Product notice

This guide describes features that are common to most products. 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. Go to [http://www.microsoft.com](http://www.microsoft.com) for details.

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

Software terms

By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a full refund subject to the refund policy of your seller.

For any further information or to request a full refund of the price of the computer, please contact your seller.
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 the International Standard for Safety of Information Technology Equipment (IEC 60950).
Processor configuration setting (select products only)

**IMPORTANT:** Select products are configured with an Intel® Pentium® N35xx/N37xx series or a Celeron® N28xx/N29xx/N30xx/N31xx series processor and a Windows® operating system. If your computer is configured as described, do not change the processor configuration setting in msconfig.exe from 4 or 2 processors to 1 processor. If you do so, your computer will not restart. You will have to perform a factory reset to restore the original settings.
# Table of contents

1 Getting started .......................................................................................................................... 1  
   Best practices .......................................................................................................................... 1  
   More HP resources .................................................................................................................. 2  

2 Getting to know your computer ............................................................................................... 3  
   Locating hardware .................................................................................................................. 3  
   Locating software ................................................................................................................... 3  
   Right side ............................................................................................................................... 4  
   Left side .................................................................................................................................. 6  
   Display .................................................................................................................................... 7  
   Keyboard area ......................................................................................................................... 8  
      TouchPad ............................................................................................................................... 8  
      Lights ................................................................................................................................... 9  
      Speakers and fingerprint reader ......................................................................................... 10  
      Special keys ....................................................................................................................... 11  
      Action keys ....................................................................................................................... 12  
   Bottom .................................................................................................................................... 14  
   Labels ..................................................................................................................................... 15  
   Inserting a microSD card or a nano SIM card (select products only) ..................................... 16  

3 Connecting to a network .......................................................................................................... 18  
   Connecting to a wireless network ......................................................................................... 18  
      Using the wireless controls ............................................................................................... 18  
         Airplane mode key .......................................................................................................... 18  
         Operating system controls ............................................................................................ 18  
   Connecting to a WLAN .......................................................................................................... 19  
   Using HP Mobile Broadband (select products only) ............................................................ 20  
   Using GPS (select products only) ........................................................................................ 20  
   Using Bluetooth wireless devices (select products only) ..................................................... 20  
      Connecting Bluetooth devices ......................................................................................... 20  
   Connecting to a wired network—LAN (select products only) .............................................. 21  

4 Enjoying entertainment features ............................................................................................ 22  
   Using the camera .................................................................................................................... 22  
   Using audio ............................................................................................................................ 22  
   Connecting speakers ............................................................................................................. 22
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting headsets</td>
<td>23</td>
</tr>
<tr>
<td>Connecting headphones</td>
<td>22</td>
</tr>
<tr>
<td>Using sound settings</td>
<td>23</td>
</tr>
<tr>
<td>Using video</td>
<td>23</td>
</tr>
<tr>
<td>Connecting a Thunderbolt device using a USB Type-C cable (select products only)</td>
<td>23</td>
</tr>
<tr>
<td>Discovering and connecting to Miracast-compatible wireless displays (select products only)</td>
<td>24</td>
</tr>
<tr>
<td>Using data transfer</td>
<td>24</td>
</tr>
<tr>
<td>Connecting devices to a USB Type-C port (select products only)</td>
<td>25</td>
</tr>
<tr>
<td>Resolving a low battery level</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when external power is available</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when no power source is available</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when the computer cannot exit Hibernation</td>
<td>34</td>
</tr>
<tr>
<td>Factory-sealed battery</td>
<td>34</td>
</tr>
<tr>
<td>Running on external power</td>
<td>34</td>
</tr>
<tr>
<td>Running on battery power</td>
<td>32</td>
</tr>
<tr>
<td>Using HP Fast Charge (select products only)</td>
<td>32</td>
</tr>
<tr>
<td>Displaying battery charge</td>
<td>32</td>
</tr>
<tr>
<td>Finding battery information in HP Support Assistant (select products only)</td>
<td>33</td>
</tr>
<tr>
<td>Conserving battery power</td>
<td>33</td>
</tr>
<tr>
<td>Identifying low battery levels</td>
<td>33</td>
</tr>
<tr>
<td>Resolving a low battery level</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when external power is available</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when no power source is available</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when the computer cannot exit Hibernation</td>
<td>34</td>
</tr>
<tr>
<td>Initiating and exiting Sleep</td>
<td>30</td>
</tr>
<tr>
<td>Initiating and exiting Hibernation (select products only)</td>
<td>31</td>
</tr>
<tr>
<td>Shutting down (turning off) the computer</td>
<td>31</td>
</tr>
<tr>
<td>Using the Power icon and Power Options</td>
<td>32</td>
</tr>
<tr>
<td>Using TouchPad and touch screen gestures</td>
<td>26</td>
</tr>
<tr>
<td>Tap</td>
<td>26</td>
</tr>
<tr>
<td>Two-finger pinch zoom</td>
<td>27</td>
</tr>
<tr>
<td>Two-finger slide (TouchPad only)</td>
<td>27</td>
</tr>
<tr>
<td>Two-finger tap (TouchPad only)</td>
<td>27</td>
</tr>
<tr>
<td>Four-finger tap (TouchPad only)</td>
<td>27</td>
</tr>
<tr>
<td>Three-finger swipe (TouchPad only)</td>
<td>28</td>
</tr>
<tr>
<td>One-finger slide (touch screen only)</td>
<td>29</td>
</tr>
<tr>
<td>Using an optional keyboard or mouse</td>
<td>29</td>
</tr>
<tr>
<td>Using an on-screen keyboard or mouse</td>
<td>29</td>
</tr>
<tr>
<td>Connecting headsets</td>
<td>23</td>
</tr>
<tr>
<td>Connecting headphones</td>
<td>22</td>
</tr>
<tr>
<td>Using sound settings</td>
<td>23</td>
</tr>
<tr>
<td>Using video</td>
<td>23</td>
</tr>
<tr>
<td>Connecting a Thunderbolt device using a USB Type-C cable (select products only)</td>
<td>23</td>
</tr>
<tr>
<td>Discovering and connecting to Miracast-compatible wireless displays (select products only)</td>
<td>24</td>
</tr>
<tr>
<td>Using data transfer</td>
<td>24</td>
</tr>
<tr>
<td>Connecting devices to a USB Type-C port (select products only)</td>
<td>25</td>
</tr>
<tr>
<td>Resolving a low battery level</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when external power is available</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when no power source is available</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when the computer cannot exit Hibernation</td>
<td>34</td>
</tr>
<tr>
<td>Factory-sealed battery</td>
<td>34</td>
</tr>
<tr>
<td>Running on external power</td>
<td>34</td>
</tr>
<tr>
<td>Running on battery power</td>
<td>32</td>
</tr>
<tr>
<td>Using HP Fast Charge (select products only)</td>
<td>32</td>
</tr>
<tr>
<td>Displaying battery charge</td>
<td>32</td>
</tr>
<tr>
<td>Finding battery information in HP Support Assistant (select products only)</td>
<td>33</td>
</tr>
<tr>
<td>Conserving battery power</td>
<td>33</td>
</tr>
<tr>
<td>Identifying low battery levels</td>
<td>33</td>
</tr>
<tr>
<td>Resolving a low battery level</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when external power is available</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when no power source is available</td>
<td>34</td>
</tr>
<tr>
<td>Resolving a low battery level when the computer cannot exit Hibernation</td>
<td>34</td>
</tr>
<tr>
<td>Factory-sealed battery</td>
<td>34</td>
</tr>
<tr>
<td>Running on external power</td>
<td>34</td>
</tr>
</tbody>
</table>
7 Maintaining your computer .................................................................................................................. 36
   Improving performance ......................................................................................................................... 36
   Using Disk Defragmenter ....................................................................................................................... 36
   Using Disk Cleanup ................................................................................................................................. 36
   Using HP 3D DriveGuard (select products only) ..................................................................................... 36
   Identifying HP 3D DriveGuard status ..................................................................................................... 37
   Updating programs and drivers ............................................................................................................. 37
   Cleaning your computer .......................................................................................................................... 37
   Cleaning procedures ............................................................................................................................... 37
   Cleaning the display ................................................................................................................................. 38
   Cleaning the sides or cover ...................................................................................................................... 38
   Cleaning the TouchPad, keyboard, or mouse (select products only) ...................................................... 38
   Traveling with or shipping your computer .............................................................................................. 38

