# Hardware Reference Guide

## OMEN X

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**Product notice**

This guide describes features that are common to most models. Some features may not be available on your computer.

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# About this book

**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.

# Table of contents


1 Product features ..... 1
Front ..... 2
Color zones ..... 3
Right ..... 4
Back ..... 6
Bottom ..... 7

2 Hardware upgrades ..... 8
Warnings and cautions ..... 8
Preparing for disassembly ..... 8
Accessing the tool kit ..... 9
Replacing or installing drives ..... 9
Installing a drive ..... 10
Removing a drive ..... 14
Drive security ..... 16
Removing and replacing the access panel ..... 18
Installing system memory ..... 18
Populating DIMM sockets ..... 19
Replacing or installing DIMMs ..... 20
Installing graphics cards ..... 22
Removing the PCI fan ..... 24
Installing a system board ..... 25
Removing the hard drive fan ..... 27
Installing a power supply ..... 28
Installing a radiator bracket for liquid cooling ..... 31
Cleaning filters ..... 32

Appendix A Electrostatic discharge ..... 33
Preventing electrostatic damage ..... 33
Grounding methods ..... 33

Appendix B Computer operating guidelines and routine care ..... 34

Appendix C Accessibility ..... 35
Supported assistive technologies ..... 35
Contacting support ..... 35

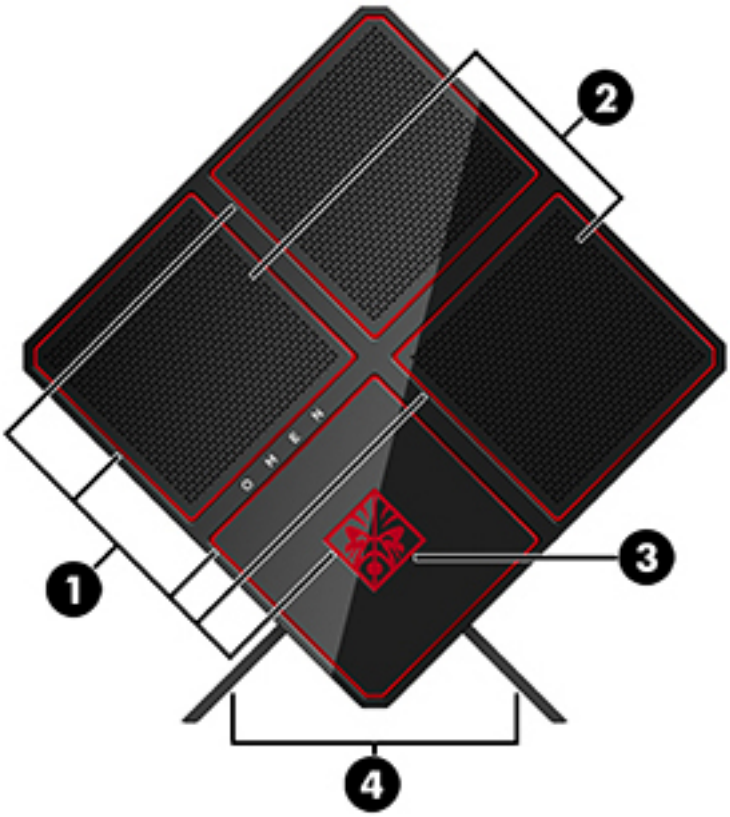
Index ..... 36

# 1 Product features

OMEN X is a high performance, customizable, expandable gaming tower.

**NOTE:** Product colors and features may vary.

# Front

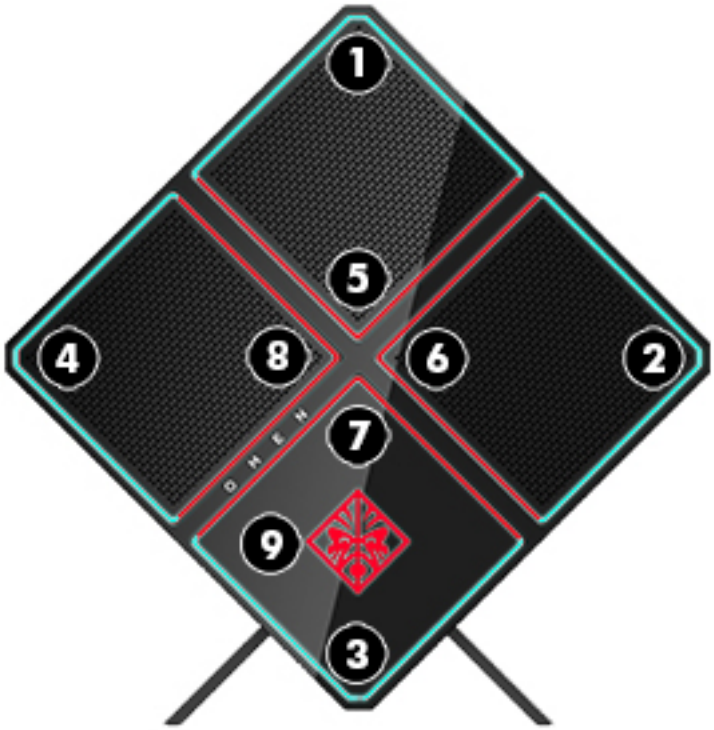



| Component | | Description |
|---|---|---|
| **(1)** | Lighted color zones | Create unique lighting effects on the computer.<br>**NOTE:** See Color zones on page 3 for more information. |
| **(2)** | Vents (2) | Enable airflow to cool internal components.<br>**NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| **(3)** | Tool kit (located under the logo panel) | Contains a wrench and screws required to install computer components and graphics card fans.<br>**WARNING!** To reduce the risk of serious injury or damage to the equipment, do not open the chassis cover of any computer containing a 600 W PSU, 750 W PSU, or 1300 W PSU. To determine if you have a 600 W, 750 W, or 1300 W PSU, refer to the label on the back of the computer. |
| **(4)** | Stand | Holds the computer in an upright position. |

## Color zones

The computer includes nine programmable lighted color zones that allow you to create unique lighting effects. With OMEN Control, you can customize the colors of each zone or group of zones.

**NOTE:** When you first set up your computer, all of the color zones are red.



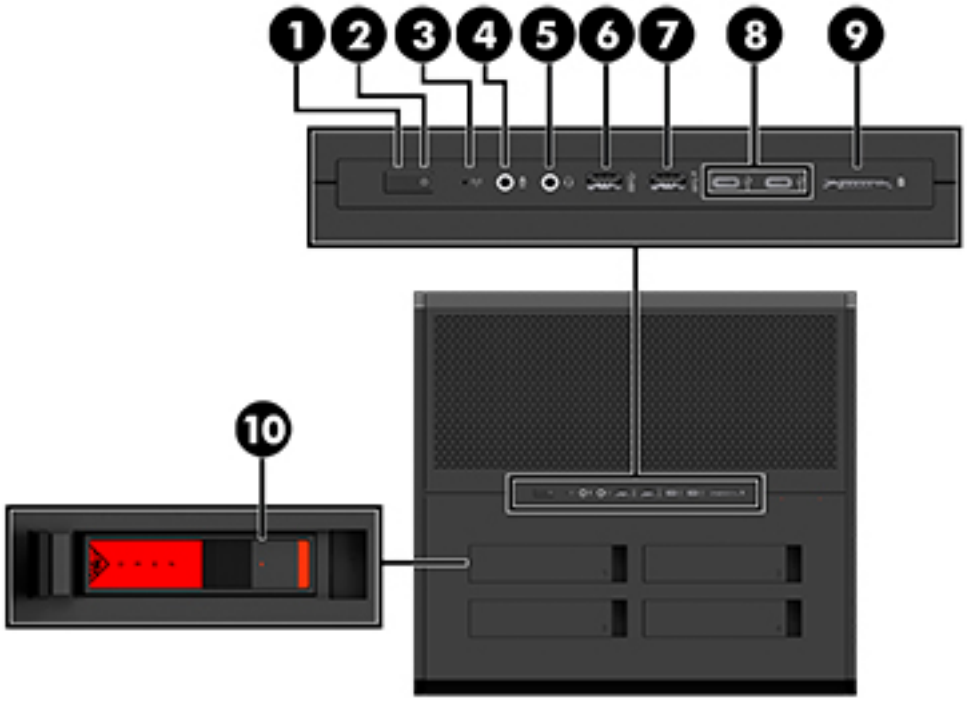

There are five color effects that you can customize in OMEN Control:

- Static color—Static lighting for each of the nine color zones.
- Color loop—Customize up to four phases for all of the color zones. The colors will transition from one phase to another.
- System vitals—Customize color zones for different computer hardware metrics (CPU usage, CPU temperature, GPU usage, or GPU temperature).
- Audio pulse—Lighting brightness responds to the audio output frequency.
- Off—All color zones are off.

