



Hardware Reference Guide

HP EliteDesk 705 G4 Desktop Mini

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Product notice

This guide describes features that are common to most models. Some features may not be available on your product. To access the latest user guide, go to <http://www.hp.com/support>, and follow the instructions to find your product. Then select **User Guides**.

Software terms

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For any further information or to request a full refund of the price of the computer, please contact your seller.

About This Guide

This guide provides basic information for upgrading the HP EliteDesk Business PC.






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-  **WARNING!** Indicates a hazardous situation that, if not avoided, **could** result in death or serious injury.
 -  **CAUTION:** Indicates a hazardous situation that, if not avoided, **could** result in minor or moderate injury.
 -  **IMPORTANT:** Indicates information considered important but not hazard-related (for example, messages related to property damage). A notice alerts the user that failure to follow a procedure exactly as described could result in loss of data or in damage to hardware or software. Also contains essential information to explain a concept or to complete a task.
 -  **NOTE:** Contains additional information to emphasize or supplement important points of the main text.
 -  **TIP:** Provides helpful hints for completing a task.
-

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1 Product features

Standard configuration features

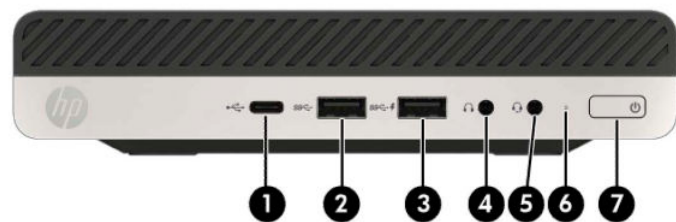
Features may vary depending on the model. For support assistance and to learn more about the hardware and software installed on your computer model, run the HP Support Assistant utility.









NOTE: This computer model can be used in a tower orientation or a desktop orientation. The stand is sold separately.



Front panel components

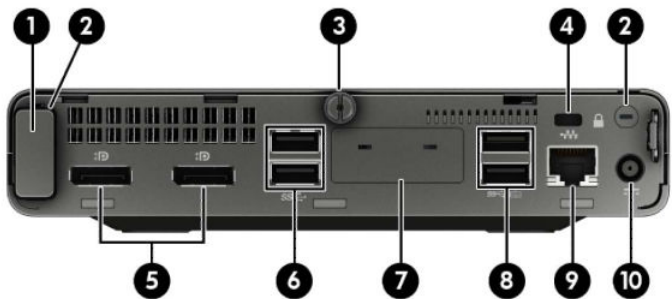


| Front panel components | | |
|------------------------|--|--|
| 1 |  USB Type-C port | 5  Audio-out (headphone)/Audio-in (microphone) combo jack |
| 2 |  USB SuperSpeed port | 6 Hard drive activity light |
| 3 |  USB SuperSpeed port with HP Sleep and Charge | 7  Power button |
| 4 |  Audio-out (headphone) jack | |







NOTE: The USB SuperSpeed port with HP Sleep and Charge provides current to charge a device such as a smart phone. The charging current is available whenever the power cord is connected to the system, even when the system is off.

The audio-out (headphone)/audio-in (microphone) combo jack supports headphones, line output devices, microphones, line input devices, or CTIA style headsets.

Rear panel components

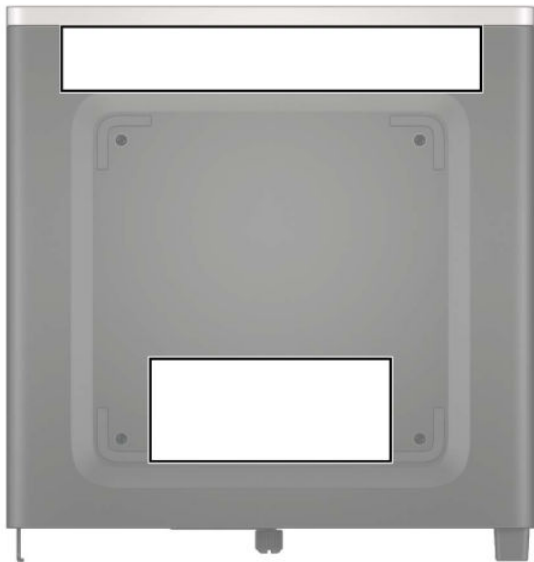


Rear panel components

| | | | | |
|---|--|----|---|--|
| 1 | Antenna cover | 6 |  | USB SuperSpeed ports (2) |
| 2 | External antenna locations | 7 | | Optional port |
| 3 | Access panel thumbscrew | 8 |  | USB SuperSpeed ports with optional keyboard power-on support (2) |
| 4 |  Security cable slot | 9 |  | RJ-45 (network) jack |
| 5 |  DisplayPort monitor connectors (2) | 10 |  | Power connector |

Serial number location

Each computer has a unique serial number and a product ID number that are located on the exterior of the computer. Keep these numbers available for use when contacting customer service for assistance.




2 Setup

Changing from desktop to tower orientation


The computer can be used in a tower orientation with an optional tower stand that can be purchased from HP.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and turn off any external devices.
4. Disconnect the power cord from the AC outlet and disconnect any external devices.


 **IMPORTANT:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. To prevent damage to internal components, you must disconnect the power cord from the power source before opening the computer.

5. Orient the computer so that its right side is facing up and place the computer in the optional stand.



 **NOTE:** To stabilize the computer in a tower orientation, HP recommends the use of the optional tower stand.

6. Reconnect the power cord and any external devices, and then turn on the computer.

 **NOTE:** Ensure that at least 10.2 centimeters (4 inches) of space on all sides of the computer remains clear and free of obstructions.

7. Lock any security devices that were disengaged before the computer was moved.


Attaching the computer to a mounting fixture

The computer can be attached to a wall, swing arm, or other mounting fixture.

 **NOTE:** This apparatus is intended to be supported by UL or CSA Listed wall mount bracket.



1. If the computer is on a stand, remove the computer from the stand and lay the computer down.
2. To attach the computer to a swing arm (sold separately), insert four screws through the holes on the swing arm plate and into the mounting holes on the computer.

 **IMPORTANT:** This computer supports the VESA industry standard 100 mm mounting holes. To attach a third-party mounting solution to the computer, use the screws that are supplied with the solution. It is important to verify that the manufacturer's mounting solution is compliant with the VESA standard and is rated to support the weight of the computer. For best performance, it is important to use the power cord and other cables provided with the computer.

To attach the computer to other mounting fixtures, follow the instructions included with the mounting fixture to ensure that the computer is safely attached.

Installing a security lock

You can attach a security cable lock to the rear of the computer. Use the key provided to attach and remove the lock.



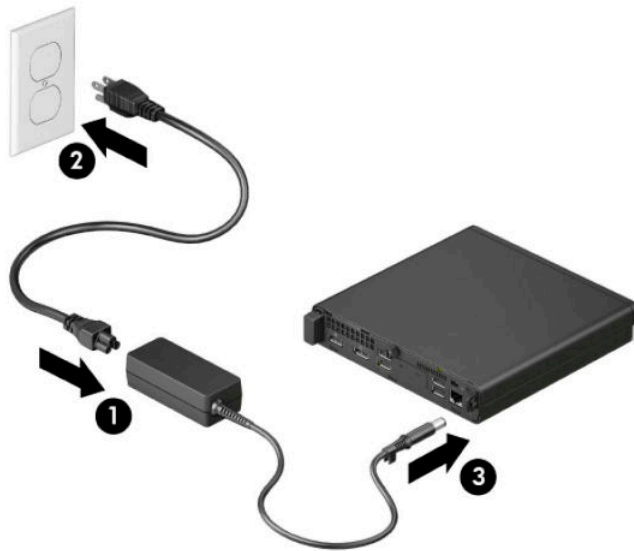
To install a padlock, slide the padlock loop out from the rear of the computer and install the padlock in the loop.



NOTE: The cable lock and padlock are designed to act as a deterrent, but they may not prevent the computer from being mishandled or stolen.

Connecting the power cord

Connect one end of the power cord to the AC adapter (1) and the other end to a grounded AC outlet (2), and then connect the round end of the AC adapter to the power connector on the computer (3).



3 Hardware upgrades

Serviceability features

The computer includes features that make it easy to upgrade and service. A Torx T15 or flat-bladed screwdriver is needed for some of the installation procedures described in this chapter.

Warnings and cautions

Before performing upgrades be sure to carefully read all of the applicable instructions, cautions, and warnings in this guide.

 **WARNING!** To reduce the risk of personal injury from electrical shock, hot surfaces, or fire:


Disconnect the power cord from the AC outlet and allow the internal system components to cool before you touch them.

Do not plug telecommunications or telephone connectors into the network interface controller (NIC) receptacles.

Do not disable the power cord grounding plug. The grounding plug is an important safety feature.


Plug the power cord into a grounded (earthed) AC outlet that is easily accessible at all times.

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. The *Safety & Comfort Guide* also provides important electrical and mechanical safety information. The *Safety & Comfort Guide* is available on the web at <http://www.hp.com/ergo>.

 **WARNING!** Energized and moving parts inside.

Disconnect power to the equipment before removing the enclosure.

Replace and secure the enclosure before re-energizing the equipment.

 **IMPORTANT:** Static electricity can damage the electrical components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See [Electrostatic discharge on page 47](#) for more information.


When the computer is plugged into an AC power source, voltage is always applied to the system board. To prevent damage to internal components, you must disconnect the power cord from the power source before opening the computer.

 **NOTE:** Your computer model may look slightly different from the illustrations in this chapter.


Removing the computer access panel

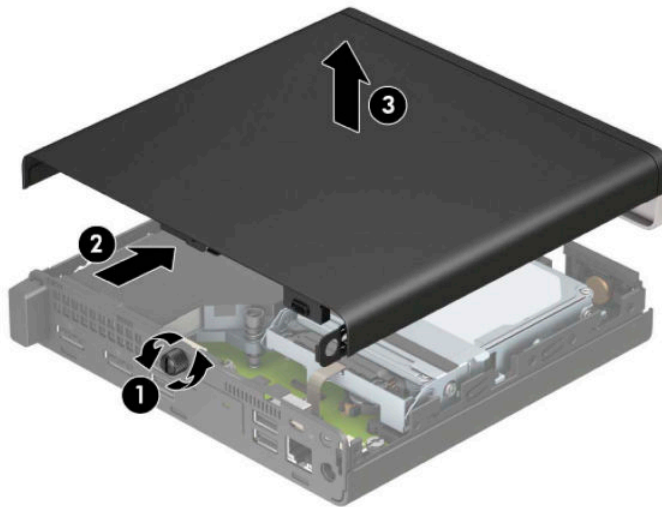
To access internal components, you must remove the access panel.


1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and turn off any external devices.
4. Disconnect the power cord from the AC outlet and disconnect any external devices.

 **IMPORTANT:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. To prevent damage to internal components, you must disconnect the power cord from the power source before opening the computer.

5. If the computer is on a stand, remove the computer from the stand and lay the computer down.
6. Remove the thumbscrew on the rear of the computer (1). Then slide the panel forward (2), and then lift it off the computer (3).

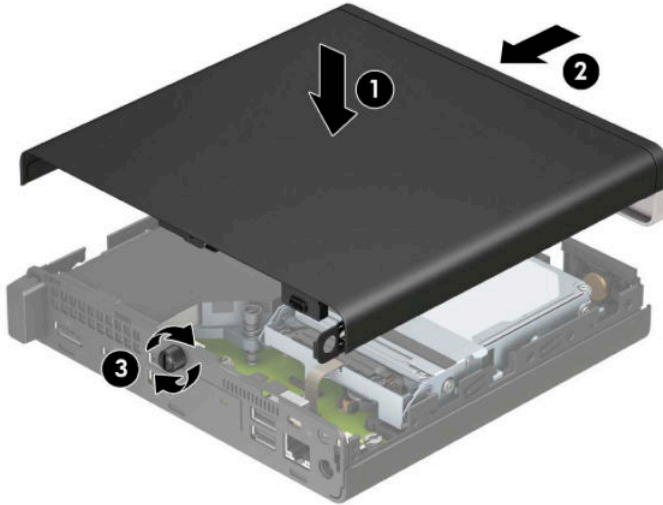
 **NOTE:** If necessary, a Torx T15 or flat-bladed screwdriver can be used to loosen the thumbscrew.



 **NOTE:** Your computer model may look slightly different from the illustration in this section. Some models have vent holes on the access panel.

Replacing the computer access panel

Place the access panel on the computer (1), and then slide it back (2). Then install the thumbscrew (3) to secure the panel in place.



NOTE: Your computer model may look slightly different from the illustration in this section. Some models have vent holes on the access panel.

Upgrading system memory

The computer comes with at least one small outline, dual in-line memory module (SODIMM). To achieve maximum memory support, you can populate the system board with up to 32 GB of memory.

