User Guide

Product notice

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

Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.microsoft.com.

To access the latest user guides, go to http://www.hp.com/support, and follow the instructions to find your product. Then select **User Guides**.

Safety warning notice

⚠ WARNING! To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by applicable safety standards.

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x

1 Getting started

After you set up and register the computer, HP recommends the following steps to get the most out of your smart investment:

- **Connect to the Internet**—Set up your wired or wireless network so that you can connect to the Internet. For more information, see Network connections on page 18.

- **Update your antivirus software**—Protect your computer from damage caused by viruses. The software is preinstalled on the computer. For more information, see Using antivirus software on page 39.

- **Get to know your computer**—Learn about your computer features. See Components on page 3 and Navigating the screen on page 24 for additional information.

- **Find installed software**—Access a list of the software preinstalled on the computer:

  Select the **Start** button.

  – or –

  Right-click the **Start** button, and then select **Apps and Features**.

- Back up your hard drive by creating recovery discs or a recovery USB flash drive. See Backup and recovery information on page 44.

Finding information

To locate resources that provide product details, how-to information, and more, use this table.

Table 1-1 Finding information

Resource	Contents
Setup Instructions	• Overview of computer setup and features
HP support For HP support, go to http://www.hp.com/support.	• Online chat with an HP technician • Support telephone numbers • Replacement parts videos (select products only) • Maintenance and service guides • HP service center locations
Safety & Comfort Guide To access this guide: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. – or – ▲ Select the **Start** button, select **HP**, and then select **HP Documentation**. – or – ▲ Go to http://www.hp.com/ergo.	• Proper workstation setup • Guidelines for posture and work habits that increase your comfort and decrease your risk of injury • Electrical and mechanical safety information

Table 1-1 Finding information (continued)

Resource	Contents
IMPORTANT: You must be connected to the Internet to access the latest version of the user guide.	
Regulatory, Safety, and Environmental Notices To access this document: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. – or – ▲ Select the **Start** button, select **HP**, and then select **HP Documentation**.	● Important regulatory notices, including information about proper battery disposal, if needed
Limited Warranty* To access this document: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. – or – ▲ Select the **Start** button, select **HP**, and then select **HP Documentation**. – or – ▲ Go to http://www.hp.com/go/orderdocuments. **IMPORTANT:** You must be connected to the Internet to access the latest version of the user guide.	● Specific warranty information about this computer

*You can find your HP Limited Warranty located with the user guides on your product and/or on the CD or DVD provided in the box. In some countries or regions, HP may provide a printed warranty in the box. For countries or regions where the warranty is not provided in printed format, you can request a copy from http://www.hp.com/go/orderdocuments. For products purchased in Asia Pacific, you can write to HP at POD, PO Box 161, Kitchener Road Post Office, Singapore 912006. Include your product name, and your name, phone number, and postal address.

2 Components

Your computer features top-rated components. This chapter provides details about your components, where they are located, and how they work.

Locating hardware

To find out what hardware is installed on your computer:

▲ Type `device manager` in the taskbar search box, and then select the **Device Manager** app.

A list displays all the devices installed on your computer.

For information about system hardware components and the system BIOS version number, select the **Start** button, select **HP** folder, and then select **HP Thin Client System Information**.

Locating software

To find out what software is installed on your computer:

▲ Right-click the **Start** button, and then select **Apps and Features**.

Right

Table 2-1 Right-side components and their descriptions

Component		Description
(1)	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.
		WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*.
		To access this guide:
		▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.
		NOTE: When a device is connected to the jack, the computer speakers are disabled.
(2)	USB SuperSpeed port (1 or 2, depending on model)	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(3)	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High Definition Multimedia Interface (HDMI) device.
(4)	RJ-45 (network) jack/status lights	Connects a network cable.
		● Green (left): The network is connected.
		● Amber (right): Activity is occurring on the network.
(5)	USB Type-C power connector port, SuperSpeed port, and DisplayPort™ connector	Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery.
		– and –
		Connects a USB device that has a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
		– and –
		Connects a display device that has a USB Type-C connector, providing DisplayPort output.
		NOTE: Cables, adapters, or both (purchased separately) might be required.
(6)	Battery light	When AC power is connected:

Table 2-1 Right-side components and their descriptions (continued)

Component		Description
		● White: The battery charge is greater than 90%.
		● Amber: The battery charge is from 0 to 90%.
		● Off: The battery is not charging.
		When AC power is disconnected (battery not charging):
		● Blinking amber: The battery has reached a low battery level. When the battery has reached a critical battery level, the battery light begins blinking rapidly.
		● Off: The battery is not charging.
(7)	⏻	Power connector	Connects an AC adapter.

Left

Table 2-2 Left-side components and their descriptions

Component		Description
(1)	🔒	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)		USB powered port	Connects and supplies power to a USB device, such as a cell phone, camera, activity tracker, optical drive, or smartwatch, and provides data transfer.
(3)		Vent	Enables airflow to cool internal components. **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)	SD	Memory card reader	Reads optional memory cards that store, manage, share, or access information. To insert a card: **1.** Hold the card label-side up, with the connectors facing the computer. **2.** Insert the card into the memory card reader, and then press in on the card until it is firmly seated.

Table 2-2 Left-side components and their descriptions (continued)

Component	Description
	To remove a card:
	▲ Press in on the card, and then remove it from the memory card reader.
(5) 💿 Drive light	● Blinking white: The hard drive is being accessed.

Display

Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antennas* (select products only)	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2)	WWAN antennas* (select products only)	Send and receive wireless signals to communicate with wireless wide area networks (WWANs).
(3)	Internal microphone(s) (1 or 2, depending on model)	Record(s) sound.
(4)	Camera(s) (select products only)	Allow(s) you to video chat, record video, and record still images. To use your camera, see Using the camera (select products only) on page 26. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. For more information, see Windows Hello (select products only) on page 39. **NOTE:** Camera functions vary depending on the camera hardware and software installed on your product.

Table 2-3 Display components and their descriptions (continued)

Component		Description
(5)	Camera privacy cover (select products only)	By default, the camera lens is uncovered, but you can slide the camera privacy cover to block the camera's view. To use the camera, slide the camera privacy cover in the opposite direction to reveal the lens.
		NOTE: If you have both front-facing and rear-facing cameras, when one camera lens is revealed and ready to use, the other is concealed.
(6)	Camera light (select products only)	On: The camera is in use.

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this guide:

▲   Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.

Keyboard area

Touchpad

Touchpad settings

To adjust touchpad settings and gestures, or to turn off the touchpad:

1. Type `touchpad settings` in the taskbar search box, and then press enter.

2. Choose a setting.

To turn on the touchpad:

1. Type `touchpad settings` in the taskbar search box, and then press enter.

2. Using an external mouse, click the **Touchpad** button.

– or –

▲ Press the Tab key repeatedly until the pointer rests on the **Touchpad** button. Then press the spacebar to select the button.
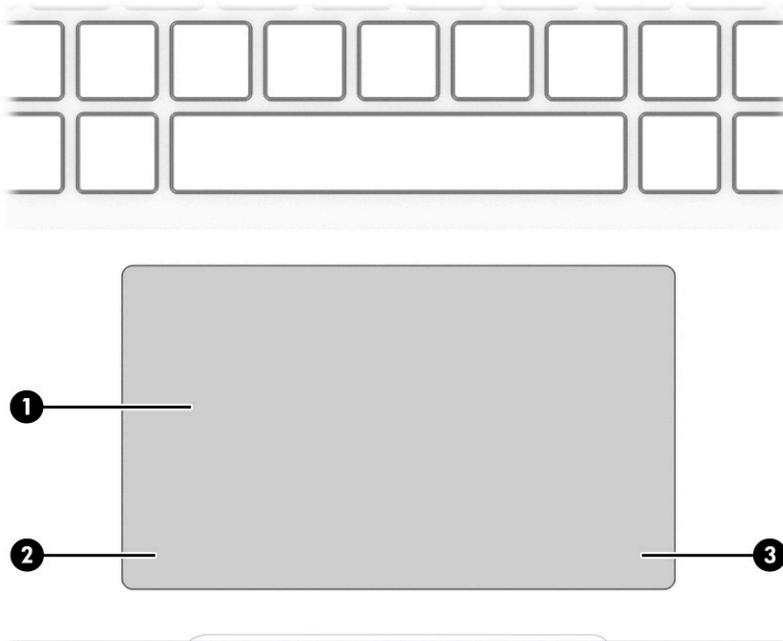
Table 2-4 Touchpad components and their descriptions

Component		Description
(1)	Touchpad zone	Reads your finger gestures to move the pointer or activate items on the screen.
		NOTE: For more information, see Using touchpad and touch screen gestures on page 24.
(2)	Left control zone	Textured area that allows you to perform additional gestures.
(3)	Right control zone	Textured area that allows you to perform additional gestures.

Lights
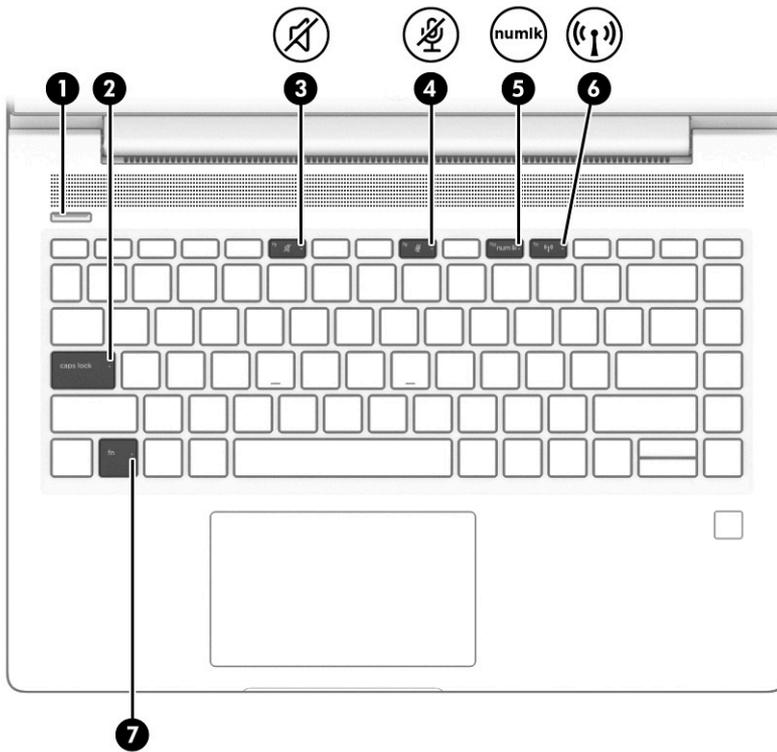
Table 2-5 Lights and their descriptions

Component		Description
(1)	Power light	● On: The computer is on.
		● Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.
		● Off: The computer is off.
(2)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(3)	Mute light	● On: Computer sound is off.
		● Off: Computer sound is on.
(4)	Microphone mute light	● On: Microphone is off.
		● Off: Microphone is on.
(5)	Num lk light	On: Num lock is on.
(6)	Wireless light	On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.
		NOTE: On some models, the wireless light is amber when all wireless devices are off.
(7)	Fn lock light	On: The fn key is locked. For more information, see Special keys on page 12 (select products only).