8 Securing your computer and information ............................................................................................. 40
   Using passwords ...................................................................................................................................... 40
      Setting Windows passwords ................................................................................................................ 40
      Setting Setup Utility (BIOS) passwords ............................................................................................... 41
   Using Windows Hello (select products only) ......................................................................................... 42
   Using Internet security software .......................................................................................................... 42
      Using antivirus software .................................................................................................................... 42
      Using firewall software ...................................................................................................................... 42
   Installing software updates .................................................................................................................... 43
   Using HP Device as a Service (HP DaaS) (select products only) .......................................................... 43
   Securing your wireless network ............................................................................................................ 43
   Backing up your software applications and information ........................................................................ 43
   Using an optional security cable (select products only) ....................................................................... 43

9 Using Setup Utility (BIOS) ..................................................................................................................... 44
   Starting Setup Utility (BIOS) .................................................................................................................. 44
   Updating Setup Utility (BIOS) ................................................................................................................ 44
      Determining the BIOS version ............................................................................................................ 44
      Downloading a BIOS update .............................................................................................................. 45

10 Using HP PC Hardware Diagnostics .................................................................................................. 46
   Using HP PC Hardware Diagnostics Windows (select products only) .................................................. 46
      Downloading HP PC Hardware Diagnostics Windows ....................................................................... 46
      Downloading the latest HP PC Hardware Diagnostics Windows version ......................................... 47
      Downloading HP Hardware Diagnostics Windows by product name or number (select products only) .............................................................................................................................. 47
Installing HP PC Hardware Diagnostics Windows ................................................................. 47
Using HP PC Hardware Diagnostics UEFI ........................................................................... 47
Starting HP PC Hardware Diagnostics UEFI ....................................................................... 48
Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive ......................... 48
  Downloading the latest HP PC Hardware Diagnostics UEFI version ................................. 48
  Downloading HP PC Hardware Diagnostics UEFI by product name or number
  (select products only) ........................................................................................................ 48
Using Remote HP PC Hardware Diagnostics UEFI settings (select products only) .......... 49
  Downloading Remote HP PC Hardware Diagnostics UEFI ............................................. 49
  Downloading the latest Remote HP PC Hardware Diagnostics UEFI version .......... 49
  Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number
  ........................................................................................................................................ 49
  Customizing Remote HP PC Hardware Diagnostics UEFI settings ................................ 49

11 Backing up, restoring, and recovering ........................................................................... 51
  Using Windows tools for backing up, restoring, and recovering your computer ............... 51
  Creating backups ............................................................................................................. 51
  Restoring and recovering ................................................................................................ 51
  Creating HP Recovery media (select products only) ....................................................... 52
    Using HP Recovery Manager to create recovery media .............................................. 52
      Before you begin ....................................................................................................... 52
      Creating the recovery media .................................................................................... 53
    Using the HP Cloud Recovery Download Tool to create recovery media .................. 53
  Restoring and recovery ................................................................................................... 53
    Restoring, resetting, and refreshing using Windows tools ......................................... 53
    Restoring using HP Recovery Manager and the HP Recovery partition .................... 53
    Recovering using HP Recovery Manager ................................................................ 54
    Recovering using the HP Recovery partition (select products only) ......................... 54
    Recovering using HP Recovery media ...................................................................... 55
    Changing the computer boot order ............................................................................. 55
    Removing the HP Recovery partition (select products only) .................................... 55

12 Specifications ................................................................................................................. 56
  Input power .................................................................................................................... 56
  Operating environment ................................................................................................. 57

13 Electrostatic Discharge ................................................................................................. 58

14 Accessibility .................................................................................................................. 59
  Accessibility .................................................................................................................. 59
1 Getting started

This computer is a powerful tool designed to enhance your work and entertainment. Read this chapter to learn about best practices after you set up your computer, fun things to do with your computer, and where to find additional HP resources.