Memory module specifications

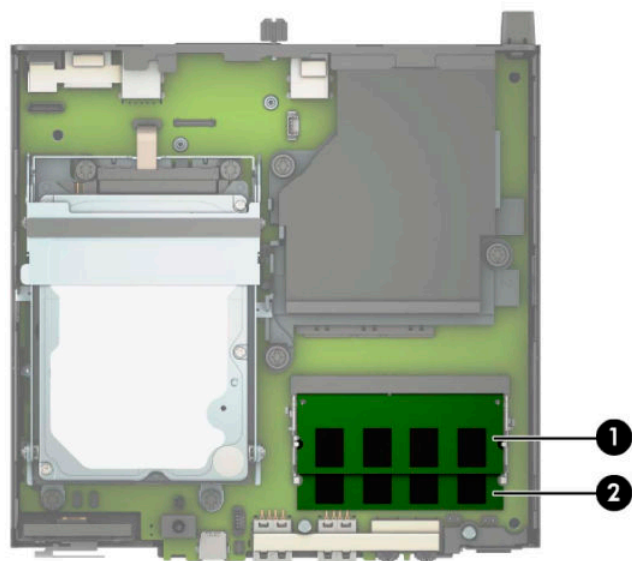
For proper system operation, the memory modules must meet the following qualifications:

| Component | Specification |
|----------------|---|
| Memory modules | 1.2 volt DDR4-SDRAM memory modules |
| Compliance | unbuffered non-ECC PC4-19200 DDR4-2400 MHz-compliant |
| Pins | industry-standard 260-pin containing the mandatory Joint Electronic Device Engineering Council (JEDEC) specification |
| Support | support CAS latency 17 DDR4 2400 MHz (17-17-17 timing) |
| Slots | 2 |
| Maximum memory | 32 |
| Supported | 2 Gbit, 4 Gbit, 8 Gbit, and 16 Gbit non-ECC memory technologies single-sided and double-sided memory modules |
| Note | The system will not operate properly if you install unsupported memory modules. Memory modules constructed with x8 and x16 DDR devices are supported; memory modules constructed with x4 SDRAM are not supported. |

HP offers upgrade memory for this computer and advises that the consumer purchase it to avoid compatibility issues with unsupported third-party memory.

Installing memory modules

There are two memory module slots on the system board, with one slot per channel. The slots are labeled DIMM1 and DIMM3. The DIMM1 slot operates in memory channel B. The DIMM3 slot operates in memory channel A.



| Item | Description | System board label | Slot color |
|------|-------------------------------|--------------------|------------|
| 1 | Memory module slot, Channel A | DIMM3 | Black |
| 2 | Memory module slot, Channel B | DIMM1 | Black |

The system will automatically operate in single channel mode, dual channel mode, or flex mode, depending on how the memory modules are installed.

- The system will operate in single channel mode if the memory module slots are populated in one channel only.
- The system will operate in a higher-performing dual channel mode if the memory capacity of the memory module in Channel A is equal to the memory capacity of the memory module in Channel B.
- The system will operate in flex mode if the memory capacity of the memory module in Channel A is not equal to the memory capacity of the memory module in Channel B. In flex mode, the channel populated with the least amount of memory describes the total amount of memory assigned to dual channel and the remainder is assigned to single channel. If one channel will have more memory than the other, the larger amount should be assigned to channel A.
- In any mode, the maximum operational speed is determined by the slowest memory module in the system.



IMPORTANT: You must disconnect the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

The memory module slots have gold-plated metal contacts. When upgrading the memory, it is important to use memory modules with gold-plated metal contacts to prevent corrosion and/or oxidation resulting from having incompatible metals in contact with each other.

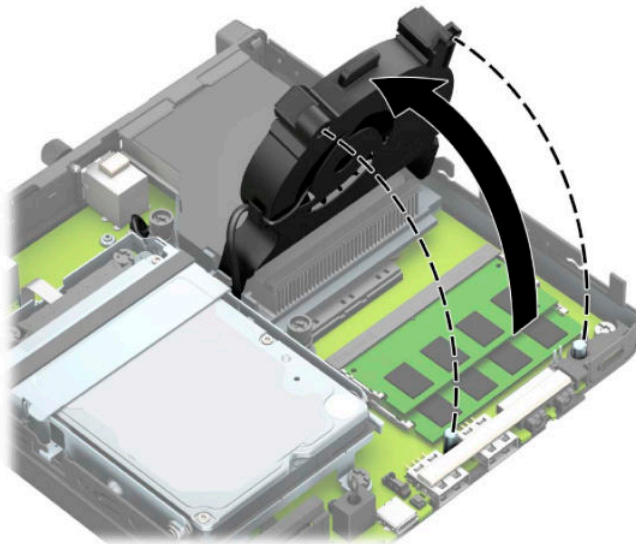
Static electricity can damage the electronic components of the computer or optional cards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. For more information, see [Electrostatic discharge on page 47](#).

When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

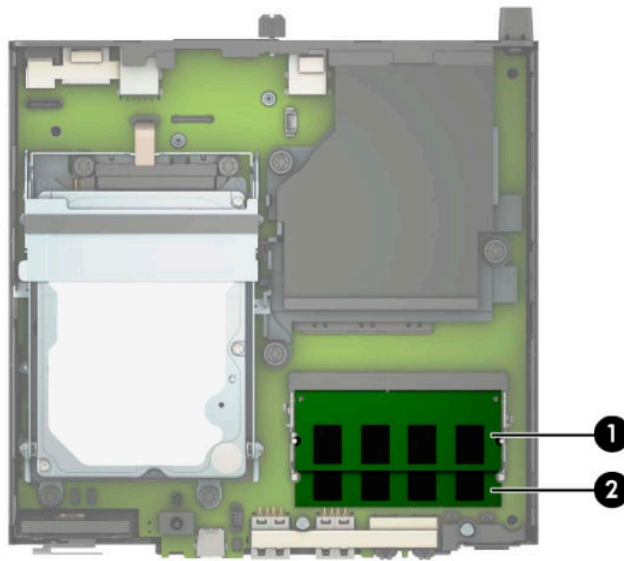
1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and turn off any external devices.
4. Disconnect the power cord from the AC outlet and disconnect any external devices.
5. If the computer is on a stand, remove the computer from the stand and lay the computer down.
6. Remove the computer access panel.

For instructions, see [Removing the computer access panel on page 9](#).

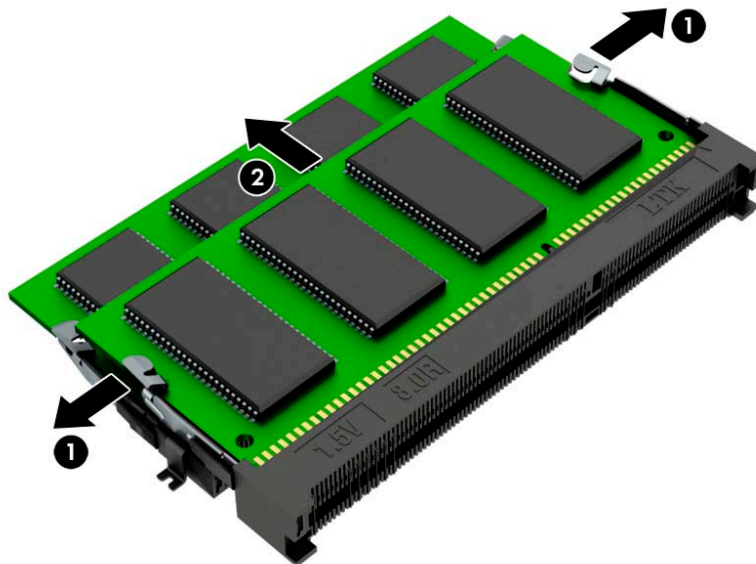
7. Tilt the fan up using the front tab and leave it in the up position.



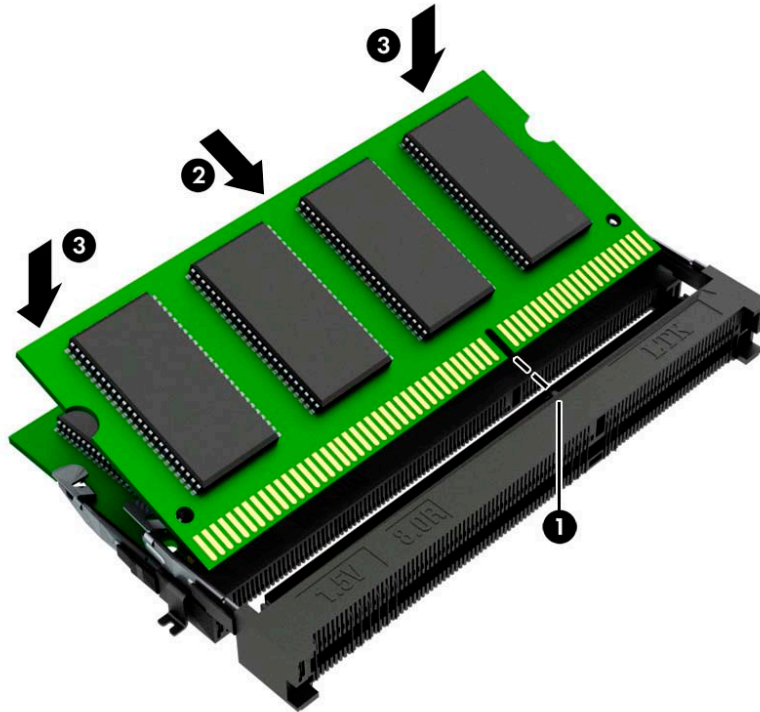
8. Locate the memory module locations (1) and (2) on the system board.




9. To remove a memory module, press outward on the two latches on each side of the memory module (1), and then pull the memory module (2) out of the slot.

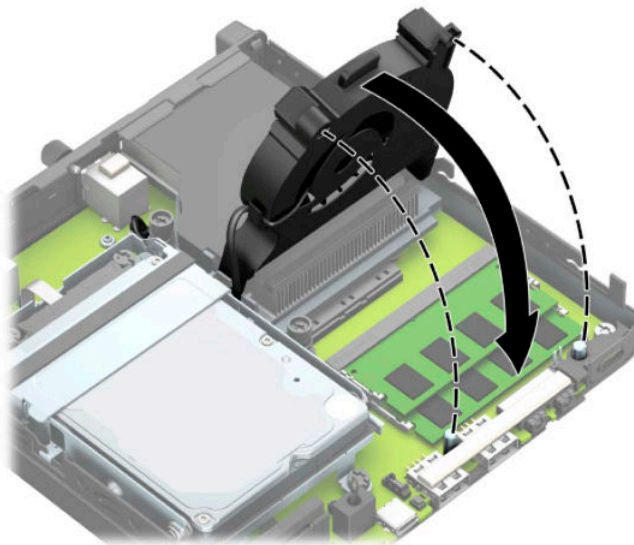


10. To install a memory module, match the notch on the new memory module with the tab on the memory slot (1). Slide the memory module into the slot (2) at approximately a 30° angle, and then press the memory module down (3) so that the latches lock it in place.



 **NOTE:** A memory module can be installed in only one way. Be sure to match the notch on the module with the tab on the memory module slot.

11. Tilt the fan down.




12. Replace the access panel.

For instructions, see [Replacing the computer access panel on page 10](#).

13. If the computer was on a stand, replace the stand.
14. Reconnect the power cord and any external devices, and then turn on the computer.
15. Lock any security devices that were disengaged when the computer cover or access panel was removed.


The computer should automatically recognize the new memory when you turn on the computer.

Removing a hard drive

 **NOTE:** Before you remove the old hard drive, be sure to back up the data from the old hard drive so that you can transfer the data to the new hard drive.

Models with a graphics processor do not include a hard drive.

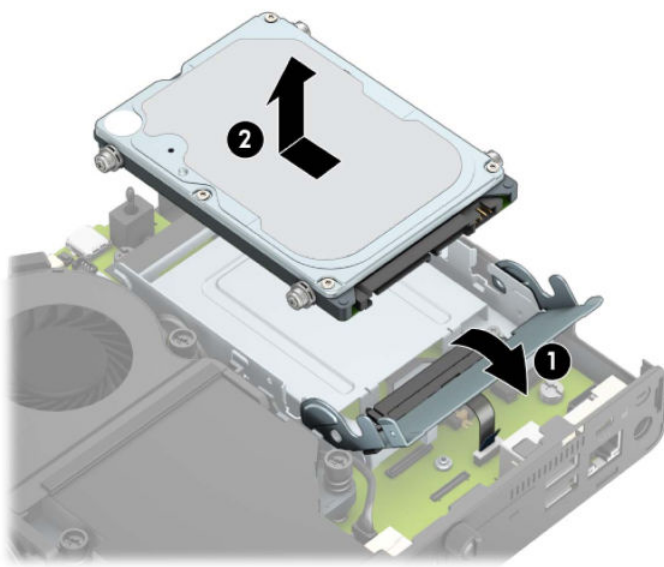
1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and turn off any external devices.
4. Disconnect the power cord from the AC outlet and disconnect any external devices.

 **IMPORTANT:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. To prevent damage to internal components, you must disconnect the power cord from the power source before opening the computer.

5. If the computer is on a stand, remove the computer from the stand.
6. Remove the computer access panel.

For instructions, see [Removing the computer access panel on page 9](#).

7. To remove the hard drive, rotate the hard drive latch up (1) to disengage the hard drive from the cage. Then slide the drive toward the rear of the chassis until it stops, and then lift the hard drive up and out of the cage (2).

