OptiPlex XE3 Small Form Factor

Service Manual

Regulatory Model: D11S
Regulatory Type: D11S004
August 2021
Rev. A01

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.

1

Working on your computer

Topics:

Safety instructions

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

WARNING: Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

WARNING: Disconnect your computer from 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 your computer to an electrical outlet.

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

CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching the pins and the contacts.

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

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: When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the ports and the connectors are correctly oriented and aligned.

CAUTION: Press and eject any installed card from the media-card reader.

CAUTION: Exercise caution when handling Lithium-ion batteries in laptops. Swollen batteries should not be used and should be replaced and disposed properly.

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

Before working inside your computer

1. Save and close all open files and exit all open applications.
2. Shut down your computer. Click **Start** > **Power** > **Shut down**.

   NOTE: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.

3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
5. Remove any media card and optical disc from your computer, if applicable.
6. After the computer is unplugged, press and hold the power button for 5 seconds to ground the system board.

   CAUTION: Place the computer on a flat, soft, and clean surface to avoid scratches on the display.

7. Place the computer face down.

Safety precautions

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

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

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

Bonding

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

Electrostatic discharge—ESD protection

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

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

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

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

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

Perform the following steps to prevent ESD damage:

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

- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

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

Components of an ESD field service kit

The components of an ESD field service kit are:

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

ESD protection summary

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

Transporting sensitive components

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

Lifting equipment

Adhere to the following guidelines when lifting heavy weight equipment:

CAUTION: Do not lift greater than 50 pounds. Always obtain additional resources or use a mechanical lifting device.

1. Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.
2. Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
3. Lift with your legs, not your back.
4. Keep the load close. The closer it is to your spine, the less force it exerts on your back.
5. Keep your back upright, whether lifting or setting down the load. Do not add the weight of your body to the load. Avoid twisting your body and back.
6. Follow the same techniques in reverse to set the load down.

After working inside your computer

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

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

2

Disassembly and reassembly

Topics:

Side cover

Removing the side cover

1. Follow the procedure in Before working inside your computer.
2. To remove the cover:
   a. Slide the release latch on the back side of your system until it gives a click sound to unlock the side cover [1].
   b. Slide and lift the side cover from the system [2].

Installing the side cover

1. Place the cover on the computer and slide the cover towards the front of the system [1] until it clicks into place [2].

2. Follow the procedure in After working inside your computer

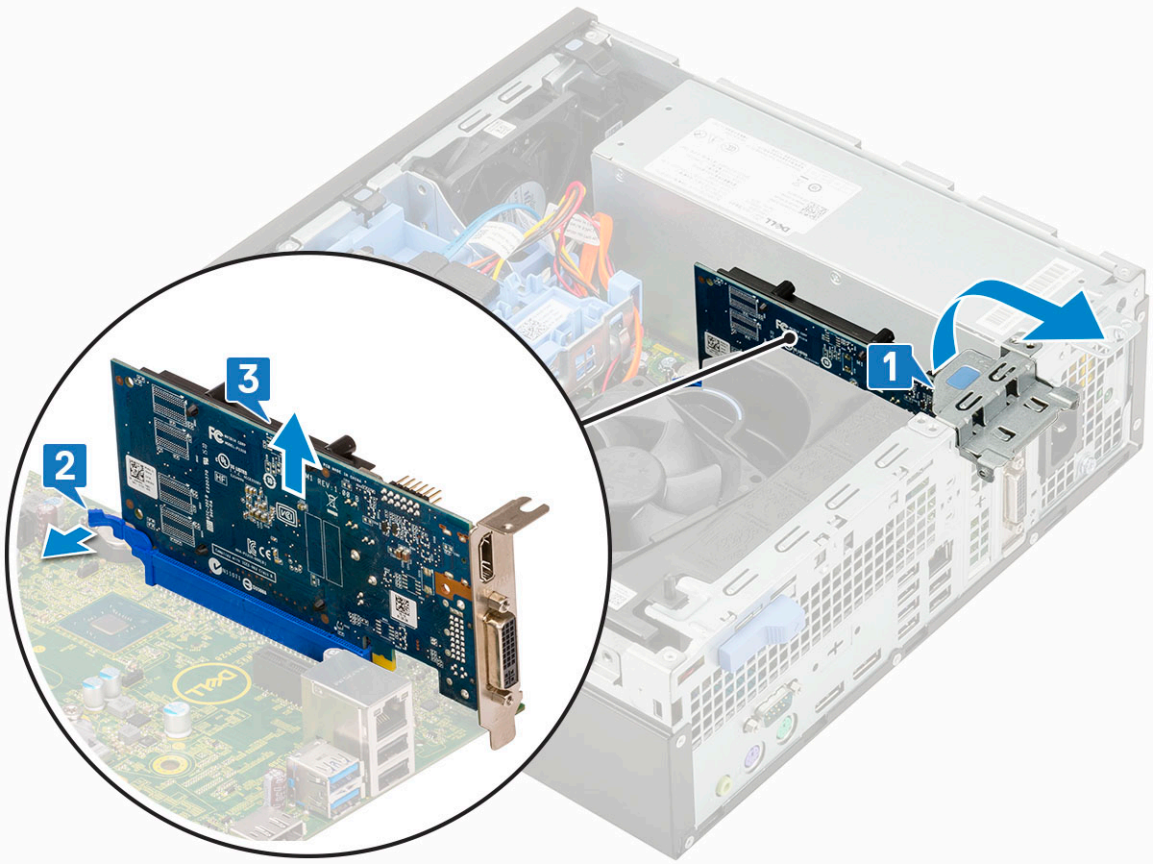
Expansion card

Removing expansion card

1. Follow the procedure in Before working inside your computer.
2. Remove the Side cover.
3. To remove the expansion card:
   a. Pull the metal tab to open the expansion card latch [1].
   b. Pull the release tab at the base of the expansion card [2].

      NOTE: Applies to x16 card slot, x1 card has no release tab.

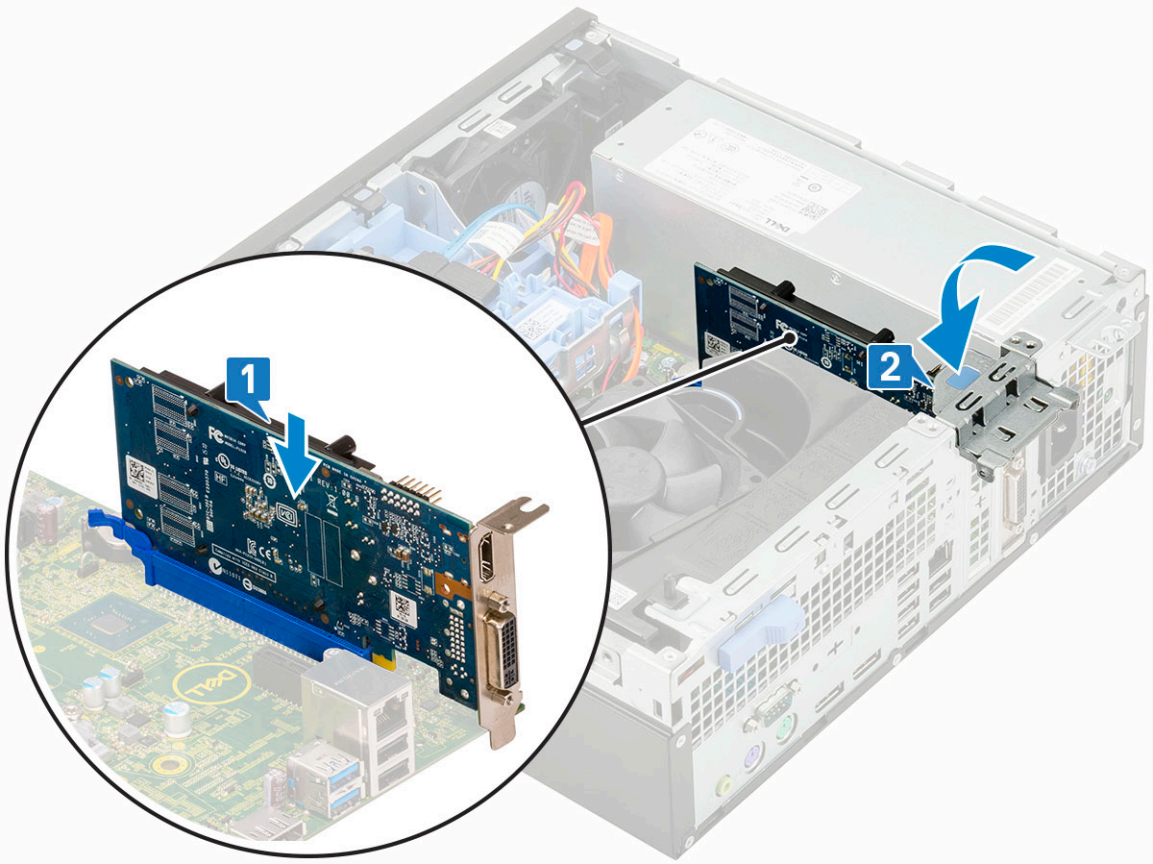
   c. Disconnect and lift the expansion card away from the connector on the system board [3].



Installing the expansion card

1. **NOTE:** To remove the PCIe brackets, push the bracket upwards from the inside of your computer to release it and then lift the bracket away from your computer.

   Insert a screwdriver in the hole of a PCIe bracket and push hard to release the bracket , and then lift the bracket out from your computer.
2. Insert the expansion card into the connector on the system board [1].
3. Press the expansion card until it clicks into place.
4. Close the expansion card latch and press it until it clicks into place [2].



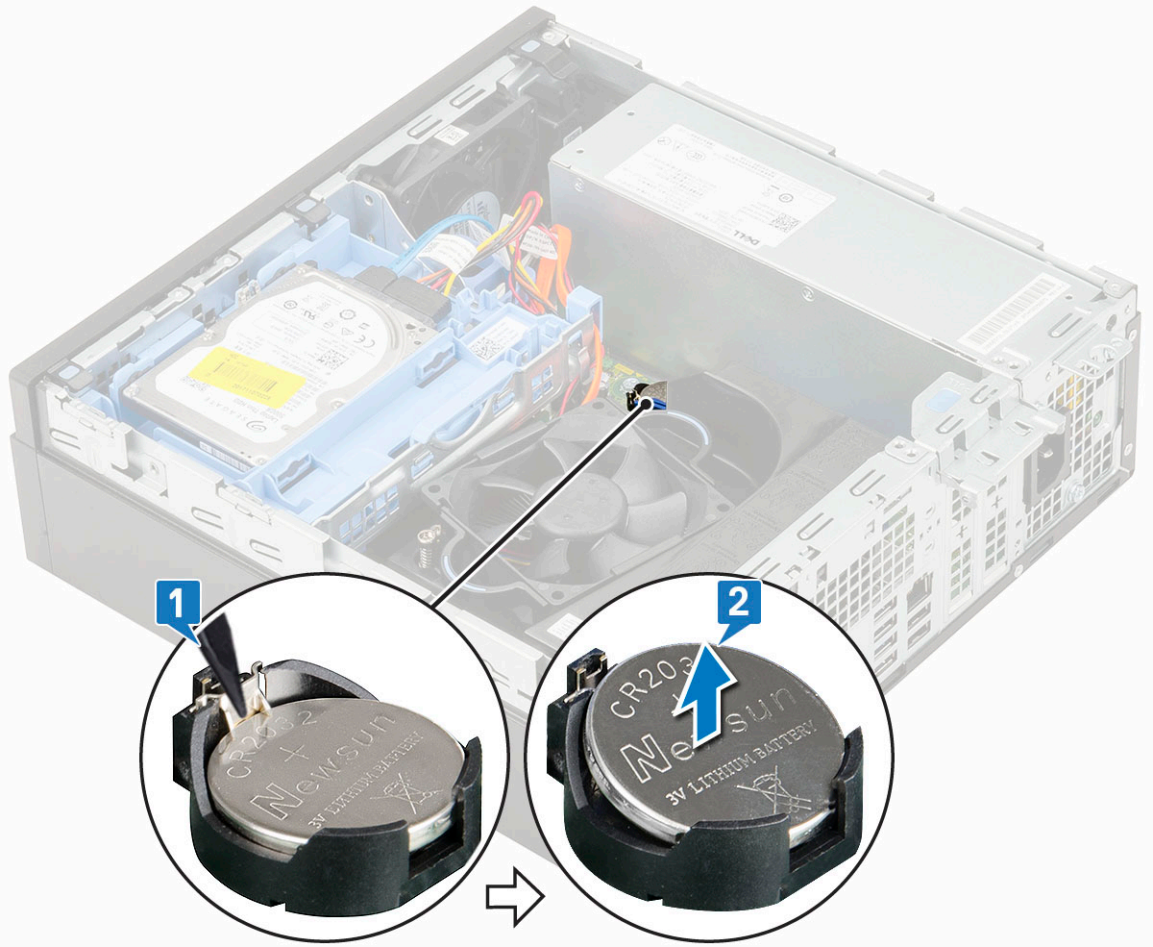
5. Install the Side cover.
6. Follow the procedure in After working inside your computer.

Coin cell battery

Removing coin cell battery

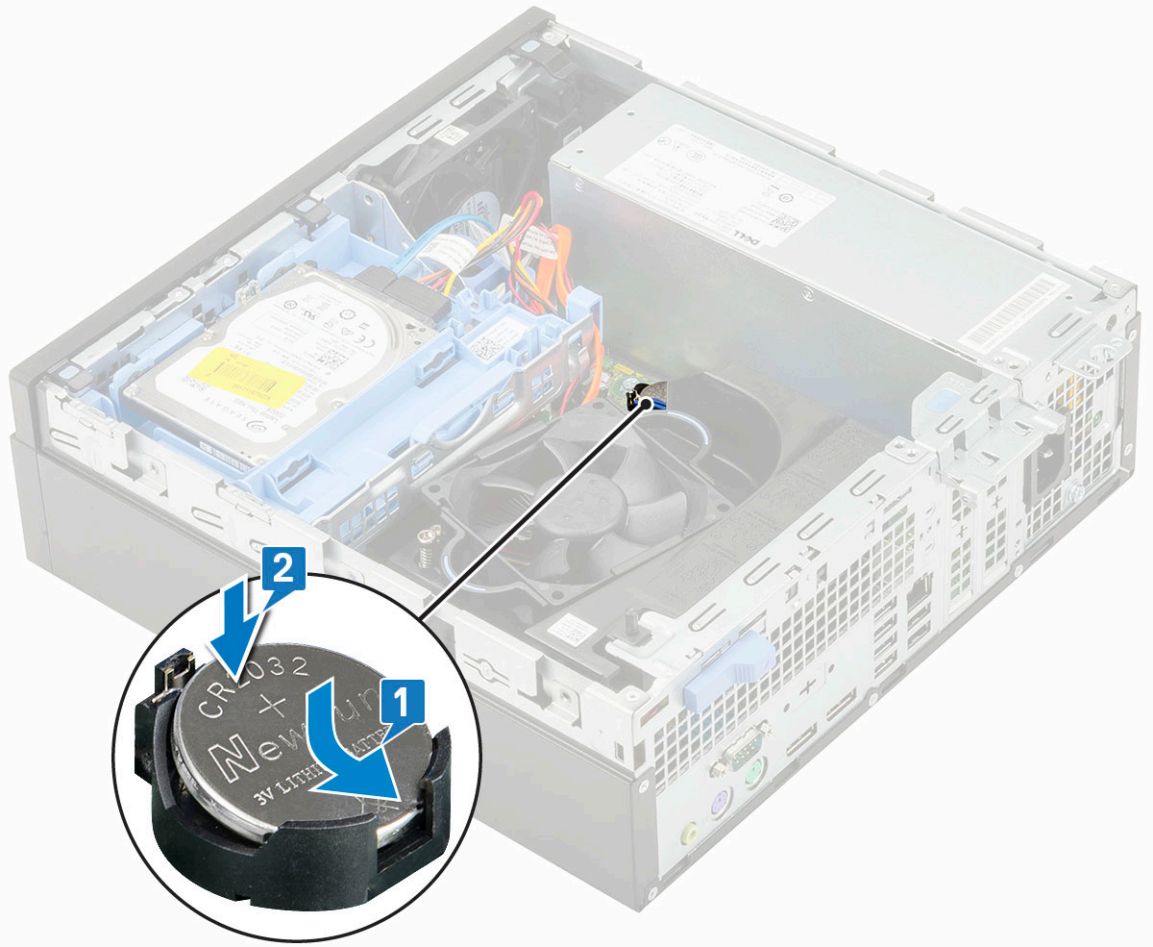
CAUTION: Removing coin cell battery may reset the motherboard.

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. 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 system [2].



Installing the coin cell battery

1. Place the coin cell battery with "+" sign facing up in the slot on the system board [1].
2. Press the battery into the connector until it locks into place [2].

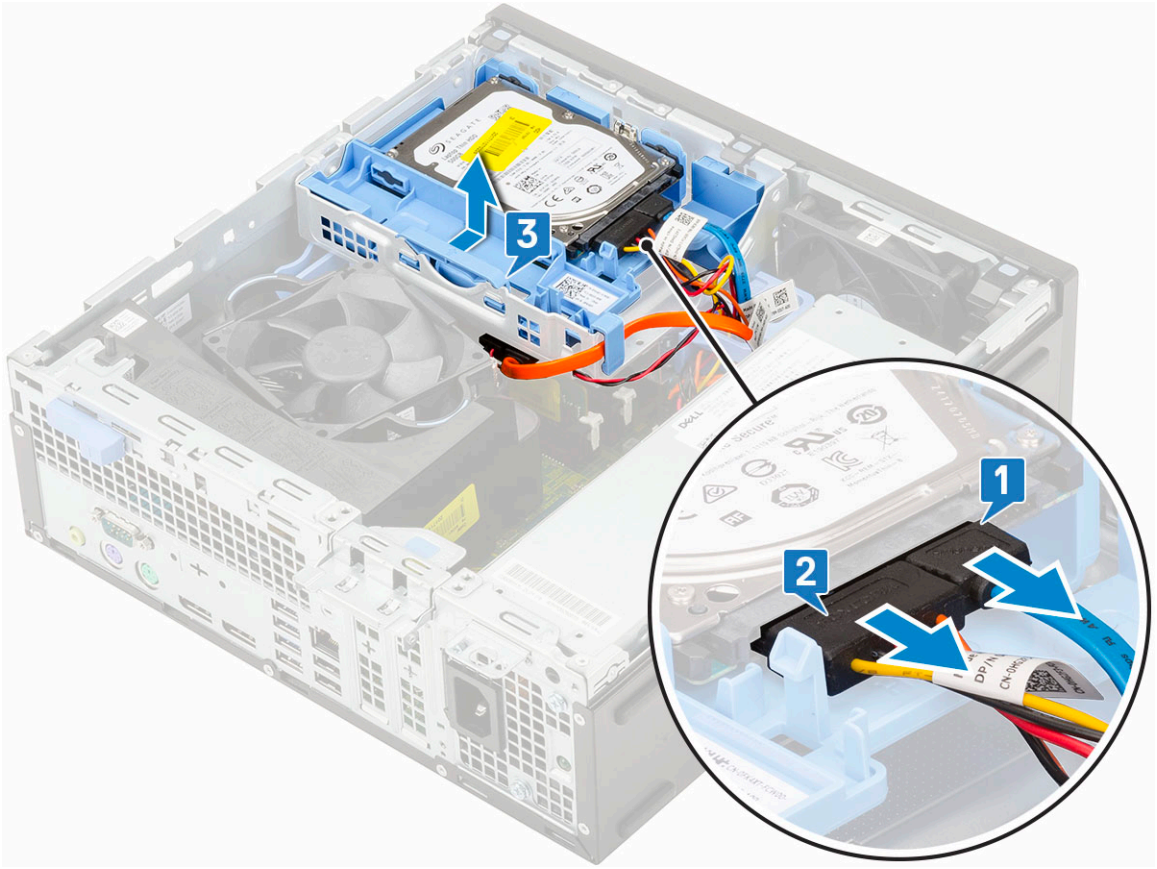


3. Install the:
   a. Expansion cards
   b. Side cover
4. Follow the procedure in After working inside your computer.

ard drive assembly

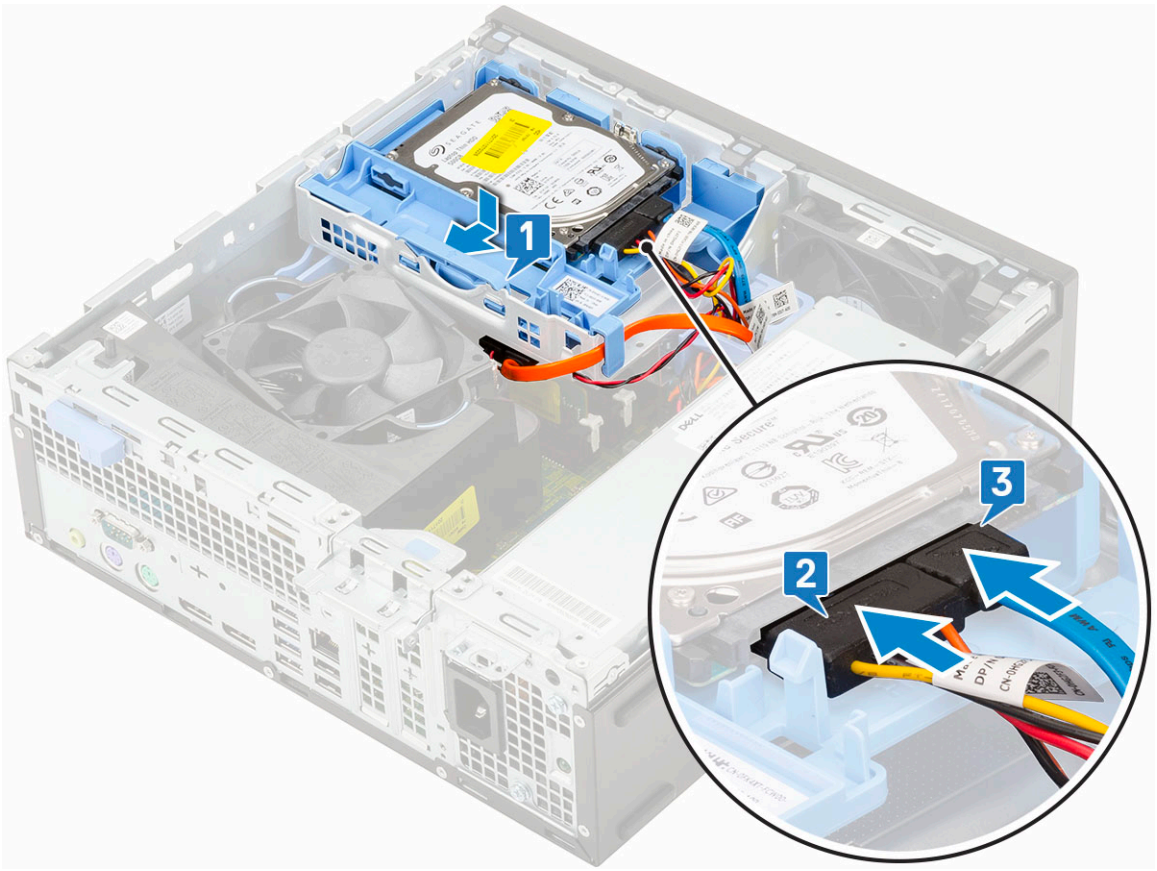
Removing the hard drive assembly

1. Follow the procedure in Before working inside your computer.
2. Remove the Side cover.
3. To remove the hard drive:
   a. Disconnect the hard drive data cable and power cable from the connectors on the hard drive [1, 2].
   b. Push the release tab and lift the hard drive assembly from the system [3].



Installing the hard drive assembly

1. Align the tabs on the hard drive assembly with the slots on the chassis at 30 degree angle .
2. Press the hard drive assembly so that it gets secured to the hard drive and optical drive cage [1].
3. Connect the hard drive data cable and hard drive power cable to the connectors on the hard drive [2,3]

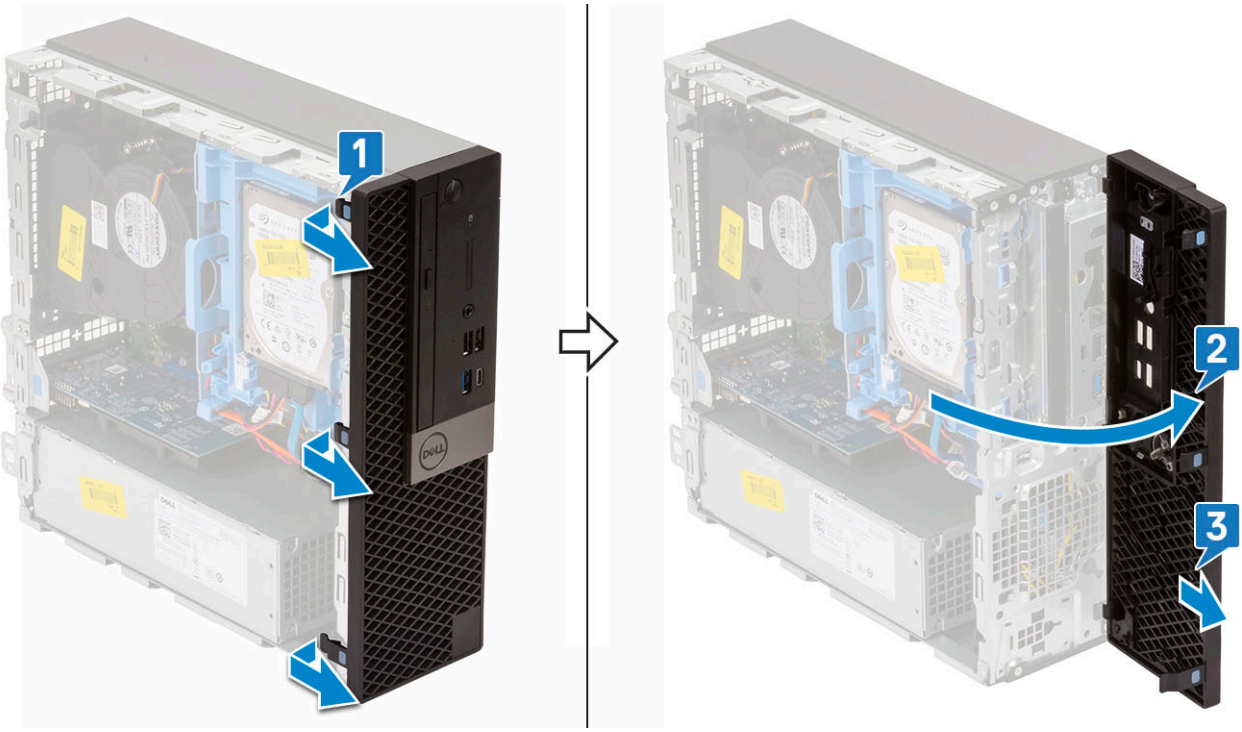


4. Install the Side cover.
5. Follow the procedure in After working inside your computer.

Bezel

Removing front bezel

1. Follow the procedure in Before working inside your computer.
2. Remove the Side cover.
3. To remove the front bezel:
   a. Pry the retention tabs to release the front bezel from the system [1].
   b. Rotate the front bezel away from the computer [2] and pull to release the hooks on the front bezel from the front-panel slots [3].



