Dell Precision 7820 Tower

Owner's Manual

Regulatory Model: D02T
Regulatory Type: D02T001
May 2020
Rev. A04

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.

© 2019 2020 Dell Inc. or its subsidiaries. All rights reserved. Dell, EMC, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be trademarks of their respective owners.

Contents

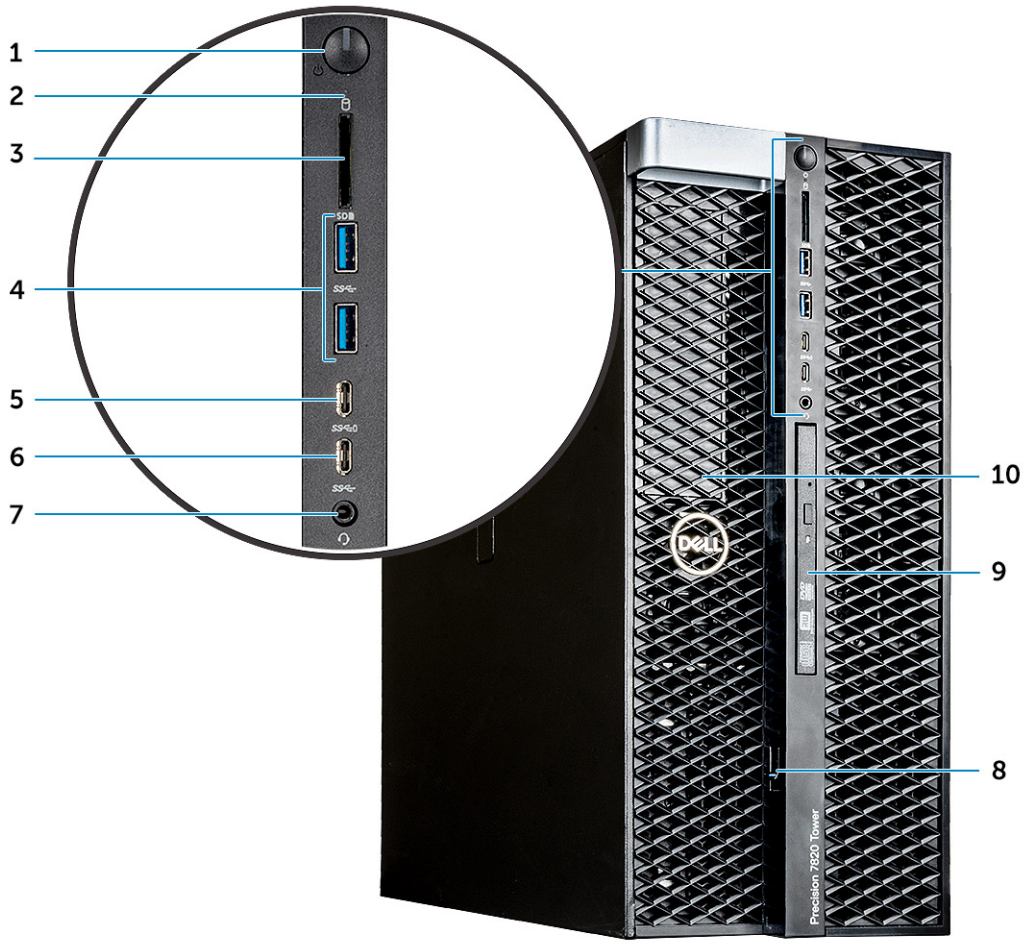
1

Chassis

This chapter illustrates the multiple chassis views along with the ports and connectors and also explains the FN hot key combinations.

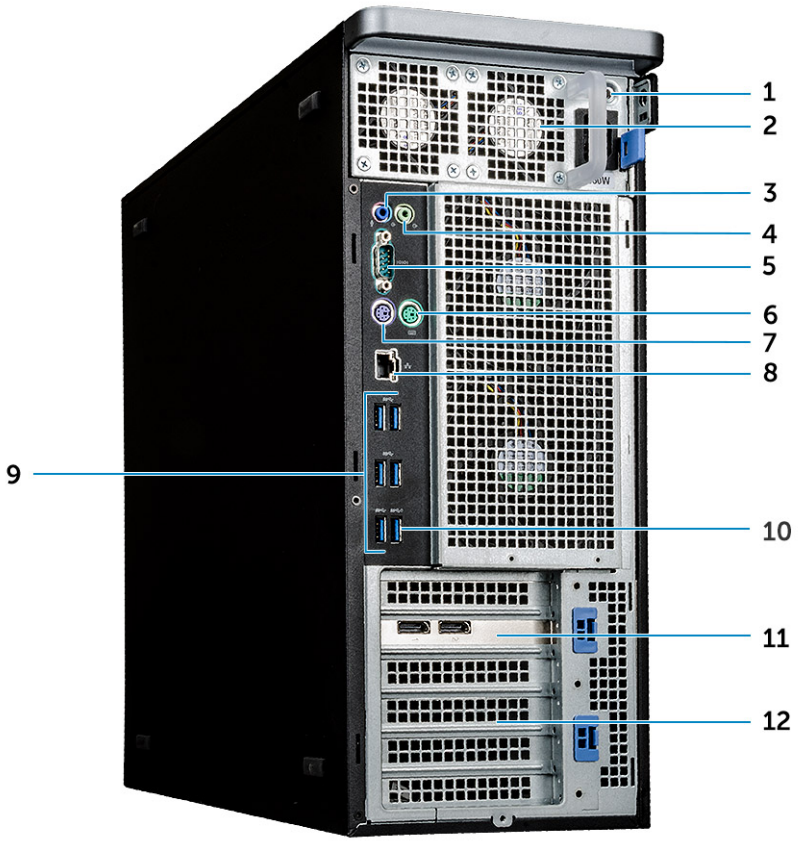
Topics:

Front view



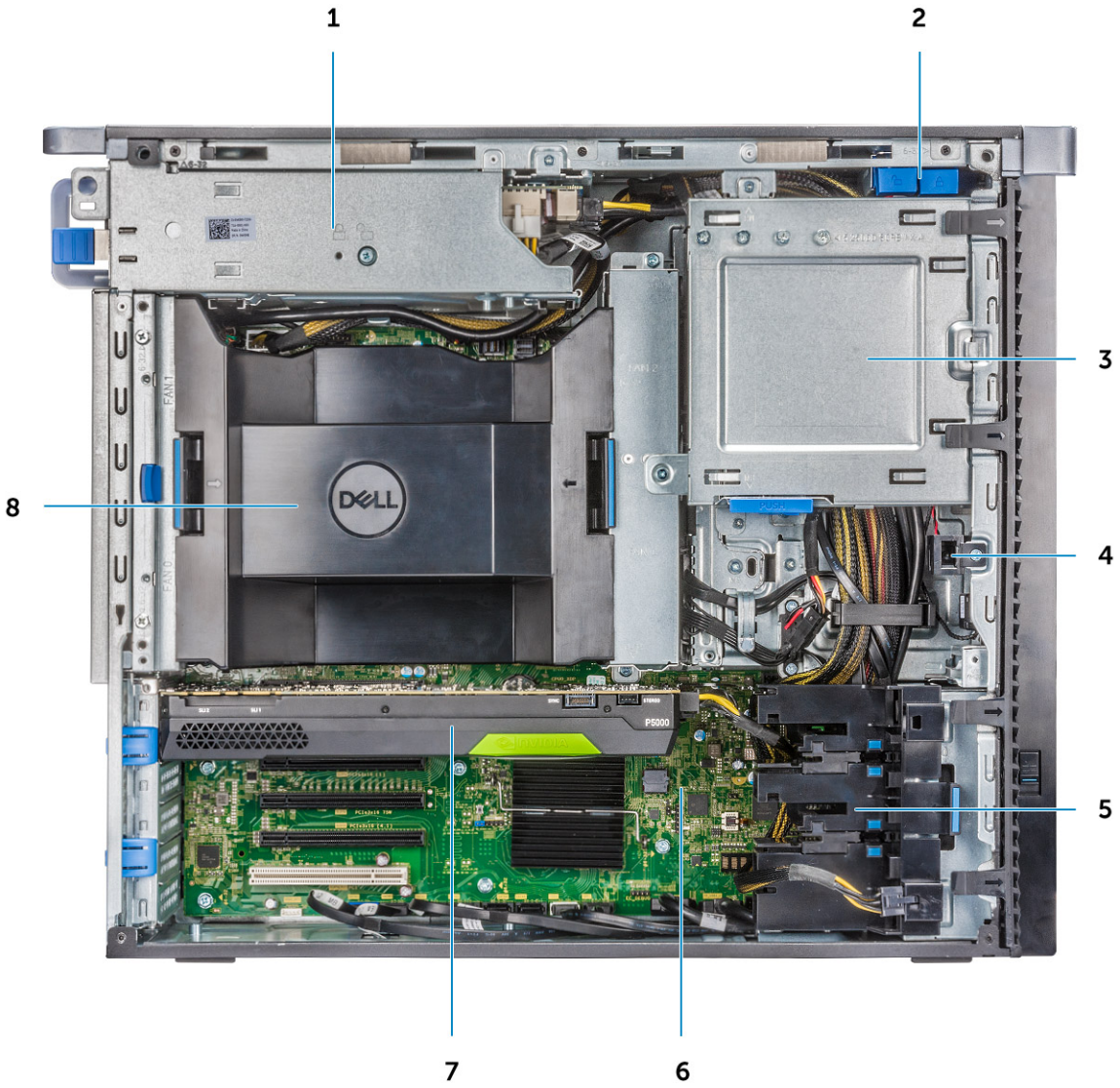
1. Power button
2. HDD activity LED
3. SD card slot
4. USB 3.1 Gen 1 ports
5. USB 3.1 Gen 1 Type C port with PowerShare
6. USB 3.1 Gen 1 Type C
7. Headset port
8. Drive access release latch
9. Slim optical disk drive
10. 5.25 inch ODD bracket

Back view

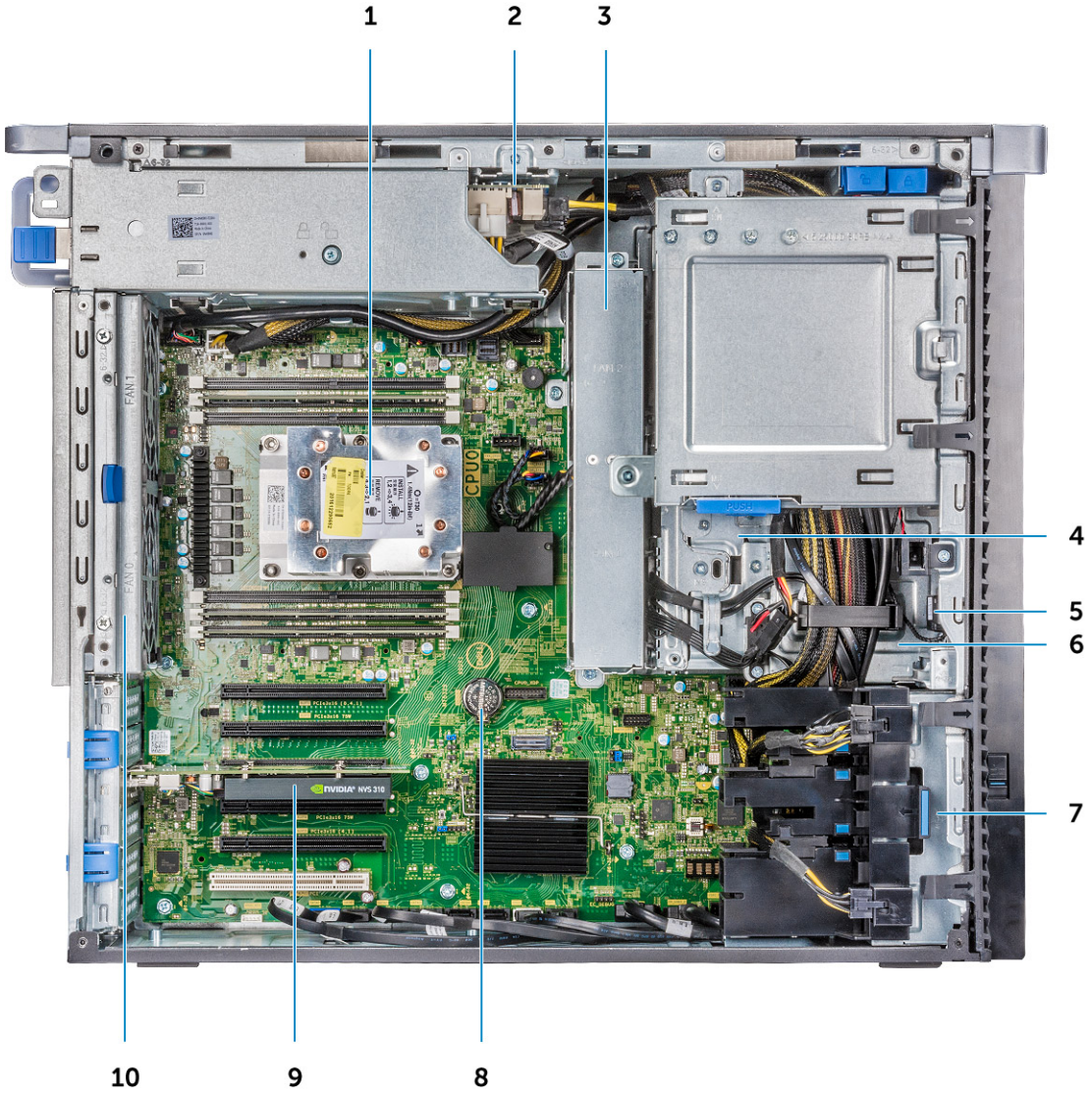


1. PSU BIST LED
2. Power supply unit
3. Microphone /Line-in port
4. Line-out port
5. Serial port
6. PS/2 Mouse port
7. PS/2 Keyboard port
8. Network port
9. USB 3.1 Gen1 ports
10. USB 3.1 Gen1 port(supports smart Power-On)
11. PCIe expansion slot
12. Mechanical expansion slots

Internal view



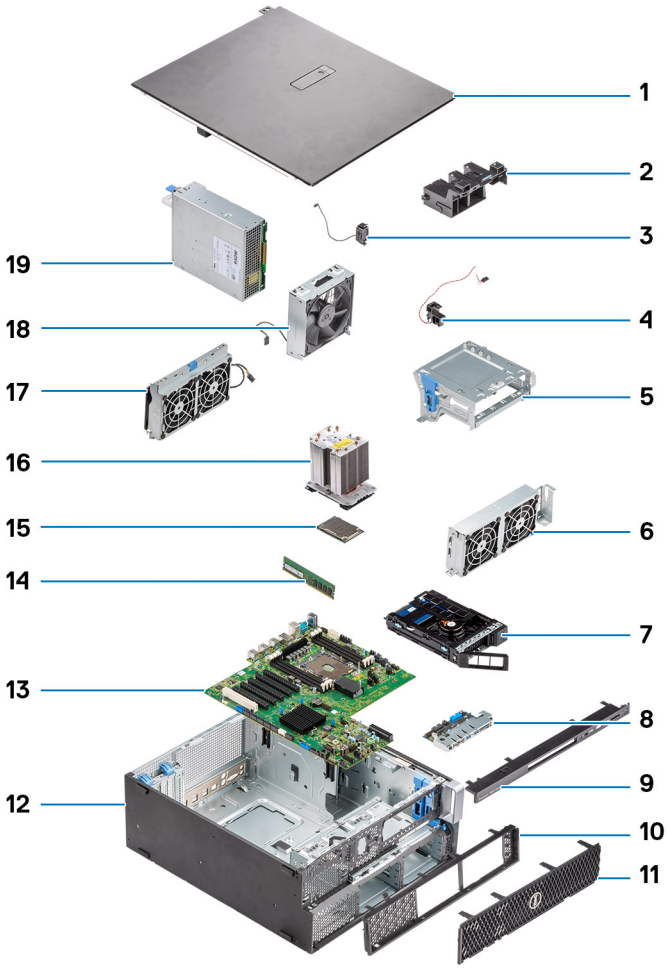
1. PSU bracket
2. HDD bezel lock/unlock button
3. ODD 5.25" bracket
4. Intrusion switch
5. PCIe holder
6. System board
7. GPU
8. Air shroud



1. Heat sink
2. PSU distribution board
3. System fan
4. 5.25 inch ODD bracket
5. Speaker
6. 2.5 inch Optical disk drive
7. Front system fan
8. Coin cell battery
9. Half length PCIe card
10. Rear system fan

Major components of your system

This section illustrates the major components of your system along with its location.



1. Side cover
2. PCIe holder
3. Internal chassis speaker
4. Intrusion switch
5. 5.25 inch ODD bracket
6. System fan
7. NVMe Flexbay
8. Front input and output panel
9. Front input and output bezel
10. Front bezel
11. Hard Disk Drive bezel
12. Computer chassis
13. System board
14. Memory
15. Processor
16. Heat sink and CPU fan assembly
17. System fan
18. Front system fan
19. Power supply unit (PSU)

NOTE: Dell provides a list of components and their part numbers for the original system configuration purchased. These parts are available according to warranty coverages purchased by the customer. Contact your Dell sales representative for purchase options.

2

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 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.

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

WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage

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

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

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

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

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

CAUTION: 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.

Turning off your computer — Windows

CAUTION: 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**.

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

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.

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.

3

Removing and installing components

Topics:

Screw size list

Table 1. Screw list

Component	Screw type	Quantity
Slim ODD Bracket	#6-32 UNC X6.0mm	1
FIO Cable Clip	#6-32X1/4 inches	1
FIO Board	M3X5.0mm	2
FIO Bracket	#6-32 UNC X6.0mm	1
Front System Fan Bracket	#6-32 UNC X6.0mm	1
Intrusion Holder	M3X5.0mm	1
PDB Board	#6-32X1/4 inches	3
PDB Bracket	M3X5.0mm	1
Slim ODD Plug	M3X5.0mm	2

Table 1. Screw list (continued)

Component	Screw type	Quantity
HDD Bracket	M3X5.0mm	1
5.25" ODD Bracket	#6-32 UNC X6.0mm M3X5.0mm	2 2
System Board	#6-32X1/4 inches	11
Middle Fan Fixed Bracket	#6-32X1/4 inches	1
Middle Fan Bracket	#6-32X1/4 inches	3
Rear Fan Bracket	#6-32X1/4 inches	2
HSBP Board	M3X5.0mm	2
Slim ODD Fixed Bracket	M2X2.0mm	2
Slim ODD	M3X5.0mm	1
5.25" ODD	M3X4.5mm	4
3.5" HDD Bracket	M3X4.5mm	4
2.5" HDD Bracket	M3X4.5mm	4
2nd CPU Support Bracket	#6-32X1/4 inches	2
2nd CPU Board	#6-32X1/4 inches	5
UPI Fixed Bracket	M3X5.0mm	1
CPU Cooler	T-30 torx bolt	4
Liquid Cooler Module	#6-32X1/4 inches #6-32 UNC X3.5mm T-30 torx bolt	4 6 4

Recommended tools

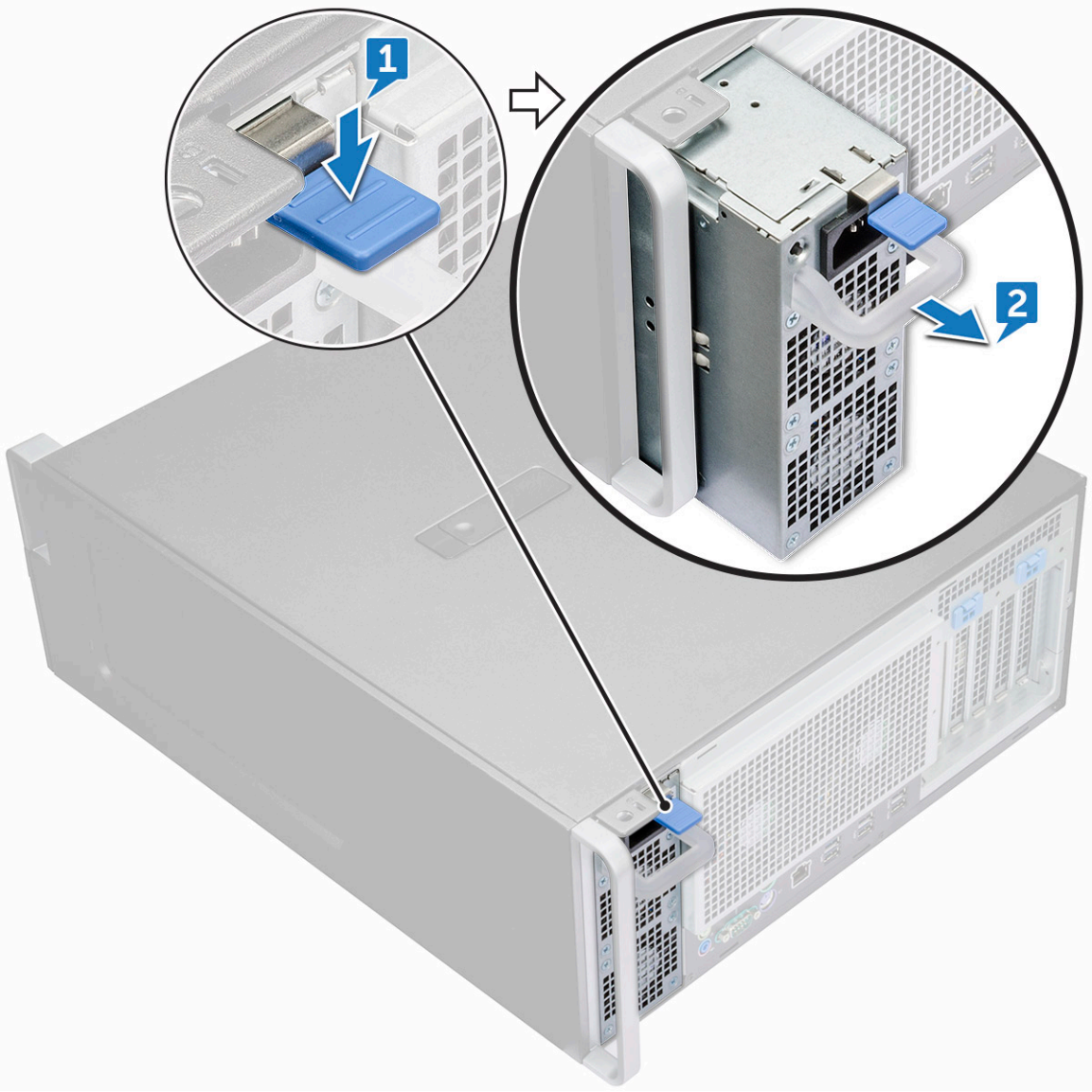
The procedures in this document may require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Philips #2 screwdriver
- Plastic scribe-Recommended for field technician
- T-30 torx screwdriver

Power supply unit (PSU)

Removing the PSU

1. Follow the procedure in Before working inside your computer.
2. Disconnect the power cable from the system.
3. Press the PSU release latch [1] and slide the power supply away from the system [2].



Installing the PSU

1. Slide in the power supply unit to the PSU slot on the system.
2. Connect the power cable to the system.
3. Follow the procedure in After working inside your computer

Side cover

Removing the side cover

1. Follow the procedure in Before working inside your computer.

   CAUTION: The system will not power on while the side cover is off. Also, the system will shut down if the side cover is removed while the system is on.

2. To remove the side cover:
3. Press the latch

4. Pull the latch [1] upward and rotate it to release the cover [2].

5. Lift the cover to remove it from the system.

Installing the side cover

1. First hold and align the bottom of the side cover to the chassis.
2. Ensure that the hook on the bottom of the side cover snaps into the notch on the system.
3. Press the system cover until it clicks into place.

   CAUTION: The system will not power on without the side cover. Also, the system will shut down if the side cover is removed while the system is on.

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

Front bezel

Removing the front bezel

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

3. To remove the front bezel:
   a. Press the latch and pry the retention tabs to release the front bezel from the system.

   b. Rotate the bezel forward and lift the front bezel away from the system.

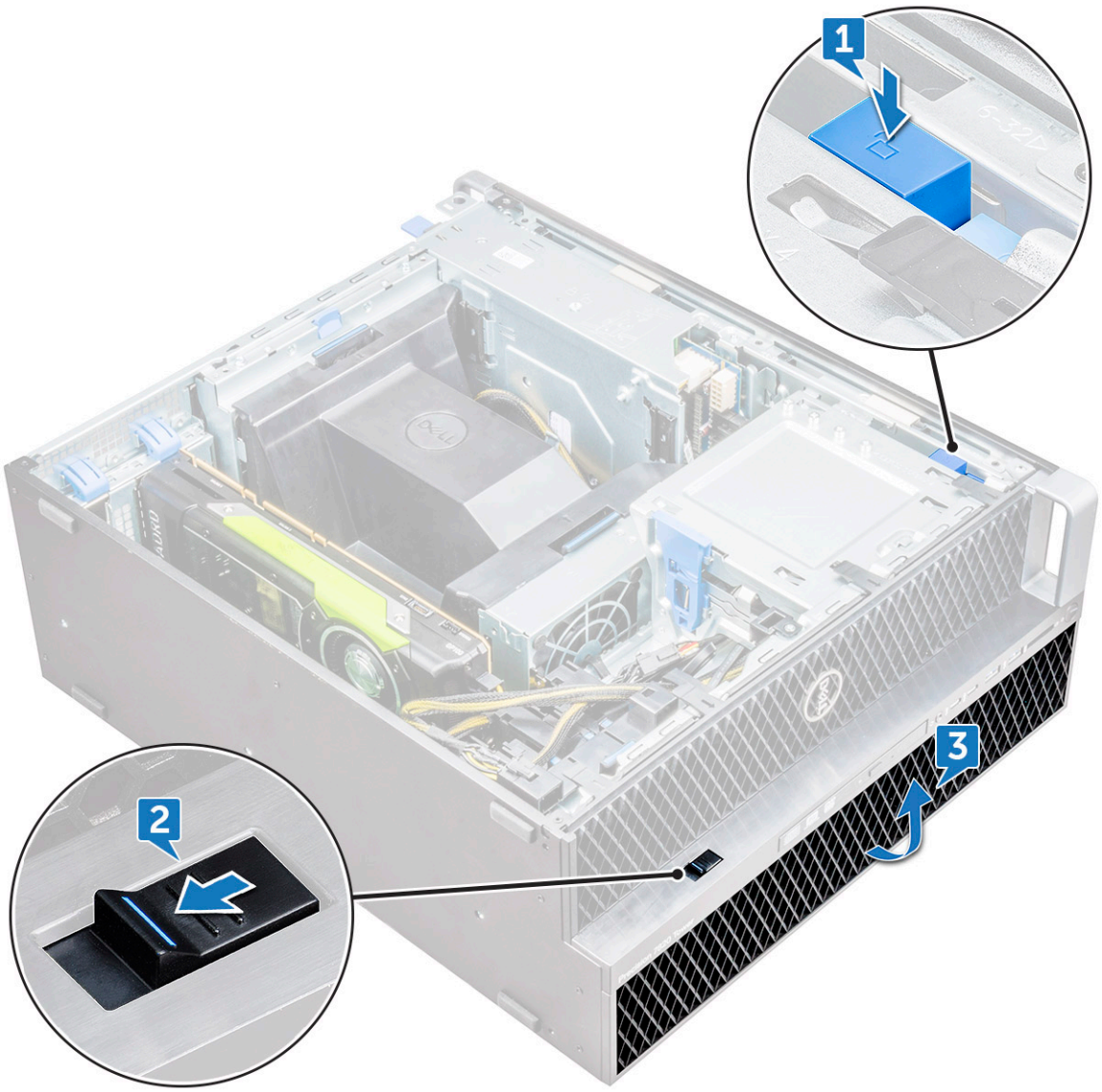
Installing the front bezel

1. Hold the bezel and ensure that the hooks on the bezel snap into the notches on the system.
2. Rotate the bezel forward and press the front bezel until the tabs click into place.
3. Follow the procedure in After working inside your computer.

Hard Disk Drive bezel

Removing HDD bezel

1. Follow the procedure in Before working inside your computer.
2. Remove the side cover.
3. To remove the HDD bezel:
   a. Press the blue unlock button [1] on the edge of ODD bay.
   b. Slide the latch [2] to the unlock position, on the front I/O bezel.
   c. Rotate forward and lift the HDD bezel [3] away from the system.



Installing HDD bezel

1. Hold the bezel and ensure that the hooks on the bezel snap into the notches on the system.
2. Press the blue lock button on the left edge of the ODD bay to secure the bezel to the system.
3. Install the side cover.
4. Follow the procedure in After working inside your computer.

Hard disk drive assembly

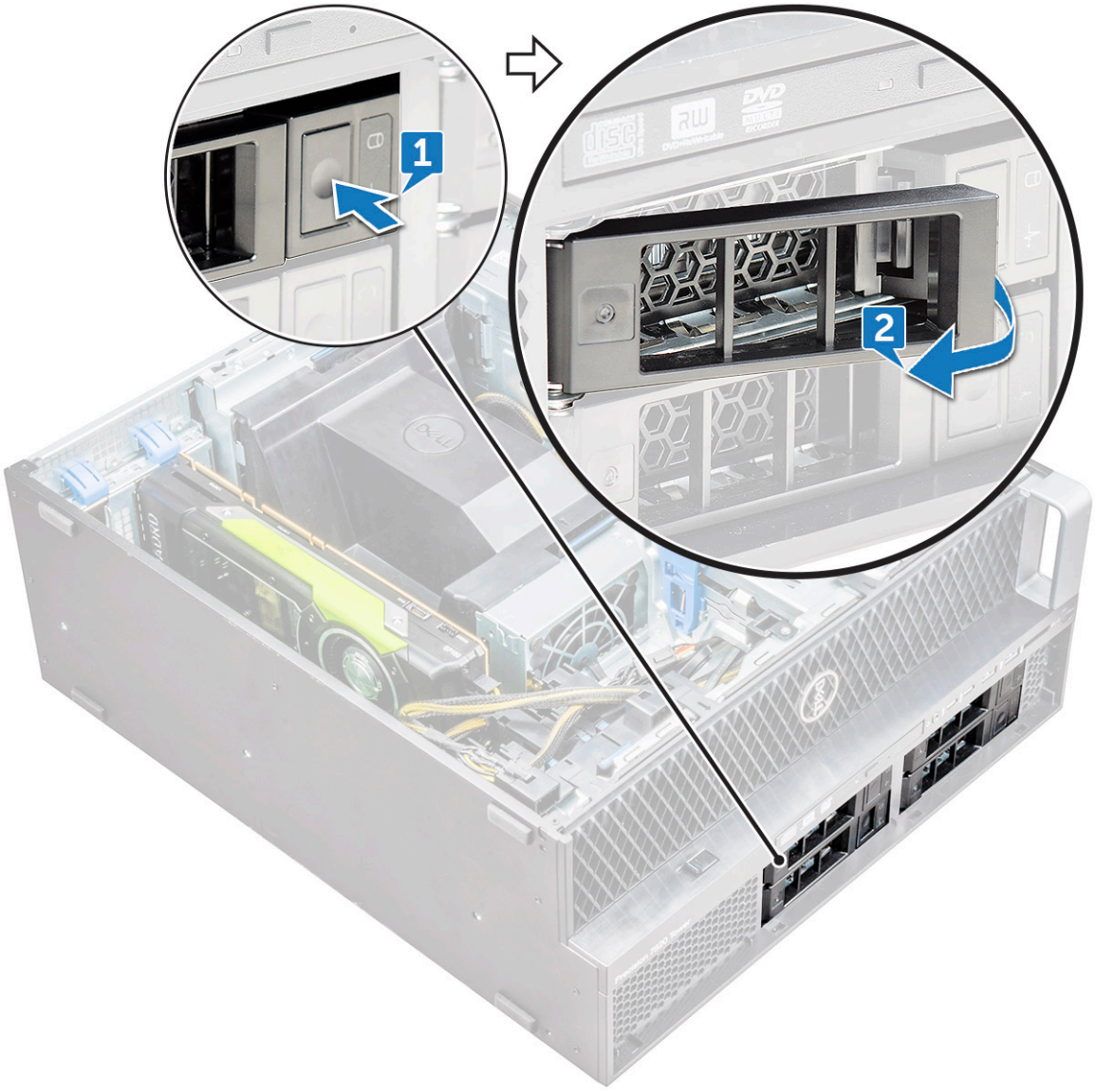
Removing the HDD carrier

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

      NOTE: Do not remove the side cover, if the front I/O bezel is unlocked.

b. HDD bezel

3. To remove the HDD carrier:
   a. Press the release button [1] to unlock the latch [2].



   b. Pull the latch to slide the carrier out of the HDD slot.

Installing the HDD carrier

1. Slide the carrier into the drive bay until it clicks into place.

   CAUTION: Ensure that the latch is open before installing the carrier.

2. Lock the latch.
3. Install the following components:
   a. HDD bezel
   b. side cover
4. Follow the procedure in After working inside your computer.

Removing the HDD

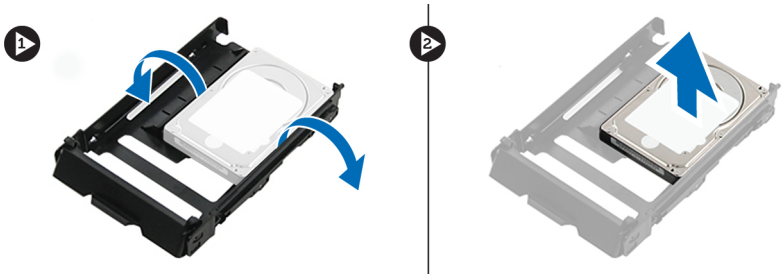
1. Follow the procedure in Before working inside your computer.
2. Remove the following:
   a. side cover
   b. HDD bezel

c. HDD carrier

3. To remove the 3.5 inch HDD:
   a. Expand one side of the carrier.

   b. Lift the hard drive out of the carrier.

4. To remove the 2.5 inch HDD:
   a. Expand two sides of the carrier.
   b. Lift the hard drive out of the carrier.



Installing the HDD

1. Insert the HDD to its slot in the HDD bracket with the connector end of the hard drive towards the back of the HDD carrier.
2. Slide the HDD carrier back into the hard drive bay.
3. Install the following:
   a. HDD carrier
   b. HDD bezel
   c. side cover
4. Follow the procedure in After working inside your computer

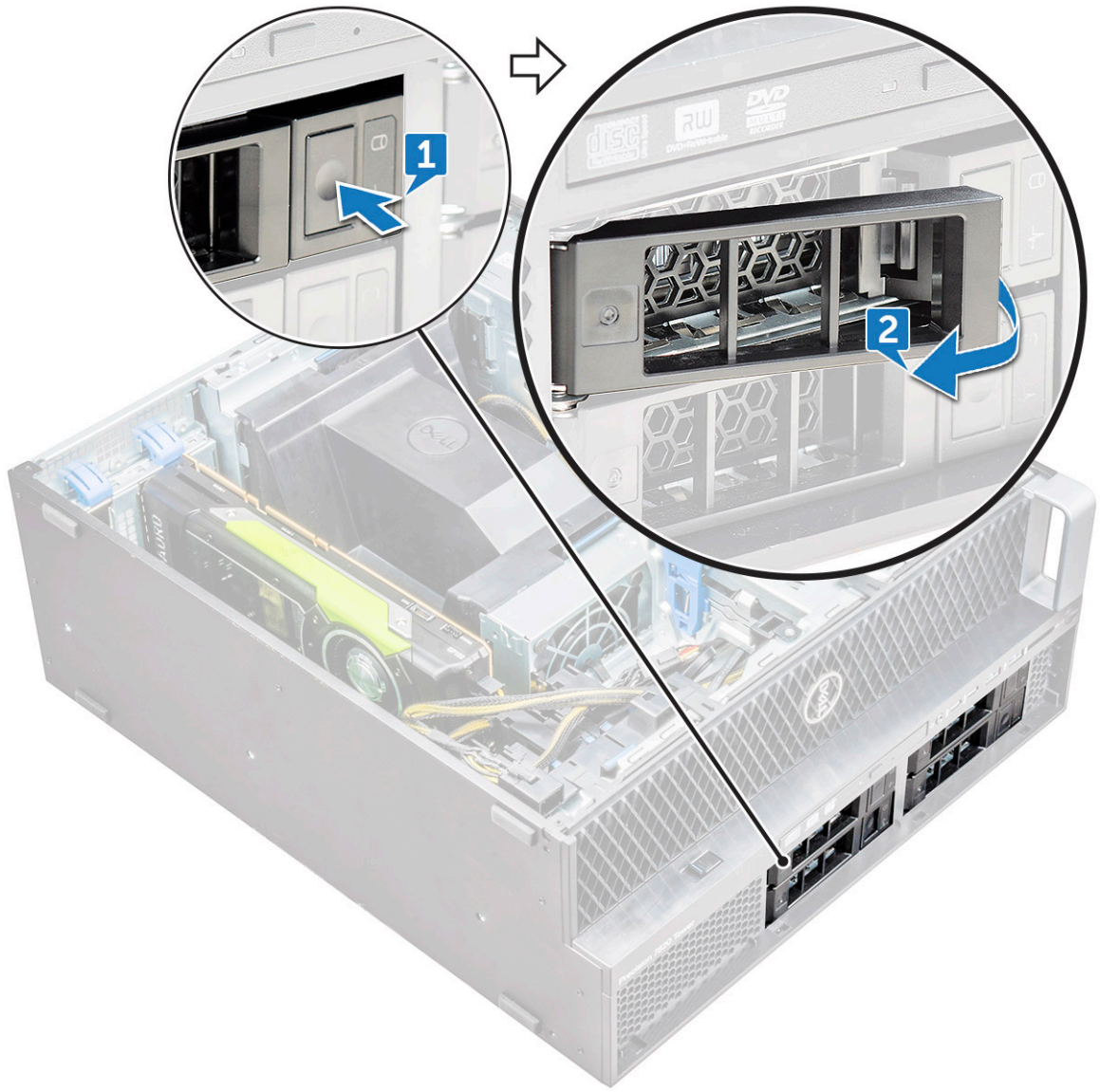
NVMe Flexbay

Removing the NVMe Flexbay

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

      NOTE: Do not remove the side cover, if the front I/O bezel is unlocked.

   b. HDD bezel
3. To remove the NVMe flexbay:
   a. Press the release button [1] to unlock the latch [2].

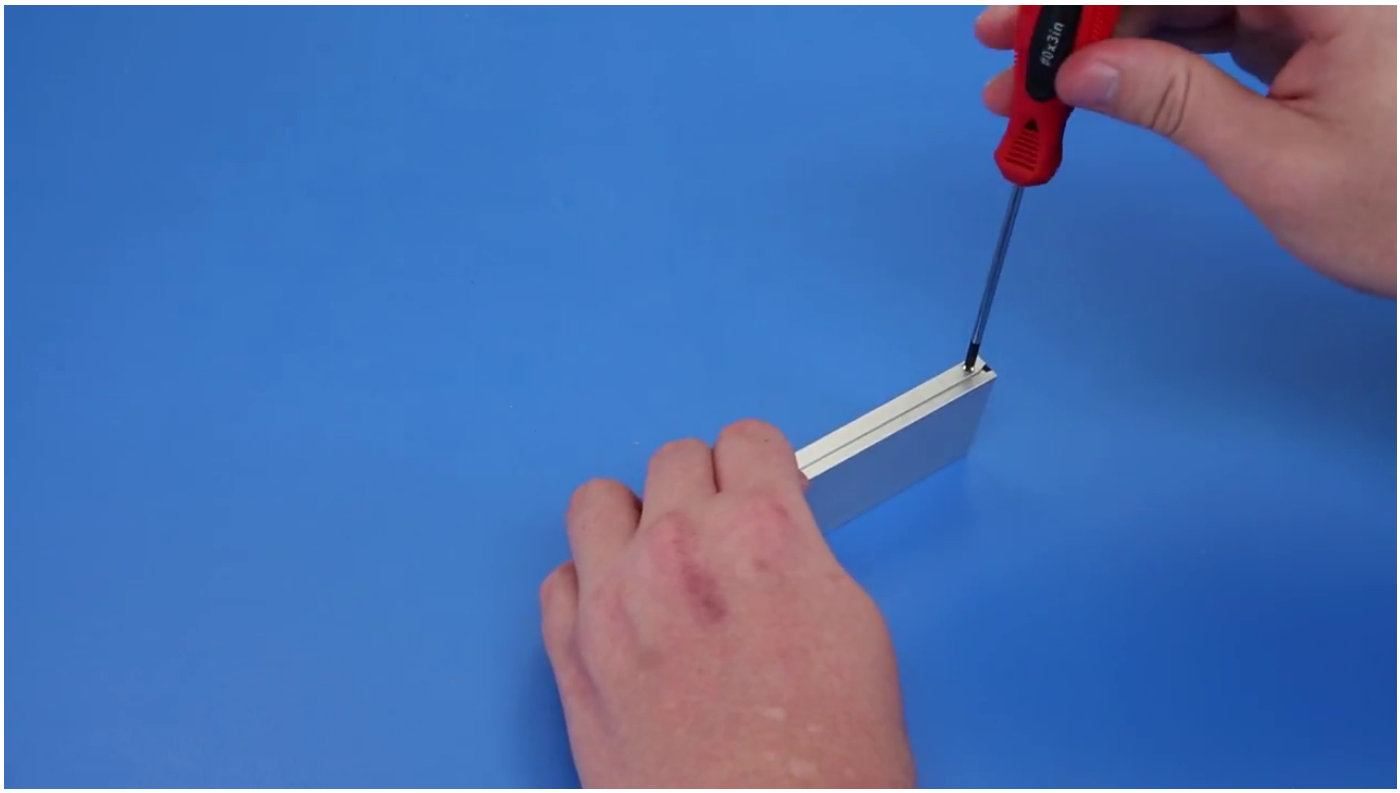


b. Pull the latch to slide the carrier out of the HDD slot.

