



# Hardware Reference Guide

HP ProOne 400 G1 All-in-One

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## About This Book

This guide provides basic information for upgrading this computer model.

 **WARNING!** Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.

 **CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

 **NOTE:** Text set off in this manner provides important supplemental information.

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# 1 Product features

## Overview

Figure 1-1 HP ProOne 400 G1 All-in-One



The HP ProOne 400 G1 All-in-One offers the following features:

- Integrated All-in-One form factor
- 50.8-cm (19.5-inch) diagonal widescreen WLED backlit anti-glare LCD (1600 x 900)
- Adjustable tilt
- Removable panel on the back of the computer allows users or technicians to easily and efficiently service the PC
- VESA mounting holes (100 mm x 100 mm)
- 4th generation Intel® Core™ processors
- Up to 2 TB Hard Drive, 180 GB Solid State Drive, 256 GB Self-encrypting Solid State Drive, 500 GB Self-encrypting Drive, or 1 TB Solid State Hard Drive
- Optional Tray-load HP SuperMulti DVD+/-RW SATA Optical Disc Drive, DVD-ROM Disc Drive, or Slim BDXL Blu-ray Writer
- Intel H81 Express chipset
- Two SODIMM slots with up to 16 GB of DDR3 SDRAM memory and dual channel memory support
- Intel integrated graphics
- DisplayPort video out (with audio) for second display support
- Serial port
- DP audio, DP to VGA/DVI/HDMI dongle support

- Integrated Realtek RTL8151GH-CH GbE Ethernet Controller
- Wireless connectivity (optional):
  - Intel Dual Band Wireless-N 7260, 802.11 a/b/g/n
  - WLAN and Bluetooth Combo Card, 802.11 a/b/g/n Bluetooth® 4.0
- Optional integrated webcam and dual microphone array
- Premium stereo speakers
- Optional 5-in-1 media card reader
- 6 USB ports: 1 USB 3.0, 1 USB 3.0 (fast-charging), 4 USB 2.0
- Choice of wired or wireless keyboard and mouse
  - Wired USB keyboard and mouse
  - HP USB–PS/2 washable keyboard and mouse
  - Wireless keyboard and mouse
- Windows® 7 Professional 32-bit or 64-bit or Windows® 8.1 Professional 64-bit operating system
- Up to 89-percent energy-efficient external power supply
- ENERGY STAR® qualified, EPEAT® Gold registered

For more information, go to <http://www.hp.com/go/productbulletin> and search for your specific computer model to find the model-specific *QuickSpecs*.



# Front components

Figure 1-2 Front components

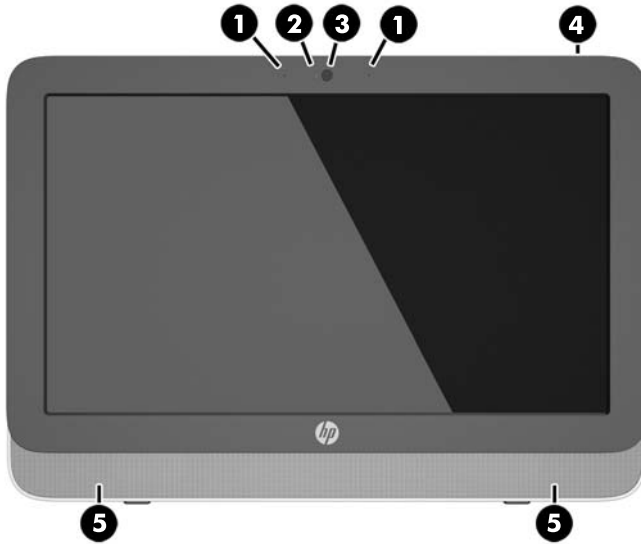


Table 1-1 Front Components

Component	Component
1 Dual microphone array (optional)	4 Power button
2 Webcam activity LED (with optional webcam)	5 High-performance stereo speakers
3 Webcam (optional)	

# Side components

Figure 1-3 Side components

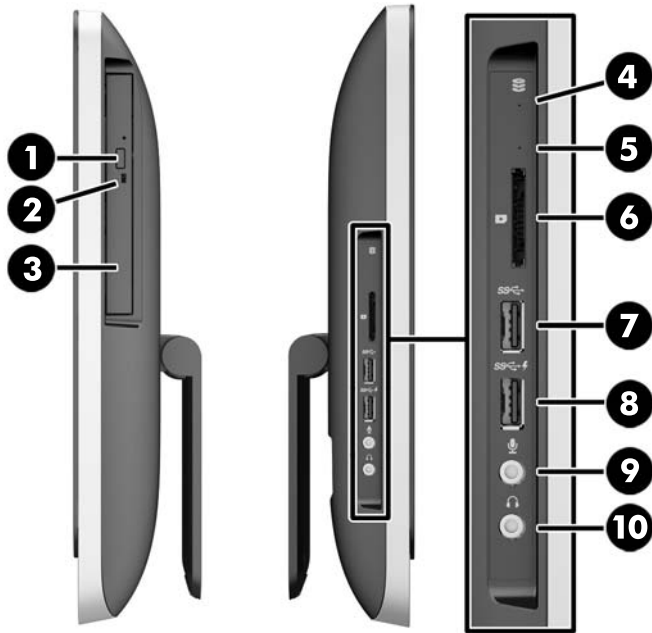


Table 1-2 Side components

Component		Component	
1	Optical disc drive eject button	6	HP 5-in-1 media card reader (optional)
2	Optical disc drive activity LED	7	USB 3.0 port
3	Tray-load optical disc drive	8	USB 3.0 port, fast-charging
4	Hard disc drive activity LED	9	Microphone jack
5	HP 5-in-1 medial card reader (optional) LED	10	Headset jack

# Rear components

Figure 1-4 Rear components

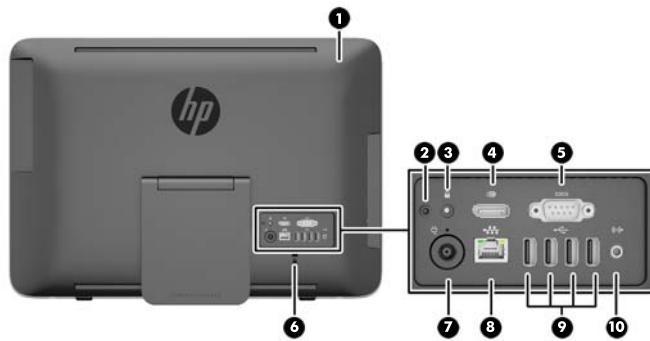


Table 1-3 Rear components

Component	Component
1 Access panel	6 Cable lock slot
2 Access panel security screw	7 Power supply connector
3 Security screw hole	8 RJ-45 Gigabit Ethernet port
4 DisplayPort port	9 (4) USB 2.0 ports
5 Serial port	10 Stereo audio line out

# Keyboard features

Figure 1-5 Keyboard features

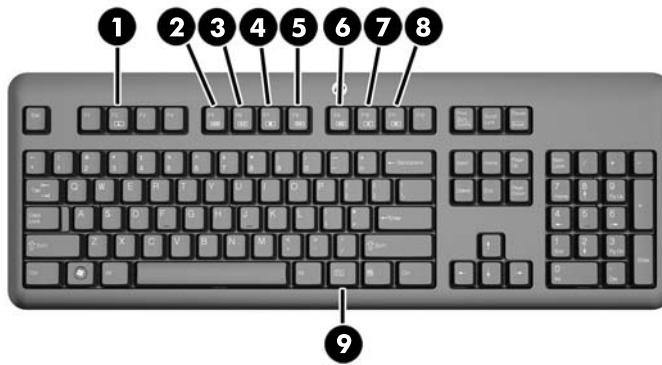


Table 1-4 Keyboard features

Component		Component	
1	Sleep	6	Mute Volume
2	Fast Reverse	7	Decrease Volume
3	Play/Pause	8	Increase Volume
4	Stop	9	Function
5	Fast Forward		

## Adjusting the stand

This stand allows you to tilt the computer backward from 10 degrees to 25 degrees to set it to a comfortable angle.

**Figure 1-6** Adjusting tilt



## Serial number location

The 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.

**Figure 1-7** Locating the serial number



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## 2 Hardware repair and upgrade

### Warnings and cautions

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

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

Disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.

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 in a grounded (earthed) outlet that is easily accessible at all times.

For your safety, do not place anything on power cords or cables. Arrange them so that no one may accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation, setup, posture, and health and work habits for computer users, and provides important electrical and mechanical safety information. This guide is located on the Web at <http://www.hp.com/ergo>.

**⚠ WARNING!** Computers that are inappropriately situated on dressers, bookcases, shelves, desks, speakers, chests, or carts may fall over and cause personal injury.

Care should be taken to route all cords and cables connected to the computer so that they can not be pulled, grabbed, or tripped over.

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

Disconnect power to the equipment before removing any access panels.

Replace and secure all access panels before reenergizing the equipment.

**⚠ CAUTION:** Static electricity can damage the electrical components of the computer or optional equipment. Before beginning these procedures, be sure that you are discharged of static electricity by briefly touching a grounded metal object. See [Electrostatic discharge on page 43](#) for more information.

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

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### Additional information

For more information on removing and replacing hardware components, the Computer Setup utility, and troubleshooting, refer to the *Maintenance and Service Guide* (available in English only) for your computer model at <http://www.hp.com>.