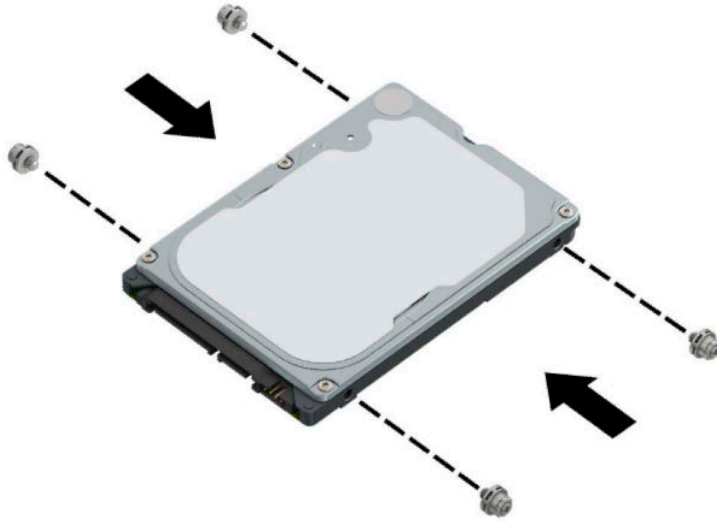


Installing a hard drive

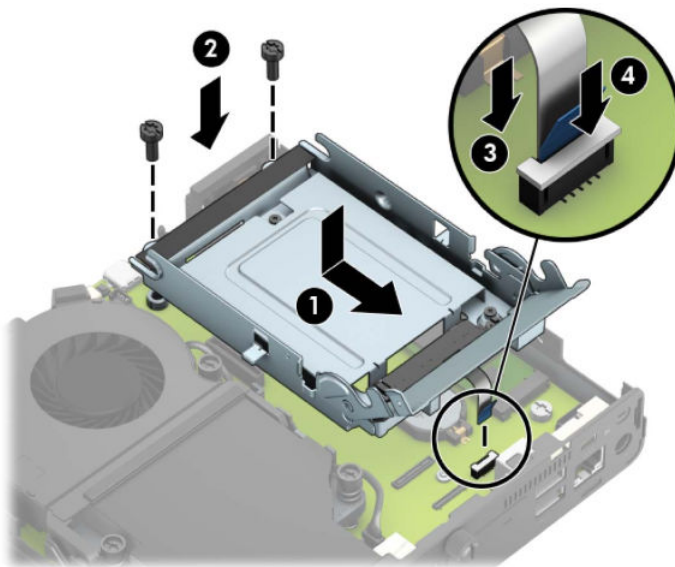
 **NOTE:** See [Removing a hard drive on page 16](#) for instructions on removing a hard drive.

1. If you are replacing a hard drive, transfer the four mounting screws from the old hard drive to the new hard drive.

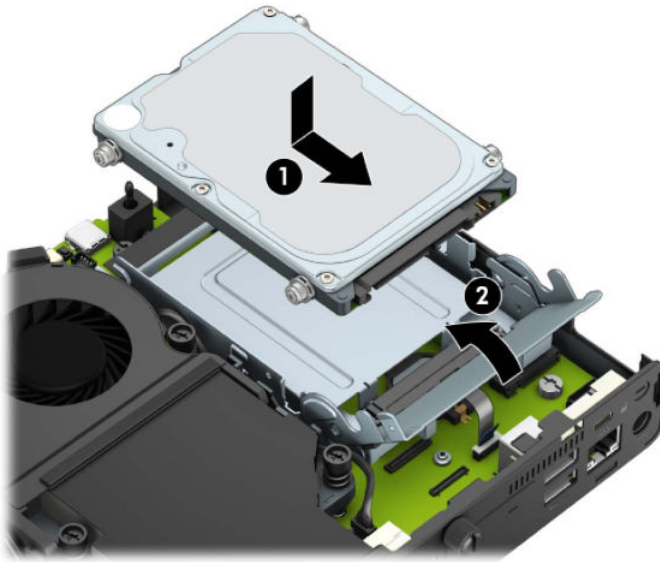
 **NOTE:** Mounting screws can be purchased from HP.



2. If you are installing a hard drive rather than replacing a hard drive, you must install the hard drive cage. Place the hard drive cage down into the chassis, and then slide it forward (1). Install the two screws (2) that secure the hard drive cage to the chassis, and then connect the hard drive cable (3) to the system board. Secure the cable by attaching the hard drive cable clamp (4) to the system board connector.




3. Align the hard drive mounting screws with the slots on the hard drive cage, press the hard drive down into the cage, and slide it forward (1). Then rotate the hard drive latch down (2) to engage the hard drive.



4. Replace the access panel.
For instructions, see [Replacing the computer access panel on page 10](#).
5. If the computer was on a stand, replace the stand.
6. Reconnect external devices, plug in the power cord, and then turn on the computer.
7. Lock any security devices that were disengaged when the access panel was removed.

Replacing an M.2 PCIe solid state drive (SSD)

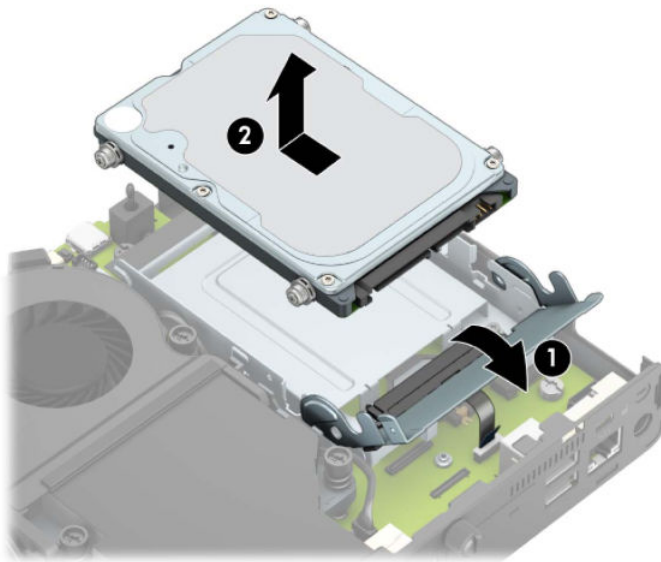
1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and turn off any external devices.
4. Disconnect the power cord from the AC outlet and disconnect any external devices.

 **IMPORTANT:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. To prevent damage to internal components, you must disconnect the power cord from the power source before opening the computer.

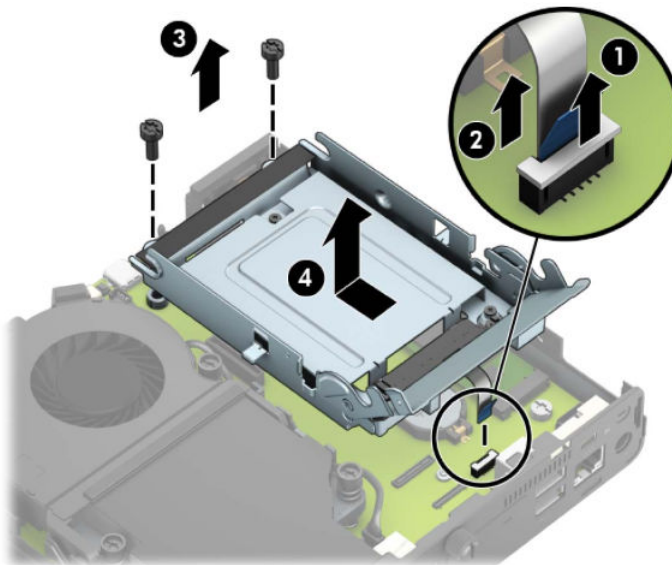
5. If the computer is on a stand, remove the computer from the stand and lay the computer down.
6. Remove the computer access panel.
For instructions, see [Removing the computer access panel on page 9](#).
7. To access the M.2 SSD, you must remove the hard drive cage or the graphics processor, depending on your model.

For models with a hard drive:

- a. Rotate the hard drive latch up (1) to disengage the hard drive from the cage. Then slide the drive toward the rear of the chassis until it stops, and then lift the hard drive up and out of the cage (2).

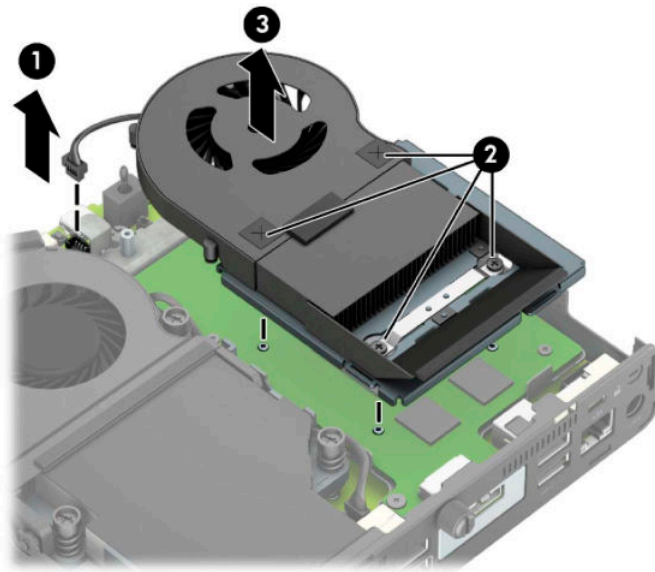


- b. Remove the hard drive cable clamp from the connector on the system board (1). Disconnect the hard drive cable (2) from the system board using the pull tab on the cable, and then remove the two screws (3) that secure the hard drive cage to the chassis. Slide the hard drive cage back and lift it (4) out of the chassis.

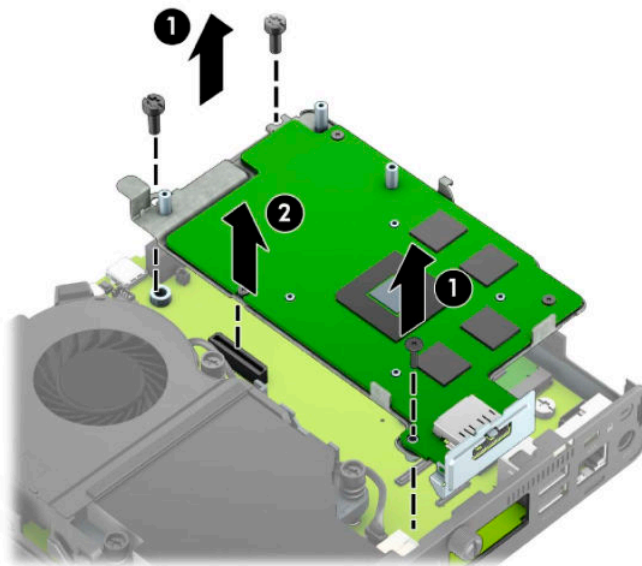


For models with a graphics processor:

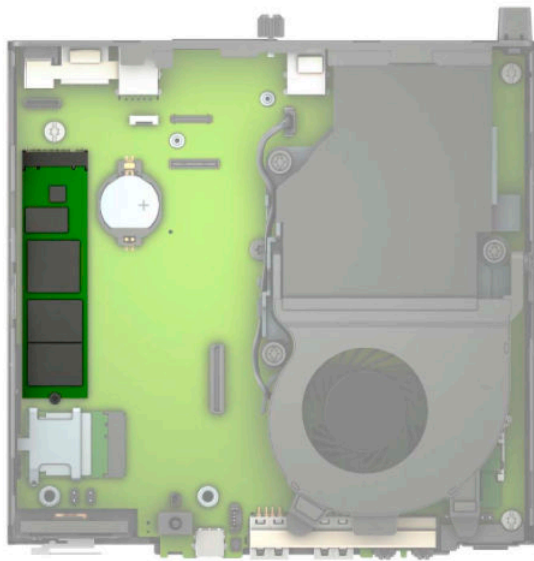
- a. Disconnect the fan cable (1) from the system board. Loosen the four screws (2) on the fan assembly, and then lift the fan assembly (3) out of the chassis.



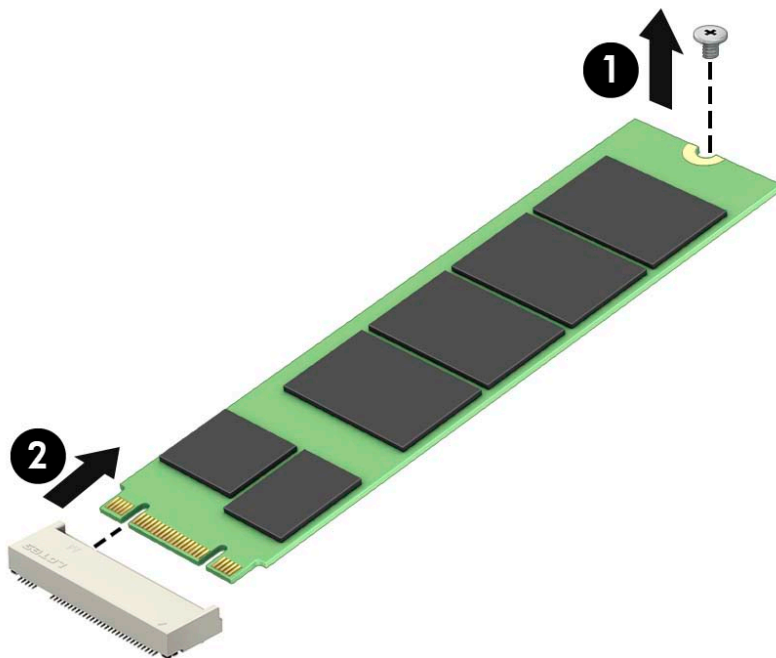
- b.** Remove the three screws (1) that secure the graphics processor to the chassis, and then lift the graphics processor (2) out of the chassis.