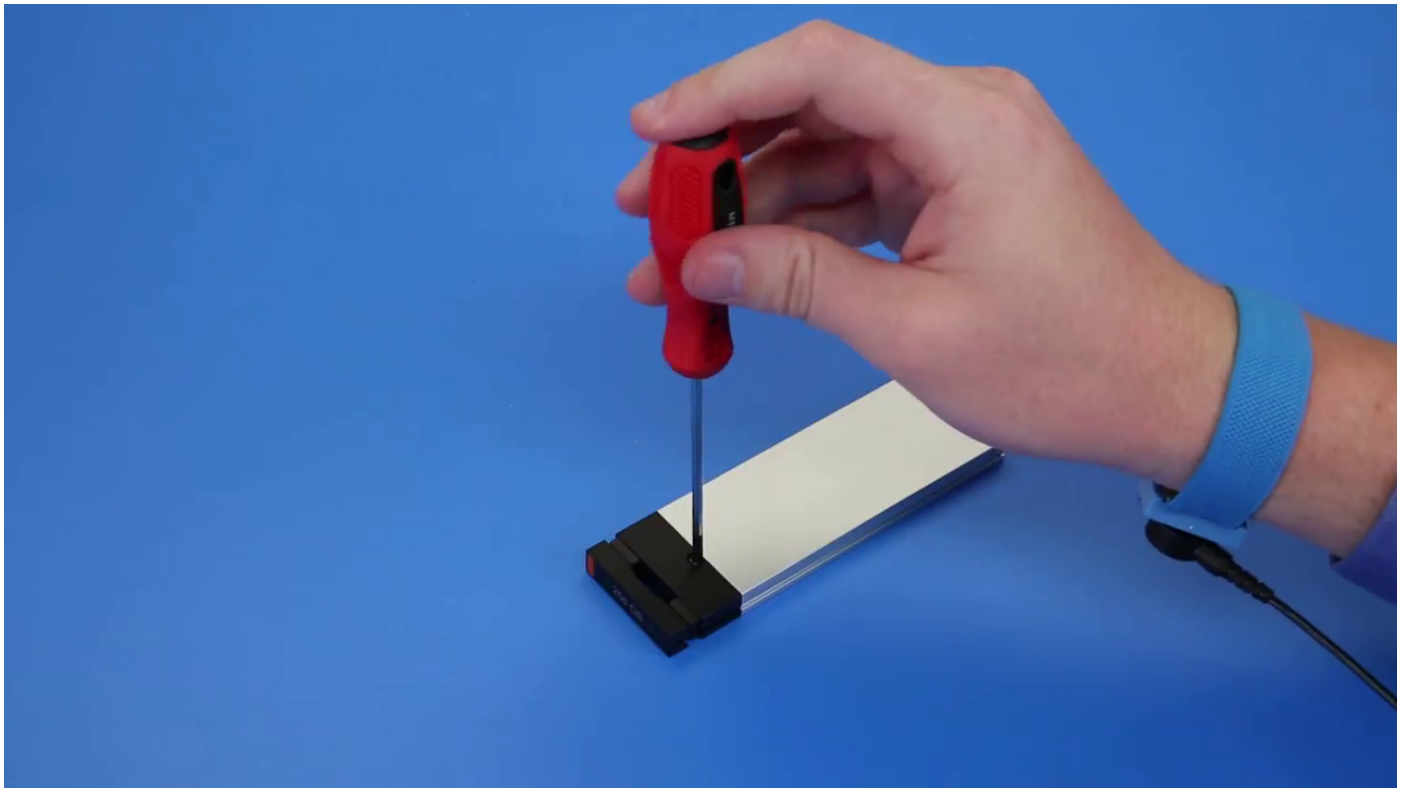
4. To remove the SSD carrier from the NVMe flexbay:
   a. Press the release button to slide the M.2 SSD carrier out of the NVMe flexbay.

   b. Pull the M.2 SSD carrier out of the NVMe flexbay.

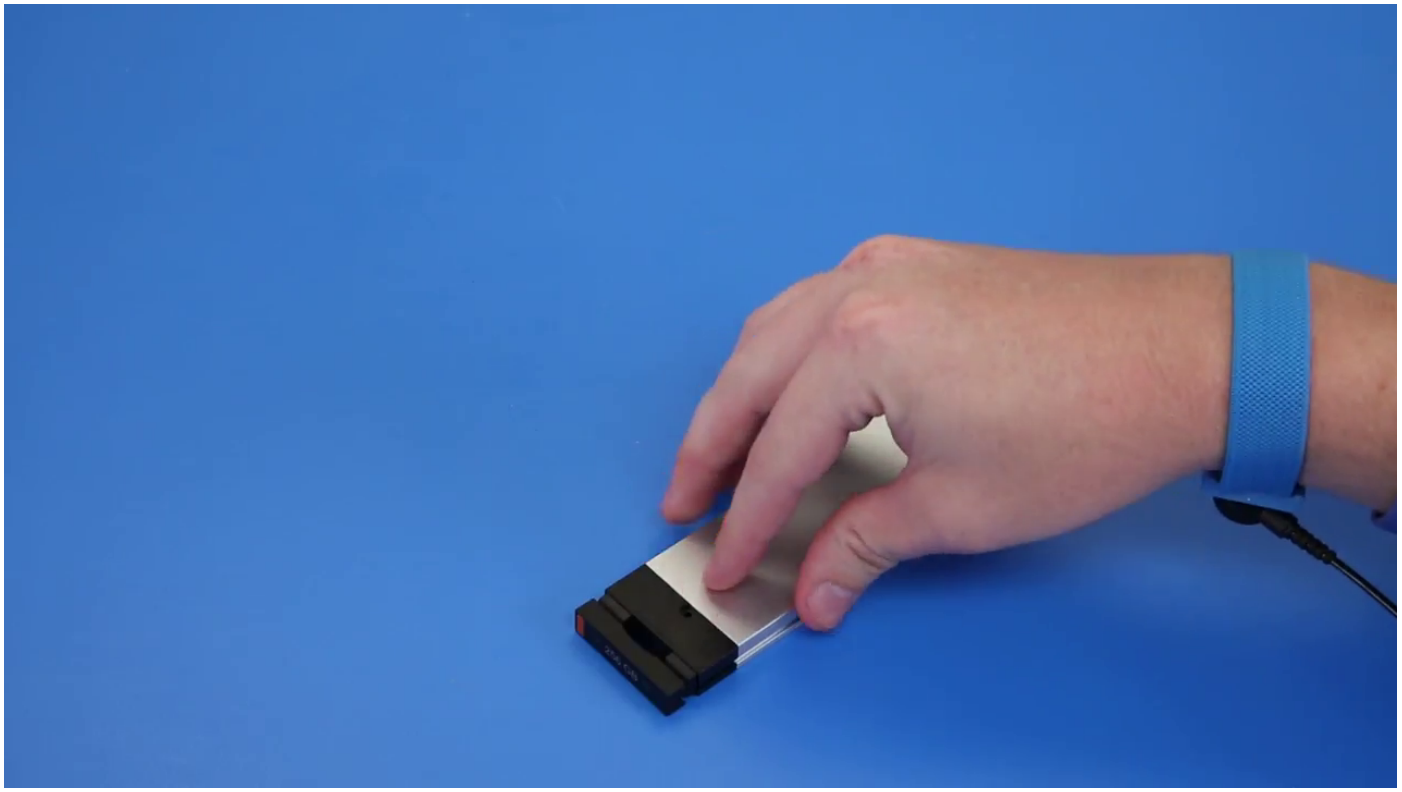
5. To remove the SSD from the SSD carrier:
   a. Remove the screws on either side of the SSD.



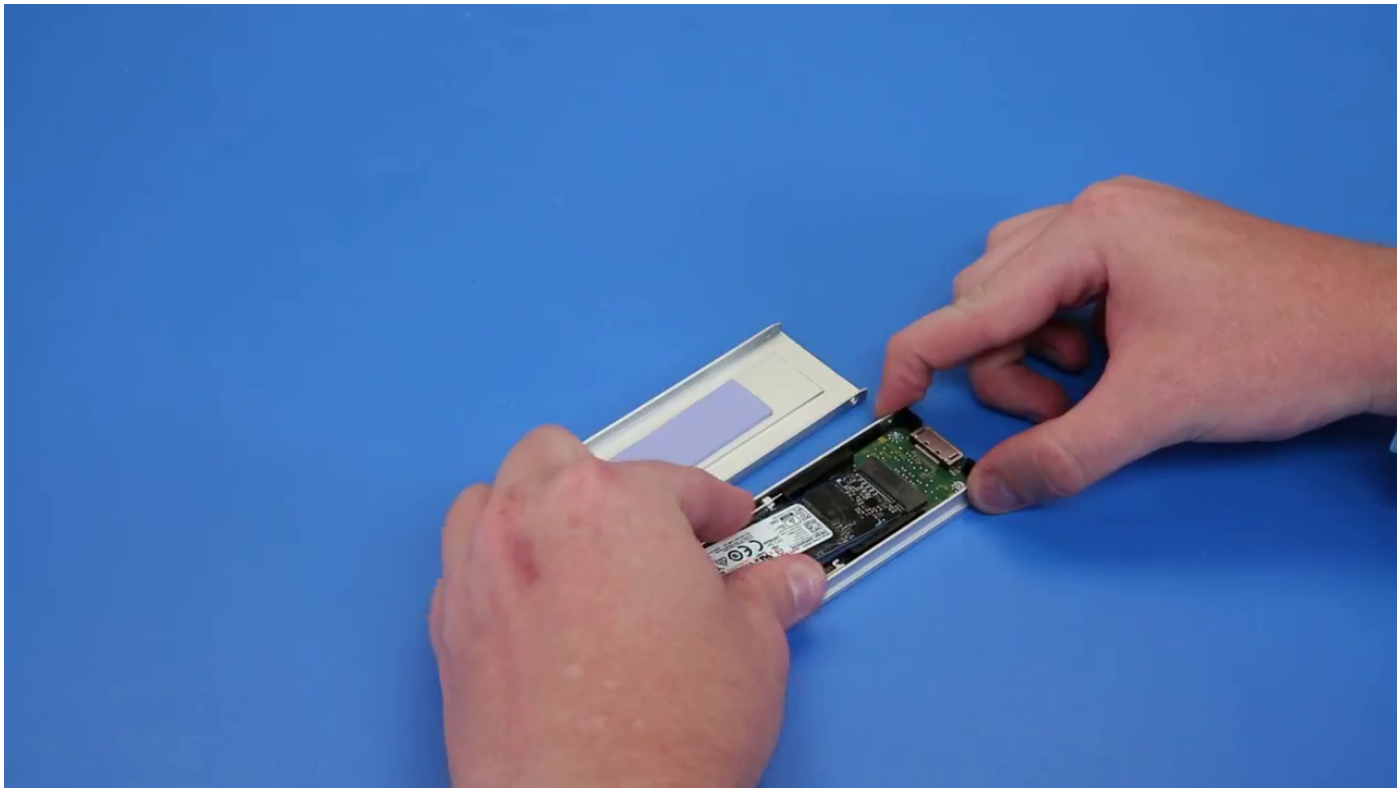
   b. Remove the screw from the top of the SSD carrier.



c. Slide the SSD cover from the top of the carrier.

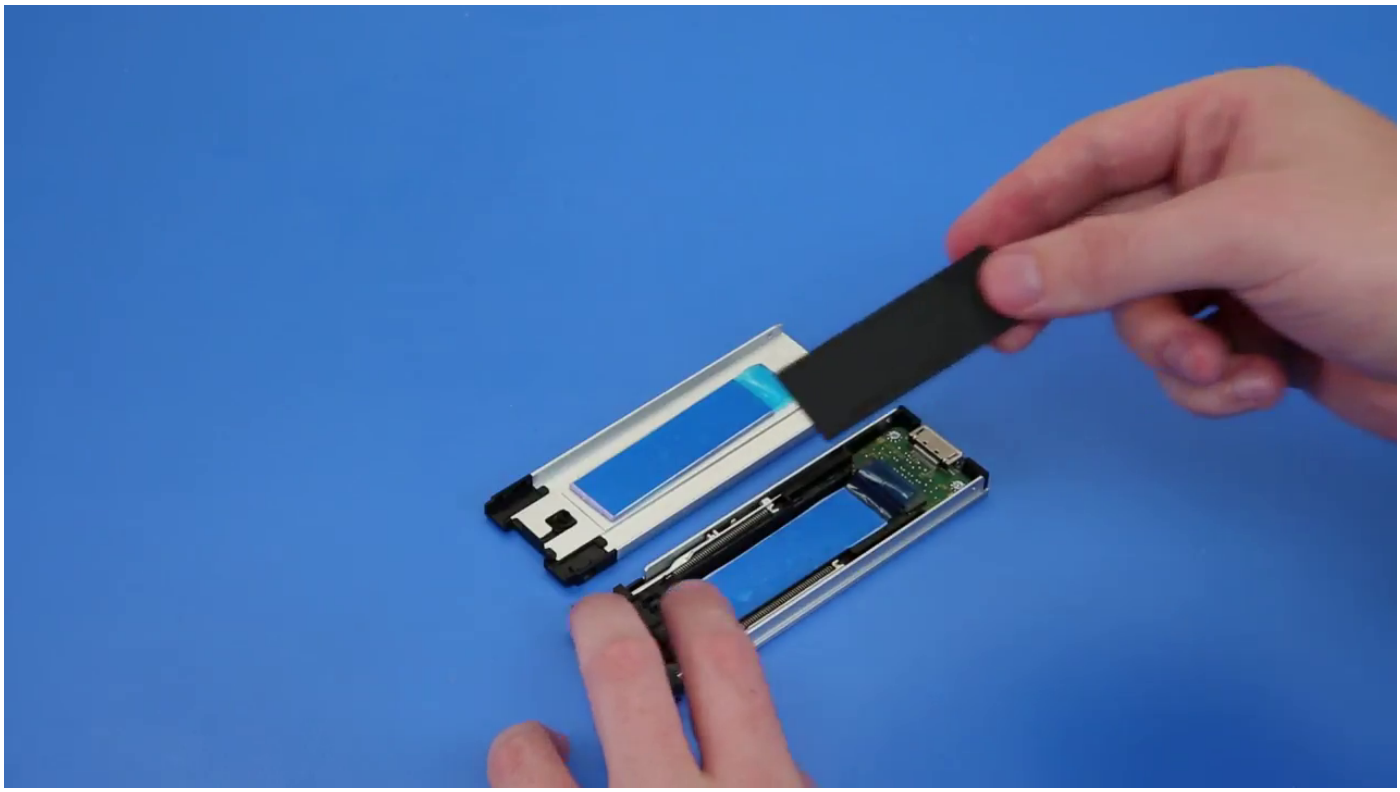


d. Slide the SSD out of the M.2 slot on the carrier.

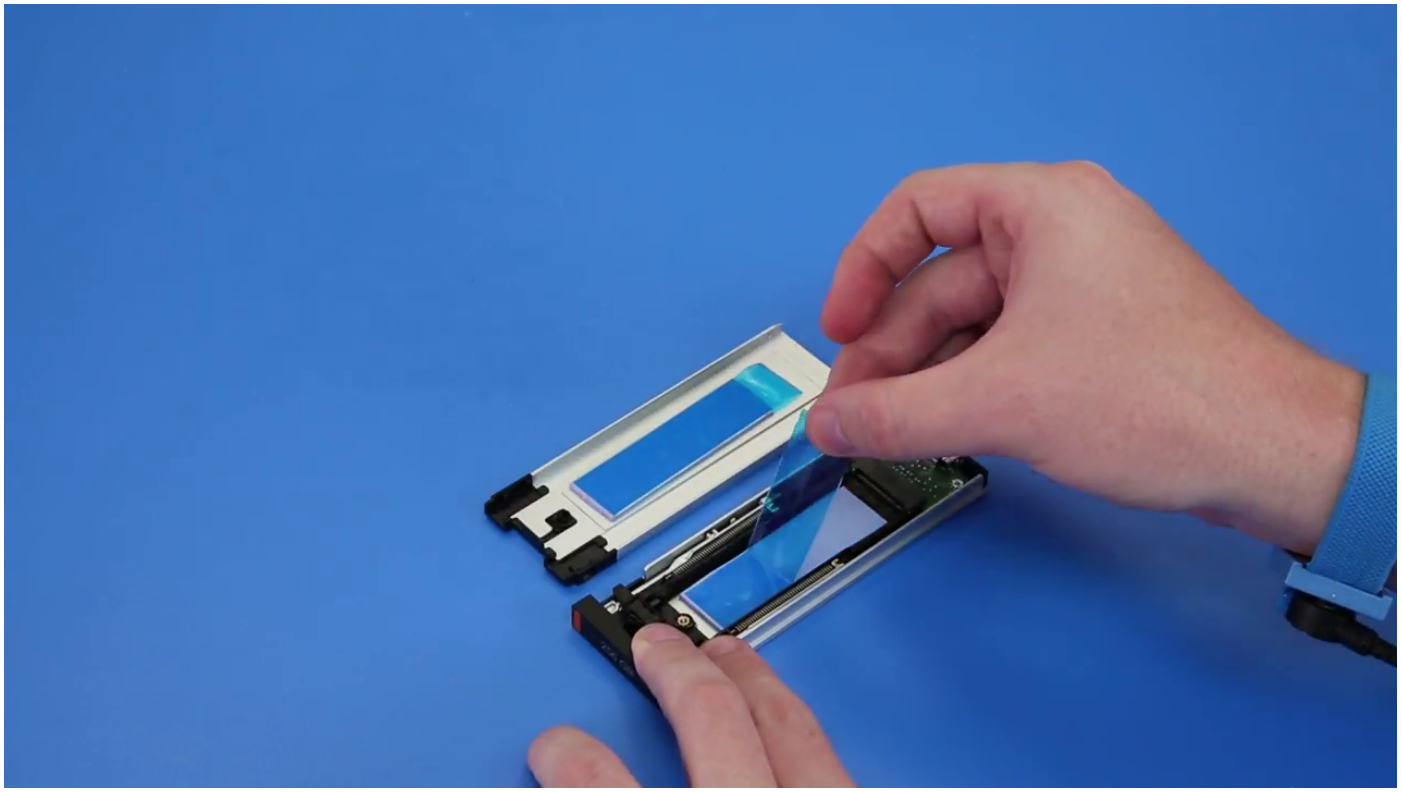


Installing the NVMe flexbay

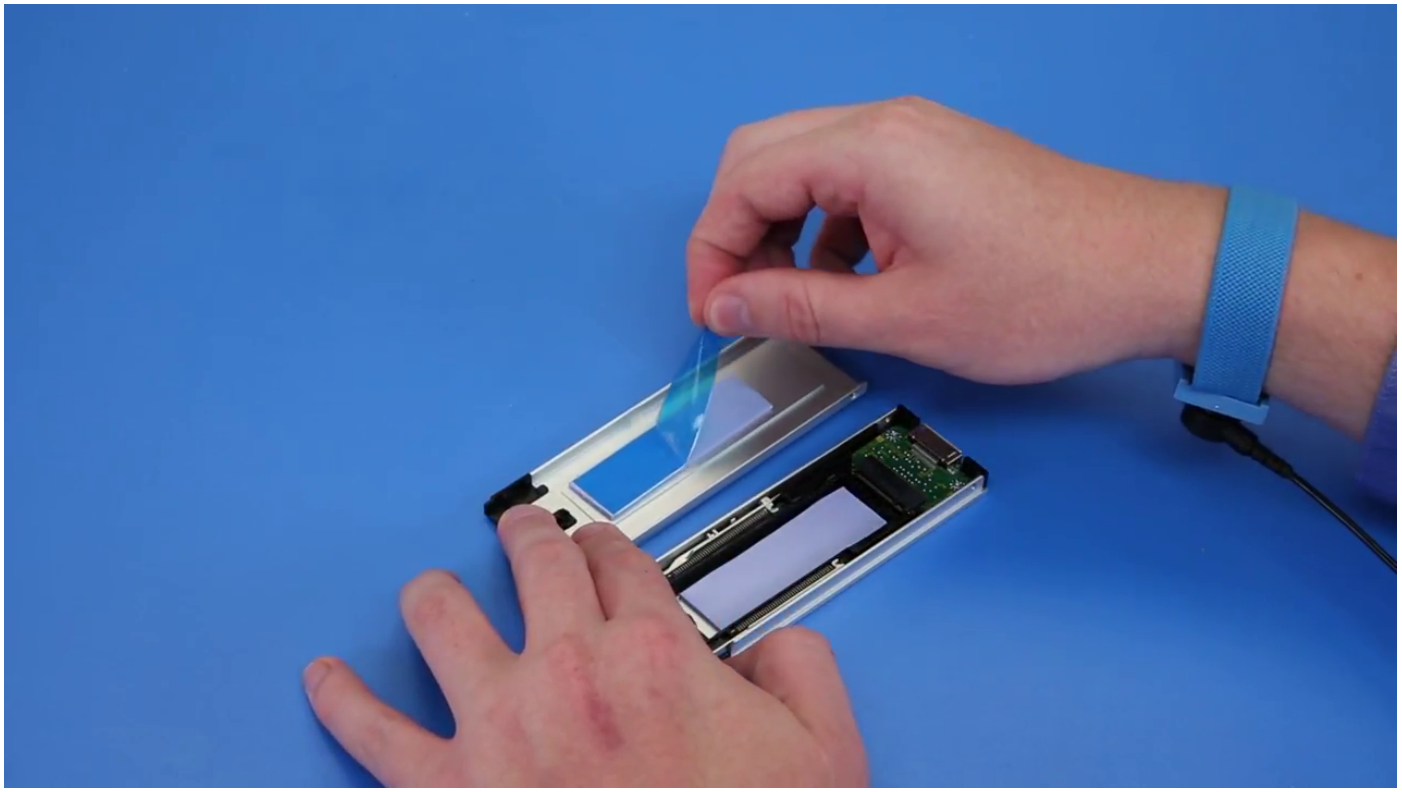
1. To install the SSD in the carrier:
   a. Remove the dummy SSD blank from the SSD carrier.



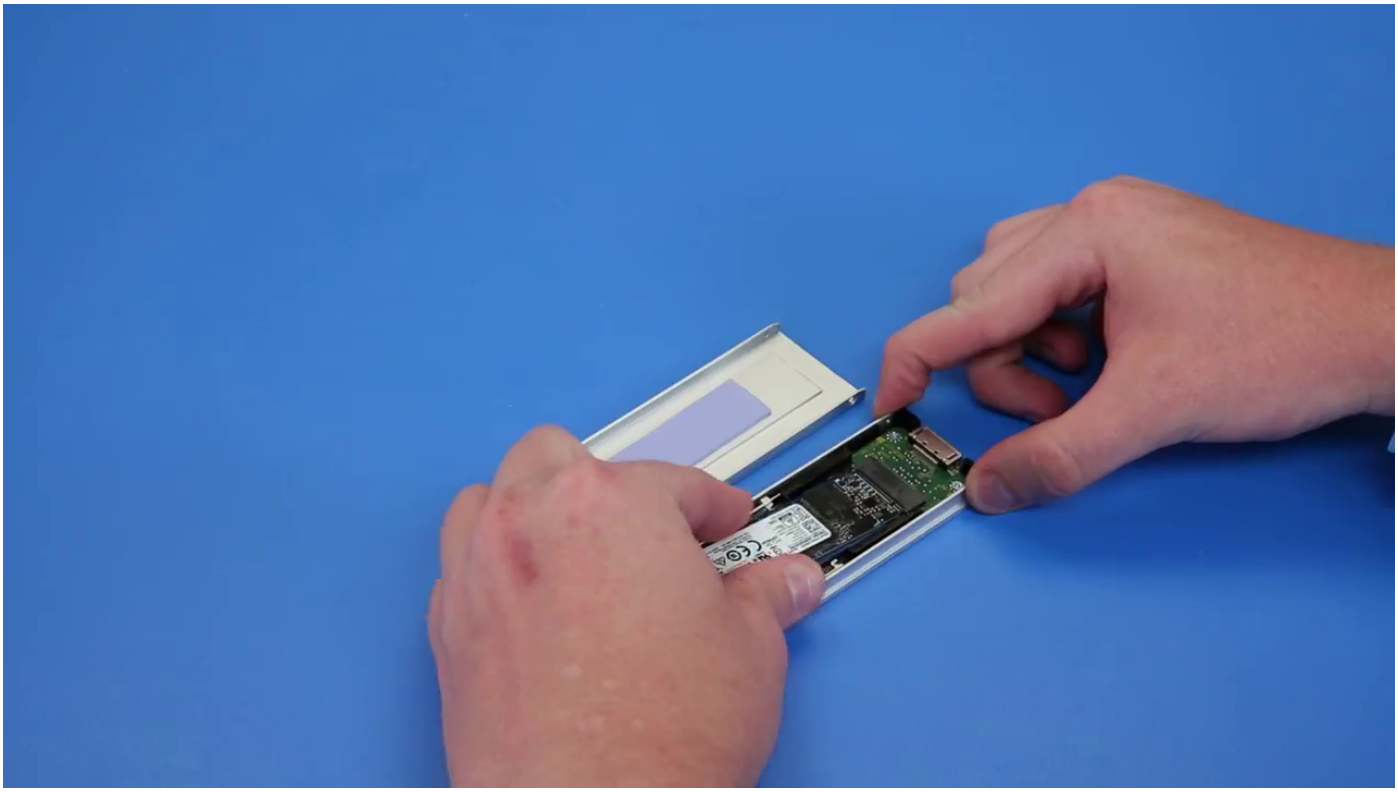
   b. Peel off the tape from the SSD carrier.



c. Peel off the adhesive tape from the SSD carrier cover.



2. Install the SSD in the carrier



3. Replac the two side screws and the central screw.
4. To install the SSD carrier slide the carrier in the NVMe flexbay until it clicks in place.
5. Slide the carrier into the drive bay until it clicks into place.

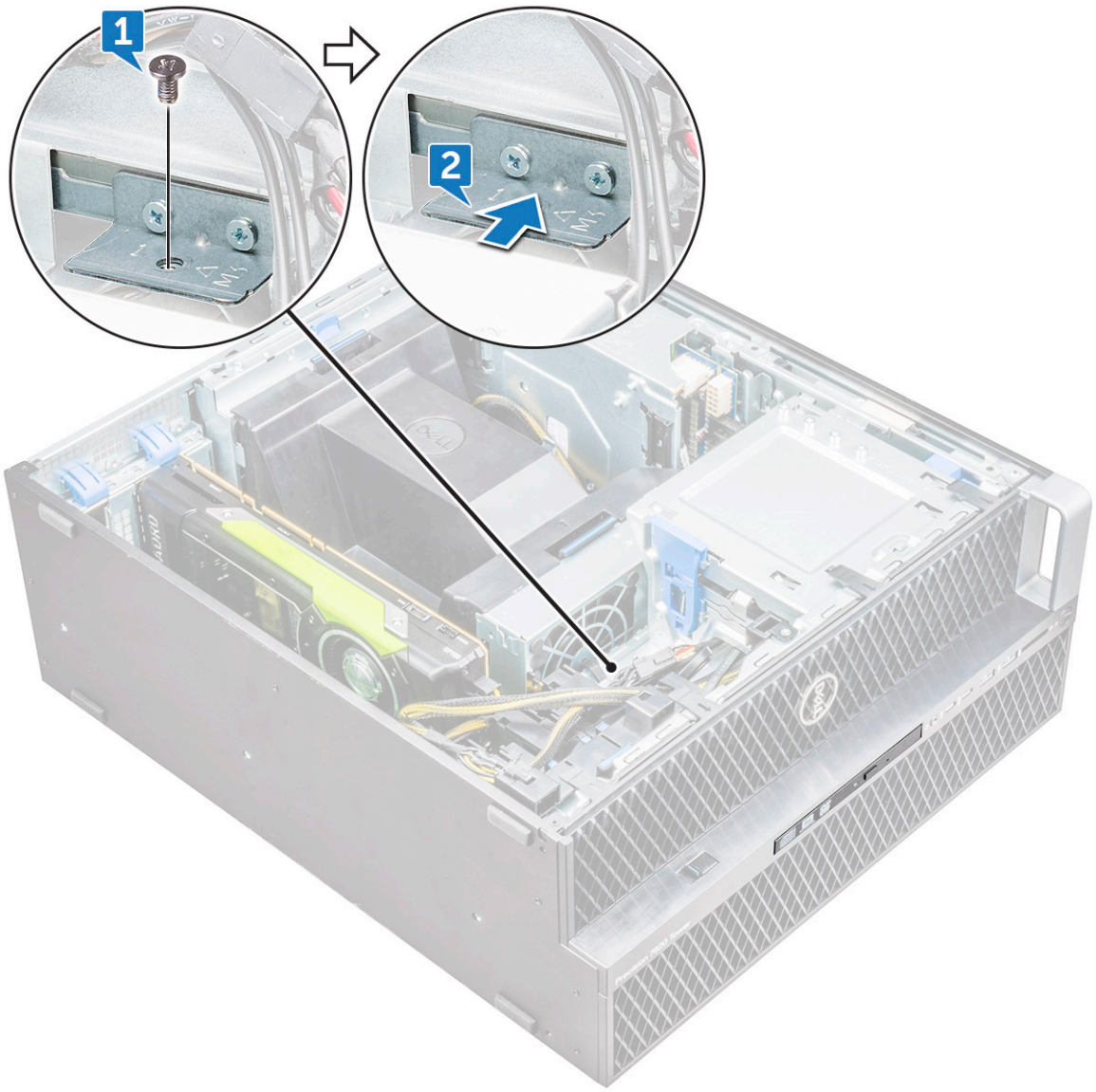
   CAUTION: Ensure that the latch is open before installing the carrier.

6. Lock the latch.
7. Install the following components:
   a. HDD bezel
   b. side cover
8. Follow the procedure in After working inside your computer.

Slim Optical Disk Drive

Removing the slim ODD

1. Follow the procedure in Before working inside the computer.
2. Remove the side cover.
3. To remove the slim ODD:
   a. Remove the screw [1] that secures the slim ODD and push the slim ODD [2] out of the chassis.



b. Slide the slim ODD out of the system.

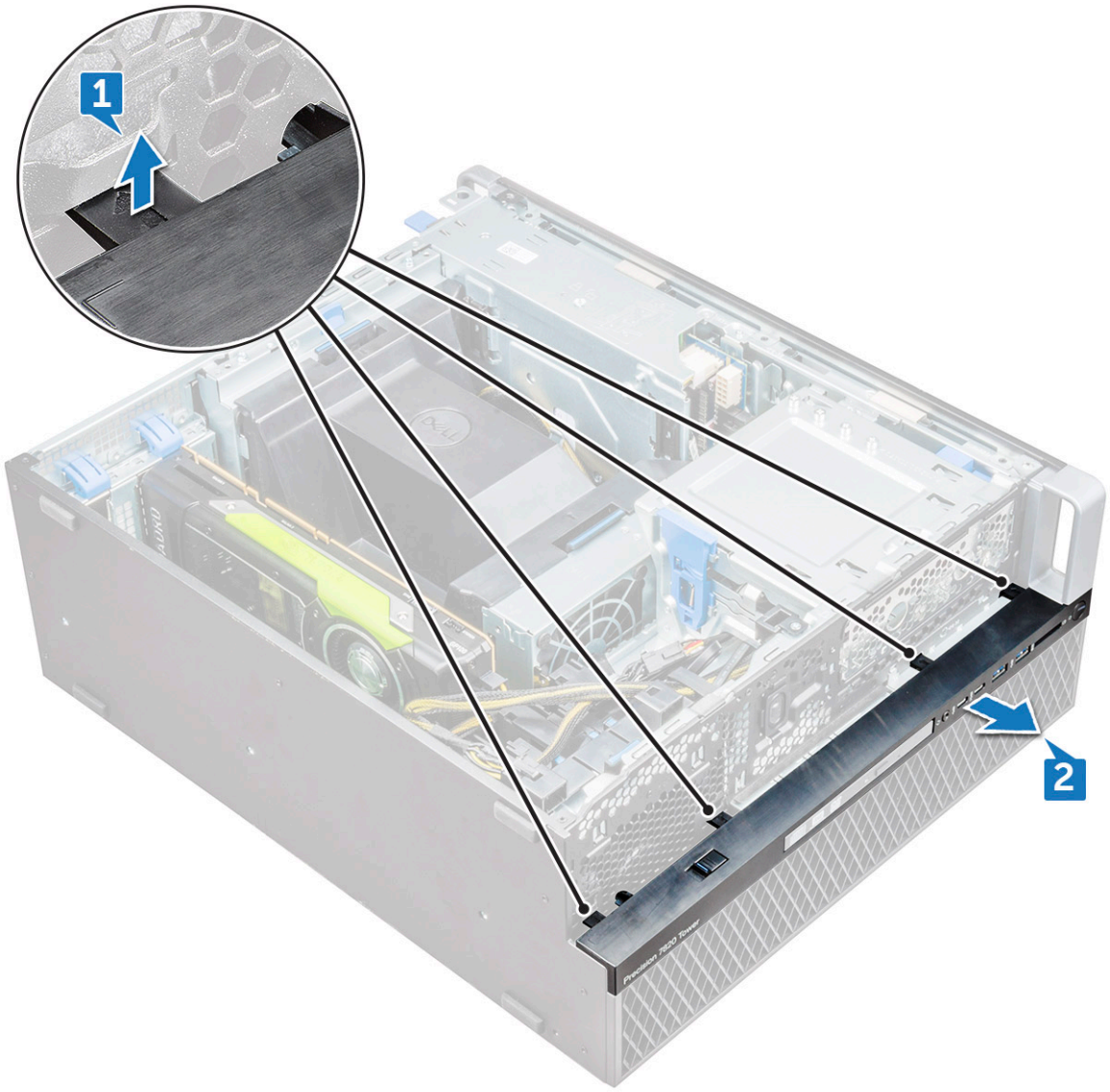
Installing the slim ODD

1. Slide the slim ODD into the slot on the chassis.
2. Tighten the screw to secure the slim ODD to the chassis.
3. Install the side cover.
4. Follow the procedure in After working inside your computer.

Front input and output bezel

Removing front input and output bezel

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. front bezel
3. To remove the front input and output(I/O) bezel:
   a. Pry the four retention tabs[1] from the chassis and push the bezel out from the chassis[2].



b. Lift the bezel from the chassis.

Installing front input and output bezel

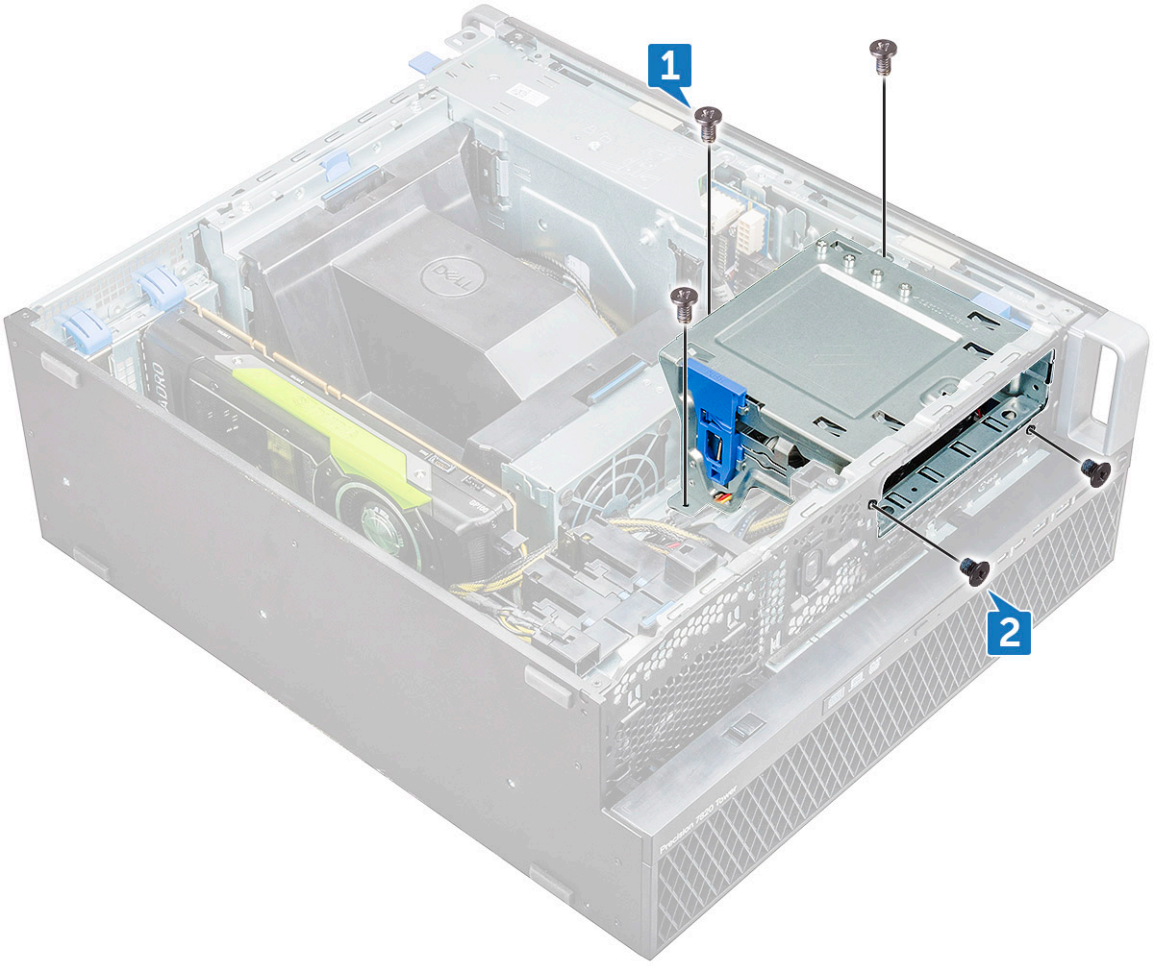
1. Hold the input and output(I/O) bezel and ensure that the hooks on the bezel snap into the notches on the system.
2. Press the retention tabs and secure them to the chassis.
3. Install the :
   a. front bezel
   b. side cover
4. Follow the procedure in After working inside your computer.

5.25 inch ODD bracket

Removing the 5.25 ODD bracket

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. front bezel
3. To remove the ODD bracket:
   a. Remove the ODD filler from the chassis.

b. Remove the five screws[1,2] that secure the bracket to the chassis.



c. Slide the ODD bracket toward the rear of the system and lift it away from the chassis.