# Connecting and disconnecting power

## Connecting power

1. Connect the peripheral cables to the appropriate ports.
2. Plug the female end of the power cord into the power supply brick (1).
3. Connect the other end of the power cord to an electrical outlet (2).
4. Connect the round end of the power supply cord to the power supply connector on the rear of the computer (3).

**Figure 2-1** Connecting power



5. Press the power button on the top of the computer to turn it on.

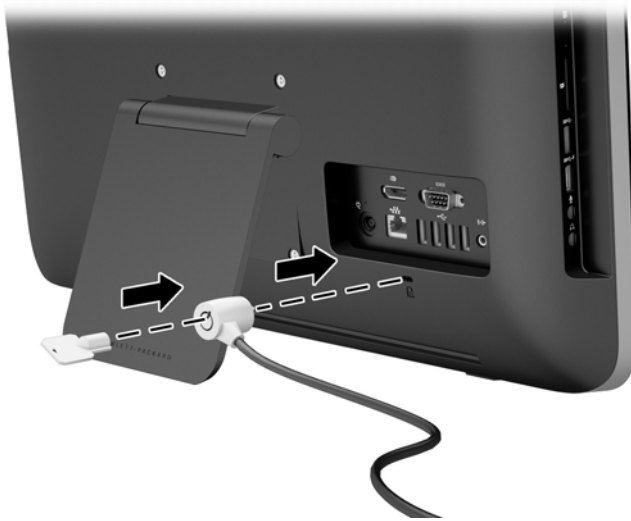
## Disconnecting power

1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, then turn off any external devices.
3. Remove the cable lock, if one is installed on the rear of the computer.
4. Disconnect the power cord from the power supply connector on the rear of the computer.

## Installing a cable lock

The cable lock slot enables you to secure your computer. A cable lock is a key lock device that has a wire cable attached. You attach one end of the cable to your desk (or other stationary object) and the other end of the cable to the cable lock slot on back of the computer. Secure the cable lock with the key.

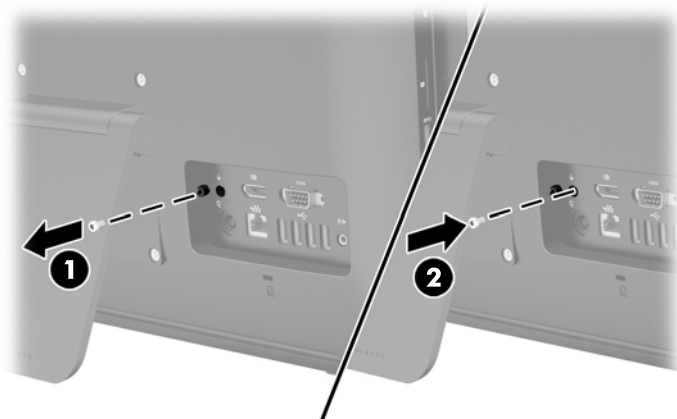
**Figure 2-2** Installing a cable lock



## Installing an access panel security screw

You may prevent access to internal components by securing the access panel. Remove the T15 tamper-resistant Torx security screw from the rear of the computer and screw it into the security screw hole to prevent removal of the access panel.

**Figure 2-3** Securing the access panel






## Synchronizing the optional wireless keyboard and mouse

The optional wireless keyboard and mouse are easy to set up. Just remove the battery tabs on both the keyboard and the mouse to activate the preinstalled batteries.

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 **NOTE:** For better mouse battery life and performance, avoid using your mouse on a dark or high-gloss surface, and turn mouse power off when not in use.

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To synchronize the wireless keyboard and mouse:


1. Make sure the keyboard and mouse are next to the computer, within 30 cm (1 foot) and away from interference from other devices.
2. Turn on the computer.
3. Make sure the Power switch on the bottom of the mouse is in the On position.
4. Insert the wireless receiver into a USB port on the computer.

**Figure 2-4** Installing the wireless receiver



5. Press and hold the Connect button on the wireless receiver for five seconds until the blue activity LED begins blinking.


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 **NOTE:** When the blue activity LED begins blinking, you have 30 seconds to synchronize the mouse with the wireless receiver.

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6. Press and release the Connect button on the bottom of the mouse. The blue activity LED from the wireless receiver turns off when synchronization is complete.

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 **NOTE:** If the Connect button on the bottom of the mouse is pressed again, the synchronization of the wireless receiver and the mouse will be broken. Turn the mouse off, then on again to restore the synchronization.


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 **NOTE:** If the procedure does not work, remove and then reinsert the wireless keyboard and mouse receiver from the back of the computer and then synchronize the keyboard and mouse again. If synchronization still does not work, remove and replace the batteries.

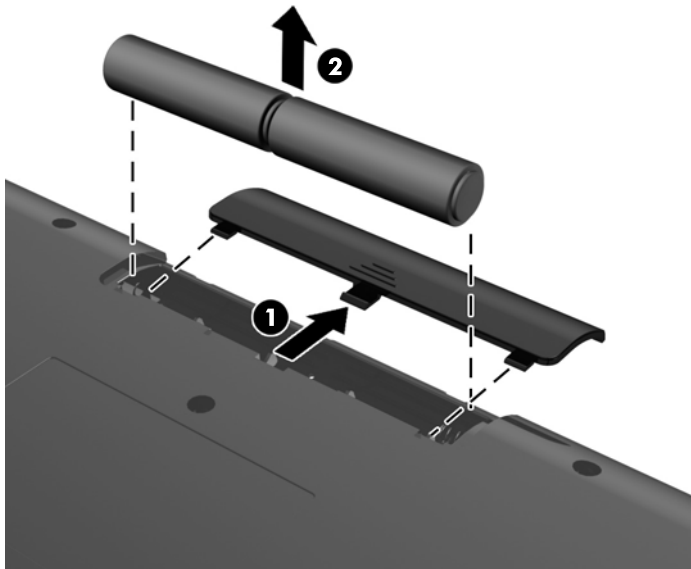
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## Removing batteries from the optional wireless keyboard or mouse

 **NOTE:** The wireless keyboard and mouse are optional components.

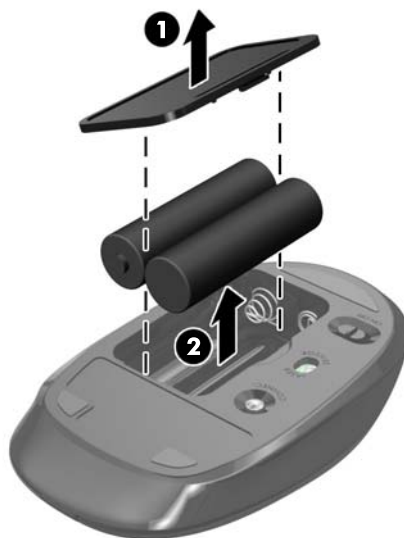
To remove batteries from the wireless keyboard, remove the battery door on the underside of the keyboard (1) and lift the batteries out of the battery compartment (2).

**Figure 2-5** Removing batteries from the wireless keyboard



To remove batteries from the wireless mouse, remove the battery door on the underside of the mouse (1) and lift the batteries out of the battery compartment (2).

**Figure 2-6** Removing batteries from the wireless mouse



## Attaching the computer to a mounting fixture

The computer stand is secured to a VESA mount inside the computer chassis. You can remove the stand and install the computer on a wall, monitor arm, or other mounting fixture.

**Table 2-1 Computer dimensions (without stand)**

Computer dimensions (without stand)		
Height	339.4 mm	13.4 in
Width	494.9 mm	19.5 in
Depth	52 mm	2.0 in
Computer weight (without stand)		
Minimum configuration	5.07 kg	11.2 lb
With Options	5.36 kg	11.8 lb
VESA standard hole patterns		
height x width	100 mm x 100 mm	3.94 in x 3.94 in

To remove the stand:

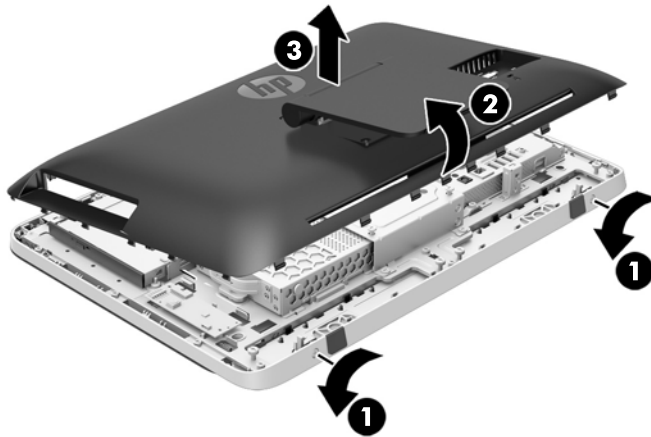
1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, then turn off any external devices.
3. Disconnect the power cord from the power outlet and disconnect any external devices.

**⚠ CAUTION:** 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. You must disconnect the power cord to avoid damage to the internal components of the computer.

4. Remove/disengage any security devices that prohibit opening the computer.
5. Place the computer face down on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
6. Turn the two screw latches at the bottom of the computer to the left (1) to release the bottom edge of the access panel.

