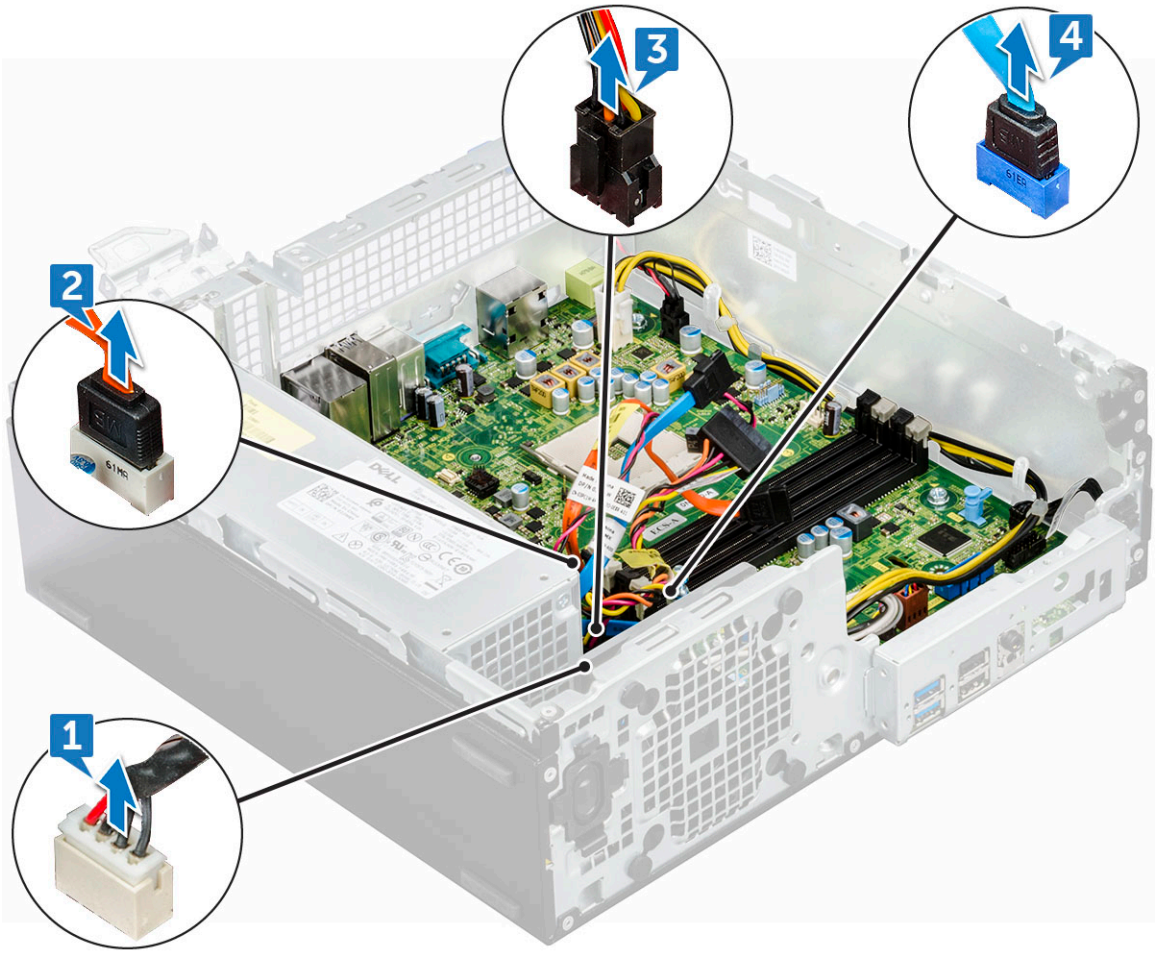
2 Connect the speaker cable to the connector on the system board.

3 Install the:
   a optical drive
   b cooling shroud
   c 2.5 inch hard drive assembly
   d front bezel
   e cover
4 Follow the procedure in After working inside your computer.