Best practices

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

- Back up your hard drive by creating recovery media. See Backing up, restoring, and recovering on page 51.
- If you haven’t already done so, connect to a wired or wireless network. See details in Connecting to a network on page 18.
- Become familiar with the computer hardware and software. For more information, see Getting to know your computer on page 3 and Enjoying entertainment features on page 22.
- Update or purchase antivirus software. See Using antivirus software on page 42.
More HP resources

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

<table>
<thead>
<tr>
<th>Resource</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup Instructions</td>
<td>• Overview of computer setup and features</td>
</tr>
<tr>
<td>HP support</td>
<td>• Online chat with an HP technician</td>
</tr>
<tr>
<td></td>
<td>• Support telephone numbers</td>
</tr>
<tr>
<td></td>
<td>• Replacement parts videos (select products only)</td>
</tr>
<tr>
<td></td>
<td>• Maintenance and service guides</td>
</tr>
<tr>
<td></td>
<td>• HP service center locations</td>
</tr>
<tr>
<td>Safety &amp; Comfort Guide</td>
<td>• Proper workstation setup</td>
</tr>
<tr>
<td></td>
<td>• Guidelines for posture and work habits that increase your comfort and decrease your risk of injury</td>
</tr>
<tr>
<td></td>
<td>• Electrical and mechanical safety information</td>
</tr>
<tr>
<td>Regulatory, Safety and Environmental Notices</td>
<td>• Important regulatory notices, including information about proper battery disposal, if needed.</td>
</tr>
<tr>
<td>Limited Warranty*</td>
<td>• Specific warranty information about this computer</td>
</tr>
</tbody>
</table>

*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 Getting to know your computer

Your computer features top-rated components. This chapter provides details about your components, where they're 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, press fn+esc (select products only).

Locating software

To find out what software is installed on your computer:

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

Refer to the illustration that most closely matches your computer.

![Image](image_url)

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| (1)       | MicroSD memory card reader (select products only) | Reads optional memory cards that enable you to store, manage, share, or access information.  
To insert a card:  
1. Hold the card label-side up, with 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.  
To remove a card:  
▲ Press in on the card, and then remove it from the memory card reader. |
| (2)       | MicroSD memory card reader/nano SIM card reader combo (select products only) | Reads optional memory cards that enable you to store, manage, share, or access information, and supports a wireless subscriber identity module (nano SIM) card.  
**CAUTION:** Inserting a SIM card of the wrong size could damage the SIM card or cause the SIM card to become stuck in the slot. The use of nano SIM card adapters is not recommended. To prevent damage to the nano SIM card or the connectors, use minimal force when inserting a nano SIM card.  
**NOTE:** Before purchasing a nano SIM card, follow these instructions to determine the correct nano SIM card size for your computer:  
1. Go to [http://www.hp.com/support](http://www.hp.com/support), and then search for your computer by product name or number.  
2. Select Product Information.  
3. Refer to the listed options to determine which card to purchase.  
For installation steps, see [Inserting a microSD card or a nano SIM card (select products only)](page16) on page 16. |
| (3)       | Camera privacy switch | Turns the camera off and on.  
**NOTE:** For more information, see [Using the camera](page22) on page 22. |
| (4)       | USB Type-C power connector and Thunderbolt™ port with HP Sleep and Charge | Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery.  
– and –  
Even when the computer is off, connects and charges most USB devices that have a Type-C connector, such as a cell phone,
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>camera, activity tracker, or smartwatch, and provides high-speed data transfer.</td>
<td>– and – Connects a display device that has a USB Type-C connector, providing DisplayPort output.</td>
</tr>
<tr>
<td>NOTE: Your computer may also support a Thunderbolt docking station.</td>
<td>NOTE: Cables and/or adapters (purchased separately) may be required.</td>
</tr>
<tr>
<td>(5) Audio-out (headphone)/Audio-in (microphone) combo jack</td>
<td>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.</td>
</tr>
<tr>
<td>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the Regulatory, Safety, and Environmental Notices.</td>
<td>To access this guide: ▲ Select the Start button, select HP Help and Support, and then select HP Documentation.</td>
</tr>
<tr>
<td>NOTE: When a device is connected to the jack, the computer speakers are disabled.</td>
<td></td>
</tr>
<tr>
<td>(6) AC adapter and battery light</td>
<td>• White: The AC adapter is connected and the battery is fully charged.</td>
</tr>
<tr>
<td></td>
<td>• Blinking white: The AC adapter is disconnected and the battery has reached a low battery level.</td>
</tr>
<tr>
<td></td>
<td>• Amber: The AC adapter is connected and the battery is charging.</td>
</tr>
<tr>
<td></td>
<td>• Off: The battery is not charging.</td>
</tr>
<tr>
<td>(7) USB Type-C power connector and Thunderbolt port with HP Sleep and Charge</td>
<td>Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery.</td>
</tr>
<tr>
<td></td>
<td>– and – Even when the computer is off, connects and charges most USB devices that have a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.</td>
</tr>
<tr>
<td></td>
<td>– and – Connects a display device that has a USB Type-C connector, providing DisplayPort output.</td>
</tr>
<tr>
<td>NOTE: Your computer may also support a Thunderbolt docking station.</td>
<td>NOTE: Cables and/or adapters (purchased separately) may be required.</td>
</tr>
</tbody>
</table>
### Left side