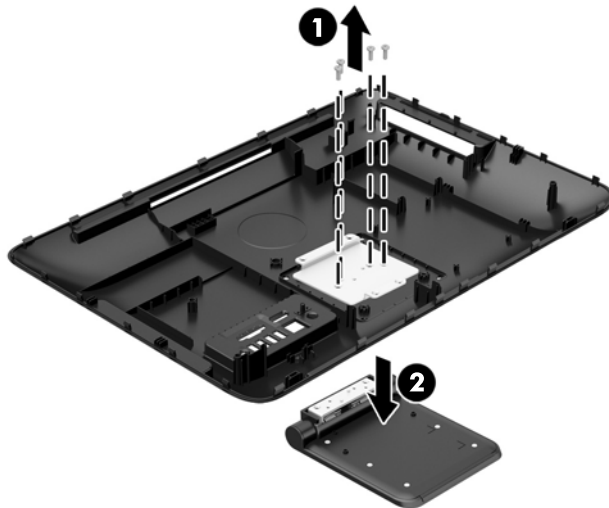
7. Rotate the bottom edge of the access panel up (2), and then lift the access panel off of the computer (3).


**Figure 2-7** Removing the access panel



8. Place the access panel down on a flat surface with the inside of the panel facing up.
9. Remove the four screws securing the stand to the access panel.

**Figure 2-8** Removing the stand



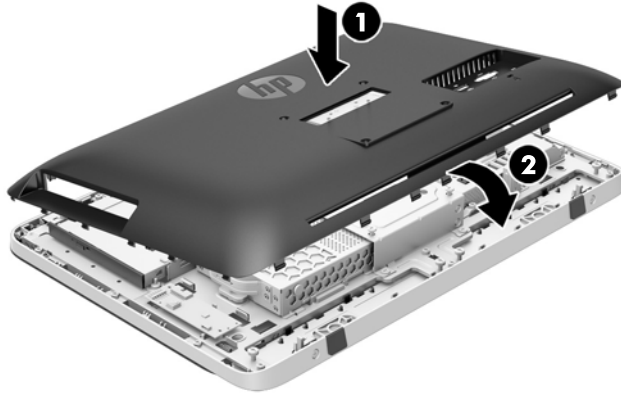
 **NOTE:** Save the screws together with the stand in case they are needed in the future.

10. Set the top edge of the access panel down on the top edge of the computer chassis (1). Be sure to align the hooks on the underside of the top edge of the access panel with the top edge of the computer.

11. Rotate the bottom edge of the access panel down (2) and press it firmly onto the chassis until it locks into place.

You will hear audible clicks as the latches click into place.

**Figure 2-9** Replacing the access panel



The computer is now ready to be mounted to a wall, monitor arm, or other mounting fixture.

## Connecting a second display

The DisplayPort connector on the rear of the computer allows you to connect a second display to the computer.

If you are adding a second display that has a DisplayPort connector, then no DisplayPort video adapter is required. If you are adding a second display that does not have a DisplayPort connector, you can purchase a DisplayPort video adaptor from HP for your configuration.

DisplayPort adapters and video cables are purchased separately. HP offers the following adapters:

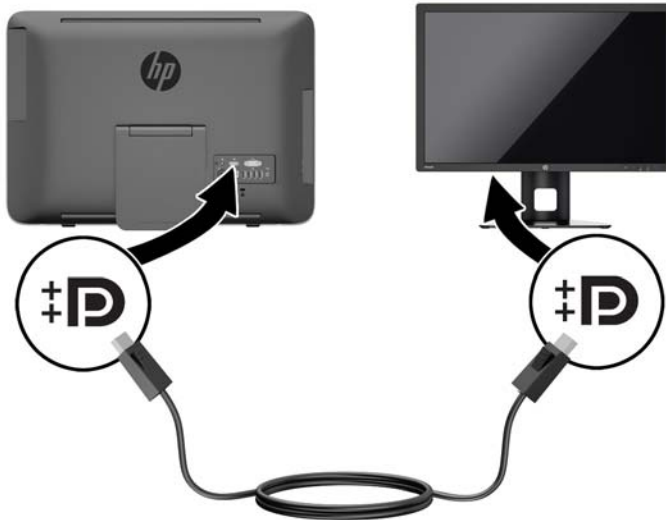
- DisplayPort to VGA adapter
- DisplayPort to DVI adapter
- DisplayPort to HDMI adapter

To connect a second display:

1. Turn off power to the computer and the second display that you are connecting to the computer.

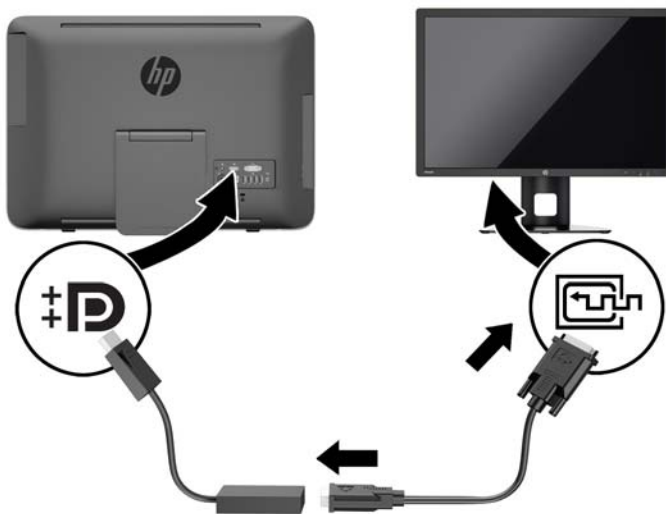
2. If your second display has a DisplayPort connector, connect a DisplayPort cable directly between the DisplayPort connector on the rear of the computer and the DisplayPort connector on the second display.

**Figure 2-10** Connecting a second display using a DisplayPort cable




3. If your second display does not have a DisplayPort connector, connect a DisplayPort video adapter to the DisplayPort connector of the computer. Then connect a cable (VGA, DVI, or HDMI, depending on your application) between the adapter and the second display.

**Figure 2-11** Connecting a second display using a DisplayPort adapter



4. Turn on power to the computer and the second display.

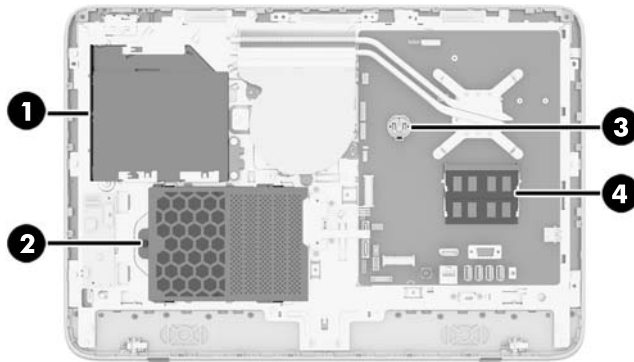
 **NOTE:** Use the graphics card software or the Windows Display Settings to configure the second display as a mirrored image of the primary display or an extension of the primary display.

# Locating internal components

The following sections contain procedures for removing and replacing these internal components:

- Optical disc drive
- Hard disc drive, solid state drive, or self-encrypting drive
- Battery
- Memory

**Figure 2-12** Locating internal components



Component	Component
1 Optical disc drive	3 Battery
2 Hard disc drive	4 Memory

## Removing and installing memory

The computer comes with double data rate 3 synchronous dynamic random access memory (DDR3-SDRAM) small outline dual inline memory modules (SODIMMs).

### SODIMMs

The memory sockets on the system board can be populated with up to two industry-standard SODIMMs. These memory sockets are populated with at least one preinstalled SODIMM. To achieve the maximum memory support, you can populate the system board with up to 16 GB of memory.

### DDR3-SDRAM SODIMMs

For proper system operation, the SODIMMs must be:

- industry-standard 204-pin
- unbuffered non-ECC PC3-10600 DDR3-1600 MHz-compliant
- 1.5 volt DDR3-SDRAM SODIMMs

The DDR3-SDRAM SODIMMs must also:

- support CAS latency 11 DDR3 1600 MHz (11-11-11 timing)
- contain the mandatory Joint Electronic Device Engineering Council (JEDEC) specification

In addition, the computer supports:

- 1-Gbit, 2-Gbit, and 4-Gbit non-ECC memory technologies
- single-sided and double-sided SODIMMS
- SODIMMs constructed with x8 and x16 SDRAMs; SODIMMs constructed with x4 SDRAMs are not supported



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

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



## Populating SODIMM sockets

The system will automatically operate in single channel mode, dual channel mode, or flex mode, depending on how the SODIMMs are installed. Refer to the following table to identify the SODIMM channel locations.

**Table 2-2 Identifying SODIMM locations**


Location	System board label	Channel
Lower Socket	SODIMM1	Channel A
Upper Socket	SODIMM3	Channel B

- The system will operate in single channel mode if the SODIMM sockets are populated in one channel only.
- The system will operate in flex mode if the memory capacity of the SODIMM in Channel A is not equal to the memory capacity of the SODIMM 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.
- The system will operate in a higher-performing dual channel mode if the memory capacity of the SODIMM in Channel A is equal to the memory capacity of the SODIMM in Channel B.
- In any mode, the maximum operational speed is determined by the slowest SODIMM in the system.