Installing the 5.25 ODD bay

1. Place the ODD bracket into the system slot.
2. Replace the (6-32 X 6.0mm) screws.
3. Place the ODD filler back into the slot.
4. Install the:
   a. front bezel
   b. side cover
5. Follow the procedure in After working inside your computer

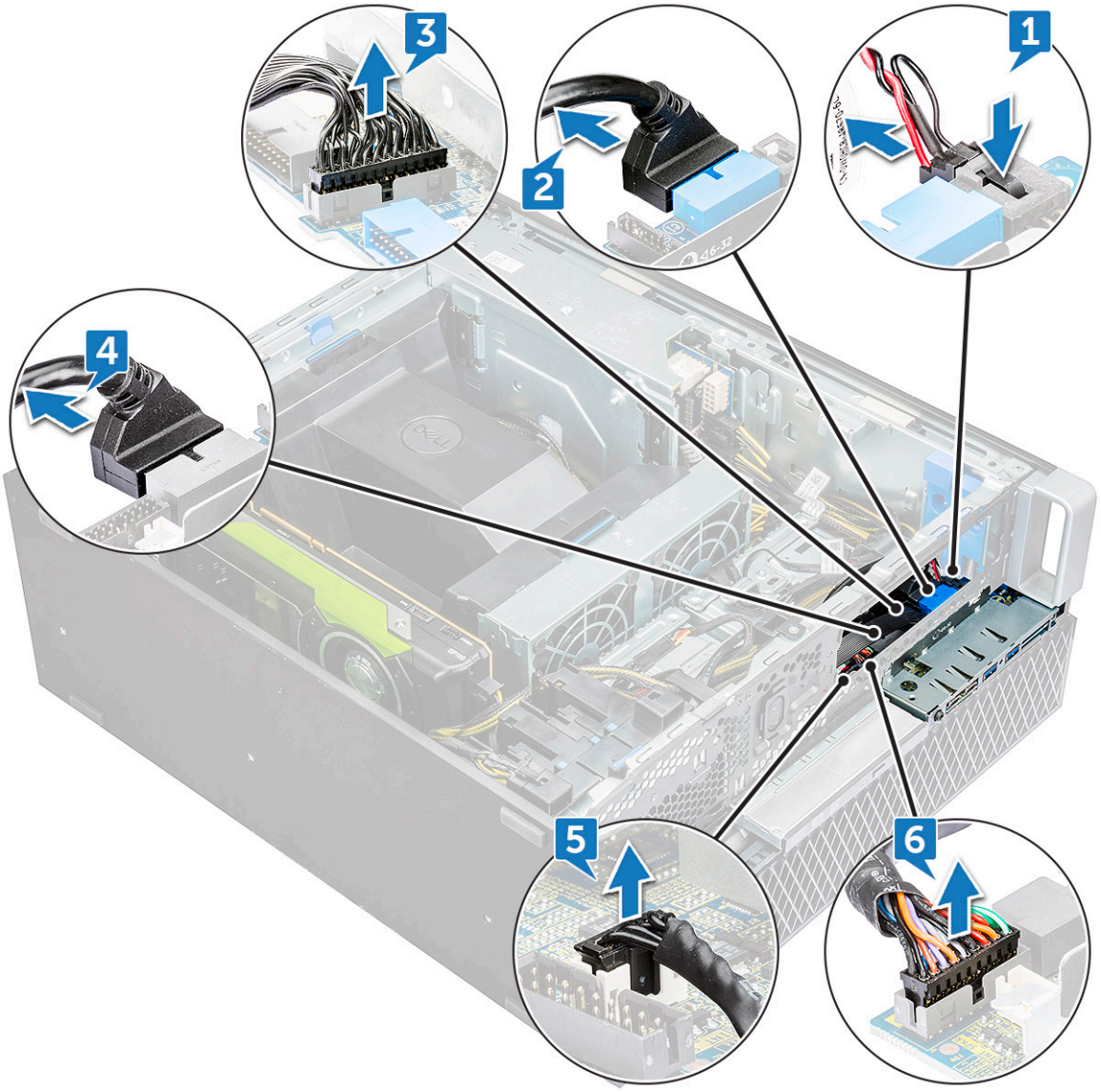
Front input and output panel

Removing front input and output panel

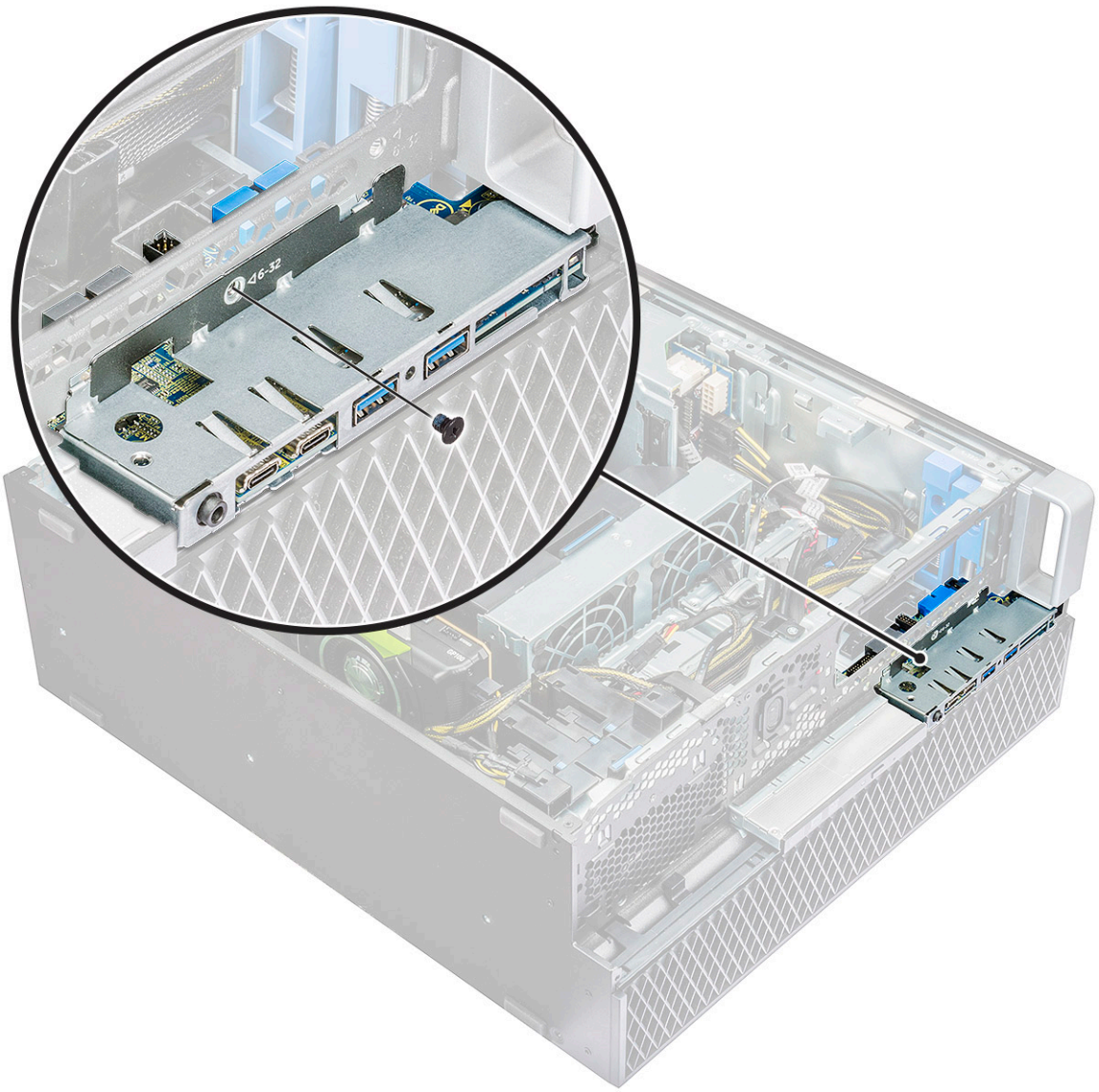
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. front bezel
   c. front input and output bezel
   d. 5.25 inch ODD bracket
3. To remove the front input and output(I/O) panel:

a. Disconnect the intrusion switch cable [1], USB 3.1 cable [2], front I/O power cable [3], USB 3.1 cable [4], Speaker cable [5], Audio cable [6]

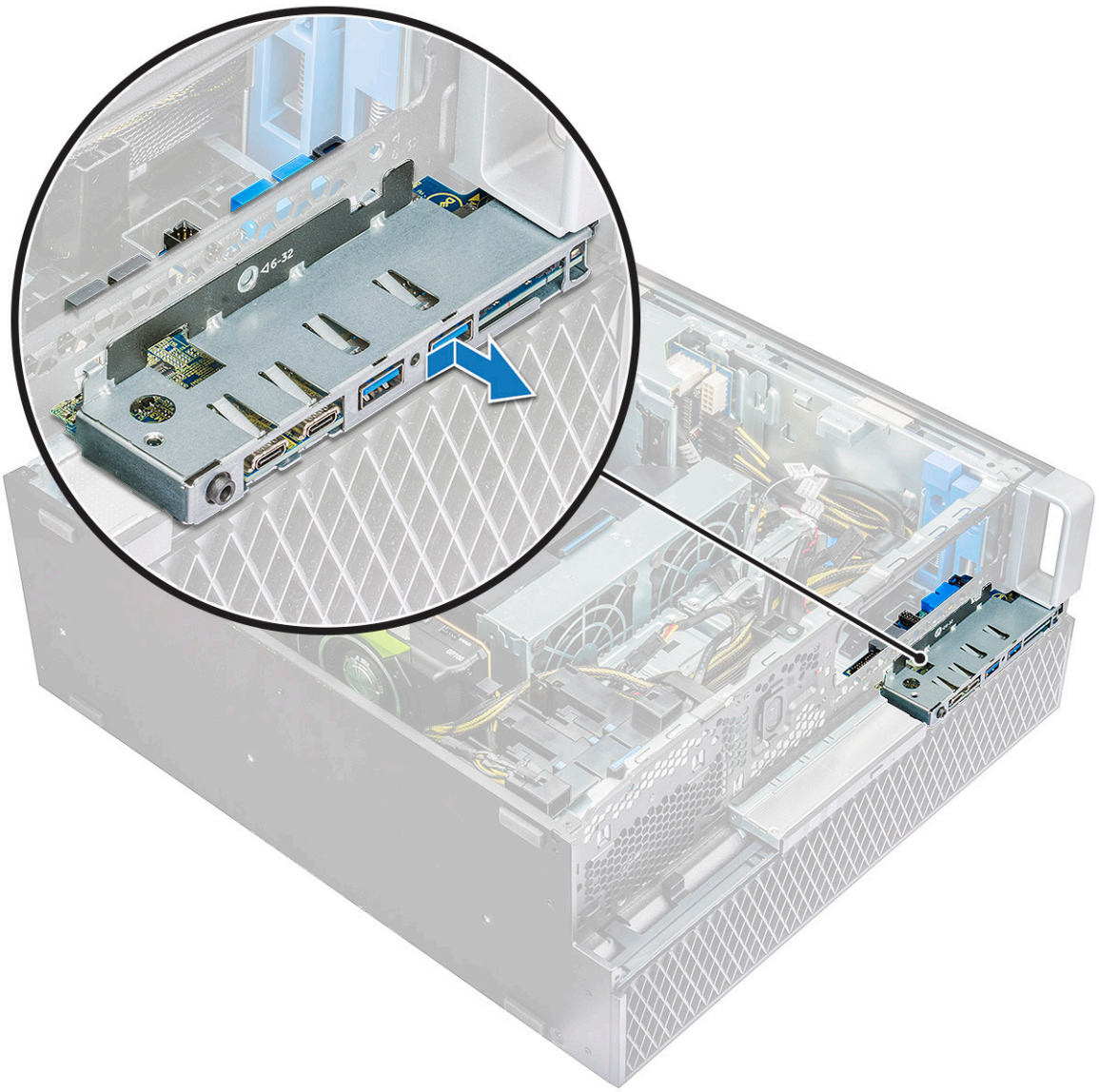
NOTE: Do not pull the connector by the cable wires. Instead, disconnect the cable by pulling the connector end. Pulling the cable wires may loosen them from the connector.



b. Remove the screw that secures the front I/O panel to the chassis.



c. Slide the I/O panel out of the chassis.



Installing front input and output panel

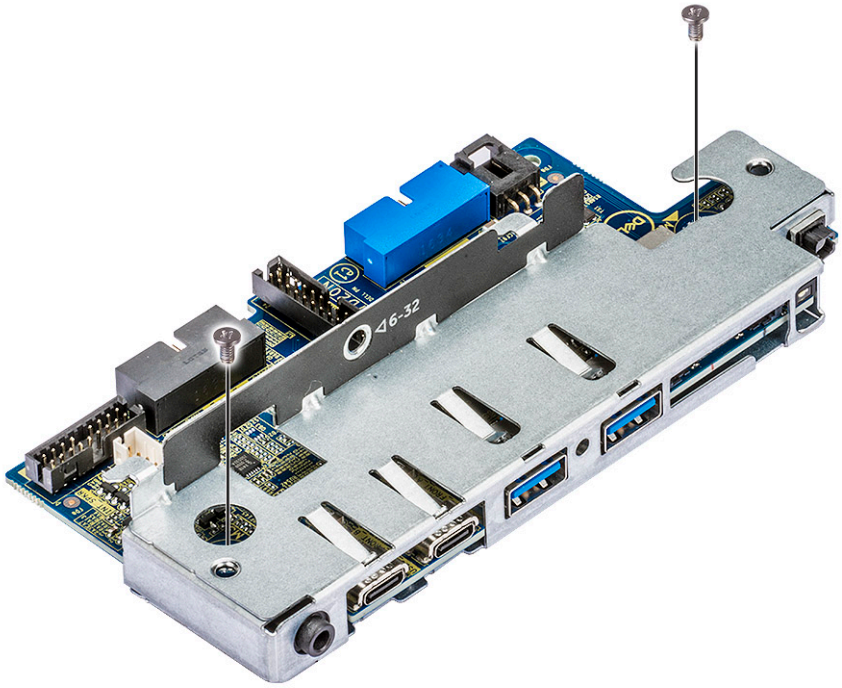
1. Insert the input and output(I/O) panel onto its slot in the system.
2. Slide the panel to secure the hooks into the chassis hole.
3. Tighten the screw to secure the front I/O panel to the chassis.
4. Connect the following cables:
   - intrusion switch cable
   - USB 3.1 cable
   - front I/O power cable
   - front I/O power cable
   - USB 3.1 cable
   - speaker cable
   - audio cable
5. Install the:
   a. front input and output bezel
   b. 5.25 inch ODD bracket
   c. front bezel
   d. side cover

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

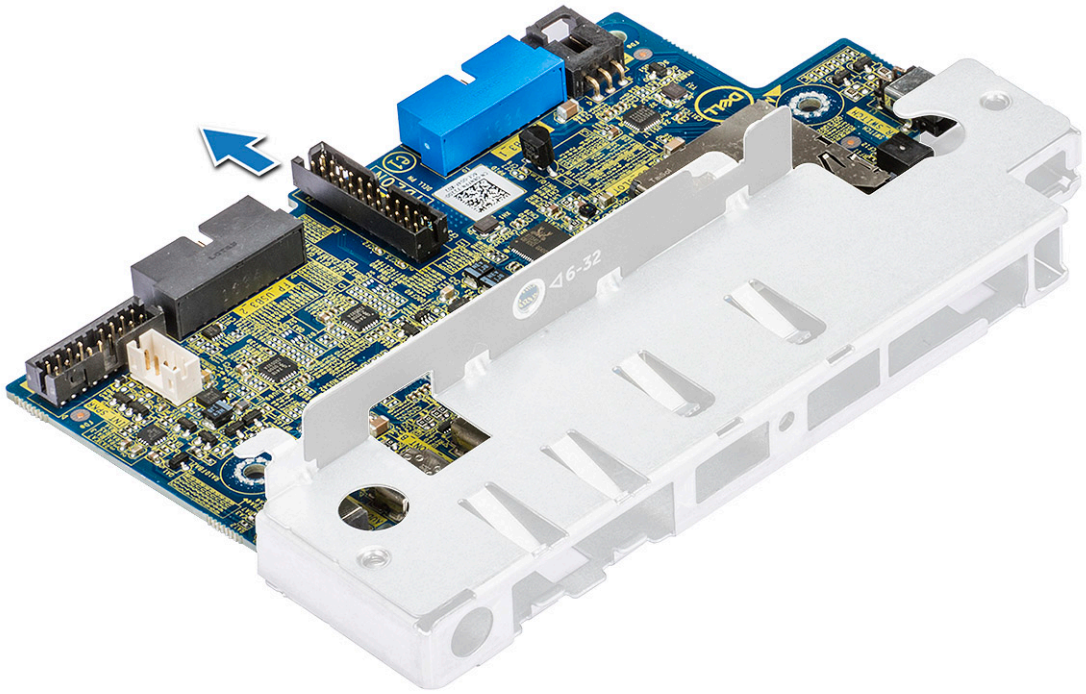
Input and output panel bracket

Removing input and output panel bracket

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. front bezel
   c. front input and output bezel
   d. 5.25 inch ODD bracket
   e. front input and output panel
3. To remove the input and output(I/O) panel bracket:
   a. Remove the two screws.



   b. Slide the I/O module out of the bracket.



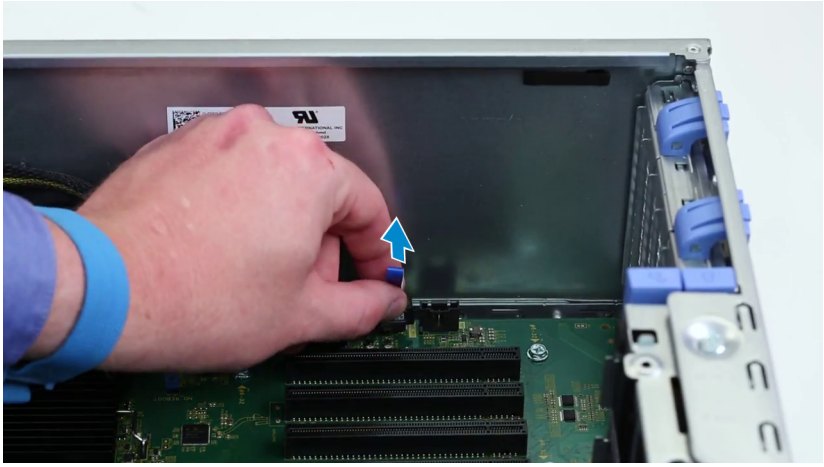
Installing input and output panel bracket

1. Insert the input and output(I/O) panel into the metal bracket.
2. Replace the screws to secure the I/O panel bracket to the I/O panel.
3. Install the:
   a. front input and output panel
   b. front input and output bezel
   c. 5.25 inch ODD bracket
   d. front bezel
   e. side cover
4. Follow the procedure in After working inside your computer.

VROC module

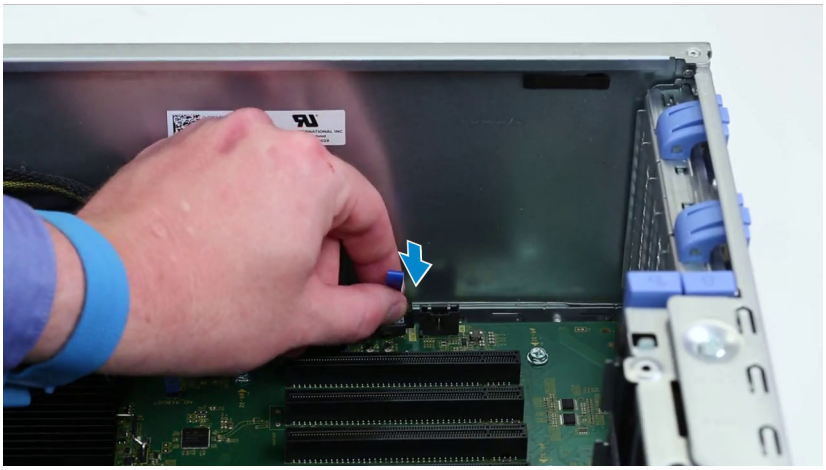
Removing the VROC module

Plug-out the VROC module from the system board in the upward direction.



Installing the VROC module

Plug-in the VROC module to the system board.

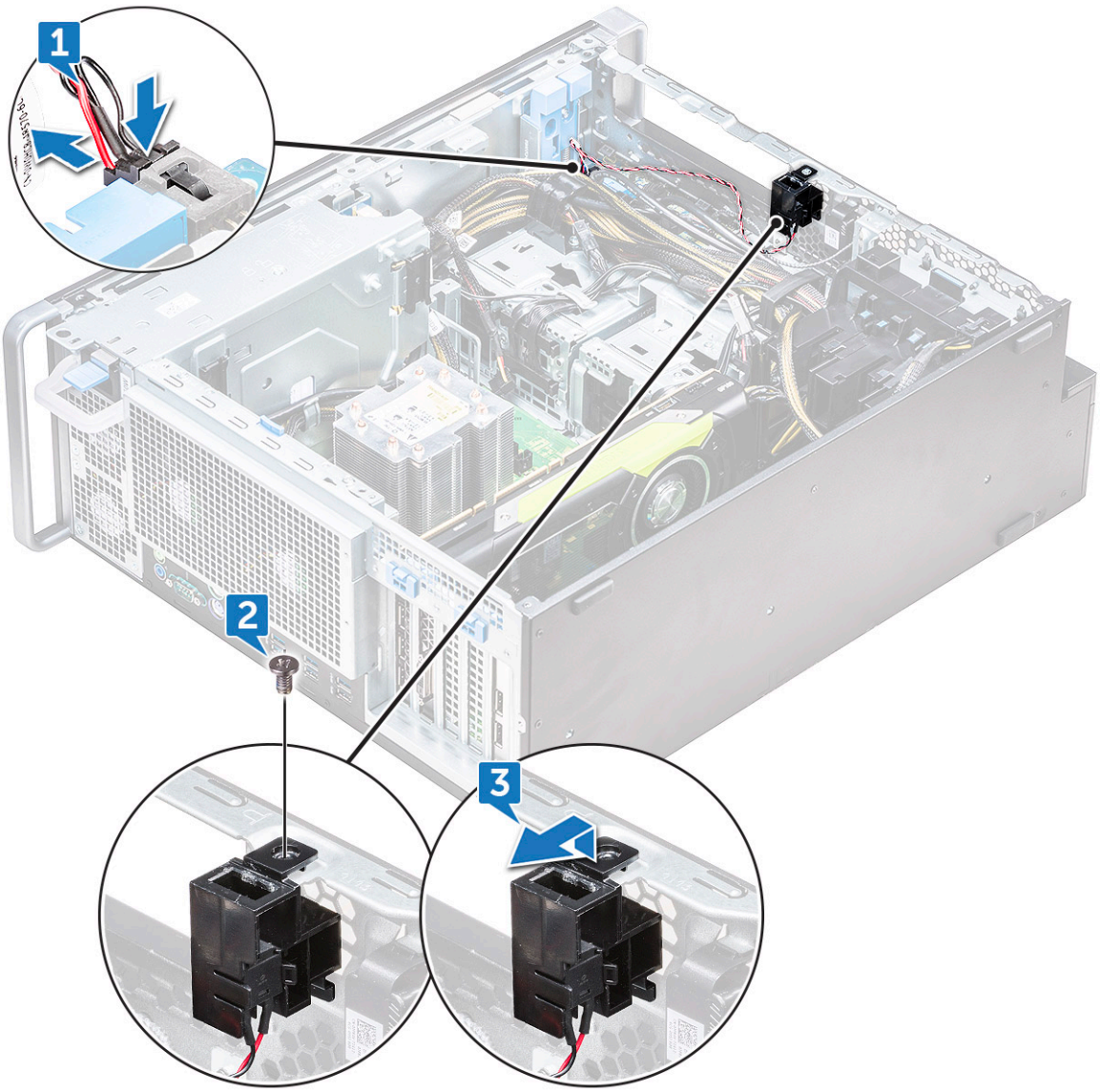


Intrusion switch

Removing the Intrusion switch

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. front bezel
   c. 5.25 inch ODD bracket
3. To remove the intrusion switch:
   a. Disconnect the intrusion cable [1] from the I/O module.
   b. Remove the screw [2] that secures the intrusion switch to the chassis.
   c. Lift the intrusion switch and remove it from the chassis.

   NOTE: The system will not power on without the intrusion switch installed.



Installing the intrusion switch

1. Place the intrusion switch into the slot in the system chassis.
2. Replace the screw and secure the switch to the chassis.
3. Connect the cable to the system board.
4. Install the:
   a. 5.25 inch ODD bracket
   b. front bezel
   c. side cover
5. Follow the procedure in After working inside your computer.

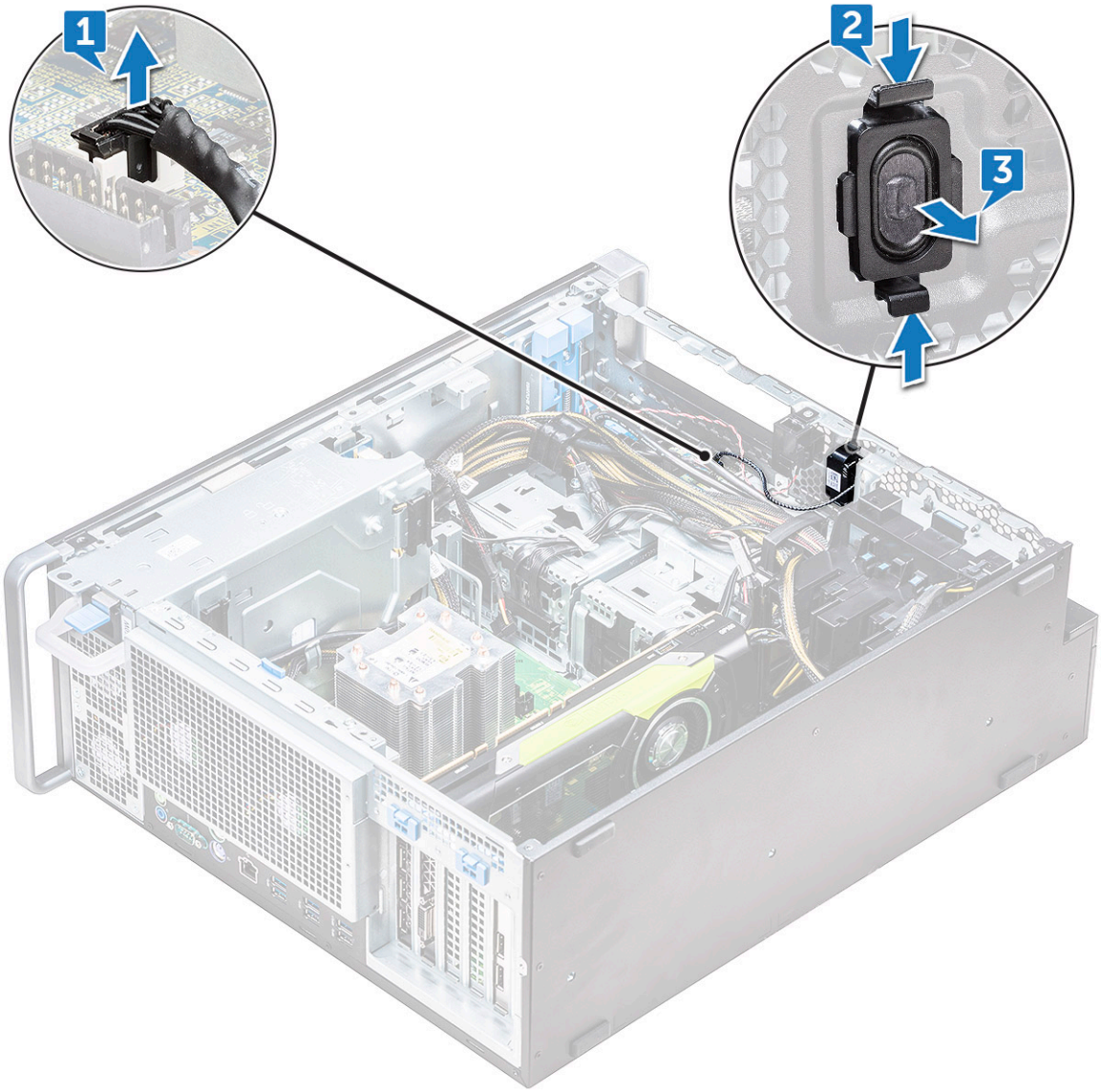
Internal chassis speaker

Removing the internal chassis speaker

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

a. side cover
b. front bezel
c. 5.25 inch ODD bracket

3. To remove the internal chassis speaker:
   a. Disconnect the speaker cable [1] from the front I/O module.
   b. Press the speaker securing tabs [2], then pull to release it from the system.
   c. Gently push the speaker [3] with its cable out of the system.



Installing the internal chassis speaker

1. Press and hold the tabs on either side of the intrusion speaker, and slide the speaker module into the slot to secure it to the system.
2. Connect the internal chassis speaker cable to the connector on the system chassis.
3. Install the:
   a. 5.25 inch ODD bracket
   b. front bezel
   c. side cover
4. Follow the procedure in After working inside your computer

Air shroud

Removing the air shroud

1. Follow the procedure in Before working inside your computer.
2. Remove the side cover
3. To remove the air shroud:
   a. Holding the shroud at both the ends, press the tabs[1] and then lift the shroud[2] from the system.

Installing the air shroud

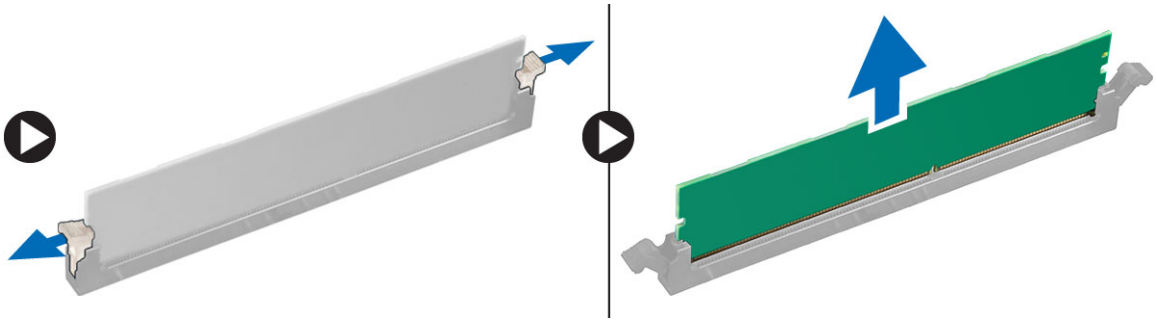
1. Place the shroud into its position and make sure that the tab fits into the system.
2. Align the shroud to its locking tab.
3. Press down the shroud until it clicks into place.
4. Install the side cover.
5. Follow the procedure in After working inside your computer.

Memory

Removing the memory module

1. Follow the procedure in Before working inside your computer.
2. Remove the following:
   a. side cover
   b. air shroud
3. Press the memory module retention tabs on each side of the memory module.
4. Lift the memory module out of the memory slot on the system board.

   WARNING: Rotating the memory module out of the slot will cause damage to the memory module. Ensure to pull it straight out of the memory module slot.



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 slot.
3. Press the memory module firmly until the retention tabs click into place.

   NOTE: Do not pull the retention levers up. Always press down firmly on the module until the levers lock into place unassisted.

4. Install the:
   a. air shroud
   b. side cover
5. Follow the procedure in After working inside your computer

Graphical processing unit(GPU)

Removing the GPU

1. Follow the procedure in Before working inside your computer.
2. Remove the side cover.
3. To remove the GPU:
   a. Disconnect the power cable [1] from the GPU card.

      NOTE: Not all GPU cards will have power cable, may not apply to all systems.

   b. Press and rotate the blue clips backward [2], to unlock the filler bracket.

c. Lift the GPU from the PCIe slot on the system board.

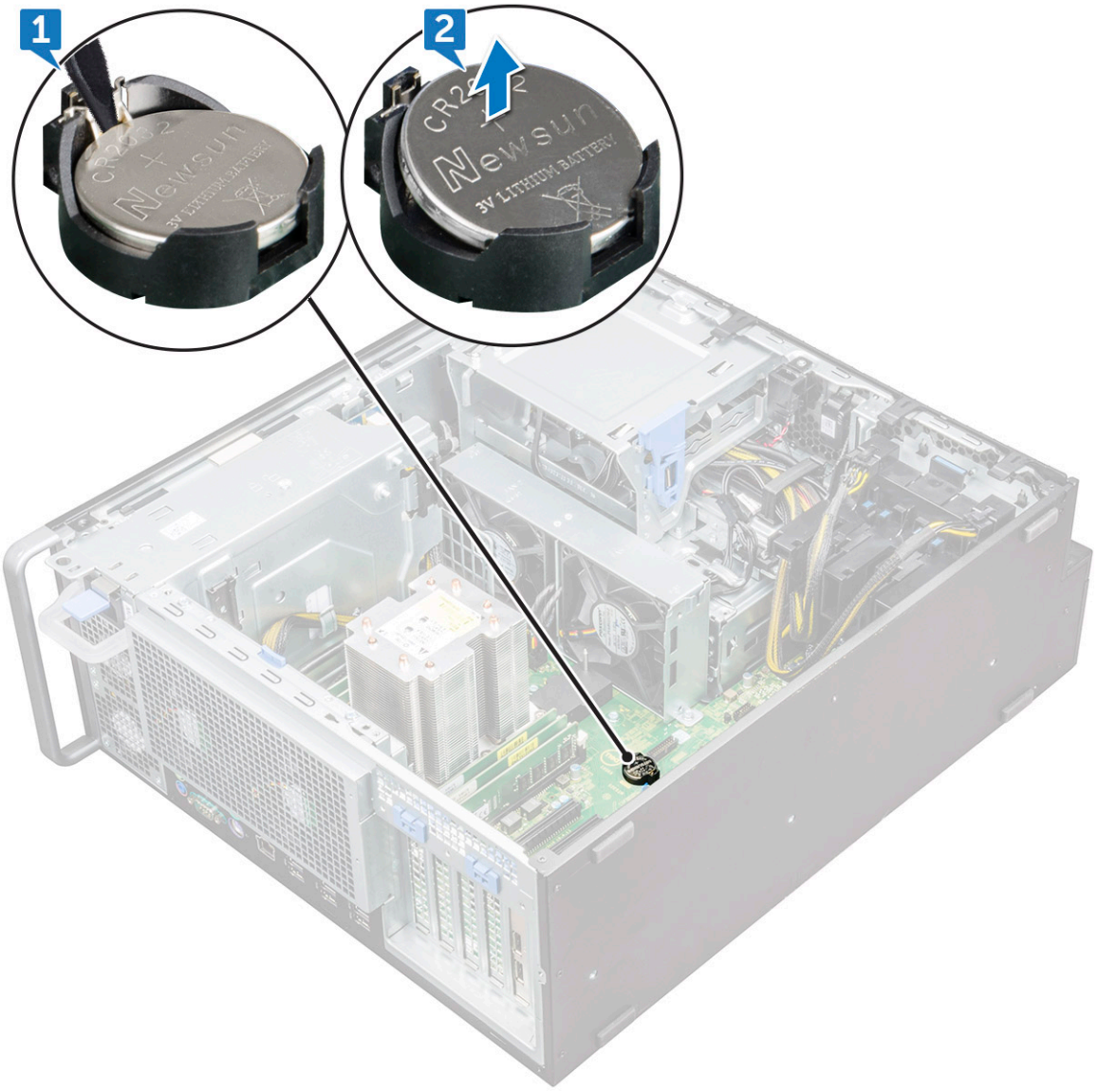
Installing the GPU

1. Align and place the GPU to the PCIe slot on the system board.
2. Press it down so that it is securely seated on the slot.
3. Connect the power cable to the GPU.
4. Lock both the blue clips forward on the filler bracket to secure the GPU to the system board.
5. Install the side cover.
6. Follow the procedure in After working inside your computer.

Coin cell battery

Removing the coin cell battery

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



b. Lift the coin-cell battery out of the system board.

Installing the coin cell battery

1. Place the coin-cell battery into its slot on the system board.
2. Press the coin-cell battery with positive (+) side facing up until the release latch springs back into place and secures it to the system board.
3. To install:
   a. graphical processing unit (GPU)
   b. side cover
4. Follow the procedure in After working inside your computer.

System fan

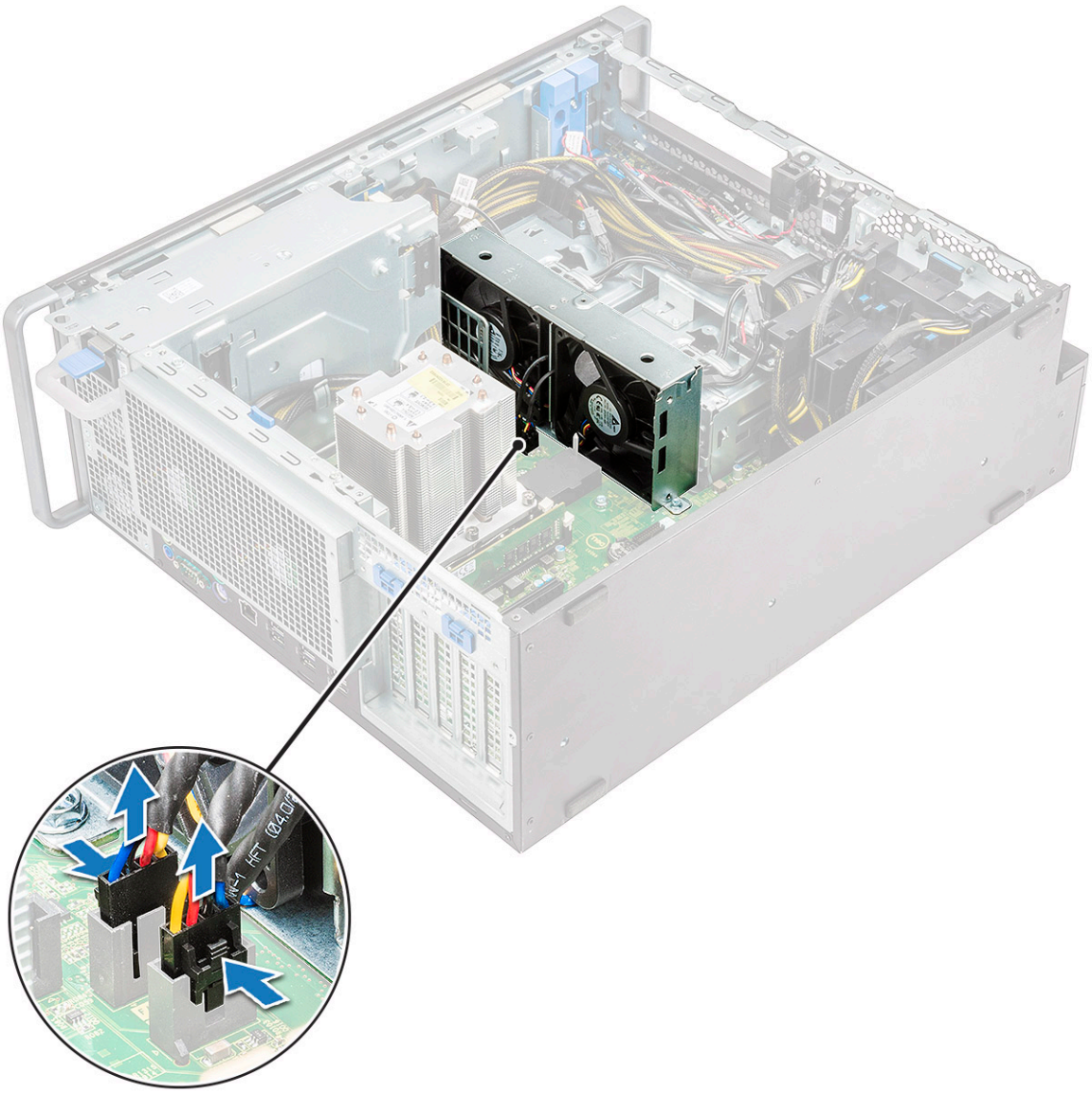
Removing the System fan

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

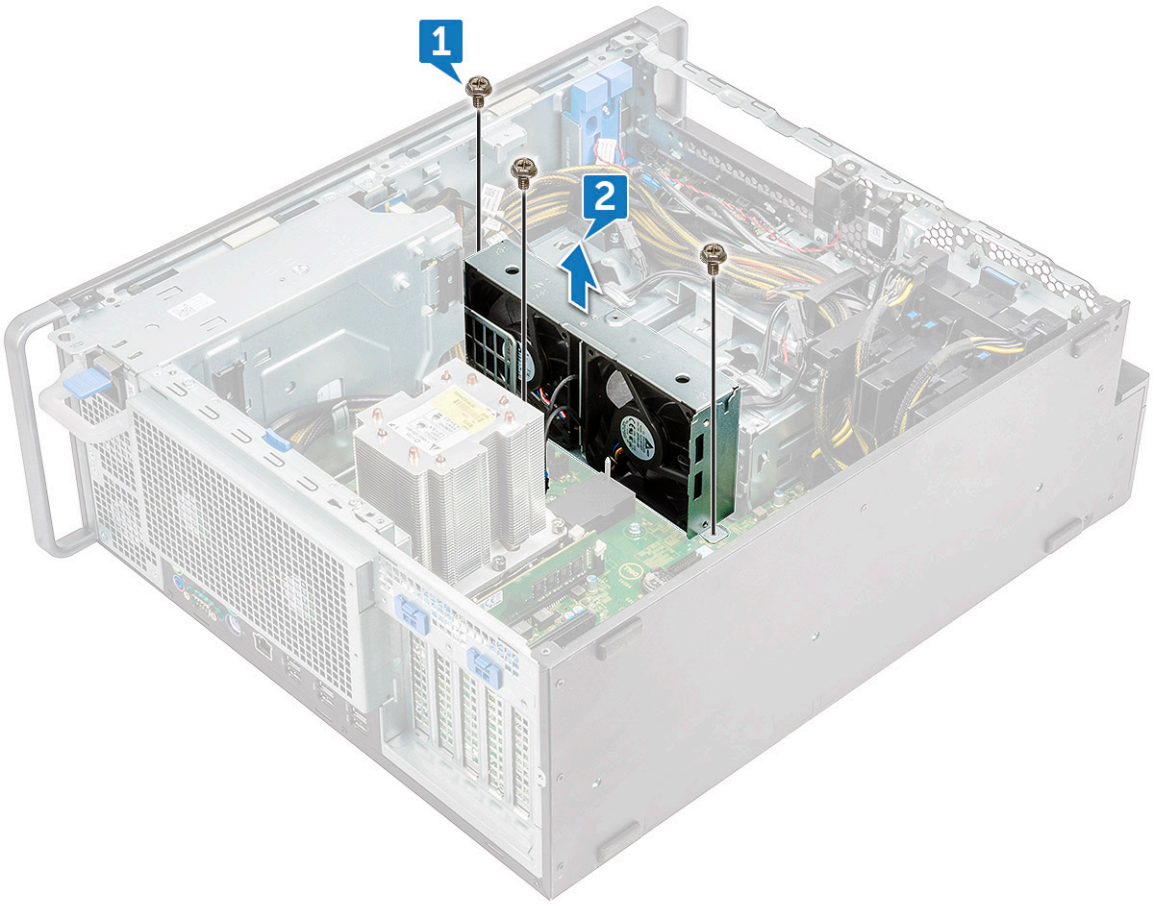
a. side cover
b. air shroud
c. front bezel
d. 5.25 inch ODD bracket
e. graphical processing unit(GPU)

3. To remove the system fan:
   a. Press the connector tab and disconnect the two fan cables from the system board.

      NOTE: Do not pull the connector by the cable wires. Instead, disconnect the cable by pulling on the connector end. Pulling on the cable wires may loosen them from the connector.



   b. Remove the screws [1] securing the system fan to the system board and lift the system fan up [2] .