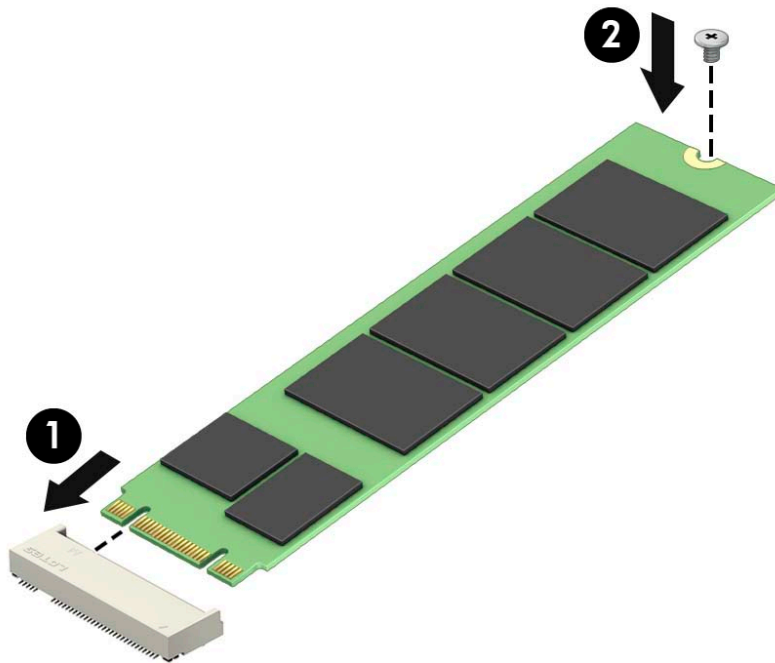
8. Locate the M.2 SSD on the system board.



9. Remove the screw (1) securing the SSD to the system board, and then pull the SSD from the socket (2) on the system board.



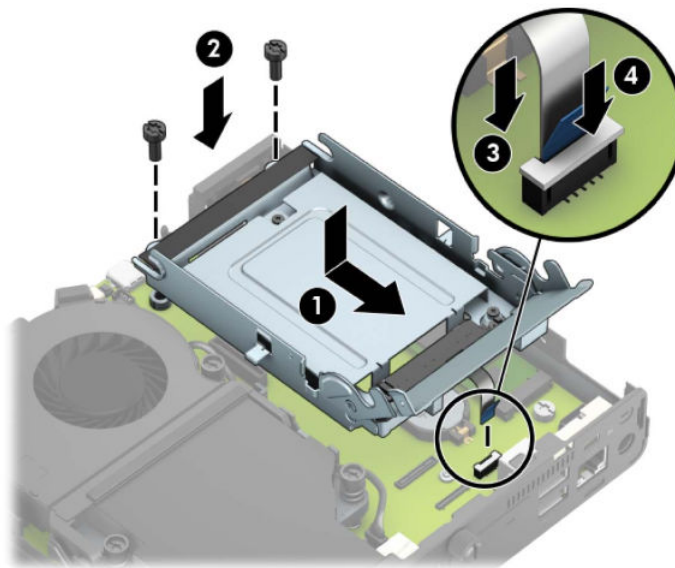
10. Slide the connector end of the SSD into the socket (1) on the system board, and then secure the SSD with the screw (2).



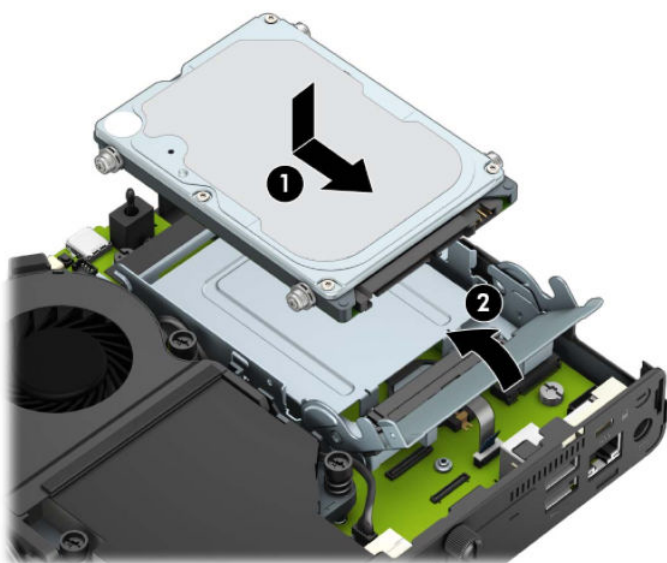
11. Replace the hard drive cage or the graphics processor, depending on your model.

For models with a hard drive:

- a. Place the hard drive cage down into the chassis, and then slide it forward (1). Install the two screws (2) that secure the hard drive cage to the chassis, and then connect the hard drive cable (3) to the system board. Secure the cable by attaching the hard drive cable clamp (4) to the system board connector.

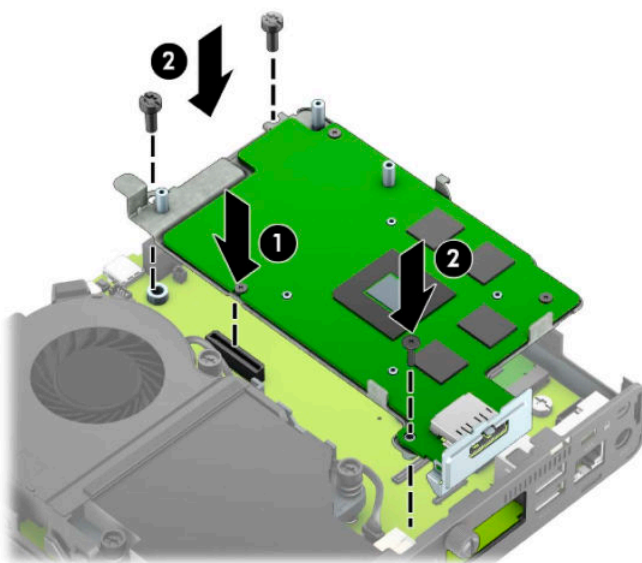


- b.** Align the hard drive mounting screws with the slots on the hard drive cage, press the hard drive down into the cage, and slide it forward (1). Then rotate the hard drive latch down (2) to engage the hard drive.

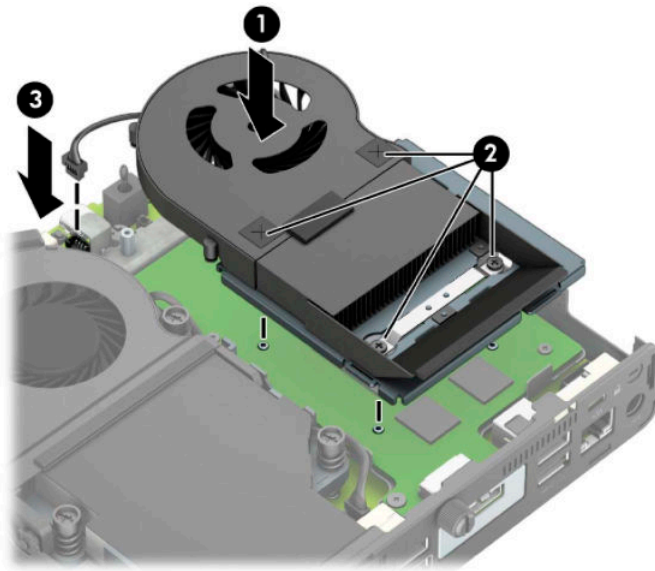


For models with a graphics processor:

- a.** Place the graphics processor down into the chassis so that it connects with the system board (1), and then secure the graphics processor to the system board with the three screws (2).



- b.** Place the fan assembly (1) on the graphics processor. Secure the fan assembly with the four screws (2), and then connect the fan assembly cable (3) to the system board.




- 12.** Replace the access panel.

For instructions, see [Replacing the computer access panel on page 10](#).

- 13.** If the computer was on a stand, replace the stand.
- 14.** Reconnect external devices, plug in the power cord, and then turn on the computer.
- 15.** Lock any security devices that were disengaged when the computer cover or access panel was removed.

Replacing the WLAN module

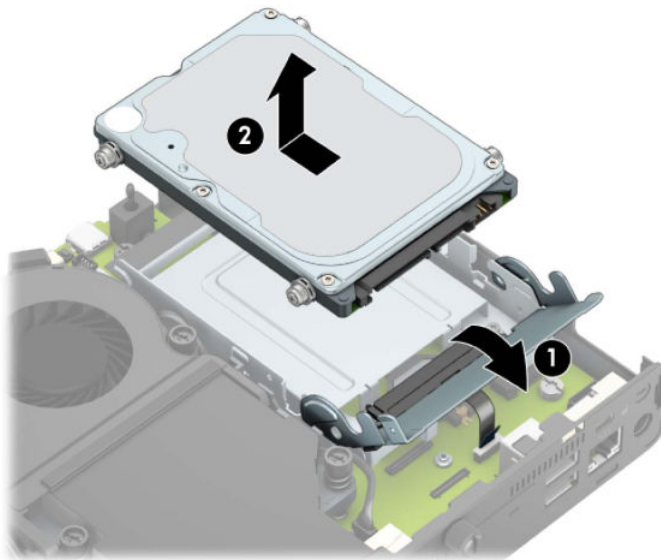
1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and turn off any external devices.
4. Disconnect the power cord from the AC outlet and disconnect any external devices.

 **IMPORTANT:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. To prevent damage to internal components, you must disconnect the power cord from the power source before opening the computer.

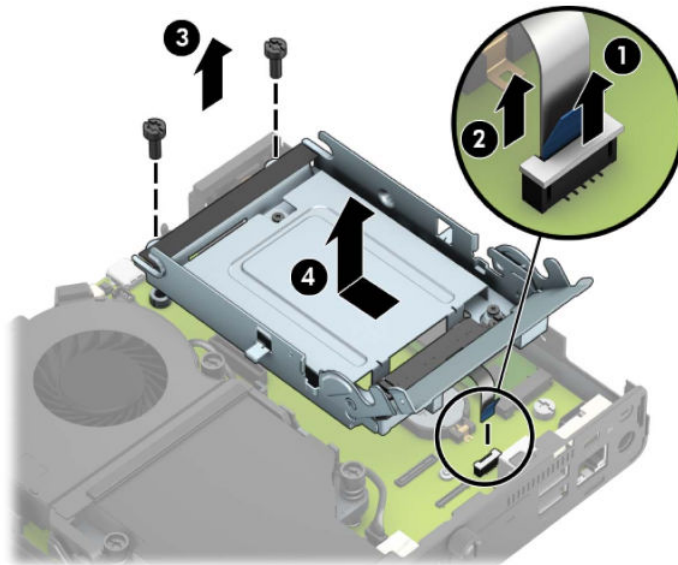
5. If the computer is on a stand, remove the computer from the stand and lay the computer down.
6. Remove the computer access panel.
For instructions, see [Removing the computer access panel on page 9](#).
7. To access the WLAN module, you must remove the hard drive cage or the graphics processor, depending on your model.

For models with a hard drive:

- a. Rotate the hard drive latch up (1) to disengage the hard drive from the cage. Then slide the drive toward the rear of the chassis until it stops, and then lift the hard drive up and out of the cage (2).

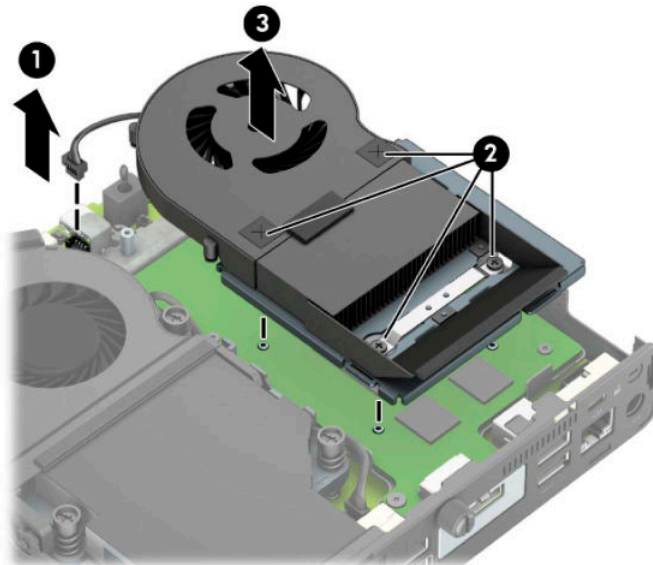


- b.** Remove the hard drive cable clamp from the connector on the system board (1). Disconnect the hard drive cable (2) from the system board using the pull tab on the cable, and then remove the two screws (3) that secure the hard drive cage to the chassis. Slide the hard drive cage back and lift it (4) out of the chassis.