System board

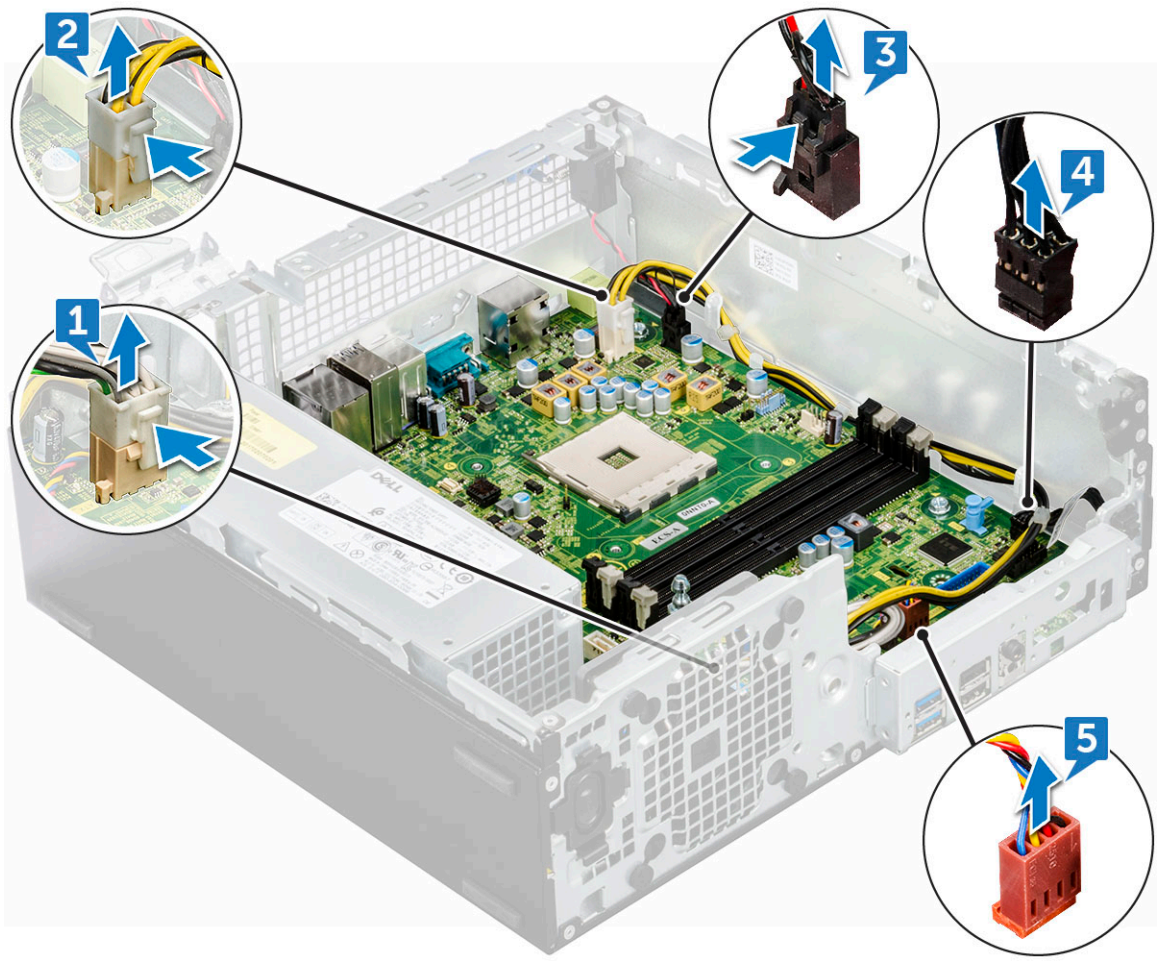
Removing the system board

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a cover
   b front bezel
   c 2.5 inch hard drive assembly
   d cooling shroud
   e optical drive
   f M.2 PCIe SSD
   g heat sink assembly
   h memory module
   i processor
   j expansion card
   k SD card
3 Disconnect the following cables from the system board:
   a speaker [1]
   b 2.5–inch drive [2]
   c optical drive [3]
   d data cable [4]