Button, vent, speakers, and fingerprint reader
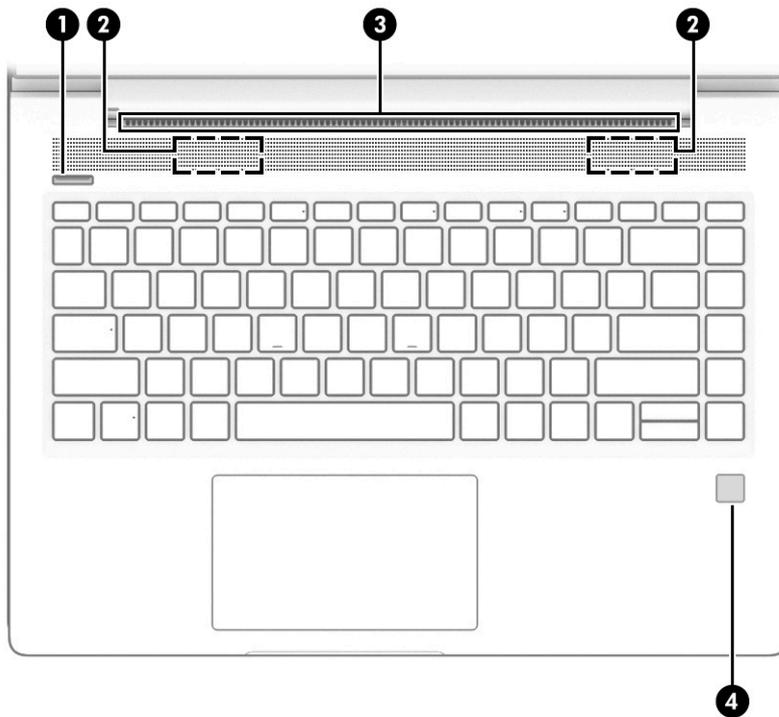
Table 2-6 Button, vent, speakers, fingerprint reader and their descriptions

Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer.
		• When the computer is on, press the button briefly to initiate Sleep.
		• When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only).
		IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information.
		If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.
		To learn more about your power settings, see your power options.
		▲ Right-click the **Power meter** icon and then select **Power Options**.
(2)	Speakers (2)	Produce sound.
(3)	Vent	Enables airflow to cool internal components.

Component		Description
		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)	Fingerprint reader (select products only)	Allows a fingerprint logon to Windows, instead of a password logon.

▲ Touch your finger to the fingerprint reader. See Windows Hello (select products only) on page 39 for details.

IMPORTANT: To prevent fingerprint logon issues, be sure that when you register your fingerprint, that all sides of your finger are registered by the fingerprint reader.

IMPORTANT: To verify that your computer has a fingerprint reader, type `Sign-in options` in the task bar search box and follow the on-screen instructions. If **Fingerprint Reader** is listed as an option, then your computer includes a fingerprint reader.

Special keys
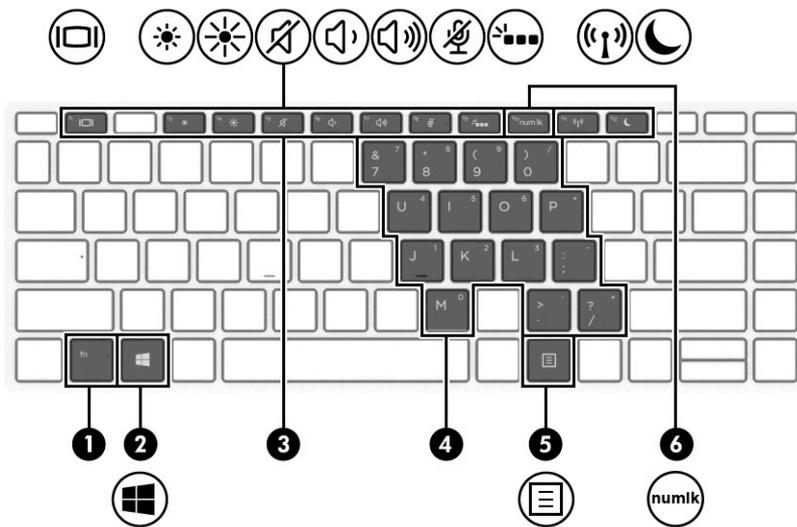
Table 2-7 Special keys and their descriptions

	Component	Description
(1)	fn key	Executes frequently used system functions when pressed in combination with another key. Such key combinations are called *hot keys*. See Hot keys (select products only) on page 15.
(2)	Windows key	Opens the Start menu. **NOTE:** The Windows key is not functional on HP ThinPro or HP Smart Zero operating systems.
(3)	Action keys	Execute frequently used system functions. See Action keys on page 13.
(4)	Embedded numeric keypad	A numeric keypad superimposed over the keyboard alphabet keys. When num lk is pressed, the keypad can be used like an external numeric keypad. Each key on the keypad performs the function indicated by the icon in the upper-right corner of the key. **NOTE:** If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.
(5)	Windows application key	Displays options for a selected object. **NOTE:** The Windows application key is not functional on HP ThinPro or HP Smart Zero operating systems.
(6)	num lk key	Turns the embedded numeric keypad on and off.

Action keys

An action key performs the function indicated by the icon on the key. To determine which keys are on your product, see Special keys on page 12.

▲ To use an action key, press and hold the key.

Table 2-8 Action keys and their descriptions

Icon	Description
🖥	Helps prevent side-angle viewing from onlookers. If needed, decrease or increase brightness for well-lit or darker environments. Press the key again to turn off the privacy screen. **NOTE:** To quickly turn on the highest privacy setting, press fn+p.
☀	Decreases the screen brightness incrementally as long as you hold down the key.
☀	Increases the screen brightness incrementally as long as you hold down the key.
⌨	Turns the keyboard backlight off or on. On select products, you can adjust the brightness of the keyboard backlight. Press the key repeatedly to adjust the brightness from high (when you first start up the computer), to low, to off. After you adjust the keyboard backlight setting, the backlight will revert to your previous setting each time you turn on the computer. The keyboard backlight will turn off after 30 seconds of inactivity. To turn the keyboard backlight back on, press any key or tap the touchpad (select products only). To conserve battery power, turn off this feature.
⏮	Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD).
⏯	Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.
⏭	Plays the next track of an audio CD or the next section of a DVD or a BD.
⏹	Stops audio or video playback of a CD, a DVD, or a BD.
🔉	Decreases speaker volume incrementally while you hold down the key.
🔊	Increases speaker volume incrementally while you hold down the key.
🎤	Mutes the microphone.

Table 2-8 Action keys and their descriptions (continued)

Icon	Description
🔇	Mutes or restores speaker sound.
((ᵢ))	Turns the wireless feature on or off. **NOTE:** A wireless network must be set up before a wireless connection is possible.
⊘	Turns the touchpad on or off.
☞	Turns the touchpad and touchpad light on and off.
⎙	Switches the screen image among display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing the key alternates the screen image from computer display to monitor display to simultaneous display on both the computer and the monitor.
🌙	Initiates Sleep, which saves your information in system memory. The display and other system components turn off and power is conserved. To exit Sleep, briefly press the power button. **IMPORTANT:** To reduce the risk of information loss, save your work before initiating Sleep.
📅	Provides quick access to your Skype for Business calendar. **NOTE:** This feature requires Skype® for Business or Lync® 2013 running on Microsoft Exchange or Office 365® servers.
🖵	Turns the screen sharing function on or off. **NOTE:** This feature requires Skype for Business or Lync 2013 running on Microsoft Exchange or Office 365 servers.
📞	● Answers a call. ● Starts a call during a 1-on-1 chat. ● Places a call on hold. **NOTE:** This feature requires Skype for Business or Lync 2013 running on Microsoft Exchange or Office 365 servers.
📞	● Ends a call. ● Declines incoming calls. ● Ends screen sharing. **NOTE:** This feature requires Skype for Business or Lync 2013 running on Microsoft Exchange or Office 365 servers.

NOTE: The action key feature is enabled at the factory. You can disable this feature by pressing and holding the fn key and the left shift key. The fn lock light will turn on. After you have disabled the action key feature, you can still perform each function by pressing the fn key in combination with the appropriate action key.

Hot keys (select products only)

A hot key is the combination of the fn key and another key.

To use a hot key:

▲ Press the fn key, and then press one of the keys listed in the following table.

Table 2-9 Hot keys and their descriptions

Key	Description
C	Turns on scroll lock.
R	Breaks the operation.
S	Sends a programing query.
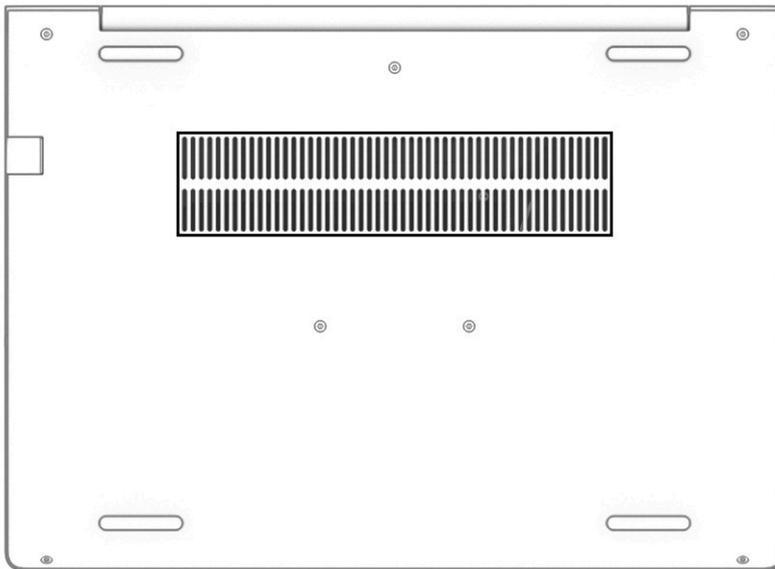
Bottom

Table 2-10 Bottom component and its description

Component	Description
Vent	Enables airflow to cool internal components.
	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.

Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer. Labels may be in paper form or imprinted on the product.

📝 **IMPORTANT:** Check the following locations for the labels described in this section: the bottom of the computer, inside the battery bay, under the service door, on the back of the display, or on the bottom of a tablet kickstand.

- Service label—Provides important information to identify your computer. When contacting support, you may be asked for the serial number, the product number, or the model number. Locate this information before you contact support.

  Your service label will resemble one of the following examples. Refer to the illustration that most closely matches the service label on your computer.
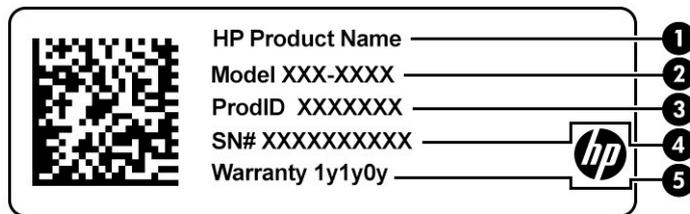
Table 2-11 Service label components

	Component
(1)	HP product name
(2)	Model number
(3)	Product ID
(4)	Serial number
(5)	Warranty period
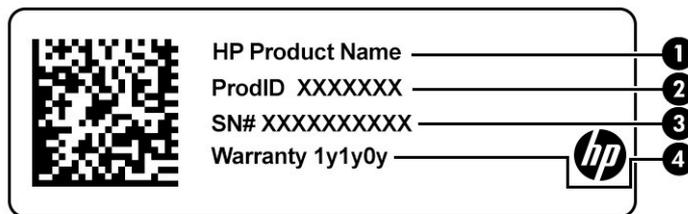
Table 2-12 Service label components

	Component
(1)	HP product name
(2)	Product ID

Table 2-12 Service label components (continued)

	Component
(3)	Serial number
(4)	Warranty period

- Regulatory label(s)—Provide(s) regulatory information about the computer.

- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

3   Network connections

Your computer can travel with you wherever you go. But even at home, you can explore the globe and access information from millions of websites using your computer and a wired or wireless network connection. This chapter helps you get connected to that world.

Connecting to a wireless network

Your computer may be equipped with one or more of the following wireless devices:

NOTE: Mobile Thin Client computers that run on HP ThinPro or HP Smart Zero operating systems do not support HP Mobile Broadband Modules or Bluetooth devices.

- WLAN device—Connects the computer to wireless local area networks (commonly referred to as Wi-Fi networks, wireless LANs, or WLANs) in corporate offices, your home, and public places such as airports, restaurants, coffee shops, hotels, and universities. In a WLAN, the mobile wireless device in your computer communicates with a wireless router or a wireless access point.

- HP Mobile Broadband Module (select products only)—A wireless wide area network (WWAN) device that gives you wireless connectivity over a much larger area. Mobile network operators install base stations (similar to cell phone towers) throughout large geographic areas, effectively providing coverage across entire states, regions, or even countries.

- Bluetooth® device—Creates a personal area network (PAN) to connect to other Bluetooth-enabled devices such as computers, phones, printers, headsets, speakers, and cameras. In a PAN, each device communicates directly with other devices, and devices must be relatively close together—typically within 10 meters (approximately 33 feet) of each other.

Using the wireless controls

You can control the wireless devices in your computer using one or more of these features:

- Wireless button (also called "airplane mode key" or "wireless key")
- Operating system controls

Wireless button

The computer may have a wireless button, one or more wireless devices, and one or two wireless lights. All the wireless devices on your computer are enabled at the factory.

The wireless light indicates the overall power state of your wireless devices, not the status of individual devices.

Operating system controls

The Network and Sharing Center allows you to set up a connection or network, connect to a network, and diagnose and repair network problems.

To use operating system controls:

1.   Type `control panel` in the taskbar search box, and then select **Control Panel**.

2.   Select **Network and Internet**, and then select **Network and Sharing Center**.

Connecting to a WLAN

NOTE: When you are setting up Internet access in your home, you must establish an account with an Internet service provider (ISP). To purchase Internet service and a modem, contact a local ISP. The ISP will help set up the modem, install a network cable to connect your wireless router to the modem, and test the Internet service.

To connect to a WLAN, follow these steps:

1. Be sure that the WLAN device is on.

2. Select the network status icon in the taskbar, and then connect to one of the available networks.

   If the WLAN is a security-enabled WLAN, you are prompted to enter a security code. Enter the code, and then select **Next** to complete the connection.

   NOTE: If no WLANs are listed, you may be out of range of a wireless router or access point.

   NOTE: If you do not see the WLAN you want to connect to, right-click the network status icon in the taskbar, and then select **Open Network and Sharing Center**. Select **Set up a new connection or network**. A list of options is displayed, allowing you to manually search for and connect to a network or to create a new network connection.

3. Follow the on-screen instructions to complete the connection.

After the connection is made, select the network status icon at the far right of the taskbar, to verify the name and status of the connection.

NOTE: The functional range (how far your wireless signals travel) depends on WLAN implementation, router manufacturer, and interference from other electronic devices or structural barriers such as walls and floors.

Using HP Mobile Broadband (select products only)

NOTE: Mobile Thin Client computers that run on HP ThinPro or HP Smart Zero operating systems do not support HP Mobile Broadband.

Your HP Mobile Broadband computer has built-in support for mobile broadband service. Your new computer, when used with a mobile operator's network, gives you the freedom to connect to the Internet, send email, or connect to your corporate network without the need for Wi-Fi hotspots.

You might need the HP Mobile Broadband Module IMEI, MEID number, or both to activate mobile broadband service. The number might be printed on a label located on the bottom of your computer, inside the battery bay, under the service door, or on the back of the display.

– or –

You can find the number following these steps:

1. From the taskbar, select the network status icon.

2. Select **View Connection Settings**.

3. Under the **Mobile broadband** section, select the network status icon.

Some mobile network operators require the use of a SIM card. A SIM card contains basic information about you, such as a personal identification number (PIN), as well as network information. Some computers include a SIM card that is preinstalled. If the SIM card is not preinstalled, it may be provided in the HP Mobile Broadband information provided with your computer or the mobile network operator may provide it separately from the computer.

For information about HP Mobile Broadband and how to activate service with a preferred mobile network operator, see the HP Mobile Broadband information included with your computer.

Using GPS (select products only)

Your computer may be equipped with a Global Positioning System (GPS) device. GPS satellites deliver location, speed, and direction information to GPS-equipped systems.

To enable GPS, make sure location is enabled under the Windows privacy setting.

1. Type `location` in the taskbar search box, and then select **Location privacy settings**.

2. Follow the on-screen instructions for using location settings.

Using Bluetooth wireless devices (select products only)

NOTE: Mobile Thin Client computers that run on HP ThinPro or HP Smart Zero operating systems do not support Bluetooth devices.

Bluetooth device provides short-range wireless communications that replace the physical cable connections that traditionally link electronic devices such as:

- Audio devices (headset, speakers)
- Mouse
- External keyboard

Connecting Bluetooth devices

Before you can use a Bluetooth device, you must establish a Bluetooth connection.

1. Type `bluetooth` in the taskbar search box, and then select **Bluetooth and other devices settings**.

2. Turn on Bluetooth, if it is not already turned on.

3. Select your device from the list, and then follow the on-screen instructions.

NOTE: If the device requires verification, a pairing code is displayed. On the device you are adding, follow the on-screen instructions to verify that the code on your device matches the pairing code. For more information, see the documentation provided with the device.

NOTE: If your device does not appear in the list, be sure that Bluetooth on that device is turned on. Some devices may have additional requirements; see the documentation provided with the device.

Connecting to a wired network

Select products may allow wired connections: local area network (LAN) and modem connection. A LAN connection uses a network cable and is much faster than a modem, which uses a telephone cable. Both cables are sold separately.

WARNING!   To reduce the risk of electric shock, fire, or damage to the equipment, do not plug a modem cable or telephone cable into a network jack.

Connecting to a local area network (LAN) (select products only)

Use a LAN connection if you want to connect the computer directly to a router in your home (instead of working wirelessly), or if you want to connect to an existing network at your office.

NOTE: A feature called HP LAN-Wireless Protection may be enabled on your computer. It closes your wireless (Wi-Fi) or WWAN connection when you connect directly to a LAN. For more information about HP LAN-Wireless Protection, see Using HP LAN-Wireless Protection (select products only) on page 22.

If the computer does not have a network port, you can connect to the network jack on an optional docking device or expansion product.

To connect the network cable, follow these steps:

1.   Plug the network cable into the network jack **(1)** on the computer or on an optional docking device or expansion product.

2.   Plug the other end of the network cable into a network wall jack **(2)** or router.

NOTE: If the network cable contains noise suppression circuitry **(3)**, which prevents interference from TV and radio reception, orient the circuitry end of the cable toward the computer.
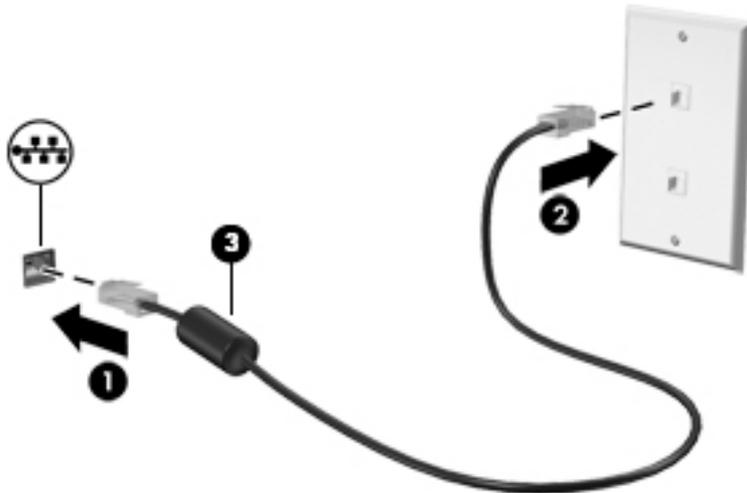
Using HP LAN-Wireless Protection (select products only)

In a LAN environment, you can set HP LAN-Wireless Protection to safeguard your LAN network from unauthorized wireless access. When HP LAN-Wireless Protection is enabled, the WLAN (Wi-Fi) or WWAN connection is turned off when the computer is connected directly to a LAN.