Installing front bezel

1. Align the bezel and insert the retention tabs on the bezel into the slots on the system.
2. Press the bezel until the tabs clicks into place.

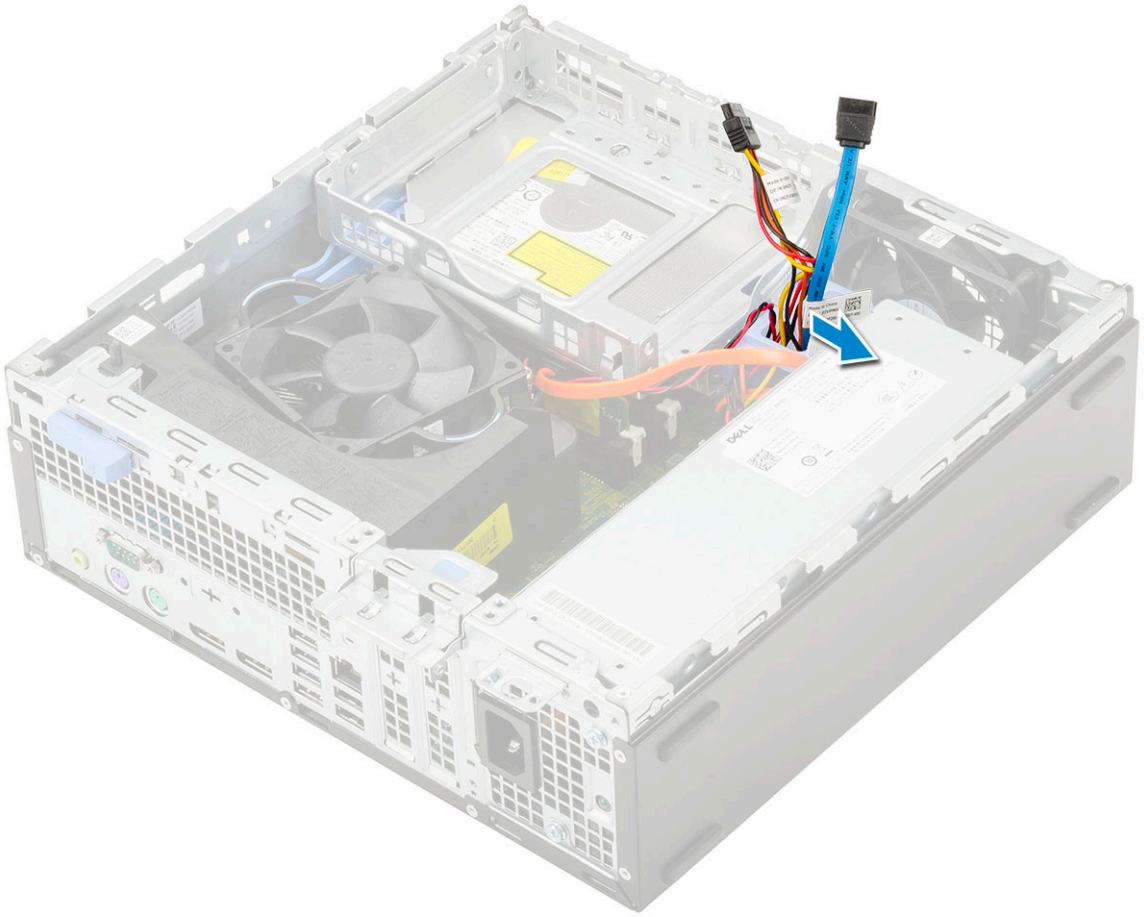
3. Install the Side cover.

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

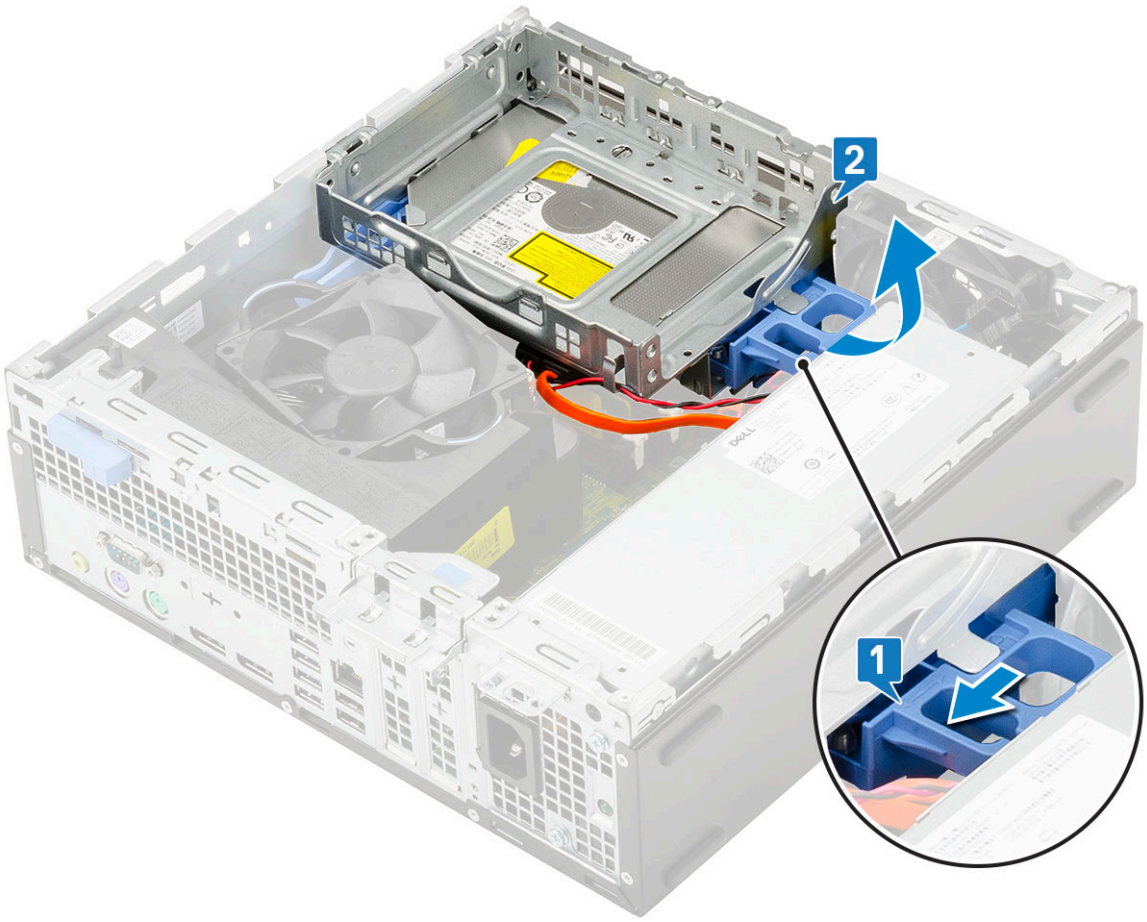
Hard drive and optical drive module

Removing the hard drive and optical drive module

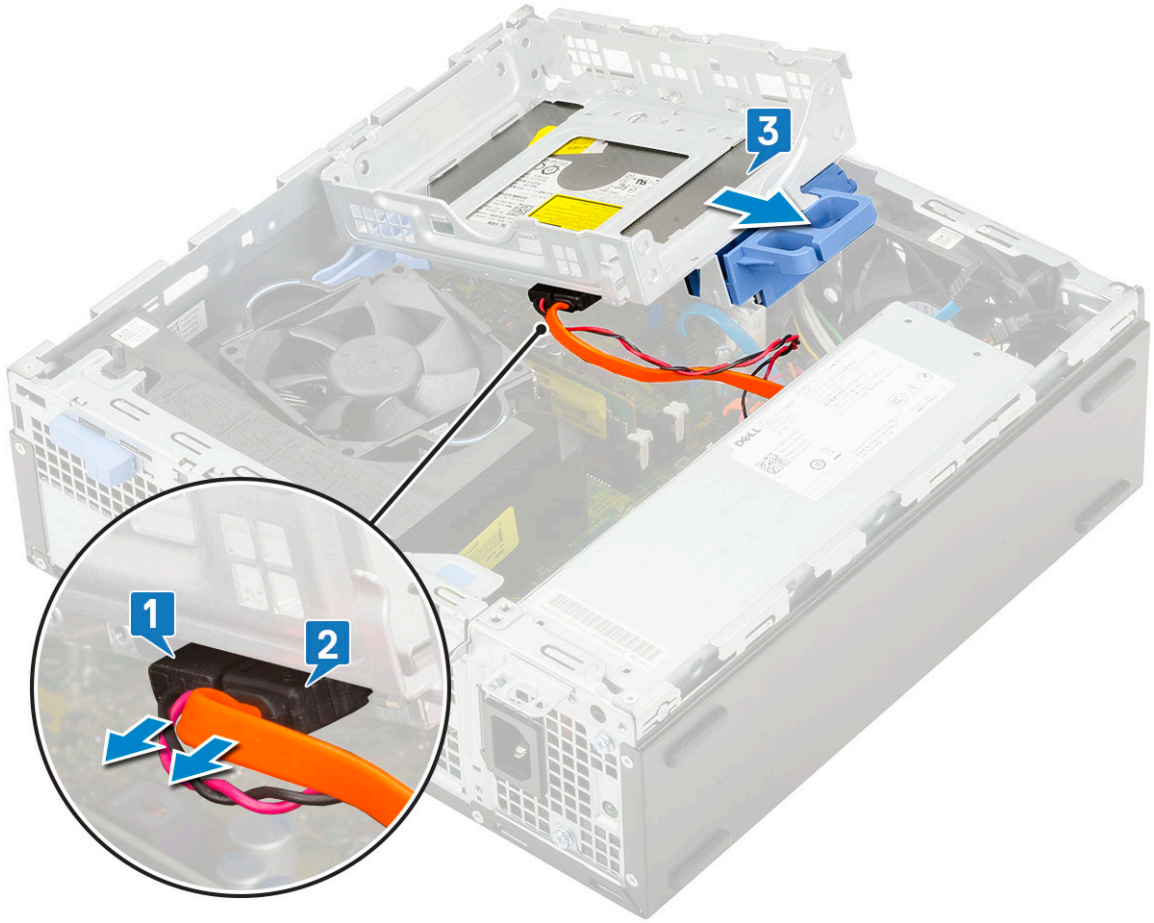
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
3. To release the hard drive and optical drive module:
   a. Unroute the optical drive cables and hard drive cables through the retention clip and HDD-ODD release tab respectively.



   b. Slide the release tab to unlock the hard drive and optical module [1].
   c. Lift the hard drive and optical module [2]

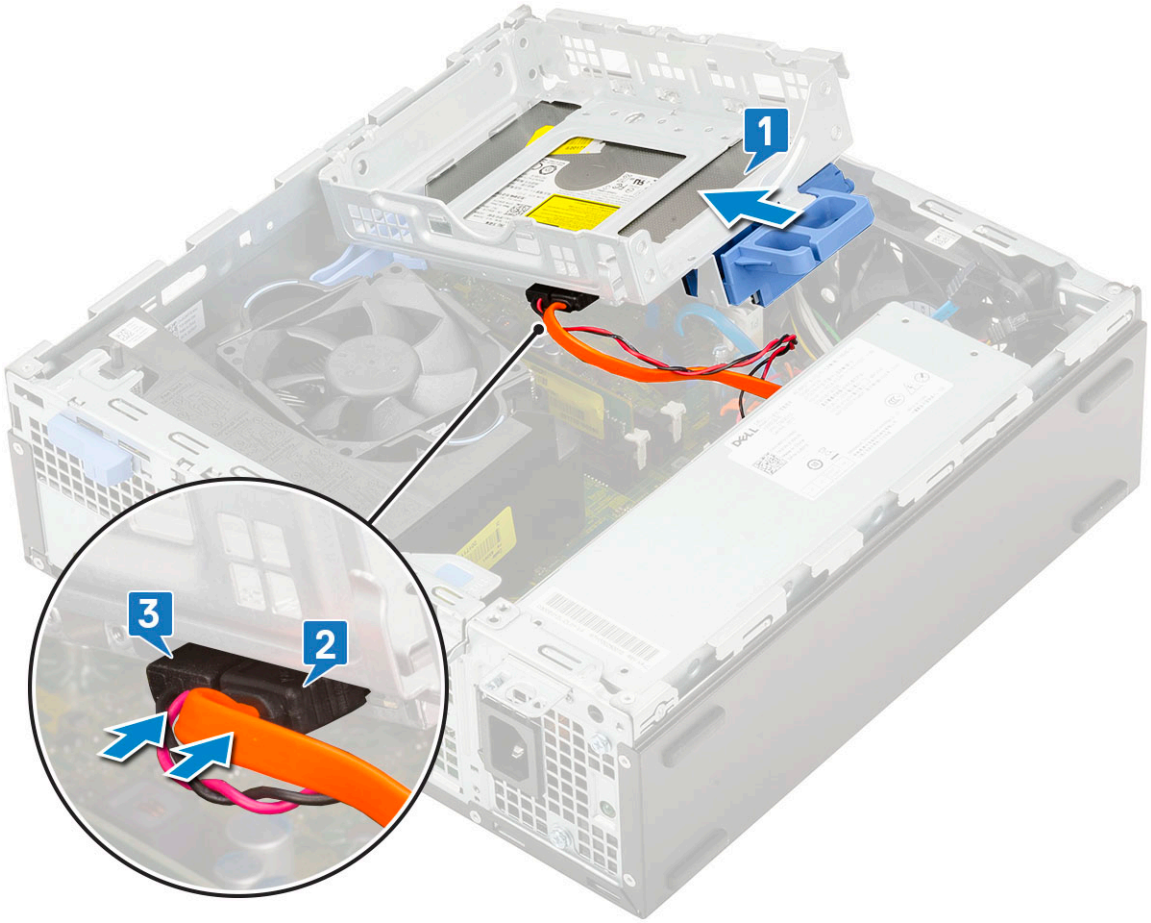


4. To remove the hard drive and optical drive module:
   a. Disconnect the optical drive data cable and optical drive power cable from the connectors on the optical drive [1, 2].
   b. Slide and lift the hard drive and optical drive module from the system [3].

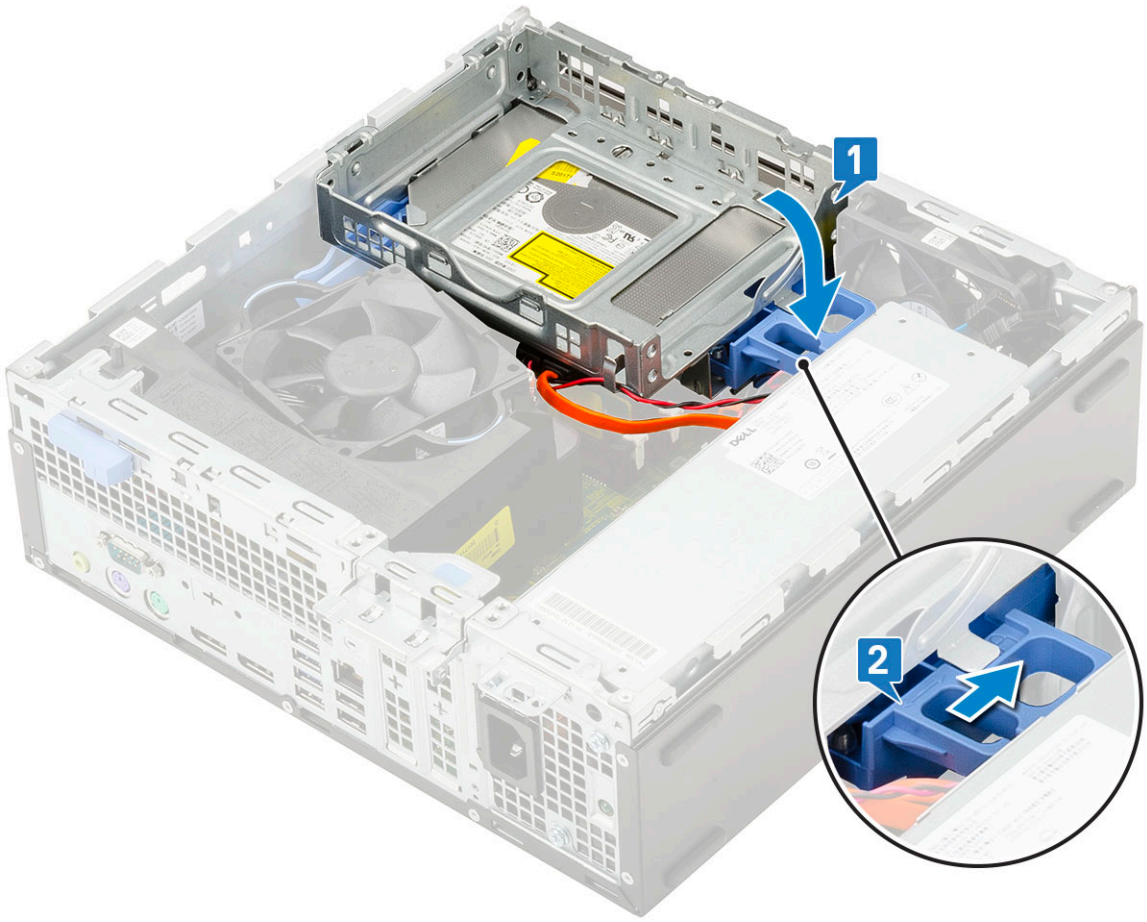


Installing the hard drive and optical drive module

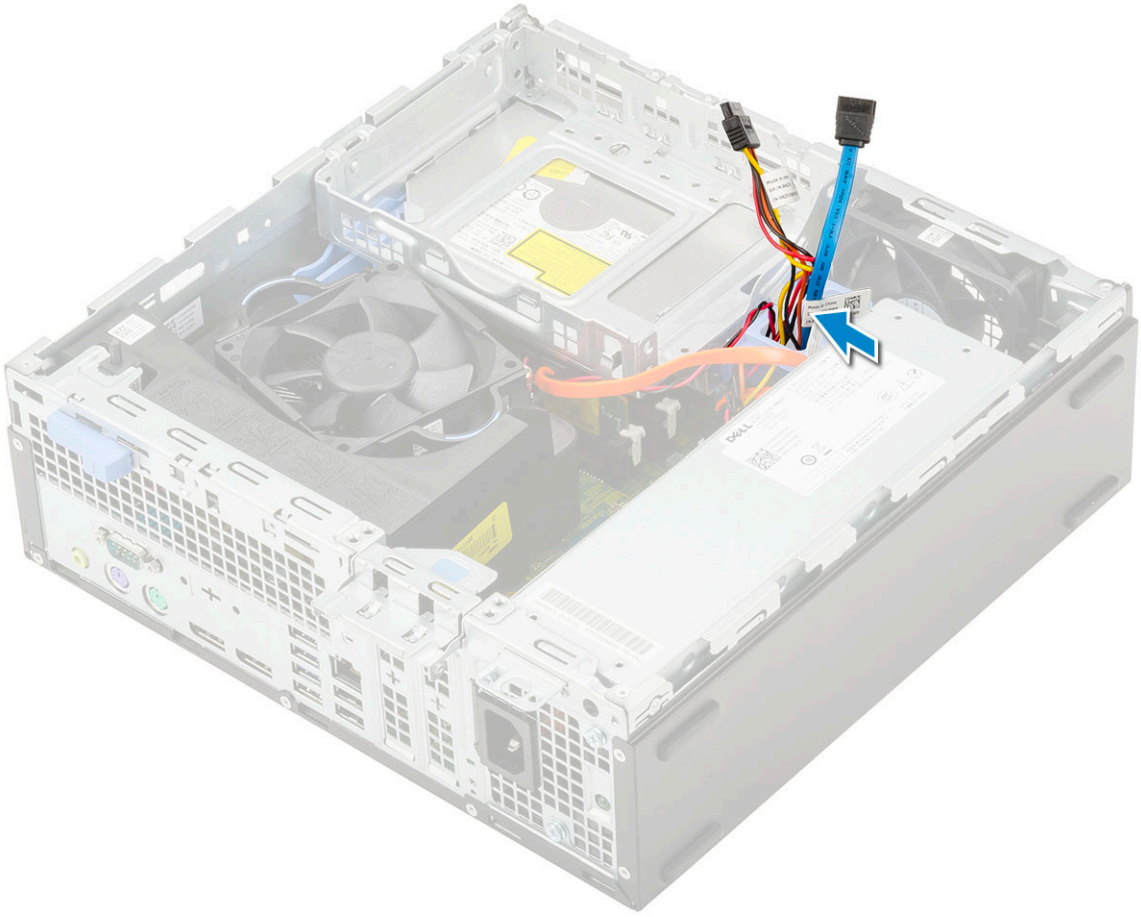
1. Insert the tabs on the hard drive and optical drive module into the slot on the system at 30 degree angle [1].
2. Connect the optical drive data cable and power cable to the connectors on the optical drive [2, 3].



3. Lower the hard drive and optical drive module so that it is placed in its slot [1].
4. Slide the release tab to lock the module [2].



5. Route the hard drive data and power cables through the HDD-ODD release tab .
6. Route the optical drive data cable and power cable through the retention clips .

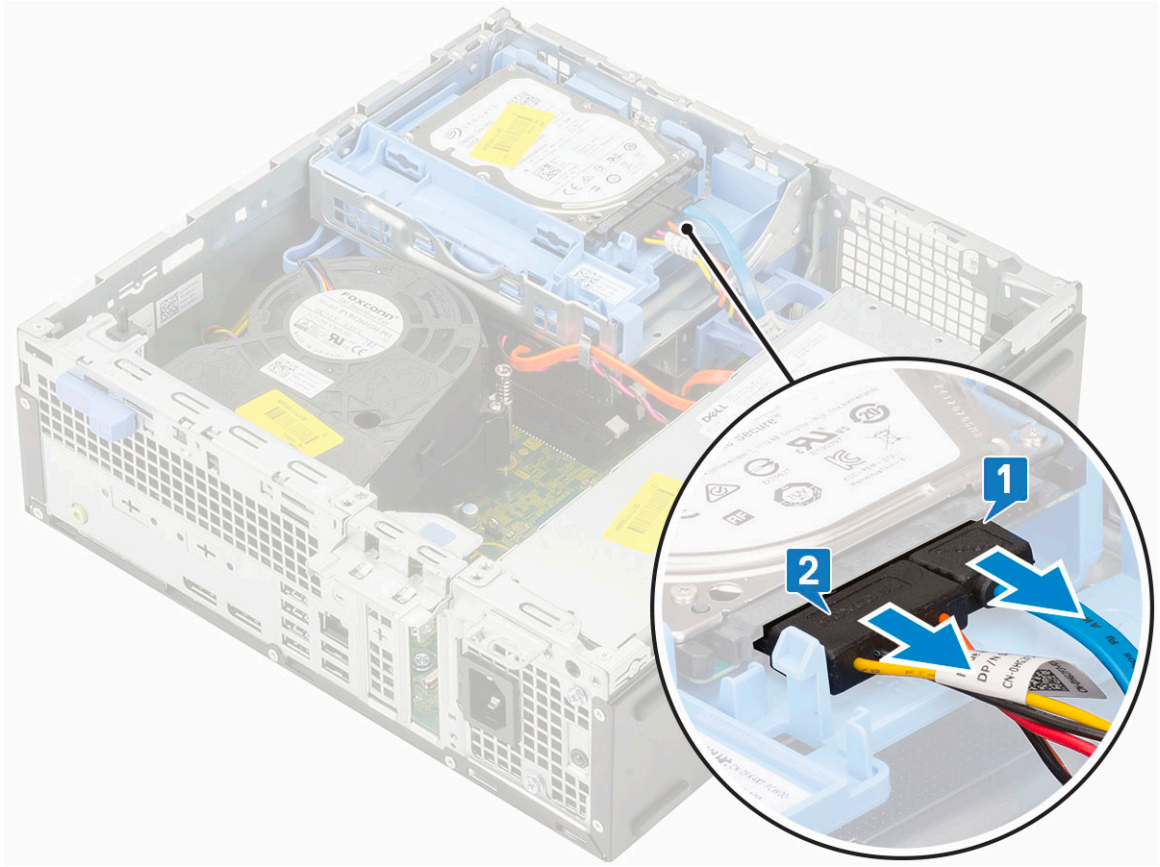


7. Install the:
   a. HDD assembly
   b. Front bezel
   c. Side cover
8. Follow the procedure in After working inside your computer.