Installing the system fan

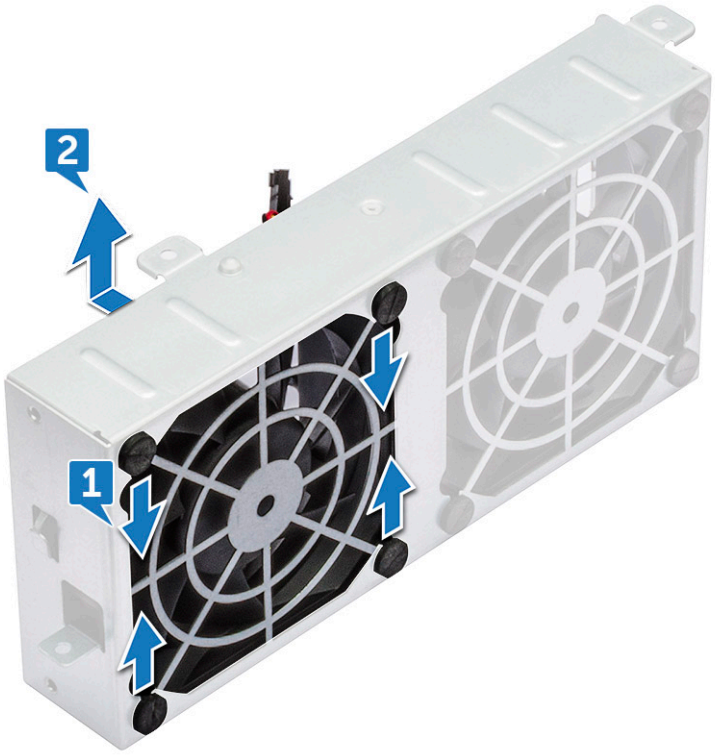
1. Align the system fan to its slot on the system board and secure it with the 3 screws.
2. Connect the fan cables to the slot on the system board.
3. Install the:
   a. graphical processing unit(GPU)
   b. 5.25 ODD bracket
   c. front bezel
   d. air shroud
   e. side cover
4. Follow the procedure in After working inside your computer.

Fan bracket

Removing the fan from the fan bracket

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. system fan
3. To remove the fan from the fan bracket:
   a. Slide out the four rubber grommets for each fan from the fan chassis [1].

b. Lift the fan and remove it from the fan assembly [2].



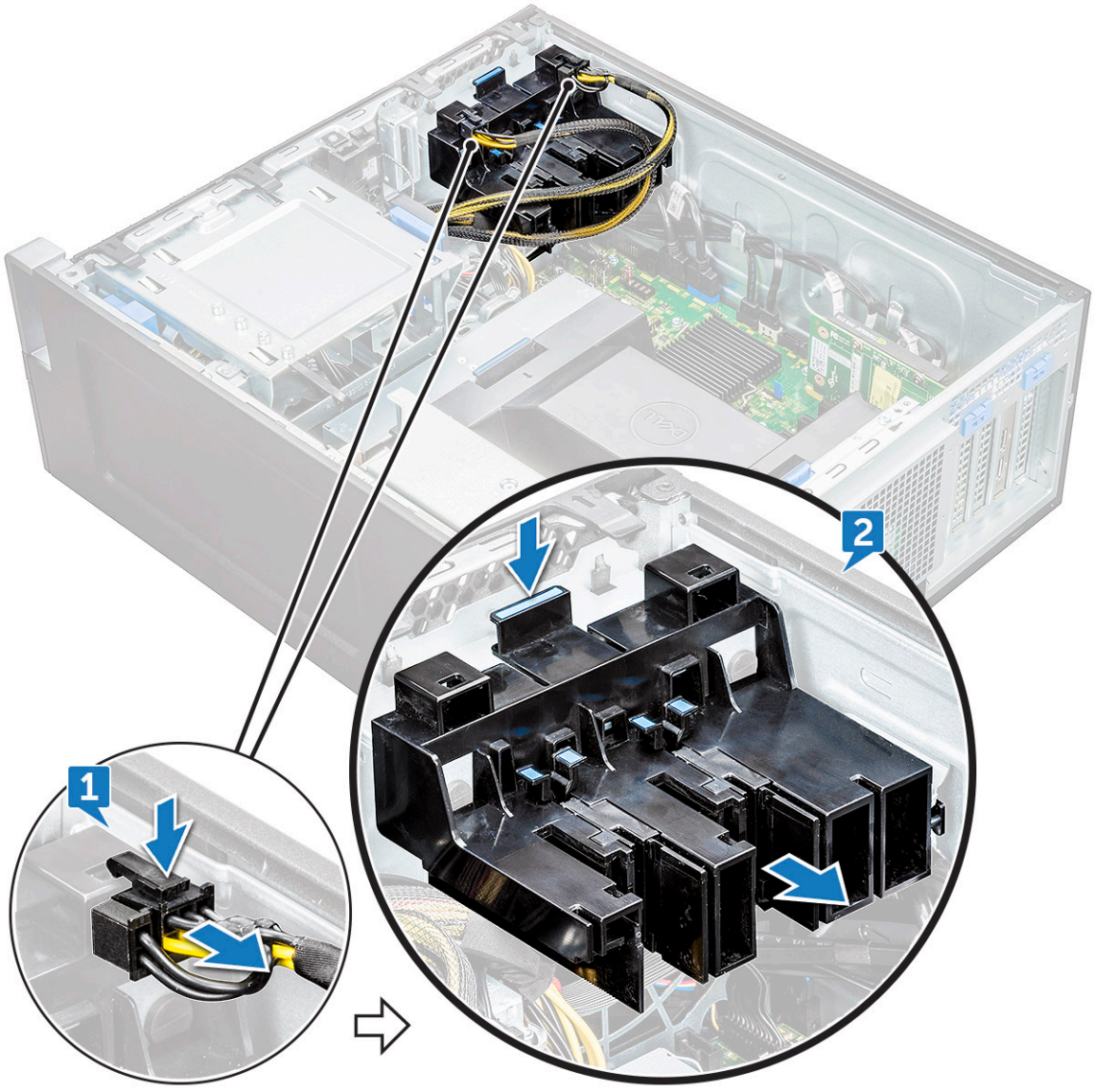
Installing the fan into the fan bracket

1. Place the fan into the fan bracket.
2. Tighten the grommets that secure the fan to the fan bracket.
3. Install the:
   a. system fan
   b. side cover
4. Follow the procedure in After working inside your computer

PCIe holder

Removing PCIe holder

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. graphical processing unit(GPU)
3. To remove the PCIe holder:
   a. Disconnect the two power cables from the cable slot in the PCIe holder [1].
   b. Press the PCIe holder securing clip and slide the holder [2] out of the chassis.



Installing the PCIe holder

1. Align and place the PCIe holder to the system chassis.
2. Press the holder back until it clicks to the system.
3. Connect the two power cables to the cable slots in the holder.
4. Install the:

a. graphical processing unit(GPU)
b. side cover

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

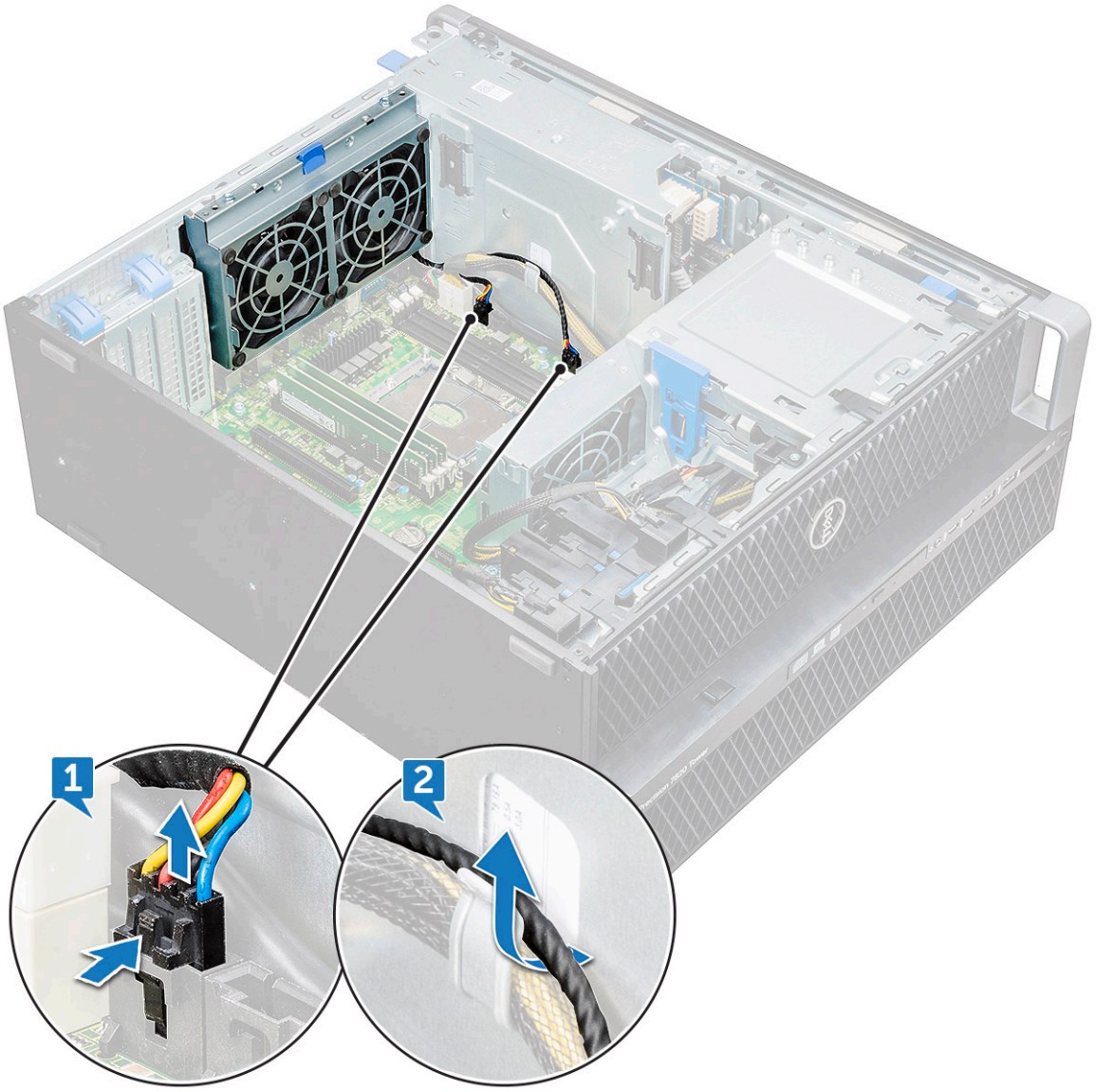
Rear system fan

Removing the rear system fan

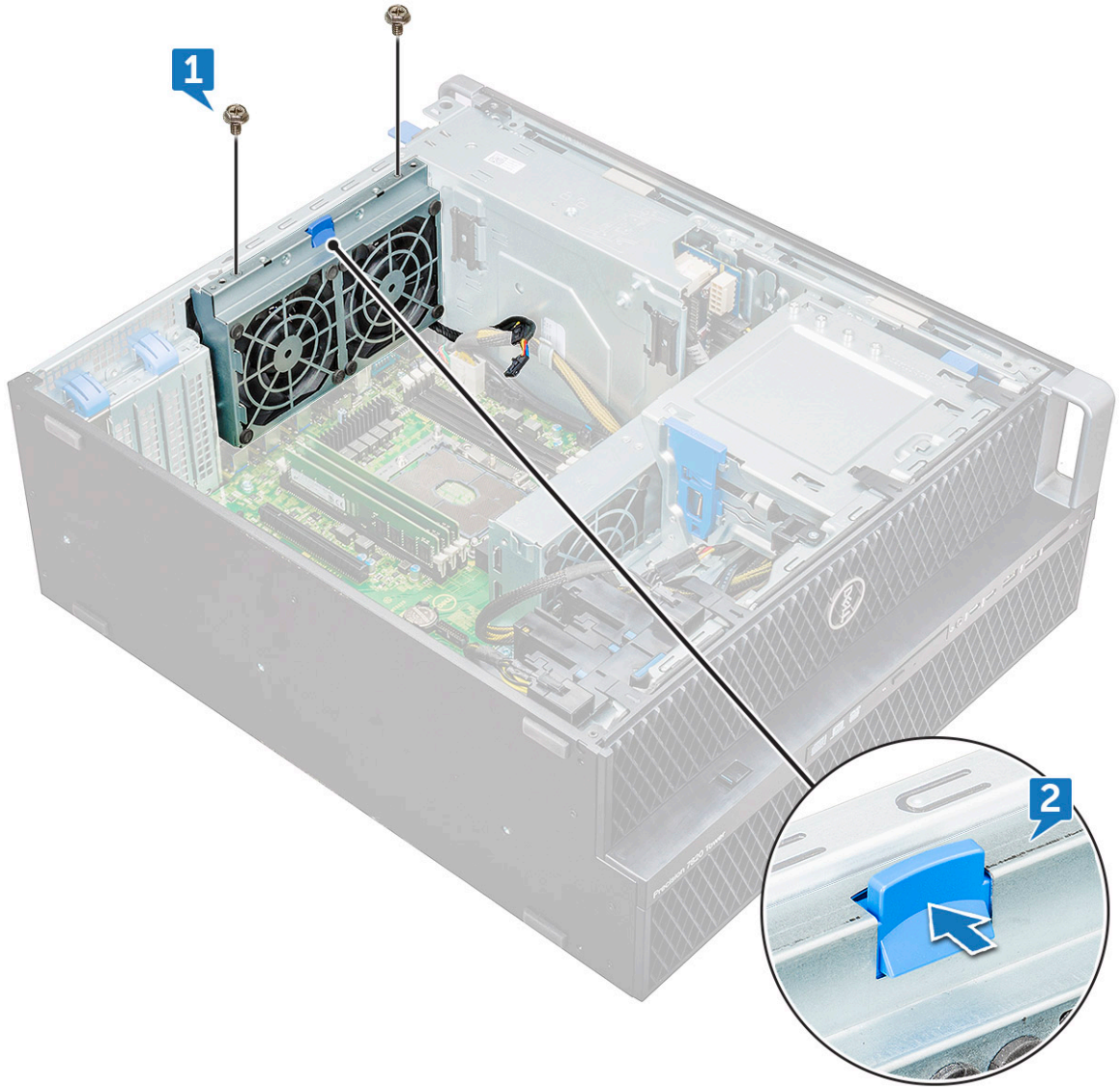
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. processor heat sink module(PHM)
3. To remove the rear system fan:
   a. Disconnect the two fan cables [1] from the system board.

      NOTE: Do not pull the connector by the cable wires. Instead, disconnect the cable by pulling on the connector end. Pulling on the cable wires may loosen them from the connector.

   b. Unroute the cable from the cable holder [2] on the PSU bracket.



c. Remove the screws [1].
d. Press the tab[2] to detach the fan from the system.



e. Rotate the fan forward and lift it away from the system.

Installing the rear system fan

1. Insert the fan assembly on one side to align it with the screw tab on the PSU bracket.
2. Press the assembly on the other side to align it with the screw tab on the PCI bracket.
3. Tighten the two screws to secure it with the system.
4. Connect the two fan cables to the system board.
5. Install the:
   a. processor heat sink module(PHM)
   b. side cover
6. Follow the procedure in After working inside your computer.

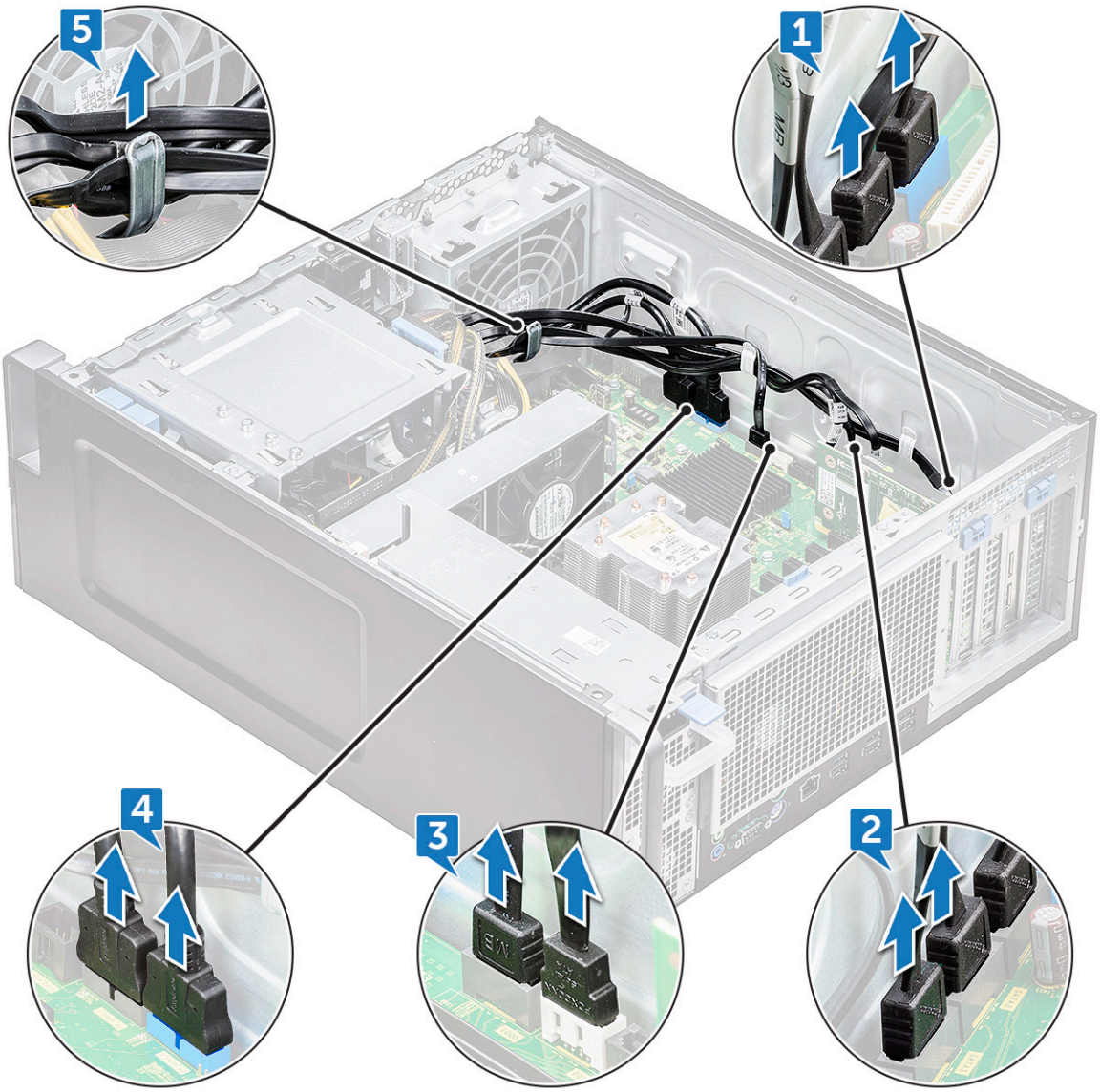
Front system fan

Removing the front system fan

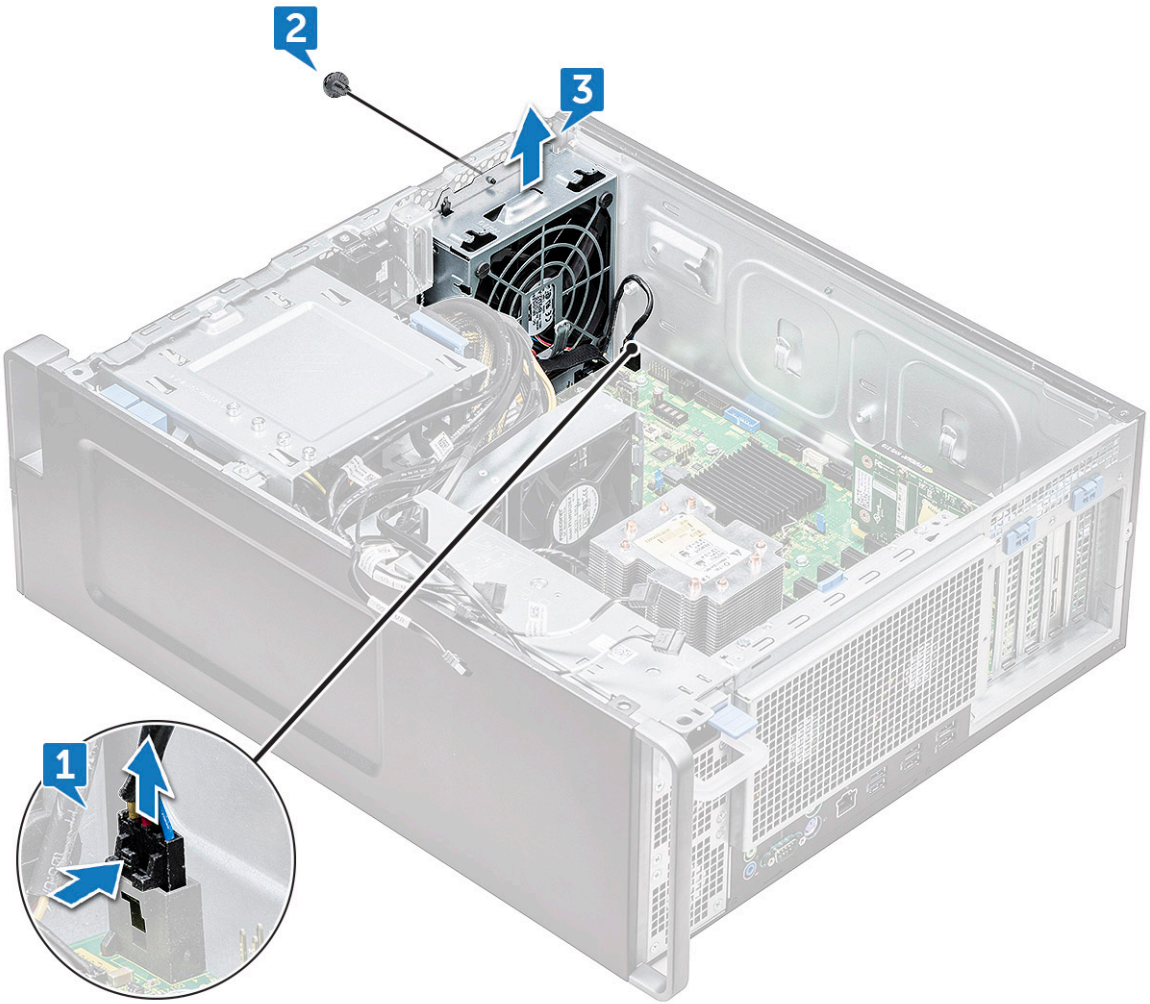
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. front bezel
   c. PCIe holder
   d. graphical processing unit (GPU)

3. To remove the front system fan:
   a. Unroute the following cables from the card holder [5]:
      - SATA 0,1 cable [1]
      - SATA 2, 3, 4, 5 cable [2]
      - ODD 0, 1 cable [3]
      - USB 3.1 cable [4]

      NOTE: Do not pull the connector by the cable wires. Instead, disconnect the cable by pulling the connector end. Pulling the cable wires may loosen them from the connector.



   b. Unroute the fan cable [1] from the system board.
   c. Remove the screw [2] that secure the rear system fan to the chassis.
   d. Lift the fan to release it from the retention slot in the system chassis [3].



Installing the front system fan

1. Align the front system fan to its retention slot in the system chassis.
2. Replace the screw that secures the front system fan to the chassis.
3. Connect the fan cable to the system board.
4. Route the following cables through the cable holder and connect to the system board:
   - SATA 2, 3, 4, 5 cable
   - SATA 0, 1 cable
   - ODD 0, 1 cable
   - USB 3.1 cable
5. Install the:
   a. PCIe holder
   b. graphical processing unit (GPU)
   c. front bezel
   d. side cover
6. Follow the procedure in After working inside your computer.

Processor heat sink module

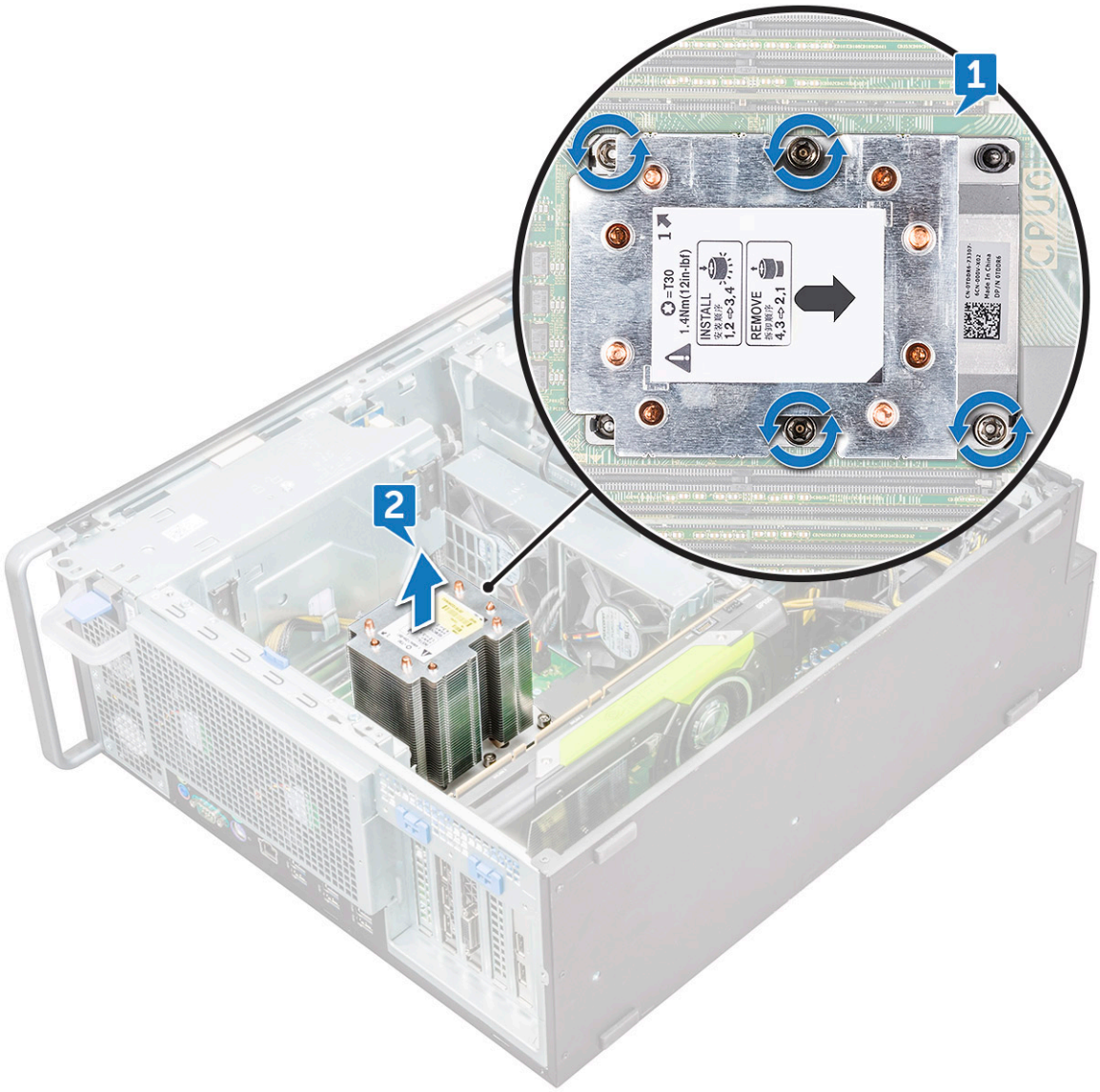
Removing the processor heat sink module

1. Follow the procedure in Before working inside your computer.

   NOTE: Ensure that you have Torx 30 screwdriver to remove the processor heat sink module (PHM).

2. Remove the:
   a. side cover
   b. air shroud
3. To remove the heat sink:
   a. Remove the four heat sink screws [1], in the diagonal order (4, 3, 2, 1).
   b. Lift the heat sink away from the CPU slot on the system board.

   CAUTION: CPU will be removed with the heat sink.

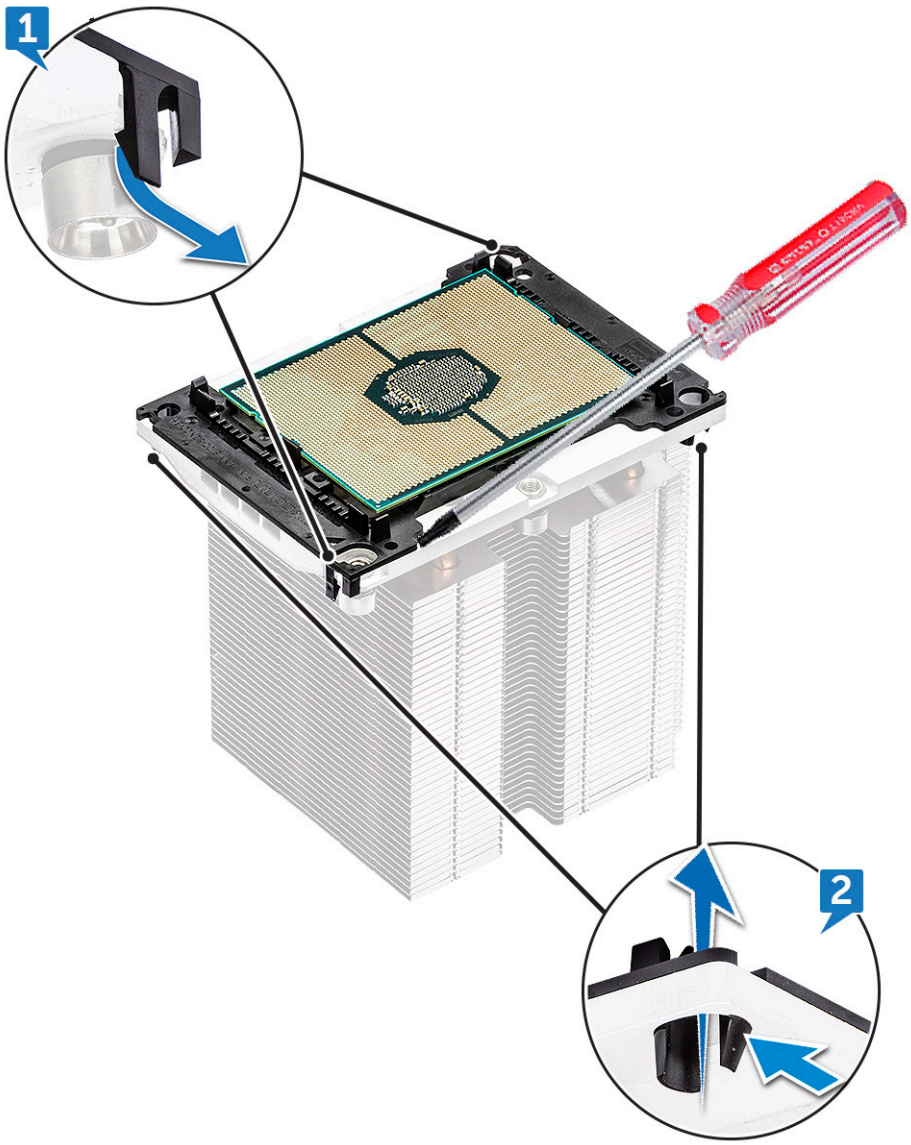


Installing the processor heat sink module

1. Place the heat sink on the CPU slot.
2. Replace the four screws in the diagonal order (1,2,3,4), to secure the heat sink to the system board.
3. Install the:
   a. air shroud
   b. side cover
4. Follow the procedure in After working inside your computer.

Removing the CPU

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. air shroud
   c. processor heat sink module
3. To remove the central processing unit (CPU):
   a. Hold the processor heat sink module upside down.
   b. Pry the two processor carrier latchs [1] from the processor heat sink module.
   c. Press the other two carrier latchs [2] of the processor carrier and remove it from the slot in the heat sink.

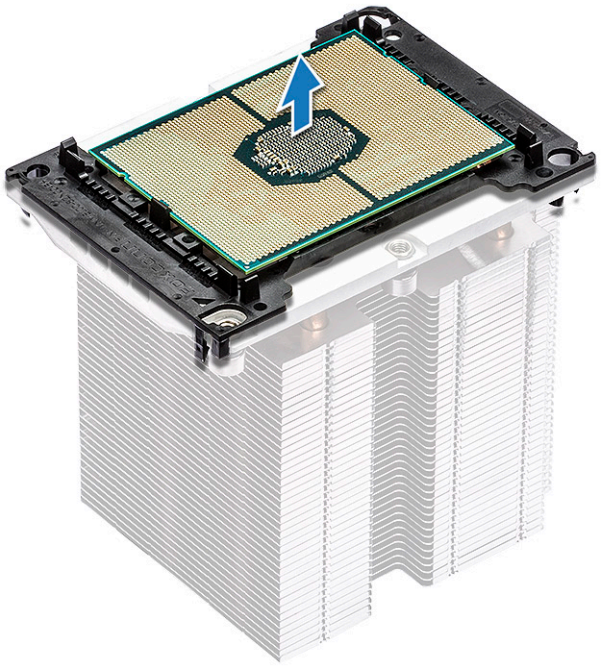


d. Use a torx screwdriver to pry the CPU off the processor heat sink module. Place the blade between the clip and the CPU.

NOTE: A flatbed screwdriver or plastic scribe can also be used as well.

e. Unlatch the CPU from the two keying latches on the processor carrier and gently lift the CPU.

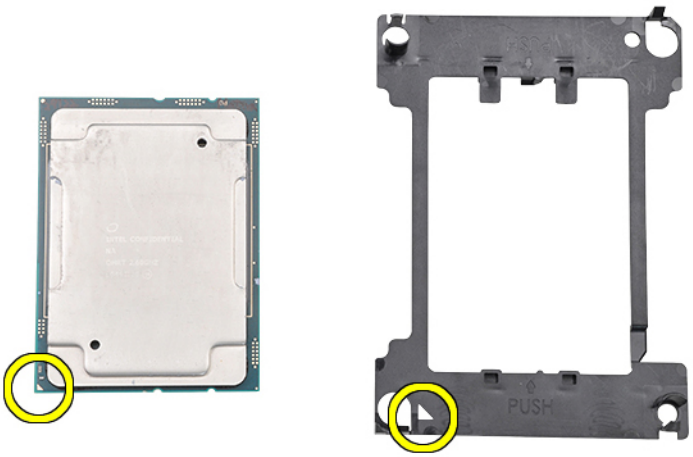
NOTE: Avoid touching the CPU contacts with your fingers.



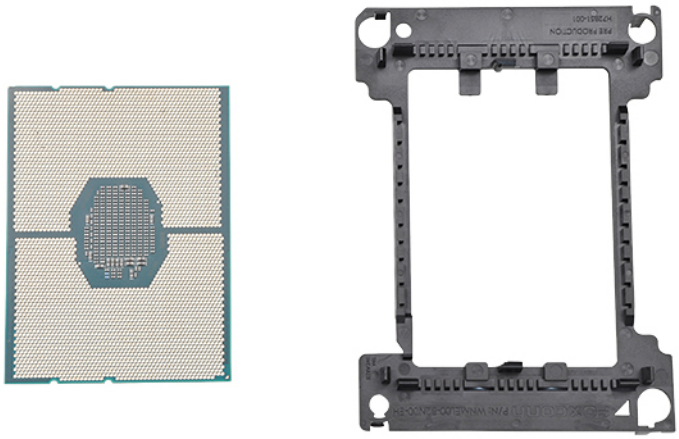
Installing the CPU

1. Orient the processor carrier so that the smooth (logo-less) side of the carrier is facing up and the triangle mark on the carrier is on the bottom left hand corner.

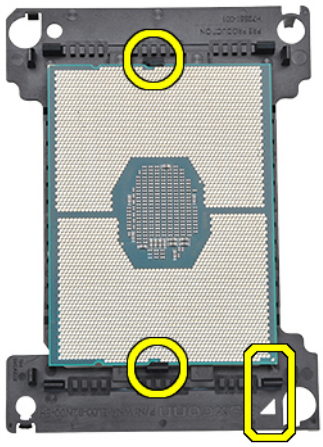
2. Align the processor with the carrier so that the triangle mark on the top side of the processor is aligned with the triangle mark on the carrier.



3. Flip both the processor and the carrier over so that the pins on the processor and the logo side of the carrier are facing up.

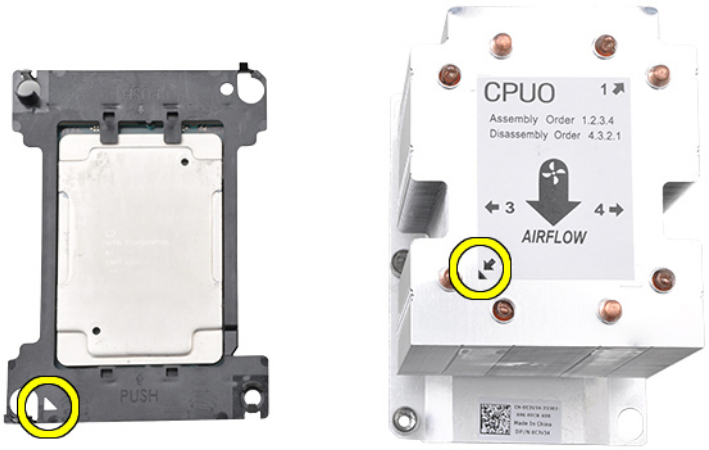


4. Carefully insert the processor into the carrier so that it is secured by the hooks on the upper and lower side of the carrier.

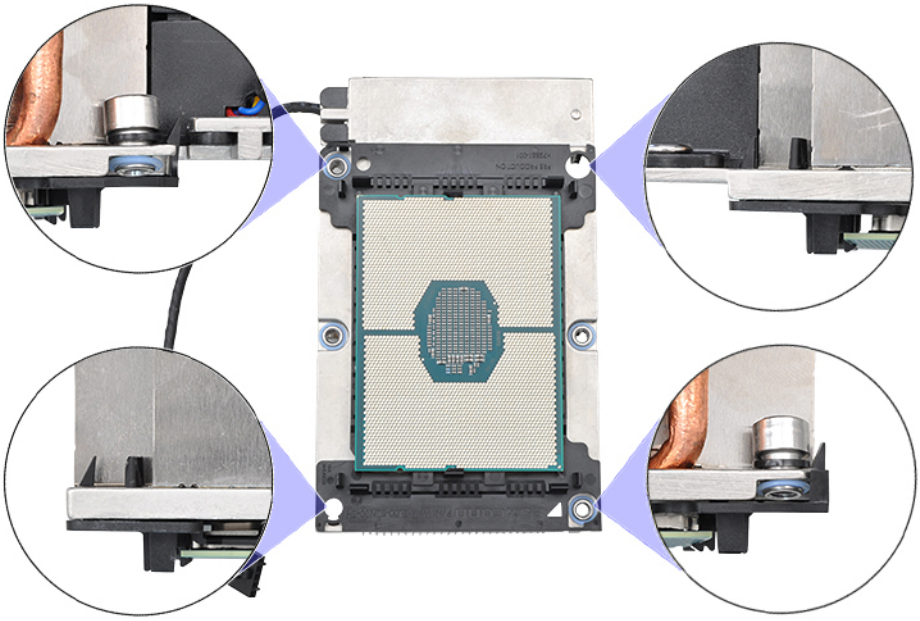


NOTE: After inserting the processor into the carrier, check to see whether the small triangle on the processor aligns with the triangle on the carrier. If they are not aligned repeat the preceding steps.

5. Align the processor and carrier assembly with the heat sink so that the triangle marks on the processor and carrier are aligned with the triangle mark on the top side of the heat sink (captive screw #2).

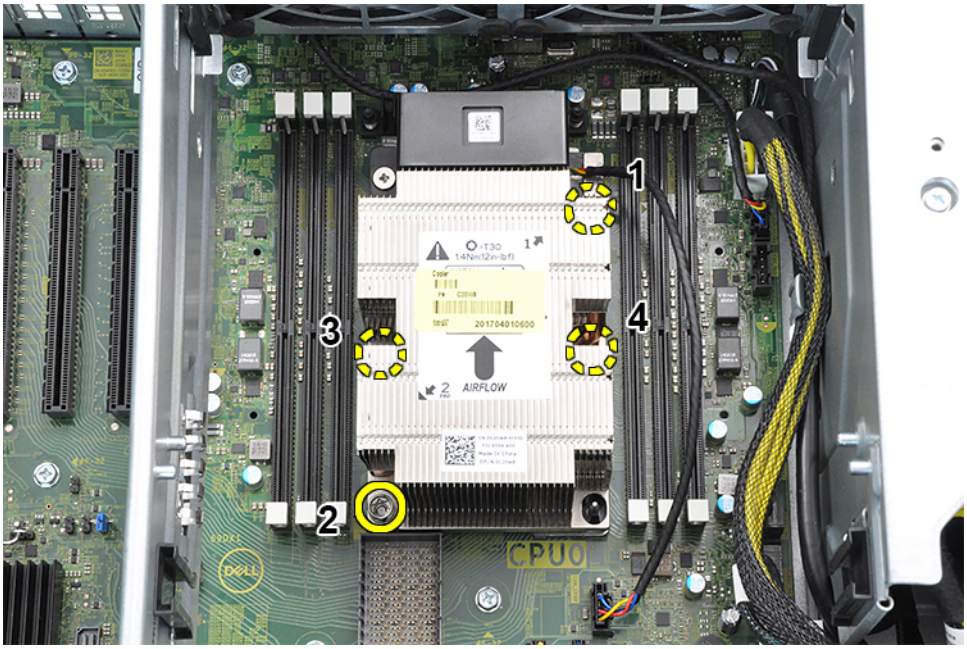


6. Insert the processor and carrier assembly into the heat sink so that the hooks on the four corners of the carrier are locked into the openings of heat sink.