Turning on and customizing HP LAN-Wireless Protection

1. Connect a network cable to the network jack on the computer or on an optional docking device or expansion product.

2. Start Computer Setup (BIOS).

   ● Computers or tablets with keyboards:

     ▲ Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

   ● Tablets without keyboards:

     ▲ Turn on or restart the tablet, and then quickly hold down the volume down button until the Startup menu is displayed. Tap **f10** to enter Computer Setup.

3. Select **Advanced**, and then select **Built-in Device Options**.

4. Select the check box for **LAN/WLAN Auto Switching** and/or **LAN/WWAN Auto Switching** to turn off WLAN and/or WWAN connections when connected to a LAN network.

5. To save your changes and exit Computer Setup, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes take effect when the computer restarts.

Using HP MAC Address Pass Through to identify your computer on a network (select products only)

MAC Address Pass Through provides a customizable way of identifying your computer and its communications on networks. This system MAC address provides unique identification even when your computer is connected through an Ethernet adapter. This address is enabled by default.

Customizing MAC Address Pass Through

1. Start Computer Setup (BIOS).

   ● Computers or tablets with keyboards:

     ▲ Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

   ● Tablets without keyboards:

     ▲ Turn on or restart the tablet, and then quickly hold down the volume down button until the Startup menu is displayed. Tap **f10** to enter Computer Setup.

2. Select **Advanced**, and then select **MAC Address Pass Through**.

3. In the box to the right of **Host Based MAC Address**, select either **System** to enable MAC address Pass Through or **Custom** to customize the address.

4. If you selected **Custom**, select **MAC ADDRESS**, enter your customized system MAC address, and then press enter to save the address.

5. If the computer has an embedded LAN and you would like to use the embedded MAC address as the system MAC address, select **Reuse Embedded LAN Address**.

    – or –

    Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes take effect when the computer restarts.

4 Navigating the screen

Depending on your computer model, you can navigate the computer screen using one or more of the following methods:

- Use touch gestures directly on the computer screen.

- Use touch gestures on the touchpad.

- Use an optional mouse or keyboard (purchased separately).

- Use an on-screen keyboard.

- Use a pointing stick.

Using touchpad and touch screen gestures

The touchpad helps you navigate the computer screen and control the pointer using simple touch gestures. You can also use the left and right touchpad buttons as you would use the corresponding buttons on an external mouse. To navigate a touch screen (select products only), touch the screen directly using gestures described in this chapter.

To customize gestures and see videos of how they work, type `control panel` in the taskbar search box, select **Control Panel**, and then select **Hardware and Sound**. Under **Devices and Printers**, select **Mouse**.

Some products include a precision touchpad, which provides enhanced gesture functionality. To determine if you have a precision touchpad and find additional information, select **Start**, select **Settings**, select **Devices**, and then select **Touchpad**.

NOTE: Unless noted, you can use gestures on both the touchpad and a touch screen.

Tap

Point to an item on the screen, and then tap one finger on the touchpad zone or touch screen to select the item. Double-tap an item to open it.

Two-finger slide (touchpad and precision touchpad)

Place two fingers slightly apart on the touchpad zone and then drag them up, down, left, or right to move up, down, or sideways on a page or image.
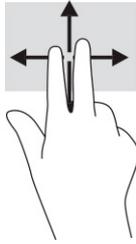
Two-finger tap (touchpad and precision touchpad)

Tap two fingers on the touchpad zone to open the options menu for the selected object.

NOTE: The two-finger tap performs the same function as right-clicking with a mouse.
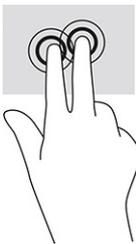
Using an optional keyboard or mouse

An optional keyboard or mouse allows you to type, select items, scroll, and perform the same functions as you do using touch gestures. The keyboard also allows you to use action keys and hot keys to perform specific functions.

Using an on-screen keyboard (select products only)

1. To display an on-screen keyboard, tap the keyboard icon in the notification area, at the far right of the taskbar.

2. Begin typing.

   NOTE: Suggested words may be displayed above the on-screen keyboard. Tap a word to select it.

   NOTE: Action keys and hot keys do not display or function on the on-screen keyboard.

5   Entertainment features

Use your HP computer for business or pleasure to meet with others via the camera, mix audio and video, or connect external devices like a projector, monitor, TV, or speakers. See Components on page 3 to locate the audio, video, and camera features on your computer.

Using the camera (select products only)

Your computer may have one or more cameras that enable you to connect with others for work or play. Cameras may be front facing, rear facing, or pop up.

Most cameras allow you to video chat, record video, and record still images. Some also provide HD (high-definition) capability, apps for gaming, or facial recognition software like Windows Hello. See Windows Hello (select products only) on page 39 for details about using Windows Hello.

On select products, you can also enhance your camera privacy by turning the camera off. By default, the camera is turned on. To turn off your camera, slide the camera privacy switch toward the icon next to the switch. To turn the camera back on, slide the switch away from the icon.

Using audio

You can download and listen to music, stream audio content (including radio) from the web, record audio, or mix audio and video to create multimedia. You can also play music CDs on the computer (on select products) or attach an external optical drive to play CDs. To enhance your listening enjoyment, attach headphones or speakers.

Connecting speakers

You can attach wired speakers to your computer by connecting them to a USB port or to the audio-out (headphone)/audio-in (microphone) combo jack on your computer or on a docking station.

To connect wireless speakers to your computer, follow the device manufacturer's instructions. To connect high-definition speakers to the computer, see Setting up HDMI audio on page 29. Before connecting speakers, lower the volume setting.

Connecting headphones

⚠ **WARNING!**   To reduce the risk of personal injury, lower the volume setting before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*.

To access this guide:

▲   Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.

You can connect wired headphones to the audio-out (headphone)/audio-in (microphone) combo jack on your computer.

To connect wireless headphones to your computer, follow the device manufacturer's instructions.

Connecting headsets

⚠ WARNING! To reduce the risk of personal injury, lower the volume setting before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices.*

To access this guide:

▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.

Headphones combined with a microphone are called headsets. You can connect wired headsets to the audio-out (headphone)/audio-in (microphone) combo jack on your computer.

To connect wireless headsets to your computer, follow the device manufacturer's instructions.

Using sound settings

Use sound settings to adjust system volume, change system sounds, or manage audio devices.

To view or change sound settings:

▲ Type `control panel` in the taskbar search box, select **Control Panel**, select **Hardware and Sound**, and then select **Sound**.

Your computer may include an enhanced sound system by Bang & Olufsen, DTS, Beats audio, or another provider. As a result, your computer may include advanced audio features that can be controlled through an audio control panel specific to your audio system.

Use the audio control panel to view and control audio settings.

▲ Type `control panel` in the taskbar search box, select **Control Panel**, select **Hardware and Sound**, and then select the audio control panel specific to your system.

Using video

Your computer is a powerful video device that enables you to watch streaming video from your favorite websites and download video and movies to watch on your computer when you are not connected to a network.

To enhance your viewing enjoyment, use one of the video ports on the computer to connect an external monitor, projector, or TV.

📝 IMPORTANT: Be sure that the external device is connected to the correct port on the computer, using the correct cable. Follow the device manufacturer's instructions.

Connecting a DisplayPort device using a USB Type-C cable (select products only)

NOTE: To connect a USB Type-C DisplayPort device to your computer, you need a USB Type-C cable, purchased separately.

To see video or high-resolution display output on an external DisplayPort device, connect the DisplayPort device according to the following instructions:

1. Connect one end of the USB Type-C cable to the USB SuperSpeed port and DisplayPort connector on the computer.
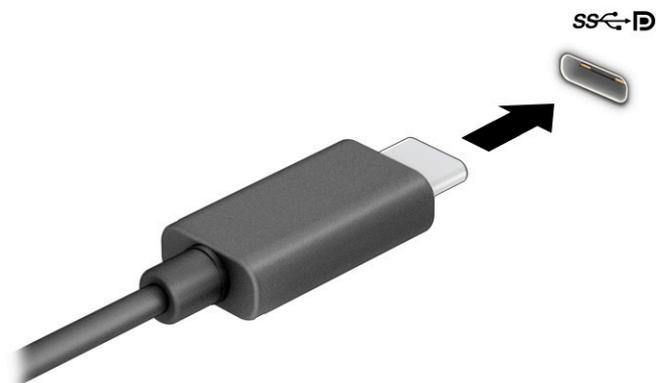
2. Connect the other end of the cable to the external DisplayPort device.

3. Press f1 to cycle through four display states:

   - **PC screen only:** View the screen image on the computer only.

   - **Duplicate:** View the screen image simultaneously on both the computer and external device.

   - **Extend:** View the screen image extended across both the computer and external device.

   - **Second screen only:** View the screen image on the external device only.

   Each time you press f1, the display state changes.

   NOTE: For best results, especially if you choose the **Extend** option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Connecting video devices using an HDMI cable (select products only)

NOTE: To connect an HDMI device to your computer, you need an HDMI cable, purchased separately.

To see the computer screen image on a high-definition TV or monitor, connect the high-definition device according to the following instructions:

1. Connect one end of the HDMI cable to the HDMI port on the computer.

HDMI
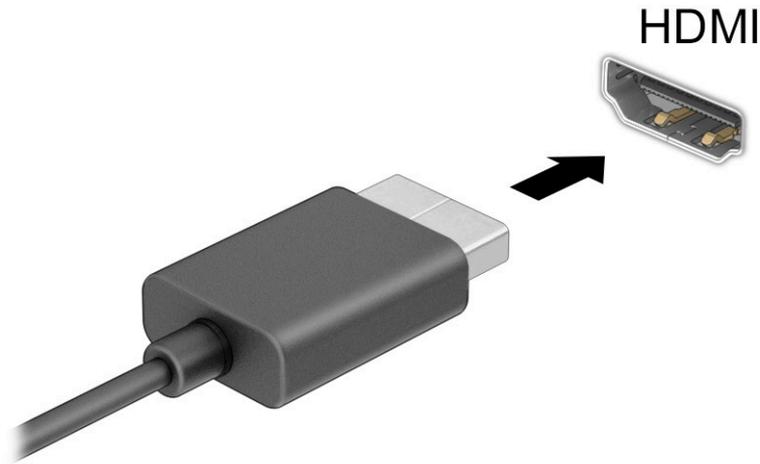
2. Connect the other end of the cable to the high-definition TV or monitor.