To open OMEN Command Center and customize the lighting effects:

▲ Click the **OMEN** icon on the taskbar.

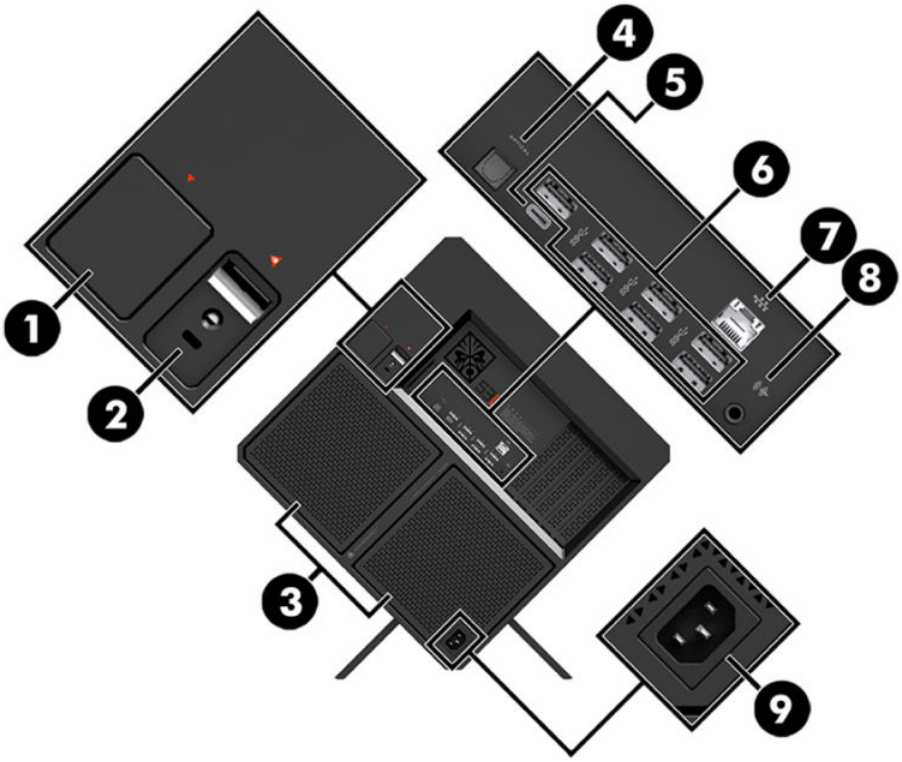
# Right




| Component | | | Description |
|---|---|---|---|
| **(1)** | | Power button | • When the computer is off, press the button to turn on the computer.<br>• When the computer is on, press the button briefly to initiate Sleep.<br>• When the computer is in the Sleep state, press the button briefly to exit Sleep.<br>• When the computer is in Hibernation, press the button briefly to exit Hibernation.<br>**CAUTION:** Pressing and holding down the power button results in the loss of unsaved information.<br>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.<br>To learn more about your power settings, see your power options by right-clicking the **Start** button, and then selecting **Power Options**. |
| **(2)** | | Power light | • On: The computer is on.<br>• Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.<br>• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power. |
| **(3)** | | Wireless light | On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. The wireless light stays on even when all wireless devices are off. |

| Component | | Description |
|---|---|---|
| **(4)** | Audio-in (microphone) jack | Connects an optional computer headset microphone, stereo array microphone, or monaural microphone. |
| **(5)** | Audio-out (headphone)/ Audio-in (microphone) combo jack | Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.<br>**WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*.<br>To access this guide:<br>▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.<br>**NOTE:** When a device is connected to the jack, the computer speakers are disabled. |
| **(6)** | USB 3.x SuperSpeed port | Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer. |
| **(7)** | USB 3.x SuperSpeed port with HP Sleep and Charge | Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch. |
| **(8)** | USB Type-C ports (2) | When the computer is on, connects and charges a USB device that has a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer. |
| **(9)** | Memory card reader | Reads optional memory cards that enable you to store, manage, share, or access information.<br>To insert a card:<br>1. Hold the card label-side up, with connectors facing the computer.<br>2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated.<br>To remove a card:<br>▲ Press in on the card, and then remove it from the memory card reader. |
| **(10)** | Hard drive lock | Locks the hard drive service door. |

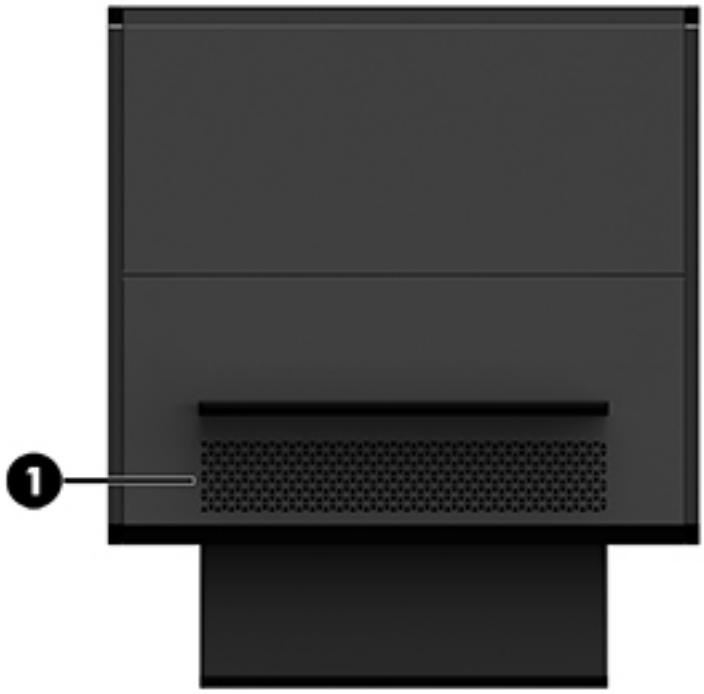
# Back




| Component | | | Description |
|---|---|---|---|
| **(1)** | | Side panel release latch | Releases the side panel.<br>**WARNING!** To reduce the risk of serious injury or damage to the equipment, do not open the chassis cover of any computer containing a 600 W PSU, 750 W PSU, or 1300 W PSU. To determine if you have a 600 W, 750 W, or 1300 W PSU, refer to the label on the back of the computer. |
| **(2)** | | Security cable slot | Attaches an optional security cable to the computer.<br>**NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. |
| **(3)** | | Vents (2) | Enable airflow to cool internal components.<br>**NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| **(4)** | | Optical out connector | Connects digital speakers (purchased separately). |
| **(5)** | | USB Type-C charging port (select products only) | When the computer is on, connects and charges a USB device that has a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer. |
| **(6)** | SS | USB 3.x SuperSpeed ports (6 or 7) | Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.<br>**NOTE:** Depending on your product, your computer may have 6 or 7 USB 3.x SuperSpeed ports. |
| **(7)** | | RJ-45 (network) jack/status lights | Connects a network cable.<br>• White: The network is connected. |

| Component | | | Description |
|---|---|---|---|
| | | | • Amber: Activity is occurring on the network. |
| **(8)** | | Audio-out (headphone) jack | Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable.<br><br>**WARNING!** To reduce the risk of personal injury, adjust the volume before using headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety and Environmental Notices*.<br><br>To access this guide:<br><br>▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.<br><br>**NOTE:** When a device is connected to a headphone jack, the computer speakers are disabled. |
| **(9)** | | Power connector | Connects an AC power cord. |

# Bottom




| Component | | Description |
|---|---|---|
| **(1)** | Vent | Enables airflow to cool internal components.<br><br>**NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |

# 2 Hardware upgrades

## Warnings and cautions

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

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

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

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

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

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation setup and provides guidelines for posture and work habits that increase your comfort and decrease your risk of injury. It also provides electrical and mechanical safety information. The *Safety & Comfort Guide* is located on the HP website at http://www.hp.com/ergo.

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

Disconnect power to the equipment before removing the access panel.

Replace and secure the access panel before re-energizing the equipment.

**IMPORTANT:** Static electricity can damage the electrical components of the computer or optional equipment. Before beginning the following procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See Electrostatic discharge on page 33 for more information.

## Preparing for disassembly

Use the following disassembly steps as necessary, depending on whether you are installing new components or replacing existing components.

1. Remove all removable media, such as a USB flash drive, from the computer.
2. Turn off the computer properly through the operating system, and turn off any external devices.
3. Unplug the power cord from the AC outlet and disconnect any external devices.