4 Disconnect the following cables and screw from the system board:

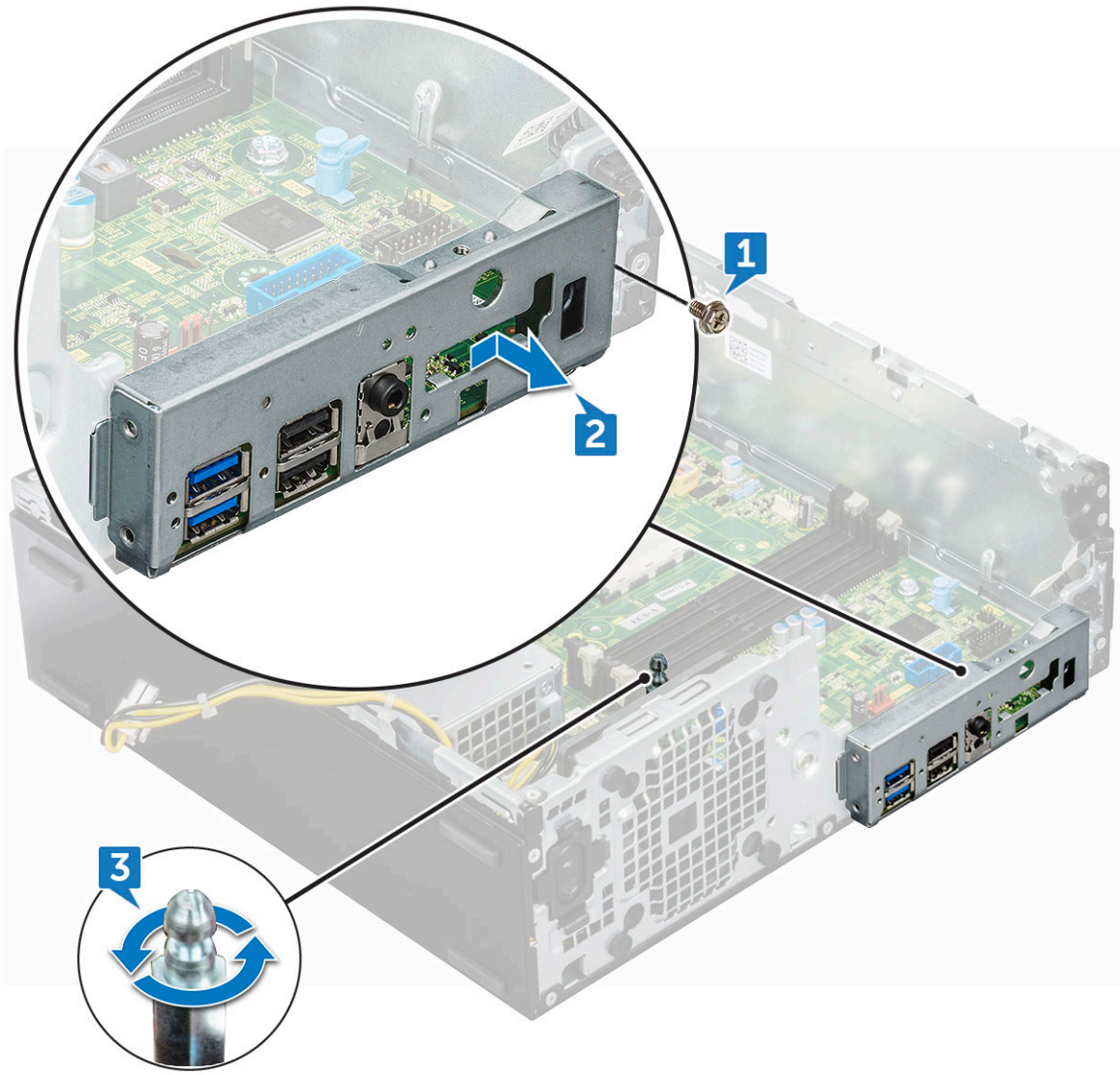
a PSU [1]
b hard drive and optical drive caddy stand off screw [2]
c PSU [3]
d power switch [4]
e intrusion switch [5]



5 To remove the I/O panel plate:

a Remove the screw (6 lbs) that secures the I/O panel [1].