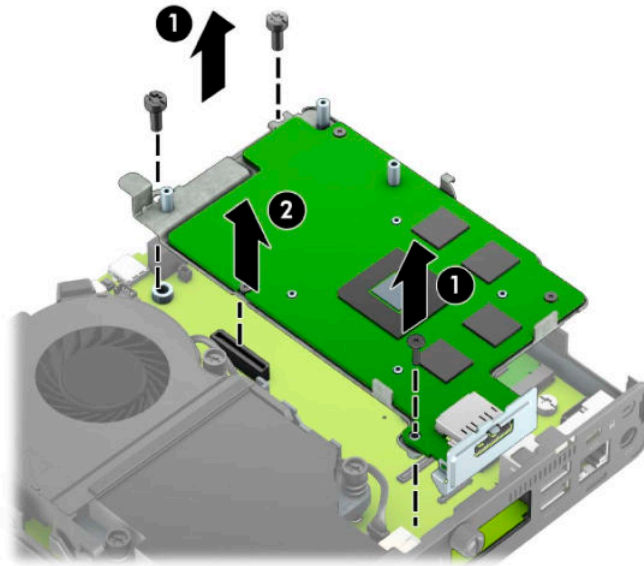


For models with a graphics processor:

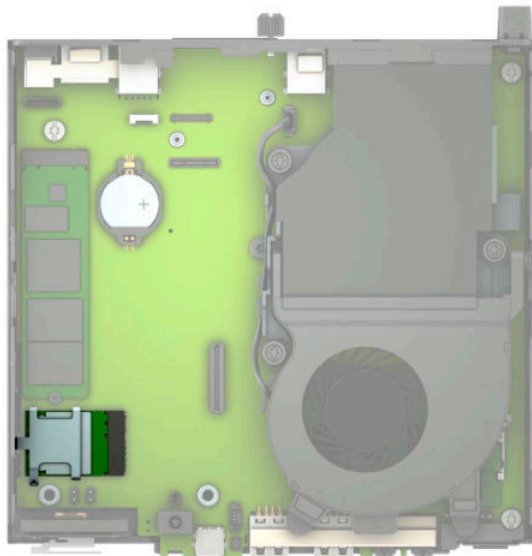
- a.** Disconnect the fan cable (1) from the system board. Loosen the four screws (2) on the fan assembly, and then lift the fan assembly (3) out of the chassis.




- b. Remove the three screws (1) that secure the graphics processor to the chassis, and then lift the graphics processor (2) out of the chassis.

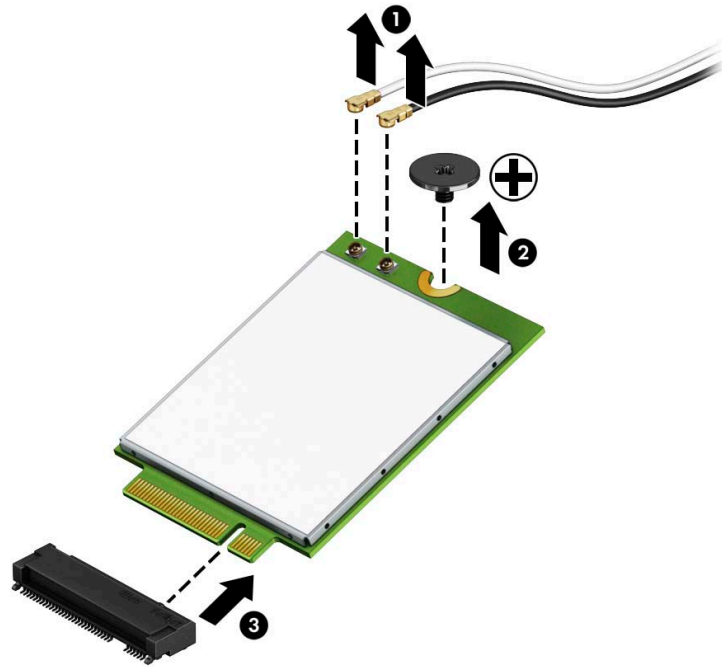


8. Locate the WLAN module on the system board.



9. Disconnect both antenna cables (1) from the WLAN module. Remove the screw (2) securing the WLAN module to the system board, and then grasp the WLAN module by the sides and pull it out of the socket (3).

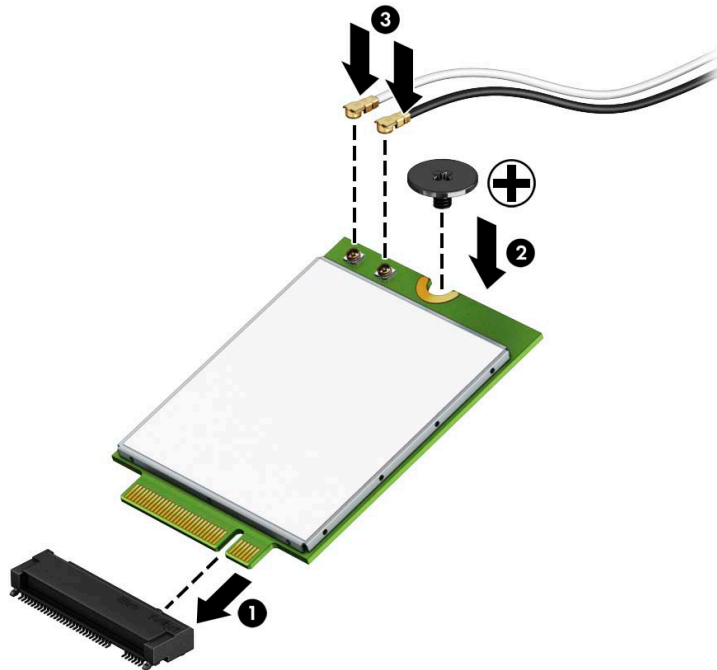
 **NOTE:** You may need to use a small tool, such as a pair of tweezers or needle-nose pliers, to disconnect and connect the antenna cables.



10. Insert the new WLAN module firmly into the socket (1) on the system board, and then secure the module to the system board using the screw (2) provided. Match the label on each antenna cable to the corresponding connector on the WLAN module and attach the antenna cables (3) to the connectors.



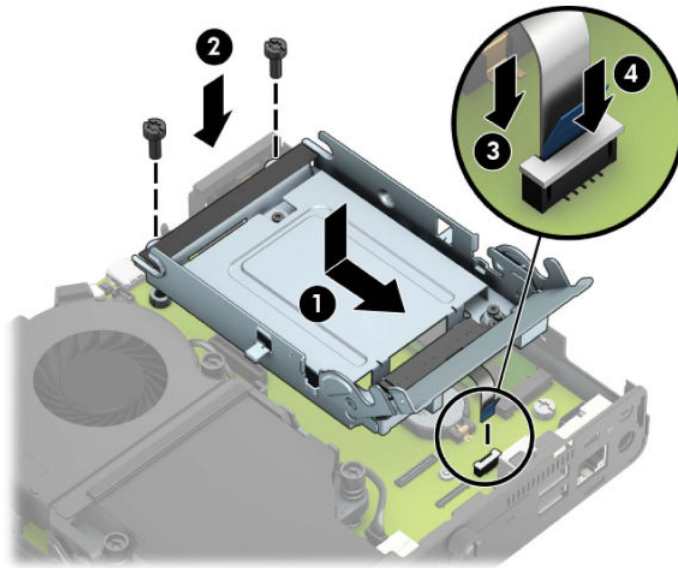
NOTE: A WLAN module can be installed in only one way.



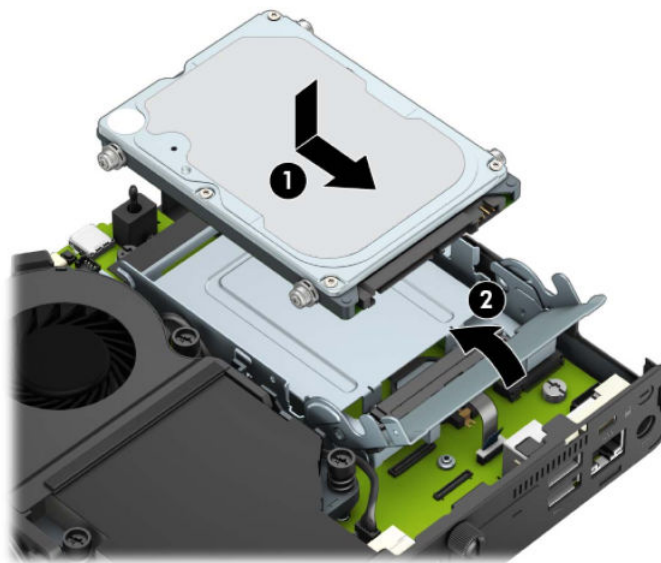
11. Replace the hard drive cage or the graphics processor, depending on your model.

For models with a hard drive:

- a. Place the hard drive cage down into the chassis, and then slide it forward (1). Install the two screws (2) that secure the hard drive cage to the chassis, and then connect the hard drive cable (3) to the system board. Secure the cable by attaching the hard drive cable clamp (4) to the system board connector.

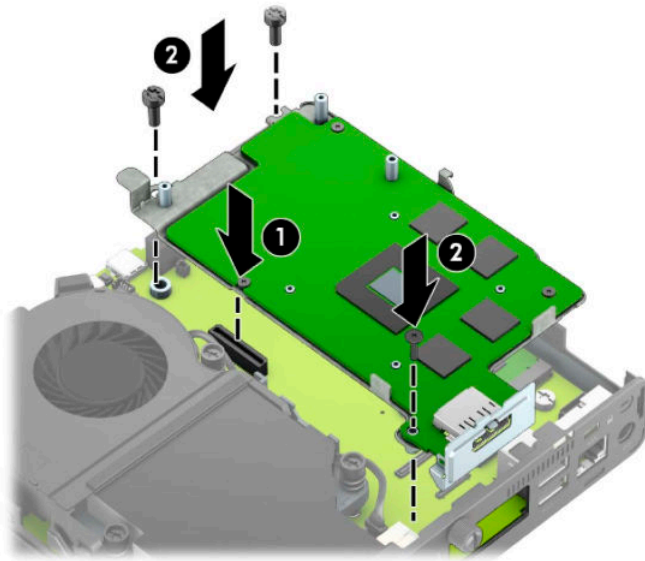


- b.** Align the hard drive mounting screws with the slots on the hard drive cage, press the hard drive down into the cage, and slide it forward (1). Then rotate the hard drive latch down (2) to engage the hard drive.

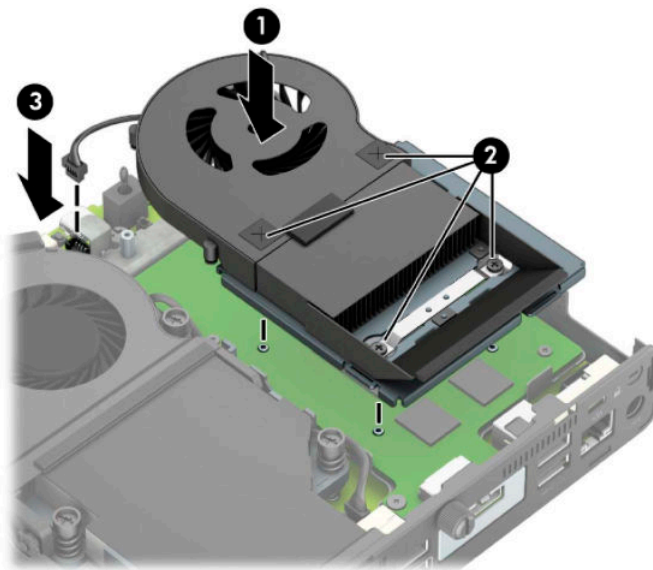


For models with a graphics processor:

- a.** Place the graphics processor down into the chassis so that it connects with the system board (1), and then secure the graphics processor to the system board with the three screws (2).



- b.** Place the fan assembly (1) on the graphics processor. Secure the fan assembly with the four screws (2), and then connect the fan assembly cable (3) to the system board.



- 12.** Replace the access panel.


For instructions, see [Replacing the computer access panel on page 10](#).

- 13.** If the computer was on a stand, replace the stand.
- 14.** Plug in the power cord and turn on the computer.
- 15.** Lock any security devices that were disengaged when the computer cover or access panel was removed.

Installing an external antenna

Internal WLAN antennas are standard. If the computer is to be installed in a metal kiosk or other enclosure, you may want to use an external WLAN antenna.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and turn off any external devices.
4. Disconnect the power cord from the AC outlet and disconnect any external devices.

 **IMPORTANT:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. To prevent damage to internal components, you must disconnect the power cord from the power source before opening the computer.