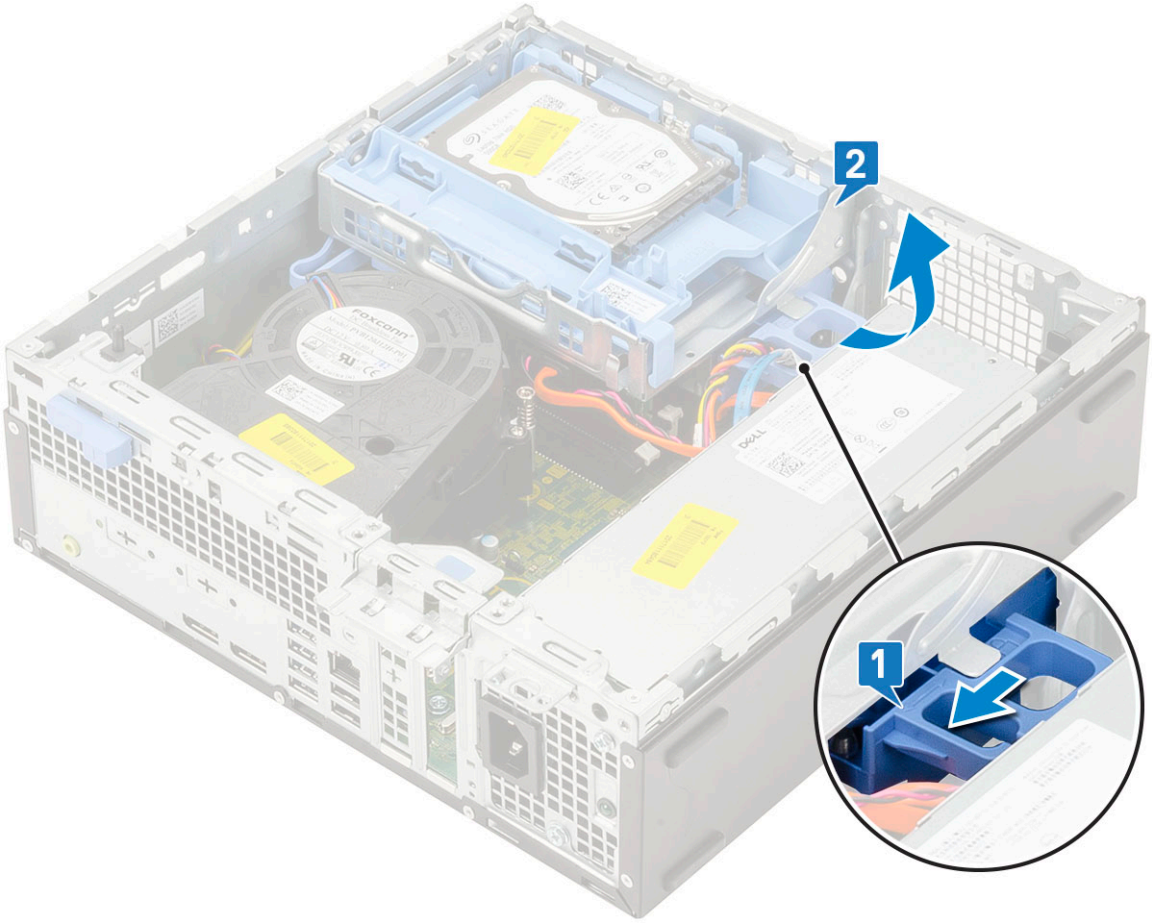
Optical drive

Removing the optical drive

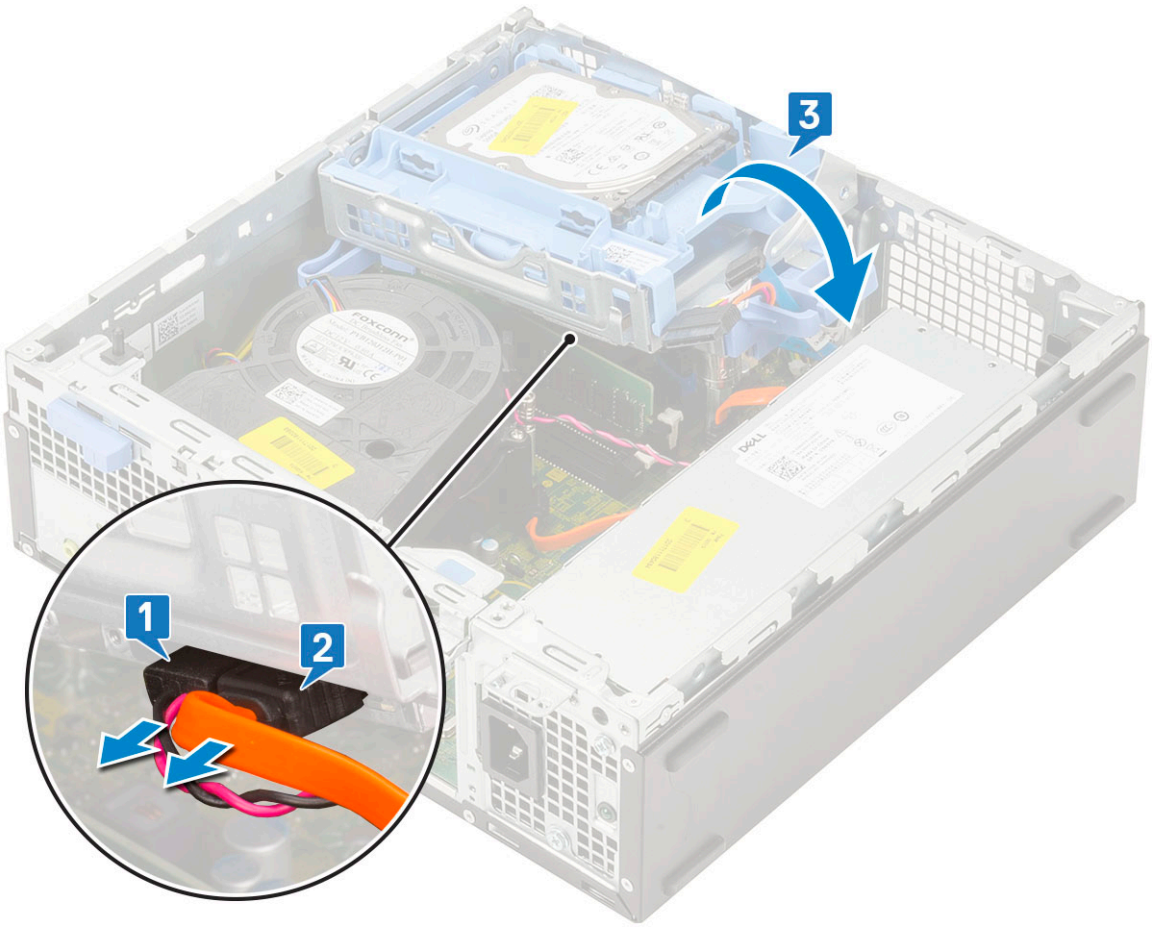
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
3. To remove the optical drive:
   a. Disconnect the hard drive data cable and power cable from the connectors on the hard drive [1, 2].



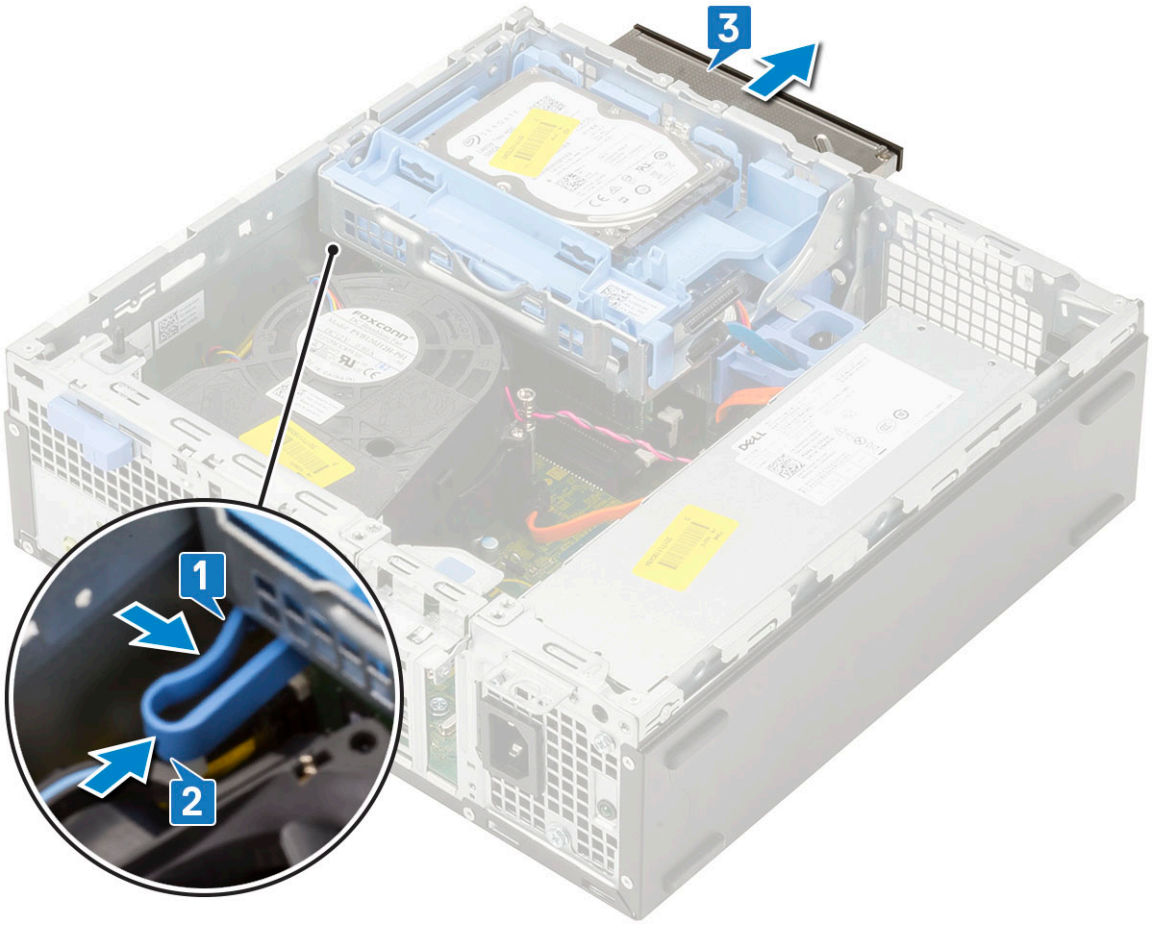
b. Slide the release tab to unlock the hard drive and optical module [1].
c. Lift the hard drive and optical module [2].



d. Disconnect the optical drive data cable and optical drive power cable from the connectors on the optical drive [1, 2] and lower the hard drive and optical module until it is seated.

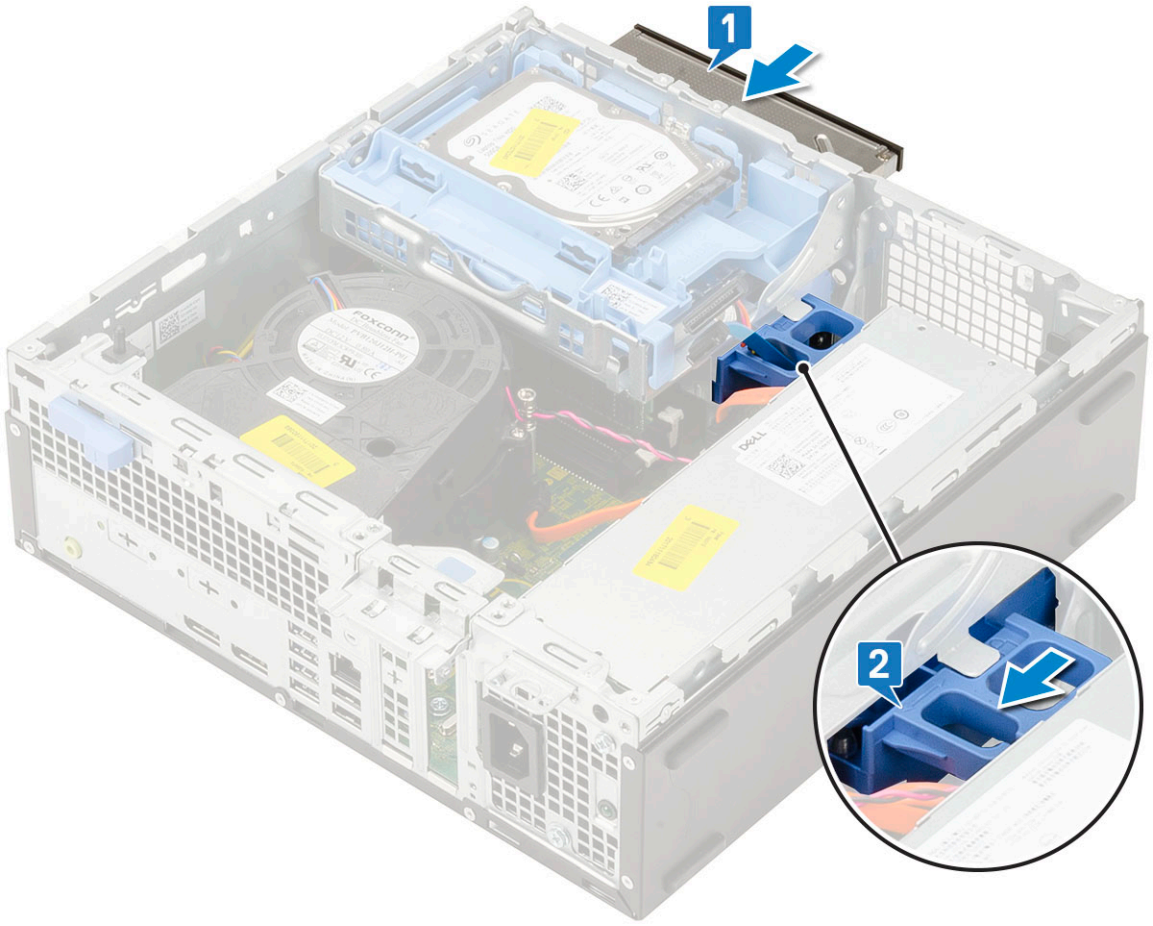


e. Push the release latch on the optical drive [1] and pull the optical drive out from the system [3].

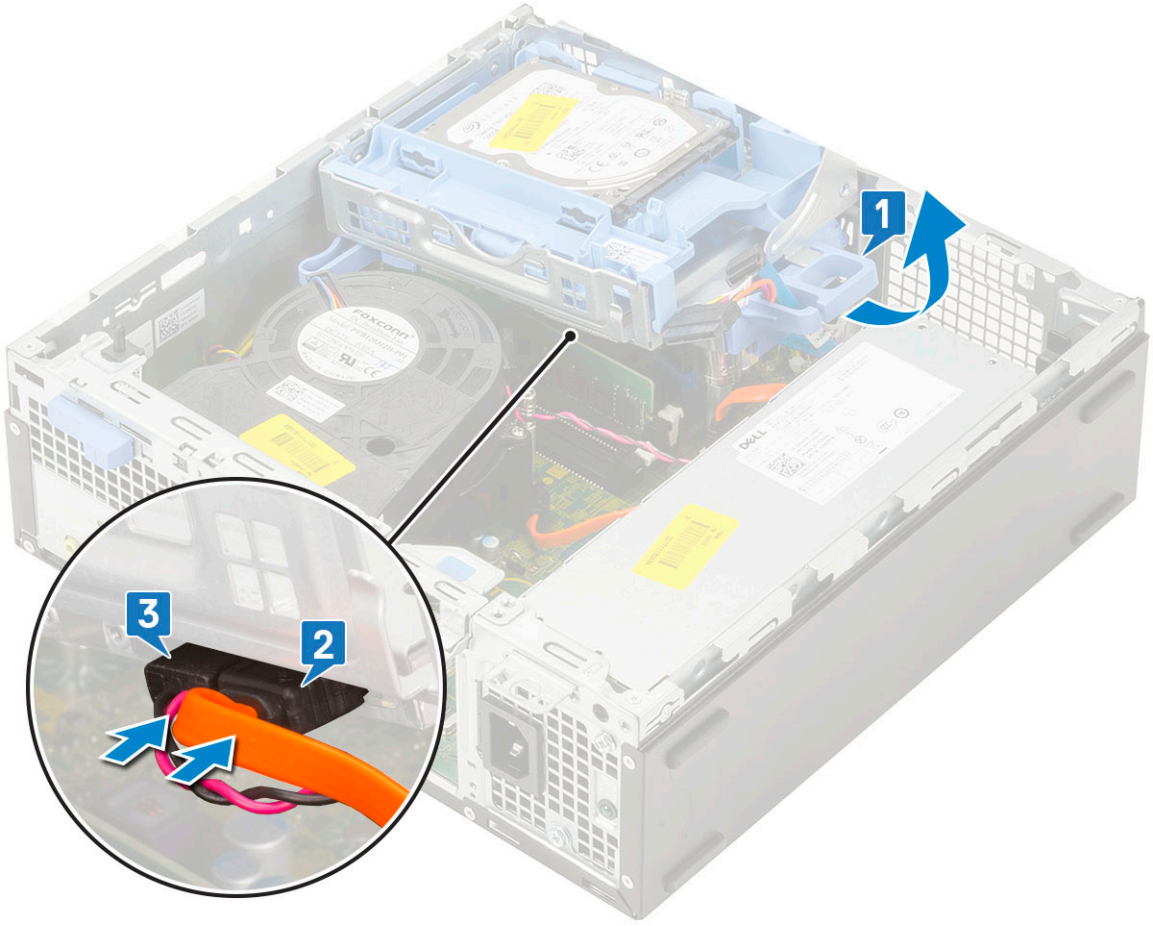


Installing the optical drive

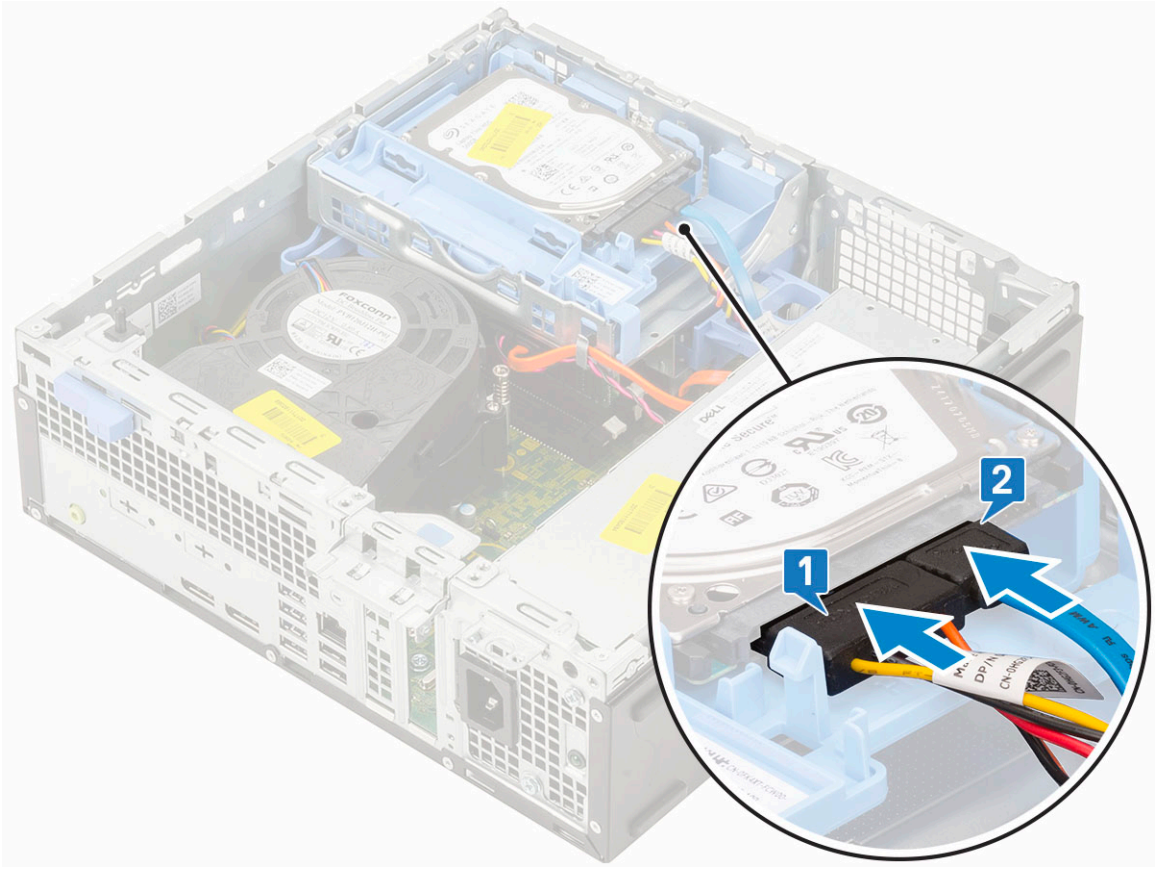
1. Slide the optical drive into its slot in the system [1].
2. Slide the release tab to unlock the hard drive and optical drive module [2].



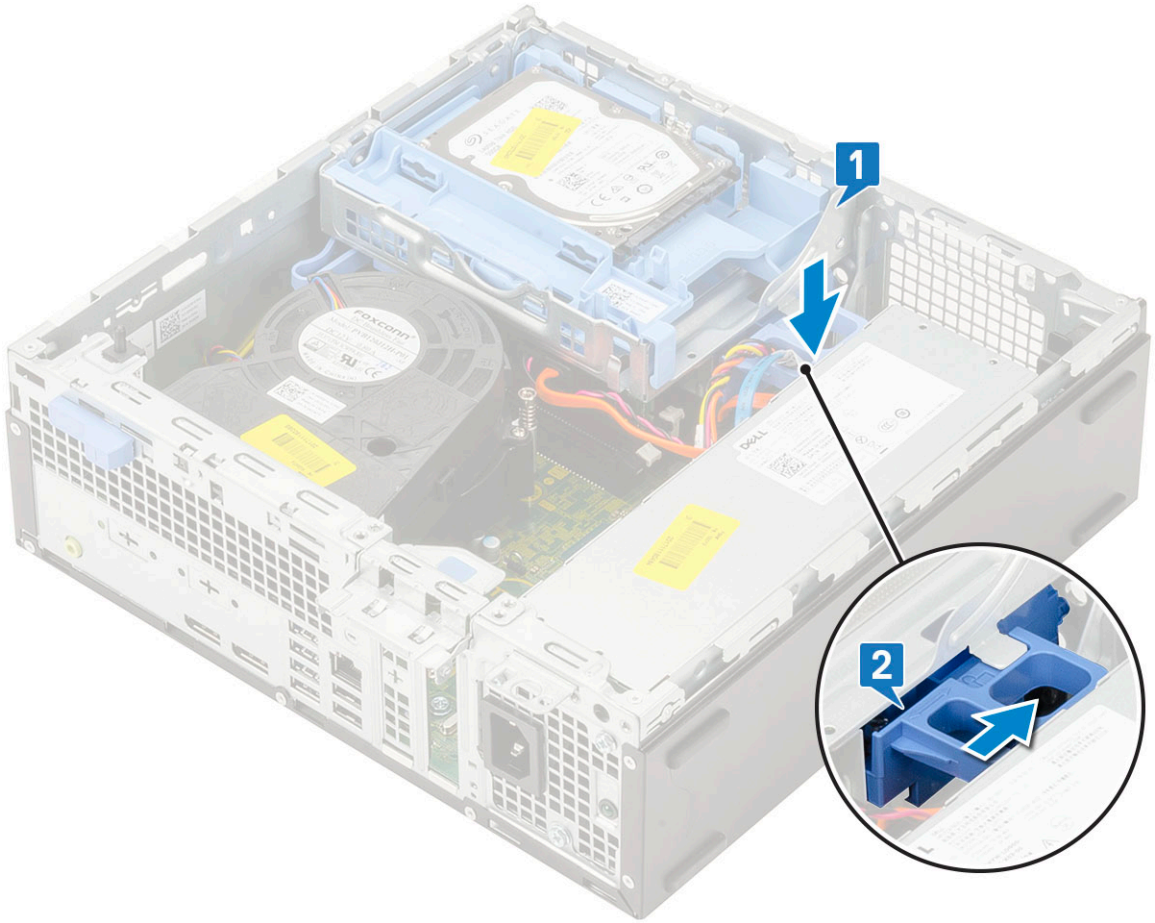
3. Lift the hard drive and optical module [1], connect the optical drive data cable and power cable to the connectors on the optical drive [2, 3].