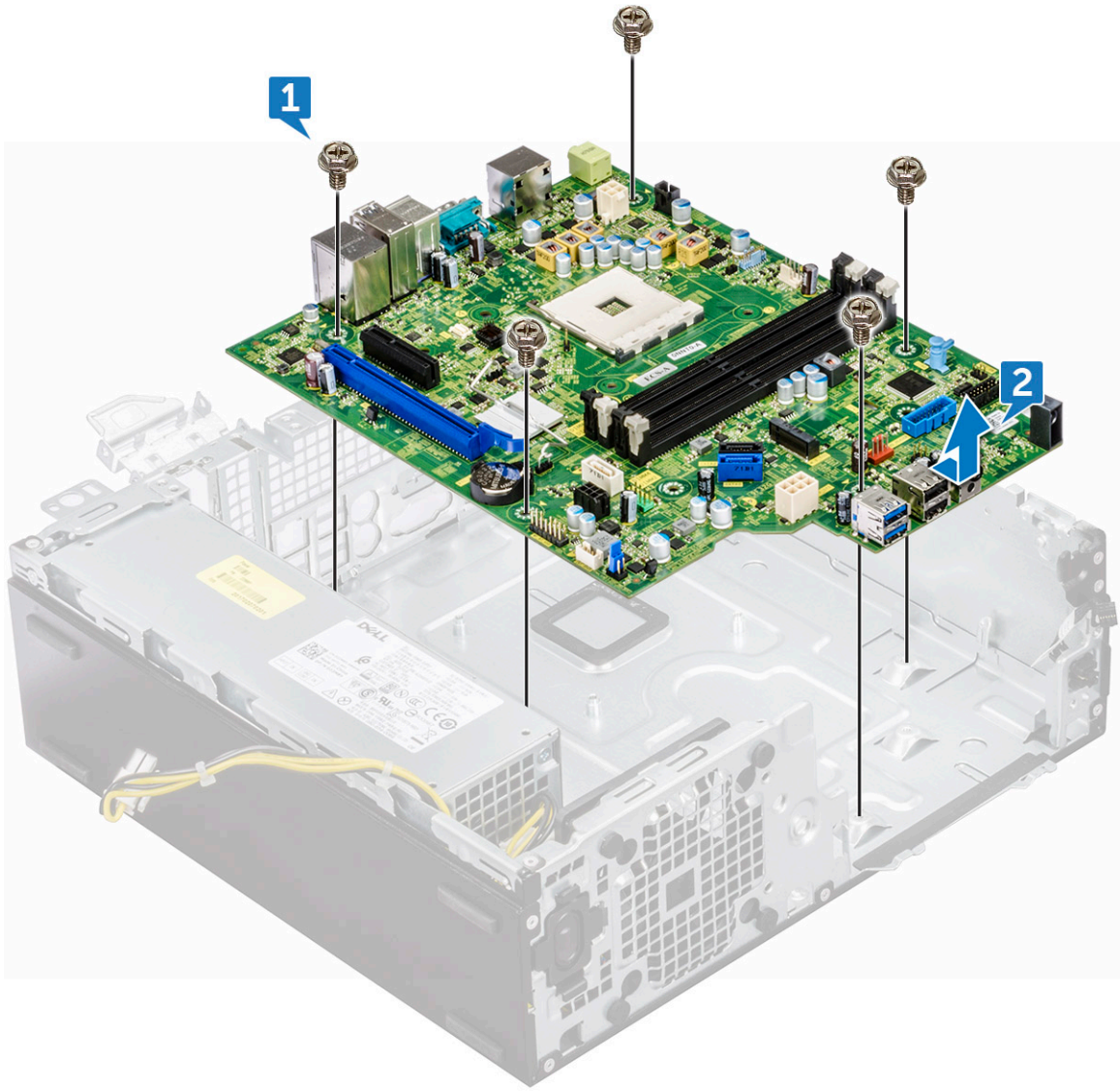
b Slide and push toward the front from the computer [2].



6 To remove the system board:

a Remove the screws (12 lbs) that secure the system board to the computer

b Slide and lift the system board away from the computer [2].



Installing the system board

1 Hold the system board by its edges and align it toward the back of the computer.
2 Lower the system board into the chassis until the connectors at the back of the system board.
3 Align with the slots on the chassis, and the screw holes on the system board align with the standoffs on the computer.
4 Replace the screws (12 lbs) to secure the system board to the computer.
5 Route all the cables through the routing clips.
6 Align the cables with the pins on connectors on the system board and connect the following cables to the system board:
   a intrusion switch
   b optical drive
   c hard drive
   d PSU
   e power switch
   f power distribution for optical drive and hard drive
7 Install the:
   a expansion card

b memory module
c heat sink assembly
d SD card
e M.2 PCIe SSD
f processor
g cooling shroud
h optical drive
i 2.5 inch hard drive assembly
j front bezel
k cover

8 Follow the procedure in After working inside your computer.

4

Technology and components

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

Topics:

AMD PT B350

AMD B350

- Chipset is perfect for power-users who value flexibility and overclocking control, but don't need the maximum PCIe bandwidth required by multi-GPU configurations.
- AMD Socket AM4 represents the company's new future-proof platform targeting the fastest DDR4 memory.
- With processor-direct SATA and USB connectivity, configurable for real-world flexibility, the new AM4 platform takes advantage of the leading-edge features

Specification

Table 1. Specification

Specification	Details
PCI Express Gen3 Graphics	1x16(AMD Ryzen™)1x8 (A-Series/AMD Athlon™)
USB 3.1 G2 + 3.1 G1 + 2.0	2+6+6
SATA + NVMe	4 + x2 NVMe (or 2 SATA 1 x4 NVMe on AMD Ryzen™ Processor).
SATA Express* (SATA & GPP PCIe G3*)	1
PCI Express® GP	x6 Gen2 (plus x2 PCIe Gen3 when no x4 NVMe)
SATA RAID	0,1,10
Dual PCI Express® slots	No
Over-clocking	Unlocked

AMD Radeon R7 M450

- The first graph shows the relative performance of the video card compared to the 10 other common video cards in terms of PassMark G3D Mark.