## Installing SODIMMs

There are two memory sockets on the system board. To remove or install memory modules:

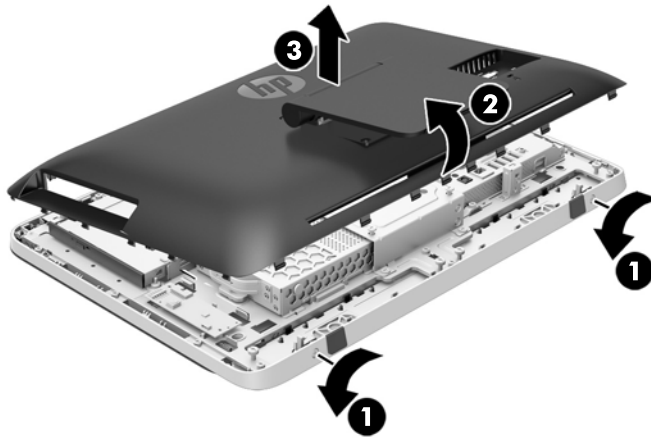
1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, then turn off any external devices.
3. Disconnect the power cord from the power outlet and disconnect any external devices.

 **CAUTION:** 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.

4. Remove/disengage any security devices that prohibit opening the computer.
5. Place the computer face down on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
6. Turn the two screw latches at the bottom of the computer to the left (1) to release the bottom edge of the access panel.

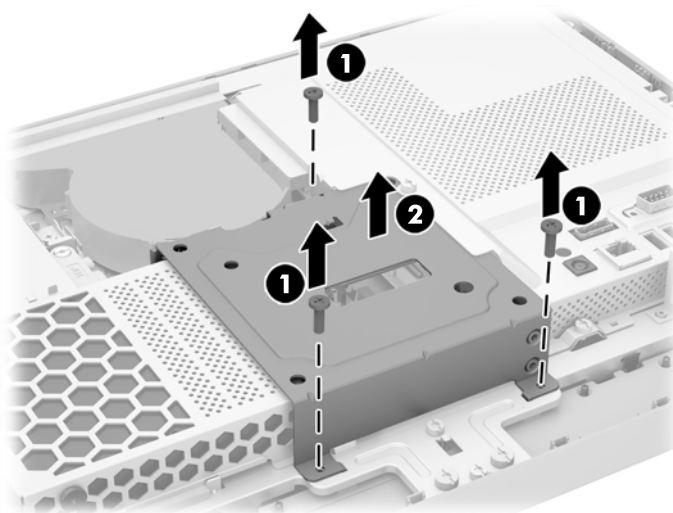
7. Rotate the bottom edge of the access panel up (2), and then lift the access panel off of the computer (3).

**Figure 2-13** Removing the access panel



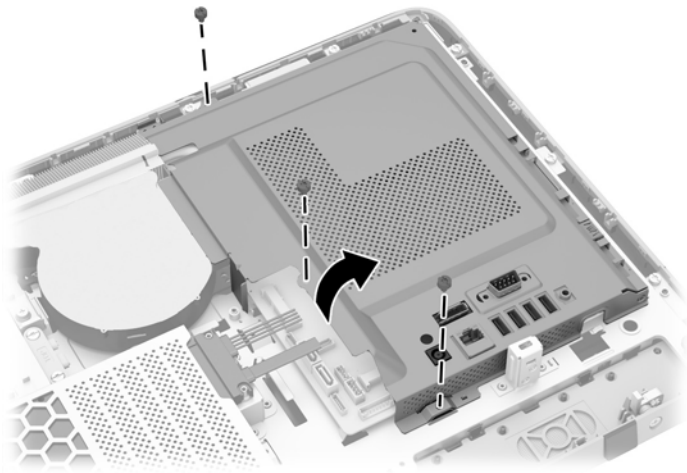
8. Remove the three screws securing the VESA panel to the chassis (1), and then lift the panel out of the chassis (2).

**Figure 2-14** Removing the VESA panel



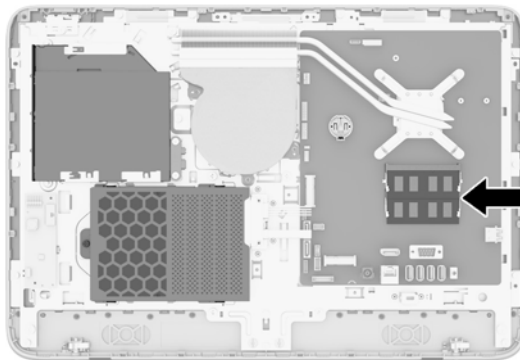
9. Remove the three screws securing the fire enclosure shield to the chassis, and then rotate the shield out of the chassis.

**Figure 2-15** Removing the fire enclosure shield



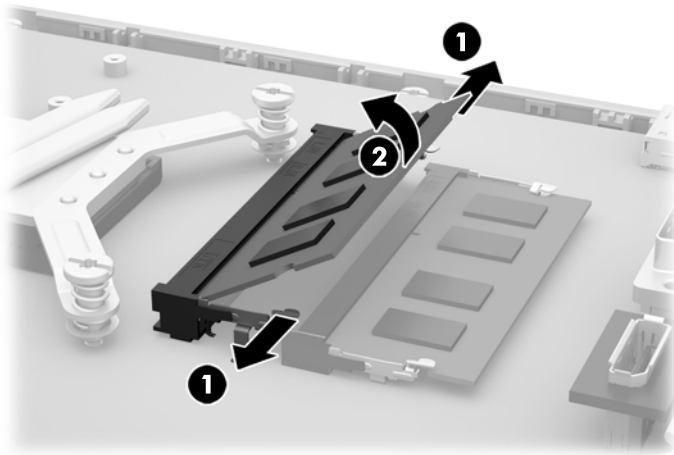
The memory modules can now be seen in the right side of the chassis.

**Figure 2-16** Locating the memory modules



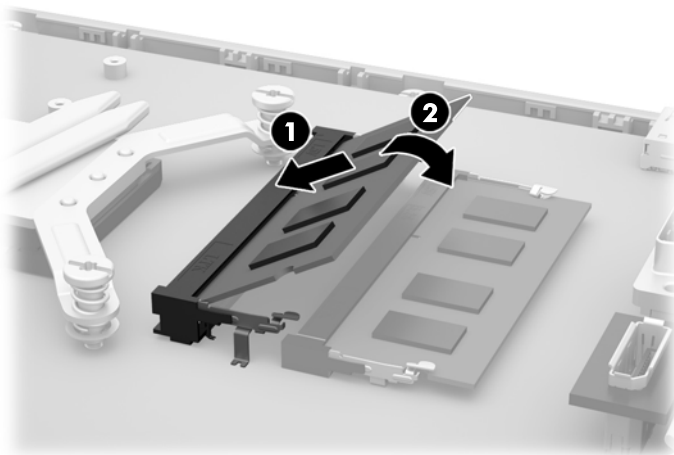
10. To remove a memory module, press outward on the two latches on each side of the SODIMM (1), then pull the SODIMM out of the socket (2).

**Figure 2-17** Removing a memory module




11. To install a memory module, slide the SODIMM into the socket at approximately a 30° angle (1), then press the SODIMM down (2) so that the latches lock it in place.

**Figure 2-18** Installing a memory module



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

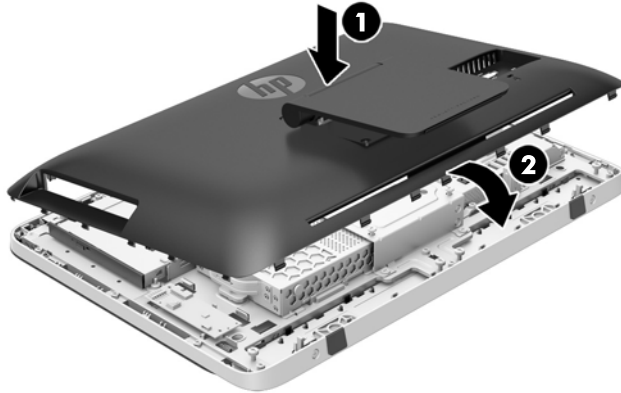
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12. Engage the four hooks on the right edge of the fire enclosure shield with the matching slots on the right side of the chassis and rotate the fire enclosure shield down onto the chassis.
13. Fasten the three screws to secure the fire enclosure shield to the chassis.
14. Place the VESA panel onto the chassis and fasten the three screws to secure the VESA panel to the chassis.
15. Set the top edge of the access panel down on the top edge of the computer chassis (1). Be sure to align the hooks on the underside of the top edge of the access panel with the top edge of the computer.

16. Rotate the bottom edge of the access panel down (2) and press it firmly onto the chassis until it locks into place.

You will hear audible clicks as the latches click into place.

**Figure 2-19** Replacing the access panel



17. Place the computer in the upright position.
18. Reconnect the power cord and external devices.
19. Lock any security devices that were disengaged when the access panel was removed.
20. Turn on the computer. The computer automatically recognizes the additional memory when you turn on the computer.

## Replacing the battery

The battery is located on the system board on the lower right side of the fan. 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.


**CAUTION:** 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, be sure 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.

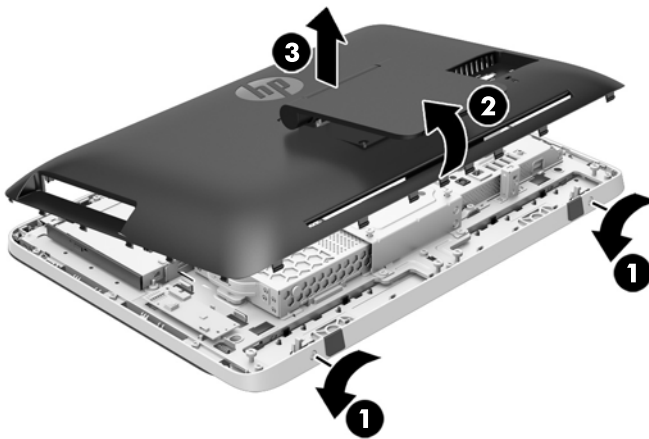
HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, go to <http://www.hp.com/recycle>.