4. Connect the hard drive data cable and hard drive power cable to the connectors on the hard drive [1,2].



5. Slide the release tab to lock the module [2].

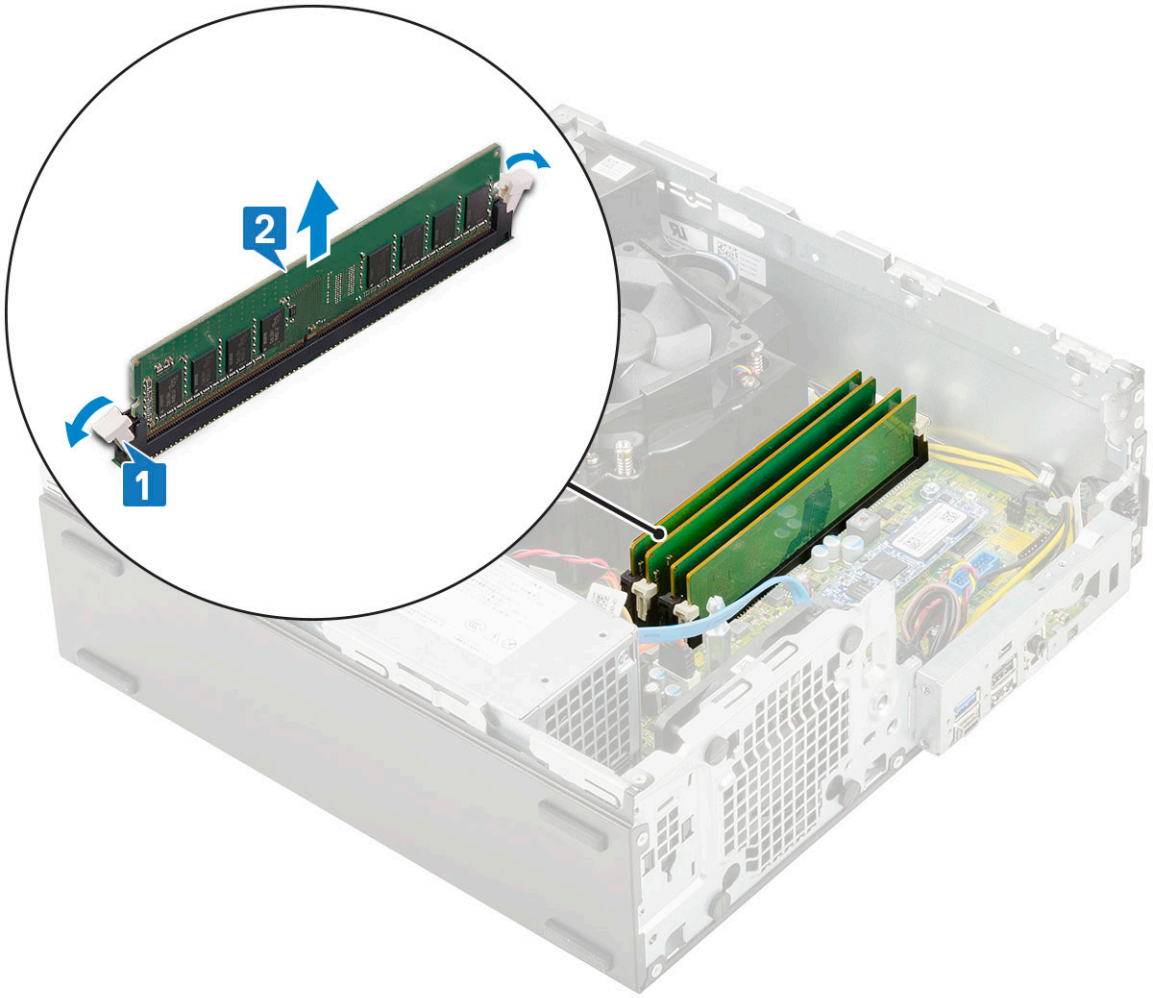


6. Install the:
   a. Front bezel
   b. Side cover
7. Follow the procedure in After working inside your computer.

Memory module

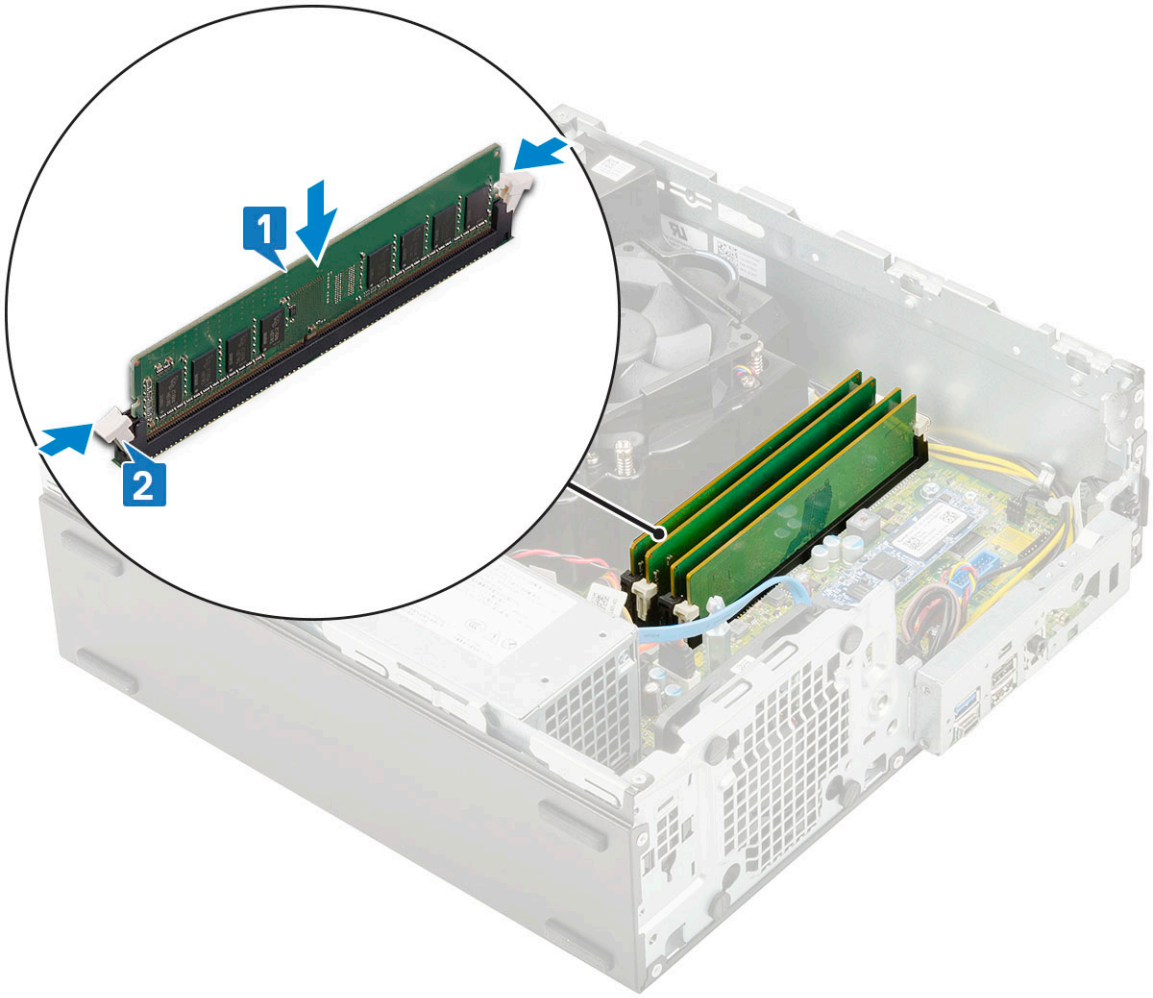
Removing memory module

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
3. To remove the memory module:
   a. Pry open the retention tabs from both sides to lift the memory module from the connector [1].
   b. Remove the memory module from the system board [2].



Installing the 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 [1].
3. Press the memory module until the memory module retention tabs click into place [2].

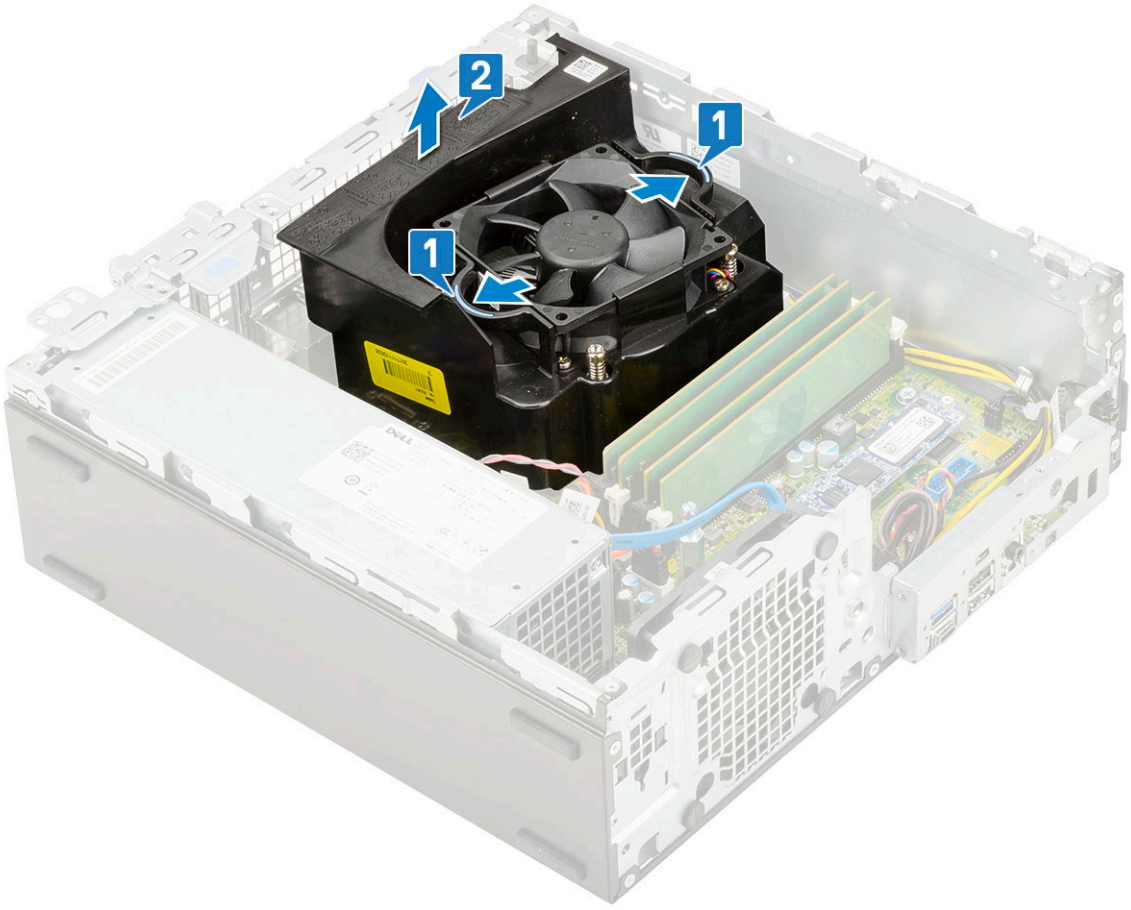


4. Install the:
   a. Hard drive and optical drive module
   b. HDD assembly
   c. Front bezel
   d. Side cover
5. Follow the procedure in After working inside your computer.

Heat sink duct

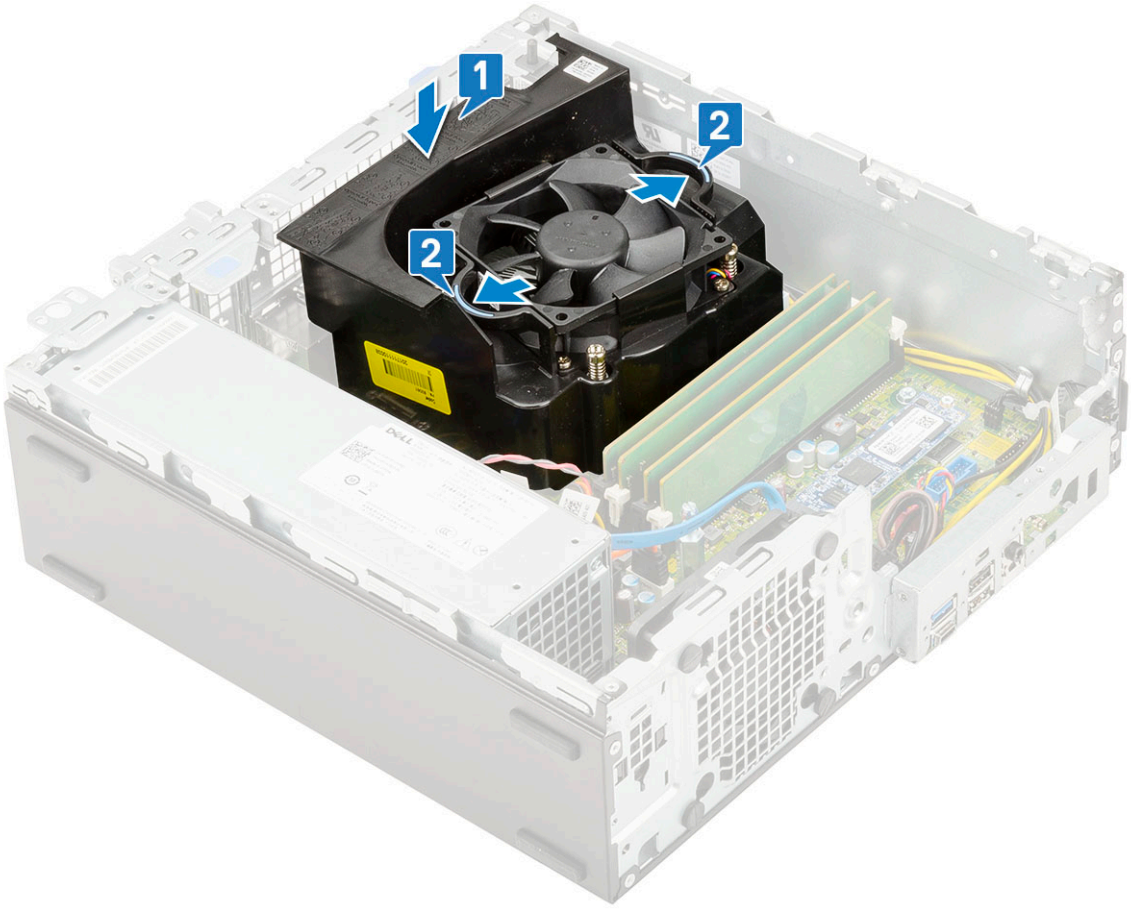
Removing heat sink duct

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
3. To remove the heat sink bracket:
   a. Pull both the release tabs simultaneously, to remove the plastic duct that secures the heat sink assembly [1].
   b. Lift the plastic duct away from the heat sink assembly [2].



Installing heat sink duct

1. To install the heat sink duct:
   a. Align the plastic duct over the heat sink assembly [1].
   b. Pull the release tabs and push the plastic bracket until it clicks in place [2].



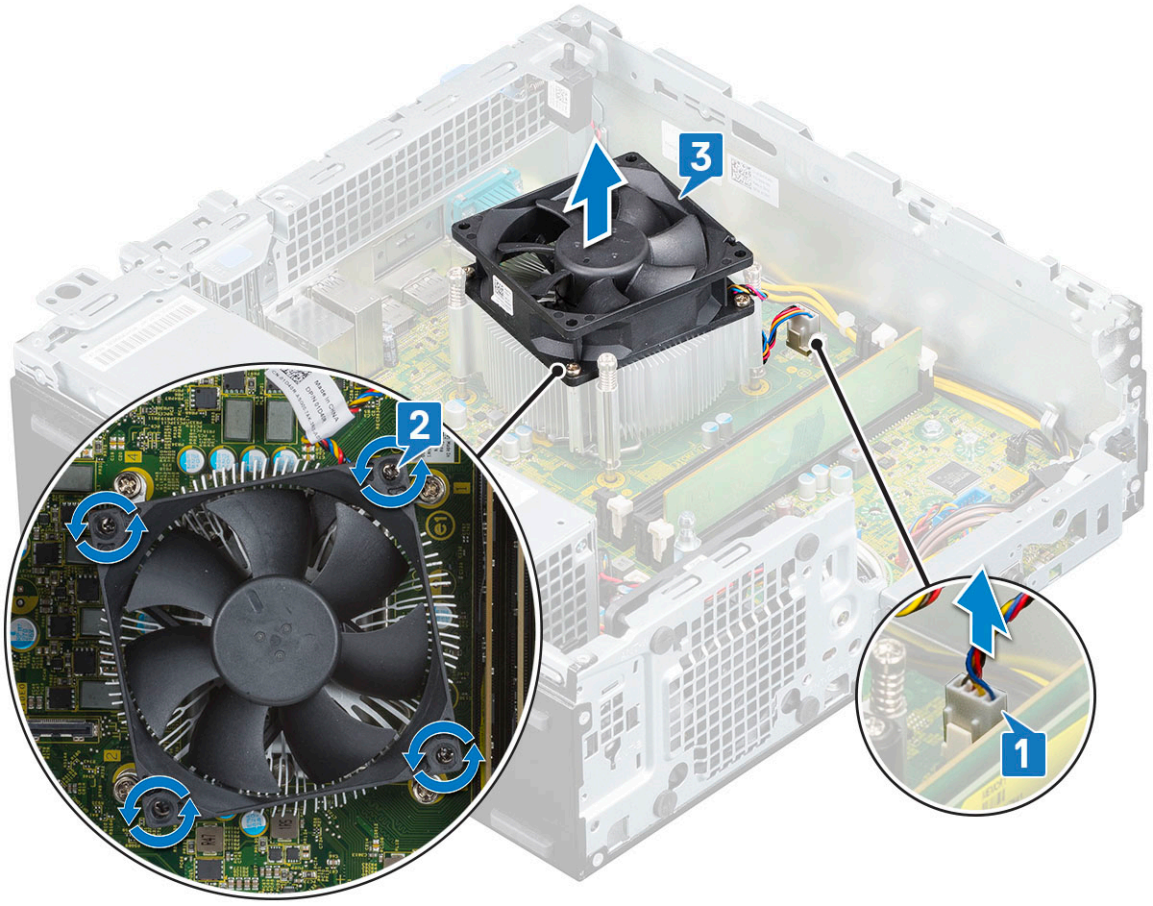
2. Install the:
   a. Hard drive and optical drive module
   b. HDD assembly
   c. Front bezel
   d. Side cover
3. Follow the procedure in After working inside your computer.

Heat sink fan

Removing heat sink fan

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
   e. Heat sink duct
3. To remove the heat sink fan:
   a. Disconnect the heat sink fan cable from the system board [1].
   b. Loosen the screws (4) that secure the heat sink fan to the heat sink [2].
   c. Lift the heat sink away from the system [3].

   NOTE: Loosen the screws in a sequential order (1,2,3,4) as mentioned on the system board.

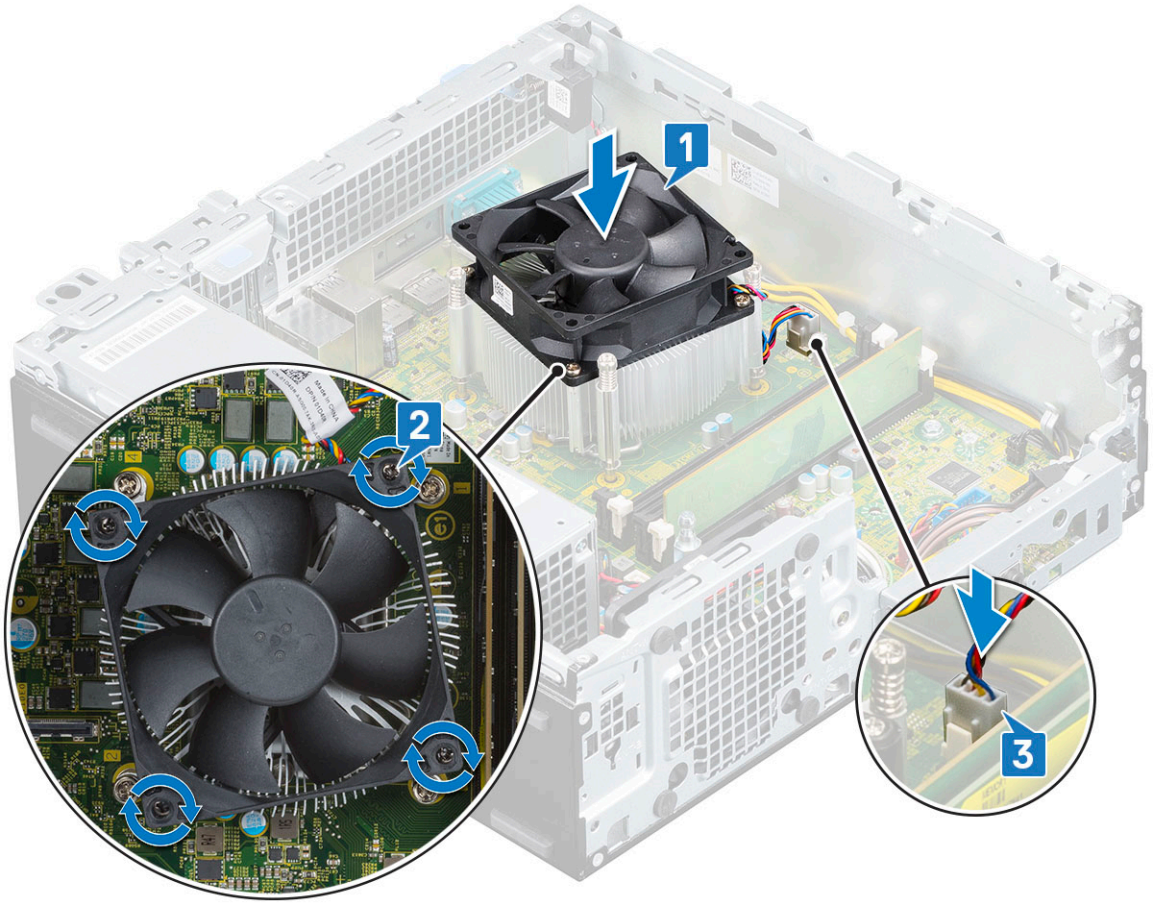


Installing heat sink fan

1. Place the heat sink fan on the heat sink [1].
2. Tighten the screws (4) to secure the heat sink fan over the heat sink [2].

   NOTE: Tighten the screws in a sequential order (1,2,3,4) as mentioned on the system board.

3. Connect the heat sink fan cable to the connector on the system board [3].



4. Install the:
   a. Heat sink duct
   b. Hard drive and optical drive module
   c. HDD assembly
   d. Front bezel
   e. Side cover
5. Follow the procedure in After working inside your computer.

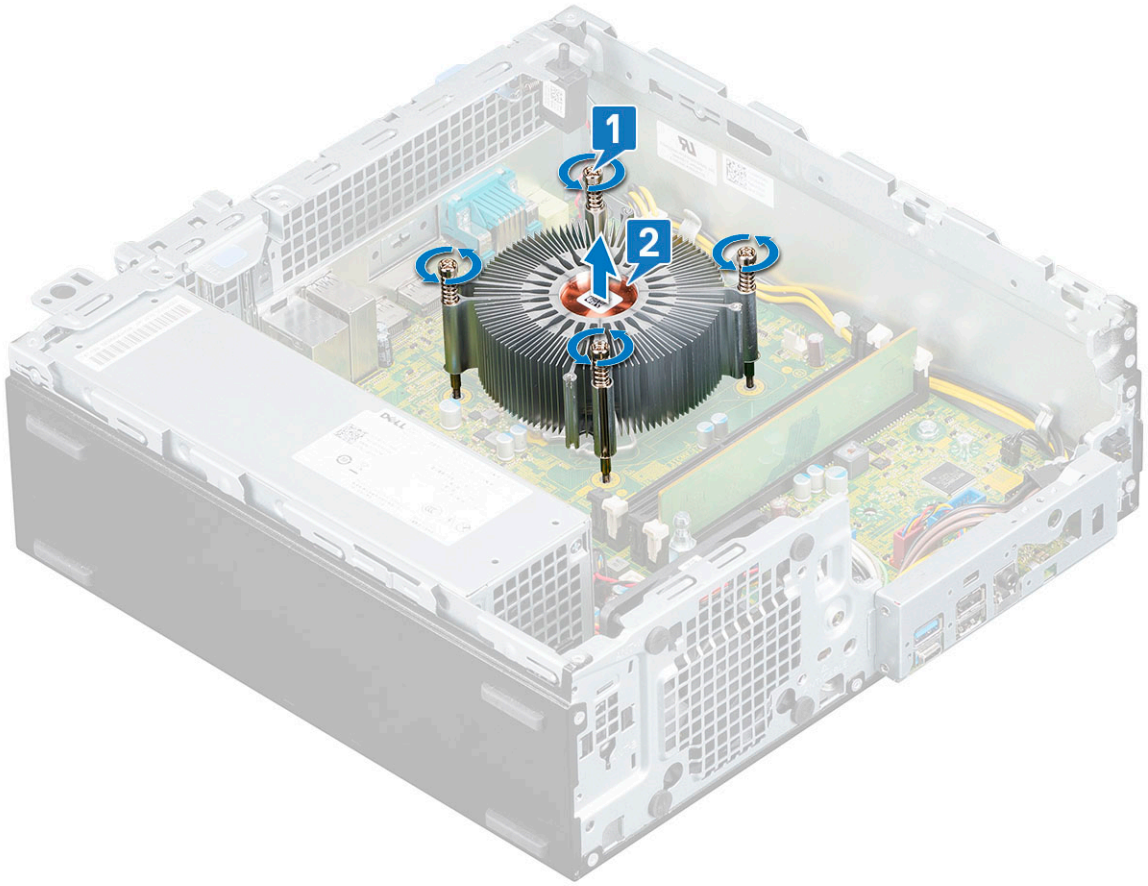
Heat sink

Removing heat sink

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
   e. Heat sink duct
   f. Heat sink fan
3. To remove the heat sink:
   a. Loosen the captive screws (4) that secure the heat sink to the system board [1].

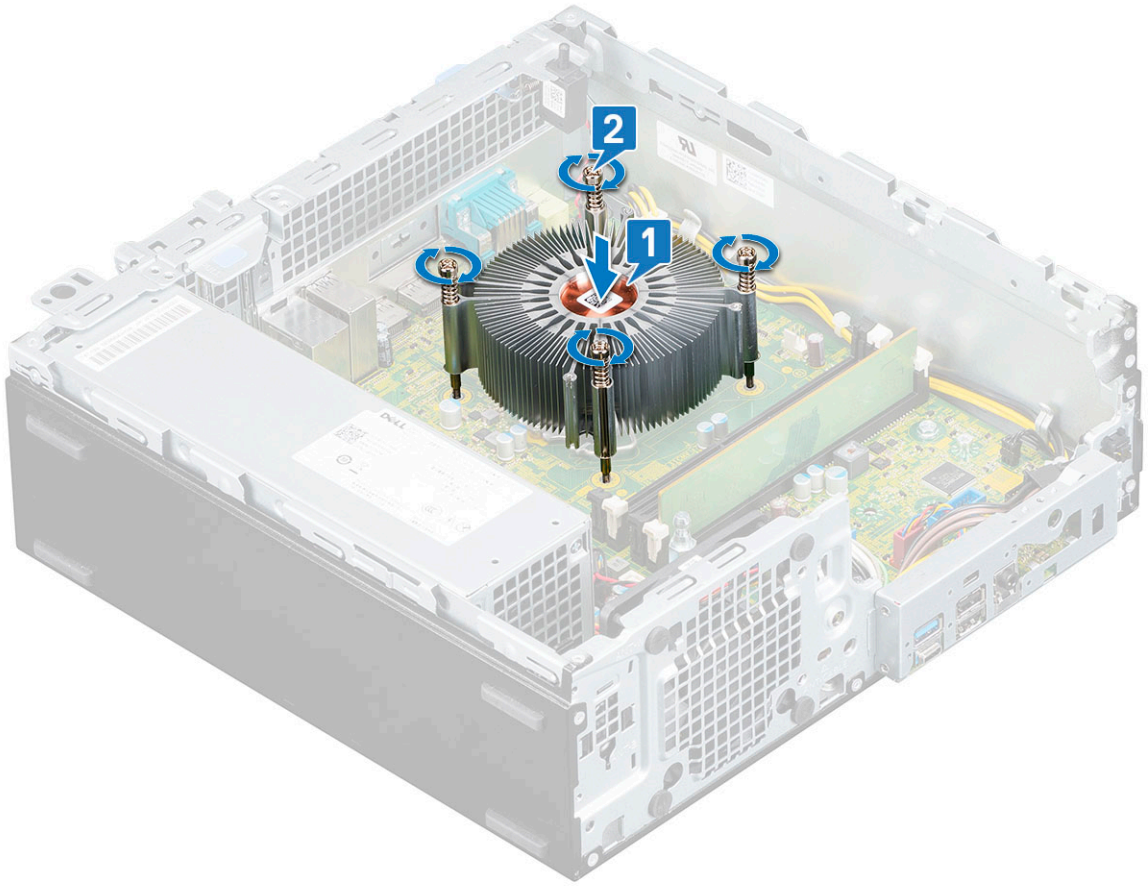
      NOTE: Remove the screw in the sequential order (1,2,3,4) as printed on the system board.

   b. Lift the heat sink away from the computer [2].