NOTE: After inserting the processor and carrier assembly into the heat sink, double check to see whether the triangle on the carrier is located on the bottom right corner of the heat sink (when the bottom side of the heat sink is facing up).

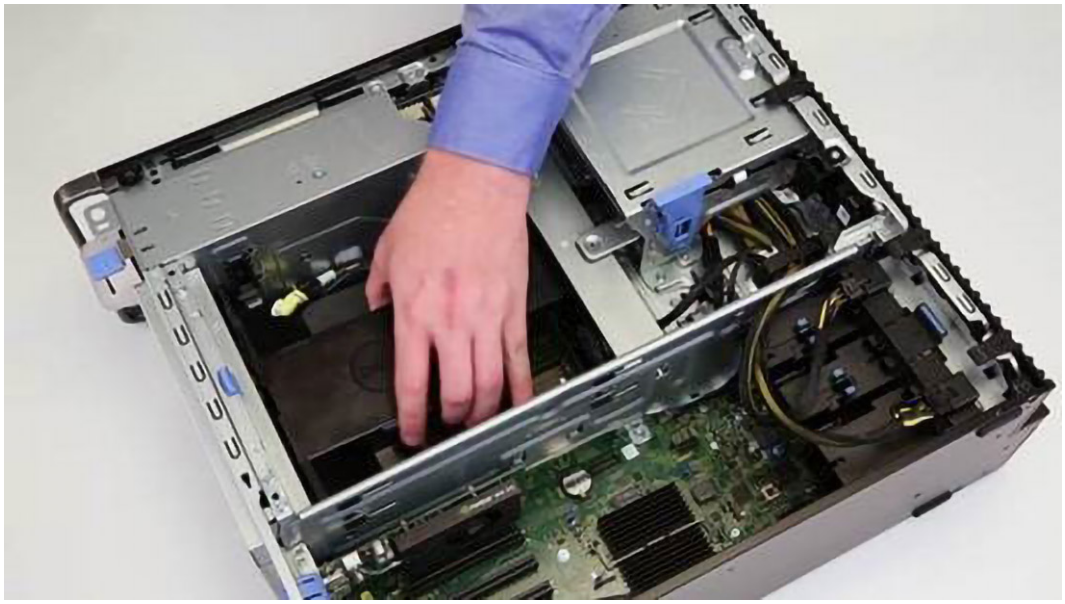
7. Install the processor and heat sink onto the central processing unit (CPU) socket and then secure the four captive screws on the heat sink to the system board in sequential order (1 > 2 > 3 > 4).



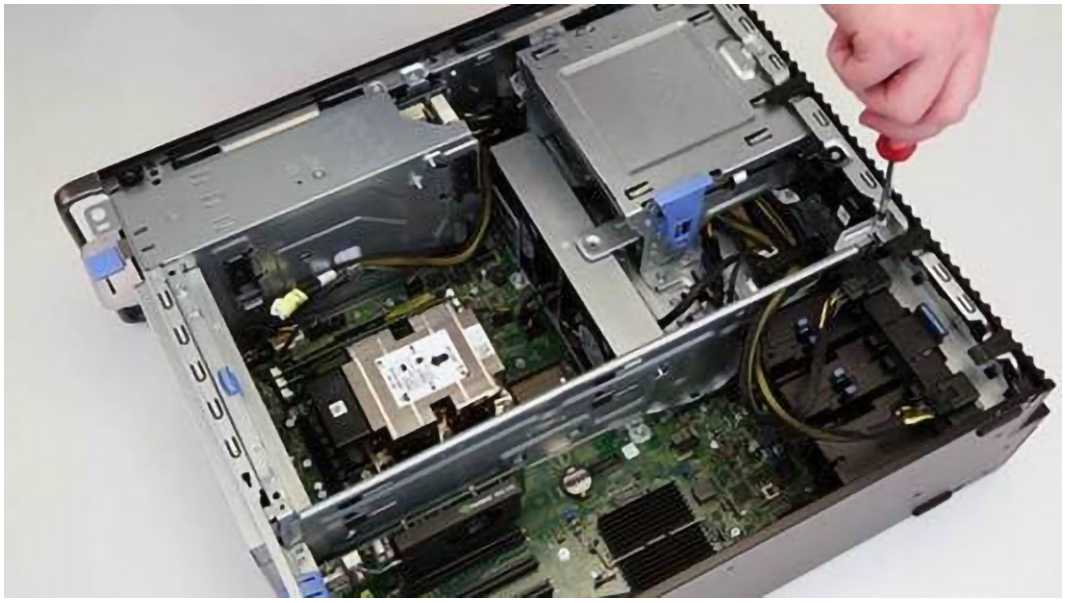
8. Install the:
   a. heat sink
   b. air shroud
   c. side cover
9. Follow the procedure in After working inside your computer

Removing the 2nd Processor and expansion card

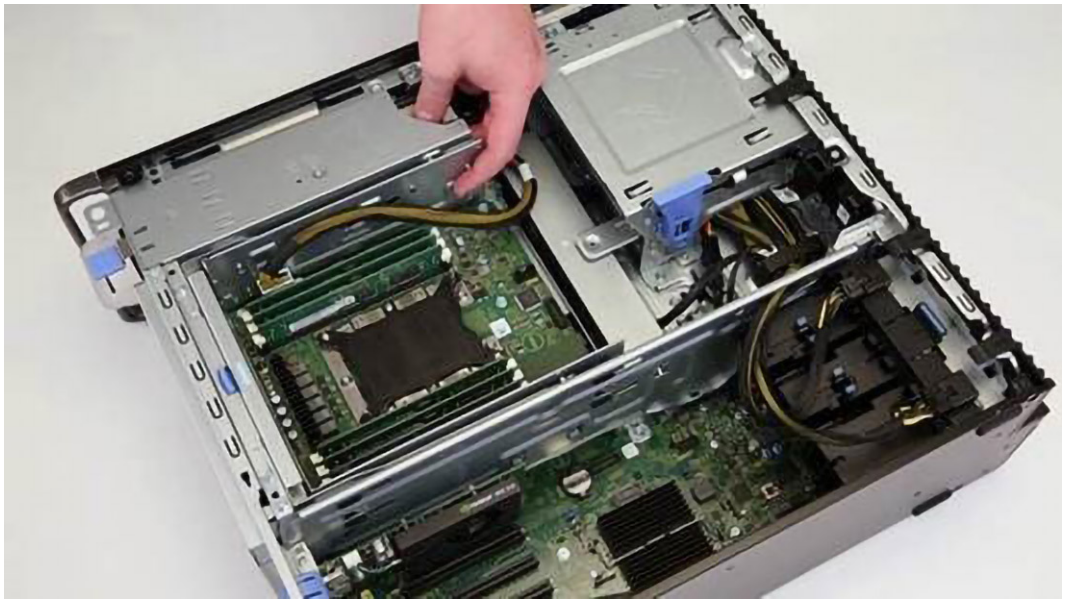
1. Follow the procedure in Before working inside your computer.
2. Remove the side cover.
3. To remove the central processing unit (CPU):
   a. Remove the air shroud.



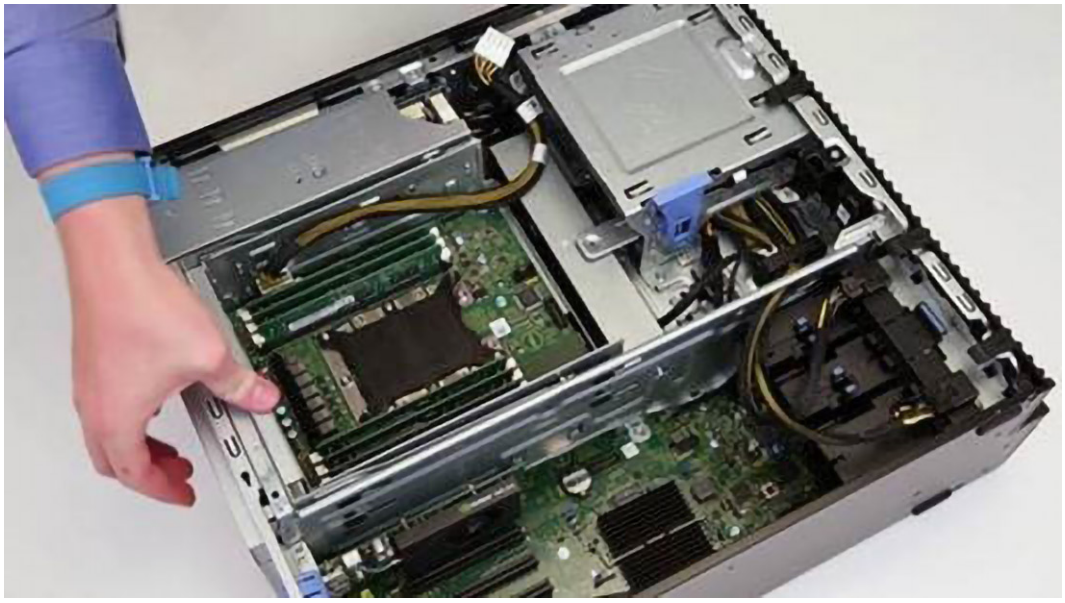
   b. Loosen the screws [1] and remove the heatsink assembly along with the processor



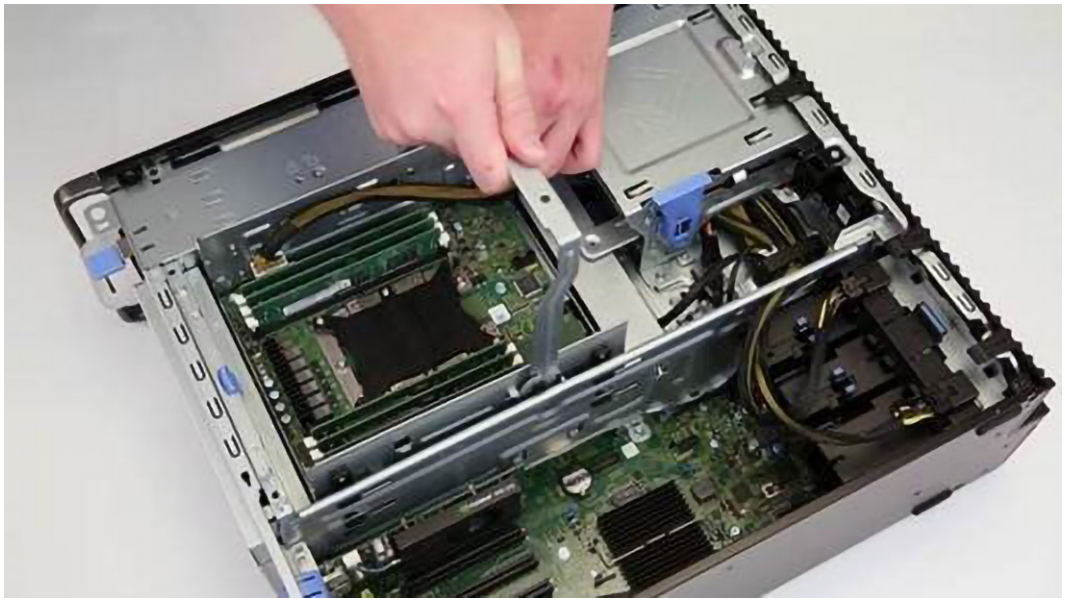
c. Disconnect the power cable from the expansion card



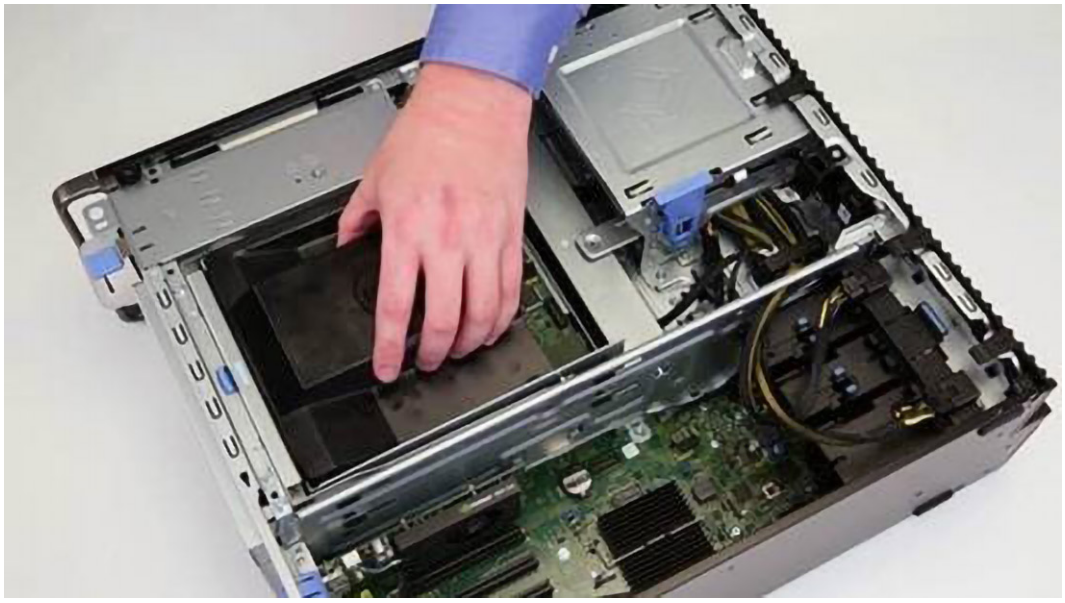
d. Press and release the expansion card latch



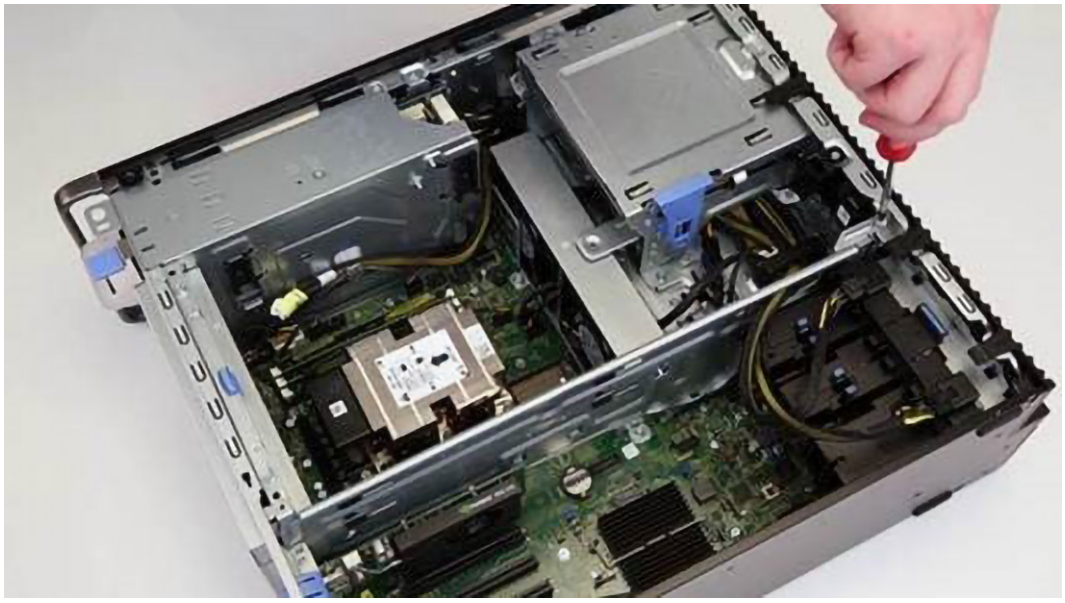
e. Lift and remove the expansion card from the computer



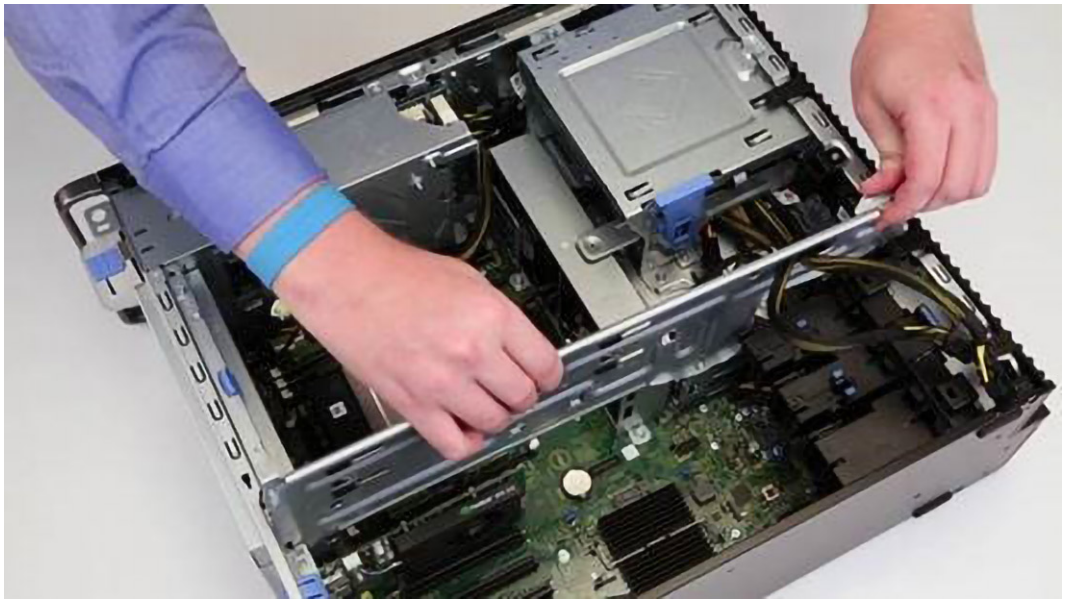
4. To remove the CPU0 and the heatsink assembly
   a. Remove the air shroud on the CPU0



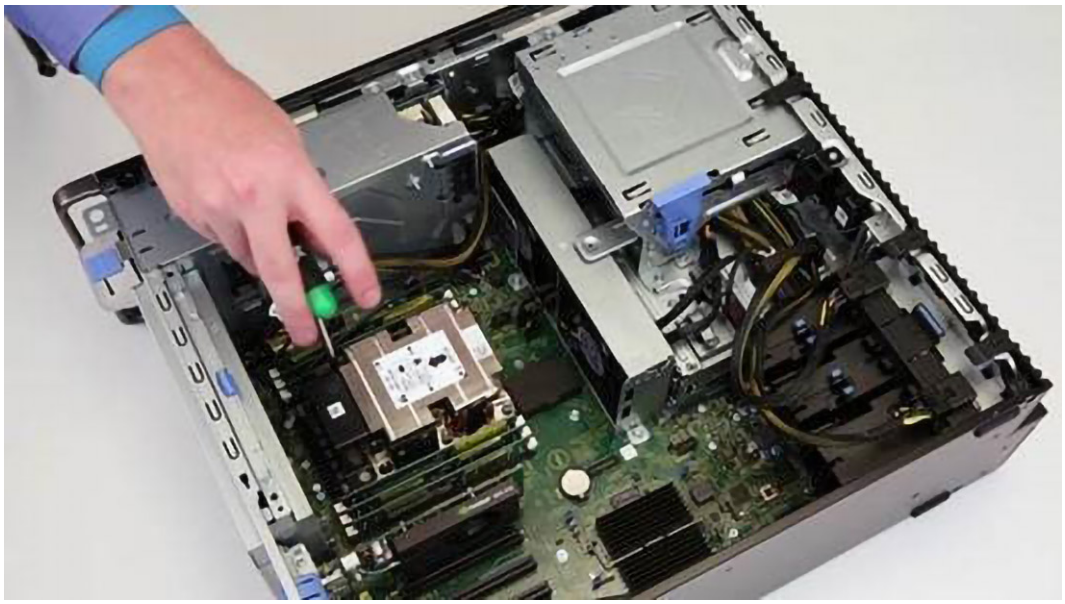
b. Remove the screw securing the metal bracket to the chassis



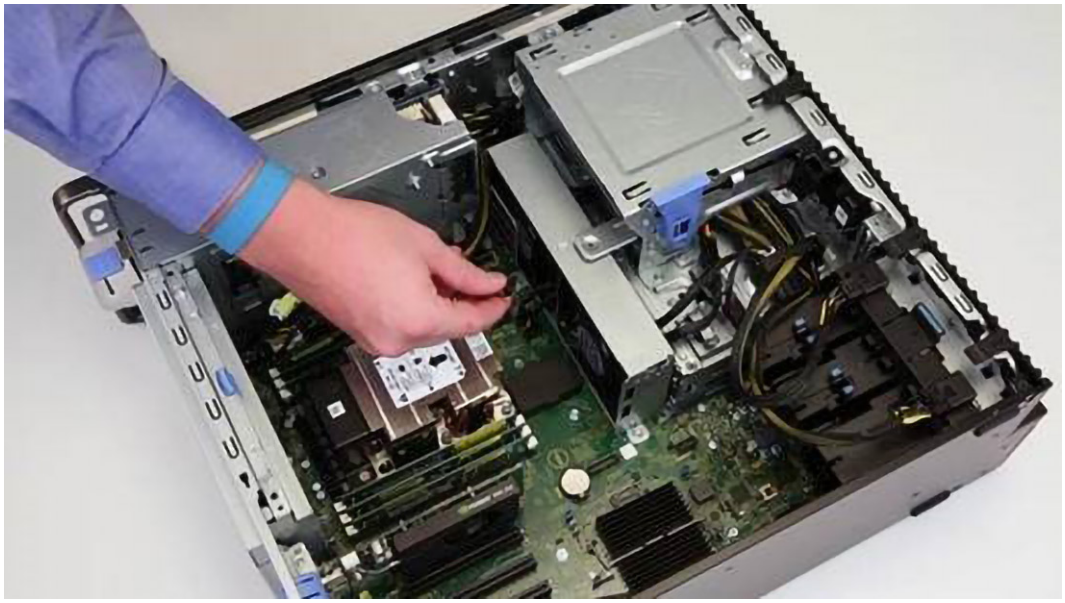
c. Disconnect the HDD and ODD cable and remove the metal separator from the system



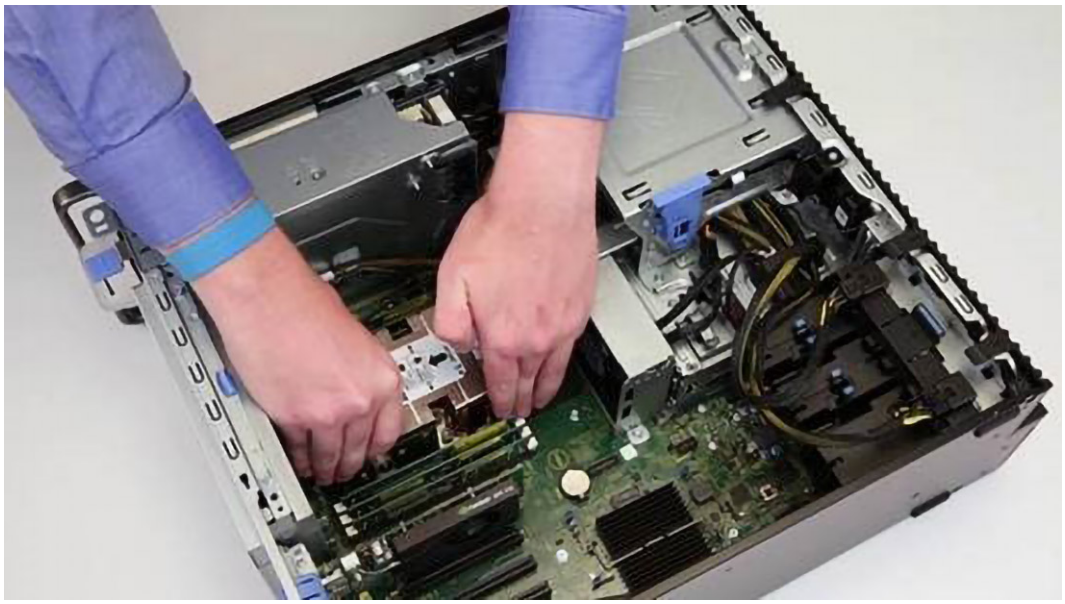
d. Loosen the heatsink screws from the system board



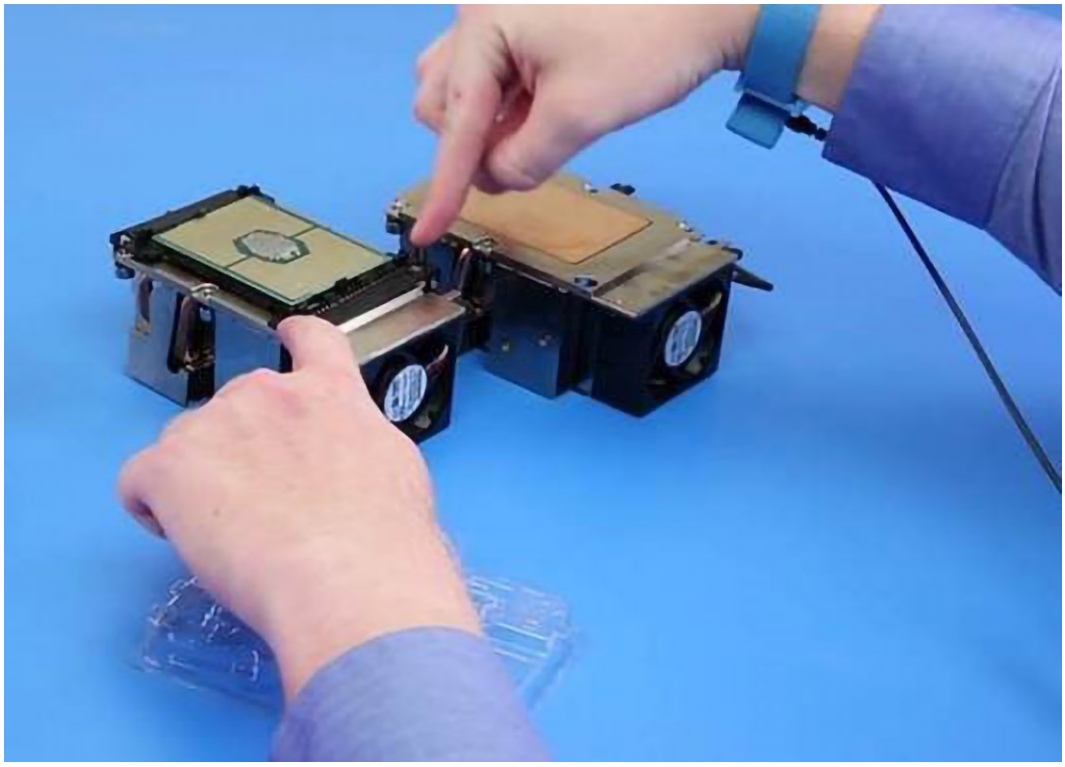
e. Disconnect the fan cable from the system board



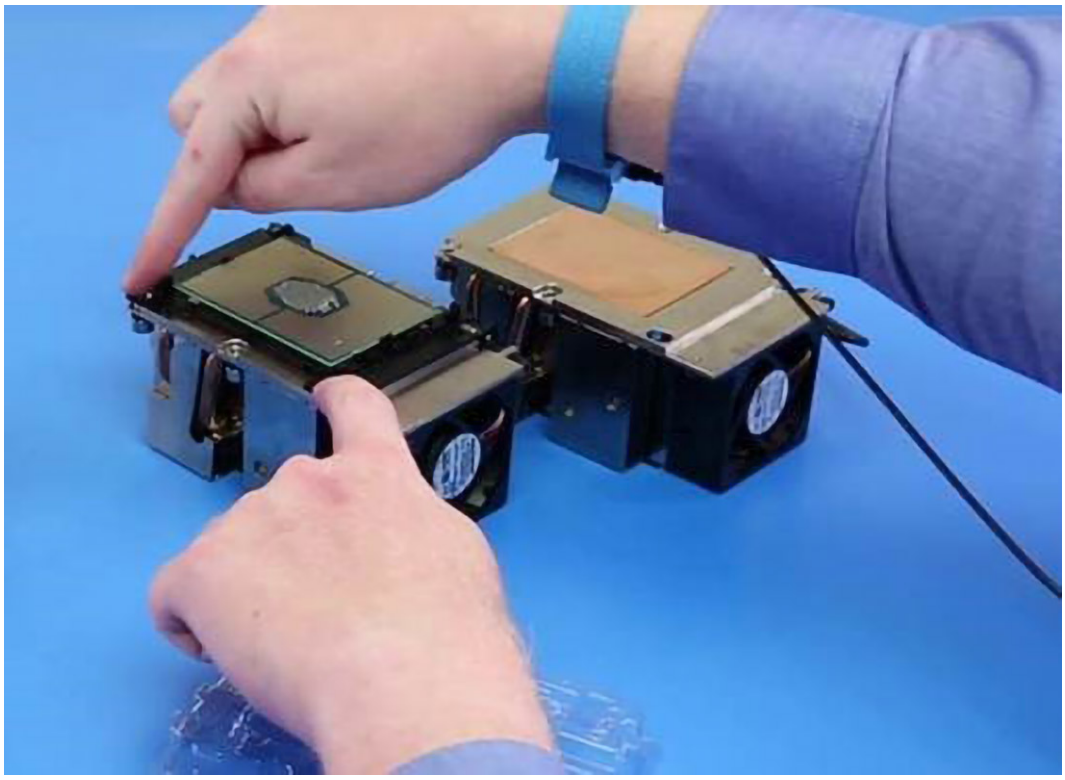
f. Lift and remove the CPU0 along with heatsink from the computer



5. To remove the processor from the heatsink assembly
   a. Press and release the latch that secures the CPU to the heatsink assembly

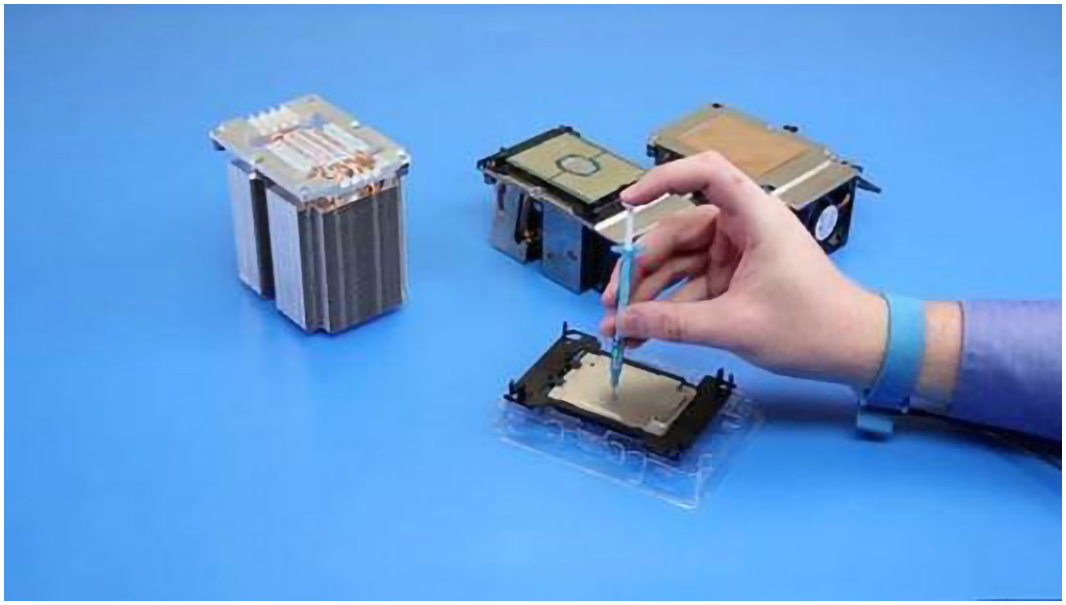


b. Pry the securing tabs to release the processor from the heatsink assembly

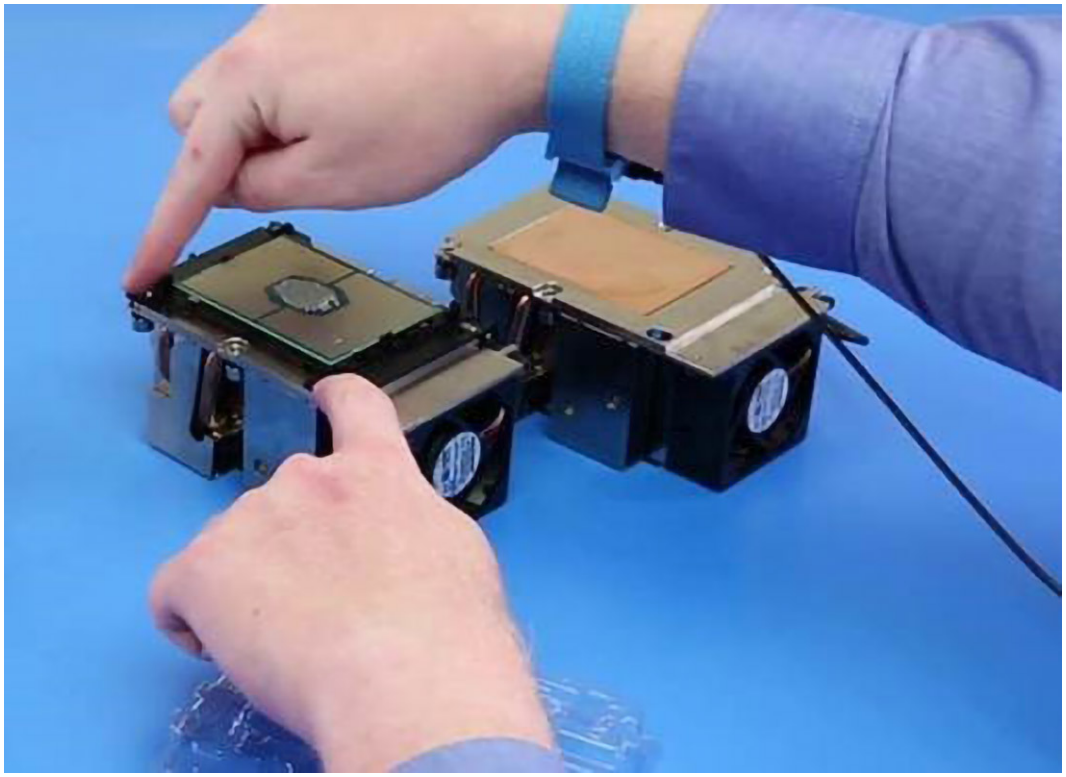


Installing the 2nd Processor and expansion card

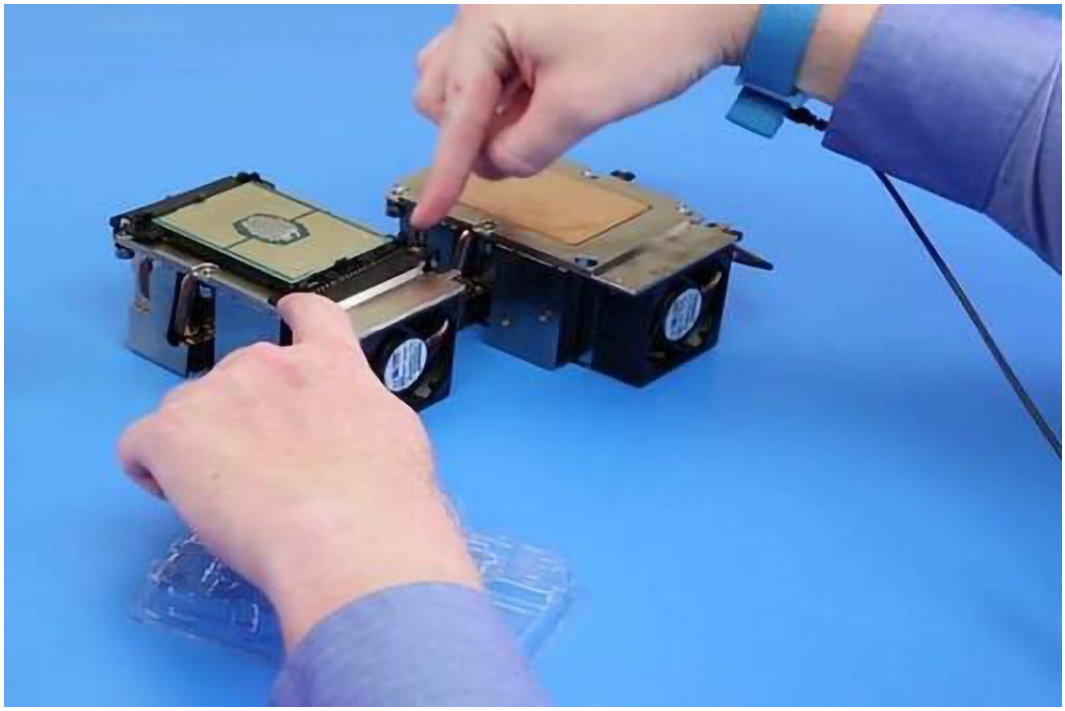
1. To install the processor on the heatsink assembly:
   a. Apply thermal gel on the processor.