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| (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).  
- When the computer is in Hibernation, press the button briefly to exit Hibernation.  
**CAUTION:** 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 down 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 icon and then select **Power Options**. |
<p>| (2) USB SuperSpeed port with HP Sleep and Charge | Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch. |</p>
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) WWAN antennas* (select products only)</td>
<td>Send and receive wireless signals to communicate with wireless wide area networks (WWANs).</td>
</tr>
<tr>
<td>(2) WLAN antennas*</td>
<td>Send and receive wireless signals to communicate with wireless local area networks (WLANs).</td>
</tr>
<tr>
<td>(3) Internal microphones</td>
<td>Record sound.</td>
</tr>
<tr>
<td>(4) Camera lights</td>
<td>On: One or more cameras are in use.</td>
</tr>
</tbody>
</table>
| (5) Camera | Allows you to video chat, record video, and record still images. To use your camera, see Using the camera on page 22. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. For more information, see Using Windows Hello (select products only) on page 42.  
**NOTE:** Camera functions vary depending on the camera hardware and software installed on your product. |

*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:

1. Type **support** in the taskbar search box, and then select the **HP Support Assistant** app.
   - or –
   Click the question mark icon in the taskbar.

2. Select **My notebook**, select the **Specifications** tab, and then select **User Guides**.
Keyboard area

TouchPad

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| (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 26. |
| (2) Left TouchPad button | Functions like the left button on an external mouse.          |
| (3) Right TouchPad button | Functions like the right button on an external mouse.          |
## Lights

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Caps lock light</td>
<td>On: Caps lock is on, which switches the key input to all capital letters.</td>
</tr>
</tbody>
</table>
| (2) Mute light | - On: Computer sound is off.  
- Off: Computer sound is on. |
# Speakers and fingerprint reader

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Speakers Produce sound.</td>
</tr>
</tbody>
</table>
| (2)      | Fingerprint reader Allows a fingerprint logon to Windows, instead of a password logon.  

▲ To use the fingerprint reader, tap or swipe the upper-left corner of the TouchPad. See *Using Windows Hello (select products only)* on page 42 for details.
## Special keys

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) esc key</td>
<td>Displays system information when pressed in combination with the fn key.</td>
</tr>
<tr>
<td>(2) fn key</td>
<td>Executes specific functions when pressed in combination with another key.</td>
</tr>
<tr>
<td>(3) Windows key</td>
<td>Opens the Start menu. ( \textbf{NOTE:} ) Pressing the Windows key again will close the Start menu.</td>
</tr>
<tr>
<td>(4) Action keys</td>
<td>Execute frequently used system functions. ( \textbf{NOTE:} ) On select products, the f5 action key turns the keyboard backlight feature off or on.</td>
</tr>
</tbody>
</table>
**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 11**.

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

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Icon" /></td>
<td>Helps prevent side-angle viewing from onlookers (select products only). If needed, decrease or increase brightness for well-lit or darker environments. Press the key again to turn off the privacy screen.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Icon" /></td>
<td>Decreases the screen brightness incrementally as long as you hold down the key.</td>
</tr>
<tr>
<td><img src="image3.png" alt="Icon" /></td>
<td>Increases the screen brightness incrementally as long as you hold down the key.</td>
</tr>
<tr>
<td><img src="image4.png" alt="Icon" /></td>
<td>Switches the screen image between display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing this key alternates the screen image from the computer display to the monitor display to a simultaneous display on both the computer and the monitor.</td>
</tr>
<tr>
<td><img src="image5.png" alt="Icon" /></td>
<td>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.</td>
</tr>
<tr>
<td><img src="image6.png" alt="Icon" /></td>
<td>Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD).</td>
</tr>
<tr>
<td><img src="image7.png" alt="Icon" /></td>
<td>Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.</td>
</tr>
<tr>
<td><img src="image8.png" alt="Icon" /></td>
<td>Plays the next track of an audio CD or the next section of a DVD or a BD.</td>
</tr>
<tr>
<td><img src="image9.png" alt="Icon" /></td>
<td>Decreases speaker volume incrementally while you hold down the key.</td>
</tr>
<tr>
<td><img src="image10.png" alt="Icon" /></td>
<td>Increases speaker volume incrementally while you hold down the key.</td>
</tr>
<tr>
<td><img src="image11.png" alt="Icon" /></td>
<td>Mutes or restores speaker sound.</td>
</tr>
<tr>
<td><img src="image12.png" alt="Icon" /></td>
<td>Turns the airplane mode and wireless feature on or off. <strong>NOTE:</strong> The airplane mode key is also referred to as the wireless button.</td>
</tr>
<tr>
<td>Icon</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
</tbody>
</table>

**NOTE:** A wireless network must be set up before a wireless connection is possible.
## Bottom

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Speakers (2)</td>
</tr>
</tbody>
</table>
| (2)       | 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 examples shown below. Refer to the illustration that most closely matches the service label on your computer.

<table>
<thead>
<tr>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) HP product name</td>
</tr>
<tr>
<td>(2) Model number</td>
</tr>
<tr>
<td>(3) Product ID</td>
</tr>
<tr>
<td>(4) Serial number</td>
</tr>
<tr>
<td>(5) Warranty period</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) HP product name</td>
</tr>
<tr>
<td>(2) Product ID</td>
</tr>
</tbody>
</table>

---

**Labels**

15
Component

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(3)</td>
<td>Serial number</td>
</tr>
<tr>
<td>(4)</td>
<td>Warranty period</td>
</tr>
</tbody>
</table>

- 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.