1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, then turn off any external devices.
3. Disconnect the power cord from the power outlet and disconnect any external devices.

 **CAUTION:** 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. You must disconnect the power cord to avoid damage to the internal components of the computer.

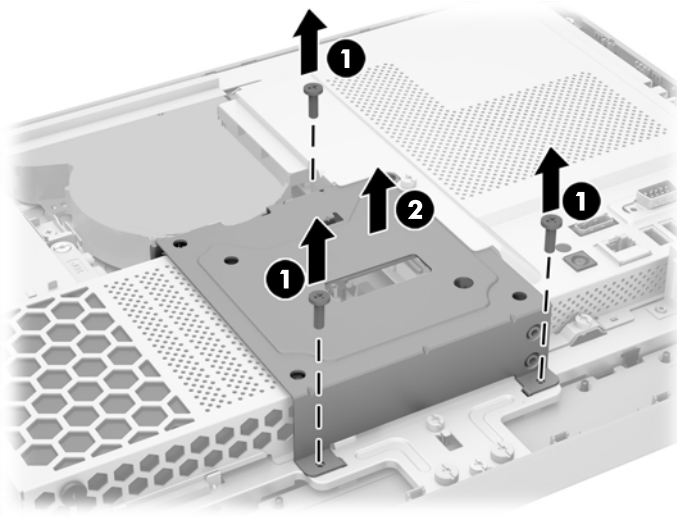
4. Remove/disengage any security devices that prohibit opening the computer.
5. Place the computer face down on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
6. Turn the two screw latches at the bottom of the computer to the left (1) to release the bottom edge of the access panel.
7. Rotate the bottom edge of the access panel up (2), and then lift the access panel off of the computer (3).

**Figure 2-20** Removing the access panel



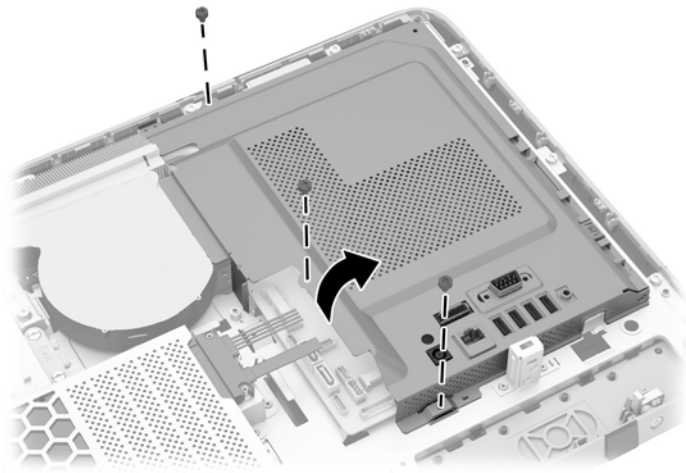
8. Remove the three screws securing the VESA panel to the chassis (1), and then lift the panel out of the chassis (2).

**Figure 2-21** Removing the VESA panel



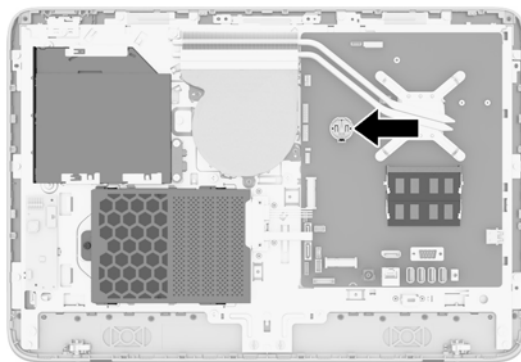
9. Remove the three screws securing the fire enclosure shield to the chassis, and then rotate the shield out of the chassis.

**Figure 2-22** Removing the fire enclosure shield



The battery can now be seen to the right of the fan.

**Figure 2-23** Locating the battery

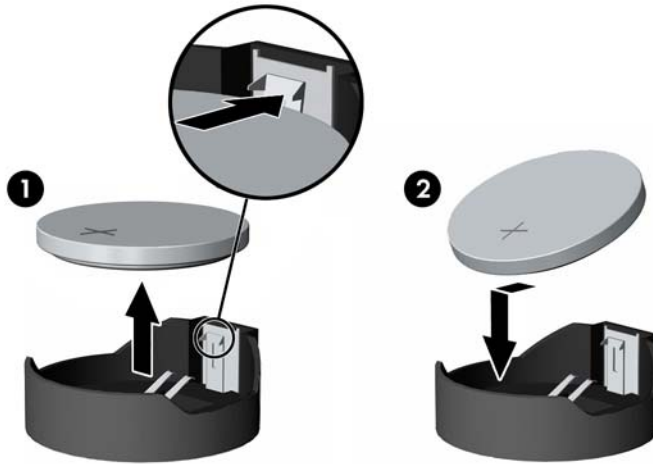


10. To release the battery from its holder, squeeze the metal clamp that extends above one edge of the battery. When the battery pops up, lift it out (1).



11. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up. Push the other edge down until the clamp snaps over the other edge of the battery (2).

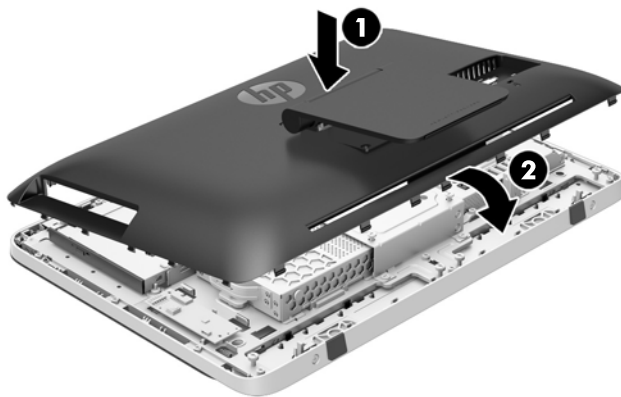
**Figure 2-24** Removing and replacing a coin cell battery



12. Engage the four hooks on the right edge of the fire enclosure shield with the matching slots on the right side of the chassis and rotate the fire enclosure shield down onto the chassis.
13. Fasten the three screws to secure the fire enclosure shield to the chassis.
14. Place the VESA panel onto the chassis and fasten the three screws to secure the VESA panel to the chassis.
15. Set the top edge of the access panel down on the top edge of the computer chassis (1). Be sure to align the hooks on the underside of the top edge of the access panel with the top edge of the computer.
16. Rotate the bottom edge of the access panel down (2) and press it firmly onto the chassis until it locks into place.

You will hear audible clicks as the latches click into place.

**Figure 2-25** Replacing the access panel



17. Place the computer in the upright position.
18. Reconnect the power cord and external devices.
19. Lock any security devices that were disengaged when the access panel was removed.
20. Turn on the computer.
21. Reset the date and time, your passwords, and any special system setups using Computer Setup.

## Replacing drives

### Replacing a hard drive

The hard drive is located behind the access panel on the lower left side of the computer (when viewed from behind). The drive is housed in a removable cage.

Any one of the following may be installed in the computer:

- One 3.5-inch hard drive
- One 2.5-inch solid state drive (SSD), self-encrypting drive (SED), or solid state hybrid drive (SSHD)



---

**NOTE:** Replacing a 3.5-inch drive with a 2.5-inch drive is not supported.

---

- [Removing a hard drive](#)
- [Installing a hard drive](#)

### Removing a hard drive

- [Removing a 3.5-inch hard drive](#)
- [Removing a 2.5-inch solid state drive \(SSD\), self-encrypting drive \(SED\), or solid state hybrid drive \(SSHD\)](#)

### Removing a 3.5-inch hard drive

1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, then turn off any external devices.
3. Disconnect the power cord from the power outlet and disconnect any external devices.



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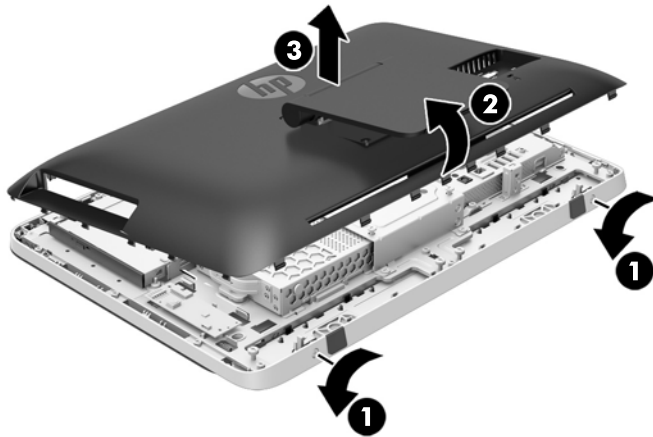
**CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

---

4. Remove/disengage any security devices that prohibit opening the computer.
5. Place the computer face down on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
6. Turn the two screw latches at the bottom of the computer to the left (1) to release the bottom edge of the access panel.

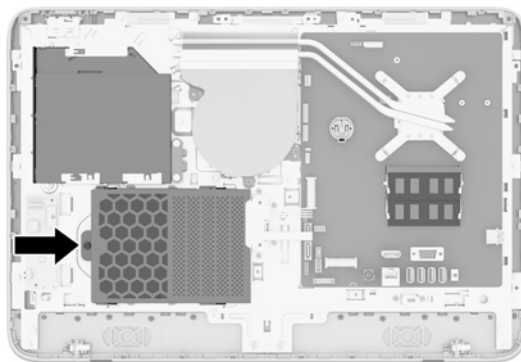
7. Rotate the bottom edge of the access panel up (2), and then lift the access panel off of the computer (3).