3. Press f1 to cycle through four display states:

   - **PC screen only:** View the screen image on the computer only.

   - **Duplicate:** View the screen image simultaneously on both the computer and the external device.

   - **Extend:** View the screen image extended across both the computer and the external device.

   - **Second screen only:** View the screen image on the external device only.

   Each time you press f1, the display state changes.

NOTE: For best results, especially if you choose the **Extend** option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Setting up HDMI audio

HDMI is the only video interface that supports high-definition video and audio. After you connect an HDMI TV to the computer, you can then turn on HDMI audio by following these steps:

1. Right-click the **Speakers** icon in the notification area, at the far right of the taskbar, and then select **Playback devices**.

2. On the **Playback** tab, select the name of the digital output device.

3. Select **Set Default**, and then select **OK**.

To return the audio stream to the computer speakers:

1. Right-click the **Speakers** icon in the notification area, at the far right of the taskbar, and then select **Playback devices**.

2. On the **Playback** tab, select **Speakers**.

3. Select **Set Default**, and then select **OK**.

Discovering and connecting wired displays using MultiStream Transport

MultiStream Transport (MST) allows you to connect multiple wired display devices to your computer by connecting to the VGA port or DisplayPort connectors on your computer and also to the VGA port or DisplayPort connectors on a hub or an external docking station. You can connect in several ways, depending on the type of graphics controller installed on your computer and whether or not your computer includes a built-in hub. Go to Device Manager to find out what hardware is installed on your computer.

▲ Type `device manager` in the taskbar search box, and then select the **Device Manager** app. A list displays all the devices installed on your computer.

Connect displays to computers with AMD graphics (with an optional hub)

> **NOTE:** With an AMD™ graphics controller and optional hub, you can connect up to four external display devices.

To set up multiple display devices, follow these steps:

1. Connect an external hub (purchased separately) to the DisplayPort™ (DP) connector on your computer, using a DP-to-DP cable (purchased separately). Be sure that the hub power adapter is connected to AC power.

2. Connect your external display devices to the VGA port or DisplayPort connectors on the hub.

3. To see all of your connected display devices, type `device manager` in the taskbar search box, and then select the **Device Manager** app. If you don't see all of your connected displays, be sure that each is connected to the correct port on the hub.

> **NOTE:** Multiple display choices include **Duplicate**, which mirrors your computer screen on all enabled display devices, or **Extend**, which spans your computer screen across all enabled display devices.

Discovering and connecting to Miracast-compatible wireless displays (select products only)

> **NOTE:** To learn what type of display you have (Miracast®–compatible or Intel WiDi), see the documentation that came with your TV or secondary display.

To discover and connect to Miracast®-compatible wireless displays without leaving your current apps, follow the steps below.

To open Miracast:

▲ Type `project` in the taskbar search box, and then select **Project to a second screen**. Select **Connect to a wireless display**, and then follow the on-screen instructions.

Using data transfer

Your computer is a powerful entertainment device that enables you to transfer photos, videos, and movies from your USB devices to view on your computer.

To enhance your viewing enjoyment, use one of the USB Type-C ports on the computer to connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and transfer the files to your computer.

IMPORTANT: Be sure that the external device is connected to the correct port on the computer, using the correct cable. Follow the device manufacturer's instructions.

Connecting devices to a USB Type-C port (select products only)

NOTE: To connect a USB Type-C device to your computer, you need a USB Type-C cable, purchased separately.

1. Connect one end of the USB Type-C cable to the USB Type-C port on the computer.
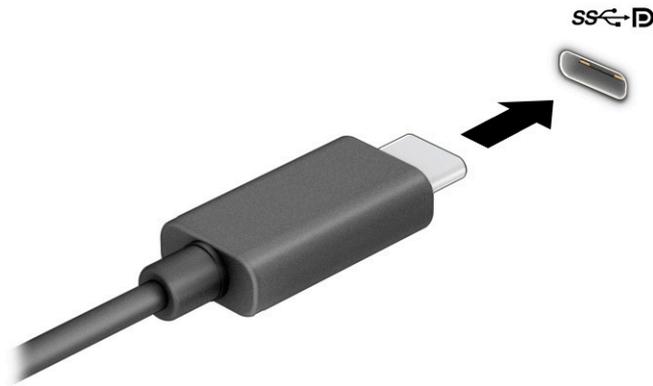
2. Connect the other end of the cable to the external device.

6 Managing power

Your computer can operate on either battery power or external power. When the computer is running on battery power and an external power source is not available to charge the battery, it is important to monitor and conserve the battery charge.

Some power management features described in this chapter may not be available on your computer.

Using Sleep

IMPORTANT: To reduce the risk of possible audio and video degradation, loss of audio or video playback functionality, or loss of information, do not initiate Sleep while reading from or writing to a disc or an external media card.

- Sleep is a Windows power-saving state. The Sleep state is automatically initiated after a period of inactivity. Your work is saved to memory, allowing you to resume your work very quickly. You can also initiate Sleep manually. For more information, see Initiating and exiting Sleep on page 32.

Initiating and exiting Sleep

You can initiate Sleep in any of the following ways:

- Select the **Start** button, select the **Power** icon, and then select **Sleep**.
- Close the display (select products only).
- Press the Sleep hot key (select products only); for example, fn+f1 or fn+f12.
- Briefly press the power button (select products only).

You can exit Sleep in any of the following ways:

- Briefly press the power button.
- If the computer is closed, raise the display (select products only).
- Press a key on the keyboard (select products only).
- Tap the TouchPad (select products only).

When the computer exits Sleep, your work returns to the screen.

NOTE: If you have set a password to be required on exiting Sleep, you must enter your Windows password before your work returns to the screen.

Shutting down (turning off) the computer

IMPORTANT: Unsaved information is lost when the computer shuts down. Be sure to save your work before shutting down the computer.

The Shut down command closes all open programs, including the operating system, and then turns off the display and the computer.

Shut down the computer when it will be unused and disconnected from external power for an extended period.

The recommended procedure is to use the Windows Shut down command.

NOTE: If the computer is in the Sleep state, first exit Sleep by briefly pressing the power button.

1. Save your work and close all open programs.

2. Select the **Start** button, select the **Power** icon, and then select **Shut down**.

If the computer is unresponsive and you are unable to use the preceding shutdown procedures, try the following emergency procedures in the sequence provided:

- Press ctrl+alt+delete, select the **Power** icon, and then select **Shut down**.

- Press and hold the power button for at least 10 seconds.

Using the Power icon and Power Options

The Power icon ▭ is located on the Windows taskbar. The Power icon allows you to quickly access power settings and view the remaining battery charge.

- To view the percentage of remaining battery charge, place the mouse pointer over the **Power** icon ▭.

- To use Power Options, right–click the **Power** icon ▭, and then select **Power Options**.

Different Power icons indicate whether the computer is running on battery or external power. Placing the mouse pointer over the icon reveals a message if the battery has reached a low or critical battery level.

Running on battery power

WARNING! To reduce potential safety issues, use only the battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

When a charged battery is in the computer and the computer is not plugged into external power, the computer runs on battery power. When the computer is off and unplugged from external power, the battery in the computer slowly discharges. The computer displays a message when the battery reaches a low or critical battery level.

Computer battery life varies, depending on power management settings, programs running on the computer, screen brightness, external devices connected to the computer, and other factors.

NOTE: When you disconnect external power, the display brightness is automatically decreased to conserve battery charge. Select computer products can switch between graphic controllers to conserve battery charge.

Using HP Fast Charge (select products only)

The HP Fast Charge feature allows you to quickly charge your computer battery. Charging time may vary by ±10%. Depending on your computer model and the HP AC adapter provided with your computer, HP Fast Charge operates in one or more of the following ways:

- When the remaining battery charge is between zero and 50%, the battery will charge to 50% of full capacity in no more than 30 to 45 minutes, depending on your computer model.

- When the remaining battery charge is between zero and 90%, the battery will charge to 90% of full capacity in no more than 90 minutes.

To use HP Fast Charge, shut down your computer, and then connect the AC adapter to your computer and to external power.

Displaying battery charge

To view the percentage of remaining battery charge, place the mouse pointer over the **Power** icon .

Conserving battery power

To conserve battery power and maximize battery life:

- Lower the brightness of the display.

- Turn off wireless devices when you are not using them.

- Disconnect unused external devices that are not plugged into an external power source, such as an external hard drive connected to a USB port.

- Stop, disable, or remove any external media cards that you are not using.

- Before you leave your work, initiate Sleep or shut down the computer.

Identifying low battery levels

When a battery that is the sole power source for the computer reaches a low or critical battery level, the following behavior occurs:

- The battery light (select products only) indicates a low or critical battery level.

– or –

- The Power icon shows a low or critical battery notification.

> **NOTE:** For additional information about the Power icon, see Using the Power icon and Power Options on page 33.

The computer takes the following actions for a critical battery level:

- If the computer is on or in the Sleep state, the computer remains briefly in the Sleep state and then shuts down and loses any unsaved information.

Resolving a low battery level

Resolving a low battery level when external power is available

Connect one of the following to the computer and to external power:

- AC adapter
- Optional docking device or expansion product
- Optional power adapter purchased as an accessory from HP

Resolving a low battery level when no power source is available

Save your work and shut down the computer.

Factory-sealed battery

The battery[ies] in this product cannot be easily replaced by users themselves. Removing or replacing the battery could affect your warranty coverage. If a battery is no longer holding a charge, contact support.

When a battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for battery disposal.

Running on external power

For information about connecting to external power, see the *Setup Instructions* poster provided in the computer box.

The computer does not use battery power when the computer is connected to external power with an approved AC adapter or an optional docking device or expansion product.

⚠ **WARNING!**   To reduce potential safety issues, use only the AC adapter provided with the computer, a replacement AC adapter provided by HP, or a compatible AC adapter purchased from HP.

⚠ **WARNING!**   Do not charge the computer battery while you are aboard aircraft.

Connect the computer to external power under any of the following conditions:

- When charging or calibrating a battery

- When installing or updating system software

- When updating the system BIOS

- When writing information to a disc (select products only)

- When performing a backup or recovery

When you connect the computer to external power:

- The battery begins to charge.

- The screen brightness increases.

- The Power icon ▭ changes appearance.

When you disconnect external power:

- The computer switches to battery power.

- The screen brightness automatically decreases to conserve battery charge.

- The Power icon ▭ changes appearance.

7 Security

Protecting the computer

Standard security features provided by the Windows operating system and the Windows Computer Setup utility (BIOS, which runs under any operating system) can protect your personal settings and data from a variety of risks.