Inserting a microSD card or a nano SIM card (select products only)

To insert a microSD card, follow these steps:

1. Position the computer display-side up on a flat surface.
2. Insert a small straightened paper clip into the card tray access hole.
3. Press in gently on the clip until the card tray is ejected. (1)
4. Remove the tray (2) from the computer and insert the card (3).
5. Replace the tray in the computer. Press in gently on the tray (4) until it is firmly seated.
**CAUTION:** Inserting a SIM card of the wrong size could damage the SIM card or cause the SIM card to become stuck in the slot. The use of nano SIM card adapters is not recommended. To prevent damage to the nano SIM card or the connectors, use minimal force when inserting a nano SIM card.

**NOTE:** Before purchasing a nano SIM card, follow these instructions to determine the correct nano SIM card size for your computer:

1. Go to [http://www.hp.com/support](http://www.hp.com/support), and then search for your computer by product name or number.
2. Select **Product Information**.
3. Refer to the listed options to determine which card to purchase.

To insert a nano SIM card, follow these steps:

1. Position the computer display-side up on a flat surface.
2. Insert a small straightened paper clip into the card tray access hole.
3. Press in gently on the clip until the card tray is ejected (1).
4. Remove the tray (2) from the computer and insert the card (3).
5. Replace the tray in the computer. Press in gently on the tray (4) until it is firmly seated.

To remove the card:

1. Release the card tray as described above, and then remove the card.
2. Replace the tray in the computer. Press in gently on the tray until it is firmly seated.
Connecting to a network

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 will help 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:

- **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**—Gives you wireless connectivity over a wireless wide area network (WWAN), 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:

- **Airplane mode key** (also called wireless button or wireless key) (referred to in this chapter as airplane mode key)

- **Operating system controls**

  **Airplane mode key**

  The computer may have an airplane mode key, 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:

  ▲ On the taskbar, right-click the network status icon, and then select **Open Network & Internet settings**.

  - or –

  ▲ On the taskbar, select the network status icon, and then select **Network & Internet settings**.
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. On the taskbar, select the network status icon, 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:
   
   1. On the taskbar, right-click the network status icon, and then select \Open Network & Internet settings.\n    
       -- or --
       
       On the taskbar, select the network status icon, and then select Network & Internet settings.

   2. Under the Change your network settings section, select Network and Sharing Center.

   3. 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, right-click 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)

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 e-mail, or connect to your corporate network without the need for Wi-Fi hotspots.

You might need the HP Mobile Broadband Module IMEI and/or MEID number to activate mobile broadband service. The number may 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 —

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

2. Select **Network & Internet settings**.

3. Under the **Network & Internet** section, select **Cellular**, and then select **Advanced Options**.

Some mobile network operators require the use of a subscriber identity module (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 included with the HP Mobile Broadband documents 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 Location setting.

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

Using Bluetooth wireless devices (select products only)

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

- Computers (desktop, notebook)
- Phones (cellular, cordless, smartphone)
- Imaging devices (printer, camera)
- 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. Select **Add Bluetooth or other device**.

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, refer to 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; refer to the documentation provided with the device.

Connecting to a wired 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.

Connecting to a LAN requires an RJ–45 (network) cable and a network jack or an optional docking device or expansion port, if there is no RJ–45 jack on the computer.

To connect the network cable, follow these steps:

1. Plug the network cable into the network jack (1) on the computer.
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.
4 Enjoying entertainment features

Use your HP computer as an entertainment hub to socialize via the camera, enjoy and manage your music, and download and watch movies. Or, to make your computer an even more powerful entertainment center, connect external devices like a monitor, projector, TV, speakers, or headphones.

Using the camera

Your computer has 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. To determine which camera(s) are on your product, see Getting to know your computer on page 3.

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 Securing your computer and information on page 40 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.

To use your camera, type camera in the taskbar search box, and then select Camera from the list of applications.

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 models) or attach an external optical drive to play CDs. To enhance your listening enjoyment, attach external audio devices such as speakers or headphones.

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. 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 document:

▲ Select the Start button, select HP Help and Support, and then select HP Documentation.

You can connect wired headphones to the headphone jack or 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 document:

▲ Select the Start button, select HP Help and Support, 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, B&O Play, 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 sound 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.

For information on using your video features, refer to HP Support Assistant.

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

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

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

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

3. Press f4 to alternate the computer screen image between 4 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 f4 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 the **Settings** icon, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

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

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 click **Project to a second screen**. Click **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.

For information on using your USB Type-C features, refer to HP Support Assistant.

**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.
Navigating the screen

You can navigate the computer screen in one or more of the following ways:

- 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.

You can also customize gestures and view demonstrations 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.

**NOTE:** Unless noted, gestures can be used on the TouchPad or a touch screen (select products only).

Tap

Use the tap/double-tap gesture to select or open an item on the screen.

- 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 pinch zoom

Use the two-finger pinch zoom to zoom out or in on images or text.

- Zoom out by placing two fingers apart on the TouchPad zone or touch screen and then moving your fingers together.
- Zoom in by placing two fingers together on the TouchPad zone or touch screen and then moving your fingers apart.

Two-finger slide (TouchPad only)

Use the two-finger slide to move up, down, or sideways on a page or image.

- Place two fingers slightly apart on the TouchPad zone and then drag them up, down, left, or right.

Two-finger tap (TouchPad only)

Use the two-finger tap to open the menu for an object on the screen.

**NOTE:** The two-finger tap performs the same function as right-clicking with the mouse.

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

Four-finger tap (TouchPad only)

Use the four-finger tap to open the action center.
• Tap four fingers on the Touchpad to open the action center and view current settings and notifications.

Three-finger swipe (TouchPad only)

Use the three-finger swipe to view open windows and to switch between open windows and the desktop.
• Swipe 3 fingers away from you to see all open windows.
• Swipe 3 fingers toward you to show the desktop.
• Swipe 3 fingers left or right to switch between open windows.
One-finger slide (touch screen only)

Use the one-finger slide to pan or scroll through lists and pages, or to move an object.