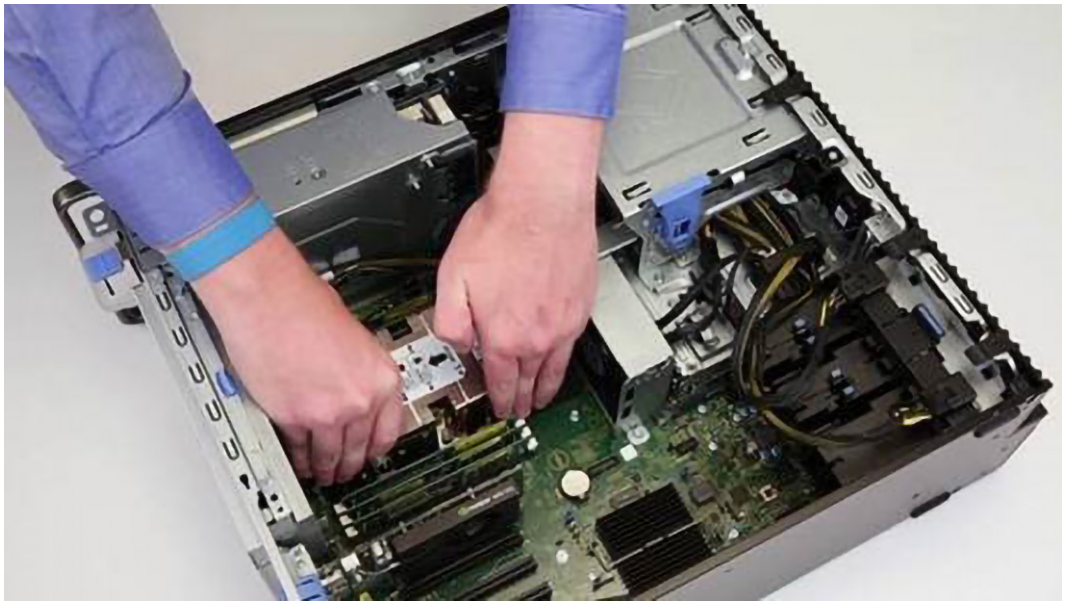
b. Replace the processor on the heatsink assembly



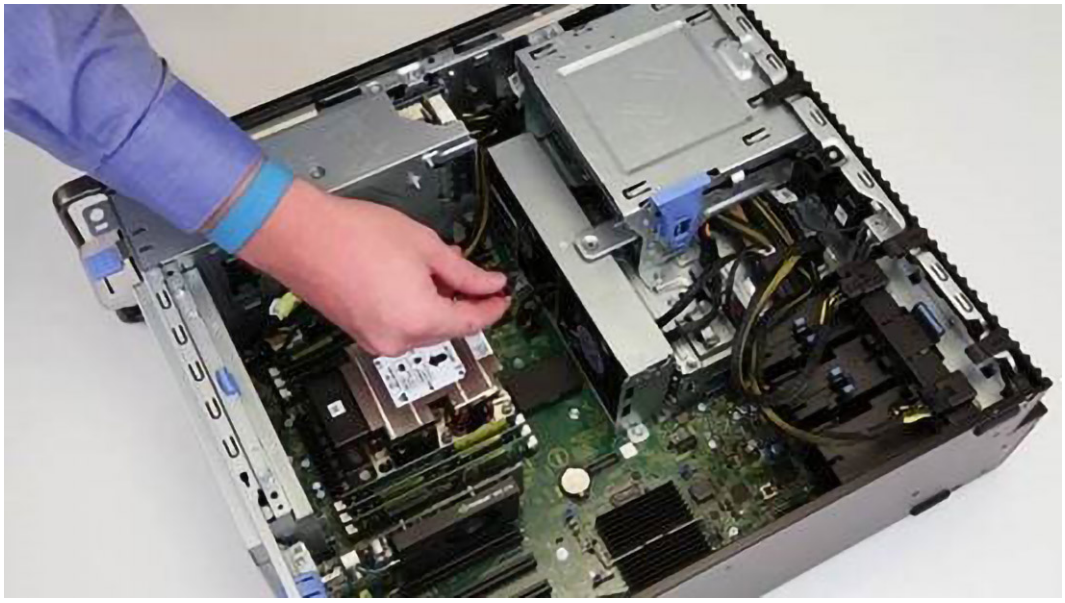
c. Press the latch to secure the processor on the heatsink assembly



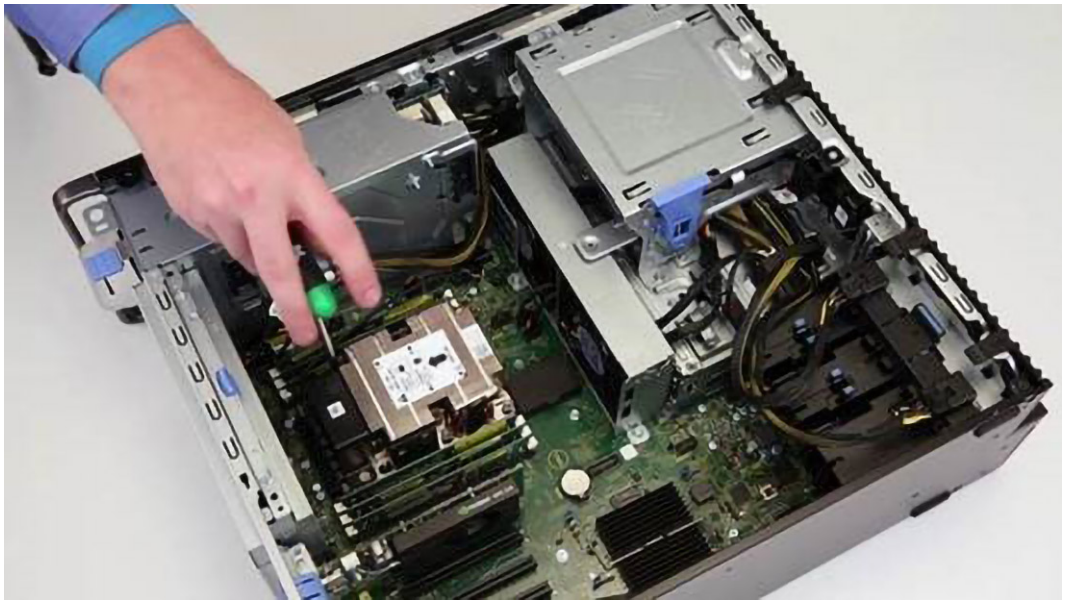
2. Install the CPU 0 and the heatsink assembly
   a. Install the CPU 0 preassembled with the heatsink assembly on the system board



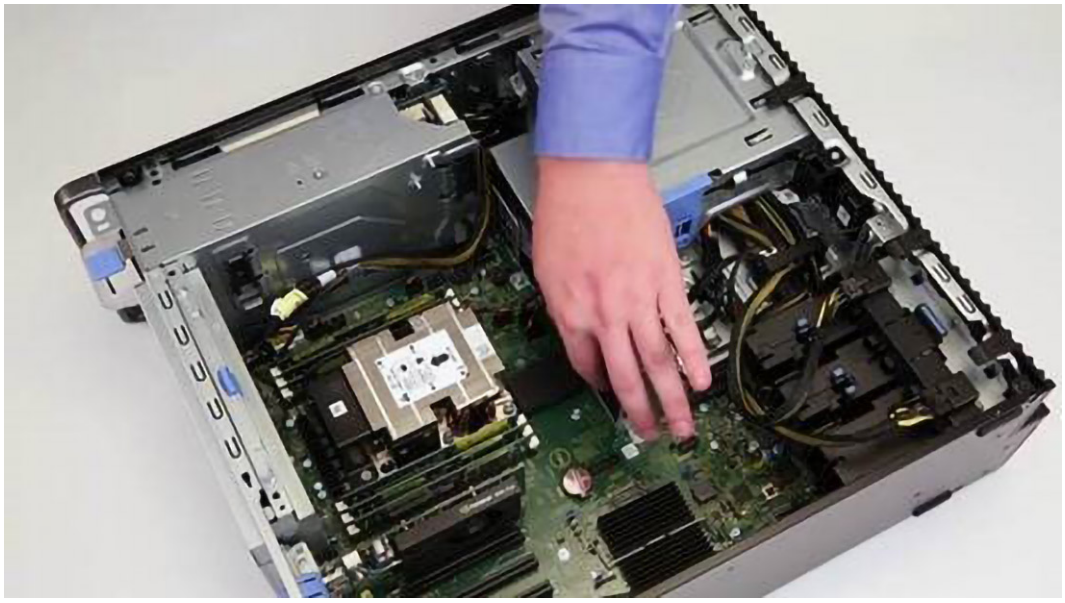
   b. Connect the fan cable for CPU 0 to the system board



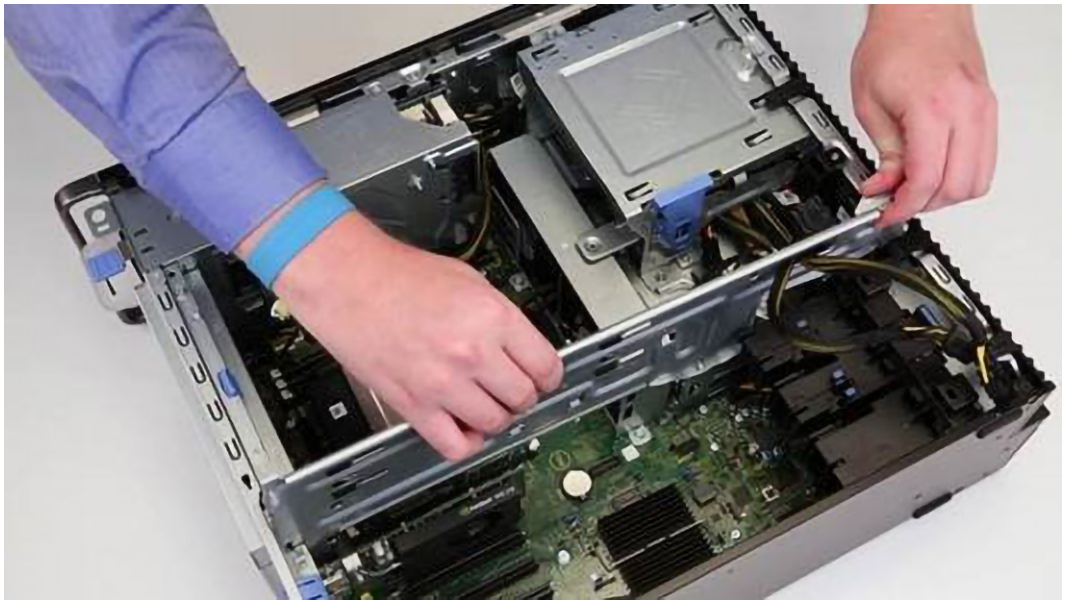
c. Tighten the heatsink screws to the system board



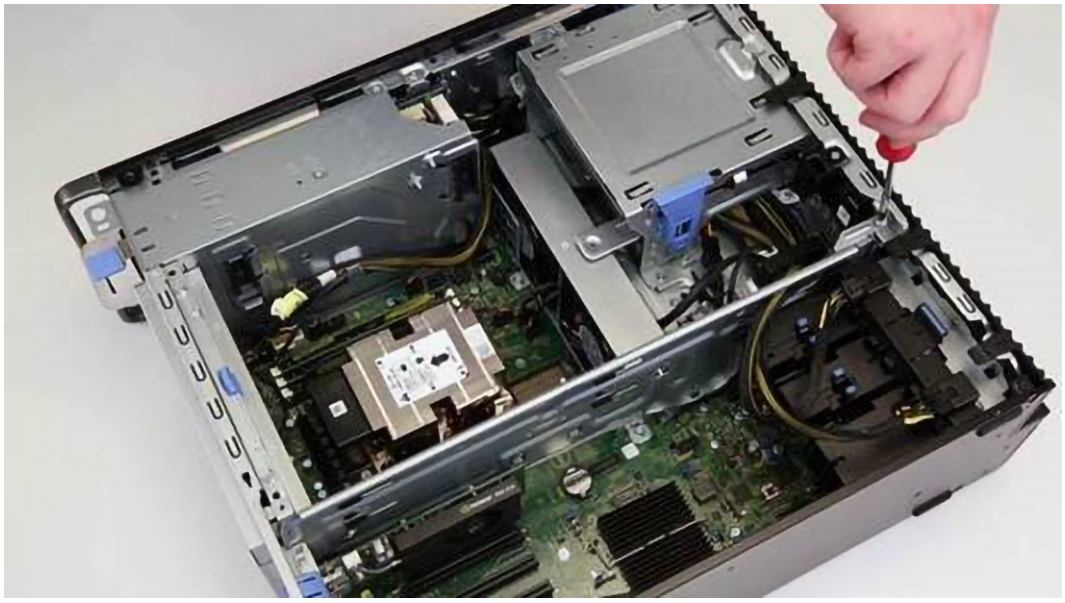
d. Remove the cap from the CPU 1 connector(in upgrading scenarios



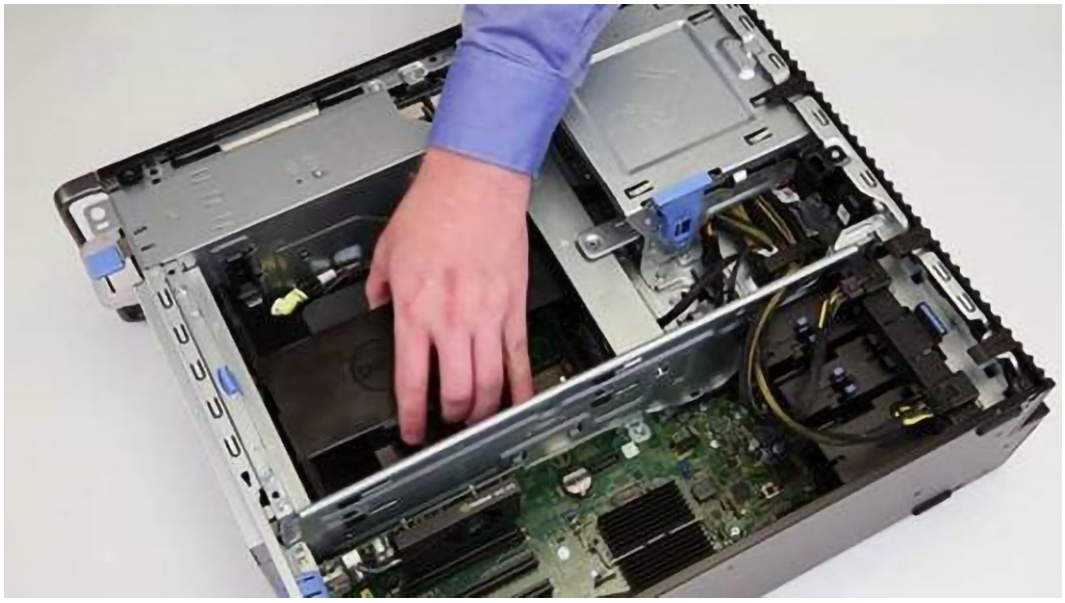
e. Pass the hard drive and optical drive cable through the metal separator.



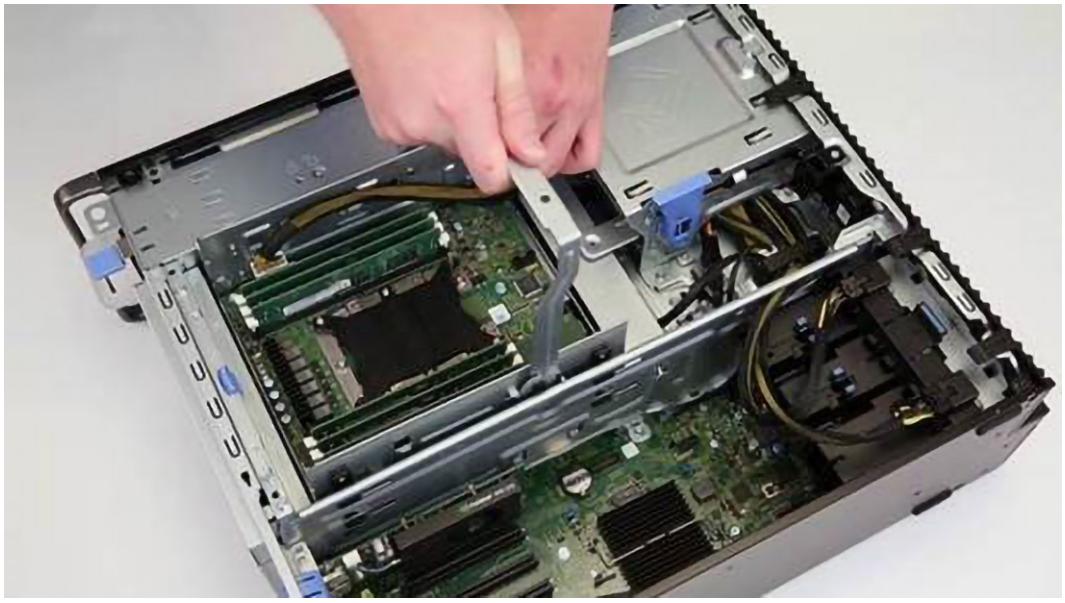
f. Replace the screw and secure the metal separator to the chassis



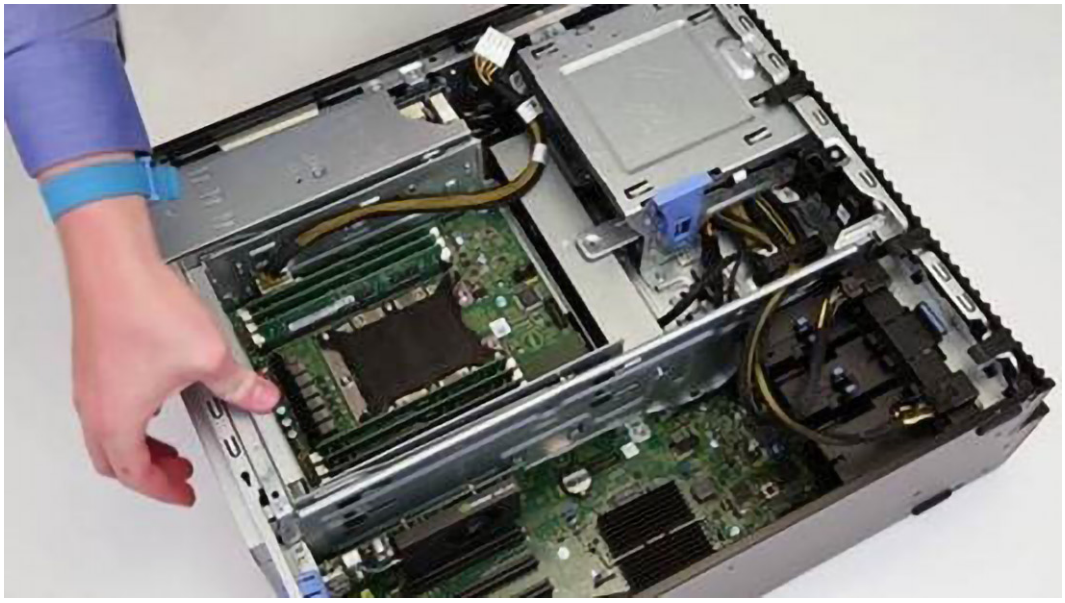
g. Replace the air shroud for the CPU 0



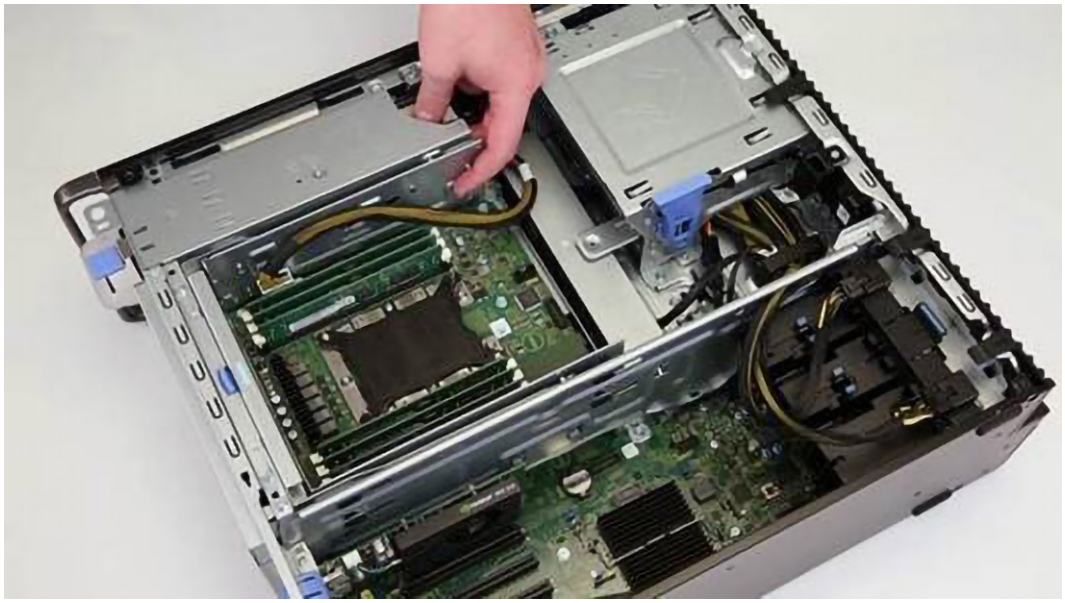
3. To install the CPU1 and the expansion card
   a. Replace the expansion card on the computer



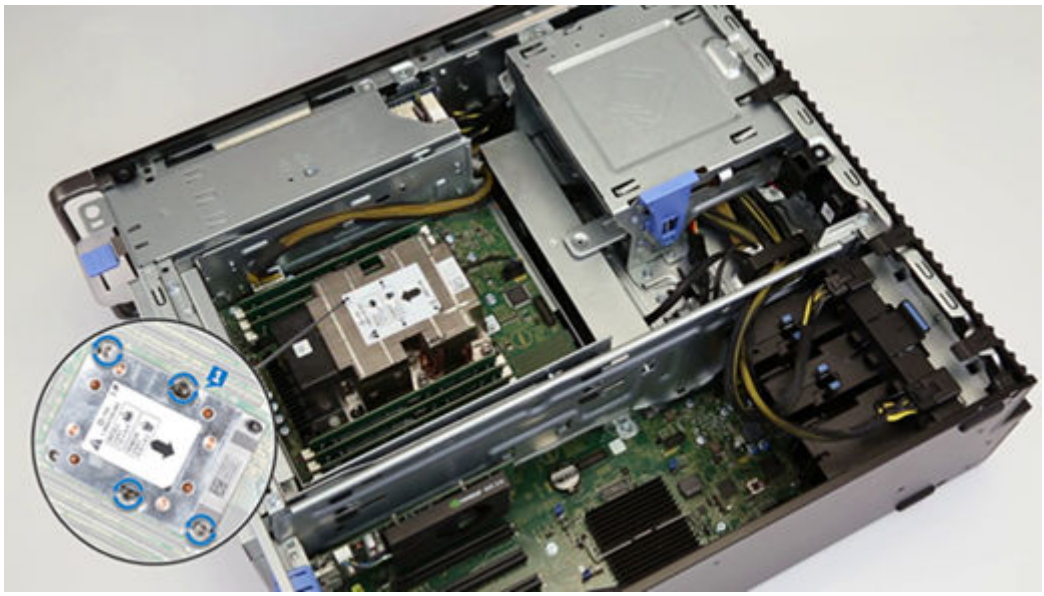
b. Press and secure the expansion card latch



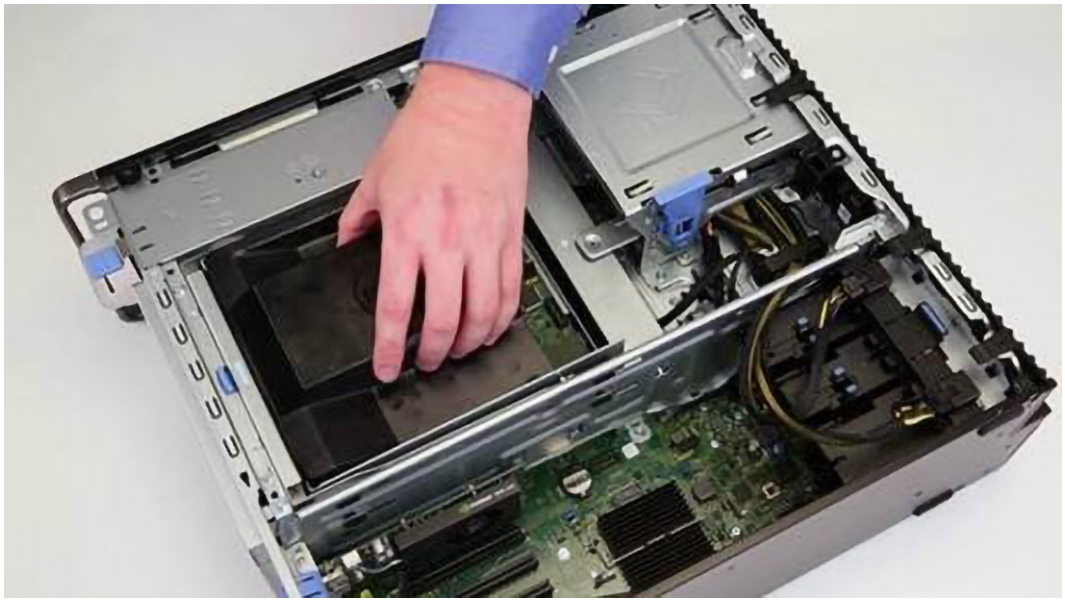
c. Connect the power cable to the expansion card



d. Install the heatsink assembly pre-assembled with the CPU1 and tighten the screws [1]



e. Install the heatsink assembly pre-assembled with the CPU1 and tighten the screws [1]

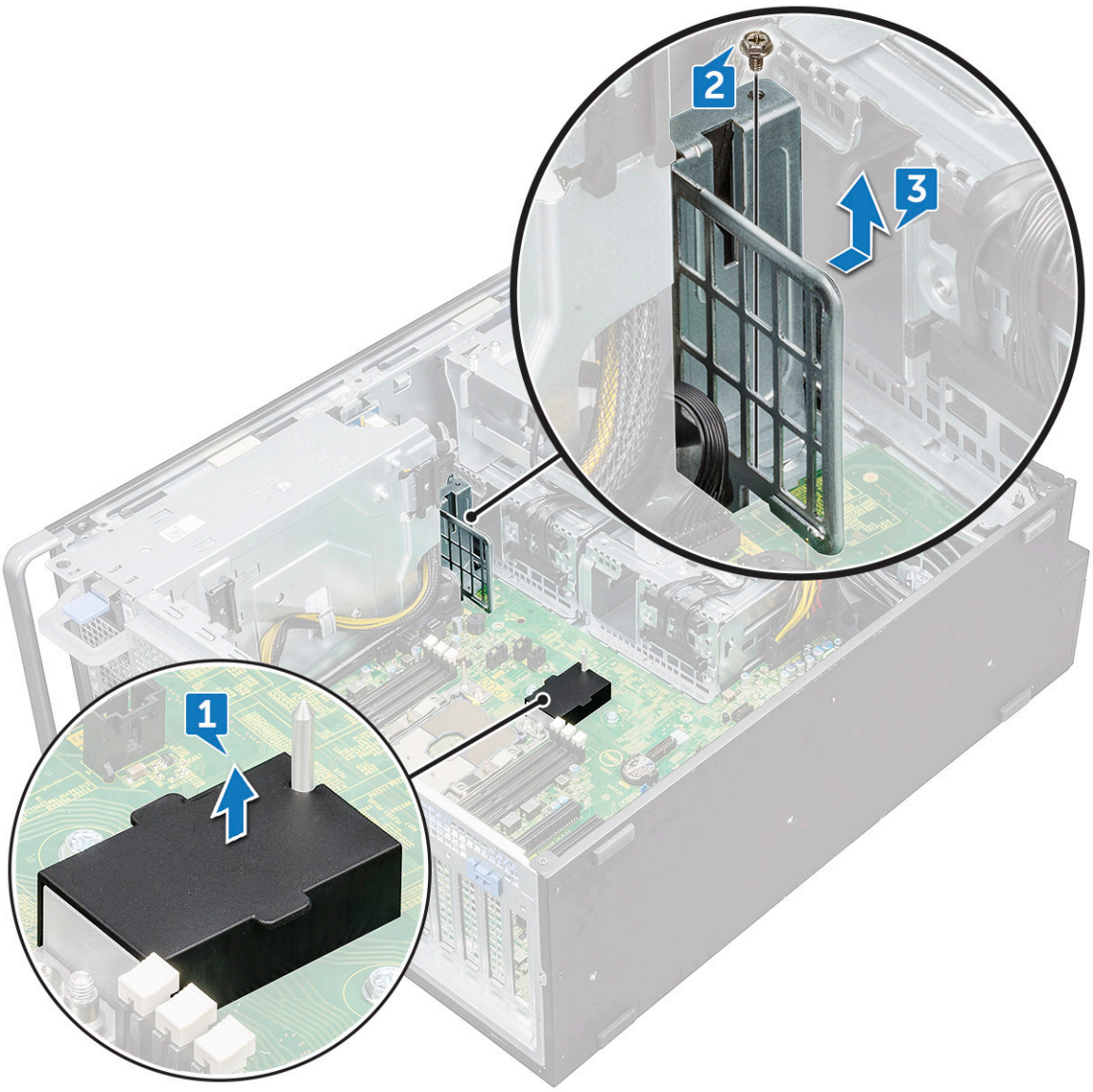


4. Install the side cover
5. Follow the procedure in After working inside your computer

System board

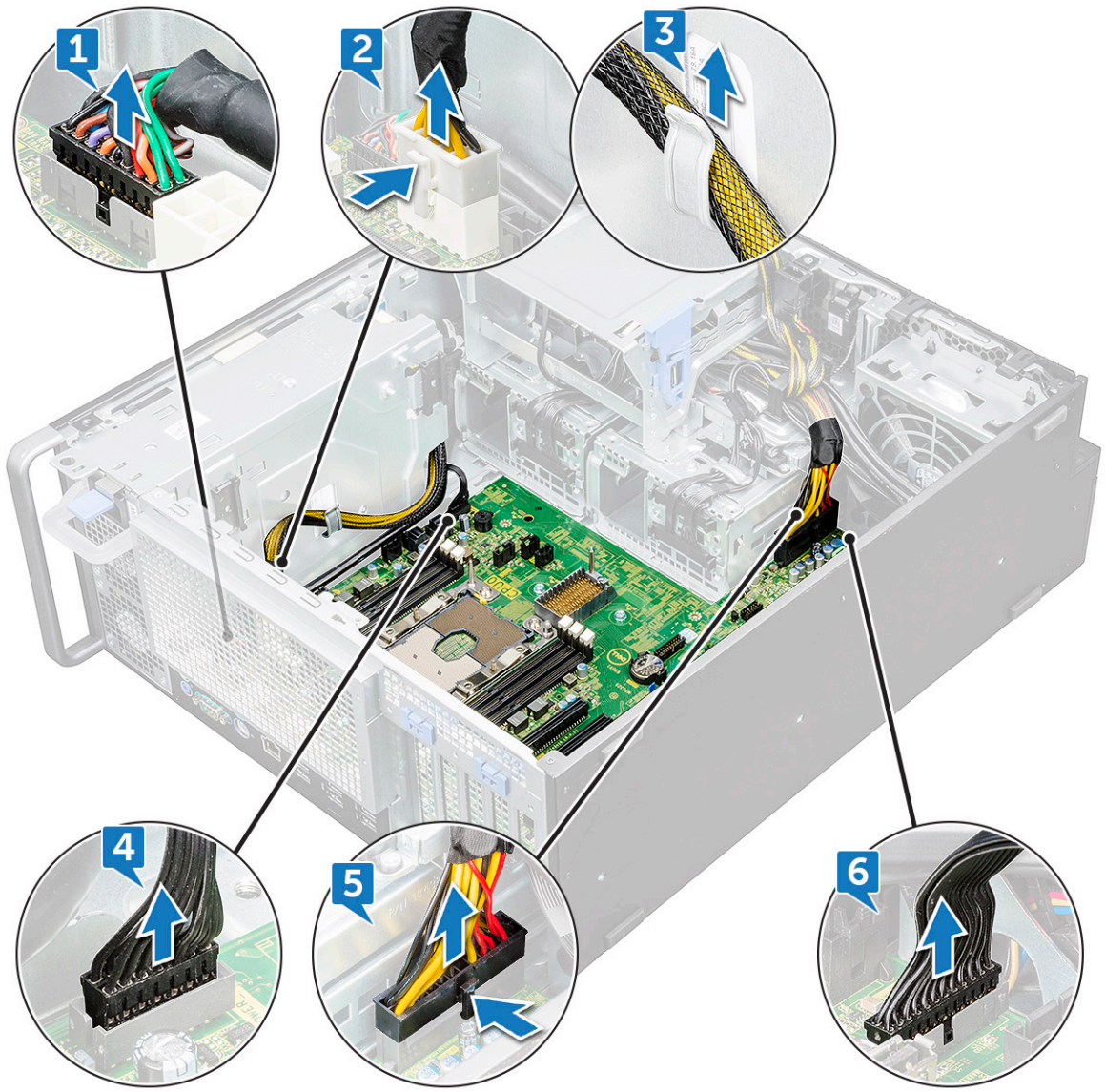
Removing system board

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. side cover
   b. air shroud
   c. GPU
   d. memory module
   e. system fan
   f. rear system fan
   g. PHM
   h. PCIe card holder
3. To remove the system board:
   a. Pull and remove the bracket [1] from the system board.
   b. To remove the system fan fixed bracket, remove the screw [2] that secure the fixed bracket to the system board.
   c. Lift the system fan fixed bracket from the system board [3].



d. Disconnect the following cables from the system board connectors:

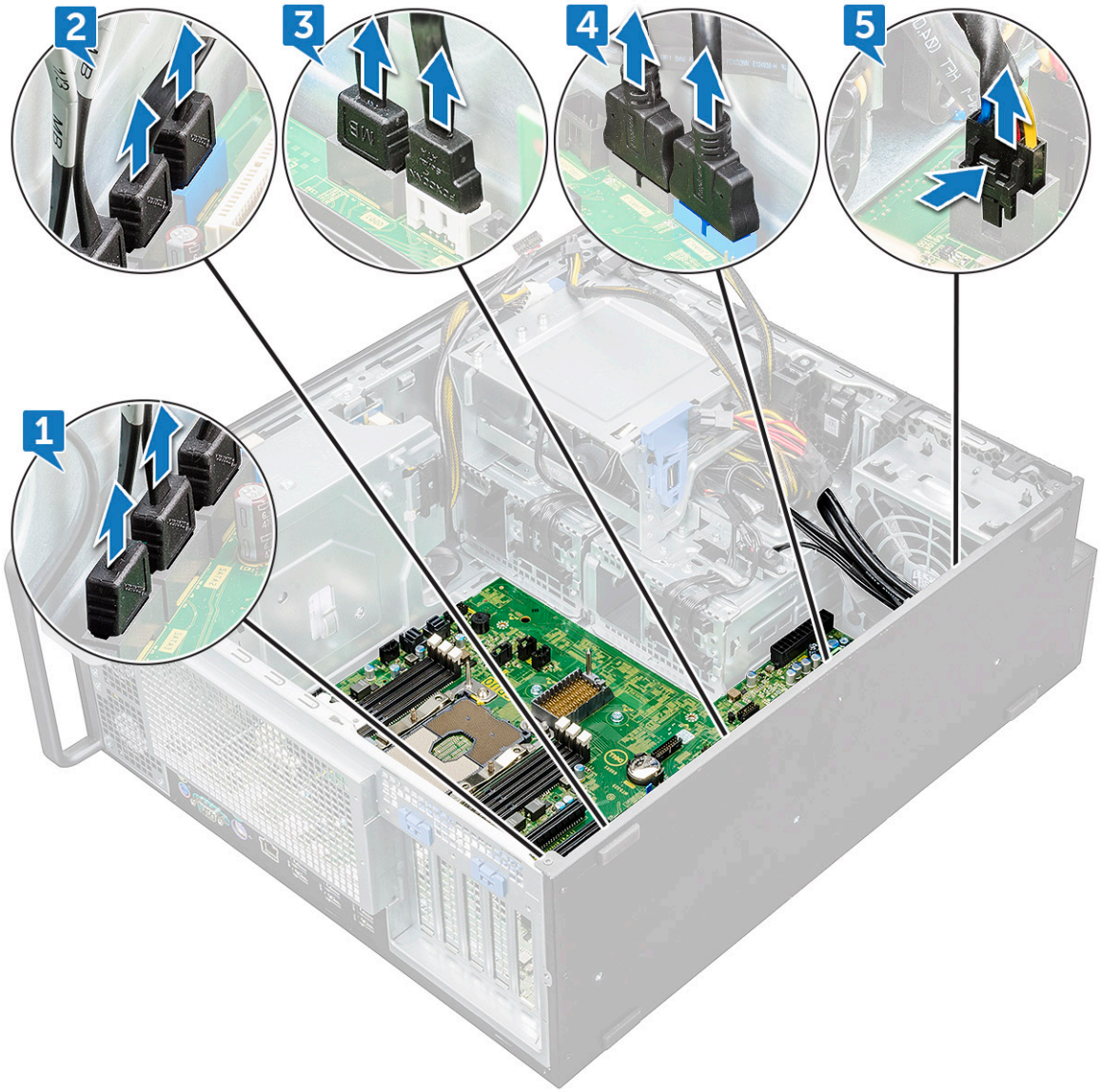
- audio cable [1]
- power cable [2]
- cable holder [3]
- power control cable [4]
- 24 Pin power cable [5]
- front I/O panel [6]



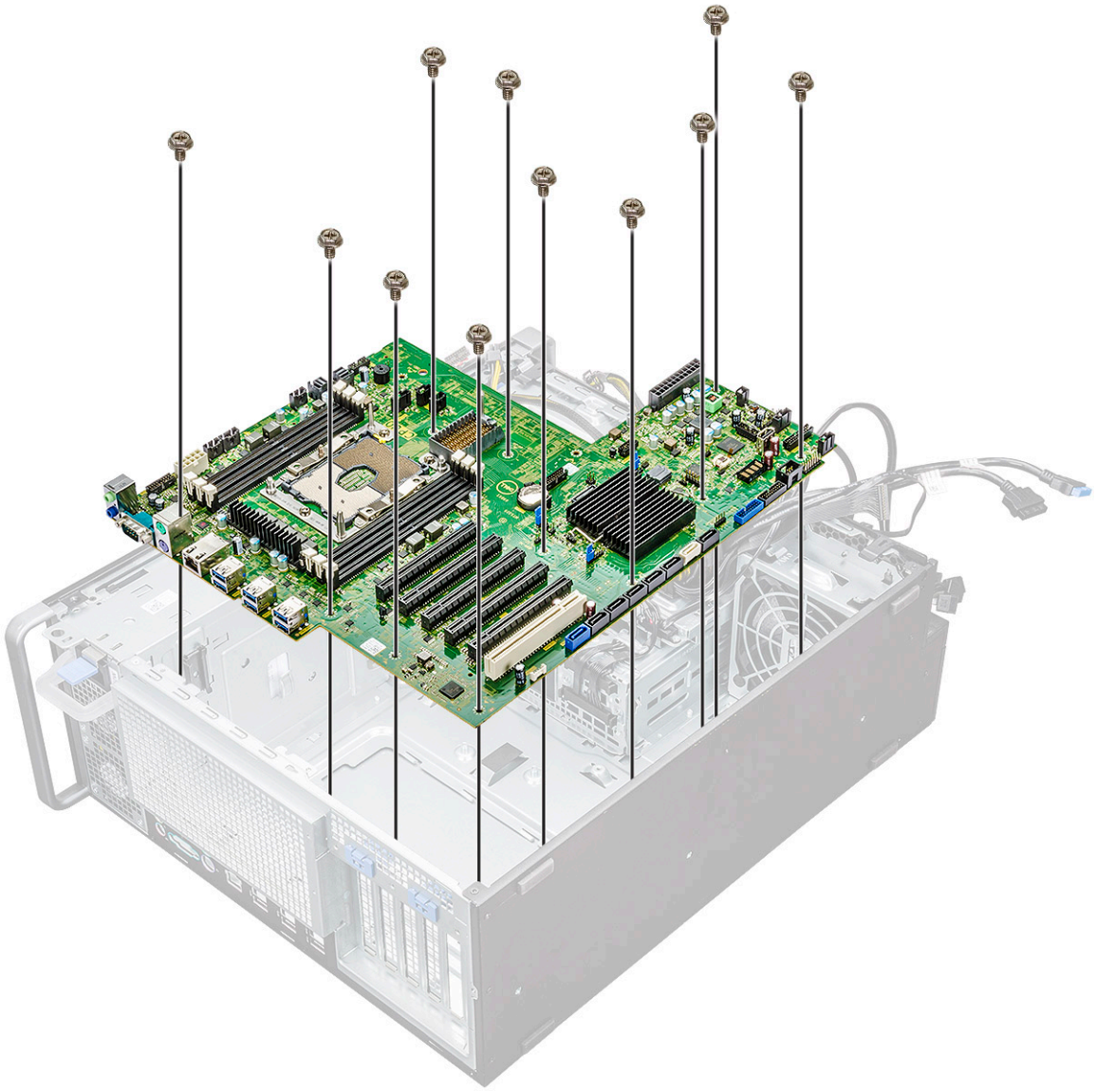
e. Disconnect the following cables:

- SATA 2, 3, 4, 5 cable [1]
- SATA 0,1 cable [2]
- ODD 0, 1 cable [3]
- USB 3.1 cable [4]
- Front system fan cable [5]

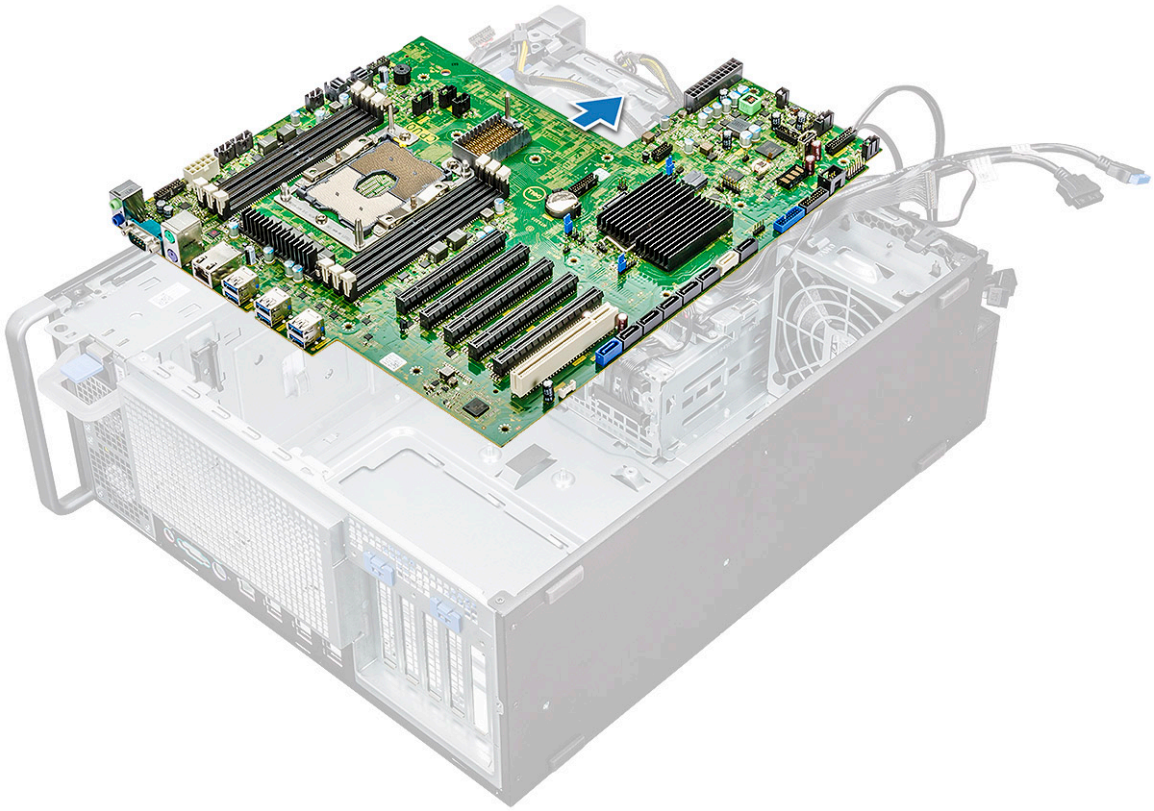
NOTE: Do not pull the connector by the cable wires . Instead, disconnect the cable by pulling on the connector end. Pulling on the cable wires may loosen them from the connector.