📝 **NOTE:** Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.

📝 **NOTE:** Before you send your computer for service, back up and delete confidential files, and remove all password settings.

📝 **NOTE:** Some features listed in this chapter may not be available on your computer.

Table 7-1 Security solutions

Computer risk	Security feature
Unauthorized use of the computer	BIOS power-on password
Unauthorized access to Computer Setup (BIOS)	BIOS administrator password in Computer Setup*
Unauthorized startup from an optional external optical drive (select products only), optional external hard drive (select products only), or internal network adapter	Boot options feature in Computer Setup*
Unauthorized access to a Windows user account	Windows user password
Unauthorized access to data	Windows BitLocker
Unauthorized removal of the computer	Security cable slot (used with an optional security cable on select products only)

*Computer Setup is an embedded, ROM-based utility that can be used even when the operating system is not working or will not load. You can use a pointing device (touchpad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

NOTE: On tablets without keyboards, you can use the touch screen.

Using passwords

A password is a group of characters that you choose to secure your computer information. Several types of passwords can be set, depending on how you want to control access to your information. Passwords can be set in Windows or in Computer Setup, which is preinstalled on the computer.

- BIOS administrator and power-on passwords are set in Computer Setup and are managed by the system BIOS.

- Windows passwords are set only in the Windows operating system.

You can use the same password for a Computer Setup feature and for a Windows security feature.

Use the following tips for creating and saving passwords:

- When creating passwords, follow requirements set by the program.

- Do not use the same password for multiple applications or websites, and do not reuse your Windows password for any other application or website.

- Do not store passwords in a file on the computer.

The following tables list commonly used Windows and BIOS administrator passwords and describe their functions.

Setting passwords in Windows

Table 7-2 Types of Windows passwords and their functions

Password	Function
Administrator password*	Protects access to a Windows administrator-level account.
	NOTE: Setting the Windows administrator password does not set the BIOS administrator password.
User password*	Protects access to a Windows user account.

Setting passwords in Computer Setup

Table 7-3 Types of Computer Setup passwords and their functions

Password	Function
BIOS administrator password*	Protects access to Computer Setup.
	NOTE: If features have been enabled to prevent removing the BIOS administrator password, you may not be able to remove it until those features have been disabled.
Power-on password	- Must be entered each time you turn on or restart the computer. - If you forget your power-on password, you cannot turn on or restart the computer.

*For details about each of these passwords, see the following topics.

Managing a BIOS administrator password

To set, change, or delete this password, follow these steps:

Setting a new BIOS administrator password

1. Start Computer Setup.

- Computers or tablets with keyboards:

  ▲ Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

- Tablets without keyboards:

▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.

2. Select **Security**, select **Create BIOS administrator password** or **Set Up BIOS administrator Password** (select products only), and then press enter.

3. When prompted, type a password.

4. When prompted, type the new password again to confirm.

5. To save your changes and exit Computer Setup, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

📝 **NOTE:** If you are using arrow keys to highlight your choice, you must then press enter.

Your changes take effect when the computer restarts.

Changing a BIOS administrator password

1. Start Computer Setup.

- Computers or tablets with keyboards:

   ▲ Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

- Tablets without keyboards:

   ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.

2. Enter your current BIOS administrator password.

3. Select **Security**, select **Change BIOS administrator Password** or **Change Password** (select products only), and then press enter.

4. When prompted, type your current password.

5. When prompted, type your new password.

6. When prompted, type your new password again to confirm.

7. To save your changes and exit Computer Setup, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

📝 **NOTE:** If you are using arrow keys to highlight your choice, you must then press enter.

Your changes go into effect when the computer restarts.

Deleting a BIOS administrator password

1. Start Computer Setup.

- Computers or tablets with keyboards:

   ▲ Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

- Tablets without keyboards:

   ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **f10** to enter Computer Setup.

2. Enter your current BIOS administrator password.

3. Select **Security**, select **Change BIOS administrator Password** or **Change Password** (select products only), and then press enter.

4. When prompted, type your current password.

5. When prompted for the new password, leave the field empty, and then press enter.

6. When prompted to type your new password again, leave the field empty, and then press enter.

7. To save your changes and exit Computer Setup, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

📝 **NOTE:** If you are using arrow keys to highlight your choice, you must then press enter.

Your changes go into effect when the computer restarts.

Entering a BIOS administrator password

At the **BIOS administrator password** prompt, type your password (using the same kind of keys you used to set the password), and then press enter. After two unsuccessful attempts to enter the BIOS administrator password, you must restart the computer and try again.

Windows Hello (select products only)

On products equipped with a fingerprint reader, Windows Hello allows you to enroll your fingerprint and set up a PIN. After enrollment, you can use your fingerprint reader or PIN to sign in to Windows.

To set up Windows Hello:

1. Select the **Start** button, select **Settings**, select **Accounts**, and then select **Sign-in options**.

2. To add a password, select **Password**, and then select **Add**.

3. Under **Windows Hello Fingerprint** and select **Set up**.

4. Select **Get Started**, and then follow the on-screen instructions to enroll your fingerprint and set up a PIN.

📝 **IMPORTANT:** To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.

📝 **NOTE:** The PIN is not limited in length. The default setting is for numbers only. To include alphabetic or special characters, select the **include letters and symbols** check box.

Using antivirus software

When you use the computer to access e-mail, a network, or the Internet, you potentially expose it to computer viruses. Computer viruses can disable the operating system, programs, or utilities, or cause them to function abnormally.

Antivirus software can detect most viruses, destroy them, and, in most cases, repair any damage they have caused. To provide ongoing protection against newly discovered viruses, antivirus software must be kept up to date.

Windows Defender is preinstalled on your computer. It is strongly recommended that you continue to use an antivirus program in order to fully protect your computer.

Using firewall software

Firewalls are designed to prevent unauthorized access to a system or network. A firewall can be a software program you install on your computer, network, or both, or it can be a solution made up of both hardware and software.

There are two types of firewalls to consider:

- Host-based firewalls—Software that protects only the computer where it is installed.

- Network-based firewalls—Installed between your DSL or cable modem and your home network to protect all the computers on the network.

When a firewall is installed on a system, all data sent to and from the system is monitored and compared with a set of user-defined security criteria. Any data that does not meet those criteria is blocked.

Your computer or networking equipment may already have a firewall installed. If not, firewall software solutions are available.

NOTE: Under some circumstances a firewall can block access to Internet games, interfere with printer or file sharing on a network, or block authorized e-mail attachments. To temporarily resolve the problem, disable the firewall, perform the task that you want to perform, and then reenable the firewall. To permanently resolve the problem, reconfigure the firewall.

Using an optional security cable (select products only)

A security cable (purchased separately) is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. To connect a security cable to your computer, follow the device manufacturer's instructions.

Fingerprint reader (select products only)

Integrated fingerprint readers are available on select products.

Locating the fingerprint reader

The fingerprint reader is a small metallic sensor that is located in one of the following areas of your computer:

- Near the bottom of the touchpad

- On the right side of the keyboard

- On the upper-right side of the display

- On the left side of the display

- On the back of the display

Depending on your product, the reader may be oriented horizontally or vertically.

8   Maintenance

It is important to perform regular maintenance to keep your computer in optimal condition. This chapter provides instructions for updating programs and drivers, steps to clean the computer, and tips for traveling with (or shipping) the computer.

Updating programs and drivers

HP recommends that you update your programs and drivers on a regular basis. Updates can resolve issues and bring new features and options to your computer. For example, older graphics components might not work well with the most recent gaming software. Without the latest driver, you would not be getting the most out of your equipment.

Go to http://www.hp.com/support to download the latest versions of HP programs and drivers. In addition, register to receive automatic notifications when updates become available.

Cleaning your computer

Use the following products to safely clean your computer:

- Alcohol-free glass-cleaning fluid
- Solution of water and mild soap
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

IMPORTANT: Avoid strong cleaning solvents or germicidal wipes that can permanently damage your computer. If you are not sure that a cleaning product is safe for your computer, check the product contents to make sure that ingredients such as alcohol, acetone, ammonium chloride, methylene chloride, hydrogen peroxide, naphtha, and hydrocarbon solvents are not included in the product.

Fibrous materials, such as paper towels, can scratch the computer. Over time, dirt particles and cleaning agents can get trapped in the scratches.

Cleaning procedures

Follow the procedures in this section to safely clean your computer.

WARNING! To prevent electric shock or damage to components, do not attempt to clean your computer while it is on.

1. Turn off the computer.
2. Disconnect AC power.
3. Disconnect all powered external devices.

IMPORTANT: To prevent damage to internal components, do not spray cleaning agents or liquids directly on any computer surface. Liquids dripped on the surface can permanently damage internal components.

Cleaning the display

Gently wipe the display using a soft, lint-free cloth moistened with an alcohol-free glass cleaner. Be sure that a display is dry before you close the computer.

Cleaning the sides or cover

To clean the sides or cover, use a soft microfiber cloth or chamois moistened with one of the cleaning solutions listed previously, or use an acceptable disposable wipe.

NOTE: When cleaning the cover of the computer, use a circular motion to aid in removing dirt and debris.

Cleaning the touchpad, keyboard, or mouse (select products only)

WARNING! To reduce the risk of electric shock or damage to internal components, do not use a vacuum cleaner attachment to clean the keyboard. A vacuum cleaner can deposit household debris on the keyboard surface.

IMPORTANT: To prevent damage to internal components, do not allow liquids to drip between the keys.

- To clean the touchpad, keyboard, or mouse, use a soft microfiber cloth or a chamois moistened with one of the cleaning solutions listed previously.

- To prevent keys from sticking and to remove dust, lint, and particles from the keyboard, use a can of compressed air with a straw extension.

Traveling with or shipping your computer

If you have to travel with or ship your computer, follow these tips to keep your equipment safe.

- Prepare the computer for traveling or shipping:

    – Back up your information to an external drive.

    – Remove all discs and all external media cards, such as memory cards.

    – Turn off and then disconnect all external devices.

    – Shut down the computer.

- Take along a backup of your information. Keep the backup separate from the computer.

- When traveling by air, carry the computer as hand luggage; do not check it in with the rest of your luggage.

IMPORTANT: Avoid exposing a drive to magnetic fields. Security devices with magnetic fields include airport walk-through devices and security wands. Airport conveyer belts and similar security devices that check carry-on baggage use X-rays instead of magnetism and do not damage drives.