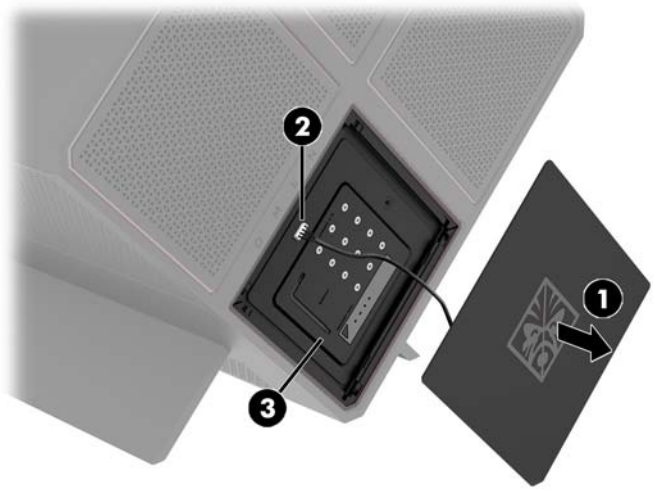
**IMPORTANT:** When the computer is plugged into an AC power source, voltage is always applied to the system board. To prevent damage to internal components, you must unplug the power cord from the power source before opening the computer.

# Accessing the tool kit

The tool kit contains the following:

- Hard drive/power supply tool
- Screwdriver/wrench, one side Phillips, one side hex. Hex screws are used on the graphics card and system fans (radiators)
- Screws

Pull the logo cover away from the case **(1)**, and then disconnect the cable from the case **(2)**. The tool kit is located under the logo cover **(3)**.




# Replacing or installing drives

The case offers four hard drive bays.

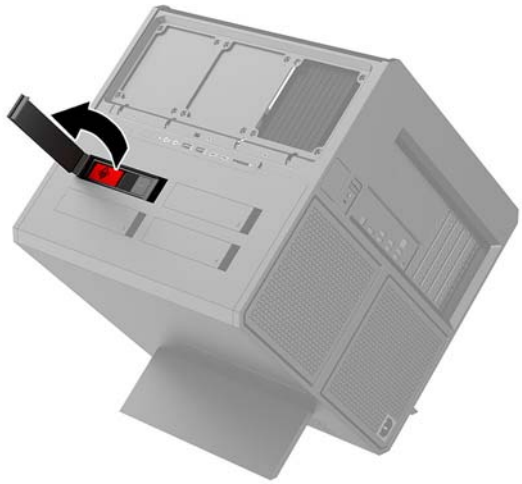
The case supports three different drive types:

- 3.5-inch hard drive
- 2.5-inch solid-state drive
- U.2 drive

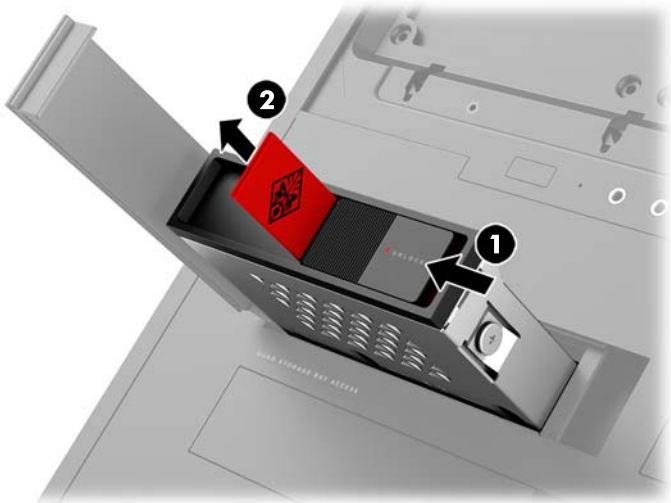
**NOTE:** U.2 hard drives can be installed only in the upper-right drive bay.

## Installing a drive

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Pull up on the right side of the hard drive door, and then rotate the door to the left. Note that the door remains connected to the case.



3. Slide the drive cage latch to the left **(1)**, and then use the pull tab to pull the drive cage out of the case **(2)**.

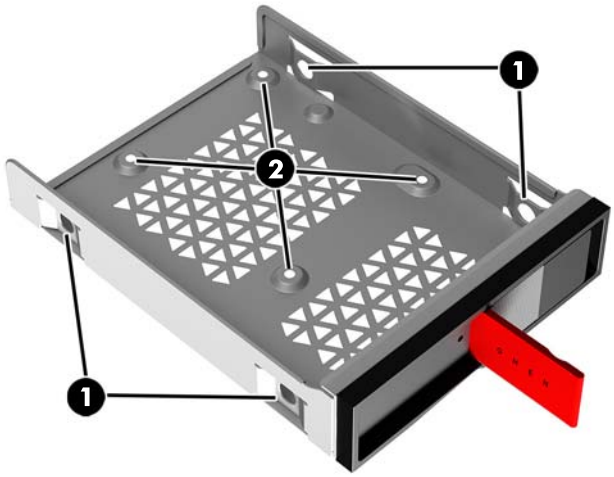


4. All drives must be secured into the drive cage using screws. Screw locations are as follows:

   **(1)** 3.5-inch hard drive and U.2 drive

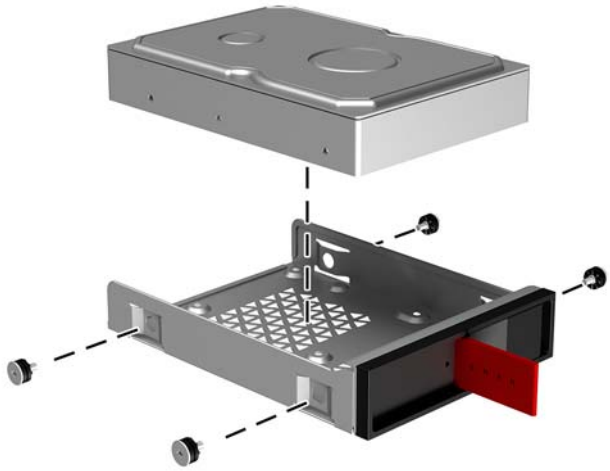
   **(2)** 2.5-inch solid-state drive

**NOTE:** Before installing a U.2 drive into the drive cage, you must first install the drive into a drive adapter bracket.

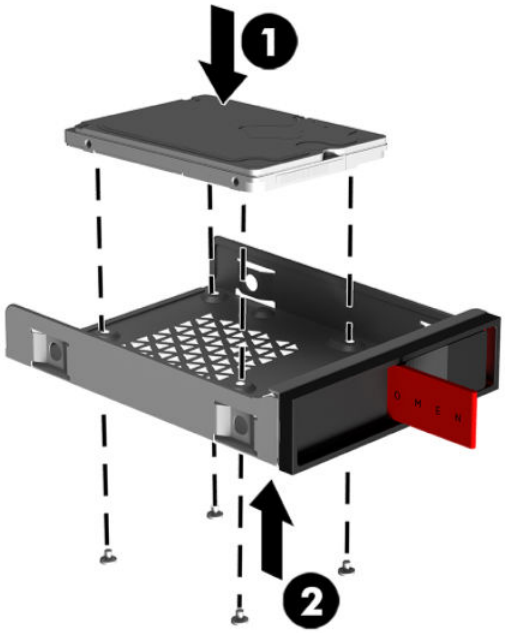



5. To install a drive into the drive cage:

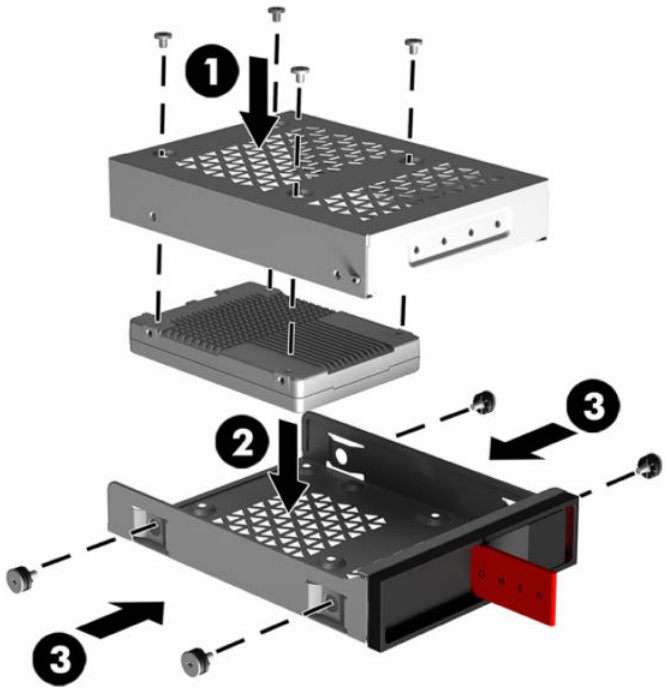
   a. **3.5-inch hard drive:** Insert the drive into the drive cage, and then install four mounting screws.