Installing heat sink

1. Place the heat sink on the processor and align the screws of the heat sink with the holders on the system board [1].
2. Tighten the captive screws to secure the heat sink to the system board [2].
   Replace the screw in the sequential order (1,2,3,4) as printed on the system board.

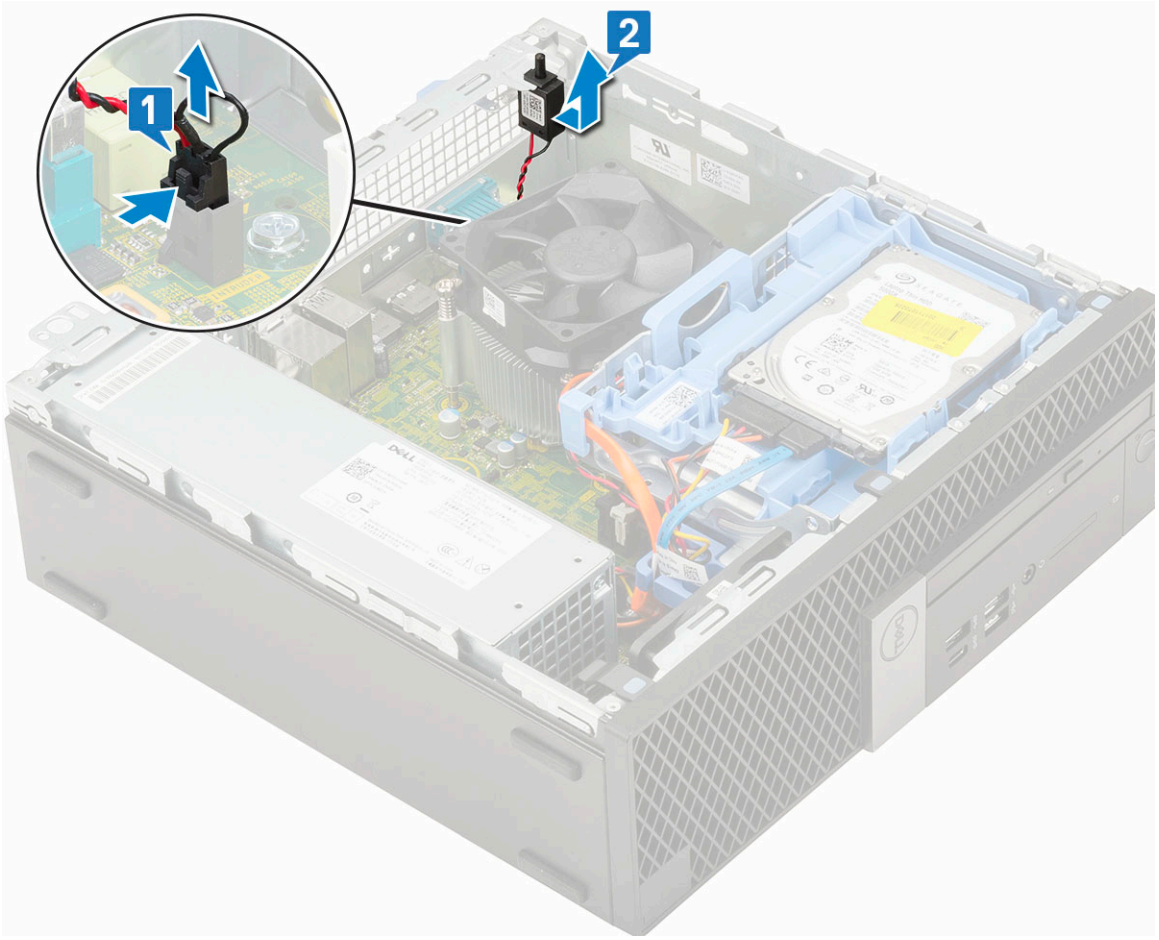


3. Replace the Heat sink fan.
4. Install the:
   a. Heat sink duct
   b. Hard drive and optical drive module
   c. HDD assembly
   d. Front bezel
   e. Side cover
5. Follow the procedure in After working inside your computer.

Intrusion switch

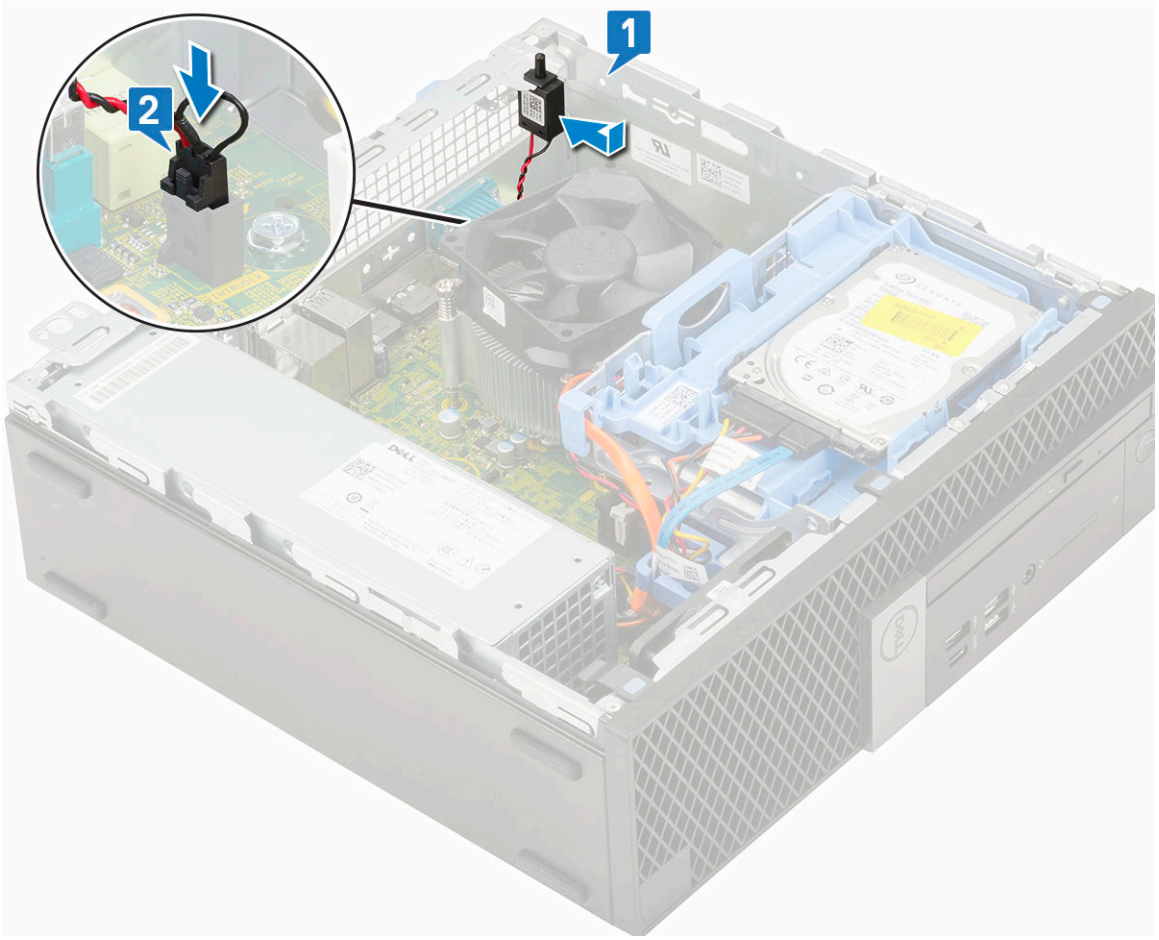
Removing intrusion switch

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
   e. Heat sink duct
   f. Heat sink fan
3. To remove the intrusion switch:
   a. Disconnect the intrusion switch cable from the connector on the system board [1].
   b. Slide the intrusion switch and lift it away from the system chassis [2].



Installing the intrusion switch

1. Insert the intrusion switch into the slot on the chassis [1].
2. Connect the intrusion switch cable to the system board [2].

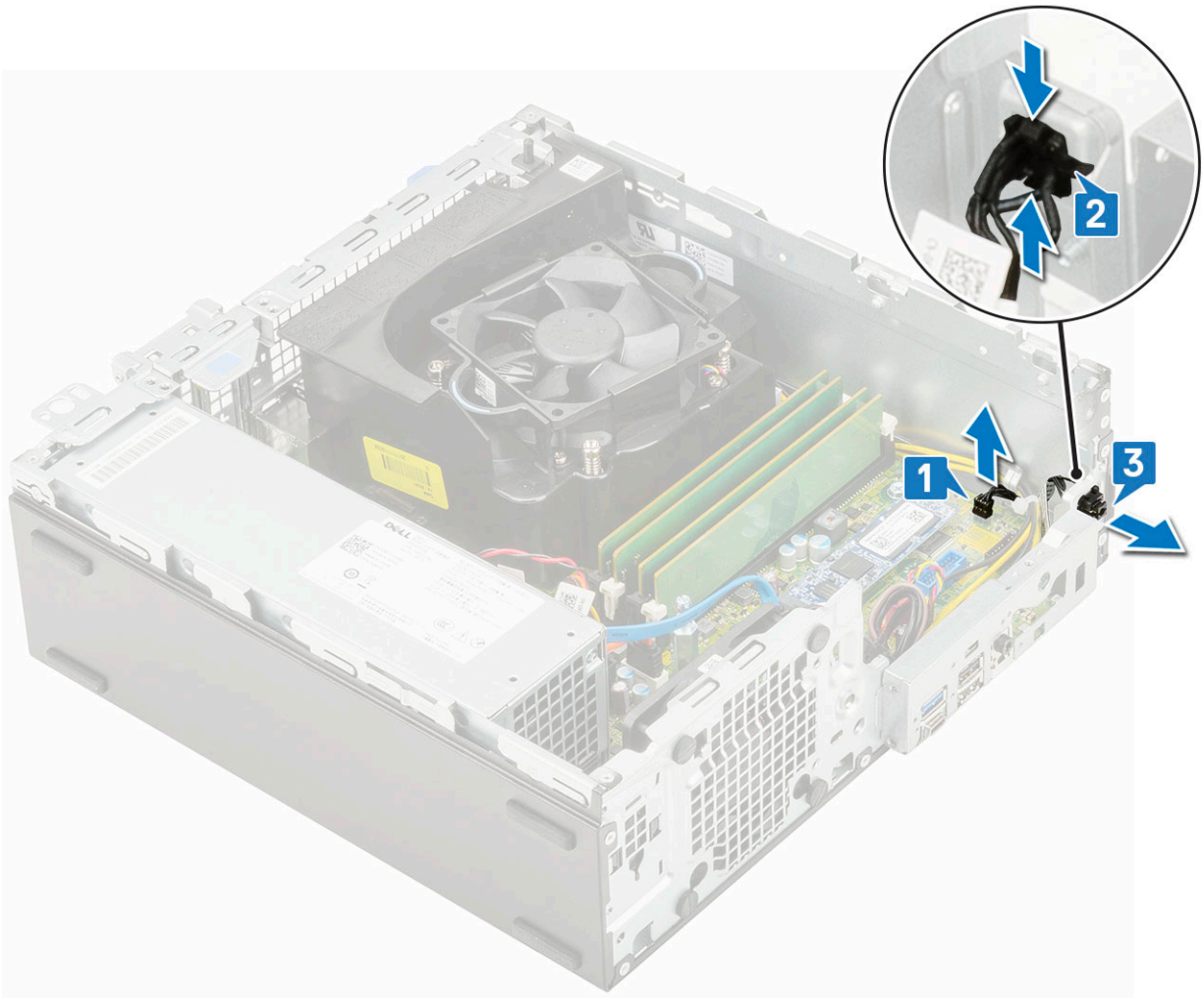


3. Install the:
   a. Heat sink fan
   b. Heat sink duct
   c. Hard drive and optical drive module
   d. HDD assembly
   e. Front bezel
   f. Side cover
4. Follow the procedure in After working inside your computer.

Power switch

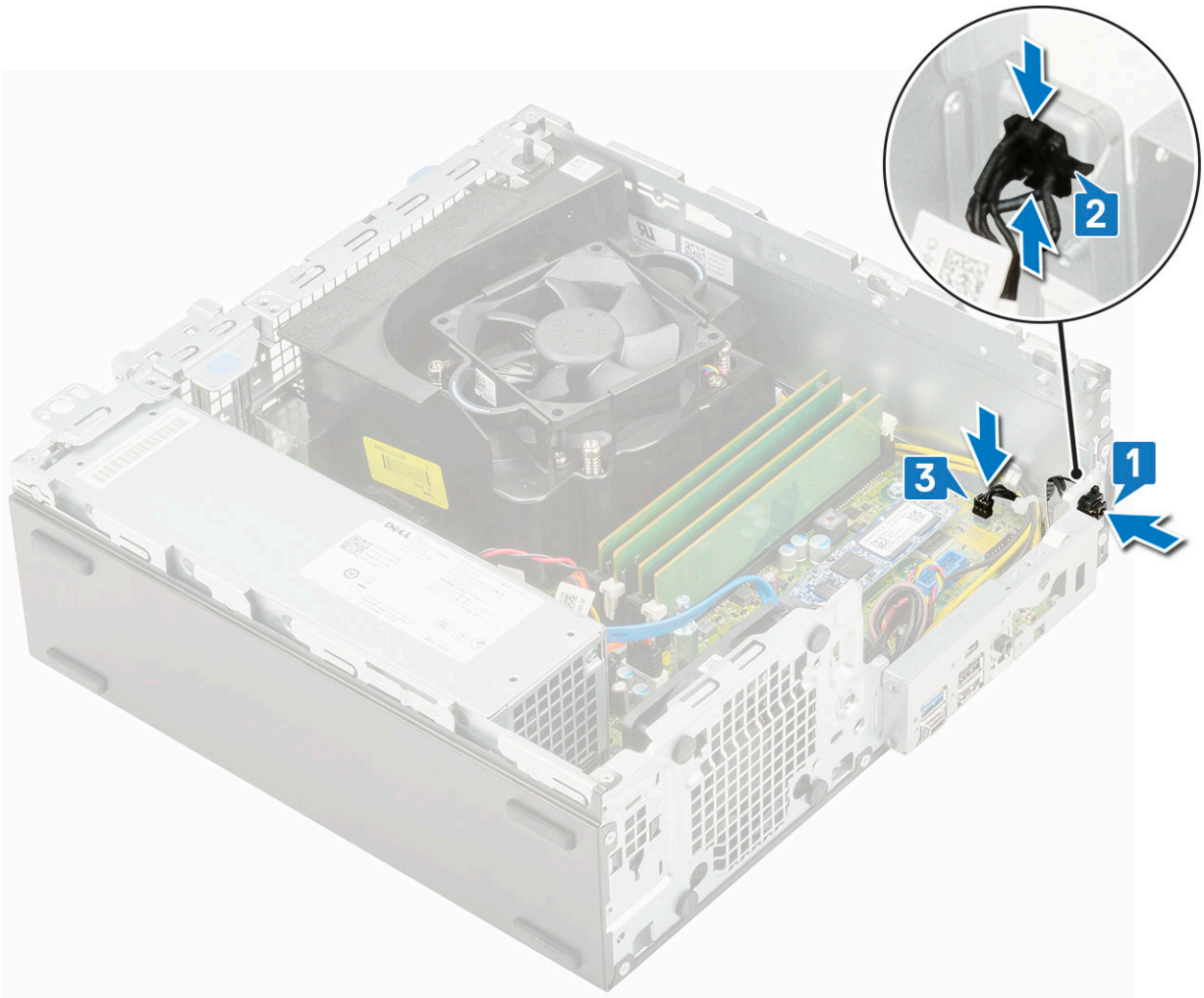
Removing power switch

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
3. To remove the power switch:
   a. Disconnect the power switch cable from the system board [1].
   b. Press the power switch retention tabs and pull the power switch out from the system [2] [3].



Installing the power switch

1. Align and slide the power switch module into the slot on the chassis until it clicks into place [1, 2].
2. Connect the power switch cable to the connector on the system board [3].



3. Install the:
   a. Hard drive and optical drive module
   b. HDD assembly
   c. Front bezel
   d. Side cover
4. Follow the procedure in After working inside your computer.

Processor

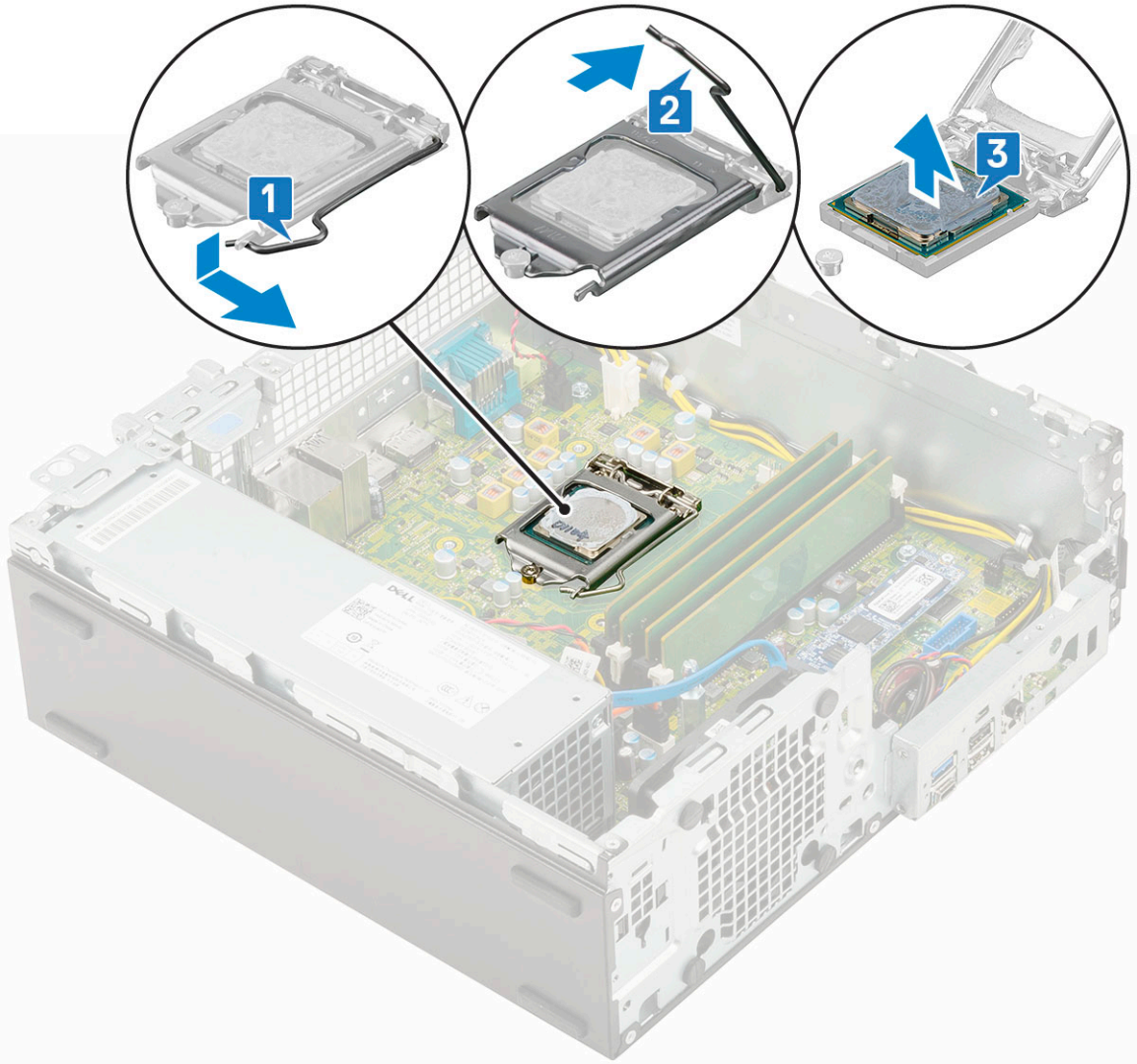
Removing processor

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
   e. Heat sink duct
   f. Heat sink fan
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].

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.

c. Lift the processor out of the socket [3].

NOTE: After removing the processor, place it in an antistatic container for reuse, return, or temporary storage. Do not touch the bottom of the processor to avoid damage to the processor contacts. Touch only the side edges of the processor.

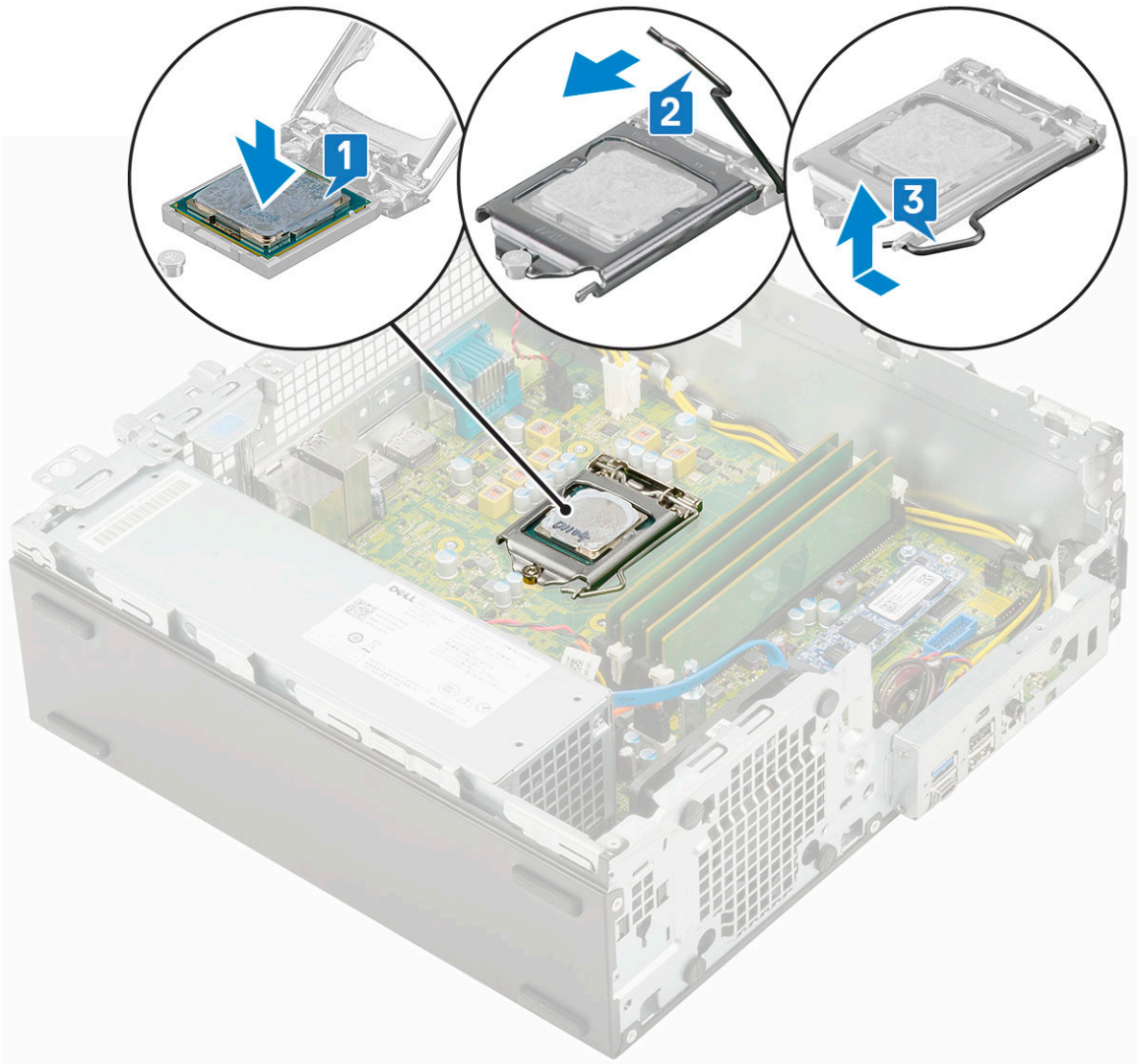


Installing the processor

1. Place the processor on the socket such that the slots on the processor align with the socket keys [1].

   CAUTION: The pin-1 corner of the processor has a triangle that aligns with the triangle on the pin-1 corner on the processor socket. When the processor is properly seated, all four corners are aligned at the same height. If one or more corners of the processor are higher than the others, the processor is not seated properly.

2. Close the processor shield by sliding it under the retention screw [2].
3. Lower the socket lever and push it under the tab to lock it [3].



4. Install the:
   a. Heat sink fan
   b. Heat sink duct
   c. Hard drive and optical drive module
   d. HDD assembly
   e. Front bezel
   f. Side cover
5. Follow the procedure in After working inside your computer.