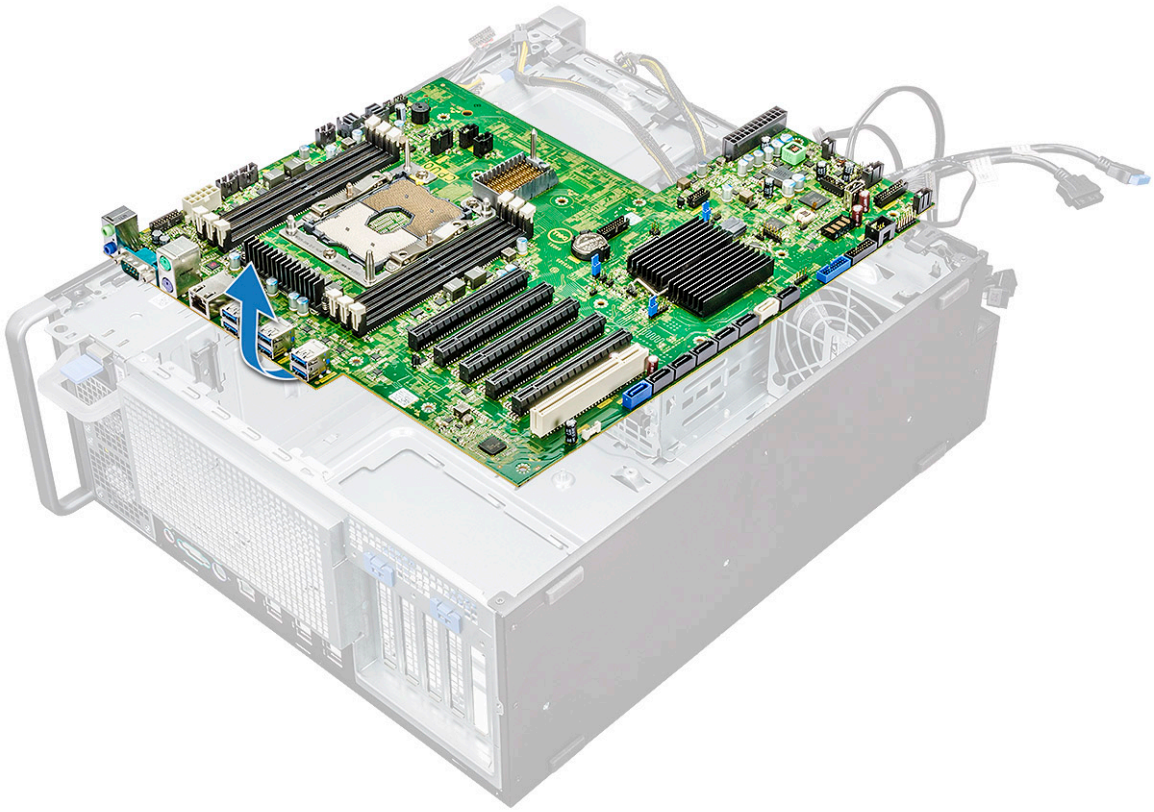
f. Remove the screws that secure the system board to the chassis.



g. Slide the system board towards HDD bracket module to detach it from the system.



h. Lift the system board up to remove it from the chassis.

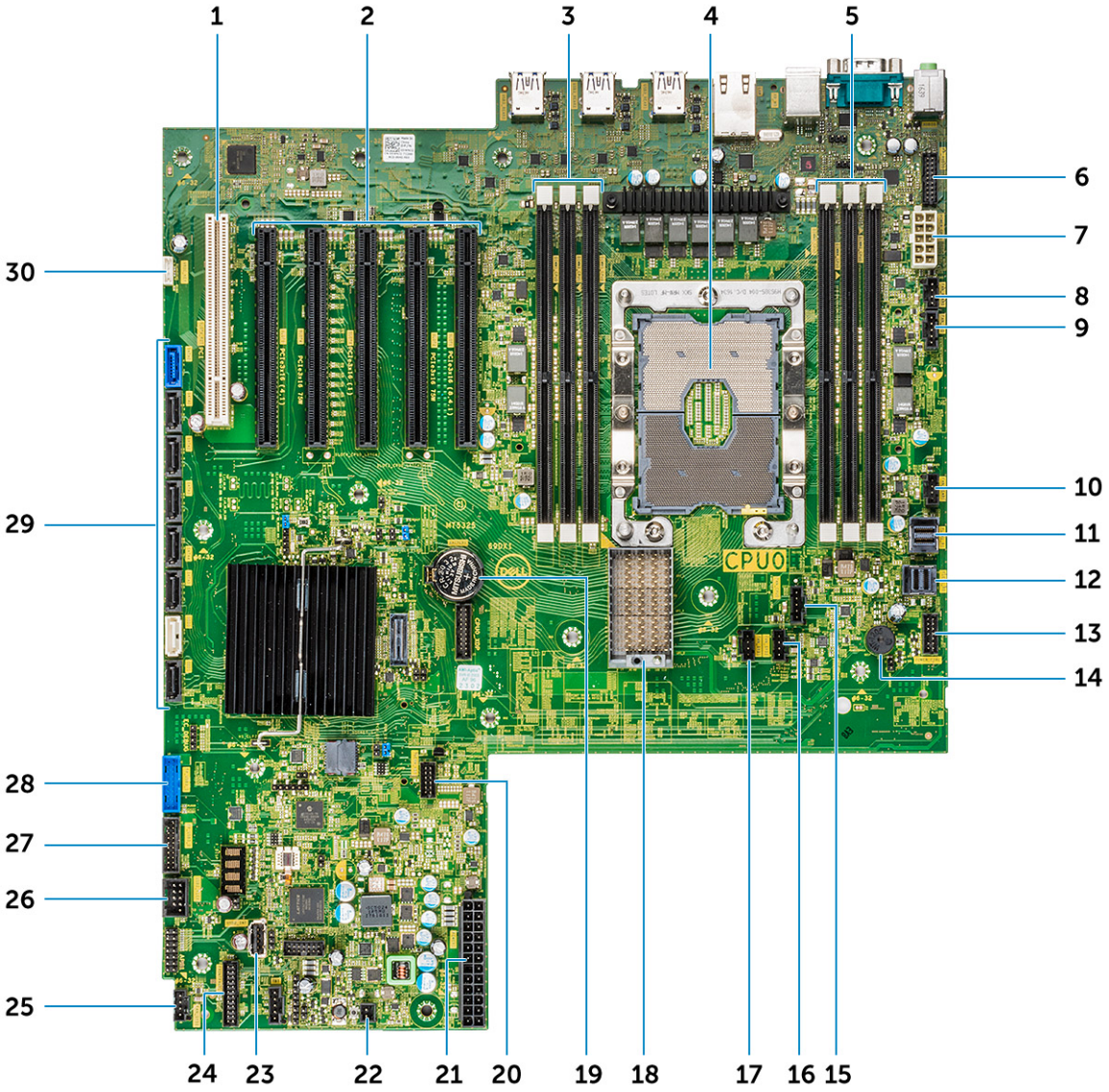


Installing the system board

1. Align and place the system board into the chassis.
2. Slide the system board to its position.
3. Replace the screws to secure the system board to the chassis.
4. Place the system fan fixed bracket and replace the single screw on the system board.
5. Connect the following cables:
   - audio cable
   - power cable
   - power control cable
   - 24Pin power cable
   - front I/O panel
   - SATA cables
   - ODD cables
   - USB 3.1 cables
   - Front system fan cable
6. Install the:
   a. PCIe holder
   b. memory module
   c. system fan
   d. rear system fan
   e. PHM
   f. air shroud
   g. GPU
   h. side cover
7. Follow the procedure in After working inside your computer.

System board components

The following image displays the system board components.



1. Slot 6 PCI
2. Slot PCI 3x16
3. Memory slots
4. CPU0
5. Memory slots
6. Front panel audio port
7. Power CPU port
8. Rear fan 0 port
9. HDD fan port
10. Rear fan 1 port
11. PCIE1
12. PCIE0
13. Power control port
14. Piezo speaker
15. CPU fan 0
16. System fan 2
17. System fan 1
18. CPU1 board connector
19. Coin cell battery
20. Thermal HDD port
21. Power port
22. Power remote
23. USB 2_INT
24. Front panel power connector
25. System fan 0
26. USB 2_flex
27. Front panel USB3.2 port
28. Front panel USB3.1
29. SATA 0, 1, 2, 3, 4, 5 and ODD 0, 1 ports
30. VROC_key

4

Technology and components

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

Topics:

- Memory configuration
- Technologies list
- MegaRAID 9440-8i and 9460-16i controller
- Teradici PCoIP

Memory configuration

This section provides information about the memory configuration for the Dell Precision Tower 7820 systems.

The following table illustrates the memory configuration and population rules for the Dell Precision Tower 7820:

Main Memory 1LM (Main memory only)							CPU0												CPU1											
							iMC1						iMC0						iMC0						iMC1					
							Ch5		Ch4		Ch3		Ch0		Ch1		Ch2		Ch5		Ch4		Ch3		Ch0		Ch1		Ch2	
							0	1	0	1	0	1	1	0	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0
Config	Platform	CPU	Total (GB)	DPC	Memory physical Frequency	System running Frequency	DIMM2		DIMM4		DIMM6		DIMM5		DIMM3		DIMM1		DIMM2		DIMM4		DIMM6		DIMM5		DIMM3		DIMM1	
S8R	M5	SKL	8	1DPC	2667	2667											8													
S16R	M5	SKL	16	1DPC	2667	2667	8										8													
S32R	M5	SKL	32	1DPC	2667	2667	8		8						8		8													
S48R	M5	SKL	48	1DPC	2667	2667	8		8		8		8		8		8													
S32Rb	M5	SKL	32	1DPC	2667	2667	16										16													
S64R	M5	SKL	64	1DPC	2667	2667	16		16						16		16													
S96R	M5	SKL	96	1DPC	2667	2667	16		16		16		16		16		16													
S192R	M5	SKL	192	1DPC	2667	2667	32		32		32		32		32		32													
D16R	M5	SKL	16	1DPC	2667	2667											8													8
D32R	M5	SKL	32	1DPC	2667	2667	8										8		8											8
D64R	M5	SKL	64	1DPC	2667	2667	8		8						8		8		8		8						8		8	8
D96R	M5	SKL	96	1DPC	2667	2667	8		8		8		8		8		8		8		8		8		8		8		8	8
D64R	M5	SKL	64	1DPC	2667	2667	16										16		16											16
D96R	M5	SKL	96	1DPC	2667	2667	16								16		16		16		16									16
D128R	M5	SKL	128	1DPC	2667	2667	16		16						16		16		16		16						16			16
D192R	M5	SKL	192	1DPC	2667	2667	16		16		16		16		16		16		16		16		16		16		16		16	16
D256R	M5	SKL	256	1DPC	2667	2667	32		32						32		32		32		32						32		32	32
D384R	M5	SKL	384	1DPC	2667	2667	32		32		32		32		32		32		32		32		32		32		32		32	32
S8R	M5	CLX/SKL	8	1DPC	2933	CLX:2933/SKL:2666	64										8													
S16R	M5	CLX/SKL	16	1DPC	2933	CLX:2933/SKL:2666	8										8													
S32R	M5	CLX/SKL	32	1DPC	2933	CLX:2933/SKL:2666	8		8						8		8													
S48R	M5	CLX/SKL	48	1DPC	2933	CLX:2933/SKL:2666	8		8		8		8		8		8													
S32Rb	M5	CLX/SKL	32	1DPC	2933	CLX:2933/SKL:2666	16										16													
S64R	M5	CLX/SKL	64	1DPC	2933	CLX:2933/SKL:2666	16		16						16		16													
S96R	M5	CLX/SKL	96	1DPC	2933	CLX:2933/SKL:2666	16		16		16		16		16		16													
S192R	M5	CLX/SKL	192	1DPC	2933	CLX:2933/SKL:2666	32		32		32		32		32		32													
S256R	M5	CLX	256	1DPC	2933	CLX:2933	64		64						64		64													
S384R	M5	CLX	384	1DPC	2933	CLX:2933	64		64		64		64		64		64													
D16R	M5	CLX/SKL	16	1DPC	2933	CLX:2933/SKL:2666											8													8
D32R	M5	CLX/SKL	32	1DPC	2933	CLX:2933/SKL:2666	8										8		8											8
D64R	M5	CLX/SKL	64	1DPC	2933	CLX:2933/SKL:2666	8		8						8		8		8		8						8		8	8
D96R	M5	CLX/SKL	96	1DPC	2933	CLX:2933/SKL:2666	8		8		8		8		8		8		8		8		8		8		8		8	8
D64R	M5	CLX/SKL	64	1DPC	2933	CLX:2933/SKL:2666	16										16		16											16
D96R	M5	CLX/SKL	96	1DPC	2933	CLX:2933/SKL:2666	16								16		16		16		16									16
D128R	M5	CLX/SKL	128	1DPC	2933	CLX:2933/SKL:2666	16		16						16		16		16		16						16			16
D192R	M5	CLX/SKL	192	1DPC	2933	CLX:2933/SKL:2666	16		16		16		16		16		16		16		16		16		16		16		16	16
D256R	M5	CLX/SKL	256	1DPC	2933	CLX:2933/SKL:2666	32		32						32		32		32		32						32		32	32
D384R	M5	CLX/SKL	384	1DPC	2933	CLX:2933/SKL:2666	32		32		32		32		32		32		32		32		32		32		32		32	32
D256R	M5	CLX	256	1DPC	2933	2933	64										64		64											64
D512R	M5	CLX	512	1DPC	2933	2933	64		64						64		64		64		64						64		64	64
D768R	M5	CLX	768	1DPC	2933	2933	64		64		64		64		64		64		64		64		64		64		64		64	64
S8R	M5	CLX/SKL	8	1DPC	3200	CLX:2933/SKL:2666											8													
S16R	M5	CLX/SKL	16	1DPC	3200	CLX:2933/SKL:2666	8										8													
S32R	M5	CLX/SKL	32	1DPC	3200	CLX:2933/SKL:2666	8		8						8		8													
S48R	M5	CLX/SKL	48	1DPC	3200	CLX:2933/SKL:2666	8		8		8		8		8		8													
S32Rb	M5	CLX/SKL	32	1DPC	3200	CLX:2933/SKL:2666	16										16													
S64R	M5	CLX/SKL	64	1DPC	3200	CLX:2933/SKL:2666	16		16						16		16													
S96R	M5	CLX/SKL	96	1DPC	3200	CLX:2933/SKL:2666	16		16		16		16		16		16													
S192R	M5	CLX/SKL	192	1DPC	3200	CLX:2933/SKL:2666	32		32		32		32		32		32													
S256R	M5	CLX	256	1DPC	3200	CLX:2933	64		64						64		64													
S384R	M5	CLX	384	1DPC	3200	CLX:2933	64		64		64		64		64		64													
D16R	M5	CLX/SKL	16	1DPC	3200	CLX:2933/SKL:2666											8													8
D32R	M5	CLX/SKL	32	1DPC	3200	CLX:2933/SKL:2666	8										8		8											8
D64R	M5	CLX/SKL	64	1DPC	3200	CLX:2933/SKL:2666	8		8						8		8		8		8						8		8	8
D96R	M5	CLX/SKL	96	1DPC	3200	CLX:2933/SKL:2666	8		8		8		8		8		8		8		8		8		8		8		8	8
D64R	M5	CLX/SKL	64	1DPC	3200	CLX:2933/SKL:2666	16										16		16											16
D96R	M5	CLX/SKL	96	1DPC	3200	CLX:2933/SKL:2666	16								16		16		16		16									16
D128R	M5	CLX/SKL	128	1DPC	3200	CLX:2933/SKL:2666	16		16						16		16		16		16						16			16
D192R	M5	CLX/SKL	192	1DPC	3200	CLX:2933/SKL:2666	16		16		16		16		16		16		16		16		16		16		16		16	16
D256R	M5	CLX/SKL	256	1DPC	3200	CLX:2933/SKL:2666	32		32						32		32		32		32						32		32	32
D384R	M5	CLX/SKL	384	1DPC	3200	CLX:2933/SKL:2666	32		32		32		32		32		32		32		32		32		32		32		32	32
D256R	M5	CLX	256	1DPC	3200	2933	64										64		64											64
D512R	M5	CLX	512	1DPC	3200	2933	64		64						64		64		64		64						64		64	64
D768R	M5	CLX	768	1DPC	3200	2933	64		64		64		64		64		64		64		64		64		64		64		64	64

Technologies list

This section provides information about the technologies that comes with the Dell Precision 7820 Tower.

The following table lists the basic of technologies that are available on the Dell Precision7820 Tower systems for Dell internal users only.

Table 2. Technologies list

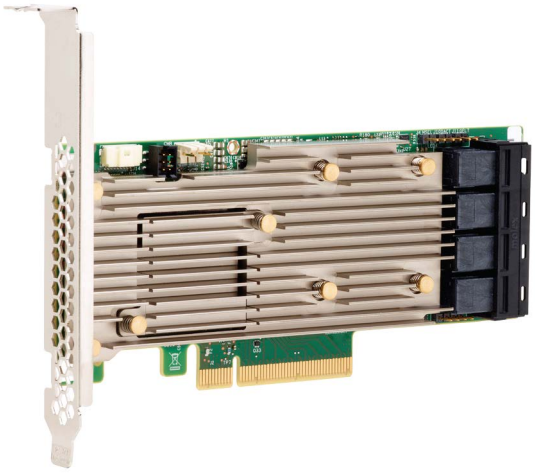
No.	Category	Technology	Browser Path
1	**Chipset**	Intel C620 Series Chipset (C621)	
2	**Processor**	• Intel Xeon Platinum 81xx Processor • Intel Xeon Gold 61xx Processor • Intel Xeon Gold 51xx Processor • Intel Xeon Silver 41xx Processor • Intel Xeon Bronze 31xx Processor • Intel Xeon Gold 52xx processors • Intel Xeon Silver 42xx processors • Intel Xeon Bronze 32xx processors • Intel Xeon Platinum 82xx processors • Intel Xeon Gold 62xx processors	
3	**Memory**	DDR4	
4	**Audio**	Integrated Realtek ALC3234 High Definition Audio Codec (2 Channel)	
5	**Network**	NIC Integrated RJ45	
6	**Graphics**	Radeon Pro WX	• 9100 • 7100 • 5100 • 4100 • 3100 • 2100 • 3200
		NVIDIA	• Quadro GP100 • Quadro P6000 • Quadro P5000 • Quadro P4000 • Quadro P2000 • Quadro P1000 • Quadro P600 • Quadro P400 • Quadro 8000 • Quadro 2200

Table 2. Technologies list (continued)

No.	Category	Technology	Browser Path
			• Quadro P620 • Quadro GV100 • NVS 310 • NVS 315 • Quadro RTX 4000 • Quadro RTX 5000/6000 • GeForce RTX 2080 B
7	**Storage**	SATA	
		SAS	
		Dell UltraSpeed Quad (PCIE M.2 Interposer)	
		Dell UltraSpeed Duo (PCIE M.2 Interposer)	
9	**Remote Solutions**	1-1 Teradici PCoIP	• CLIENT: Dell or other Branded Zero Client (TERA Gen 2) (Dell-Wyse P25) DUAL Monitor Support • HOST: PCIe x1 PCoIP Dual Host Card (TERA Gen 2) • CLIENT: Dell or other Branded Zero Client (TERA Gen 2) (Dell-Wyse P45) QUAD Monitor Support • HOST: PCIe x1 PCoIP Quad Host Card (TERA Gen 2) • Support Dual Terra Card configurations **NOTE:** For further information about the Teradici PCoIP Card host driver installation, see Teradici PCoIP.

MegaRAID 9440-8i and 9460-16i controller

Small and medium businesses (SMBs) deploying entry-level server platforms and workstations need affordable, reliable storage solutions. The MegaRAID Tri-Mode Storage Adapter is a 12Gb/s SAS/SATA/PCIe (NVMe) controller card that addresses these needs by delivering proven performance and RAID data protection for a range of non-business crticial applications. The MegaRAID Tri-Mode storage adapters bring NVMe performance benefits to the storage tier by providing connectivity and data protection for SAS/SATA interfaces. Based on the dual-core SAS3516 or SAS3508 RAID on Chip (ROC) and 72-bit DDR4-2133 SDRAM, these controllers provide bandwidth and IOPS performance increases and are ideal for high-end servers utilizing

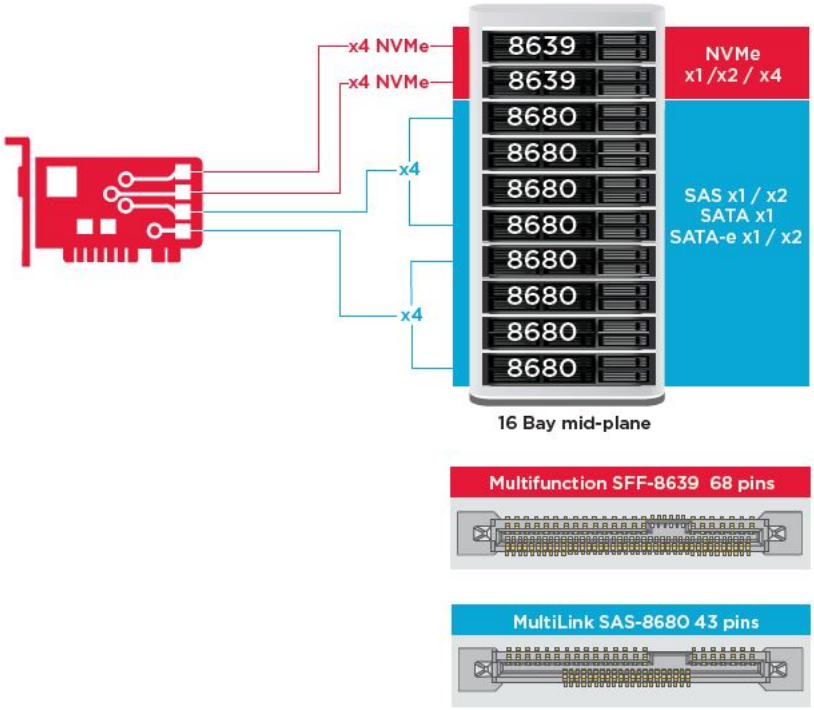


internal storage or connecting to large-scale external storage enclosures.

NOTE: The MegaRAID 9440 and 9460 controllers are only supported when using Intel Xeon W Series CPUs.

Tri-Mode SerDes Technology enables operation of NVMe, SAS, or SATA storage devices in a single drive bay. All the 3 modes concurrently serving NVMe, SAS, and SATA drives can be operated by a single controller. The controller negotiates between the

speeds and protocols to seamlessly work with any of the three types of storage devices. Tri-Mode support provides a non-disruptive way to evolve existing data center infrastructure. By upgrading to a tri-mode controller, users can expand beyond SAS/SATA and use NVMe without major changes to other system configurations. The MegaRAID Tri-Mode storage adapters support both REFCLK and SRIS based NVMe x1, x2, and x4 devices.



Key Features:

- Tri-Mode SerDes Technology enables the operation of NVMe, SAS or SATA devices in a single drive bay, allowing for endless design flexibility
- Supports 12, 6, and 3 Gb/s SAS and 6, 3 Gb/s SATA data transfer rates
- Up to 8 PCIe links. Each link supporting x4, x2, or x1 link widths, supporting 8.0 GT/s (PCIe Gen3) per lane
- SFF-9402 Compliant, Connector Pin-out
- SFF-8485 Compliant, SGPIO
- Fits into rack-mounted servers with low-profile form factor and side-mounted SAS connectors
- Support critical, high-bandwidth applications with PCIe 3.1 connectivity
- CacheVault flash back-up at power fail. Supports bad block management
- Balance protection and performance for critical applications with RAID levels 0, 1, 5, 6, 10, 50, and 60

Table 3. Features of MegaRAID 9440-8i and 9460-16i controller

	9440-8i	9460-16i
Ports	8 internal	16 internal
Connectors	2 x SFF8643	4 x SFF8643 x4
Storage Interface Support	SATA: Eight x1 SAS: One x8, Two x4, Four x2, Eight x1 NVMe: Two x4, Four x2, Four x1	SATA: Sixteen x1 SAS: Two x8, Four x4, Eight x2, Sixteen x1 NVMe: Four x4, Eight x2, Eight x1
Max Devices Per Controller	SAS/SATA: 64 NVMe: 4	SAS/SATA: 240 NVMe: 24
Cache Memory	N/A	4 GB 2133 MHz DDR4 SDRAM

Table 3. Features of MegaRAID 9440-8i and 9460-16i controller (continued)

	9440-8i	9460-16i
I/O Processor / SAS Controller	SAS3408	SAS3516
Host Bus Type	PCIe 3.1 x8	PCIe 3.1 x8
Cache Protection	N/A	CacheVault CVPM05
Physical Dimensions	6.127" x 2.712" (155.65 mm x 68.90 mm)	6.127" x 2.712" (155.65 mm x 68.90 mm)
Maximum Operating Conditions	Operating: 10°C to 55°C 20 to 80% non-condensing Airflow: 300 LFM Storage: -45°C to 105°C 5 to 90% non-condensing	Operating: 10°C to 55°C 20 to 80% non-condensing Airflow: 300 LFM Storage: -45°C to 105°C 5 to 90% non-condensing
MTBF (Calculated)	>3,000,000 hours at 40C	>3,000,000 hours at 40C
Operating Voltage	+12V +/-8%; 3.3V +/-9%	+12V +/-8%; 3.3V +/-9%
Hardware Warranty	3 years; with advanced replacement option	3 years; with advanced replacement option
MegaRAID Management Suite	LSI Storage Authority (LSA) StorCLI (command-line interface), CTRL-R (BIOS configuration utility), HII (UEFI Human Interface Infrastructure)	LSI Storage Authority (LSA) StorCLI (command-line interface), CTRL-R (BIOS configuration utility), HII (UEFI Human Interface Infrastructure)
Regulatory Certifications	USA (FCC 47 CFR part 15 Subpart B, class B); Canada (ICES -003, Class B); Taiwan (CNS 13438); Japan (VCCI V-3); Australia/New Zealand (AS/NZS CISPR 22); Korea (RRA no 2013-24 & 25); Europe (EN55022/EN55024); Safety: EN/IEC/UL 60950; RoHS; WEEE	USA (FCC 47 CFR part 15 Subpart B, class B); Canada (ICES -003, Class B); Taiwan (CNS 13438); Japan (VCCI V-3); Australia/New Zealand (AS/NZS CISPR 22); Korea (RRA no 2013-24 & 25); Europe (EN55022/EN55024); Safety: EN/IEC/UL 60950; RoHS; WEEE
OS Support	Microsoft Windows, VMware vSphere/ ESXi, Red Hat Linux, SuSe Linux, Ubuntu Linux, Oracle Linux, CentOS Linux, Debian Linux, Fedora, and FreeBSD. Contact Oracle support for Oracle Solaris driver or software support.	Microsoft Windows, VMware vSphere/ ESXi, Red Hat Linux, SuSe Linux, Ubuntu Linux, Oracle Linux, CentOS Linux, Debian Linux, Fedora, and FreeBSD. Contact Oracle support for Oracle Solaris driver or software support.

Teradici PCoIP

This section provides an overview of the host driver installation process.

Installing the Teradici PCoIP Card Host Dual/Quad

Install the PCoIP host driver software from dell.com/support.

NOTE: You cannot upgrade the PCoIP host driver software while a VMware View-brokered PCoIP session is active between a host workstation or host PC and VMware View client. Doing this will result in losing access to your mouse and keyboard when the driver software is removed.

To upgrade the PCoIP host driver software in this type of deployment, do one of the following:

- Connect to the host from a zero client.
- Upgrade the software while connecting to the host through another desktop-remoting protocol such as RDP or VNC.

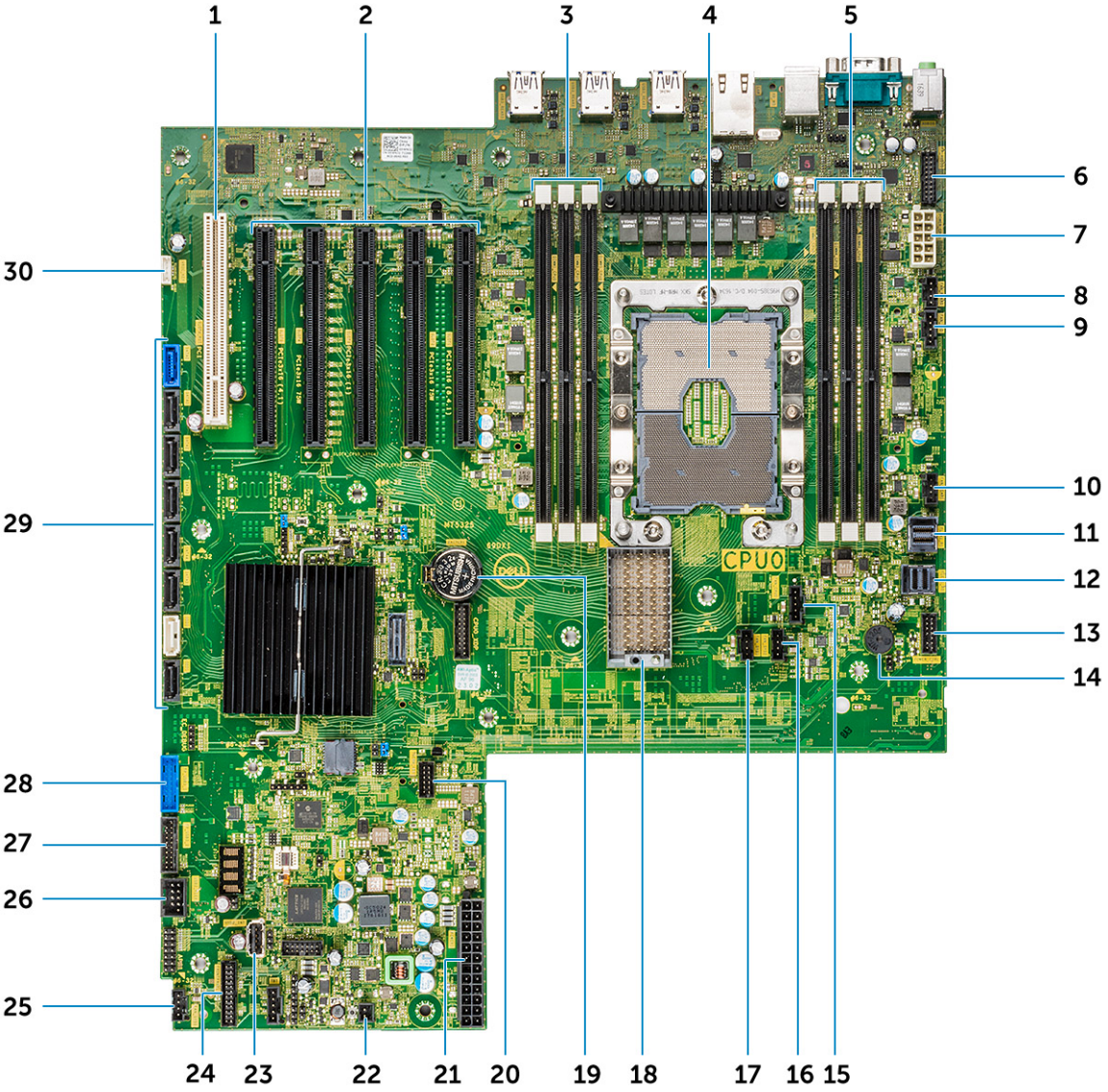
Installing the PCoIP Host Driver Software on a Host PC:

1. Download the PCoIP host driver software from the Teradici Support site (click Current PCoIP Product and Releases).
2. Log in to the administrative web interface for the host card.
3. From the **Configuration > Host Driver Function** menu, enable the Host Driver Function.
4. Restart the host PC.
5. Install the PCoIP host software package appropriate for the operating system installed on the host PC. You can start the install process by double-clicking the installer:
   a. 64 bit: PCoipHostSoftware_x64-v4.3.0.msi (or later)
6. When the Welcome screen appears, click **Next**.
7. Accept the terms, and then click **Next**.
8. Ensure that the installation location is correct, and click **Next**.
9. Click **Install**.
   NOTE: For Windows 7, when the driver is installed, a Windows Security dialog may appear. Click **Install** to continue with the installation. To keep this dialog box from appearing in the future, select **Always trust software from Teradici Corporation**.
10. If prompted, restart the operating system; otherwise, skip this step. When restarted, the host driver software installation process continues when the OS boots up. Click **Install** to continue.
11. Click **Finish** to complete the installation.

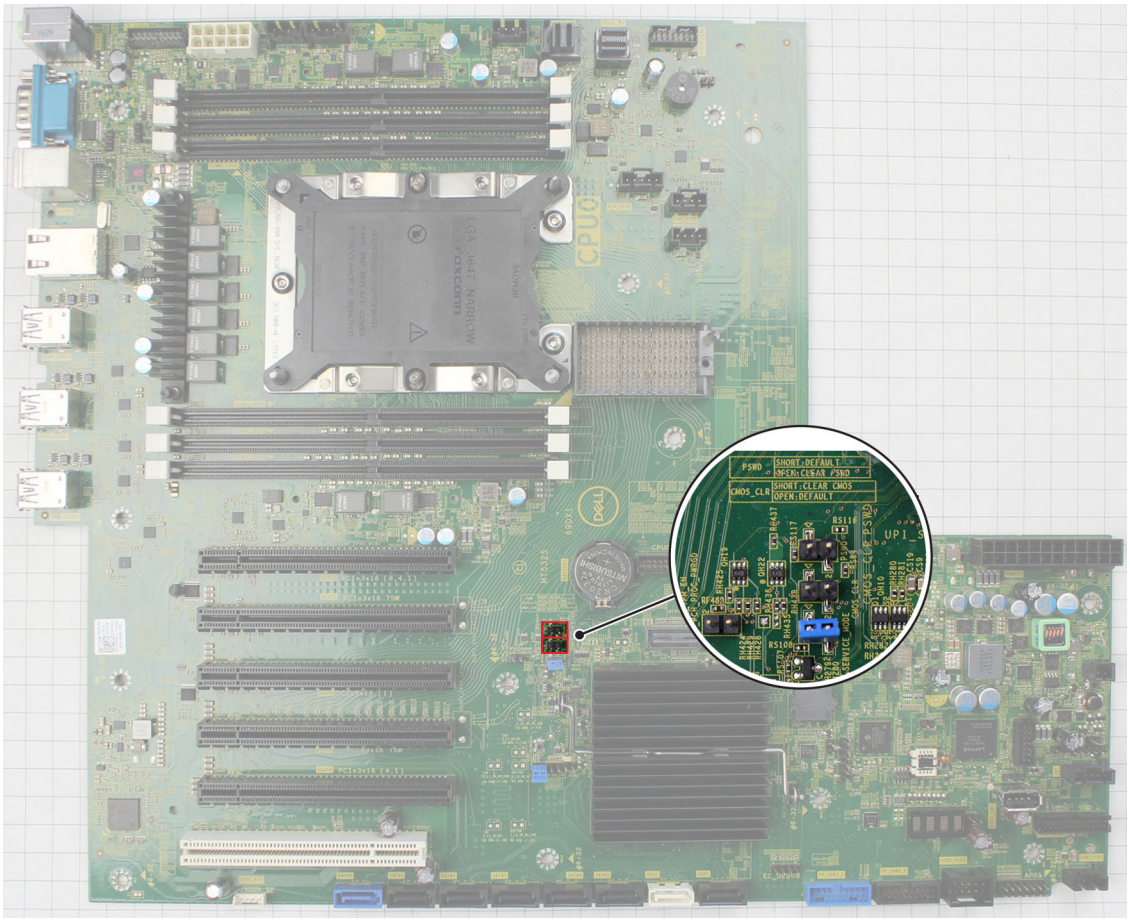
Power management cable configuration for Teradici PCoIP Portal and Host Card

If the Dell Precision Workstation comes equipped with the optional Teradici PCoIP Portal and Host Card, make sure the power management cable on the Teradici card is connected properly on the system board. The power management cable from the Teradici card must be plugged into the correct Power remote connection on the system board. Refer the below image for an

example of the **Power remote** connector labeled 22 on the system board diagram:



Make sure the power management cable from the Teradici card is not plugged into either the two-pin Clear CMOS or Clear PSWD jumpers.



Plugging the power management cable into the Clear CMOS jumper will cause the BIOS to reset when sending a remote restart request to the Teradici card. You will then have to reset the time and BIOS settings.

If the power management cable from the Teradici card is plugged into the Clear PSWD jumper, then the BIOS password will be cleared and a new one will need to be configured.

5

System specifications

Topics:

System specifications

Feature	Specification
Processor type	• Intel Xeon Platinum 81xx processors • Intel Xeon Gold 51xx processors • Intel Xeon Gold 61xx processors • Intel Xeon Silver 41xx processors • Intel Xeon Gold 52xx processors • Intel Xeon Silver 42xx processors • Intel Xeon Bronze 32xx processors • Intel Xeon Platinum 82xx processors • Intel Xeon Gold 62xx processors
Total cache	Upto 38.5 MB

Memory specifications

Features	Specifications
Type	DDR4 ECC
Speed	Up to 2933 MHz
Connectors	12 DIMM Slots
Capacity	6 channel memory up to 768 GB 2933 MHz DDR4 ECC memory with dual CPUs
Maximum memory	768 GB

Video specifications

Features	Specifications
Graphic card	• Radeon Pro WX 9100 • NVIDIA Quadro GP100 • NVIDIA Quadro P6000 • NVIDIA Quadro P5000 • Radeon Pro WX 7100 • Radeon Pro WX 5100 • Radeon Pro WX 4100 • NVIDIA Quadro P4000 • NVIDIA Quadro P2000 • Radeon Pro WX 3100 • Radeon Pro WX 2100 • NVIDIA Quadro P1000 • NVIDIA Quadro P600 • NVIDIA Quadro P400 • NVIDIA NVS 310 • NVIDIA NVS 315 • NVIDIA Quadro RTX 4000 • NVIDIA Quadro RTX 5000/6000 • NVIDIA GeForce RTX 2080 B

Audio specifications

Features	Specifications
Type	High Definition Audio Codec (2 Channel)
Controller	Integrated Realtek ALC3234
Internal Speaker Power Rating	2W
Internal microphone support	no

Network specifications

Features	Specifications
Integrated	Intel i219 Gigabit Ethernet controllers with Intel Remote Wake UP, PXE and Jumbo frames support
Optional	• Intel i210 10/100/1000 single port PCIe (Gen 1 x 1) gigabit network card. • Intel X550-T2 10GbE dual port PCIe (Gen 3 x 4) network card • Aquantia AQN-108 2.5Gbit/5Gbe single port PCIe (Gen 3 x 4) network card.

Card slots

Features	Specifications
Type	PCIe Gen 3

Features	Specifications
Slots	• 2 PCIe x 16 • 1 PCIe x 16 wired as x8 • 1 PCIe x 16 wired as x4 • 1 PCIe x 16 wired as x1 • 1 PCI 32/33

Storage specifications

Features	Specifications
Externally Accessible	DVD-ROM; DVD+/-RW 5.25” Bay Options: BD, DVD+/-RW
Internally Accessible	• M.2 NVMe PCIe SSDs — Up to 4 x 1TB drives on 1 Dell Precision Ultra-Speed Drive Quad x16 cards • Front FlexBay M.2 NVMe PCIe SSDs —Up to 2 x 1TB drives • Up to 6 x 2.5” SATA drives • Up to 5 x 3.5” SATA drives • Slim ODD • SAS available with optional controller

External connectors

Features	Specifications
Audio	• Rear—1 x Audio Line in/Microphone • Rear—1 x Audio Line out • Front—1 x Universal Audio Jack
Network	Rear—1 x RJ45 Network
USB	• Front—4 x USB 3.1 Gen1 • Rear—6 x USB 3.1 Gen1
Serial port	Rear—1 x Serial port
PS2	• Rear—1 x Keyboard • Rear—1 x Mouse

Power specifications

Features	Specifications
Wattage	950 W
Voltage	input voltage 100 VAC-240 AC

Physical specifications

Features	Specifications
Height	417.9 mm
Width	176.5 mm

Features	Specifications
Depth	• 518.3 mm
Optional	19” rackmount rail kit

Environmental specifications

Temperature	Specifications
Operating	5 °C to 35 °C (41 F to 95 °F) **NOTE:** * Starting at 5000 ft, the maximum operating ambient temperature is derated by 1 C (1.8 F) per 1000 ft up to 10,000 ft.
Storage	-40 °C to 65 °C(-40 F to 149 F)

Relative humidity (maximum)	Specifications
Operating	8% to 85% (non-condensing)
Storage	5% to 95% (non-condensing)

Maximum vibration	Specifications
Operating	0.52 Grms, 5 to 350 Hz
Storage	2.0 Grms, 5 to 500 Hz

Maximum Shock	Specifications
Operating	40 G half-sine 2.5 ms pulse
Storage	105 G half-sine 2.5 ms pulse

CPU utilization matrix for AEP DIMM

NOTE: While using a 512 GB SKU configuration, you may see high CPU utilization (25% to 75%) persisting between 5 to 40 minutes when you boot into Windows 10

CPU utilization matrix

Main Memory		CPU0														CPU1											
		iMC1						iMC0								iMC0						iMC1					
		Ch5		Ch4		Ch3		Ch0		Ch1		Ch2				Ch5		Ch4		Ch3		Ch0		Ch1		Ch2	
		0	1	0	1	0	1	1	0	1	0	1	0			0	1	0	1	0	1	1	0	1	0	1	0
DDR4 (GB)	Intel Optance DC (GB)	DIMM2	DIMM8	DIMM4	DIMM10	DIMM6	DIMM12	DIMM11	DIMM5	DIMM9	DIMM3	DIMM7	DIMM1			DIMM1	DIMM7	DIMM3	DIMM9	DIMM5	DIMM11	DIMM12	DIMM6	DIMM10	DIMM4	DIMM8	DIMM2
64	256	128		16		16			16		16		128														
64	512	256		16		16			16		16		256														
128	1024	512		32		32			32		32		512														
128	512	128		16		16			16		16		128			128		16		16			16		16		128
128	1024	256		16		16			16		16		256			256		16		16			16		16		256
256	2048	512		32		32			32		32		512			512		32		32			32		32		512

6

System Setup

Topics:

General options

Table 4. General

Option	Description
System Information	This section lists the primary hardware features of your computer. The options are: • **System Information** • **Memory Configuration** • **Processor Information** • **PCI Information** • **Device Information**
Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. The options are: • **Diskette Drive** • **USB Storage Device** • **CD/DVD/CD-RW Drive** • **Onboard NIC** • **Internal HDD** **Boot List Option** Allows you to change the boot list options. Click one of the following options:

Table 4. General (continued)

Option	Description
	• **Legacy** • **UEFI**—Default
Advanced Boot Options	Allows you to Enable Legacy Option ROMs. The options are: • **Enable Legacy Option ROMs**—Default • **Enable Attempt Legacy Boot**
UEFI Boot Path Security	Allows you to control whether the system prompts the user to enter the Admin password when booting to a UEFI boot path. Click one of the following options: • **Always, Except Internal HDD**—Default • **Always** • **Never**
Date/Time	Allows you to set the date and time. The change to the system date and time takes effect immediately.