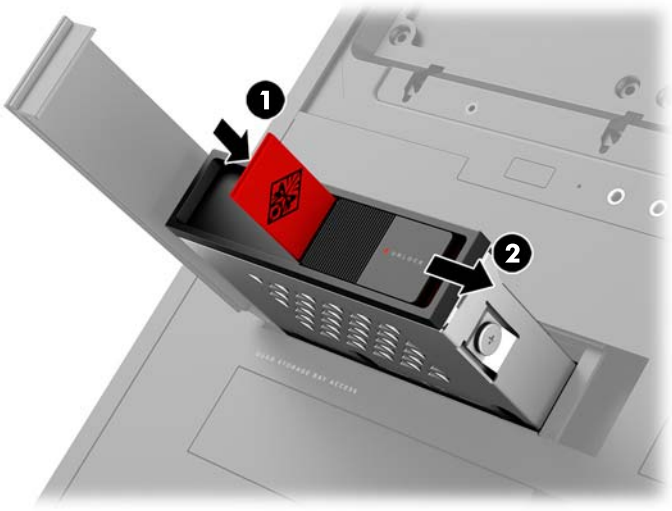
b. **2.5-inch solid-state drive:** Insert the drive into the drive cage **(1)**, and then install four mounting screws **(2)**.




c. **U.2 drive:** Insert the drive into the adapter bracket and secure with four screws **(1)**. Insert the adapter bracket assembly into the drive cage **(2)**, and then install four mounting screws **(3)**.



6. Insert the drive cage into the drive bay **(1)**, and then slide the drive cage latch to the right to secure the drive cage **(2)**.

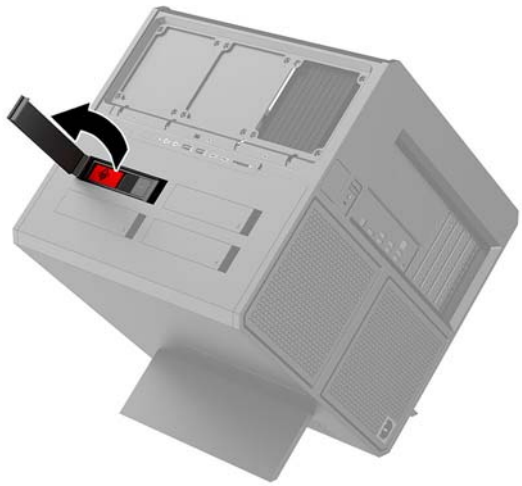



7. Rotate the hard drive door to the right and press down until it snaps into place.

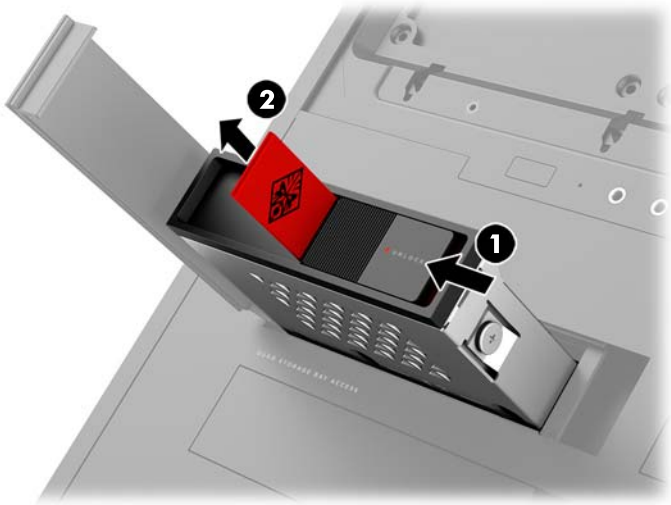
## Removing a drive

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

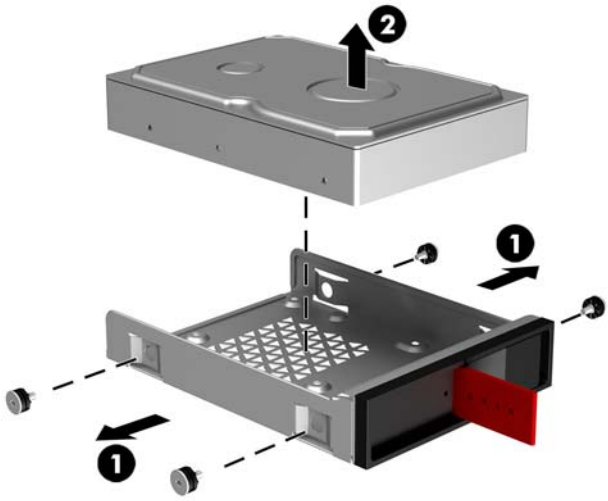
1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Pull up on the right side of the hard drive door, and then rotate the door to the left. Note that the door remains connected to the case.



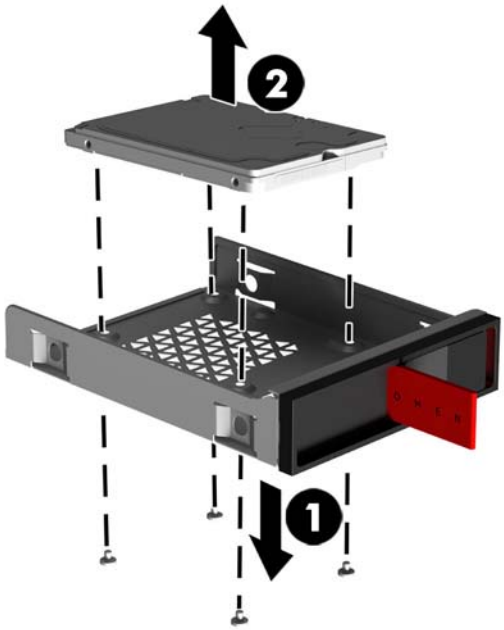
3. Slide the drive cage latch to the left **(1)**, and then use the pull tab to pull the drive cage out of the case **(2)**.



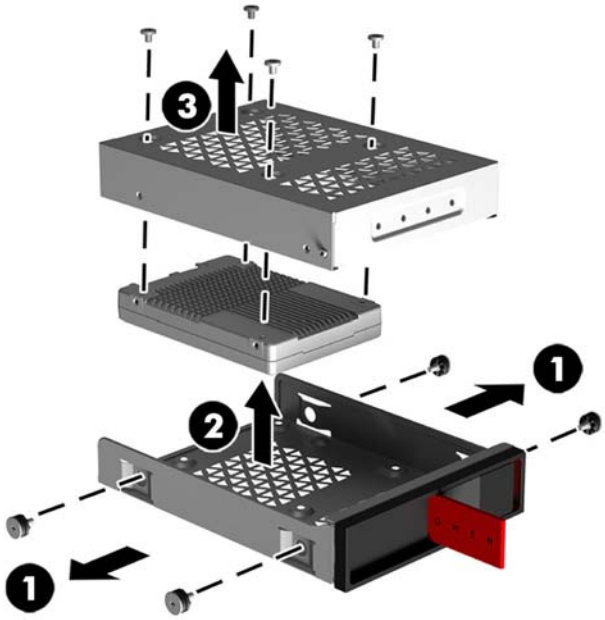

4. To remove a drive from the drive cage:
   a. **3.5-inch hard drive:** Remove the four mounting screws **(1)** from the sides of the cage, and then lift the drive out of the cage **(2)**.




b. **2.5-inch solid-state drive:** Remove the four mounting screws from the bottom of the cage **(1)** and then lift the drive out of the cage **(2)**.



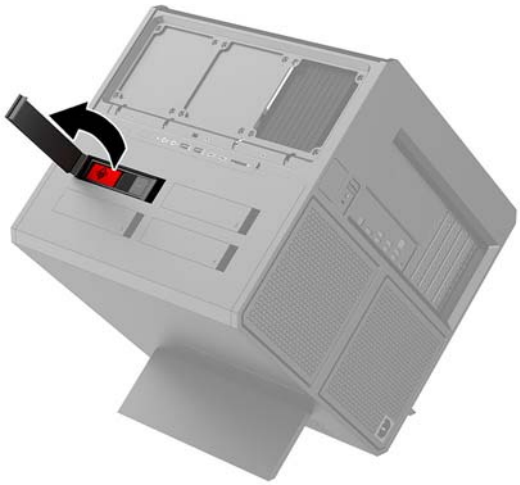
c. **U.2 drive:** Remove the four mounting screws that secure the drive adapter bracket to the drive cage **(1)**. Lift the adapter bracket out of the drive cage **(2)**, and remove the four screws that secure the drive to the adapter bracket **(3)**. Then remove the drive from the adapter bracket.