M.2 PCIe SSD

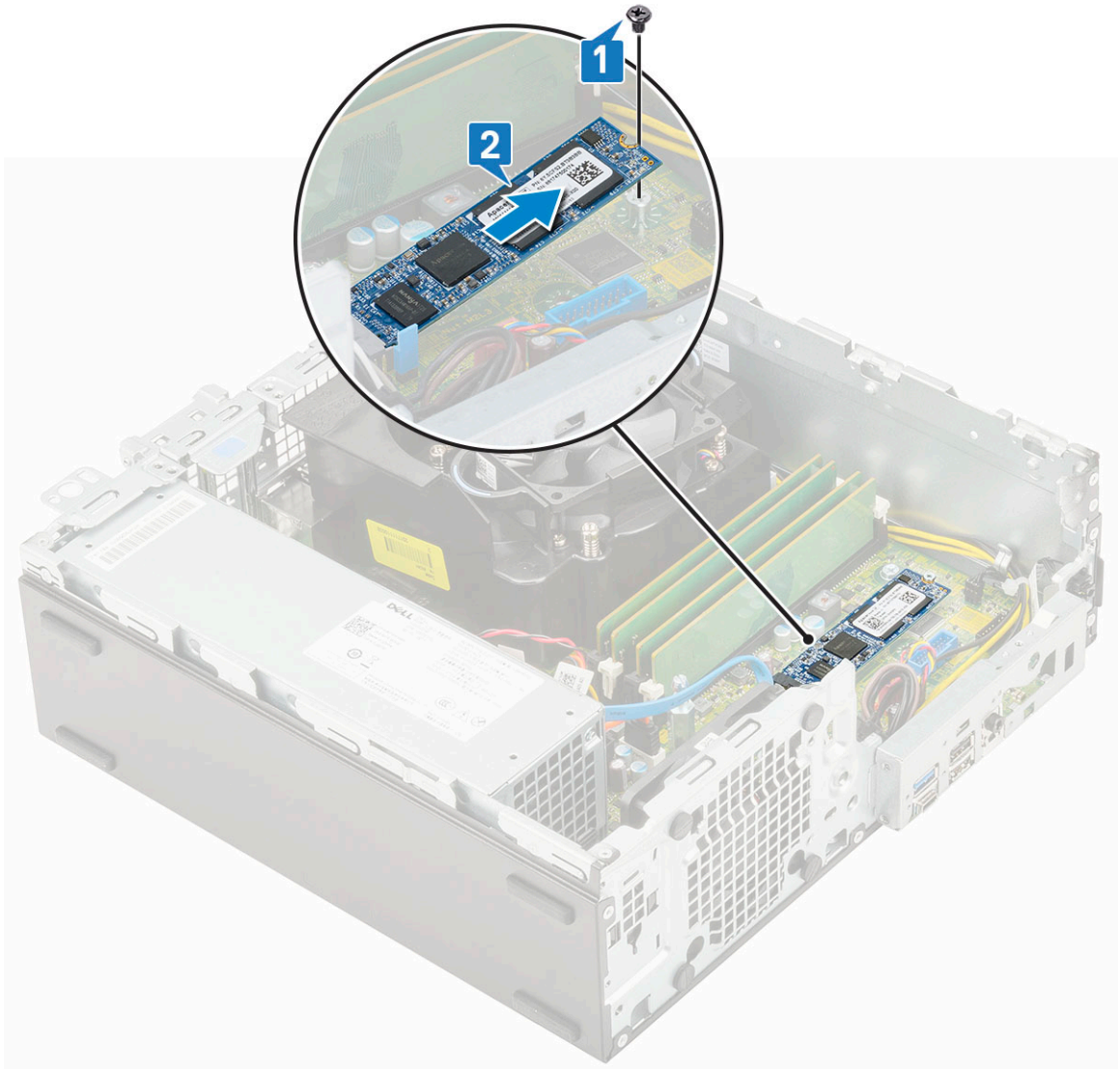
Removing the M.2 PCIe SSD

NOTE: The instructions are applicable to M.2 SATA SSD also.

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module

e. Heatsink assembly

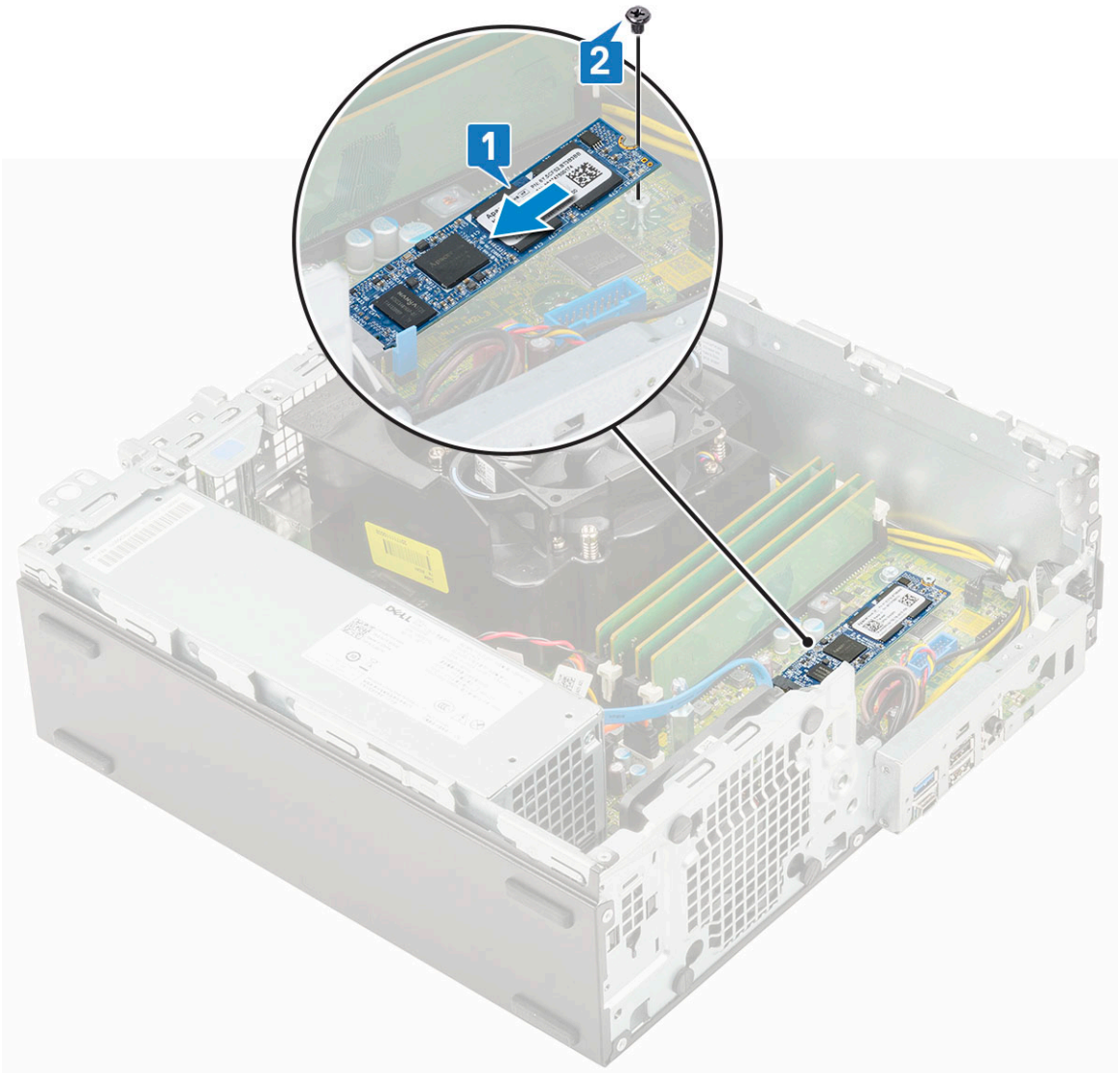
3. To remove the M.2 PCIe SSD:
   a. Remove the single (M2x3.5) screw that secures the M.2 PCIe SSD to the system board [1].
   b. Lift and pull out the PCIe SSD from its connector on the system board [2].



Installing the M.2 PCIe SSD

NOTE: The instructions are applicable to M.2 SATA SSD also.

1. Place the SSD thermal pad into the slot on the system board [1] .
2. Insert the M.2 PCIe SSD to the connector on the system board [2].



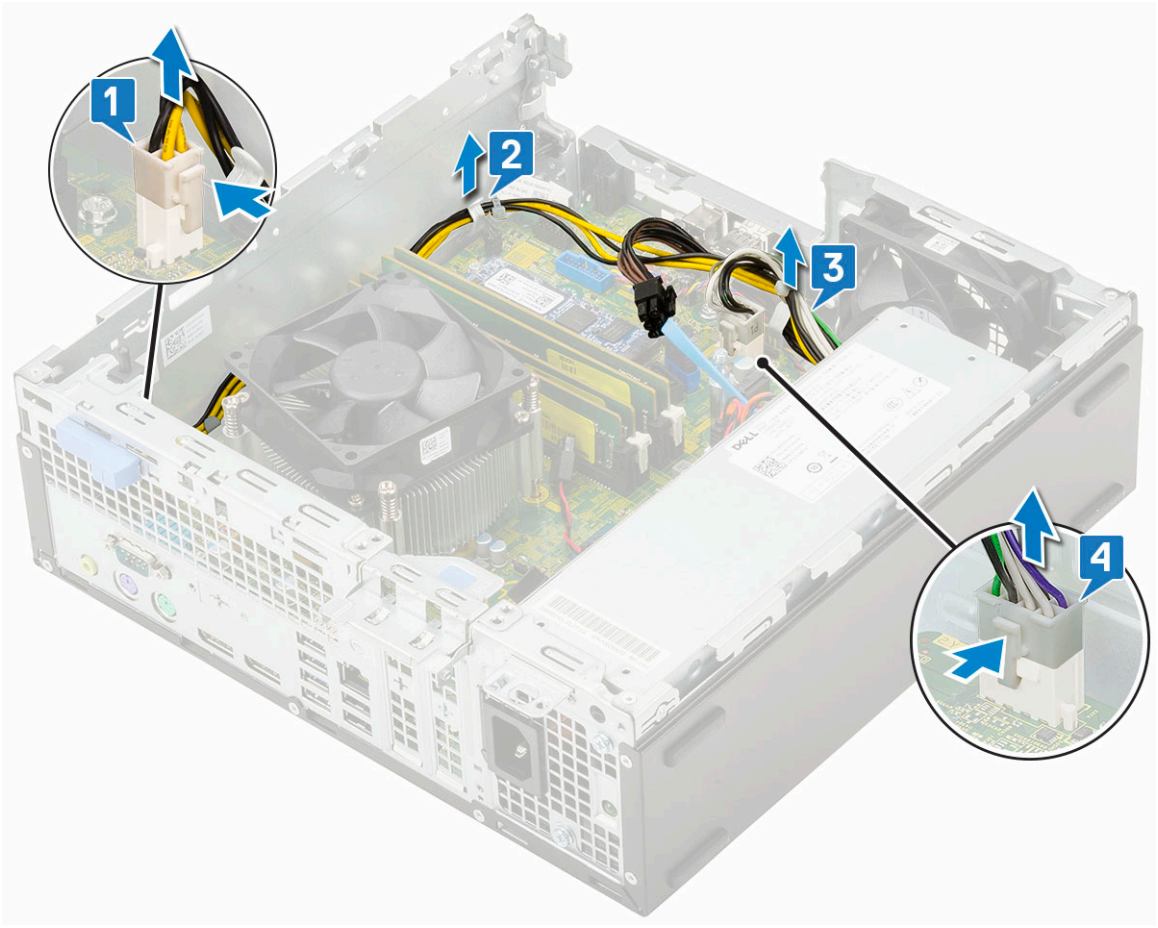
3. Install the:
   a. Heatsink assembly
   b. Hard drive and optical drive module
   c. HDD assembly
   d. Front bezel
   e. Side cover
4. Follow the procedure in After working inside your computer.

Power supply unit

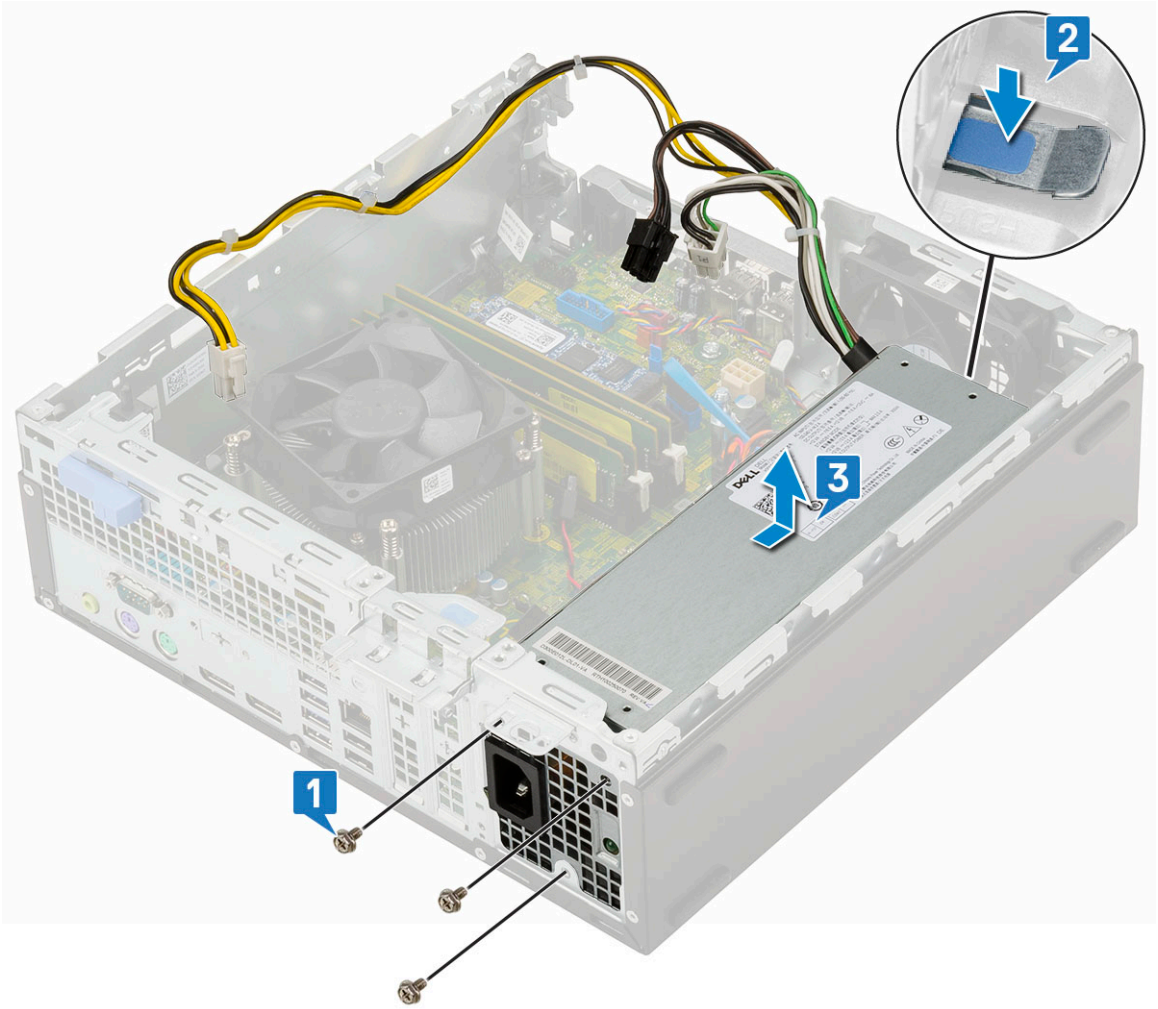
Removing power supply unit or PSU

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
   e. Heat sink duct
   f. Heat sink fan

3. To release the PSU:
   a. Disconnect the CPU power cable from the system board [1].
   b. Unroute the power cables from the retention clips on the chassis [2,3].

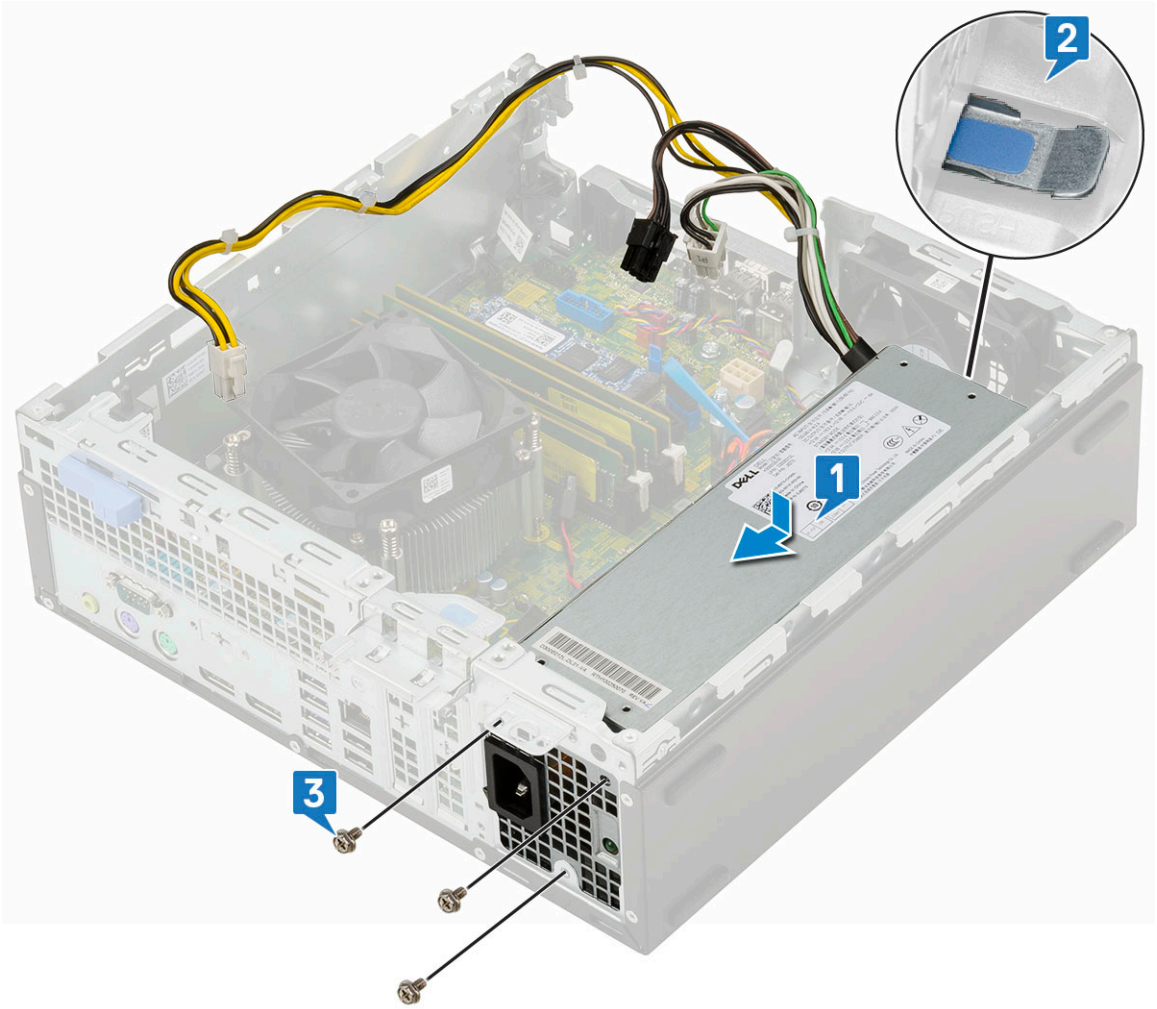


   c. Disconnect the system power cable from the connector on the system board [4].
4. To remove the PSU:
   a. Remove the screws (3) that secure the PSU to the system [1].
   b. Press the blue release tab at the rear end of the PSU unit [2].
   c. Slide the PSU and lift it away from the system [3].

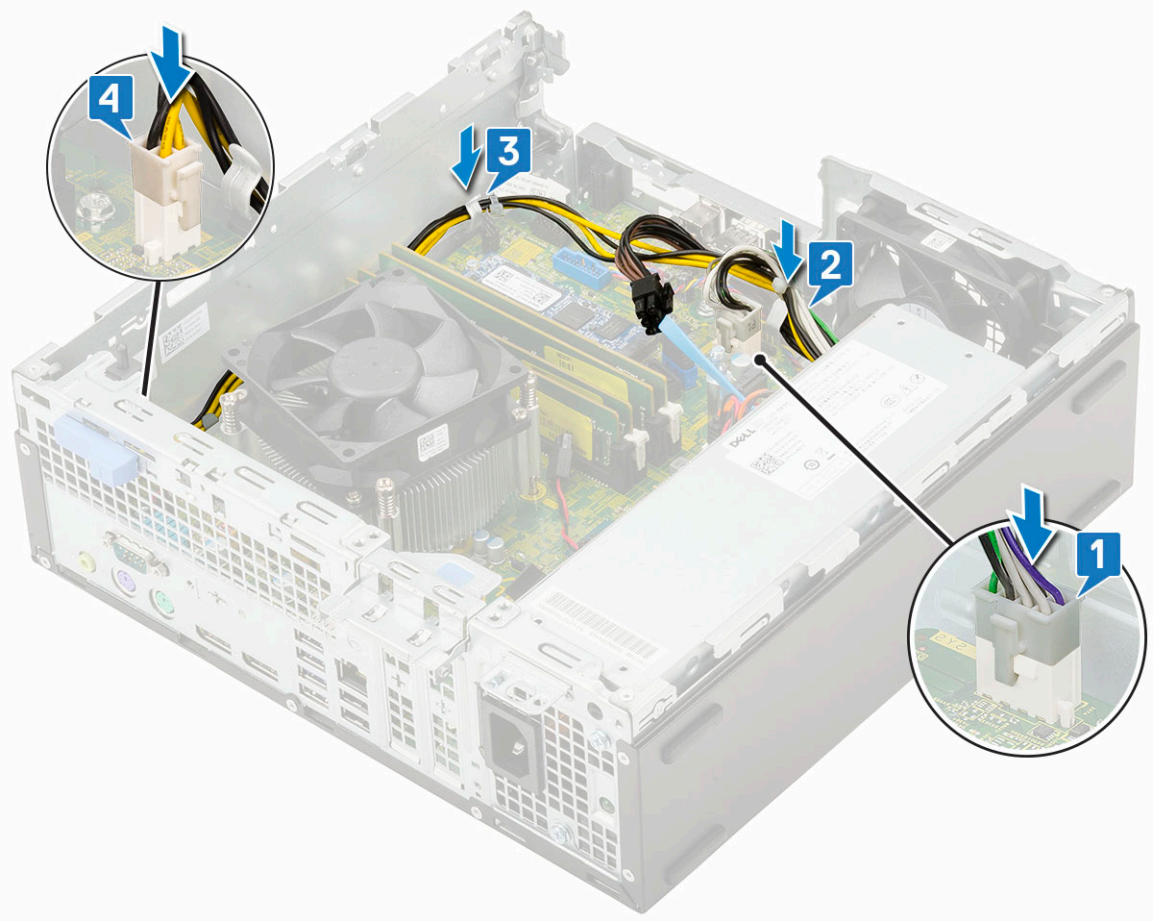


Installing the power supply unit or PSU

1. Insert the PSU in the chassis and slide it towards the back of the system to secure it [1, 2].
2. Replace the screws to secure the PSU to the rear chassis of the system [3].



3. Connect the power cable to the connector on the system board [1].
4. Route the CPU power cable through the retention clips [2,3].
5. Connect the CPU power cable to the connector on the system board [4].

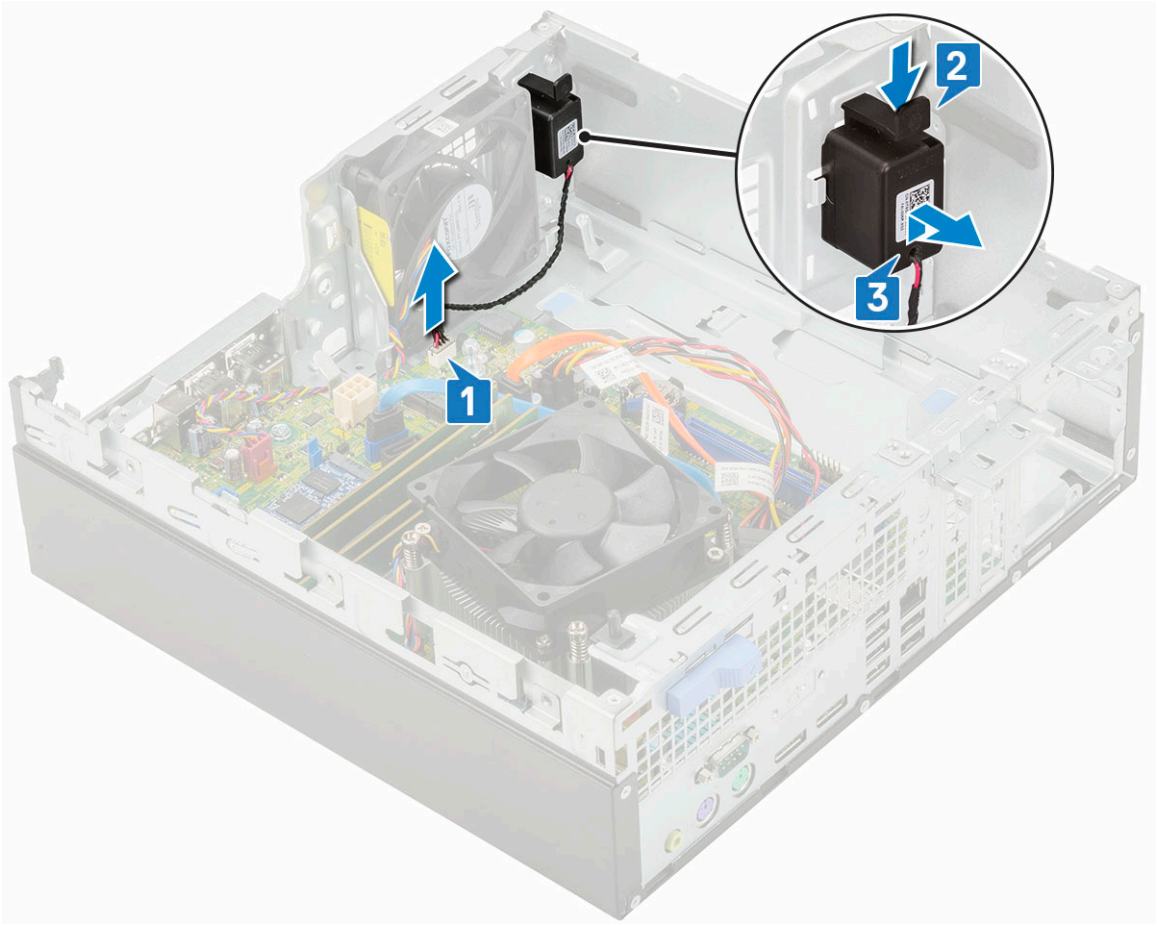


6. Install the:
   a. Heat sink fan
   b. Heat sink duct
   c. Hard drive and optical drive module
   d. HDD assembly
   e. Front bezel
   f. Side cover
7. Follow the procedure in After working inside your computer.