- If you plan to use the computer during a flight, listen for the in-flight announcement that tells you when you are allowed to use your computer. In-flight computer use is at the discretion of the airline.

- If you are shipping the computer or a drive, use suitable protective packaging and label the package "FRAGILE."

- The use of wireless devices might be restricted in some environments. Such restrictions might apply aboard aircraft, in hospitals, near explosives, and in hazardous locations. If you are uncertain of the

policy that applies to the use of a wireless device in your computer, ask for authorization to use your computer before you turn it on.

- If you are traveling internationally, follow these suggestions:

  - Check the computer-related customs regulations for each country or region on your itinerary.

  - Check the power cord and adapter requirements for each location in which you plan to use the computer. Voltage, frequency, and plug configurations vary.

    ⚠ WARNING! To reduce the risk of electric shock, fire, or damage to the equipment, do not attempt to power the computer with a voltage converter kit sold for appliances.

9 Backup and recovery information

This chapter provides information about software to be used for backup and recovery. The information in this chapter is standard procedure for most Thin Client products.

HP ThinUpdate software is installed on Thin Client computers (select products only) to provide backup and recovery. If it is not installed on your computer, you can download it from http://www.hp.com/support (search for the Thin Client model and click the **Drivers & software** section of the support page for that model. For information about using this software, see the Manuals section).

NOTE: HP recommends periodically going to the website to check for application updates.

Using HP ThinUpdate

Use HP ThinUpdate software for the following purposes:

● Creating recovery media and backups

● Restoring and recovering your system

● Installing and updating software

10 Computer Setup (BIOS), TPM, and HP Sure Start

Using Computer Setup

Computer Setup, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

NOTE: Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup

▲ Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

Navigating and selecting in Computer Setup

- To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to select the item.

- To scroll up and down, select the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.

- To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

To exit Computer Setup, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, select **Main**, select **Ignore Changes and Exit**, and then select **Yes**.

  NOTE: If you are using arrow keys to highlight your choice, you must then press enter.

- To save your changes and exit Computer Setup menus, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

  NOTE: If you are using arrow keys to highlight your choice, you must then press enter.

Your changes take effect when the computer restarts.

Restoring factory settings in Computer Setup

NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Start Computer Setup. See Starting Computer Setup on page 45.

2. Select **Main**, select **Apply Factory Defaults and Exit**, and then select **Yes**.

   NOTE: If you are using arrow keys to highlight your choice, you must then press enter.

> **NOTE:** On select products, the selections may display **Restore Defaults** instead of **Apply Factory Defaults and Exit**.

Your changes take effect when the computer restarts.

> **NOTE:** Your password settings and security settings are not changed when you restore the factory settings.

Updating the BIOS

Updated versions of the BIOS may be available on the HP website.

Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

To decide whether you need to update Computer Setup (BIOS), first determine the BIOS version on your computer.

BIOS version information (also known as *ROM date* and *System BIOS*) can be accessed by pressing fn+esc (if you are already in Windows) or by using Computer Setup.

1.   Start Computer Setup. See Starting Computer Setup on page 45.

2.   Select **Main**, and then select **System Information**.

3.   To exit Computer Setup menus without saving your changes, select **Main**, select **Ignore Changes and Exit**, and then select **Yes**.

   > **NOTE:** If you are using arrow keys to highlight your choice, you must then press enter.

To check for later BIOS versions, see Downloading a BIOS update on page 46.

Downloading a BIOS update

> **IMPORTANT:** To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:
>
> Do not disconnect power on the computer by unplugging the power cord from the AC outlet.
>
> Do not shut down the computer or initiate Sleep.
>
> Do not insert, remove, connect, or disconnect any device, cable, or cord.

1.   To access HP Support, go to http://www.hp.com/support, and select your country. Select **Drivers & Downloads**, and then follow the on-screen instructions to access BIOS downloads.

   – or –

   Select the question mark icon in the taskbar.

2.   At the BIOS download area, follow these steps:

a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.

b. Follow the on-screen instructions to download your selection to the hard drive.

   Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

NOTE: If you connect your computer to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Type `file` in the taskbar search box, and then select **File Explorer**.

2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).

3. Using the hard drive path you recorded earlier, open the folder that contains the update.

4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.

5. Complete the installation by following the on-screen instructions.

NOTE: After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

Changing the boot order using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Access the Boot Device Options menu:

   ● Turn on or restart the computer, and when the HP logo appears, press f9 to enter the Boot Device Options menu.

2. Select a boot device, press enter, and then follow the on-screen instructions.

TPM BIOS settings (select products only)

IMPORTANT: Before enabling Trusted Platform Module (TPM) functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable. For any compliance issues arising from your operation or usage of TPM which violates the above mentioned requirement, you shall bear all the liabilities wholly and solely. HP will not be responsible for any related liabilities.

TPM provides additional security for your computer. You can modify the TPM settings in Computer Setup (BIOS).

NOTE: If you change the TPM setting to Hidden, TPM is not visible in the operating system.

To access TPM settings in Computer Setup:

1. Start Computer Setup. See Starting Computer Setup on page 45.

2. Select **Security**, select **TPM Embedded Security**, and then follow the on-screen instructions.

Using HP Sure Start (select products only)

Select computer models are configured with HP Sure Start, a technology that monitors the computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start automatically restores the BIOS to its previously safe state, without user intervention.

HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. Advanced users can customize the default configuration.

To access the latest documentation on HP Sure Start, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.

11 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

HP PC Hardware Diagnostics Windows is a Windows-based utility that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs within the Windows operating system in order to diagnose hardware failures.

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 49.

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from HP Help and Support.

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:

    a. Select the **Start** button, and then select **HP Help and Support**.

    b. Select **HP PC Hardware Diagnostics Windows**, select **More**, and then select **Run as administrator**.

2. When the tool opens, select the type of diagnostic test you want to run, and then follow the on-screen instructions.

    NOTE: If you need to stop a diagnostic test at any time, select **Cancel**.

3. When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. The screen displays one of the following options:

    ●   A Failure ID link. Select the link and follow the on-screen instructions.

    ●   A Quick Response (QR) code. With a mobile device, scan the code and then follow the on-screen instructions.

    ●   Instructions for calling support. Follow those instructions.

Downloading HP PC Hardware Diagnostics Windows

●   The HP PC Hardware Diagnostics Windows download instructions are provided in English only.

●   You must use a Windows computer to download this tool because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics Windows version

To download HP PC Hardware Diagnostics Windows, follow these steps:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. Select **Download HP Diagnostics Windows**, and then select a location on your computer or a USB flash drive.

The tool downloads to the selected location.

Downloading HP Hardware Diagnostics Windows by product name or number (select products only)

> **NOTE:** For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

To download HP PC Hardware Diagnostics Windows by product name or number, follow these steps:

1. Go to http://www.hp.com/support.

2. Select **Get software and drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.

3. In the **Diagnostics** section, select **Download**, and then follow the on-screen instructions to select the specific Windows diagnostics version to be downloaded to your computer or USB flash drive.

The tool is downloaded to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, follow these steps:

▲ Navigate to the folder on your computer or the USB flash drive where the .exe file was downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface) allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs outside the operating system so that it can isolate hardware failures from issues that are caused by the operating system or other software components.

If your PC will not boot into Windows, you can use HP PC Hardware Diagnostics UEFI to diagnose hardware issues.

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in solving the problem:

▲ Select **Get Support**, and then use a mobile device to scan the QR code that displays on the next screen. The HP Customer Support - Service Center page displays, with your Failure ID and product number automatically filled in. Follow the on-screen instructions.

– or –

Contact support, and provide the Failure ID code.

> **NOTE:** To start diagnostics on a convertible computer, your computer must be in notebook mode, and you must use the attached keyboard.

> **NOTE:** If you need to stop a diagnostic test, press esc.

Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow these steps:

1. Turn on or restart the computer, and quickly press esc.

2. Press f2.

The BIOS searches three places for the diagnostic tools, in the following order:

    a. Connected USB flash drive

> 📝 **NOTE:** To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 51.

    b. Hard drive

    c. BIOS

3. When the diagnostic tool opens, select a language, select the type of diagnostic test you want to run, and then follow the on-screen instructions.

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in the following situations:

- HP PC Hardware Diagnostics UEFI is not included in the preinstall image.
- HP PC Hardware Diagnostics UEFI is not included in the HP Tool partition.
- The hard drive is damaged.

> 📝 **NOTE:** The HP PC Hardware Diagnostics UEFI download instructions are provided in English only, and you must use a Windows computer to download and create the HP UEFI support environment because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. Select **Download HP Diagnostics UEFI**, and then select **Run**.

Downloading HP PC Hardware Diagnostics UEFI by product name or number (select products only)

> 📝 **NOTE:** For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

To download HP PC Hardware Diagnostics UEFI by product name or number (select products only) to a USB flash drive:

1. Go to http://www.hp.com/support.

2. Enter the product name or number, select your computer, and then select your operating system.

3. In the **Diagnostics** section, follow the on-screen instructions to select and download the specific UEFI Diagnostics version for your computer.

Using Remote HP PC Hardware Diagnostics UEFI settings (select products only)

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then run the diagnostics on your computer, and it may upload results to a preconfigured server. For more information about Remote HP PC Hardware Diagnostics UEFI, go to http://www.hp.com/go/techcenter/pcdiags, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI

NOTE: HP Remote PC Hardware Diagnostics UEFI is also available as a Softpaq that can be downloaded to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

To download the latest Remote HP PC Hardware Diagnostics UEFI version, follow these steps:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. Select **Download Remote Diagnostics**, and then select **Run**.

Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number

NOTE: For some products, you might have to download the software by using the product name or number.

To download HP Remote PC Hardware Diagnostics UEFI by product name or number, follow these steps:

1. Go to http://www.hp.com/support.

2. Select **Get software and drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.

3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

Using the Remote HP PC Hardware Diagnostics setting in Computer Setup (BIOS), you can perform the following customizations:

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.

- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a disk drive or USB flash drive) to run remote diagnostics.

- Set a location for storing the test results. You can also set the user name and password settings used for uploads.

- Display status information about the diagnostics run previously.

To customize Remote HP PC Hardware Diagnostics UEFI settings, follow these steps:

1. Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

2. Select **Advanced**, and then select **Settings**.

3. Make your customization selections.

4. Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

12 Specifications

Input power

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. The AC power source must be rated at 100–240 V, 50–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications. The voltage and current for your computer is located on the regulatory label.