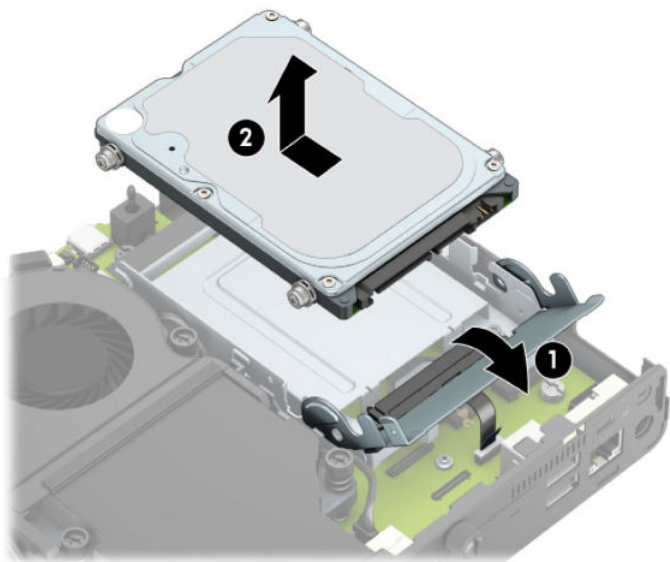
5. If the computer is on a stand, remove the computer from the stand and lay the computer down.
6. Remove the computer access panel.

For instructions, see [Removing the computer access panel on page 9](#).

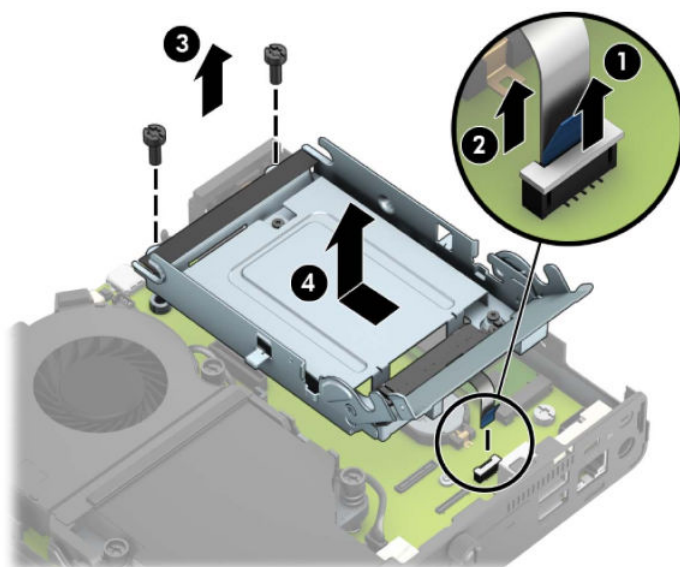
7. To access the WLAN module, you must remove the hard drive cage or the graphics processor, depending on your model.

For models with a hard drive:

- a. Rotate the hard drive latch up (1) to disengage the hard drive from the cage. Then slide the drive toward the rear of the chassis until it stops, and then lift the hard drive up and out of the cage (2).

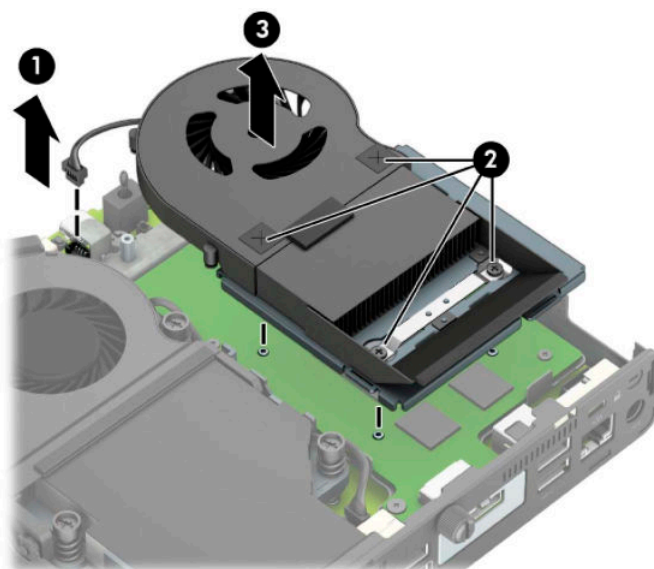


- b.** Remove the hard drive cable clamp from the connector on the system board (1). Disconnect the hard drive cable (2) from the system board using the pull tab on the cable, and then remove the two screws (3) that secure the hard drive cage to the chassis. Slide the hard drive cage back and lift it (4) out of the chassis.

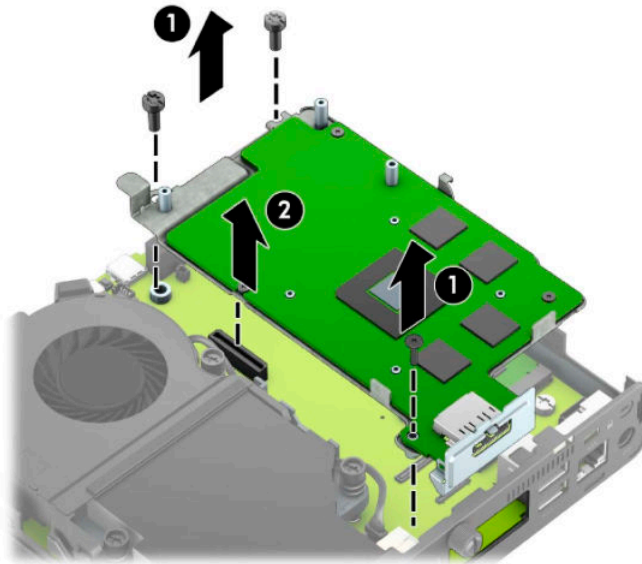


For models with a graphics processor:

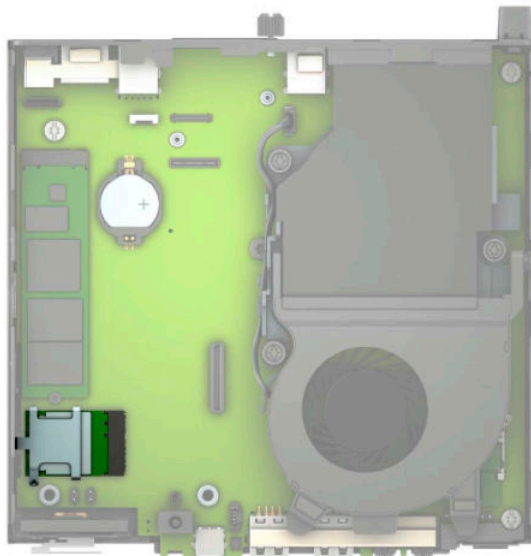
- a.** Disconnect the fan cable (1) from the system board. Loosen the four screws (2) on the fan assembly, and then lift the fan assembly (3) out of the chassis.



- b. Remove the three screws (1) that secure the graphics processor to the chassis, and then lift the graphics processor (2) out of the chassis.



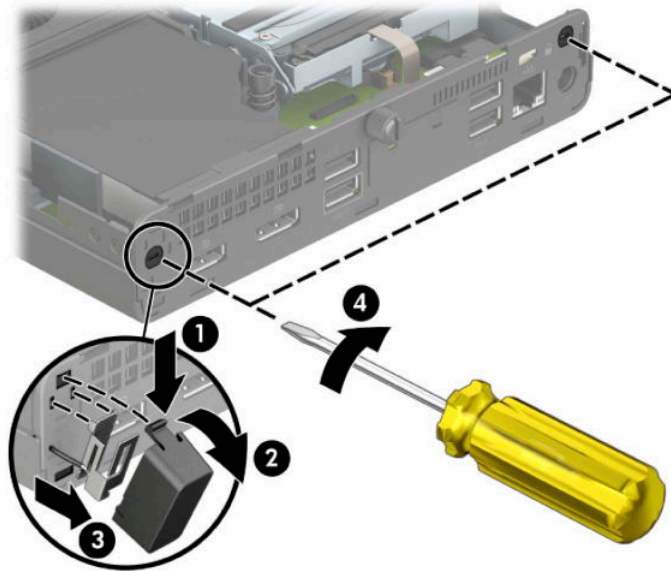
8. Locate the WLAN module on the system board.



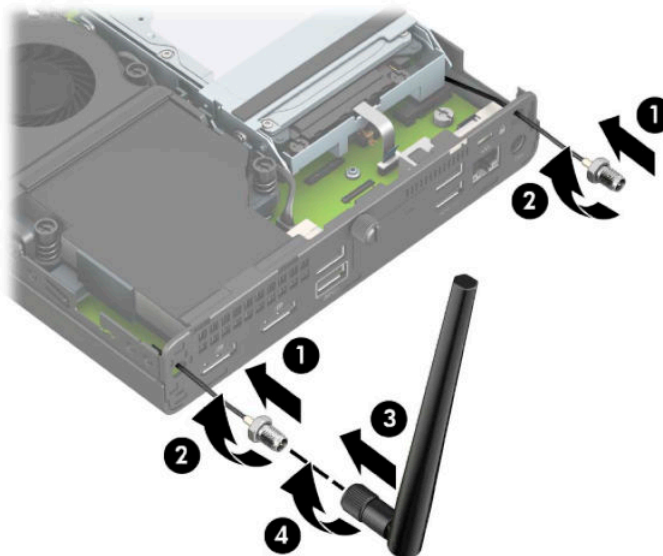
9. Disconnect the internal antenna cables from the WLAN module.
For instructions, see [Replacing the WLAN module on page 25](#).
10. Locate both external antenna positions on the rear of the chassis.

11. To view the knock-out feature on the left side of the rear panel, remove the antenna cover by pushing down on the antenna cover (1) and pulling it away from the panel (2). Disconnect the internal antenna (3) from the chassis and pull the internal antenna cable out of the chassis. Then insert a flat-bladed screwdriver into each knock-out feature (3) and rotate to remove the blanks.

 **NOTE:** You may need needle nose pliers to pull the internal cable out of the chassis.



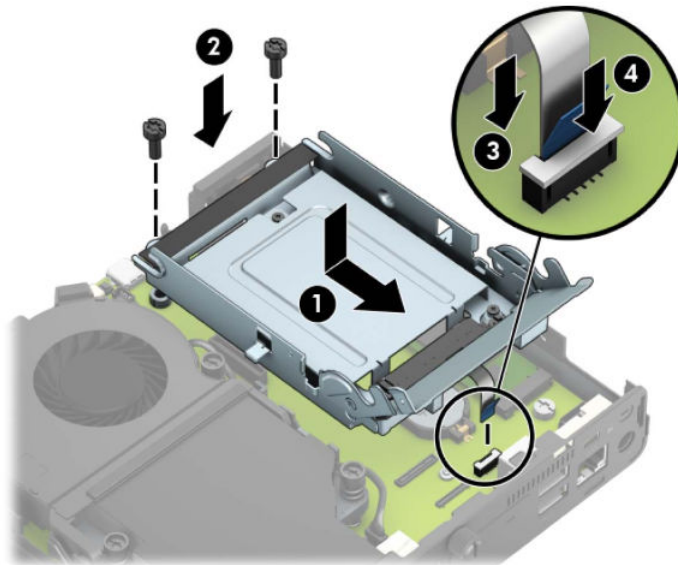
12. Feed the external antenna cable through each hole (1) and screw the antenna (2) into position. Attach the antenna extension (3) and screw it on (4).



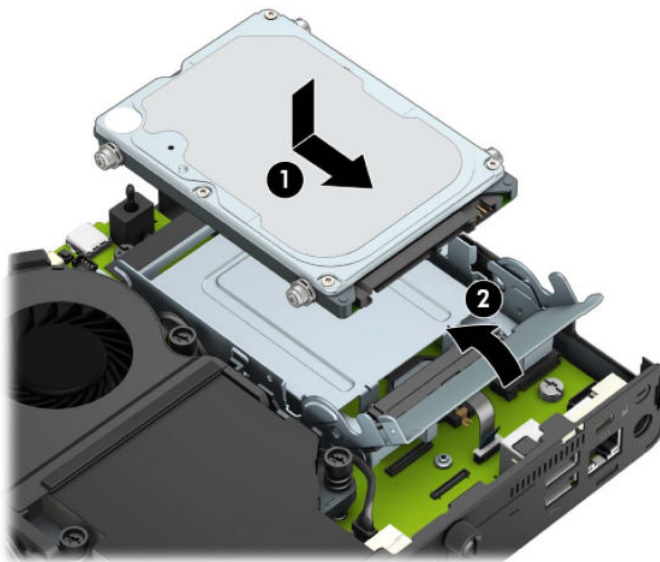
13. Connect the external antenna cables to the WLAN module. Be sure to match the labels on the antenna cables to the corresponding connectors on the WLAN module when connecting the cables.
14. Replace the hard drive cage or the graphics processor, depending on your model.

For models with a hard drive:

- a.** Place the hard drive cage down into the chassis, and then slide it forward (1). Install the two screws (2) that secure the hard drive cage to the chassis, and then connect the hard drive cable (3) to the system board. Secure the cable by attaching the hard drive cable clamp (4) to the system board connector.