- To scroll across the screen, lightly slide one finger across the screen in the direction you want to move.
- To move an object, press and hold your finger on an object, and then drag your finger to move the object.

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.
Chapter 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 and Hibernation

**CAUTION:** Several well-known vulnerabilities exist when a computer is in the Sleep state. To prevent an unauthorized user from accessing data on your computer, even encrypted data, HP recommends that you always initiate Hibernation instead of Sleep anytime the computer will be out of your physical possession. This practice is particularly important when you travel with your computer.

**CAUTION:** 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.

Windows has two power-saving states, Sleep and Hibernation.

- **Sleep**—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 30*.
- **Hibernation**—The Hibernation state is automatically initiated if the battery reaches a critical level or the computer has been in the Sleep state for an extended period of time. In the Hibernation state, your work is saved to a hibernation file and the computer powers down. You can also initiate Hibernation manually. For more information, see *Initiating and exiting Hibernation (select products only) on page 31*.

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.
**Initiating and exiting Hibernation (select products only)**

You can enable user-initiated Hibernation and change other power settings and timeouts using Power Options.

1. Right-click the **Power** icon, and then select **Power Options**.

2. In the left pane, select **Choose what the power buttons do** (wording may vary by product).

3. Depending on your product, you can enable Hibernation for battery power or external power in any of the following ways:
   - **Power button**—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I press the power button**, and then select **Hibernate**.
   - **Sleep button** (select products only)—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I press the sleep button**, and then select **Hibernate**.
   - **Lid** (select products only)—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I close the lid**, and then select **Hibernate**.
   - **Power menu**—Select **Change Settings that are currently unavailable**, and then, under **Shutdown settings**, select the **Hibernate** check box.

   The Power menu can be accessed by selecting the **Start** button.

4. Select **Save changes**.

   ▲ To initiate Hibernation, use the method that you enabled in step 3.

   ▲ To exit Hibernation, briefly press the power button.

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

**Shutting down (turning off) the computer**

⚠️ **CAUTION:** 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 or in Hibernation, first exit Sleep or Hibernation 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.
Finding battery information in HP Support Assistant (select products only)

To access battery information:

1. Type support in the taskbar search box, and then select the HP Support Assistant app.
   – or –
   Select the question mark icon in the taskbar.

2. Select Troubleshooting and fixes, and then in the Diagnostics section, select HP Battery Check. If HP Battery Check indicates that your battery should be replaced, contact support.

HP Support Assistant provides the following tools and information about the battery:
- HP Battery Check
- Information about battery types, specifications, life cycles, and capacity

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 32.

The computer takes the following actions for a critical battery level:
- If Hibernation is disabled and 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.
- If Hibernation is enabled and the computer is on or in the Sleep state, the computer initiates Hibernation.
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.

Resolving a low battery level when the computer cannot exit Hibernation

1. Connect the AC adapter to the computer and to external power.
2. Exit Hibernation by pressing the power button.

Factory-sealed battery

To monitor the status of the battery, or if the battery is no longer holding a charge, run HP Battery Check in the HP Support Assistant app (select products only).

1. Type support in the taskbar search box, and then select the HP Support Assistant app.
   - or –
   Select the question mark icon in the taskbar.
2. Select Troubleshooting and fixes, and then in the Diagnostics section, select HP Battery Check. If HP Battery Check indicates that your battery should be replaced, contact support.

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.

Running on external power

For information about connecting to external power, refer to 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 running Disk Defragmenter on computers with internal hard drives
- 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 \[ \text{Power icon} \] 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 \[ \text{Power icon} \] changes appearance.
7 Maintaining your computer

It is important to perform regular maintenance to keep your computer in optimal condition. This chapter explains how to use tools like Disk Defragmenter and Disk Cleanup. It also provides instructions for updating programs and drivers, steps to clean the computer, and tips for traveling with (or shipping) the computer.

Improving performance

You can improve the performance of your computer by performing regular maintenance tasks with tools such as Disk Defragmenter and Disk Cleanup.

Using Disk Defragmenter

HP recommends using Disk Defragmenter to defragment your hard drive at least once a month.

**NOTE:** It is not necessary to run Disk Defragmenter on solid-state drives.

To run Disk Defragmenter:
1. Connect the computer to AC power.
2. Type `defragment` in the taskbar search box, and then select **Defragment and Optimize Drives**.
3. Follow the on-screen instructions.

For additional information, access the Disk Defragmenter software Help.

Using Disk Cleanup

Use Disk Cleanup to search the hard drive for unnecessary files that you can safely delete to free up disk space and help the computer run more efficiently.

To run Disk Cleanup:
1. Type `disk` in the taskbar search box, and then select **Disk Cleanup**.
2. Follow the on-screen instructions.

Using HP 3D DriveGuard (select products only)

HP 3D DriveGuard protects a hard drive by parking the drive and halting data requests under either of the following conditions:

- You drop the computer.
- You move the computer with the display closed while the computer is running on battery power.

A short time after the end of one of these events, HP 3D DriveGuard returns the hard drive to normal operation.

**NOTE:** Only internal hard drives are protected by HP 3D DriveGuard. A hard drive installed in an optional docking device or connected to a USB port is not protected by HP 3D DriveGuard.

**NOTE:** Because solid-state drives (SSDs) lack moving parts, HP 3D DriveGuard is unnecessary for these drives.
Identifying HP 3D DriveGuard status

The hard drive light on the computer changes color to show that the drive in a primary hard drive bay and/or the drive in a secondary hard drive bay (select products only) is parked.

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](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.

If you would like to update your programs and drivers, follow these instructions:
1. Type support in the taskbar search box, and then select the HP Support Assistant app.
   - or –
   Select the question mark icon in the taskbar.
2. Select My notebook, select the Updates tab, and then select Check for updates and messages.
3. Follow the on-screen instructions.

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

⚠️ CAUTION: 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, and hydrocarbons 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.
CAUTION: 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.