System configuration

Table 5. System Configuration

Option	Description
Integrated NIC	Allows you to configure the integrated network controller. Click one of the following options: • **Disabled** • **Enabled** • **Enabled w/PXE**—Default
UEFI Network Stack	Allows pre-OS and early OS networking features to use any enabled NICs. • **Enabled UEFI Network Stack** This option is set by default.
Serial Port	Identifies and defines the serial port settings. You can set the serial port to: • **Disabled** • **COM1**—Default • **COM2** • **COM3** • **COM4** **NOTE:** The operating system may allocate resources even if the setting is disabled.
SATA Operation	
7820 Tower	Allows you to configure the operating mode of the integrated SATA hard-drive controller. Click one of the following options:

Table 5. System Configuration (continued)

Option	Description
	• **Disabled** • **AHCI** • **RAID On**—Default **NOTE:** SATA is configured to support RAID mode.
Drives	
7820 Tower	Allows you to enable or disable various drives on board. The options are: • **MiniSAS PCIe SSD-0** • **SATA-0** • **SATA–2** • **SATA–4** • **ODD–0** • **MiniSAS PCIe SSD-1** • **SATA–1** • **SATA–3** • **SATA–5** • **ODD–1** All the options are set by default.
PCIe Drives	Allows the enabling of Front PCIe attached Ports. • **MiniSAS PCIe SSD-0** • **MiniSAS PCIe SSD-1** • **MiniSAS PCIe SSD-2** • **MiniSAS PCIe SSD-3** All the options are set by default.
SMART Reporting	This field controls if the hard drive errors for the integrated drives are reported during system startup. This technology is part of the SMART(Self-Monitoring Analysis and Reporting Technology) specification. • **Enable SMART Reporting** This option is not set by default.
USB Configuration	Allows you to enable or disable the internal USB configuration. The options are: • **Enable USB Boot Support** • **Enable Front USB Ports** • **Enable Internal USB Ports** • **Enable USB 3.0 Controller** • **Enable Rear USB Ports** All the options are set by default.
Front USB Configuration	Allows you to enable/disable Front USB ports. The options are: • **USB3 Type A** * • **USB Type C port 2 (Right)** * • **USB Type C port 1 (Right)** * All the options are set by default.

Table 5. System Configuration (continued)

Option	Description
Rear USB Configuration	Allows you to enable/disable Rear USB ports. The options are: • **RearPort3 Top** * • **RearPort1 Top** * • **RearPort2 Top** * • **RearPort3 Bottom** * • **RearPort1 Bottom** * • **RearPort2 Bottom** * All the options are set by default.
Internal USB Configuration	Allows you to enable/disable Internal USB ports. • **Internal Port 2** This option is set by default.
Dell Type-C Dock Configuration	Allows you to connect to Dell WD and TB family of docks. **Always Allows Dell Docks** This option is set by default.
Thunderbolt Adapter Configuration	Allows you to enable or disable the Thunderbolt device support capability. The options are: • **Enabled Thunderbolt Technology Support** • **Enabled Thunderbolt Adapter Pre-boot Modules** • **Enabled Thunderbolt Adapter Boot Support**—Default **NOTE:** The security level configures the Thunderbolt adapter security settings within the operating system.
USB PowerShare	Allows you to configure the USB PowerShare feature behavior. • **Enable USB PowerShare** This option is not set by default.
Audio	Allows you to enable or disable the integrated audio controller. • **Enable Audio** This option is set by default.
Memory Map IO above 4GB	Allows you to enable or disable 64-bit capable PCI devices to be decoded in above 4 GB address space(only if the system supports 64-bit PCI decoding). • **Memory Map IO above 4GB** This option is not set by default.
HDD Fans	Allows you to control the HDD fans. The options are: • **HDD1 Fan Enable** • **HDD2 Fan Enable** • **HDD3 Fan Enable** All the options are not set by default.

Table 5. System Configuration (continued)

Option	Description
Miscellaneous devices	Allows you to enable or disable various on board devices. The options are: • **Enable PCI Slot**—Default • **Secure Digital (SD) Card Boot** • **Enable Secure Digital (SD) Card**—Default • **Secure Digital (SD) Card Read-Only Mode**
Intel VMD Technology	Allows you to enable or disable VMD on the front PCIe bays. • **PCIE0** • **PCIE1** • **PCIE0_CPU0** • **PCIE1_CPU0** All the options are not set by default. Allows you to disable VMD for the PCIE Slots • **Auto**—Default On • **Disabled**

Video

Table 6. Video

Option	Description
Primary Video Slot	Allows you to configure primary boot video device. Click any one of the following options: • **Auto**—Default • **SLOT 1** • **SLOT 2: VGA Compatible** • **SLOT 2** • **SLOT 3** • **SLOT 5** • **SLOT 6** • **SLOT7_CPU1**

Security

Table 7. Security

Option	Description
Admin Password	Allows you to set, change, or delete the administrator(admin) password. The entries to set password are: • **Enter the old password:** • **Enter the new password:** • **Confirm new password:** Click **OK** once you set the password.

Table 7. Security (continued)

Option	Description
	NOTE: For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.
System Password	Allows you to set, change, or delete the System password. The entries to set password are: • **Enter the old password:** • **Enter the new password:** • **Confirm new password:** Click **OK** once you set the password. **NOTE:** For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.
Internal HDD-0 Password	Allows you to set, change, or delete the password on the system's internal hard disk drive (HDD). The entries to set password are: • **Enter the old password:** • **Enter the new password:** • **Confirm new password:** Click **OK** once you set the password. **NOTE:** For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.
Strong Password	Allows you to enforce the option to always set strong password. • **Enable Strong Password** This option is not set by default.
Password Configuration	You can define the length of your password. Min = 4, Max = 32
Password Bypass	Allows you to bypass the System password and the Internal HDD password, when it is set, during a system restart. Click one of the options: • **Disabled**—Default • **Reboot bypass**
Password Change	Allows you to change the System password when the administrator password is set. • **Allow Non-Admin Password Changes** This option is set by default.
UEFI Capsule Firmware Updates	Allows you to update the system BIOS via UEFI capsule update packages. • **Enable UEFI Capsule Firmware Updates** This option is set by default.
TPM 1.2 Security	Allows you to enable or disable the Trusted Platform Module (TPM) during POST. The options are: • **TPM On**(Default) • **Clear**

Table 7. Security (continued)

Option	Description
	• **PPI Bypass for Enable Commands** • **PPI Bypass for Disable Commands** Click any one of the following: • **Enabled**—Default • **Disabled**
Computrace (R)	Allows you to activate or disable the optional Computrace software. The options are: • **Deactivate**—Default • **Disable** • **Activate**
Chassis Intrusion	Allows you to control the chassis intrusion feature. Click one of the following options: • **Disabled**—Default • **Enabled** • **On-Silent**
CPU XD Support	Allows you to enable the Execute Disable mode of the processor. • **Enable CPU XD Support** This option is set by default.
OROM Keyboard Access	Allows you to determine whether users are able to enter the Option ROM Configuration screens via hotkeys during boot. The options are: Click one of the following options: • **Enabled**—Default • **One Time Enable** • **Disabled**
Admin Setup Lockout	Allows you to prevent users from entering Setup when an administrator password is set. • **Enable Admin Setup Lockout** This option is not set by default.
Master Password Lockout	Allows you to disable master password support. • **Enable Master Password Lockout** This option is not set by default. **NOTE:** Hard Disk password should be cleared before the settings can be changed.

Secure boot

Table 8. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable the Secure Boot Feature. Click one of the following options: • **Disabled**—Default • **Enabled**

Table 8. Secure Boot (continued)

Option	Description
Expert Key Management	Allows you to enable or disable Expert Key Management. • **Enable Custom Mode** This option is not set by default. The Custom Mode Key Management options are: • **PK**(Default) • **KEK** • **db** • **dbx**

Performance

Table 9. Performance

Option	Description
Multi Core Support	This field specifies whether the processor has one or all cores enabled. The performance of some applications improves with the additional cores. • **Active Processor Cores** Choose any number from 01–08: **NOTE:** To enable Trusted Execution mode, all the cores must be enabled.
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.
Cache Prefetch	Allows you to turn on the MLC streamer prefetcher and MLC spatial prefetcher. The options are: • **Hardware Prefetcher** • **Adjacent Cache Prefetch** All the options are 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

Table 9. Performance (continued)

Option	Description
Dell Reliable Memory Technology (RMT)	Allows you to identify and isolate memory errors in system RAM. • **Enable Dell RMT**—Default • **Clear Dell RMT**
System Isochronous Mode	Allows you to enable or disable this mode to reduce latency of memory transactions at the expense of bandwidth. : Click one of the options: • **Disabled**(Default) • **Enabled**
RAS Support	Allows you to report or log errors caused by memory failures, the PCIe failures, CPU failures. The options are: • **Enable on Memory modules** • **Enable on PCIe modules** • **Enable on CPU modules** The options are not set by default.

Power management

Table 10. Power Management

Option	Description
AC Recovery	Specifies how the computer will respond when AC power is applied after an AC power loss. You can set the AC Recovery to: • **Power Off**—Default • **Power On** • **Last Power State**
Auto On Time	Allows you to set the time at which the computer must turn on automatically. Click one of the following options: • Disabled—Default • **Every Day** • **Weekdays** • **Select Days**
Deep Sleep Control	Allows you to define the controls when Deep Sleep is enabled. Click one of the options: • **Disabled**—Default • **Enabled in S5 only** • **Enabled in S4 and S5**
USB Wake Support	Allows you to enable USB devices to wake the system from standby. • **Enable USB Wake Support** This option is set by default.
Wake on LAN	This option allows the computer to power up from the off state when triggered by a special LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the computer is connected to AC power supply.

Table 10. Power Management (continued)

Option	Description
	• **Disabled** - Does not allow the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN. • **LAN Only** - Allows the system to be powered on by special LAN signals. • **LAN with PXE Boot** - Allows the system to power on and immediately boot to PXE when it receives a wake-up packet sent to the system in either the S4 or S5 state. All the options are not set by default.
Block Sleep	Allows you to block entering to sleep(S3 state) in OS Environment. This option is not set by default.

Post behaviour

Table 11. POST Behavior

Option	Description
Numlock LED	Specifies if the NumLock function can be enabled when the system boots. This option is set by default.
Keyboard Errors	Specifies whether keyboard related errors are reported when it boots. This option is set by default.
Extend BIOS POST Time	Allows you to create additional pre-boot delay and see POST status messages. Click one of the following options: • **0 seconds**(Default) • **5 seconds** • **10 seconds**
Security Audit Display Disable	Allows you to disable the display of the Security Audit results during POST. • **Disable Display Of Security Audit Display** This option is not set by default.
Full Screen Logo	Allows you to display full screen logo, if your image matches screen resolution. • **Enable Full Screen Logo** This option is not set by default.
Warnings and Errors	Allows you to select different options to either stop, prompt and wait for user input, continue when warnings are detected but pause on errors, or continue when either warnings or errors are detected during the POST process. Click one of the following options: • **Prompt on Warnings and Errors**—Default • **Continue on Warnings** • **Continue on Warnings and Errors**

Manageability

Table 12. Manageability

Option	Description
USB Provision	Allows you to provision Intel AMT using the local provisioning file via a USB storage device. • **Enable USB Provision** **NOTE:** When disabled, provisioning Intel AMT from a USB storage device is blocked. This option is not set by default.
MEBx Hotkey	Allows you to specify if the MEBx Hotkey function should be enabled when the system boots This option is set by default.

Virtualization support

Table 13. 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.
Trusted Execution	Allows you to specify whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by the Intel Trusted Execution Program. • **Trusted Execution** This option is not set by default.

Maintenance

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 not set by default.
SERR Messages	Controls the SERR message mechanism. Some graphics cards require that the SERR message mechanism be disabled. This option is not set by default.

Table 14. Maintenance (continued)

Option	Description
BIOS Downgrade	Allows you to flash previous revisions of the system firmware. • **Allow BIOS Downgrade** This option is set by default.
Data Wipe	Allows you to securely erase data from all internal storage devices. • **Wipe on Next Boot** This option is not 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. **NOTE: BIOS Recovery from Hard Drive** field should be enabled. **Always Perform Integrity Check**—Performs integrity check on every boot.

System logs

Table 15. System Logs

Option	Description
BIOS events	Displays the system event log and allows you to clear the log. • **Clear Log** This option is not set by default.

Advanced configurations

Table 16. Advanced configurations

Option	Description
Pcie LinkSpeed	Allows you to choose the Pcie linkspeed. Click one of the following options: • **Auto**—Default • **Gen1** • **Gen2**

SupportAssist system resolution

Table 17. SupportAssit System Resolution

Option	Description
Auto OS Recovery Threshold	The **Auto OS Recovery Threshold** setup option controls the automatic boot flow for Support Assist System Resolution Console and Dell OS Recovery tool. Click one of the following options: • **OFF** • **1**

Table 17. SupportAssit System Resolution

Option	Description
	• **2**—Default • **3**

Updating the BIOS in Windows

It is recommended to update your BIOS (System Setup) when you replace the system board or if an update is available.

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

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

   NOTE: Choose the appropriate category to reach the product page.

5. Select your computer model and the **Product Support** page of your computer appears.
6. Click **Get drivers** and click **Drivers and Downloads**.
   The Drivers and Downloads section opens.
7. Click **Find it myself**.
8. Click **BIOS** to view the BIOS versions.
9. Identify the latest BIOS file and click **Download**.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.
    The **File Download** window appears.
11. Click **Save** to save the file on your computer.
12. Click **Run** to install the updated BIOS settings on your computer.
    Follow the instructions on the screen.

Updating BIOS on systems with BitLocker enabled

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known, this can result in data loss or an unnecessary operating system reinstall. For more information about this subject, see Knowledge Article: Updating the BIOS on Dell Systems With BitLocker Enabled

Updating your system BIOS using a USB flash drive

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

NOTE: You will need to use a bootable USB flash drive. Please refer to the following article for further details How to Create a Bootable USB Flash Drive using Dell Diagnostic Deployment Package (DDDP)

1. Download the BIOS update .EXE file to another system.
2. Copy the file e.g. O9010A12.EXE onto the bootable USB flash drive.
3. Insert the USB flash drive into the system that requires the BIOS update.
4. Restart the system and press F12 when the Dell splash logo appears to display the One Time Boot Menu.
5. Using arrow keys, select **USB Storage Device** and click **Enter**.

6. The system will boot to a Diag C:\> prompt.
7. Run the file by typing the full filename, for example, O9010A12.exe and press **Enter**.
8. The BIOS Update Utility will load. Follow the instructions on screen.

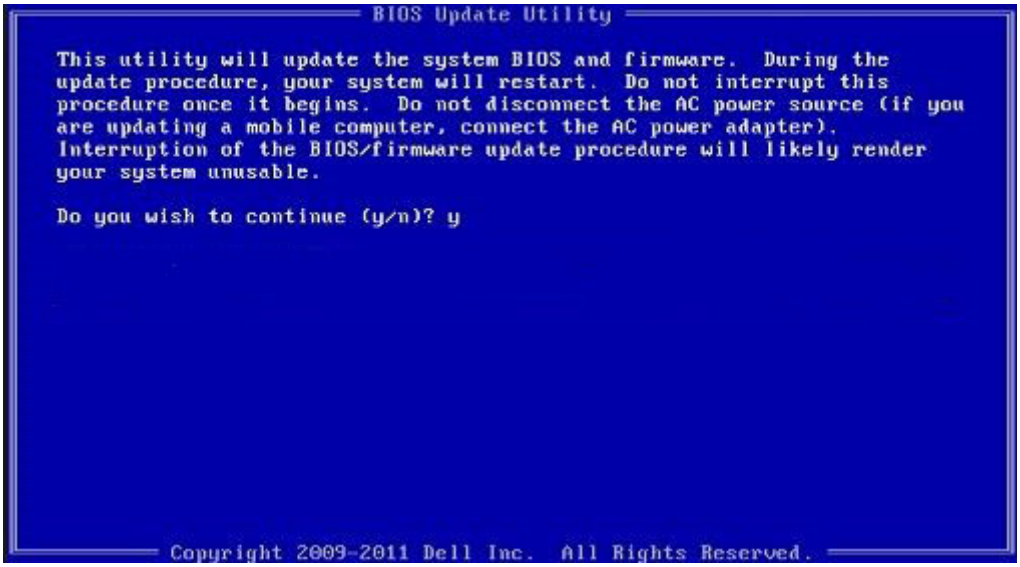


Figure 1. DOS BIOS Update Screen

Updating the Dell BIOS in Linux and Ubuntu environments

If you want to update the system BIOS in a Linux environment, such as Ubuntu, see https://www.dell.com/support/article/sln171755/.

Flashing the BIOS from the F12 One-Time boot menu

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

BIOS Update

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

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

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

Updating from the One-Time Boot Menu

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

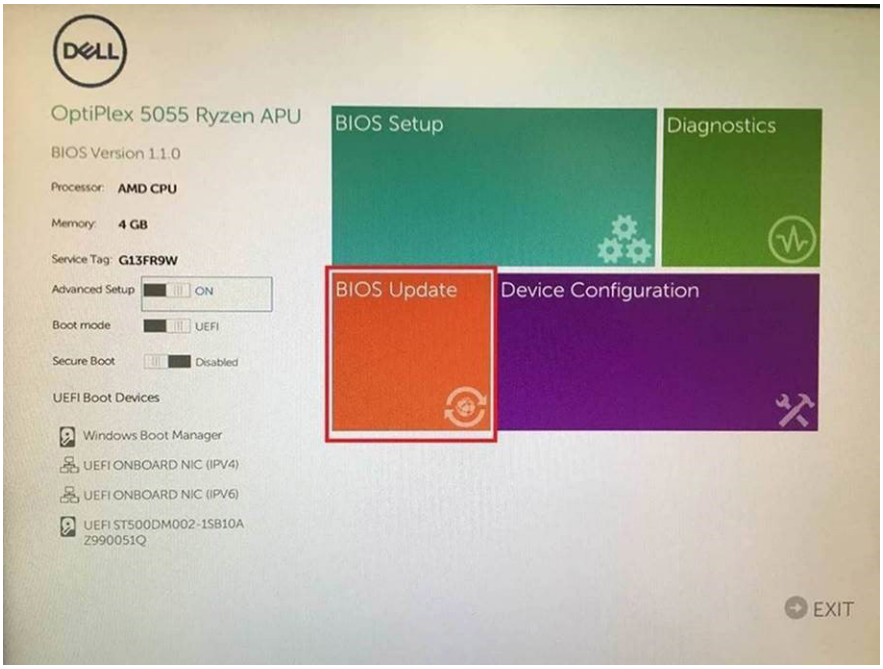
- USB key formatted to the FAT32 file system (key does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB key
- AC power adapter connected to the system
- Functional system battery to flash the BIOS

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

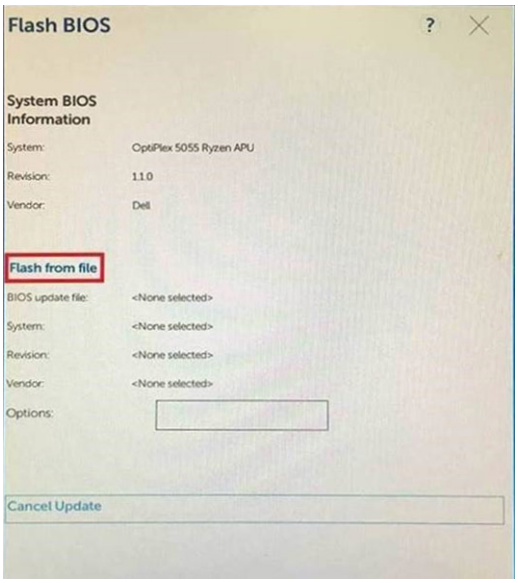
CAUTION: Do not power off the system during the BIOS update process. Powering off the system could make the system fail to boot.

1. From a power off state, insert the USB key where you copied the flash into a USB port of the system .

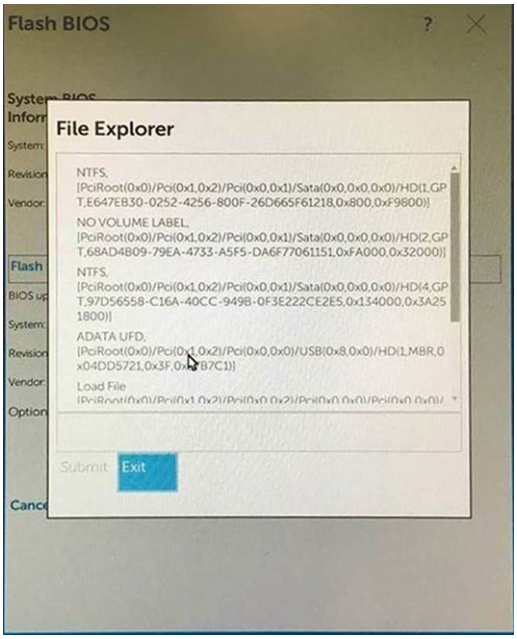
2. Power on the system and press the F12 key to access the One-Time Boot Menu, Highlight BIOS Update using the mouse or arrow keys then press **Enter**.



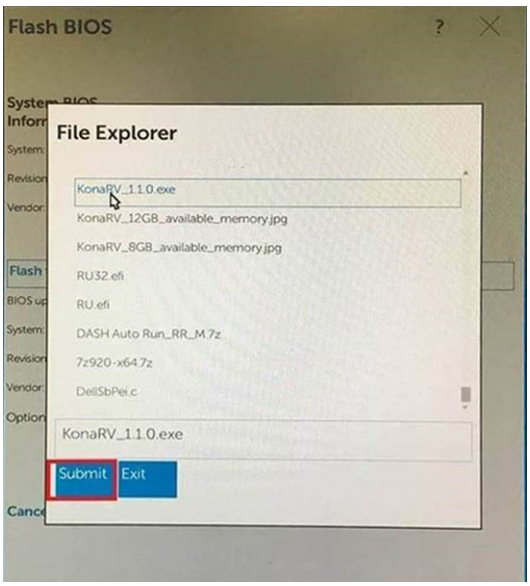
3. The Bios flash menu will open then click the **Flash from file**.



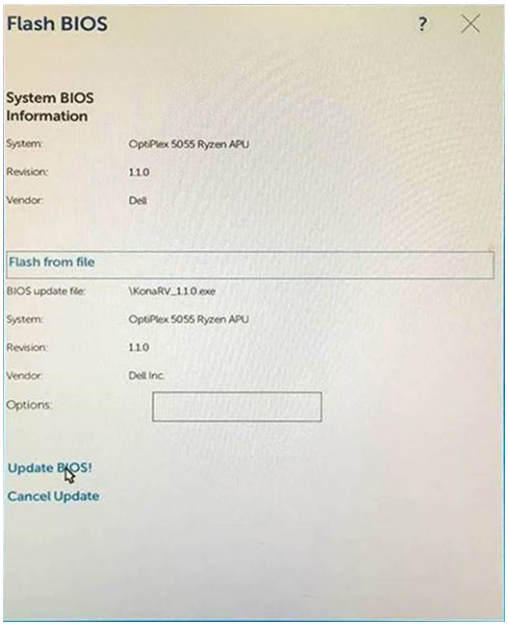
4. Select external USB device



5. Once the file is selected, Double click the flash target file, then press submit .



6. Click the **Update BIOS** then system will reboot to flash the BIOS.



7. Once complete, the system will reboot and the BIOS update process is completed.

MegaRAID controller options

During bootup, press <Ctrl> + <R> when prompted by the BIOS screen to get to the BIOS configuration utility.

Table 18. MegaRAID configuration utility

Option	Description
VD Mgmt (Virtual Device Management)	This option is used to import the existing configuration to the RAID controller or clear the existing configuration. The right-hand panel of the screen lists attributes of the virtual drive or other device selected in the left panel. • Virtual Drives • Drives • Available size • Hot spare drives
PD Mgmt (Physical Drive Management)	This screen displays basic information about existing physical drives connected to the selected controller, including drive ID, vendor, size, type, and state and allows you to manage physical drives. Press F2 to show the context menu: • Rebuild • Copyback • Locate • Place Drive online • Place drive offline • Make Global HS • Remove Hot Spare drive • Make JBOD • Make unconfigured good • Prepare for Removal
Ctrl Mgmt (Control Management)	This screen allows you to change the settings for controller options such as Enable Controller BIOS, Enable BIOS Stop on

Table 18. MegaRAID configuration utility (continued)

Option	Description
	Error and others. It also allows you to select a bootable virtual drive, restore default controller settings.
Properties	The Properties screen displays the controller properties like current versions of the controller BIOS, the MegaRAID firmware the Configuration Utility and the Boot block.

NOTE: Press <Ctrl> + <N> to move to the next screen and Press <Ctrl> + <P> to go back to the previous screen.

System and setup password

Table 19. 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.

7

Software

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

Topics:

Supported operating systems

Table 20. Operating systems

Supported operating systems		
Windows 10	• Factory installed Windows 10 Pro— 64-bit • Factory installed Win 10 Enterprise—64-bit	
Windows 7	Windows 7 Pro— 64-bit	
Linux	• RHEL 7.3 • Ubuntu 16.04 • NeoKylin v6.0	

Downloading drivers

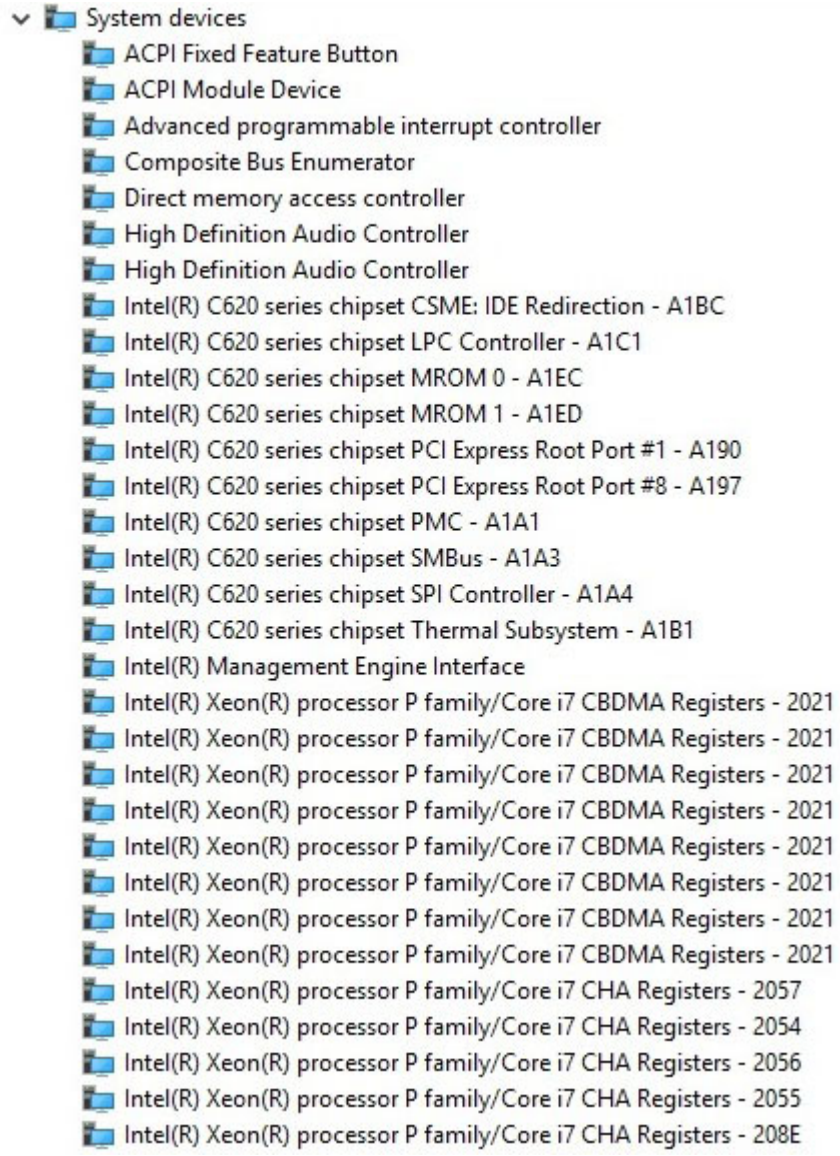
1. Turn on the computer.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your system, and then click **Submit**.

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

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

Chipset drivers

Verify if the Intel chipset and Intel Management Engine Interface drivers are already installed in the computer.



Graphics controller driver

Verify if the graphics controller driver is already installed in the computer.

Ports

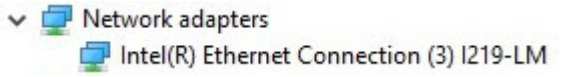
Verify if the drivers for the ports are already installed in the computer.

USB drivers

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

Network driver

The driver is labeled as Intel I219-LM Ethernet Driver.

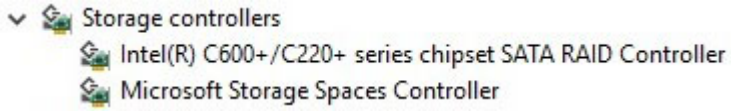


Audio drivers

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

Storage controller drivers

Verify if the storage controller drivers are already installed in the computer.

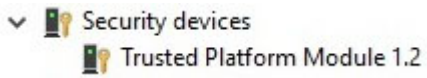


Other drivers

This section lists different driver details for all the other components in the Device Manager.

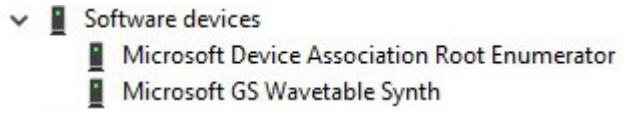
Security device drivers

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



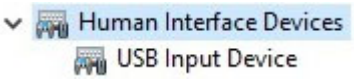
Software device drivers

Verify if the software device drivers are already installed in the computer.



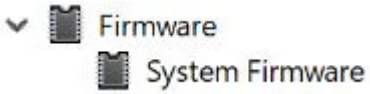
Human Interface Device drivers

Verify if the human interface device drivers are already installed in the computer.



Firmware

Verify if the Firmware drivers are already installed in the computer.



8

Troubleshooting

The following section describes common troubleshooting steps that can be performed to resolve certain problems on your computer.

Topics:

Dell Enhanced Pre-Boot System Assessment — ePSA Diagnostic 3.0

You can invoke the ePSA diagnostics by either of the following ways :

- Press the F12 key when the system posts and choose **ePSA or Diagnostics** option on One Time Boot Menu.
- Press and hold Fn(Function key on keyboard) and **Power On** (PWR) the system.

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**.

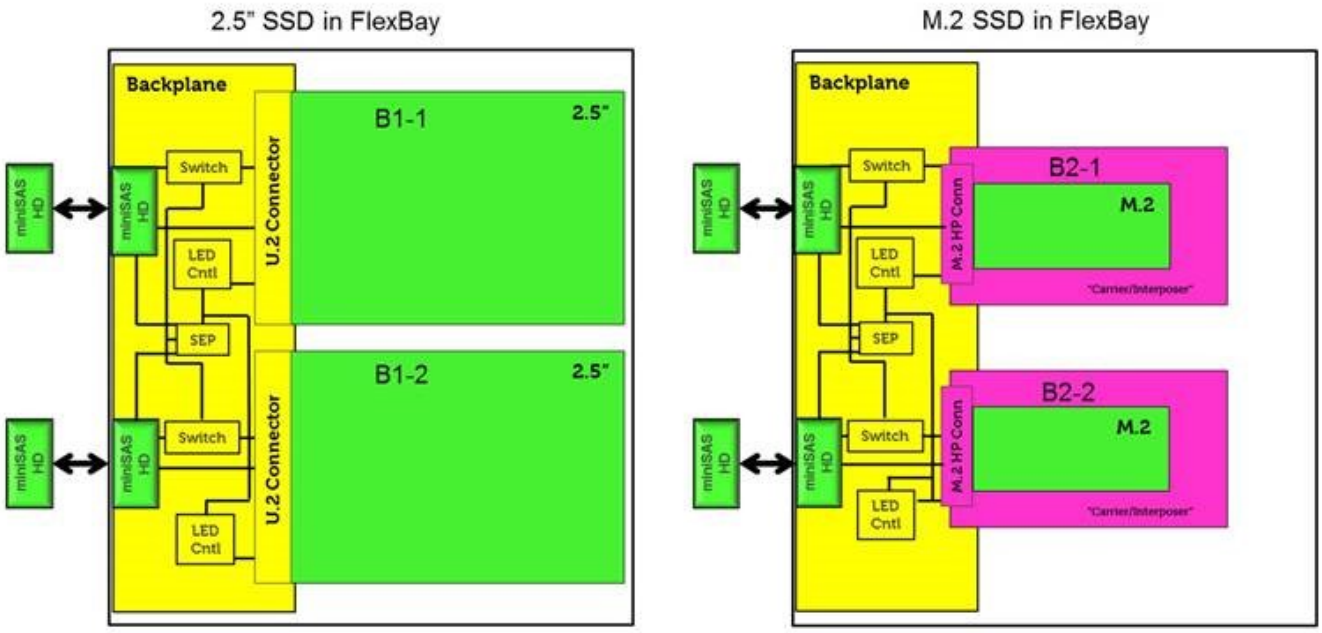
   NOTE: The **Enhanced Pre-boot System Assessment** window displays, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.

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.

Hard drive indicator codes

Each hard drive carrier has an activity LED indicator and a status LED indicator. The indicators provide information about the current status of the hard drive. The activity LED indicator indicates whether the hard drive is currently in use or not. The status LED indicator indicates the power condition of the drive.

Hard drive indicators



NOTE: LED status or activity indicators will only work with a backplane with each carriers shown below.

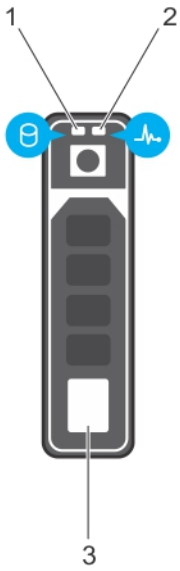


Figure 2. Hard drive indicators

1. hard drive activity LED indicator
2. hard drive status LED indicator
3. hard drive

NOTE: If the hard drive is in the Advanced Host Controller Interface (AHCI) mode, the status LED indicator does not turn on.

NOTE: Drive status indicator behavior is managed by Storage Spaces Direct. Not all drive status indicators may be used.

Table 21. Hard drive indicator codes

Hard drive status indicator code	Condition
Flashes green twice per second	Identifying drive or preparing for removal.
Off	Drive ready for removal. **NOTE:** The drive status indicator remains off until all drives are initialized after the system is turned on. Drives are not ready for removal during this time.
Flashes green, amber, and then turns off	Predicted drive failure.
Flashes amber four times per second	Drive failed.
Flashes green slowly	Drive rebuilding.
Solid green	Drive online.
Flashes green for three seconds, amber for three seconds, and then turns off after six seconds	Rebuild stopped.

Preboot blinking power button codes

Table 22. Power button LED state

Power Button LED State	Description
Off	Power is Off. LED is blank.
Blinking Amber	Initial State of LED at power up. See the table below for Blinking Amber pattern diagnostic suggestions and possible failures.
Blinking White	System is in a low power state, either S1 or S3. This does not indicate a fault condition.
Solid Amber	The second state of the LED at power up, indicates that the POWER_GOOD signal is active and it is probable that the power supply is fine.
Solid White	System is in S0 state. This is the normal power states of a functioning machine. The BIOS will turn the LED to this states to indicate it has started fetching op-codes.

Table 23. Diagnostic Indicator table

Power Light: Amber-White Blinking	Amber/White Blinking Pattern	Problem Description	Suggested Resolution
1-1	1 amber blink followed by a short pause, 1 white blink, long pause, then repeats	Faulty System board	To troubleshoot the issue with system board, contact Tech support.
1-2	1 amber blink followed by a short pause, 2 white blinks, long pause, then repeats	Bad system board, Power Supply or Power Supply cabling	• If you can assist to troubleshoot, narrow down the issue with PSU BIST Test, reseat cable. • If nothing works, contact Tech Support

Table 23. Diagnostic Indicator table (continued)

Power Light: Amber-White Blinking	Amber/White Blinking Pattern	Problem Description	Suggested Resolution
1-3	1 amber blink followed by a short pause, 3 white blinks, long pause, then repeats	Bad system board, Memory or Processor	• If you can assist to troubleshoot, narrow down the issue by reseating memory and swapping a known good memory if available. • If nothing works, contact Tech Support
1-4	1 amber blink followed by a short pause, 4 white blinks, long pause, then repeats	Bad Coin cell	• Replace Coin cell • If issue persists, replace system board
2-1	2 amber blinks followed by a short pause, 1 white blink, long pause, then repeats	Bad Processor	• CPU configuration activity is in progress or a CPU failure was detected. • Contact Tech Support • If you can assist to troubleshoot, narrow down the issue by ensuring CPU 0 is installed, CPU0 and CPU1 is an idendical matching pair and swapping a known good CPUs if available. • If nothing works, contact Tech Support
2-2	2 amber blinks followed by a short pause, 2 white blinks, long pause, then repeats	Motherboard: BIOS ROM failure	• System is in Recovery Mode. • Flash latest BIOS version. If problem persists, contact Tech Support
2-3	2 amber blinks followed by a short pause, 3 white blinks, long pause, then repeats	No Memory	• If customer can assist to troubleshoot, narrow down the issue by removing the memory module one by one to determine which one failed and swapping to a known good memory if available to confirm. • Contact Tech Support
2-4	2 amber blinks followed by a short pause, 4 white blinks, long pause, then repeats	Memory/RAM failure	• If customer can assist to troubleshoot, narrow down the issue by removing the memory module one by one to determine which one failed and swapping to a known good memory if available to confirm. • Contact Tech Support

Table 23. Diagnostic Indicator table (continued)

Power Light: Amber-White Blinking	Amber/White Blinking Pattern	Problem Description	Suggested Resolution
2-5	2 amber blinks followed by a short pause, 5 white blinks, long pause, then repeats	Invalid memory installed	• Memory subsystem configuration activity is in progress. Memory modules have been detected but appear to be incompatible or in an invalid configuration. • If customer can assist to troubleshoot, narrow down the issue by removing one by one the memory on motherboard to determine which one failed. • Contact Tech Support.
2-6	2 amber blinks followed by a short pause, 6 white blinks, long pause, then repeats	Motherboard: Chipset	• Fatal system board failure detected. • If customer can assist to troubleshoot, narrow down the issue by removing one by one the component on motherboard to determine which one failed. • If you identified any of the components failed, replace the Component. • Contact Tech Support.
3-1	3 amber blinks followed by a short pause, 1 white blink, long pause, then repeats	RTC failure	• Replace coin cell
3-2	3 amber blinks followed by a short pause, 2 white blinks, long pause, then repeats	PCI Device or Video	• PCI device configuration activity is in progress or PCI device failure was detected. • If you can assist to troubleshoot, narrow down the issue by reseating PCI card and removing one by one to determine which card failed. • Contact Tech Support.
3-3	3 amber blinks followed by a short pause, 3 white blinks, long pause, then repeats	BIOS Recovery 1	• System is in Recovery Mode. • Flash latest BIOS version. If problem persists, contact Tech Support
3-4	3 amber blinks followed by a short pause, 4 white blinks, long pause, then repeats	BIOS Recovery 2	• System is in Recovery Mode. • Flash latest BIOS version. If problem persists, contact Tech Support

Table 23. Diagnostic Indicator table (continued)

Power Light: Amber-White Blinking	Amber/White Blinking Pattern	Problem Description	Suggested Resolution
4-1	4 amber blinks followed by a short pause, 1 white blink, long pause, then repeats	CPU Config or CPU Failure	• The 2 installed CPU's do not match, Please install 2 CPU's of the same type
4-2	4 amber blinks followed by a short pause, 2 white blinks, long pause, then repeats	Generic POST Video error (Old LED pattern 1110)	• PCI device config or failure with video subsystem config or failure
4-3	4 amber blinks followed by a short pause, 3 white blinks, long pause, then repeats	Bad Memory	• Memory VR would not turn on. Check Memory insertion
4-4	4 amber blinks followed by a short pause, 4 white blinks, long pause, then repeats	Riser board issue	• Power issue on Riser second CPU board
4-6	4 amber blinks followed by a short pause, 6 white blinks, long pause, then repeats	RAID Volume degraded	• RAID volume is degraded. • If you can assist to troubleshoot, us F12 menu to enter Device Configuration tab. Rebuild the RAID volume if possible • Contact Tech Support.
4-7	4 amber blinks followed by a short pause, 7 white blinks, long pause, then repeats	System Side cover is missing	• System side cover(either left or right) is missing. • Unplug power, Install back all side covers back to the chassis and plug in power. • Contact Tech Support.

9

Contacting Dell

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

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

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