Key Specifications

The following table contains the key specifications of the AMD Radeon R7 M450:

Table 2. Key Specifications

Specification	AMD Radeon R7 M450
Product Line	AMD
API Supported	DirectX 12 , OpenCL 1.2 , OpenGL 4.3
Clock Speed	925 MHz
Bus Width	128-bit
Memory Clock Speed	1.125 GHz
Technology	DDR3 SDRAM
Max External Resolution	1920 x 1080
Interface Type	PCI Express 3.0 x16

AMD Radeon R5 M430

The AMD Radeon R5 M430 is an entry level graphics card for laptops. It is based on the older Radeon R5 M330 / M335 or R7 M340.

Key Specifications

The following table contains the key specifications of the AMD Radeon R5 M430:

Table 3. Key Specifications

Specification	AMD Radeon R5 M430
Radeon R5 M400 Series	Radeon R5 M430
Codename	Sun XT
Architecture	GCN
Pipelines	320 - unified
Memory Bus Width	64 Bit
Shared Memory	No
Technology	28 nm
DirectX	DirectX 12

USB features

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

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

Table 4. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 3.0/USB 3.1 Gen 2	5 Gbps	Super Speed	2010
USB 2.0	480 Mbps	High Speed	2000

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 3.1 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

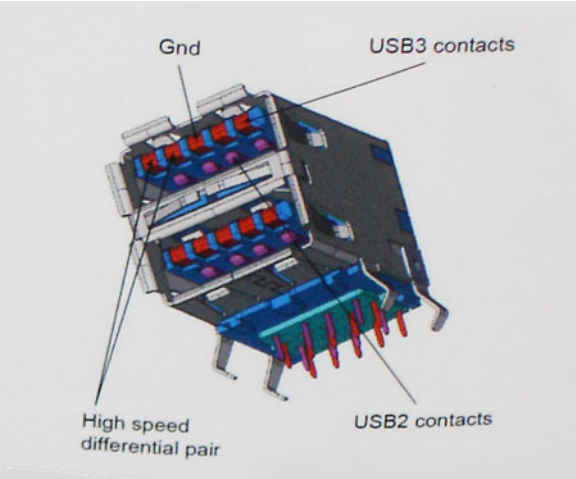
The topics below cover some of the most commonly asked questions regarding USB 3.1 Gen 1.

Speed

Currently, there are 3 speed modes defined by the latest 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 3.1 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 3.1 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 3.1 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 3.1 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 3.1 Gen 1 is a 10x improvement over USB 2.0.

Applications

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 3.1 Gen 1 products:

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

Compatibility

The good news is that 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 3.1 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 3.1 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 3.1 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 3.1 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 3.1 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.

DDR4

DDR4 (double data rate fourth generation) memory is a higher-speed successor to the DDR2 and DDR3 technologies and allows up to 512 GB in capacity, compared to the DDR3's maximum of 128 GB per DIMM. DDR4 synchronous dynamic random-access memory is keyed differently from both SDRAM and DDR to prevent the user from installing the wrong type of memory into the system.

DDR4 needs 20 percent less or just 1.2 volts, compared to DDR3 which requires 1.5 volts of electrical power to operate. DDR4 also supports a new, deep power-down mode that allows the host device to go into standby without needing to refresh its memory. Deep power-down mode is expected to reduce standby power consumption by 40 to 50 percent.

DDR4 Details

There are subtle differences between DDR3 and DDR4 memory modules, as listed below.

Key notch difference

The key notch on a DDR4 module is in a different location from the key notch on a DDR3 module. Both notches are on the insertion edge but the notch location on the DDR4 is slightly different, to prevent the module from being installed into an incompatible board or platform.

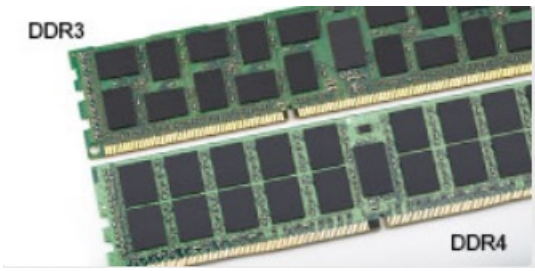


Figure 1. Notch difference

Increased thickness

DDR4 modules are slightly thicker than DDR3, to accommodate more signal layers.