CAUTION: 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.

CAUTION: 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 may be restricted in some environments. Such restrictions may 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.
Securing your computer and information

Computer security is essential for protecting the confidentiality, integrity, and availability of your information. Standard security solutions provided by the Windows operating system, HP applications, the Setup Utility (BIOS), and other third-party software can help protect your computer from a variety of risks, such as viruses, worms, and other types of malicious code.

\[\textbf{IMPORTANT: }\] Some security features listed in this chapter may not be available on your computer.

Using passwords

A password is a group of characters that you choose to secure your computer information and to protect online transactions. Several types of passwords can be set. For example, when you set up your computer for the first time, you were asked to create a user password to secure your computer. Additional passwords can be set in Windows or in HP Setup Utility (BIOS), which is preinstalled on your computer.

You may find it helpful to use the same password for a Setup Utility (BIOS) feature and for a Windows security feature.

To create and save passwords, use the following tips:

- To reduce the risk of being locked out of the computer, record each password and store it in a secure place away from the computer. Do not store passwords in a file on the computer.
- When creating passwords, follow requirements set by the program.
- Change your passwords at least every 3 months.
- An ideal password is long and has letters, punctuation, symbols, and numbers.
- Before you send your computer for service, back up your files, delete confidential files, and then remove all password settings.

For additional information about Windows passwords, such as screen-saver passwords:

\[\text{Type } \text{support} \text{ in the taskbar search box, and then select the } \text{HP Support Assistant app.} \]

- or –

Select the question mark icon in the taskbar.

Setting Windows passwords

<table>
<thead>
<tr>
<th>Password</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>User password</td>
<td>Protects access to a Windows user account.</td>
</tr>
<tr>
<td>Administrator password</td>
<td>Protects administrator-level access to computer contents.</td>
</tr>
</tbody>
</table>

\[\text{NOTE: }\] This password cannot be used to access Setup Utility (BIOS) contents.
Setting Setup Utility (BIOS) passwords

<table>
<thead>
<tr>
<th>Password</th>
<th>Function</th>
</tr>
</thead>
</table>
| Administrator password | • Must be entered each time you access Setup Utility (BIOS).  
                          • If you forget your administrator password, you cannot access Setup Utility (BIOS). |
| 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. |

To set, change, or delete an administrator or power-on password in Setup Utility (BIOS):

⚠️ **CAUTION:** Use extreme care when making changes in Setup Utility (BIOS). Errors can prevent the computer from operating properly.

1. Start Setup Utility (BIOS):
   - Computers or tablets with keyboards:
     - Turn on or restart the computer, quickly press *esc*, and then press *f10*.
   - Tablets without keyboards:
     1. Turn on or restart the tablet, and then quickly hold down the volume up button.
     - or -
        Turn on or restart the tablet, and then quickly hold down the volume down button.
     - or -
        Turn on or restart the tablet, and then quickly hold down the Windows button.
   2. Tap *f10*.

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

To save your changes, select **Exit**, 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.
Using Windows Hello (select products only)

On products equipped with a fingerprint reader or an infrared camera, you can use Windows Hello to sign in by swiping your finger or looking at the camera.

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 **Add**.
3. Select **Get Started**, and then follow the on-screen instructions enroll your fingerprint or facial ID and set up a PIN.

**NOTE:** The PIN is not limited in length, but it must consist of numbers only. To include alphabetic or special characters, select the **include letters and symbols** checkbox.

Using Internet security software

When you use your computer to access email, a network, or the Internet, you potentially expose your computer to computer viruses, spyware, and other online threats. To help protect your computer, Internet security software that includes antivirus and firewall features may be preinstalled on your computer as a trial offer. To provide ongoing protection against newly discovered viruses and other security risks, security software must be kept up to date. It is strongly recommended that you upgrade the security software trial offer or purchase the software of your choice in order to fully protect your computer.

Using antivirus software

Computer viruses can disable programs, utilities, or the operating system, 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.

An antivirus program may be preinstalled on your computer. It is strongly recommended that you use the antivirus program of your choice in order to fully protect your computer.

For more information about computer viruses, type **support** in the taskbar search box, and then select the **HP Support Assistant** app.

– or –

Select the question mark icon in the taskbar.

Using firewall software

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

There are two types of firewalls to consider:

- Host-based firewalls—Software that protects only the computer it is installed on.
- 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.
Installing software updates

HP, Windows, and third-party software installed on your computer should be regularly updated to correct security problems and improve software performance.

⚠️ CAUTION: Microsoft sends out alerts regarding Windows updates, which may include security updates. To protect the computer from security breaches and computer viruses, install all updates from Microsoft as soon as you receive an alert.

You can install these updates automatically.

To view or change the settings:

1. Select the Start button, select Settings, and then select Update & Security.
2. Select Windows Update, and then follow the on-screen instructions.
3. To schedule a time for installing updates, select Advanced options, and then follow the on-screen instructions.

Using HP Device as a Service (HP DaaS) (select products only)

HP DaaS is a cloud-based IT solution that enables businesses to effectively manage and secure their company assets. HP DaaS helps protect devices against malware and other attacks, monitors device health, and helps reduce time spent solving device and security issues. You can quickly download and install the software, which is highly cost effective relative to traditional in-house solutions. For more information, go to https://www.hptouchpointmanager.com/.

Securing your wireless network

When you set up a WLAN or access an existing WLAN, always enable security features to protect your network from unauthorized access. WLANs in public areas (hotspots) like coffee shops and airports may not provide any security.

Backing up your software applications and information

Regularly back up your software applications and information to protect them from being permanently lost or damaged through a virus attack or a software or hardware failure.

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.
9  Using Setup Utility (BIOS)

Setup Utility, 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). Setup Utility (BIOS) includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

**NOTE:** To start Setup Utility on convertible computers, your computer must be in notebook mode and you must use the keyboard attached to your notebook.