**Figure 2-26** Removing the access panel



The hard drive cage can now be seen in the lower left side of the chassis.

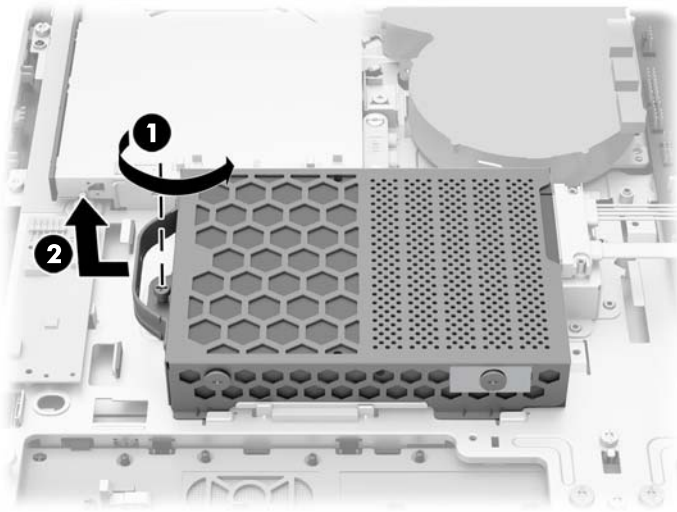
**Figure 2-27** Locating the hard drive cage



8. Loosen the captive screw securing the hard drive cage in the chassis (1).

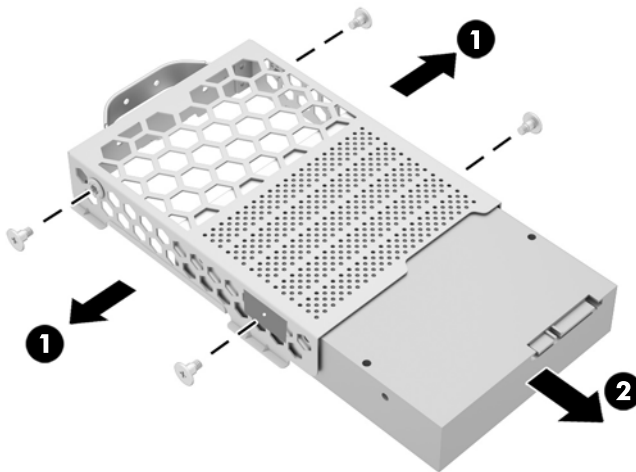
9. Slide the hard drive cage left, and then lift it out of the chassis (2).

**Figure 2-28** Removing the hard drive cage



10. Remove the four mounting screws (1) securing the 3.5-inch hard drive in the hard drive cage. Be sure to keep the screws together with the blue rubber grommets to use to install a replacement drive.
11. Slide the 3.5-inch hard drive out of the hard drive cage (2).

**Figure 2-29** Removing the mounting screws



For instructions on installing a hard drive, see [Installing a hard drive on page 34](#).

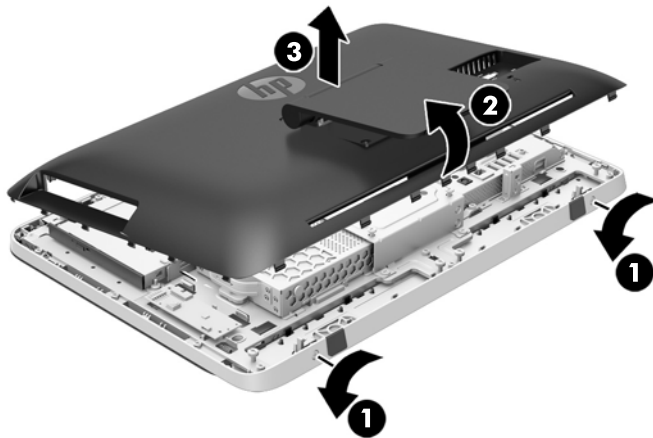
## Removing a 2.5-inch solid state drive (SSD), self-encrypting drive (SED), or solid state hybrid drive (SSHD)

1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, then turn off any external devices.
3. Disconnect the power cord from the power outlet and disconnect any external devices.

**⚠ CAUTION:** 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. You must disconnect the power cord to avoid damage to the internal components of the computer.

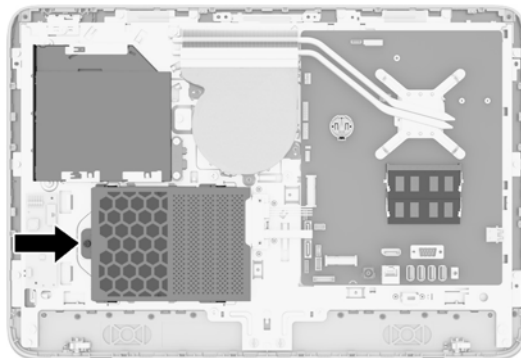
4. Remove/disengage any security devices that prohibit opening the computer.
5. Place the computer face down on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
6. Turn the two screw latches at the bottom of the computer to the left (1) to release the bottom edge of the access panel.
7. Rotate the bottom edge of the access panel up (2), and then lift the access panel off of the computer (3).

**Figure 2-30** Removing the access panel



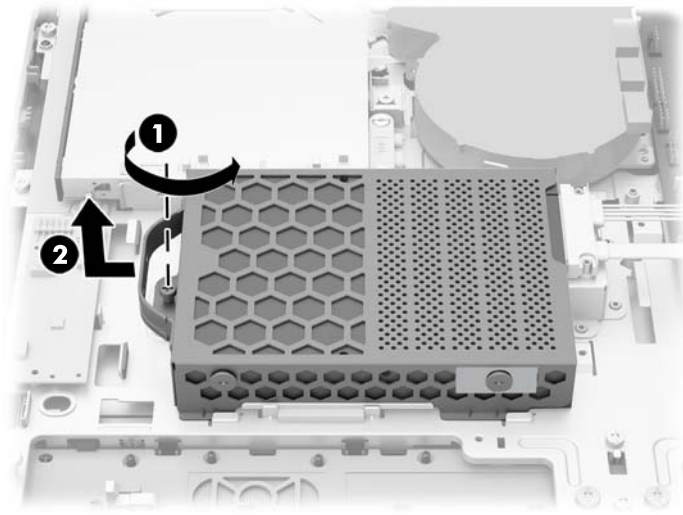
The hard drive cage can now be seen in the lower left side of the chassis.

**Figure 2-31** Locating the hard drive cage



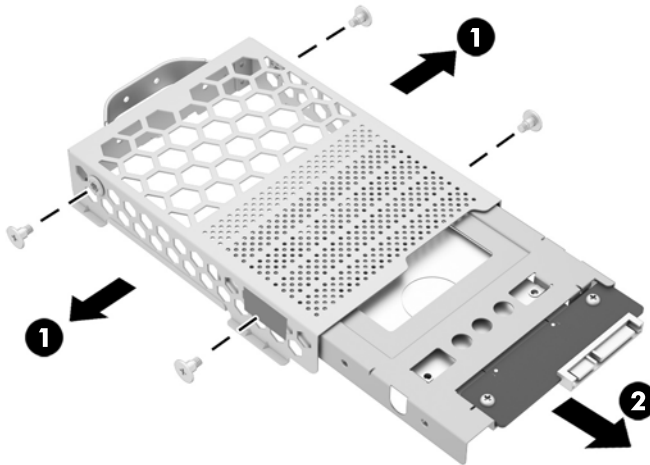
8. Loosen the captive screw securing the hard drive cage in the chassis (1).
9. Slide the hard drive cage left, and then lift it out of the chassis (2).

**Figure 2-32** Removing the hard drive cage



10. Remove the four mounting screws (1) securing the 2.5-inch drive adapter in the hard drive cage. Be sure to keep the screws together with the blue rubber grommets to use to install a replacement drive.
11. Slide the 2.5-inch drive adapter out of the hard drive cage (2).

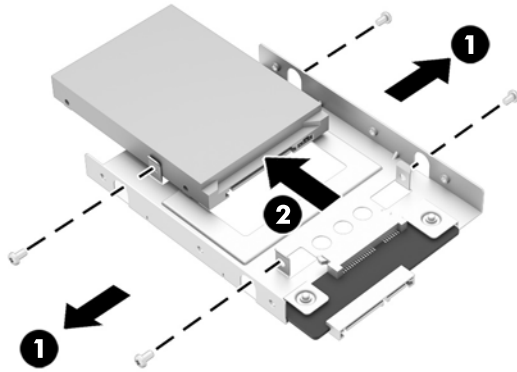
**Figure 2-33** Removing the drive cage



12. Remove the four screws (1) securing the 2.5-inch drive in the drive adapter. Be sure to keep the screws to use to install a replacement drive.

13. Slide the 2.5-inch hard drive out of the drive adapter (2).

**Figure 2-34** Removing the 2.5-inch drive adapter from the drive cage



For instructions on installing a hard drive, see [Installing a hard drive on page 34](#).