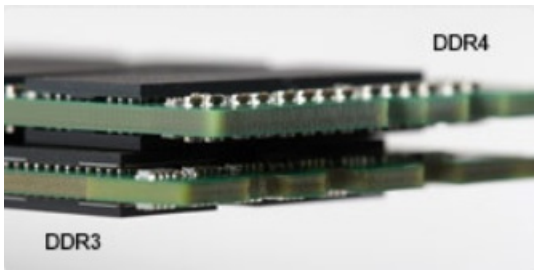


Figure 2. Thickness difference

Curved edge

DDR4 modules feature a curved edge to help with insertion and alleviate stress on the PCB during memory installation.

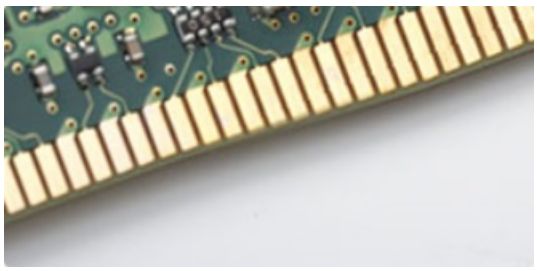


Figure 3. Curved edge

Memory Errors

Memory errors on the system display the new ON-FLASH-FLASH or ON-FLASH-ON failure code. If all memory fails, the LCD does not turn on. Troubleshoot for possible memory failure by trying known good memory modules in the memory connectors on the bottom of the system or under the keyboard, as in some portable systems.

5

System setup

System setup enables you to manage your tabletdesktopnotebook 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:

BIOS Overview

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
- UEFI Boot:
  - Windows Boot Manager
- Other Options:
  - BIOS Setup
  - BIOS Flash Update
  - Diagnostics
  - Change Boot Mode Settings

System Setup options

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

Table 5. General

Option	Description
System Information	Displays the following information: • System Information: Displays **BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, Express Service Code** and the **Singed Firmware Update**. • Memory Information: Displays **Memory Installed, Memory Available, Memory Speed, Memory Channel Mode, Memory Technology, DIMM 1 Size, DIMM 2 Size, DIMM 3 Size** and **DIMM 4 Size**. • PCI Information: Displays SLOT1_M.2, SLOT2_M.2 • Processor Information: Displays **Processor Type, Core Count, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable,** and **64-Bit Technology.** • Device Information: Displays **LOM MAC Address, Video Controller, Audio Controller**.

Boot Sequence	• Boot Mode
	• Boot List option:
	  • Legacy
	  • UEFI (Default)
	• Enable Boot Devices
	• Boot Sequence
	  • Add Boot Option
	  • Remove Boot Option
	  • View Boot Option

Advanced Boot Options	Allows you to select the Enable Legacy Option ROMs option. By default, this option is selected. • Enabled(selected by default) • Disabled
BIOS Setup Advanced Mode	Allows you to select BIOS Setup Advanced Mode. By default, this option is selected. • Enabled(selected by default) • Disabled
Date/Time	Allows you to set the date and time settings. Changes to the system date and time take effect immediately.

Table 6. System Configuration

Option	Description
Integrated NIC	Allows you to control the on-board LAN controller. The option 'Enable UEFI Network Stack' is not selected by default. The options are: • Disabled • Enabled • Enabled w/PXE (default) **NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not appear.**
Serial Port	The options are: • COM1 (Enabled by default) • COM2 (Disabled by default) • COM3 (Disabled by default)

Option	Description
	• COM4 (Disabled by default)
SATA Operation	Allows you to configure the operating mode of the integrated hard drive controller. • Disabled = The SATA controllers are hidden • AHCI (Enabled by default) • RAID ON = SATA is configured to support RAID mode (Disabled by default)
Drives	Allows you to enable or disable the various drives on-board: • SATA-0 (enabled by default) • SATA-1 • SATA-2 • SATA-3 • M.2 PCIe SSD-0
Smart Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. The **Enable Smart Reporting option** is disabled by default.
USB Configuration	Allows you to enable or disable the integrated USB controller for: • Enable Boot Support • Enable Front USB Ports • Enable Rear USB Ports All the options are enabled by default.
USB PowerShare	This option allows you to charge the external devices, such as mobile phones, music player. This option is disabled by default.
Audio	Allows you to enable or disable the integrated audio controller. The option **Enable Audio** is selected by default. • Enable Microphone • Enable Audio • Enable Internal Speaker The options are selected by default.
Miscellaneous Devices	Allows you to enable or disable the Miscellaneous Devices. The option are • Enable Secure Digital (SD) Card (Enabled by default) • Secure Digital (SD) Card Read-Only mode

Table 7. Video

Option	Description
Multi-Display	The option is selected by default.
Primary Display	Allows you to select the primary display when multiple controllers are available in the system. • Auto (default) • Integrated Graphics **NOTE: If you do not select Auto, the on-board graphics device will be present and enabled.**