Table 12-1 Input power

Input Power	Rating
Operating voltage and current	5 V dc @ 2 A / 12 V dc @ 3 A / 15 V dc @ 3 A – 45 W USB-C
	5 V dc @ 3 A / 9 V dc @ 3 A / 12 V dc @ 3.75 A / 15 V dc @ 3 A – 45 W USB-C
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 3.75 A / 12 V dc @ 3.75 A / 15 V dc @ 3 A / 20 V dc @ 2.25 A – 45 W USB-C
	5 V dc @ 3 A / 9 V dc @ 3 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 5 A / 20 V dc @ 4.5 A – 90 W USB-C
	19.5 V dc @ 2.31 A – 45 W
	19.5 V dc @ 3.33 A – 65 W
	19.5 V dc @ 4.62 A – 90 W
	19.5 V dc @ 6.15 A – 120 W
	19.5 V dc @ 6.90 A – 135 W
	19.5 V dc @ 7.70 A – 150 W
	19.5 V dc @ 10.3 A – 200 W
	19.5 V dc @ 11.8 A – 230 W
	19.5 V dc @ 16.92 A – 330 W

NOTE: This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 V rms.

Operating environment

Table 12-2 Operating environment

Factor	Metric	U.S.
Temperature		
Operating (writing to optical disc)	**5°C to 35°C**	41°F to 95°F
Nonoperating	**−20°C to 60°C**	−4°F to 140°F
Relative humidity (noncondensing)		
Operating	**10% to 90%**	10% to 90%
Nonoperating	**5% to 95%**	5% to 95%
Maximum altitude (unpressurized)		
Operating	**−15 m to 3,048 m**	−50 ft to 10,000 ft
Nonoperating	**−15 m to 12,192 m**	−50 ft to 40,000 ft

13 Electrostatic discharge

Electrostatic discharge is the release of static electricity when two objects come into contact—for example, the shock you receive when you walk across the carpet and touch a metal door knob.

A discharge of static electricity from fingers or other electrostatic conductors may damage electronic components.

IMPORTANT: To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

- If removal or installation instructions direct you to unplug the computer, first be sure that it is properly grounded.

- Keep components in their electrostatic-safe containers until you are ready to install them.

- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.

- Use nonmagnetic tools.

- Before handling components, discharge static electricity by touching an unpainted metal surface.

- If you remove a component, place it in an electrostatic-safe container.

14 Accessibility

HP and accessibility

Because HP works to weave diversity, inclusion, and work/life into the fabric of the company, it is reflected in everything HP does. HP strives to create an inclusive environment focused on connecting people to the power of technology throughout the world.

Finding the technology tools you need

Technology can unleash your human potential. Assistive technology removes barriers and helps you create independence at home, at work, and in the community. Assistive technology helps increase, maintain, and improve the functional capabilities of electronic and information technology. For more information, see Finding the best assistive technology on page 57.

The HP commitment

HP is committed to providing products and services that are accessible for people with disabilities. This commitment supports the company's diversity objectives and helps ensure that the benefits of technology are available to all.

The HP accessibility goal is to design, produce, and market products and services that can be effectively used by everyone, including people with disabilities, either on a stand-alone basis or with appropriate assistive devices.

To achieve that goal, this Accessibility Policy establishes seven key objectives to guide HP actions. All HP managers and employees are expected to support these objectives and their implementation in accordance with their roles and responsibilities:

- Raise the level of awareness of accessibility issues within HP, and provide employees with the training they need to design, produce, market, and deliver accessible products and services.

- Develop accessibility guidelines for products and services, and hold product development groups accountable for implementing these guidelines where competitively, technically, and economically feasible.

- Involve people with disabilities in the development of accessibility guidelines and in the design and testing of products and services.

- Document accessibility features, and make information about HP products and services publicly available in an accessible form.

- Establish relationships with leading assistive technology and solution providers.

- Support internal and external research and development that improves assistive technology relevant to HP products and services.

- Support and contribute to industry standards and guidelines for accessibility.

International Association of Accessibility Professionals (IAAP)

IAAP is a not-for-profit association focused on advancing the accessibility profession through networking, education, and certification. The objective is to help accessibility professionals develop and advance their careers and to better enable organizations to integrate accessibility into their products and infrastructure.

As a founding member, HP joined to participate with other organizations to advance the field of accessibility. This commitment supports HP's accessibility goal of designing, producing, and marketing products and services that people with disabilities can effectively use.

IAAP will make the profession strong by globally connecting individuals, students, and organizations to learn from one another. If you are interested in learning more, go to http://www.accessibilityassociation.org to join the online community, sign up for newsletters, and learn about membership options.

Finding the best assistive technology

Everyone, including people with disabilities or age-related limitations, should be able to communicate, express themselves, and connect with the world using technology. HP is committed to increasing accessibility awareness within HP and with our customers and partners. Whether it's large fonts that are easy on the eyes, voice recognition that lets you give your hands a rest, or any other assistive technology to help with your specific situation—a variety of assistive technologies make HP products easier to use. How do you choose?

Assessing your needs

Technology can unleash your potential. Assistive technology removes barriers and helps you create independence at home, at work, and in the community. Assistive technology (AT) helps increase, maintain, and improve the functional capabilities of electronic and information technology.

You can choose from many AT products. Your AT assessment should allow you to evaluate several products, answer your questions, and facilitate your selection of the best solution for your situation. You will find that professionals qualified to do AT assessments come from many fields, including those licensed or certified in physical therapy, occupational therapy, speech/language pathology, and other areas of expertise. Others, while not certified or licensed, can also provide evaluation information. You will want to ask about the individual's experience, expertise, and fees to determine if they are appropriate for your needs.

Accessibility for HP products

The following links provide information about accessibility features and assistive technology, if applicable, included in various HP products. These resources will help you select the specific assistive technology features and product(s) most appropriate for your situation.

- HP Elite x3–Accessibility Options (Windows 10 Mobile)
- HP PCs–Windows 7 Accessibility Options
- HP PCs–Windows 8 Accessibility Options
- HP PC's–Windows 10 Accessibility Options
- HP Slate 7 Tablets–Enabling Accessibility Features on Your HP Tablet (Android 4.1/Jelly Bean)
- HP SlateBook PCs–Enabling Accessibility Features (Android 4.3, 4.2/Jelly Bean)
- HP Chromebook PCs–Enabling Accessibility Features on Your HP Chromebook or Chromebox (Chrome OS)
- HP Shopping–peripherals for HP products

If you need additional support with the accessibility features on your HP product, see Contacting support on page 60.

Additional links to external partners and suppliers that may provide additional assistance:

- Microsoft Accessibility information (Windows 7, Windows 8, Windows 10, Microsoft Office)
- Google Products accessibility information (Android, Chrome, Google Apps)

- [Assistive Technologies sorted by impairment type](#)
- [Assistive Technology Industry Association (ATIA)](#)

Standards and legislation

Standards

Section 508 of the Federal Acquisition Regulation (FAR) standards was created by the US Access Board to address access to information and communication technology (ICT) for people with physical, sensory, or cognitive disabilities. The standards contain technical criteria specific to various types of technologies, as well as performance-based requirements which focus on functional capabilities of covered products. Specific criteria cover software applications and operating systems, web-based information and applications, computers, telecommunications products, video and multimedia, and self-contained closed products.

Mandate 376 – EN 301 549

The EN 301 549 standard was created by the European Union within Mandate 376 as the basis for an online toolkit for public procurement of ICT products. The standard specifies the functional accessibility requirements applicable to ICT products and services, together with a description of the test procedures and evaluation methodology for each accessibility requirement.

Web Content Accessibility Guidelines (WCAG)

Web Content Accessibility Guidelines (WCAG) from the W3C's Web Accessibility Initiative (WAI) helps web designers and developers create sites that better meet the needs of people with disabilities or age-related limitations. WCAG advances accessibility across the full range of web content (text, images, audio, and video) and web applications. WCAG can be precisely tested, is easy to understand and use, and allows web developers flexibility for innovation. WCAG 2.0 has also been approved as [ISO/IEC 40500:2012](#).

WCAG specifically addresses barriers to accessing the web experienced by people with visual, auditory, physical, cognitive, and neurological disabilities, and by older web users with accessibility needs. WCAG 2.0 provides characteristics of accessible content:

- **Perceivable** (for instance, by addressing text alternatives for images, captions for audio, adaptability of presentation, and color contrast)
- **Operable** (by addressing keyboard access, color contrast, timing of input, seizure avoidance, and navigability)
- **Understandable** (by addressing readability, predictability, and input assistance)
- **Robust** (for instance, by addressing compatibility with assistive technologies)

Legislation and regulations

Accessibility of IT and information has become an area of increasing legislative importance. The following links provide information about key legislation, regulations, and standards.

- [United States](#)
- [Canada](#)
- [Europe](#)
- [Australia](#)
- [Worldwide](#)

Useful accessibility resources and links

The following organizations might be good resources for information about disabilities and age-related limitations.

📝 **NOTE:** This is not an exhaustive list. These organizations are provided for informational purposes only. HP assumes no responsibility for information or contacts you encounter on the Internet. Listing on this page does not imply endorsement by HP.

Organizations

- American Association of People with Disabilities (AAPD)
- The Association of Assistive Technology Act Programs (ATAP)
- Hearing Loss Association of America (HLAA)
- Information Technology Technical Assistance and Training Center (ITTATC)
- Lighthouse International
- National Association of the Deaf
- National Federation of the Blind
- Rehabilitation Engineering & Assistive Technology Society of North America (RESNA)
- Telecommunications for the Deaf and Hard of Hearing, Inc. (TDI)
- W3C Web Accessibility Initiative (WAI)

Educational institutions

- California State University, Northridge, Center on Disabilities (CSUN)
- University of Wisconsin - Madison, Trace Center
- University of Minnesota computer accommodations program

Other disability resources

- ADA (Americans with Disabilities Act) Technical Assistance Program
- ILO Global Business and Disability network
- EnableMart
- European Disability Forum
- Job Accommodation Network
- Microsoft Enable

HP links

Our contact webform

HP comfort and safety guide

HP public sector sales

Contacting support

- Customers who are deaf or hard of hearing who have questions about technical support or accessibility of HP products:

  - Use TRS/VRS/WebCapTel to call (877) 656-7058 Monday through Friday, 6 a.m. to 9 p.m. Mountain Time.

- Customers with other disabilities or age-related limitations who have questions about technical support or accessibility of HP products, choose one of the following options:

  - Call (888) 259-5707 Monday through Friday, 6 a.m. to 9 p.m. Mountain Time.

  - Complete the Contact form for people with disabilities or age-related limitations.

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