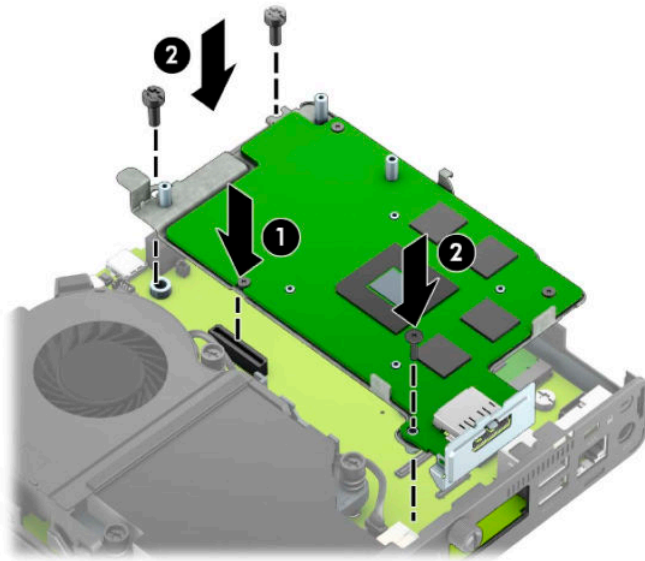


- b.** Align the hard drive mounting screws with the slots on the hard drive cage, press the hard drive down into the cage, and slide it forward (1). Then rotate the hard drive latch down (2) to engage the hard drive.

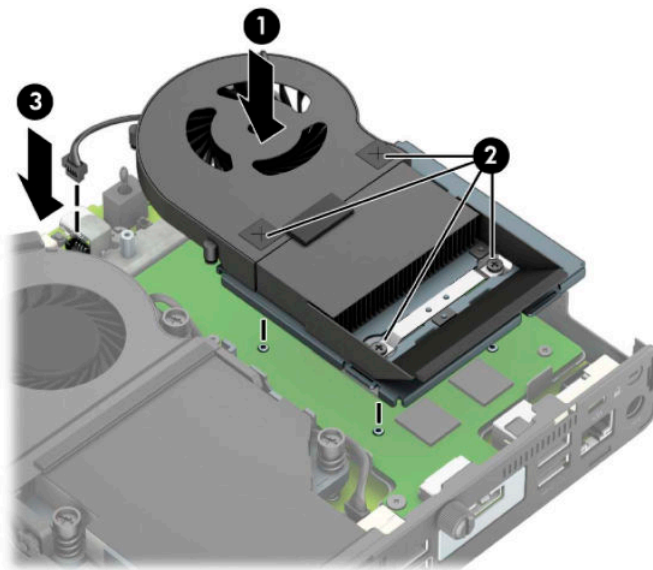


For models with a graphics processor:

- a.** Place the graphics processor down into the chassis so that it connects with the system board (1), and then secure the graphics processor to the system board with the three screws (2).




- b.** Place the fan assembly (1) on the graphics processor. Secure the fan assembly with the four screws (2), and then connect the fan assembly cable (3) to the system board.



- 15.** Replace the access panel.
For instructions, see [Replacing the computer access panel on page 10](#).
- 16.** If the computer was on a stand, replace the stand.
- 17.** Plug in the power cord and turn on the computer.
- 18.** Lock any security devices that were disengaged when the computer cover or access panel was removed.

Replacing the battery

The battery that comes with the computer provides power to the real-time clock. When replacing the battery, use a battery equivalent to the battery originally installed in the computer. The computer comes with a 3-volt lithium coin cell battery.


 **WARNING!** The computer contains an internal lithium manganese dioxide battery. There is a risk of fire and burns if the battery is not handled properly. To reduce the risk of personal injury:

Do not attempt to recharge the battery.


Do not expose to temperatures higher than 60°C (140°F).

Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.

Replace the battery only with the HP spare designated for this product.


 **IMPORTANT:** Before replacing the battery, it is important to back up the computer CMOS settings. When the battery is removed or replaced, the CMOS settings will be cleared.

Static electricity can damage the electronic components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

 **NOTE:** The lifetime of the lithium battery can be extended by plugging the computer into a live AC wall socket. The lithium battery is only used when the computer is NOT connected to AC power.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, go to <http://www.hp.com/recycle>.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as a USB flash drive, from the computer.
3. Turn off the computer properly through the operating system, and turn off any external devices.
4. Disconnect the power cord from the AC outlet and disconnect any external devices.

 **IMPORTANT:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. To prevent damage to internal components, you must disconnect the power cord from the power source before opening the computer.

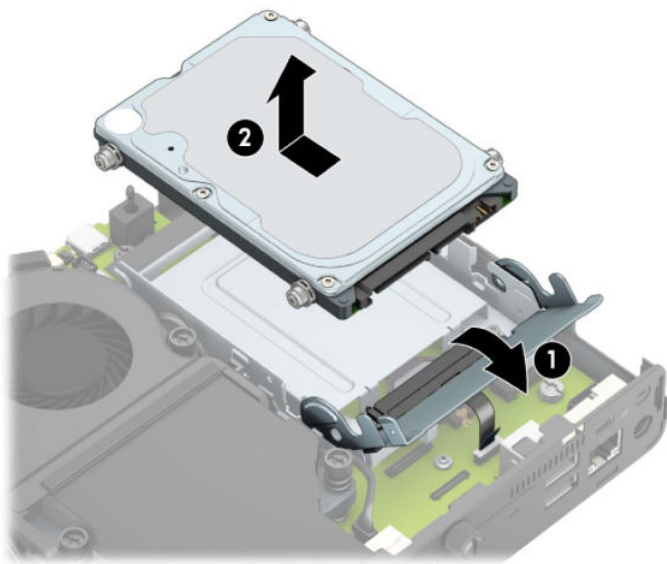
5. If the computer is on a stand, remove the computer from the stand and lay the computer down.
6. Remove the computer access panel.

For instructions, see [Removing the computer access panel on page 9](#).

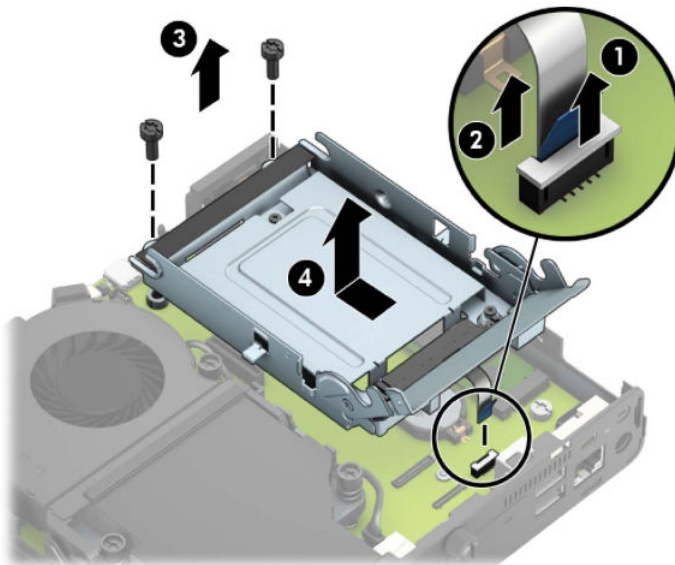
7. To access the battery, you must remove the hard drive cage or the graphics processor, depending on your model.

For models with a hard drive:

- a. Rotate the hard drive latch up (1) to disengage the hard drive from the cage. Slide the drive toward the rear of the chassis until it stops, and then lift the hard drive up and out of the cage (2).

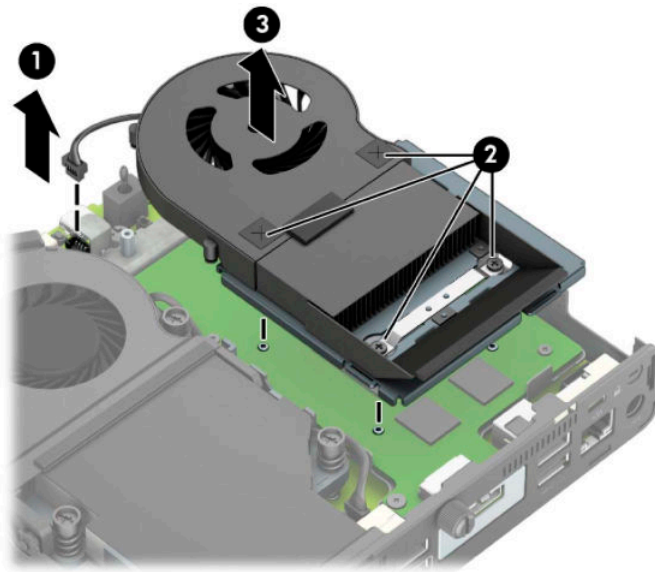


- b.** Remove the hard drive cable clamp from the connector on the system board (1). Disconnect the hard drive cable (2) from the system board using the pull tab on the cable, and then remove the two screws (3) that secure the hard drive cage to the chassis. Slide the hard drive cage back and lift it (4) out of the chassis.

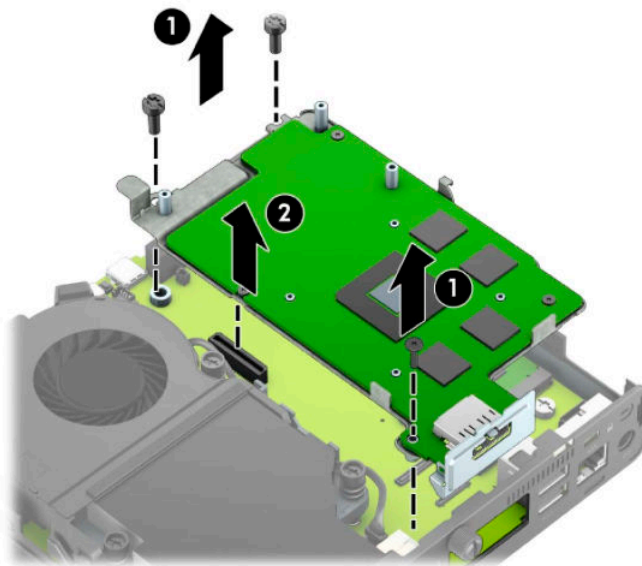


For models with a graphics processor:

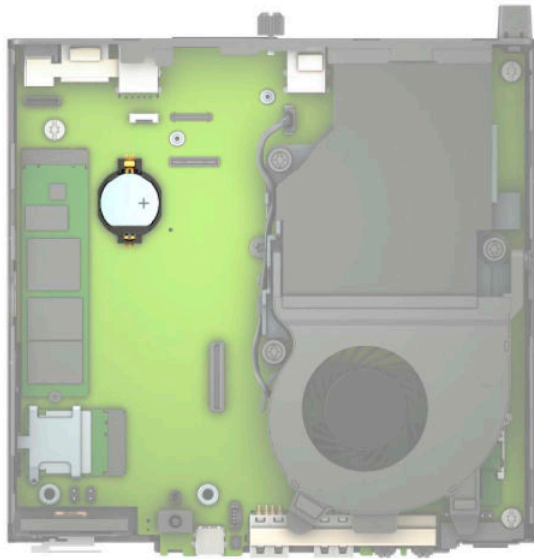
- a.** Disconnect the fan cable (1) from the system board. Loosen the four screws (2) on the fan assembly, and then lift the fan assembly (3) out of the chassis.



- b. Remove the three screws (1) that secure the graphics processor to the chassis, and then lift the graphics processor (2) out of the chassis.

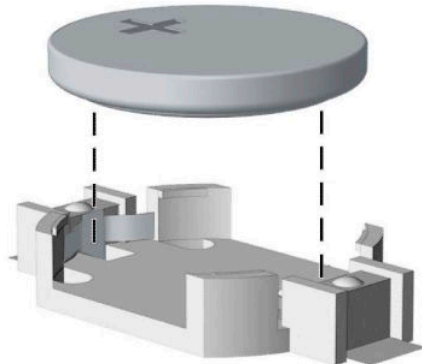


8. Locate the battery and battery holder on the system board.



NOTE: You may need to use a small tool, such as tweezers or needle-nose pliers, to remove and replace the battery.

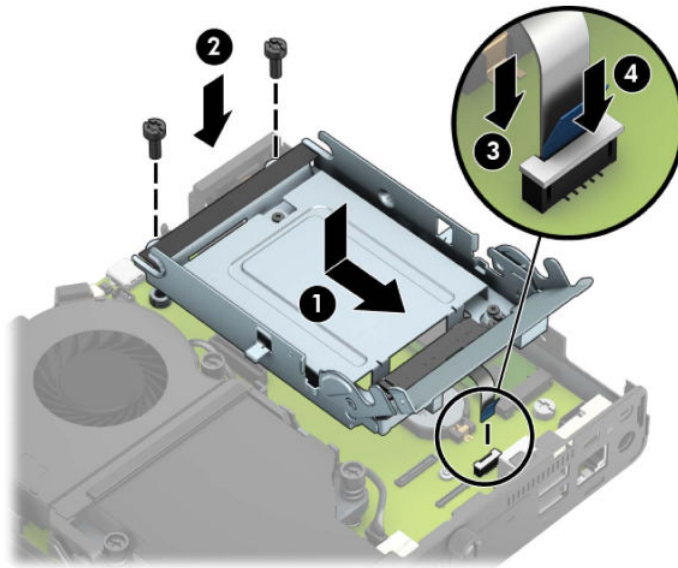
9. Lift the battery out of the holder.