Table 8. Security

Option	Description
Admin Password	Allows you to set, change, and delete the admin password.
System Password	Allows you to set, change, and delete the system password.
Internal HDD-0 Password	Allows you to set, change, and delete the computer's internal HDD.
Internal HDD-1 Password	Allows you to set, change, and delete the computer's internal HDD.
Internal HDD-2 Password	Allows you to set, change, and delete the computer's internal HDD.
Strong Password	This option lets you enable or disable strong passwords for the system.
Password Configuration	Allows you to control the minimum and maximum number of characters allowed for a administrative password and the system password. The range of characters is between 4 and 32.
Password Change	This option lets you determine whether changes to the System and Hard Disk passwords are permitted when an administrator password is set. **Allow Non-Admin Password Changes** - This option is enabled by default.
UEFI Capsule Firmware Updates	This option controls whether this system allows BIOS updates via UEFI capsule update packages. This option is selected by default. Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS)

TPM 2.0 Security	Allows you to control whether the Trusted Platform Module (TPM) is visible to the operating system.
	• TPM On (default)
	  • PPI Bypass for Enable Commands
	  • PPI Bypass for Disable Commands
	  • PPI Bypass for Clear Commands
	  • Attestation Enable (default)
	  • Key Storage Enable (default)
	  • SHA-256 (default)
	• Clear
	• TPM State
	  • Disable
	  • Enable (default)

Computrace	This field lets you Activate or Disable the BIOS module interface of the optional Computrace Service from Absolute Software. Enables or disables the optional Computrace service designed for asset management. • **Deactivate** - This option is selected by default. • Disable • Activate
Chassis Intrusion	The options are: • Disable (default) • Enable • On-Silent
Admin Setup Lockout	Allows you to enable or disable the option to enter Setup when an Administrative password is set. This option is not set by default.

Table 9. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable Secure Boot feature

Option	Description
	• Disable (selected by default) • Enable
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 (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 Key**s- Deletes all the keys **NOTE: If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.**

Table 10. Performance

Option	Description
C States Control	Allows you to enable or disable additional processor sleep states. This option is enabled by default.
AMD TurboCore Technology	This options is disable by default.

Table 11. 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: • 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. **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. • Disabled • Enabled in S5 only • Enabled in S4 and S5 This option is Enabled in S4 and S5 by default.

Option	Description
Fan Control Override	Allows you to determine the speed of the system fan. When this option is enabled, the system fan runs at the maximum speed. This option is disabled by default.
USB Wake Support	Allows you to enable the USB devices to wake the computer from standby mode. The option "Enable USB Wake Support" is selected by default
Wake on LAN/WWAN	This option allows the computer to power up from the off state when triggered by a special LAN signal. This feature only works when the computer is connected to AC power supply. • **Disabled** - Does not allows the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN. • **LAN** - Allows the system to be powered on by special LAN signals. • **WLAN Only** - Allows the system to be powered on by special WLAN signals. • **LAN or WLAN**- Allows the system to be powered on by special LAN signals or WLAN signals. • **LAN with PXE Boot** - A wakeup packet sent to the system in either the S4 or S5 state, that will cause the system to wake-up and immediately boot to PXE. This option is Disabled by default.
Block Sleep	Allows you to block entering to sleep (S3 state) in OS environment. This option is disabled by default.

Table 12. 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.
Warnings and Errors	This option can speed up the boot process by bypassing some compatibility steps: • Prompt on Warnings and Errors (enabled by default) • Continue on Warnings • Continue on Warnings and Errors
Extend BIOS POST Time	The options are: • 0 seconds (default) • 5 seconds • 10 seconds
Full Screen Logo	This options is disabled by default.

Table 13. Virtualization Support

Option	Description
AMD-V Technology	This option is enabled by default.
AMD-VI Technology	This option is enabled by default.

Table 14. 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 set by default.

Option	Description
SERR Messages	Controls the SERR message mechanism. This option is set by default. Some graphics cards require that the SERR message mechanism be disabled.
Dell Development Configuration	This options is disabled by default.
BIOS Downgrade	Allows you to control flashing of the system firmware to the previous versions. This option is enabled by default. **NOTE: If this option is not selected, the flashing of the system firmware to the previous versions is blocked.**
Data Wipe	Allows you to securely erase the data from all the available internal storages, such as HDD, SSD, mSATA, and eMMC. The option Wipe on Next Boot is disabled by default.
BIOS recovery	Allows you to recover the corrupted BIOS conditions from the recovery files on the primary hard drive. The option **BIOS Recovery from Hard Drive**is selected by default

Table 15. System Logs

Option	Description
BIOS Events	Displays the system event log and allows you to: • Clear Log • Mark all Entries

Table 16. SupportAssist System Resolution

Option	Description
Auto OS Recovery Threshold	Options are: OFF, 1, 2 (default), 3.