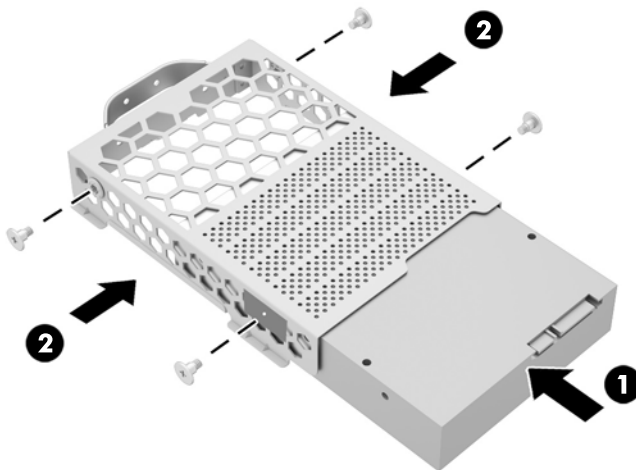
## Installing a hard drive

- [Installing a 3.5-inch hard drive](#)
- [Installing a 2.5-inch solid state drive \(SSD\), self-encrypting drive \(SED\), or solid state hybrid drive \(SSHD\)](#)

### Installing a 3.5-inch hard drive

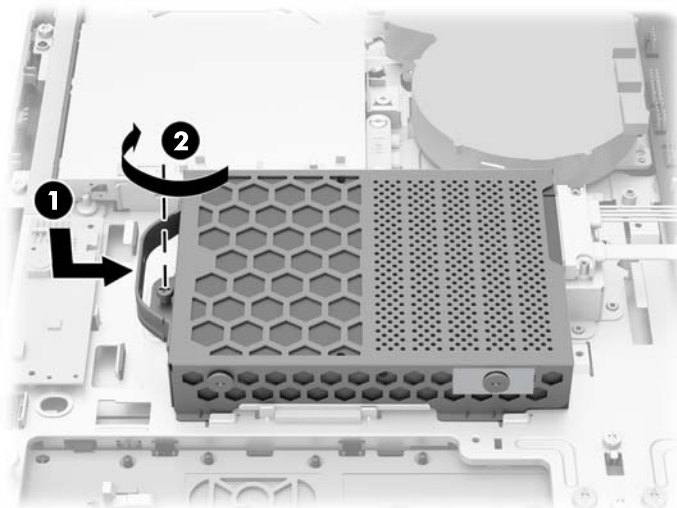
1. Slide the new 3.5-inch hard drive into the hard drive cage (1). Be sure that the hard drive connector is facing up at the open end of the drive.
2. Screw the four mounting screws through the sides of the hard drive cage into the 3.5-inch hard drive (2). Be sure to keep the blue rubber grommets behind each screw.

**Figure 2-35** Installing the 3.5-inch hard drive in the hard drive cage



3. With the 3.5-inch hard drive connector facing toward the center of the chassis, place the hard drive cage into the chassis and slide it toward the center until it snaps into place (1).
4. Tighten the captive screw (2) to secure the hard drive cage in the chassis.

**Figure 2-36** Installing the hard drive cage

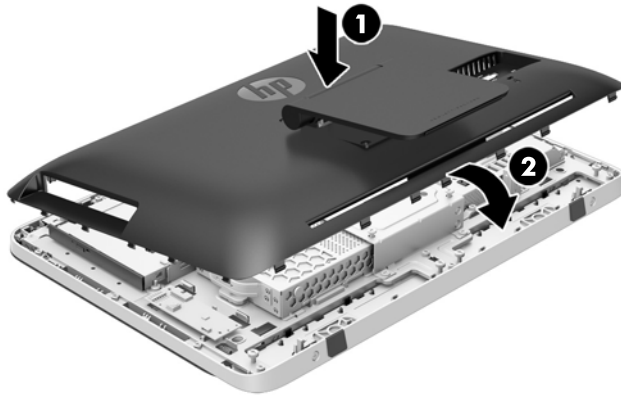




5. Set the top edge of the access panel down on the top edge of the computer chassis (1). Be sure to align the hooks on the underside of the top edge of the access panel with the top edge of the computer.
6. Rotate the bottom edge of the access panel down (2) and press it firmly onto the chassis until it locks into place.

You will hear audible clicks as the latches click into place.

**Figure 2-37** Replacing the access panel

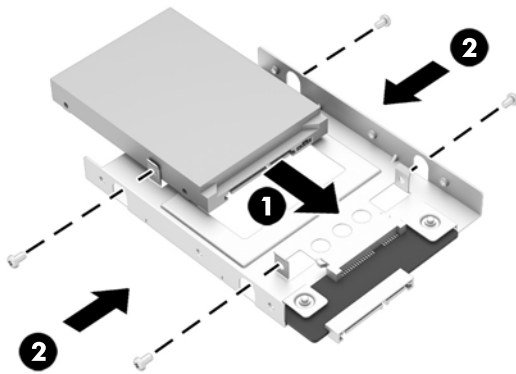


7. Place the computer in the upright position.
8. Reconnect the power cord and external devices.
9. Lock any security devices that were disengaged when the access panel was removed.
10. Turn on the computer.

## Installing a 2.5-inch solid state drive (SSD), self-encrypting drive (SED), or solid state hybrid drive (SSHD)

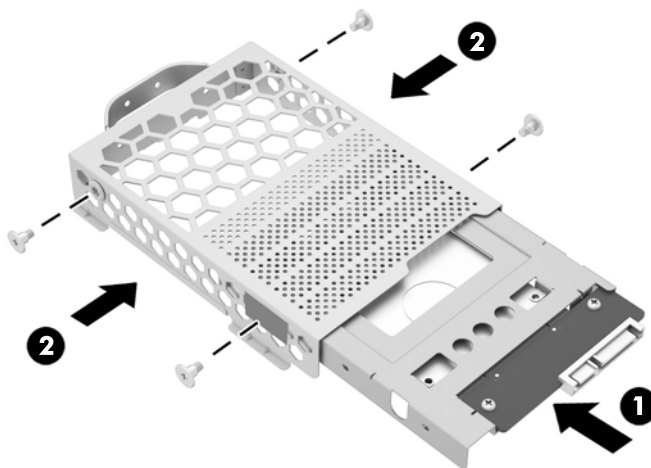
1. Insert the 2.5-inch solid state drive (SSD), self-encrypting drive (SED), or solid state hybrid drive (SSHD) into the 2.5-inch drive adapter (1). Be sure that the connector is at the opening of the adapter.
2. Fasten the four screws (2) to secure the 2.5-inch solid state drive (SSD), self-encrypting drive (SED), or solid state hybrid drive (SSHD) in the 2.5-inch drive adapter.

**Figure 2-38** Securing the 2.5-inch hard drive in the adapter



3. Slide the 2.5-inch drive adapter into the hard drive cage (1).
4. Screw the four mounting screws with grommets through the sides of the hard drive cage into the 2.5-inch drive adapter (2). Be sure to keep the blue rubber grommets behind each screw.

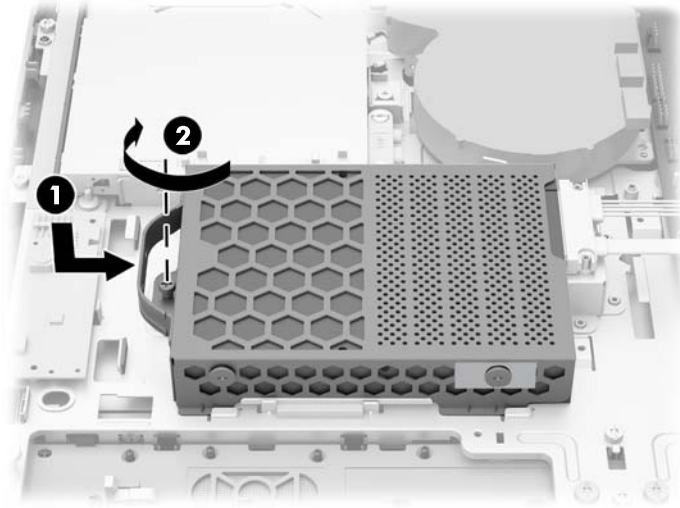
**Figure 2-39** Installing the 2.5-inch drive adapter in the hard drive cage



5. With the 2.5-inch drive connector facing toward the center of the chassis, place the drive cage into the chassis and slide it toward the center until it snaps into place (1).

6. Tighten the captive screw (2) to secure the hard drive cage in the chassis.

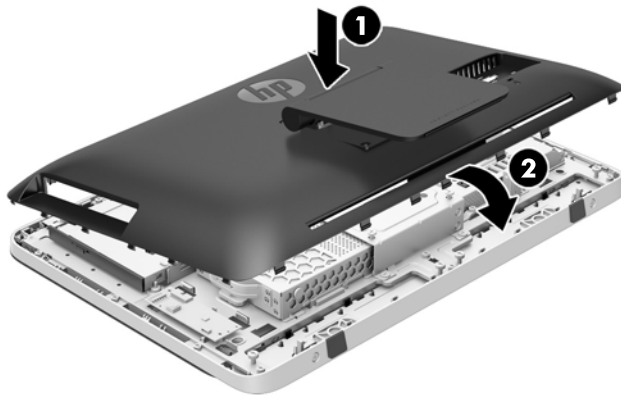
**Figure 2-40** Installing the hard drive cage



7. Set the top edge of the access panel down on the top edge of the computer chassis (1). Be sure to align the hooks on the underside of the top edge of the access panel with the top edge of the computer.
8. Rotate the bottom edge of the access panel down (2) and press it firmly onto the chassis until it locks into place.