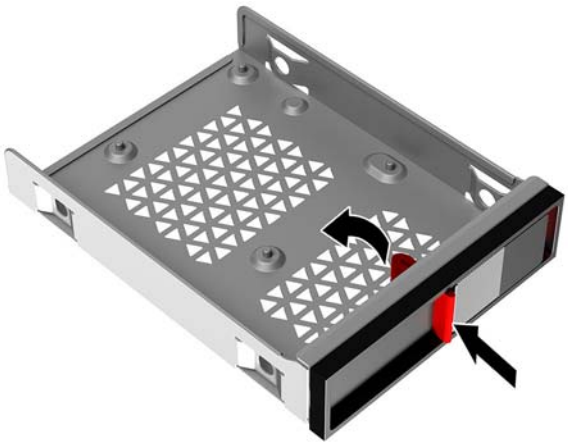

## Drive security

You can insert the hard drive pull tab into the drive cage to prevent unauthorized removal of the drive.

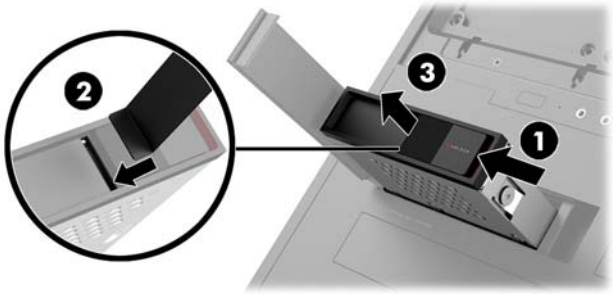
1. Pull up on the right side of the hard drive door, and then rotate the door to the left. Note that the door remains connected to the case.



2. From the outside of the drive cage, insert the pull tab into the drive cage until it is not accessible from the outside of the drive cage.



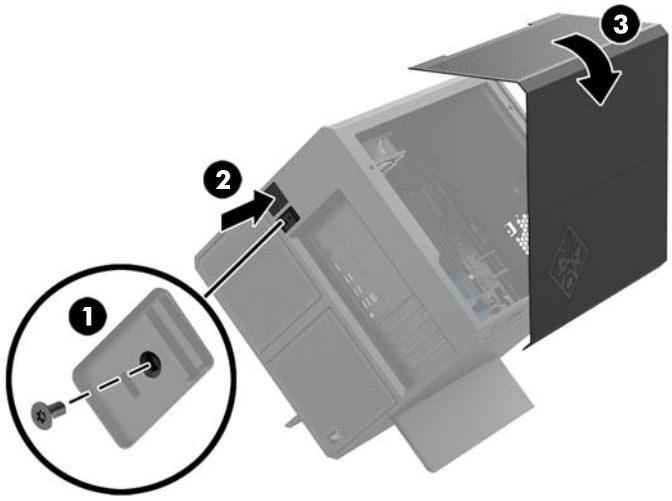
3. To remove a hard drive when the pull tab is not accessible, slide the drive cage latch to the left **(1)**, insert the security tool from the tool kit (Accessing the tool kit on page 9) into the drive cage **(2)**, and then and pull the cage out of the computer **(3)**.



# Removing and replacing the access panel

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

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. If a Phillips screw is installed to lock the access panel, remove the screw **(1)**.
3. Press the release button **(2)**, and then rotate the access panel off the computer **(3)**.




To replace the access panel, rotate it onto the computer, and replace the screw.

# Installing system memory

The computer uses double data rate 4 synchronous dynamic random access memory (DDR4-SDRAM) dual inline memory modules (DIMMs). There are four memory sockets on the system board that can be populated with up to 32 GB of memory.

For proper system operation, the DIMMs must be 1.2 volt DDR4-SDRAM DIMMs that adhere to the following specifications:

- Industry-standard 288-pin
- Unbuffered non-ECC PC4-19200 DDR4-2400 MT/s-compliant (downgraded to DDR4-2133)
- Unbuffered non-ECC PC4-17000 DDR4-2133 MT/s-compliant
- Support CAS latency 15 DDR4 2133 MT/s (15-15-15 timing)
- Contain the mandatory Joint Electronic Device Engineering Council (JEDEC) specification

The computer supports the following:

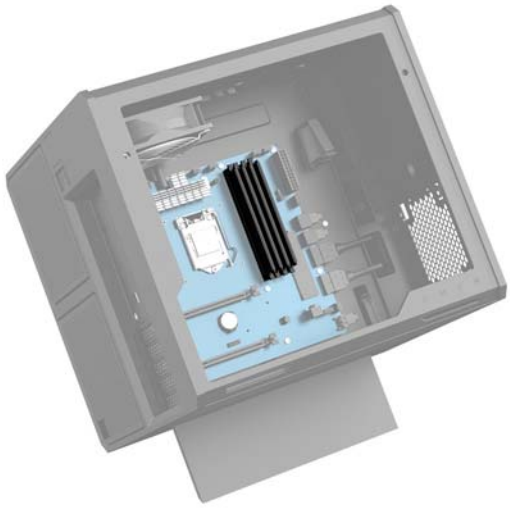
- 512-Mbit, 1-Gbit, 2-Gbit, 4-Gbit, and 8-Gbit non-ECC memory technologies
- Single-sided and double-sided DIMMs

**NOTE:** The system will not operate properly if you install unsupported DIMMs.

## Populating DIMM sockets

There are four DIMM sockets on the system board, with two sockets per channel. The sockets are labeled DIMM1, DIMM2, DIMM3, and DIMM4. The DIMM1 and DIMM3 sockets operate in memory channel A. The DIMM2 and DIMM4 sockets operate in memory channel B.

For improved performance, install memory modules in the following order: DIMM 4-2-3-1. Note that DIMM 1 is the slot closest to the processor.



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

- The system will operate in single-channel mode if the DIMM sockets are populated in one channel only.
- The system will operate in the higher-performing dual-channel mode if the memory capacity of the DIMM in Channel A is equal to the memory capacity of the DIMM in Channel B.
- The system will operate in flex mode if the memory capacity of the DIMM in Channel A is not equal to the memory capacity of the DIMM 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 DIMM in the system.

## Replacing or installing DIMMs

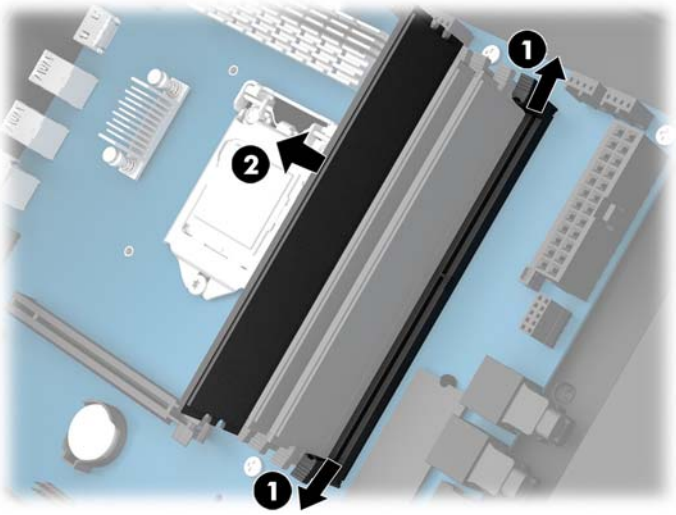
**IMPORTANT:** You must unplug the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing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

The memory module sockets 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, refer to Electrostatic discharge on page 33.

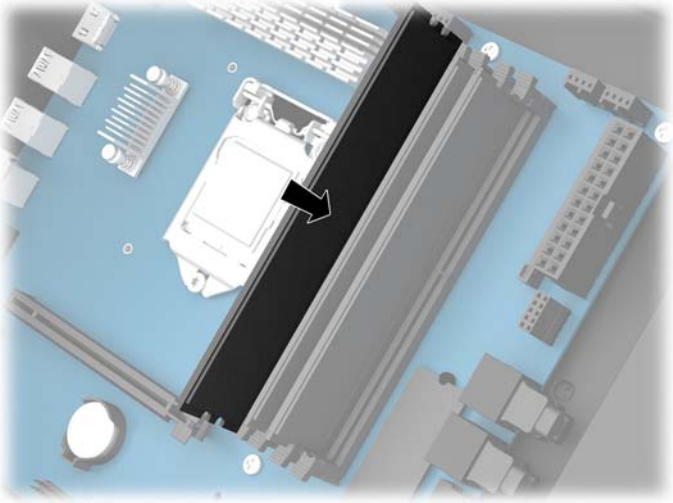
When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Remove the access panel (Removing and replacing the access panel on page 18).
3. To remove a DIMM, press outward on one latch on either side of the DIMM **(1)**, and then pull the DIMM out of the socket **(2)**.