Specifications

NOTE: Offerings may vary by region. For more information regarding the configuration of your computer in:

- Windows 10, click or tap **Start** > **Settings** > **System** > **About**.

Table 17. Chipset

Feature	Specification
Chipset	AMD PT B350 Chipset

Table 18. Memory

Feature	Specification
Memory type	DDR4
Memory speed	Up to 2400 MHz
Memory connectors	Four DIMM slots
Memory capacity	Up to 64 GB
Minimum memory	2 GB (Linux OS only)

Feature	Specification
Maximum memory	64 GB

Table 19. Video

Feature	Specification
Integrated (A Series APU only)	AMD Graphics [with Radeon R7 PRO A12-9800, A10-9700, A8-9600, A6-9500]
Optional	• 1 GB AMD Radeon R5 430 • 2 GB AMD Radeon R5 430 • 4 GB AMD Radeon R7 450

Table 20. Audio

Feature	Specification
Integrated	Realtek HDA Codec ALC3234

Table 21. Network

Feature	Specification
Integrated	BCM5762B0KMLG Broadcom ethernet controller

Table 22. Expansion bus

Feature	Specification
Bus type	USB 2.0, USB 3.1 Gen1, SATA 3, and PCIe up to Gen 3
Bus speed	• USB 2.0 – 480 Mbps • USB 3.1 Gen1 – 5 Gbps • SATA 3.0 – 6 Gbps • PCIe – 8 Gbps

Table 23. Cards

Feature	Specification
WLAN card	• Intel Wireless-AC 8265 2x2 • Intel Wireless-AC 3165 1x1 • Bluetooth 4.1 **NOTE: For optimal performance, it is recommended to use the wireless display feature with an access point that supports 5 GHz standard.**

Table 24. Drives

Feature	Specification
Internally accessible	• 2.5-inch SATA drive bay • 3.5-inch SATA drive bay

Feature	Specification
	• M.2 SATA & NVMe

Table 25. External connectors

Feature	Specification
Audio	
Front panel Rear panel	• Universal headset • Line out connector
Network adapter	RJ-45 connector
Serial	PS2 and serial connector
USB 2.0	• Front - 2 • Back - 2 • Internal -2
USB 3.1 Gen1	• Front - 2 • Back - 4 • Internal -0
Video	• 15-pin VGA connector (optional only support with A-Series APU) • DisplayPort 1.2 (optional 2*DP only support with A-Series APU)

NOTE: Available video connectors may vary based on the optional graphic board selected.

Table 26. Controls and lights

Feature	Specification
Front of the computer	
Power button light	White light — Solid white light indicates power-on state; slow blinking white light indicates sleep state of the computer.
Drive activity light	White light — Slow blinking white light indicates that the computer is reading data from or writing data to the hard drive.
Back of the computer	
Link integrity light on integrated network adapter	Green — A 10 Mbps connection exists between the network and the computer. Green — A 100 Mbps connection exists between the network and the computer. Orange — A 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 breathing 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.

Table 27. Power

Feature	Specification
Wattage	240W
AC input voltage range	90 - 264Vac
AC input current (low ac range / high ac range)	4 A/ 2 A
AC input frequency	47 HZ/ 63 HZ
Coin cell battery	3 V CR2032 lithium-coin-cell

Table 28. Physical dimension

Physical	Small Form Factor
Height	29 cm (11.42 inches)
Width	9.26 cm(3.65 inches)
Depth	29.2 cm (11.50 inches)
Weight	5.26 kgs (11.57 lbs)

Table 29. Environmental

Feature	Specification
Temperature range	
Operating	5°C to 35°C (41°F to 95°F)
Non-Operating	–40°C to 65°C (–40°F to 149°F)
Relative humidity (maximum)	
Operating	20% to 80% (non condensing)
Non-Operating	5% to 95% (non condensing)
Maximum vibration	
Operating	0.66 Grms
Non-Operating	1.37 Grms
Maximum shock	
Operating	40 G
Non-Operating	105 G
Altitude	
Operating	–15.2 m to 3048 m (–50 to 10,000 ft)
Non-Operating	–15.20 m to 10,668 m (–50 ft to 35,000 ft)
Airborne contaminant level	G1 or lower as defined by ANSI/ISA-S71.04-1985

6

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.

NOTE: Regular ePSA's run for about 5 to 10 minutes, however, the extended test takes about three and half hours with only 8GB of ram in the system.