You will hear audible clicks as the latches click into place.

**Figure 2-41** Replacing the access panel




9. Place the computer in the upright position.
10. Reconnect the power cord and external devices.
11. Lock any security devices that were disengaged when the access panel was removed.
12. Turn on the computer.

## Replacing the optical disc drive

The optical disc drive is located above the hard drive on the left side of the computer (when viewed from behind).

1. Remove all removable media, such as optical discs or USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, then turn off any external devices.
3. Disconnect the power cord from the power outlet and disconnect any external devices.

---

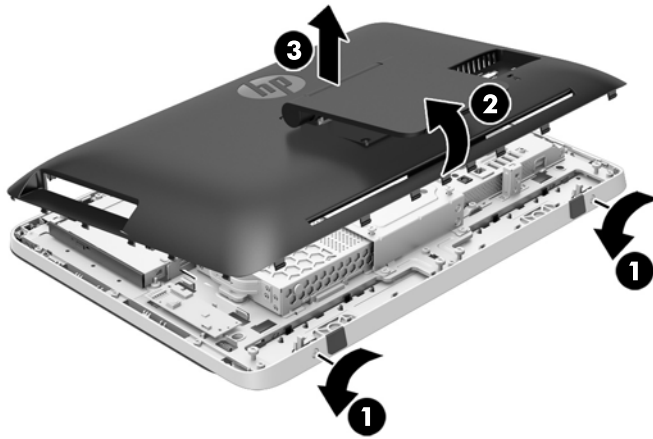
 **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

---

4. Remove/disengage any security devices that prohibit opening the computer.
5. Place the computer face down on a soft flat surface. HP recommends that you set down a blanket, towel, or other soft cloth to protect the bezel and screen surface from scratches or other damage.
6. Turn the two screw latches at the bottom of the computer to the left (1) to release the bottom edge of the access panel.

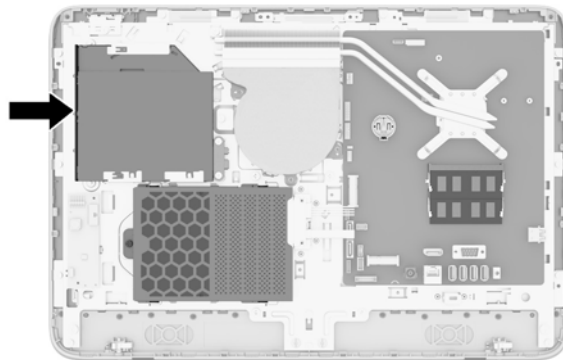
7. Rotate the bottom edge of the access panel up (2), and then lift the access panel off of the computer (3).

**Figure 2-42** Removing the access panel



The optical disc drive can now be seen in the upper left side of the chassis.

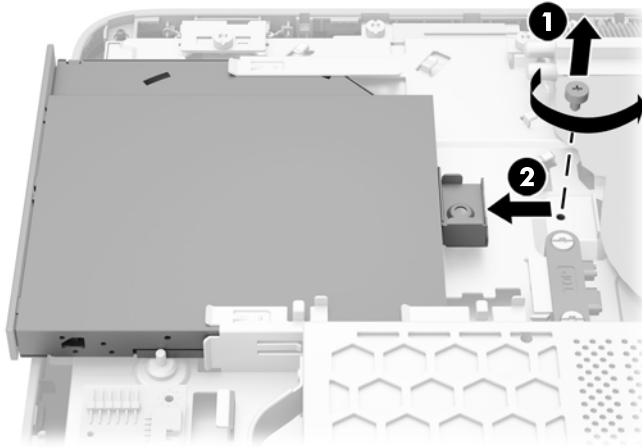
**Figure 2-43** Locating the optical disc drive



8. Remove the screw through the optical disc drive bracket that secures the optical disc drive to the chassis (1).

9. Slide the optical disc drive left (2) to remove it from the chassis.

**Figure 2-44** Removing the optical disc drive



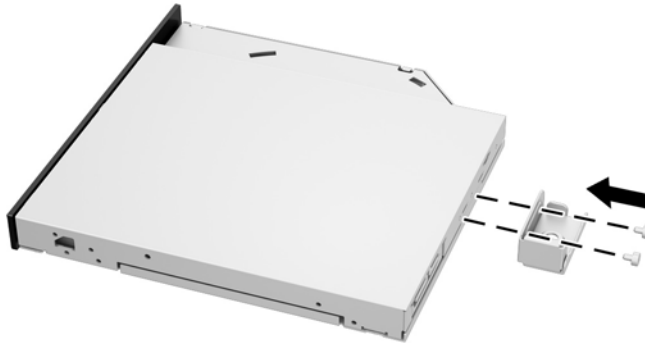
10. Remove the two screws attaching the optical disc drive bracket to the optical disc drive.

**Figure 2-45** Removing the optical disc drive bracket




11. Attach the optical disc drive bracket to the new optical disc drive by screwing the two screws through the bracket into the new drive.

**Figure 2-46** Installing the optical disc drive bracket



12. Place the new optical disc drive into the chassis and push the drive in firmly until it snaps into place (1).

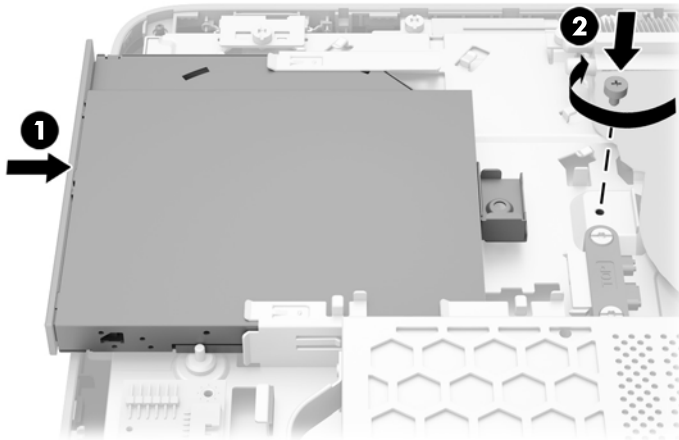
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 **NOTE:** The optical disc drive can be installed in only one way.

---

13. Fasten the screw to the inside tab of the optical disc drive to secure the drive to the chassis.

**Figure 2-47** Installing the optical disc drive

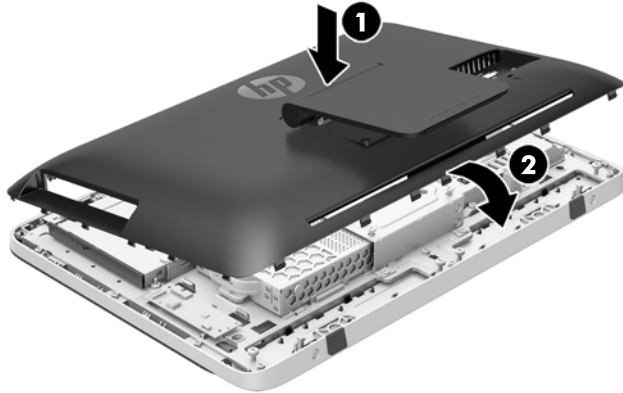


14. Set the top edge of the access panel down on the top edge of the computer chassis (1). Be sure to align the hooks on the underside of the top edge of the access panel with the top edge of the computer.

15. Rotate the bottom edge of the access panel down (2) and press it firmly onto the chassis until it locks into place.

You will hear audible clicks as the latches click into place.

**Figure 2-48** Replacing the access panel



16. Place the computer in the upright position.
17. Reconnect the power cord and external devices.
18. Lock any security devices that were disengaged when the access panel was removed.
19. Turn on 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

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 +/- 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.



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

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# 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:


- 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 to permit the required airflow.
- Never restrict the airflow into the computer by blocking any vents or air intakes.
- Never operate the computer with any of the access panels removed.
- Do not 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 with any type of material.
- Install or enable power management functions of the operating system or other software, including sleep states.
- When cleaning the computer turn off power to the computer and unplug the power cord before you do any 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.
  - Do not use cleaners that contain any petroleum based materials such as benzene, thinner, or any volatile substance to clean the screen or cabinet. These chemicals may damage the computer.
  - Wipe the screen with a soft, clean antistatic cloth. For more difficult cleaning situations, use a 50/50 mix of water and Isopropyl alcohol. Spray the cleaner onto a cloth and use the damp cloth to gently wipe the screen surface. Never spray the cleaner directly on the screen surface. It may run behind the bezel and damage the electronics.
  - 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.

## Optical disc drive precautions

Be sure to observe the following guidelines while operating or cleaning the optical disc drive.

- Do not move the drive during operation. This may cause it to malfunction during reading.
- Avoid exposing the drive to sudden changes in temperature, as condensation may form inside the unit. If the temperature suddenly changes while the drive is on, wait at least one hour before you turn off the power. If you operate the unit immediately, it may malfunction while reading.
- Avoid placing the drive in a location that is subject to high humidity, extreme temperatures, mechanical vibration, or direct sunlight.

---

 **CAUTION:** If any object or liquid falls into the drive, immediately unplug the computer and have it checked by an authorized HP service provider.

---

## Shipping preparation

Follow these suggestions when preparing to ship the computer:

1. Back up the hard drive files on optical media or external USB drives. 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 electrical outlet, then from the computer.
5. Disconnect the system components and external devices from their power sources, then from the computer.



---

**NOTE:** Be sure 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.

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