4. Insert the memory module into the socket so that the latches lock it in place.

**NOTE:** A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket.



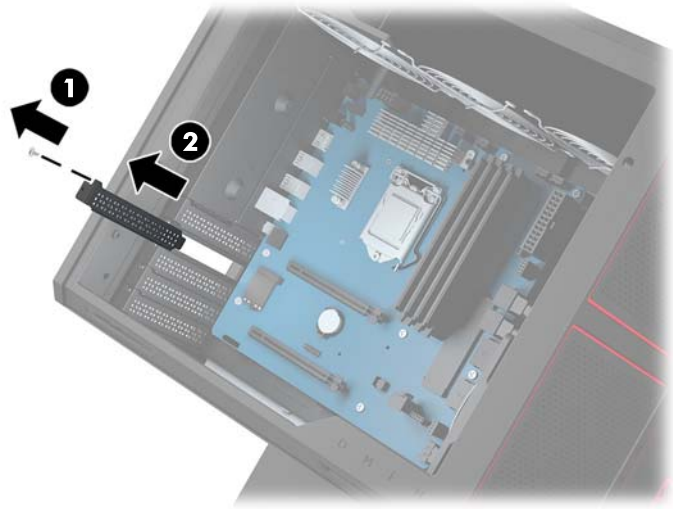
5. Replace the access panel.
6. Reconnect the power cord and any external devices, and then turn on the computer.

The computer automatically recognizes the additional memory.

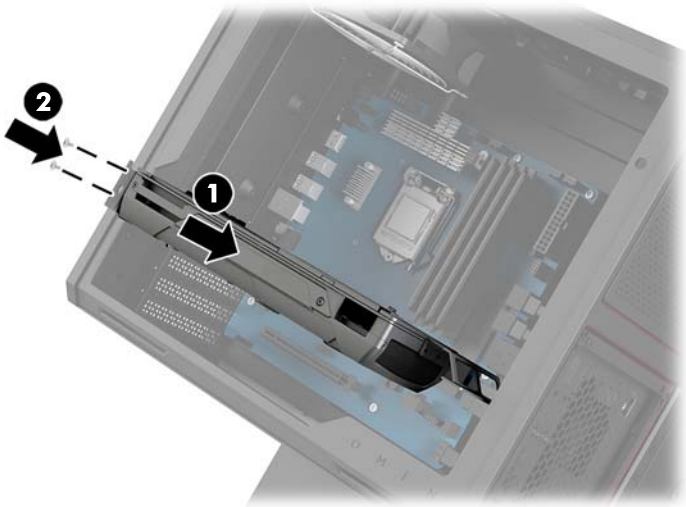
# Installing graphics cards

You can install multiple graphics cards and associated fans.

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Remove the access panel (Removing and replacing the access panel on page 18).
3. To install a graphics card:
   a. Locate the a vacant expansion socket on the system board and the corresponding expansion slot on the back of the case.
   b. Remove the expansion slot cover by removing the screw at the top of the cover **(1)**, and then lifting the cover out of the case **(2)**.

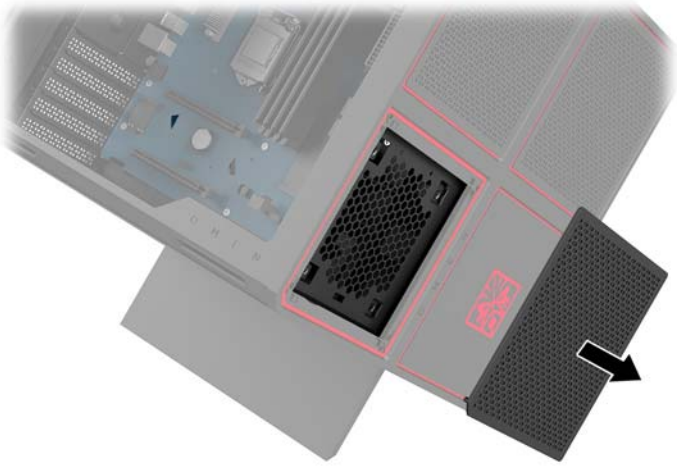



   c. Insert a graphics card into the expansion socket **(1)**.
   d. Install two screws into the left side of the graphics card **(2)**.
   e. Connect any necessary cables to the graphics card.




4. To install a graphics card fan:

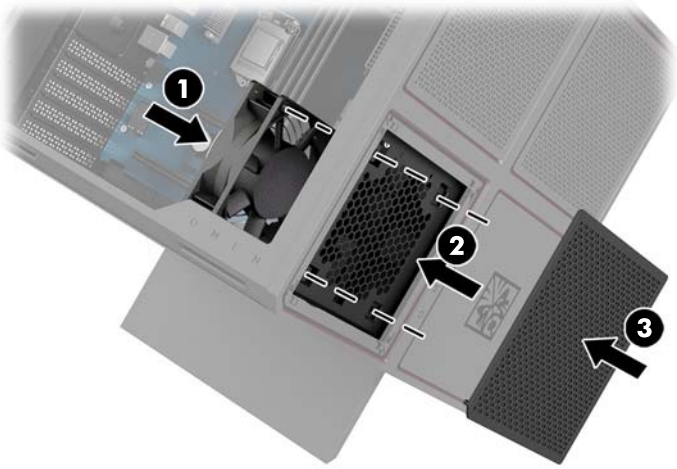
a. Remove the cover from the location where you will install the graphics card fan.



b. From the inside of the case, insert the fan into place on the outer wall **(1)**.

c. From the outside of the case, install four screws **(2)** with the screwdriver/wrench from the tool kit (Accessing the tool kit on page 9).

d. Replace the cover **(3)**.

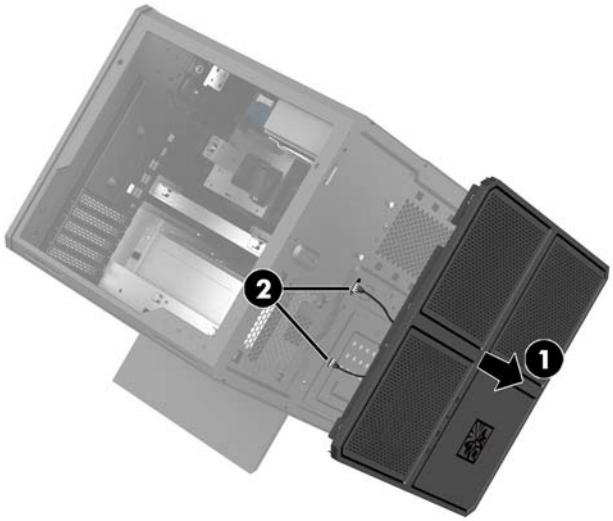



5. Replace the access panel.

# Removing the PCI fan

The PCI fan is secured to the front of the case and provides additional cooling for the graphics cards. You must remove the entire front bezel before you can remove or install the PCI fan.

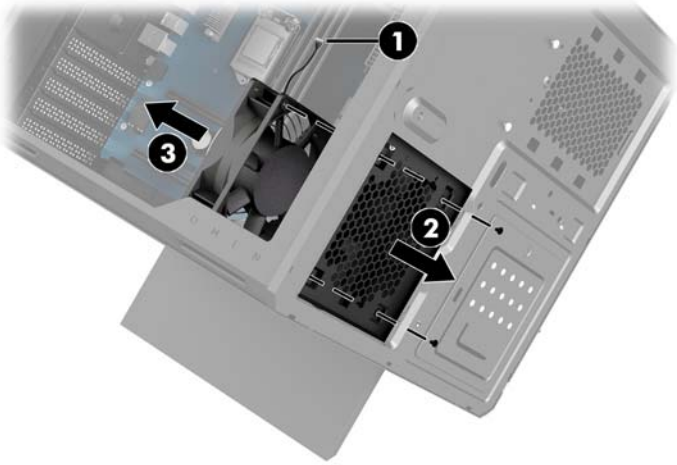
1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Remove the access panel (Removing and replacing the access panel on page 18).
3. To remove the front bezel:
   a. From the outside of the case, pry the bezel off the case **(1)** far enough to access the cables underneath. Note that there are two cables that connect to the front bezel.
   b. Disconnect the cables from the case **(2)**.




4. Remove the fan filter by sliding the filter out from under the fan.

5. To remove the PCI fan:
   a. From the inside of the case, disconnect the fan cable from the system board **(1)**.
   b. From the outside of the case, remove the four screws **(2)** that secure the fan to the case.

c. Lift the fan out of the case **(3)**.