Speaker

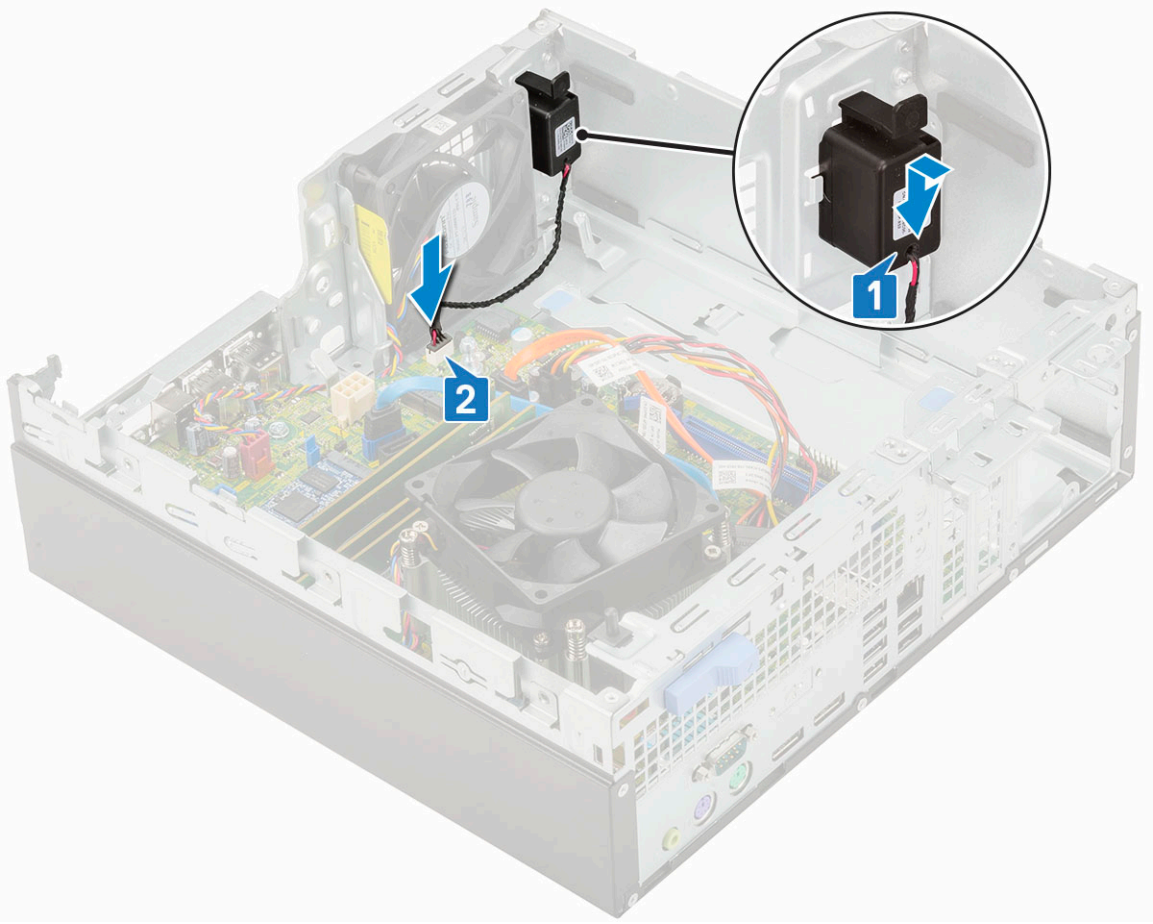
Removing speaker

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Front bezel
   c. HDD assembly
   d. Hard drive and optical drive module
   e. Heat sink duct
   f. Heat sink fan
3. To remove the speaker:
   a. Disconnect the speaker cable from the connector on the system board [1].
   b. Press the release tab [2] and pull the speaker out from the system chassis [3].



Installing the speaker

1. Insert the speaker into the slot on the system chassis and press it until it clicks into place [1, 2].
2. Connect the speaker cable to the connector on the system board [3].



3. Install the:
   a. Heat sink fan
   b. Heat sink duct
   c. Hard drive and optical drive module
   d. HDD assembly
   e. Front bezel
   f. Side cover
4. Follow the procedure in After working inside your computer.

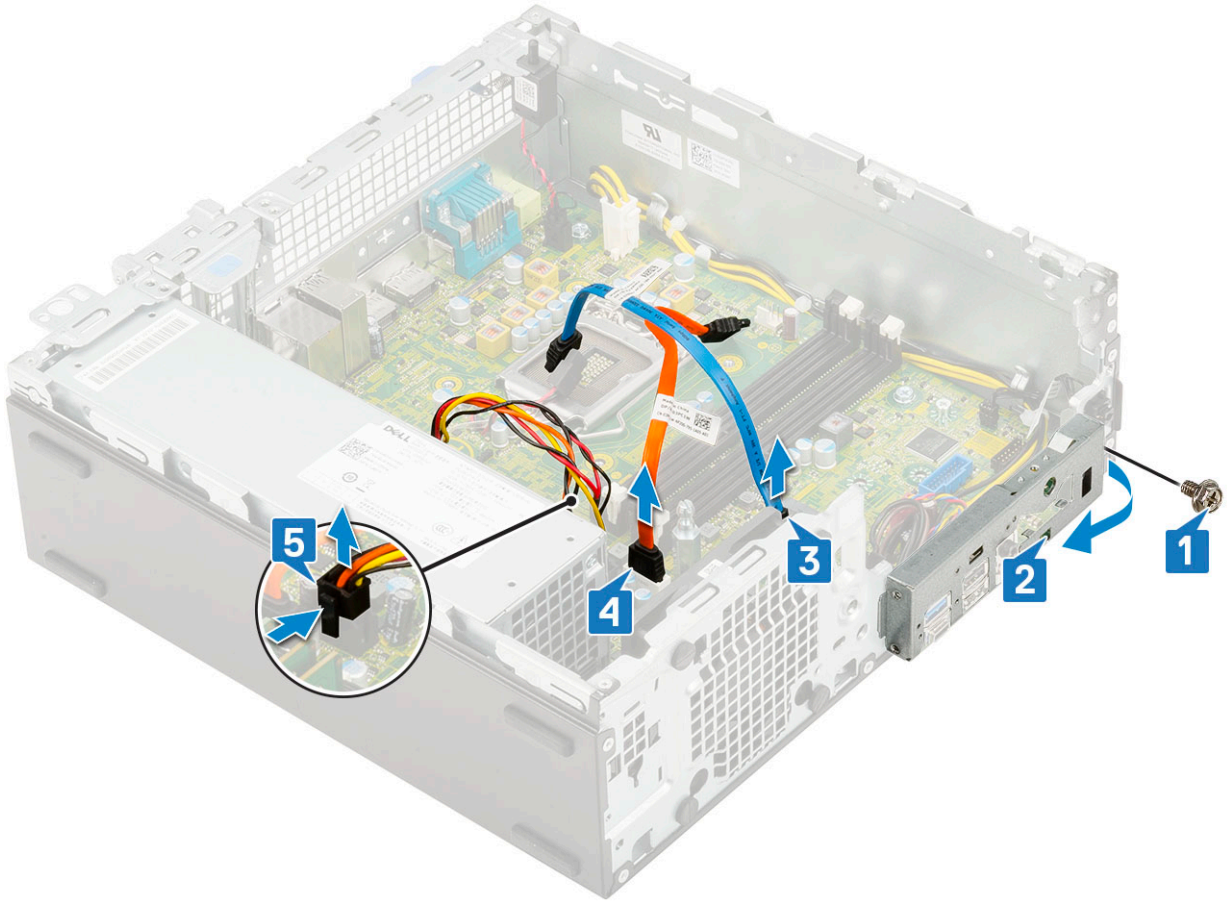
System board

Removing system board

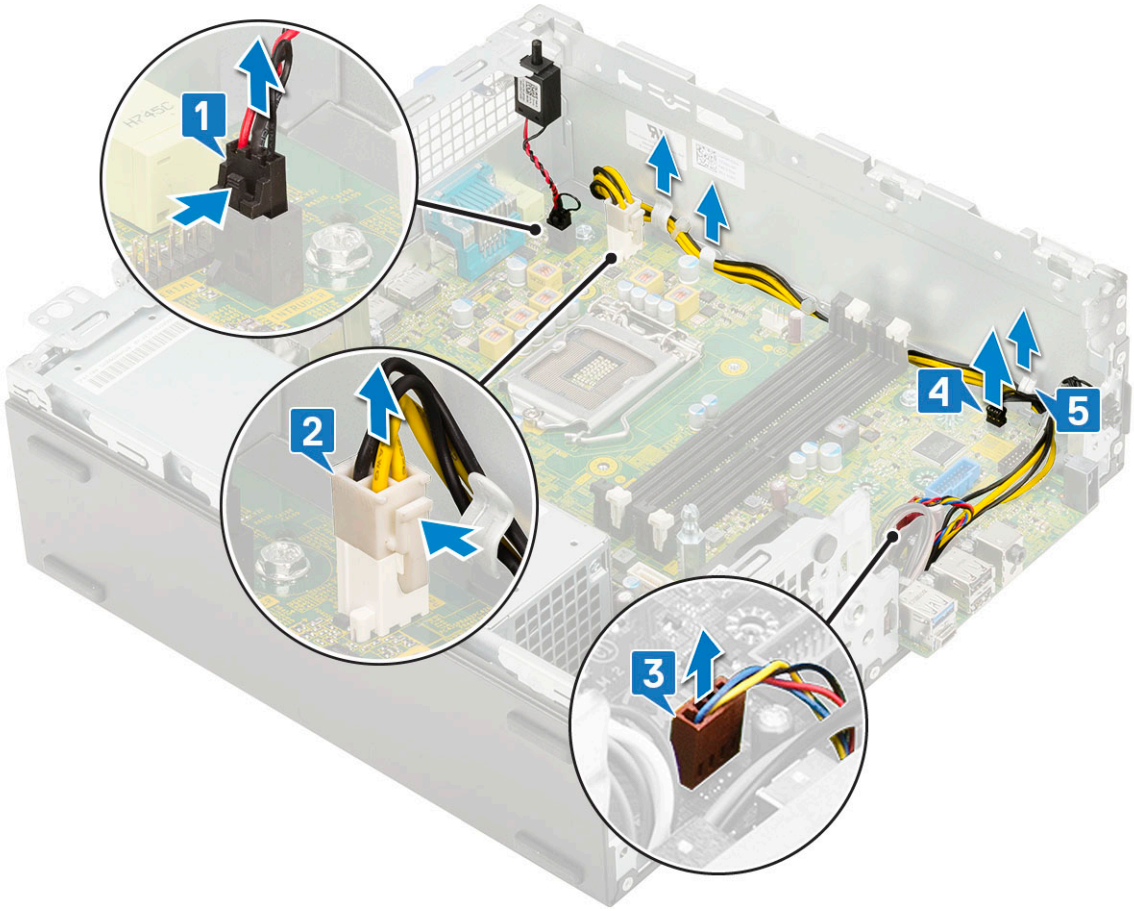
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. Side cover
   b. Coin cell
   c. Front bezel
   d. HDD assembly
   e. Hard drive and optical drive module
   f. Heat sink duct
   g. Heat sink fan
   h. Heat sink
   i. Processor
   j. Memory module

k. M.2 PCIe SSD

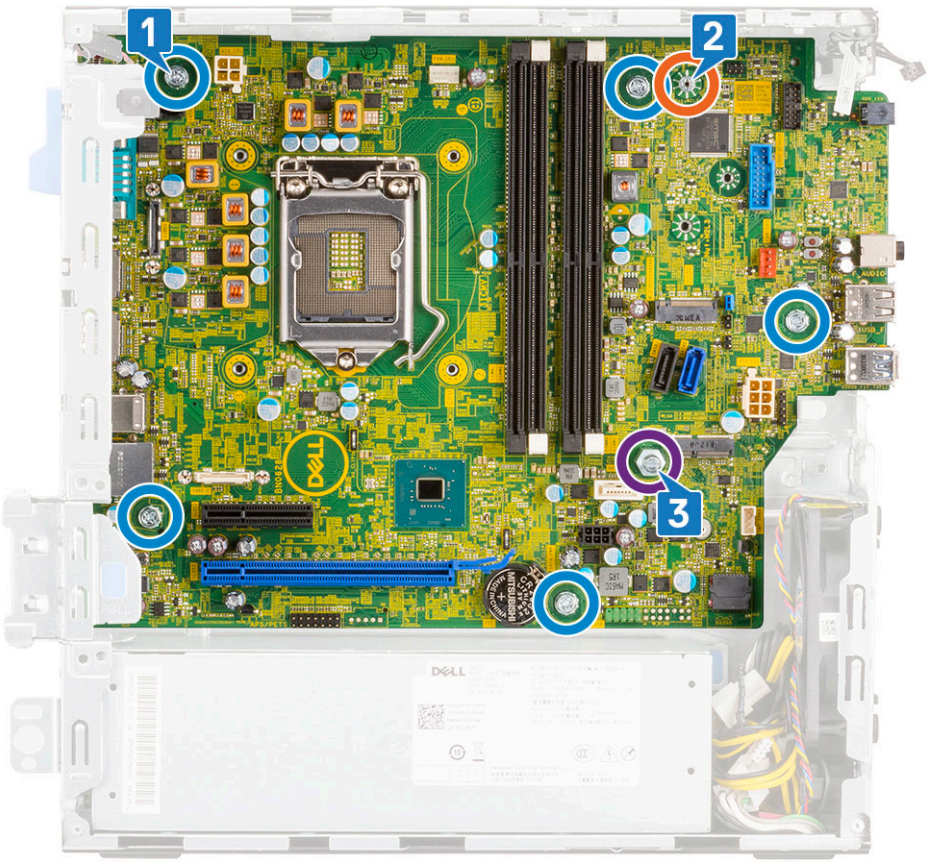
3. Disconnect the following cables:
   a. Intrusion switch
   b. Power switch
4. To remove the I/O panel:
   a. Remove the screw that secures the I/O panel [1].
   b. Rotate the I/O panel and remove it from the system [2].
   c. Disconnect the hard drive data cable [3], optical drive data cable [4] and power cable [5] from the connectors on the system board.



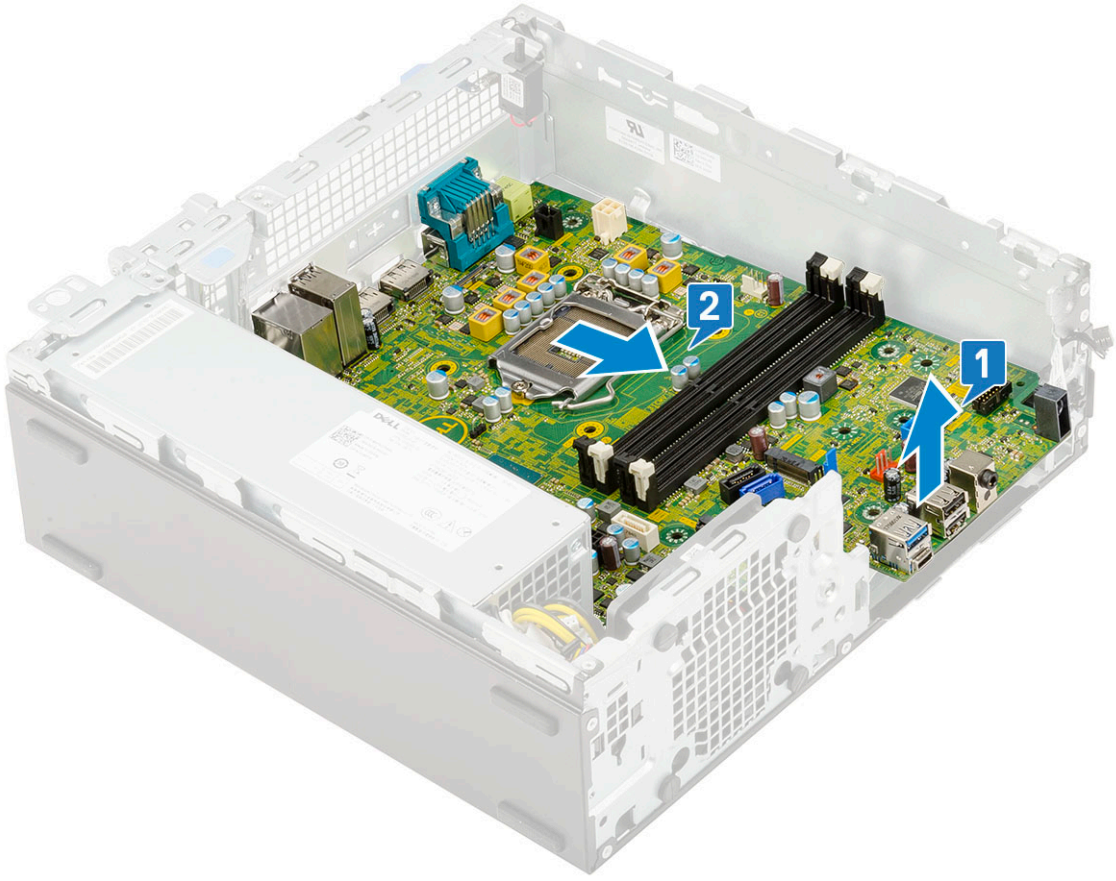
5. Disconnect the following cables from the connectors on the system board:
   a. Intrusion switch [1]
   b. CPU power [2]
   c. Power cable [3]
   d. Power switch [4]
6. Unroute the PSU cables from the retention clips [5].



7. To remove the screws from the system board:
   a. Remove the screws (5) that secure the system board to the chassis [1].
   b. Remove the single screw used as a mounting point for M.2 SSD drive [2] and the standoff single (#6-32) screw [3] that secures the system board to the system [3].

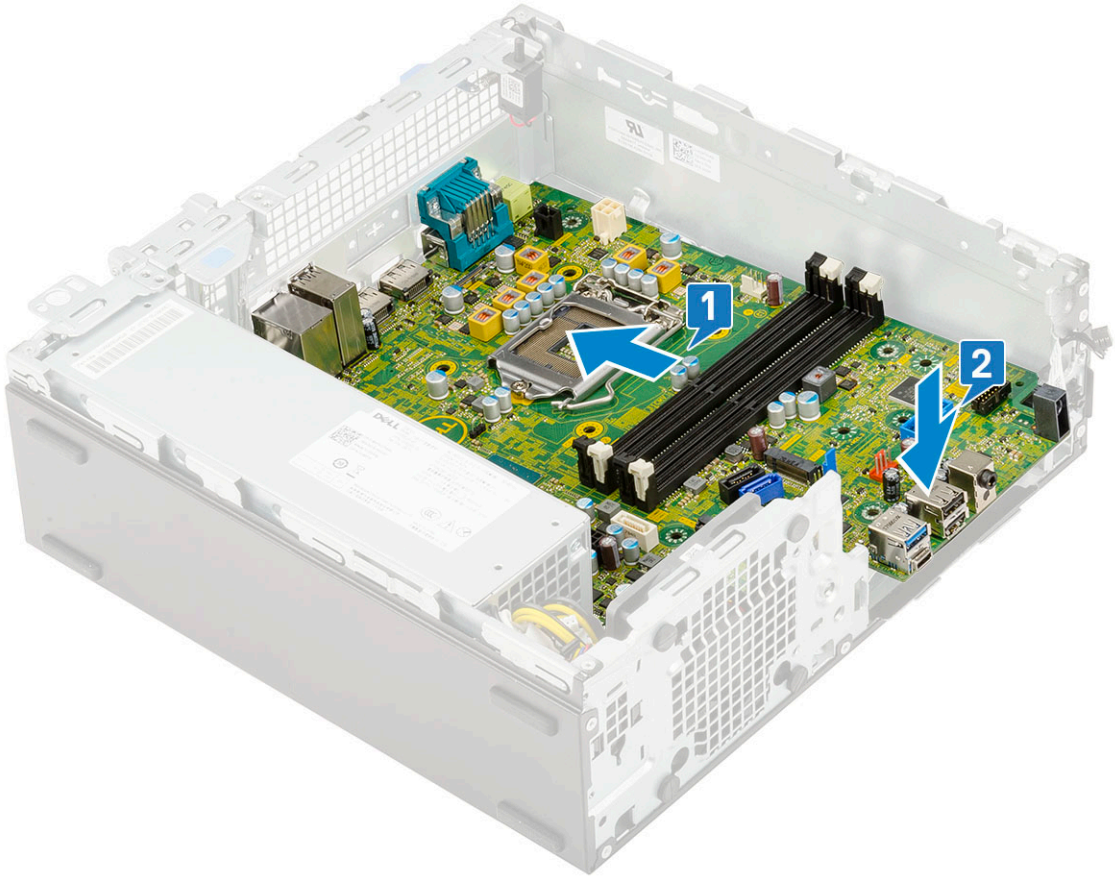


8. To remove the system board:
   a. Lift and slide the system board away from the system [1, 2].

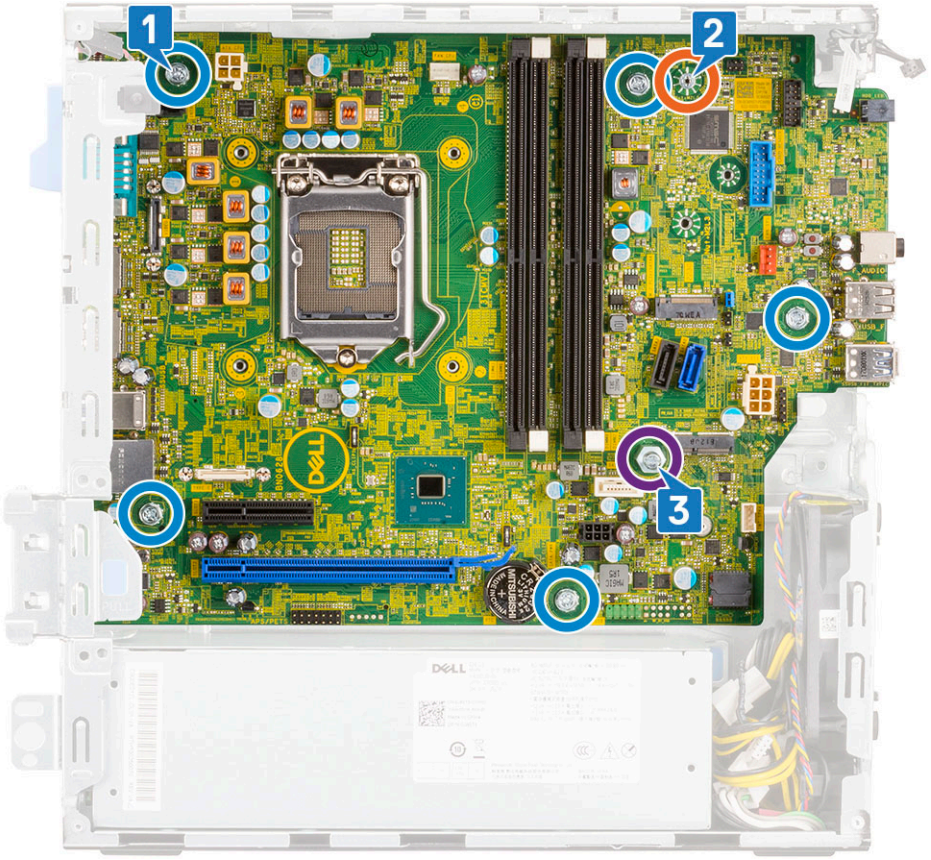


Installing the system board

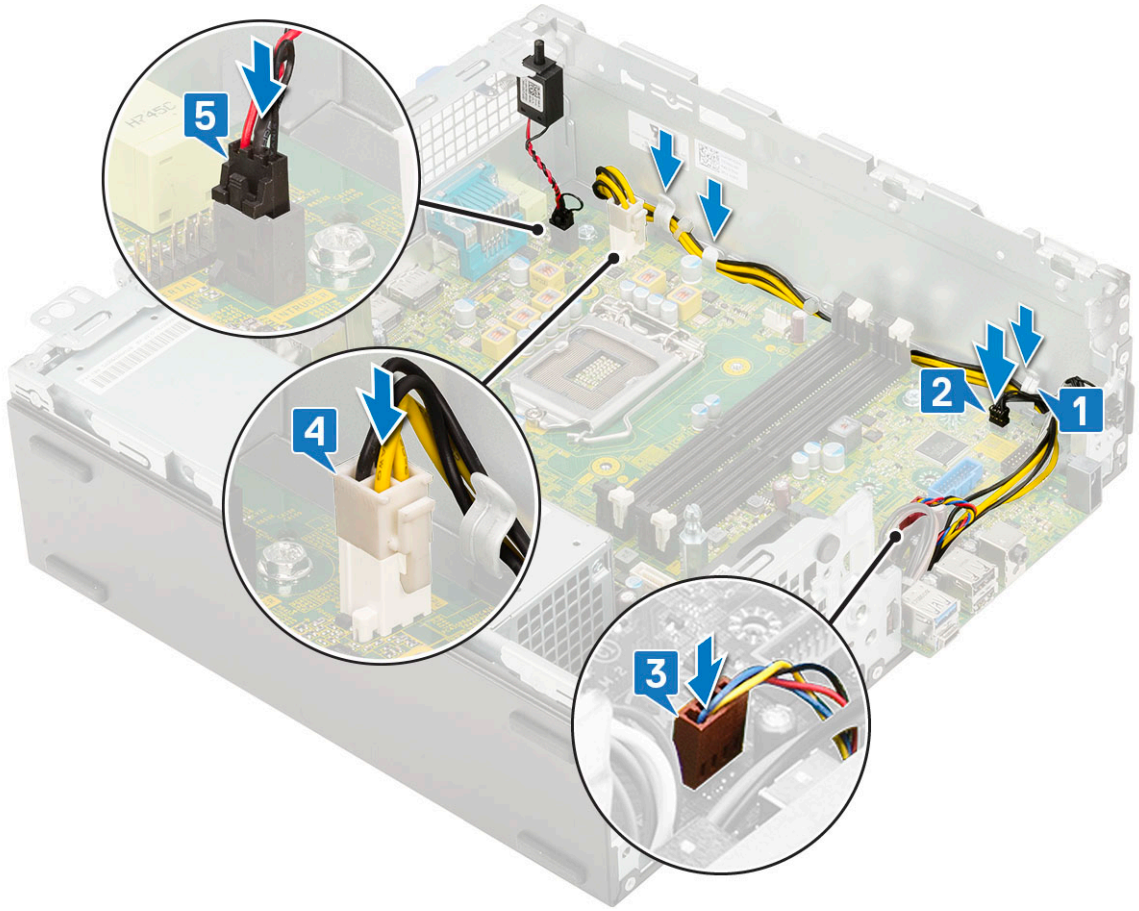
1. Hold the system board by its edges, and align it towards the back of the system.
2. Lower the system board into the system chassis until the connectors at the back of the system board align with the slots on the chassis, and the screw holes on the system board align with the standoffs on the system chassis [1,2].