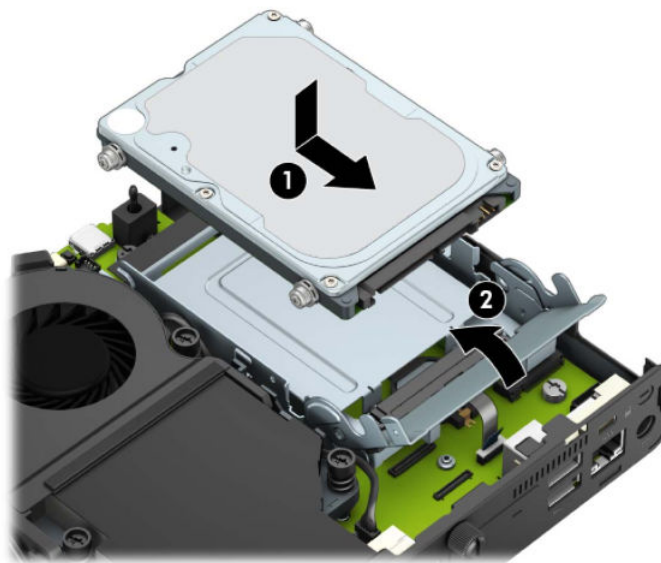
10. Slide the replacement battery into position, positive side up. The battery holder automatically secures the battery in the proper position.
11. Replace the hard drive cage or the graphics processor, depending on your model.

For models with a hard drive:

- a. Place the hard drive cage down into the chassis, and then slide it forward (1). Install the two screws (2) that secure the hard drive cage to the chassis, and then connect the hard drive cable (3) to the system board. Secure the cable by attaching the hard drive cable clamp (4) to the system board connector.

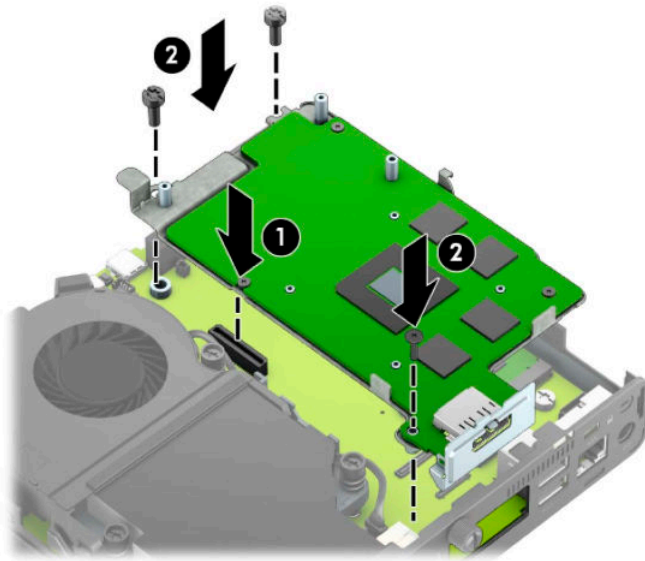


- b.** Align the hard drive mounting screws with the slots on the hard drive cage, press the hard drive down into the cage, and slide it forward (1). Then rotate the hard drive latch down (2) to engage the hard drive.

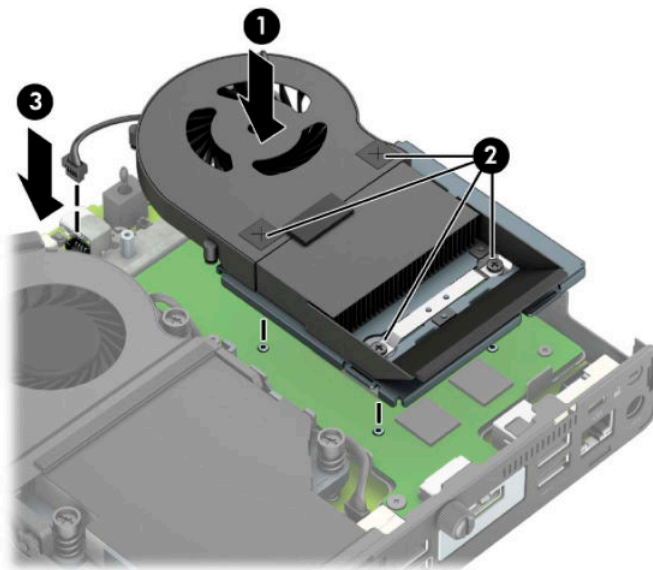


For models with a graphics processor:

- a.** Place the graphics processor down into the chassis so that it connects with the system board (1), and then secure the graphics processor to the system board with the three screws (2).



- b.** Place the fan assembly (1) on the graphics processor. Secure the fan assembly with the four screws (2), and then connect the fan assembly cable (3) to the system board.

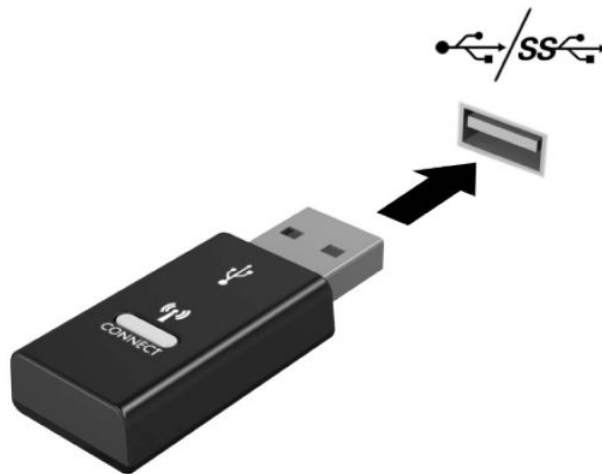


- 12.** Replace the computer access panel.
- 13.** If the computer was on a stand, replace the stand.
- 14.** Plug in the power cord and turn on the computer.
- 15.** Lock any security devices that were disengaged when the computer access panel was removed.
- 16.** Reset the date and time, your passwords, and any special system setups using Computer Setup.

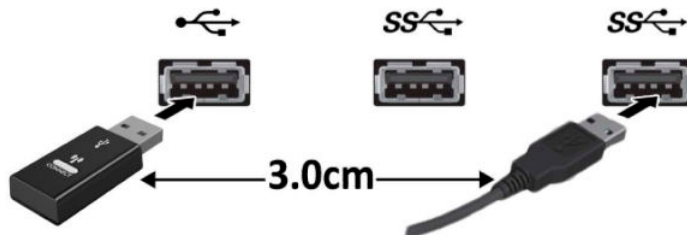
Synchronizing the optional wireless keyboard and mouse

The mouse and keyboard are synchronized at the factory. If they do not work, remove and replace the batteries. If the mouse and keyboard are still not synchronized, follow this procedure to manually re-synchronize the pair.

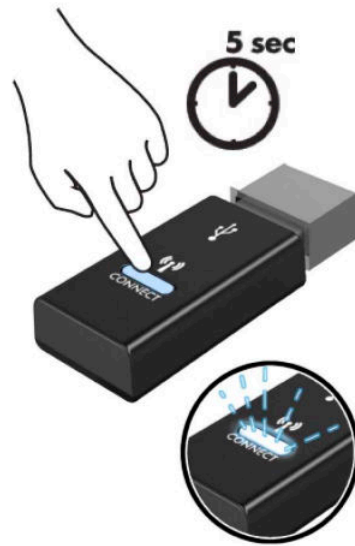
1. Connect the receiver to a USB port on the computer. If your computer only has USB SuperSpeed ports, connect the receiver to a USB SuperSpeed port.



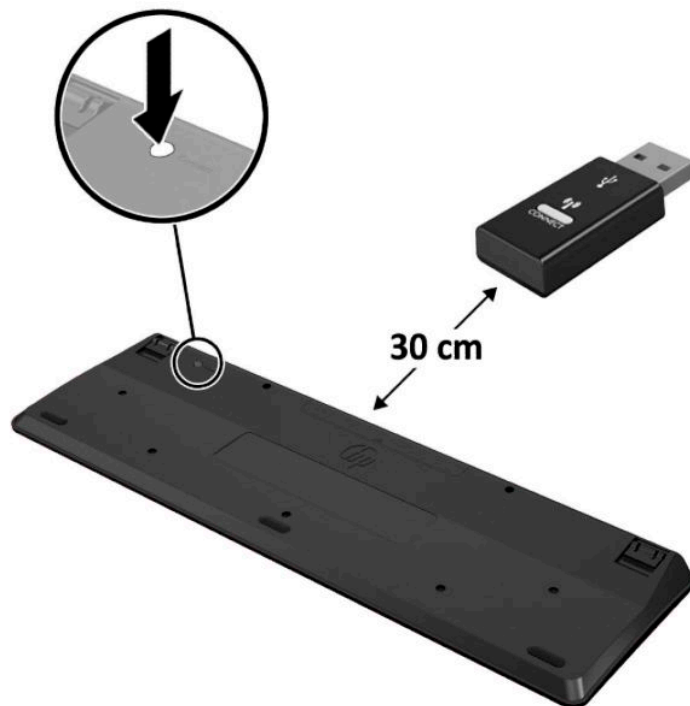
2. To avoid signal interference with a USB SuperSpeed device, distance the receiver at least 3.0 cm from the USB SuperSpeed device.



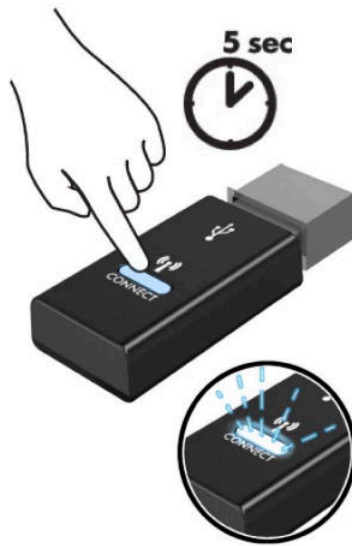
3. Press the Connect button on the receiver for approximately five seconds. The status light on the receiver will flash for approximately 30 seconds after the Connect button is pressed.



4. While the status light on the receiver is flashing, press the Connect button on the underside of the keyboard for five to ten seconds. After the Connect button is released, the status light on the receiver will stop flashing, indicating that the devices have been synchronized.




5. Press the Connect button on the receiver for approximately five seconds. The status light on the receiver will flash for approximately 30 seconds after the Connect button is pressed.



6. While the status light on the receiver is flashing, press the Connect button on the underside of the mouse for five to ten seconds. After the Connect button is released, the status light on the receiver will stop flashing, indicating that the devices have been synchronized.



 **NOTE:** If the mouse and keyboard still do not work, remove and replace the batteries. If the mouse and keyboard are still not synchronized, synchronize the keyboard and mouse again.

A Electrostatic discharge

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing electrostatic damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm \pm 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heelstraps, toestraps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, contact an HP authorized dealer, reseller, or service provider.



NOTE: For more information on static electricity, contact an HP authorized dealer, reseller, or service provider.

B Computer operating guidelines, routine care and shipping preparation

Computer operating guidelines and routine care

Follow these guidelines to properly set up and care for the computer and monitor:

- Keep the computer away from excessive moisture, direct sunlight, and extremes of heat and cold.
- Operate the computer on a sturdy, level surface. Leave a 10.2 cm (4 inch) clearance on all vented sides of the computer and above the monitor to permit the required airflow.
- Never restrict the airflow into the computer by blocking any vents or air intakes. Do not place the keyboard, with the keyboard feet down, directly against the front of the desktop unit as this also restricts airflow.
- Never operate the computer with the access panel or any of the expansion card slot covers removed.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.
- Keep liquids away from the computer and keyboard.
- Never cover the ventilation slots on the monitor with any type of material.
- Install or enable power management functions of the operating system or other software, including sleep states.
- Turn off the computer before you do either of the following:
 - Wipe the exterior of the computer with a soft, damp cloth as needed. Using cleaning products may discolor or damage the finish.
 - Occasionally clean the air vents on all vented sides of the computer. Lint, dust, and other foreign matter can block the vents and limit the airflow.

Shipping preparation

Follow these suggestions when preparing to ship the computer:

1. Back up the hard drive files to an external storage device. Be sure that the backup media is not exposed to electrical or magnetic impulses while stored or in transit.



NOTE: The hard drive locks automatically when the system power is turned off.

2. Remove and store all removable media.
3. Turn off the computer and external devices.
4. Disconnect the power cord from the AC outlet, then from the computer.
5. Disconnect the system components and external devices from their power sources, then from the computer.



NOTE: Ensure that all boards are seated properly and secured in the board slots before shipping the computer.

6. Pack the system components and external devices in their original packing boxes or similar packaging with sufficient packing material to protect them.

C Accessibility

HP designs, produces, and markets products and services that can be used by everyone, including people with disabilities, either on a stand-alone basis or with appropriate assistive devices.

Supported assistive technologies

HP products support a wide variety of operating system assistive technologies and can be configured to work with additional assistive technologies. Use the Search feature on your device to locate more information about assistive features.



NOTE: For additional information about a particular assistive technology product, contact customer support for that product.

Contacting support

We are constantly refining the accessibility of our products and services and welcome feedback from users. If you have an issue with a product or would like to tell us about accessibility features that have helped you, please contact us at (888) 259-5707, Monday through Friday, 6 a.m. to 9 p.m. Mountain Time. If you are deaf or hard-of-hearing and use TRS/VRS/WebCapTel, contact us if you require technical support or have accessibility questions by calling (877) 656-7058, Monday through Friday, 6 a.m. to 9 p.m. North American Mountain Time.



NOTE: Support is in English only.

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