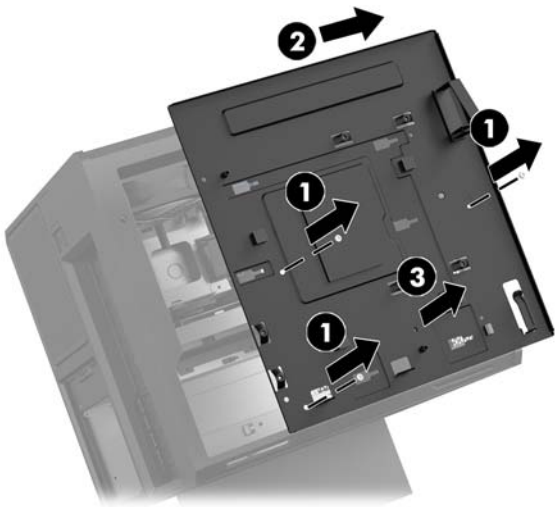



To replace the PCI fan, reverse the removal procedures.

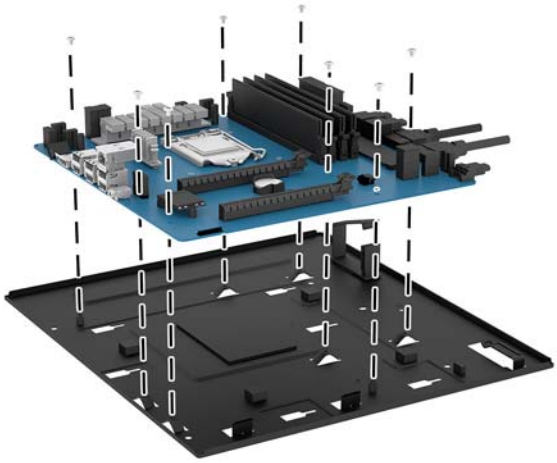
# Installing a system board

The system board is secured to a system board tray. You must remove the tray before you can remove or install a system board.

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Remove the access panel (Removing and replacing the access panel on page 18).
3. To remove the system board tray, remove the three screws that secure the tray to the case **(1)**, slide the tray to the right **(2)**, and then lift the tray out of the case **(3)**.



4. To install the system board, position the system board atop the system board tray, and then install the eight screws that secure the system board to the system board tray.

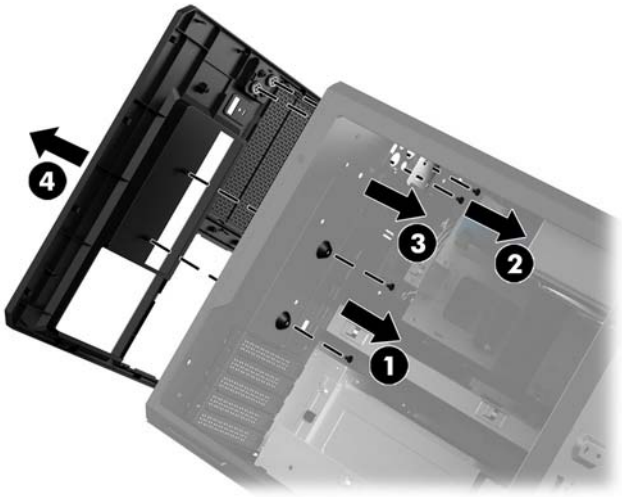


5. Replace the system board tray assembly in the case.
6. Install any graphics cards.
7. Install all other internal components.
8. Connect all cables to the system board.

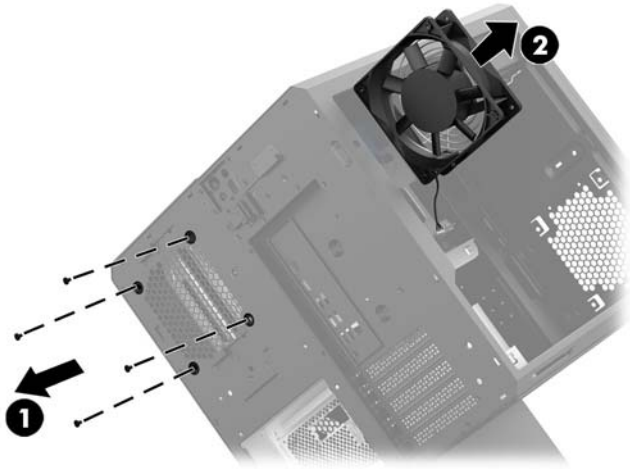
# Removing the hard drive fan

The hard drive fan is secured to the rear of the case under the system board tray. You must remove the tray before you can remove or install the hard drive fan.

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Remove the access panel (Removing and replacing the access panel on page 18).
3. Remove the system board tray (Installing a system board on page 25).
4. To remove the rear bezel:
   a. From the inside of the case, remove the two screws **(1)** that secure the bezel to the case.
   b. Remove the two screws **(2)** that secure the eject button to the case, and then remove the eject button **(3)**.
   c. From the outside of the case, pry the bezel off the case **(4)**.




5. To remove the hard drive fan:
   a. From the outside of the case, remove the four screws **(1)** that secure the fan to the case.
   b. Lift the fan out of the case **(2)**.




To replace the hard drive fan, reverse the removal procedures.

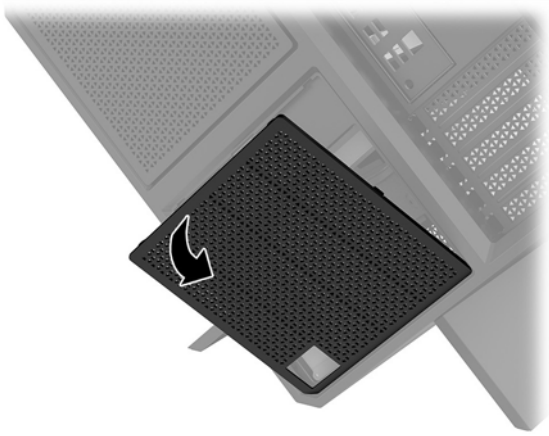
# Installing a power supply

The computer supports power supplies that follow the ATX standard with a maximum of 1450 W.

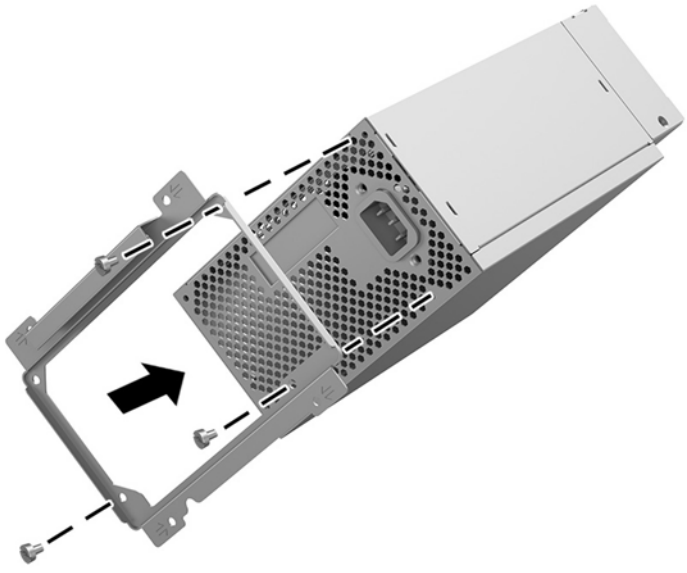
⚠ **CAUTION:** To prevent damage, the overall power consumption of the computer must not exceed the maximum rating of the computer power supply.

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Remove the access panel (Removing and replacing the access panel on page 18).
3. Remove the system board tray (Installing a system board on page 25).
4. Use the security tool from the tool kit (Accessing the tool kit on page 9) to remove the power supply cover, located on the rear of the case.

   ⚠ **CAUTION:** To avoid damaging the cover, pry only on the side of the cover as shown in the following image.



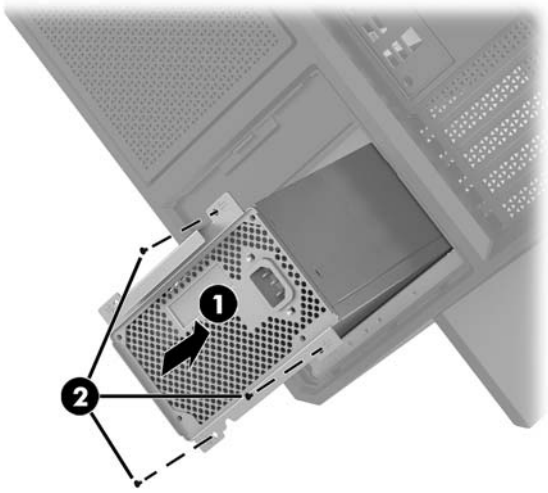
5. Install the power supply bracket onto the power supply.