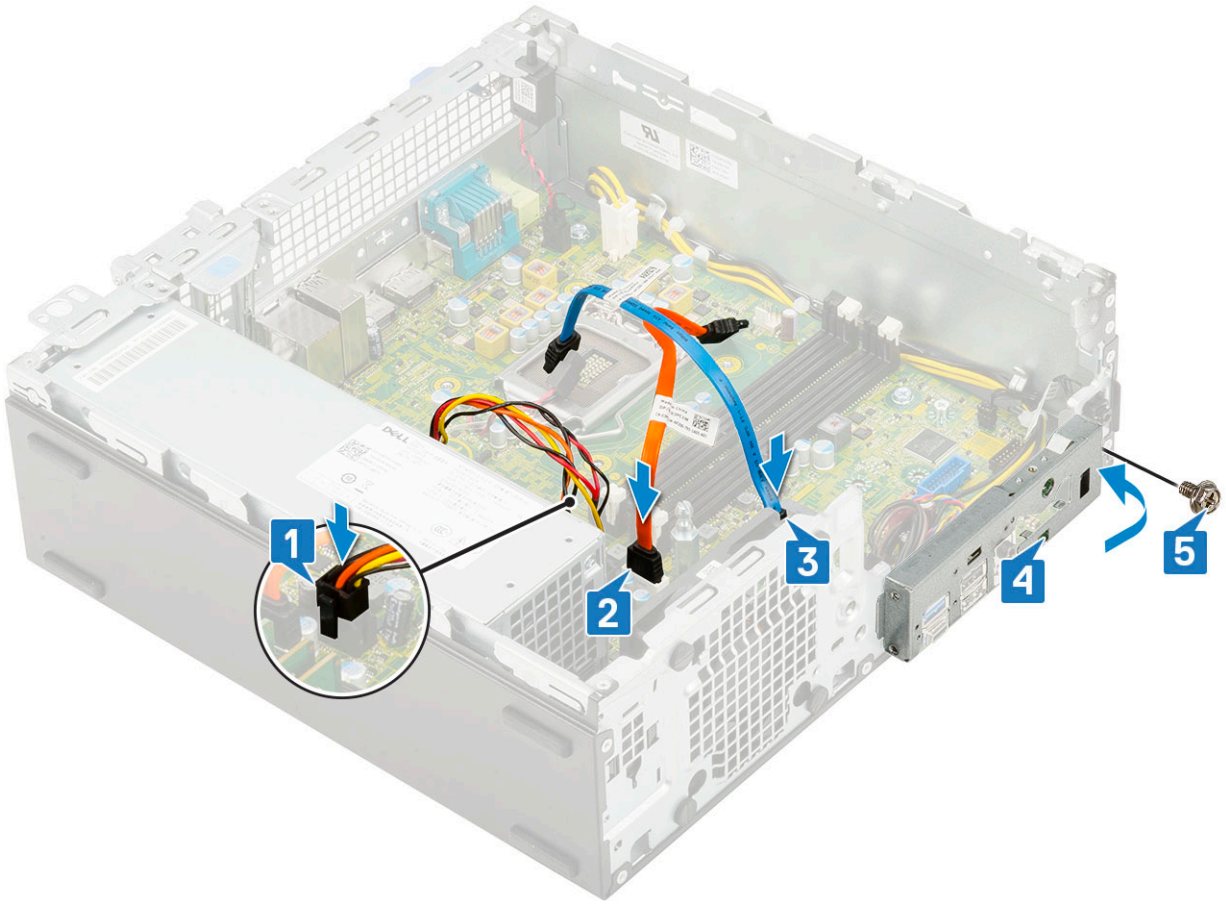
3. Replace the and the screws (5) that secure the system board to the system [1,2].



4. Route all the cables through the routing clips [1].
5. Align the cables with the pins on connectors on the system board and connect the following cables to the system board:
   a. Power switch [2]
   b. Power cable [3]
   c. CPU power [4]
   d. Intrusion switch [5]



6. Connect the power cable, optical drive data cable and hard drive data cable [1, 2, 3].
7. Insert the hook on the I/O panel into the slot on the chassis and rotate to close the I/O panel [4].
8. Replace the screw to secure the I/O panel to the chassis [5].



9. Connect the following cables:
   a. Intrusion switch
   b. Power switch
10. Install the:
    a. M.2 PCIe SSD
    b. Memory module
    c. Processor
    d. Heat sink
    e. Heat sink fan
    f. Heat sink duct
    g. Hard drive and optical drive module
    h. HDD assembly
    i. Front bezel
    j. Side cover
11. Follow the procedure in After working inside your computer.

3

Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Based article, Drivers and Downloads FAQ 000123347.

4

System setup

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

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

Topics:

Boot menu

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

The options are:

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

Navigation keys

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

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

System setup options

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

General options

Table 1. General

Option	Description
System Information	Displays the following information: • System Information: Displays **BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date,** and the **Express Service Code**. • Memory Information: Displays **Memory Installed, Memory Available, Memory Speed, Memory Channel Mode, Memory Technology, DIMM 1 Size, DIMM 2 Size**. • PCI Information: Displays SLOT1, SLOT 2, SLOT1_M.2, SLOT2_M.2 • 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, SATA 4, M.2 PCIe SSD-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. • **Windows Boot Manager** • **ONboard NIC (IPV4)** • **Onboard NIC (IPV6)**
Advanced Boot Options	Allows you to select the Enable Legacy Option ROMs option, when in UEFI boot mode. By default, this option is selected. • **Enable Legacy Option ROMs**—Default • Enable Attempt Legacy Boot
UEFI Boot Path Security	This option controls whether or not the system will prompt the user to enter the Admin password when booting a UEFI boot path from the F12 Boot Menu. • **Always, Except Internal HDD**—Default • Always, Except Internal HDD and PXE • Always • Never
Date/Time	Allows you to set the date and time settings. Changes to the system date and time take effect immediately.

.

System information

Table 2. 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.

Table 2. System Configuration (continued)

Option	Description
SATA Operation	Allows you to configure the operating mode of the integrated hard drive controller. ● Disabled = The SATA controllers are hidden ● AHCI = SATA is configured for AHCI mode ● **RAID ON** = SATA is configured to support RAID mode (selected by default)
Drives	Allows you to enable or disable the various drives on-board: ● **SATA-0** ● **SATA-4** ● **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 USB Boot Support ● Enable Front USB Ports ● Enable Rear USB Ports All the options are enabled by default.
Front USB Configuration	Allows you to enable or disable the front USB ports. All the ports are enabled by default.
Rear USB Configuration	Allows you to enable or disable the rear USB ports. All the ports are enabled by default.
USB PowerShare	This option allows you to charge the external devices, such as mobile phones, music player. This option is enabled by default.
Audio	Allows you to enable or disable the integrated audio controller. The option **Enable Audio** is selected by default. ● **Enable Microphone** ● **Enable Internal Speaker** Both the options are selected by default.
Dust Filter Maintenance	Allows you to enable or disable BIOS messages for maintaining the optional dust filter installed in your computer. BIOS will generate a pre-boot reminder to clean or replace the dust filter based on the interval set. ● **Disabled** (default) ● 15 days ● 30 days ● 60 days ● 90 days ● 120 days ● 150 days ● 180 days

Video screen options

Table 3. Video

Option	Description
Primary Display	Allows you to select the primary display when multiple controllers are available in the system. ● **Auto** (default) ● Intel HD Graphics **NOTE:** If you do not select Auto, the on-board graphics device will be present and enabled.

Security

Table 4. Security

Option	Description
Strong Password	This option lets you enable or disable strong passwords for the system. The option is disabled by default.
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 Bypass	This option lets you bypass the System (Boot) Password and the internal HDD password prompts during a system restart. ● **Disabled** — Always prompt for the system and internal HDD password when they are set. This option is enabled by default. ● Reboot Bypass — Bypass the password prompts on Restarts (warm boots). **NOTE:** The system will always prompt for the system and internal HDD passwords when powered on from the off state (a cold boot). Also, the system will always prompt for passwords on any module bay HDDs that may be present.
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) ● Clear ● 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) Choose any one option: ● Disabled ● Enabled (default)
Absolute	This field lets you Enable, Disable or Permanently Disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute Software. ● **Enabled** (default) ● Disabled ● Permanently Disabled
Chassis Intrusion	This field controls the chassis intrusion feature. Choose any one of the option: ● **Disabled** (default) ● Enabled ● On-Silent
OROM Keyboard Access	● Disabled ● **Enabled** (default) ● One Time Enable

Table 4. Security (continued)

Option	Description
Admin Setup Lockout	Allows you to prevent users from entering Setup when Admin password is set. This option is not set by default.
SMM Security Mitigation	Allows you to enable or disable additional UEFI SMM Security Mitigation protections. This option is not set by default.

Secure boot options

Table 5. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable Secure Boot feature • Secure Boot Enable This option is not selected by default.
Secure Boot Mode	Allows you to modify the behavior of Secure Boot to allow evaluation or enforcement of UEFI driver signatures. • **Deployed Mode** (default) • Audit Mode
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.

Intel Software Guard Extensions options

Table 6. Intel Software Guard Extensions

Option	Description
Intel SGX Enable	This field specifies you to provide a secured environment for running code/storing sensitive information in the context of the main OS. Click one of the following options: • Disabled • Enabled • **Software controlled**—Default
Enclave Memory Size	This option sets **SGX Enclave Reserve Memory Size** Click one of the following options:

Table 6. Intel Software Guard Extensions (continued)

Option	Description
	• **32 MB** • **64 MB** • **128 MB**—Default

Performance

Table 7. Performance

Option	Description
Multi Core Support	This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores. • **All**—Default • **1** • **2** • **3**
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of processor. • **Enable Intel SpeedStep** This option is set by default.
C-States Control	Allows you to enable or disable the additional processor sleep states. • **C states** This option is set by default.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. • **Enable Intel TurboBoost** This option is set by default.
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. • Disabled • **Enabled**—Default

Power management

Table 8. 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 set to **Power Off** by default.
Enable Intel Speed Shift Technology	Allows you to enable or disable Intel Speed Shift Technology support. The option **Enable Intel Speed Shift Technology** is set by default.

Table 8. Power Management (continued)

Option	Description
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 (default)** • Enabled in S5 only • Enabled in S4 and S5
Fan Control Override	The option is not set 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** or **WLAN** - Allows the system to be powered on by special LAN or wireless LAN signals. • **LAN Only** - Allows the system to be powered on by special LAN 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. • **WLAN Only** - Allows the system to be powered on by special WLAN signals. This option is set to **Disabled** by default.
Block Sleep	Allows you to block entering to sleep (S3 state) in OS environment. This option is disabled by default.

Post behavior

Table 9. 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. The option **Enable Keyboard Error Detection** is enabled by default.
Fast Boot	This option can speed up the boot process by bypassing some compatibility steps: • 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. • Auto — This allows the operating system to control this setting (this works only when the operating system supports Simple Boot Flag). This option is set to **Thorough** by default.
Extend BIOS POST Time	This option creates an additional pre-boot delay. • **0 seconds** (default) • 5 seconds • 10 seconds
Full Screen Logo	This option will display full screen logo if your image match screen resolution. The option Enable Full Screen Logo is not set by default.
Warnings and Errors	This option causes the boot process to only pause when warning or errors are detected. Choose any one of the option:

Table 9. POST Behavior (continued)

Option	Description
	• **Prompt on Warnings and Errors** (default) • Continue on Warnings • Continue on Warnings and Errors

Manageability

Table 10. Manageability

Option	Description
USB provision	This option is not selected by default.
MEBx Hotkey	This option is selected by default.

Virtualization support

Table 11. Virtualization Support

Option	Description
Virtualization	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by the Intel Virtualization technology. • **Enable Intel Virtualization Technology** This option is set by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by the Intel Virtualization technology for direct I/O. • **Enable VT for Direct I/O** This option is set by default.

Wireless options

Table 12. Wireless

Option	Description
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. The options are: • **WLAN/WiGig** • **Bluetooth** All the options are enabled by default.

Maintenance

Table 13. 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.

Table 13. Maintenance (continued)

Option	Description
	This option is not set by default.
SERR Messages	Controls the SERR message mechanism. This option is set by default. Some graphics cards require that the SERR message mechanism be disabled.
BIOS Downgrade	Allows you to flash previous revisions of the system firmware. • **Allow BIOS Downgrade** This option is set by default.
Bios Recovery	**BIOS Recovery from Hard Drive**—This option is set by default. Allows you to recover the corrupted BIOS from a recovery file on the HDD or an external USB key. **BIOS Auto-Recovery**— Allows you to recover the BIOS automatically.
First Power On Date	Allows you the set Ownership date. The option **Set Ownership Date** is not set by default.

System logs

Table 14. System Logs

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

Advanced configuration

Table 15. Advanced configuration

Option	Description
ASPM	Allows you to set the ASPM level. • Auto (default) - There is handshaking between the device and PCI Express hub to determine the best ASPM mode supported by the device • Disabled - ASPM power management is turned off at all time • L1 Only - ASPM power management is set to use L1

Updating the BIOS

Updating the BIOS in Windows

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

1. Go to www.dell.com/support.
2. Click **Product support**. In the **Search support** box, enter the Service Tag of your computer, and then click **Search**.

   NOTE: If you do not have the Service Tag, use the SupportAssist feature to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.

5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, see knowledge base article 000124211 at www.dell.com/support.

Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see the knowledge base article 000131486 at www.dell.com/support.

Updating the BIOS using the USB drive in Windows

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, see the knowledge base article 000145519 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

Updating the BIOS from the F12 One-Time boot menu

Update your computer BIOS using the BIOS update.exe file that is copied to a FAT32 USB drive and booting from the F12 One-Time boot menu.

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

BIOS Update

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

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

NOTE: Only computers with BIOS Flash Update option in the F12 One-Time boot menu can use this function.

Updating from the One-Time boot menu

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

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

- Functional computer battery to flash the BIOS

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

CAUTION: Do not turn off the computer during the BIOS update process. The computer may not boot if you turn off your computer.

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.
2. Turn on the computer and press F12 to access the One-Time Boot Menu, select BIOS Update using the mouse or arrow keys then press Enter.
   The flash BIOS menu is displayed.
3. Click **Flash from file**.
4. Select external USB device.
5. Select the file and double-click the flash target file, and then click **Submit**.
6. Click **Update BIOS**. The computer restarts to flash the BIOS.
7. The computer will restart after the BIOS update is completed.

System and setup password

Table 16. System and setup password

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.

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

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

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

NOTE: System and setup password feature is disabled.

Assigning a system setup password

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

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

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

Deleting or changing an existing system setup password

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

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

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press **Enter**.
   The **System Security** screen is displayed.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password**, alter or delete the existing system password and press **Enter** or **Tab**.
4. Select **Setup Password**, alter or delete the existing setup password and press **Enter** or **Tab**.

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

5. Press **Esc** and a message prompts you to save the changes.
6. Press **Y** to save the changes and exit from System Setup.
   The computer restarts.

5

Troubleshooting

Topics:

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:

The ePSA diagnostics can be initiated by the FN+PWR buttons while powering on the computer.

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

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

Running the ePSA Diagnostics

Invoke diagnostics boot by either of the methods that are suggested below:

1. Power on the computer.
2. As the computer boots, press the F12 key when the Dell logo is displayed.
3. In the boot menu screen, use Up/Down arrow key to select the **Diagnostics** option and then press **Enter**.

   NOTE: The **Enhanced Pre-boot System Assessment** window displays, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.

4. Press the arrow in the lower-right corner to go to the page listing.
   The detected items are listed and tested.
5. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
6. Select the device from the left pane and click **Run Tests**.
7. If there are any issues, error codes are displayed.
   Note the error code and contact Dell.

Diagnostics

The computer POST (Power On Self Test) ensures that it meets the basic computer requirements and the hardware is working appropriately before the boot process begins. If the computer passes the POST, the computer continues to start in a normal mode. However, if the computer fails the POST, the computer emits a series of LED codes during the start-up. The system LED is integrated on the Power button.

The following table shows different light patterns and what they indicate.

Table 17. Diagnostics

Amber Blinking Pattern	Possible Problem	Problem Description
2, 1	System board	System board failure
2, 2	System board, PSU, or cabling	System board, PSU, or cabling failure
2, 3	System board, memory, CPU	System board, memory, or CPU failure
2, 4	CMOS (coin-cell) battery	Coin-cell battery failure
2, 5	BIOS	Corrupt BIOS. Recovery image is not found or is invalid during auto BIOS recovery process.
2, 6	CPU	CPU configuration error or CPU failure
2, 7	Memory	Memory failure
3, 1	PCI/video	PCI or video card / chip failure
3, 2	Storage/USB	Storage and USB configuration error or failure
3, 3	Memory	No memory detected
3, 4	System board	System board error
3, 5	Memory	Memory configuration error, incompatible memory, or invalid memory configuration
3, 6	BIOS	Recovery image not found
3, 7	BIOS	Recovery image found but invalid

Diagnostic error messages

Table 18. Diagnostic error messages

Error messages	Description
AUXILIARY DEVICE FAILURE	The touchpad or external mouse may be faulty. For an external mouse, check the cable connection. Enable the **Pointing Device** option in the System Setup program.
BAD COMMAND OR FILE NAME	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct path name.
CACHE DISABLED DUE TO FAILURE	The primary cache internal to the microprocessor has failed. **Contact Dell**
CD DRIVE CONTROLLER FAILURE	The optical drive does not respond to commands from the computer.
DATA ERROR	The hard drive cannot read the data.

Table 18. Diagnostic error messages (continued)

Error messages	Description
DECREASING AVAILABLE MEMORY	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules or, if necessary, replace them.
DISK C: FAILED INITIALIZATION	The hard drive failed initialization. Run the hard drive tests in **Dell Diagnostics**.
DRIVE NOT READY	The operation requires a hard drive in the bay before it can continue. Install a hard drive in the hard drive bay.
ERROR READING PCMCIA CARD	The computer cannot identify the ExpressCard. Reinsert the card or try another card.
EXTENDED MEMORY SIZE HAS CHANGED	The amount of memory recorded in non-volatile memory (NVRAM) does not match the memory module installed in the computer. Restart the computer. If the error appears again, **Contact Dell**
THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE	The file that you are trying to copy is too large to fit on the disk, or the disk is full. Try copying the file to a different disk or use a larger capacity disk.
A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? " < > | -	Do not use these characters in filenames.
GATE A20 FAILURE	A memory module may be loose. Reinstall the memory module or, if necessary, replace it.
GENERAL FAILURE	The operating system is unable to carry out the command. The message is usually followed by specific information. For example, `Printer out of paper. Take the appropriate action.`
HARD-DISK DRIVE CONFIGURATION ERROR	The computer cannot identify the drive type. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. Run the **Hard Disk Drive** tests in **Dell Diagnostics**.
HARD-DISK DRIVE CONTROLLER FAILURE 0	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the **Hard Disk Drive** tests in **Dell Diagnostics**.
HARD-DISK DRIVE FAILURE	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the **Hard Disk Drive** tests in **Dell Diagnostics**.
HARD-DISK DRIVE READ FAILURE	The hard drive may be defective. Shut down the computer, remove the hard drive, and boot the computer from an optical. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the **Hard Disk Drive** tests in **Dell Diagnostics**.
INSERT BOOTABLE MEDIA	The operating system is trying to boot to non-bootable media, such as an optical drive. Insert bootable media.
INVALID CONFIGURATION INFORMATION-PLEASE RUN SYSTEM SETUP PROGRAM	The system configuration information does not match the hardware configuration. The message is most likely to occur

Table 18. Diagnostic error messages (continued)

Error messages	Description
	after a memory module is installed. Correct the appropriate options in the system setup program.
KEYBOARD CLOCK LINE FAILURE	For external keyboards, check the cable connection. Run the **Keyboard Controller** test in **Dell Diagnostics**.
KEYBOARD CONTROLLER FAILURE	For external keyboards, check the cable connection. Restart the computer, and avoid touching the keyboard or the mouse during the boot routine. Run the **Keyboard Controller** test in **Dell Diagnostics**.
KEYBOARD DATA LINE FAILURE	For external keyboards, check the cable connection. Run the **Keyboard Controller** test in **Dell Diagnostics**.
KEYBOARD STUCK KEY FAILURE	For external keyboards or keypads, check the cable connection. Restart the computer, and avoid touching the keyboard or keys during the boot routine. Run the **Stuck Key** test in **Dell Diagnostics**.
LICENSED CONTENT IS NOT ACCESSIBLE IN MEDIADIRECT	Dell MediaDirect cannot verify the Digital Rights Management (DRM) restrictions on the file, so the file cannot be played.
MEMORY ADDRESS LINE FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ALLOCATION ERROR	The software you are attempting to run is conflicting with the operating system, another program, or a utility. Shut down the computer, wait for 30 seconds, and then restart it. Run the program again. If the error message still appears, see the software documentation.
MEMORY DOUBLE WORD LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY ODD/EVEN LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY WRITE/READ FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
NO BOOT DEVICE AVAILABLE	The computer cannot find the hard drive. If the hard drive is your boot device, ensure that the drive is installed, properly seated, and partitioned as a boot device.
NO BOOT SECTOR ON HARD DRIVE	The operating system may be corrupted, **Contact Dell**.
NO TIMER TICK INTERRUPT	A chip on the system board may be malfunctioning. Run the **System Set** tests in **Dell Diagnostics**.
NOT ENOUGH MEMORY OR RESOURCES. EXIT SOME PROGRAMS AND TRY AGAIN	You have too many programs open. Close all windows and open the program that you want to use.
OPERATING SYSTEM NOT FOUND	Reinstall the operating system. If the problem persists, **Contact Dell**.
OPTIONAL ROM BAD CHECKSUM	The optional ROM has failed. **Contact Dell**.
SECTOR NOT FOUND	The operating system cannot locate a sector on the hard drive. You may have a defective sector or corrupted File Allocation Table (FAT) on the hard drive. Run the Windows error-checking utility to check the file structure on the hard drive. See **Windows Help and Support** for instructions (click **Start** > **Help and Support**). If a large number of sectors are defective, back up the data (if possible), and then format the hard drive.

Table 18. Diagnostic error messages (continued)

Error messages	Description
SEEK ERROR	The operating system cannot find a specific track on the hard drive.
SHUTDOWN FAILURE	A chip on the system board may be malfunctioning. Run the **System Set** tests in **Dell Diagnostics**. If the message reappears, **Contact Dell**.
TIME-OF-DAY CLOCK LOST POWER	System configuration settings are corrupted. Connect your computer to an electrical outlet to charge the battery. If the problem persists, try to restore the data by entering the System Setup program, then immediately exit the program. If the message reappears, **Contact Dell**.
TIME-OF-DAY CLOCK STOPPED	The reserve battery that supports the system configuration settings may require recharging. Connect your computer to an electrical outlet to charge the battery. If the problem persists, **Contact Dell**.
TIME-OF-DAY NOT SET-PLEASE RUN THE SYSTEM SETUP PROGRAM	The time or date stored in the system setup program does not match the system clock. Correct the settings for the **Date and Time** options.
TIMER CHIP COUNTER 2 FAILED	A chip on the system board may be malfunctioning. Run the **System Set** tests in **Dell Diagnostics**.
UNEXPECTED INTERRUPT IN PROTECTED MODE	The keyboard controller may be malfunctioning, or a memory module may be loose. Run the **System Memory** tests and the **Keyboard Controller** test in **Dell Diagnostics** or **Contact Dell**.
X:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY	Insert a disk into the drive and try again.

Backup media and recovery options

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

Recovering the operating system

When your computer is unable to boot to the operating system even after repeated attempts, it automatically starts Dell SupportAssist OS Recovery.

Dell SupportAssist OS Recovery is a standalone tool that is preinstalled in all Dell computers installed with Windows operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

You can also download it from the Dell Support website to troubleshoot and fix your computer when it fails to boot into their primary operating system due to software or hardware failures.

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/serviceabilitytools. Click **SupportAssist** and then, click **SupportAssist OS Recovery**.

System error messages

Table 19. System error messages

System message	Description
`Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support`	The computer failed to complete the boot routine three consecutive times for the same error.
`CMOS checksum error`	RTC is reset, **BIOS Setup** default has been loaded.
`CPU fan failure`	CPU fan has failed.
`System fan failure`	System fan has failed.
`Hard-disk drive failure`	Possible hard disk drive failure during POST.
`Keyboard failure`	Keyboard failure or loose cable. If reseating the cable does not solve the problem, replace the keyboard.
`No boot device available`	No bootable partition on hard disk drive, the hard disk drive cable is loose, or no bootable device exists. ● If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device. ● Enter system setup and ensure that the boot sequence information is correct.
`No timer tick interrupt`	A chip on the system board might be malfunctioning or motherboard failure.
`NOTICE - Hard Drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem`	S.M.A.R.T error, possible hard disk drive failure.

6

Getting help and contacting Dell

Self-help resources

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

Table 20. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
My Dell app	
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	www.dell.com/support/windows
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals and documents.	Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, enter the Service Tag or Express Service Code at www.dell.com/support. For more information on how to find the Service Tag for your computer, see Locate the Service Tag on your computer.
Dell knowledge base articles for a variety of computer concerns	1. Go to www.dell.com/support. 2. On the menu bar at the top of the Support page, select **Support** > **Knowledge Base**. 3. In the Search field on the Knowledge Base page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see www.dell.com/contactdell.

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

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