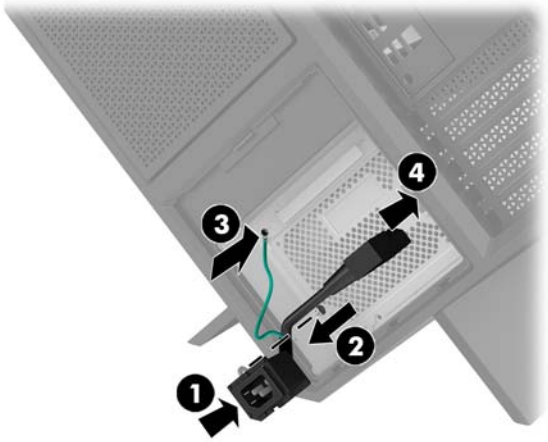
6. Route the power cables into the case, and then insert the power supply **(1)**.

7. Install three screws to secure the power supply to the case **(2)**.

**NOTE:** You will install one other screw in the next step to secure the grounding wire.




8. To install the power supply connector cable into the case:
   a. Place the connector into the corner of the power supply bay **(1)**.
   b. Install the connector hex screw **(2)** using the wrench/screwdriver from the tool kit.
   c. Install the green ground wire onto the remaining power supply screw **(3)**.
   d. Plug the cable into the power supply **(4)**.



9. Connect the power supply SATA cables **(1)** and I/O board and cable **(2)**.

   Five SATA power cables (four hard drive + one U.2 drive) and one PATA power connector (from the I/O board) are available to connect to the power supply.

   The cables in the computer case are labeled to indicate components they connect to.

⚠ **CAUTION:** To avoid damaging the cable, pull the tab or connector instead of the cable itself.

10. Replace the power supply cover.
11. Replace the system board tray assembly.

# Installing a radiator bracket for liquid cooling

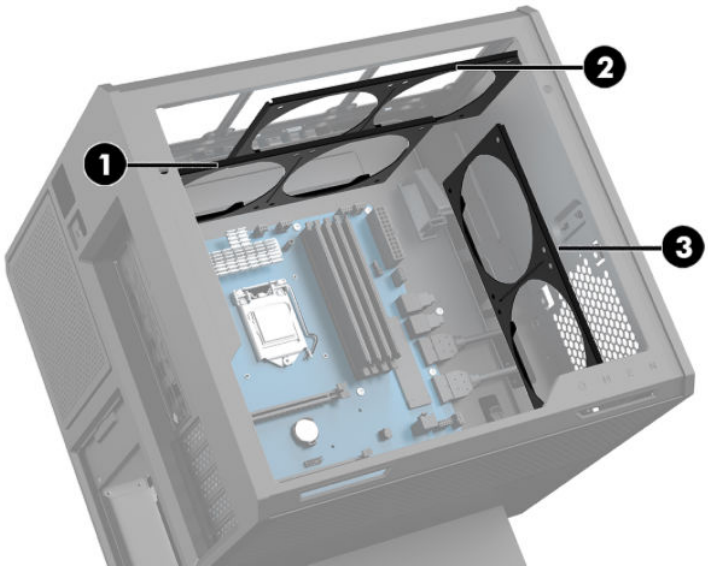
The radiator bracket can accommodate only 240 mm radiators.

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Remove the access panel (Removing and replacing the access panel on page 18).
3. Remove any fans mounted to the side of the case.
4. If you want to add additional liquid cooling, install the radiator bracket in one of the positions shown in the following image.

**NOTE:** On models that support only one bracket, you can install the bracket in either position 1 or 2.

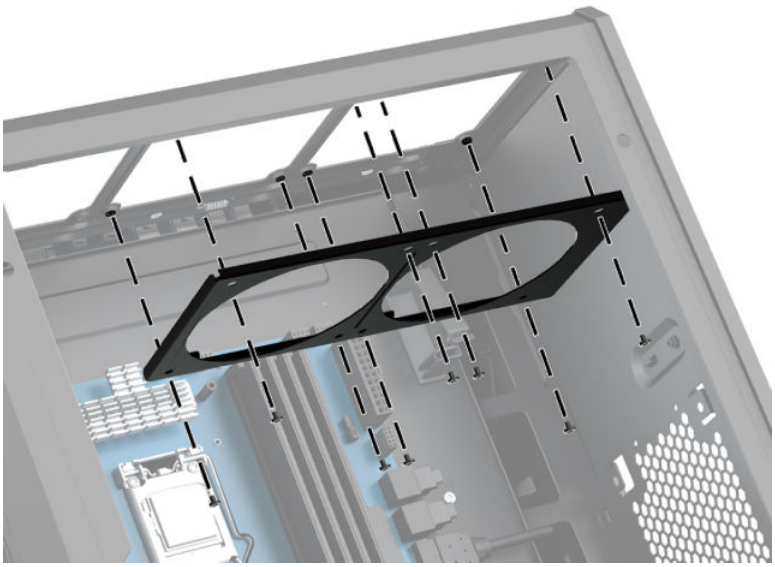
On models that support two brackets, you can install the brackets in either positions 1 and 3 or positions 2 and 3.

Installation location **(3)** is present in select models only.




5. Insert the bracket onto the inside rear of the case.

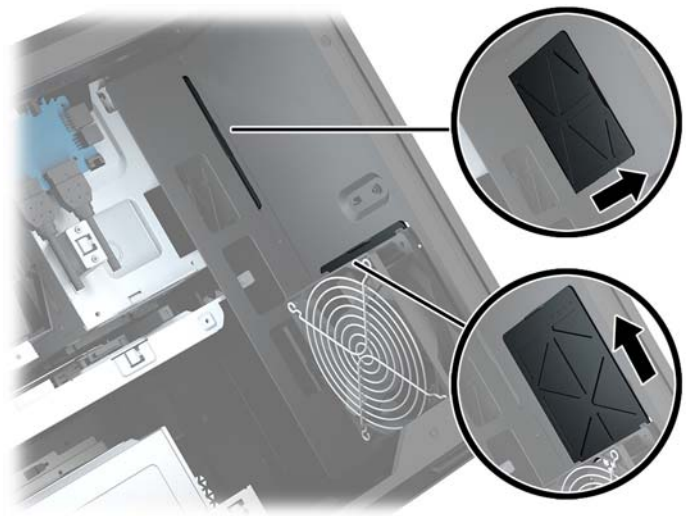
6. Install the eight hex screws using the wrench/screwdriver from the tool kit (Accessing the tool kit on page 9) to secure the bracket to the case.



7. Install any needed fans.

# Cleaning filters

1. Prepare the computer for disassembly (Preparing for disassembly on page 8).
2. Remove the access panel (Removing and replacing the access panel on page 18).
3. Remove and clean the air filters on all vented sides of the computer.



# 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

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 +/- 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 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 recirculated 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.

# 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. Mountain Time.

# Index


**A**

access panel
  removal 18
accessibility 35
accessing the tool kit 9
audio-in (microphone) jack 5
audio-out (headphone) jacks 7
audio-out (headphone)/audio-in (microphone) jack, identifying 5

**B**

buttons
  power 4

**C**

color zones 3
color zones, identifying 2
components
  back 6
  bottom 7
  right 4
computer operating guidelines 34
connector, power 7

**D**

drive cage latch, identifying 5

**E**

electrostatic discharge, preventing damage 33

**F**

filters
  removing and cleaning 32

**G**

graphics cards
  installing 22

**H**

hard drive
  installation 10
  removal 14
  security 16
hard drive fan
  installing 27

**I**

installation guidelines 8
installing
  graphics cards 22
  memory 20
  power supply 28
  radiator bracket 31
  solid-state drive 10
  system board 25

**J**

jacks
  audio-in (microphone) 5
  audio-out (headphone) 7
  audio-out (headphone)/audio-in (microphone) 5
  network 6
  RJ-45 (network) 6

**L**

lighting
  OMEN Control 3
lights
  power 4
  RJ-45 (network) status 6
  wireless 4

**M**

memory
  installation 20
  socket population 19
memory card reader, identifying 5
memory card, identifying 5

**N**

network jack, identifying 6

**O**

OMEN Control 3
optical out connector, identifying 6

**P**

PCI fan
  installing 24
ports
  USB 3.0 5, 6
  USB 3.0 (powered) charging 5
  USB Type-C 5
power button, identifying 4
power connector, identifying 7
power light, identifying 4
power supply
  installing 28
preparing for disassembly 8

**R**

radiator bracket
  installing 31
removing
  access panel 18
  hard drive 14
  hard drive fan 27
  PCI fan 24
  solid-state drive 14
RJ-45 (network) jack, identifying 6
RJ-45 (network) status lights, identifying 6

**S**

security
  hard drive 16
security cable slot, identifying 6
side panel release latch, identifying 6
slots
  memory card reader 5
  security cable 6
solid-state drive
  removal 14
stand 2
system board
  installing 25

**T**

tool kit location 9
tool kit, identifying 2

**U**
USB 3.0 charging (powered) port, identifying 5
USB 3.0 port, identifying 5, 6
USB Type-C port, identifying 5

**V**
ventilation guidelines 34
vents, identifying 2, 6, 7

**W**
wireless light 4