### Starting Setup Utility (BIOS)

**CAUTION:** Use extreme care when making changes in Setup Utility (BIOS). Errors can prevent the computer from operating properly.

Turn on or restart the computer, quickly press `esc`, and then press `f10`.

### Updating Setup Utility (BIOS)

Updated versions of Setup Utility (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 Setup Utility (BIOS), first determine the BIOS version on your computer.

To reveal the BIOS version information (also known as *ROM date* and *System BIOS*), use one of these options.

- **HP Support Assistant**
  1. Type `support` in the taskbar search box, and then select the *HP Support Assistant* app.
     - or –
     Select the question mark icon in the taskbar.
  2. Select *My notebook*, and then select *Specifications*.

- **Setup Utility (BIOS)**
  1. Start Setup Utility (BIOS) (see *Starting Setup Utility (BIOS) on page 44*).
  2. Select *Main*, and then make note of the BIOS version.
  3. Select *Exit*, select one of the options, and then follow the on-screen instructions.

To check for later BIOS versions, see *Downloading a BIOS update on page 45*. 

---

**Chapter 9   Using Setup Utility (BIOS)**

44  Chapter 9   Using Setup Utility (BIOS)
Downloading a BIOS update

⚠️ **CAUTION:** 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 from 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.

⚠️ **NOTE:** If your computer is connected to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
   - or –
   Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. If the update is more recent than your BIOS version, 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.

   BIOS installation procedures vary. Follow any instructions that appear on the screen after the download is complete. If no instructions appear, 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.
10 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 46.

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

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. Right-click HP PC Hardware Diagnostics Windows, select More, and then select Run as administrator.

   – or –

   To access HP PC Hardware Diagnostics Windows from HP Support Assistant:
   a. Type support in the taskbar search box, and then select the HP Support Assistant app.

   – or –

   Select the question mark icon in the taskbar.
   b. Select Troubleshooting and fixes.
   c. Select Diagnostics, and then select HP PC Hardware Diagnostics Windows.

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. For assistance in correcting the problem, contact support, and then provide the Failure ID code.

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:


2. In the HP PC Hardware Diagnostics section, select Download, and then select a location on your computer or a USB flash drive.

The tool is downloaded 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:


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 HP PC Hardware Diagnostics section, select Download, and then select a location on your computer or a 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

NOTE: For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 48.

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 UEFI detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in correcting the problem, 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
   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:


2. In the **HP PC Hardware Diagnostics UEFI** section, select **Download UEFI Diagnostics**, 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:


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 execute the diagnostics on your computer, and it may upload results to a preconfigured server. For more information on Remote HP PC Hardware Diagnostics UEFI, go to [http://www.hp.com/go/techcenter/pcdiags](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:

2. In the **HP PC Hardware Diagnostics UEFI** section, select **Download Remote Diagnostics**, and then select **Run**.

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

**NOTE:** For some products, it may be necessary 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:

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.
11  Backing up, restoring, and recovering

This chapter provides information about creating backups and restoring and recovering your system.

Windows provides tools to back up your personal information, restore your computer from a backup, and recover the computer to its original state. See Using Windows tools for backing up, restoring, and recovering your computer on page 51.

In addition to the Windows tools, depending on the operating system preinstalled on your computer, your computer may also include tools provided by HP for additional functionality.

**IMPORTANT:** If you will be performing recovery procedures on a tablet, the tablet battery must be at least 70% charged before you start the recovery process.

**IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning any recovery process.

Using Windows tools for backing up, restoring, and recovering your computer

**IMPORTANT:** Windows is the only option that allows you to back up your personal information. Schedule regular backups to avoid information loss.

You can use Windows tools to back up personal information and create system restore points and recovery media, allowing you to restore from backup, refresh the computer, and reset the computer to its original state.

**NOTE:** If computer storage is 32 GB or less, Microsoft System Restore is disabled by default.

Creating backups

You can create recovery media, system restore points, and backups of personal information using Windows tools.

To create a backup:

1. Select **Start**, select **Settings**, and then select **Update & Security**.
2. Select **Backup**, and then follow the on-screen instructions.

Restoring and recovering

Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state.

To restore your system:

1. Select **Start**, select **Settings**, and then select **Update & Security**.
2. Select **Recovery**, and then follow the on-screen instructions.
Creating HP Recovery media (select products only)

After you have successfully set up the computer, use HP Recovery Manager to create a backup of the HP Recovery partition on the computer. This backup is called HP Recovery media. In cases where the hard drive is corrupted or has been replaced, the HP Recovery media can be used to reinstall the original operating system.

To check for the presence of the Recovery partition in addition to the Windows partition, right-click the Start button, select File Explorer, and then select This PC.

**NOTE:** If your computer does not list the Recovery partition in addition to the Windows partition, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

On select products, you can use the HP Cloud Recovery Download Tool to create HP Recovery media on a bootable USB flash drive. For more information, see Using the HP Cloud Recovery Download Tool to create recovery media on page 53.

Using HP Recovery Manager to create recovery media

**NOTE:** If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

Before you begin

Before you begin, note the following:

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required media storage capacity.
- To create recovery media, use one of the following options:

  **NOTE:** If the computer does not have a recovery partition, HP Recovery Manager displays the Windows Create a Recovery Drive feature. Follow the on-screen instructions to create a recovery image on a blank USB flash drive or hard drive.

  - If your computer has an optical drive with DVD writer capability, be sure to use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs, which are not compatible with HP Recovery Manager software.
  - If your computer does not include an integrated optical drive with DVD writer capability, you can use an external optical drive (purchased separately) to create recovery discs, as described above. If an external optical drive is used, you must connect it directly to a USB port on the computer. It cannot be connected to a USB port on an external device, such as a USB hub.
  - To create a recovery USB flash drive, use a high-quality blank USB flash drive.
  - Be sure that the computer is connected to AC power before you begin creating the recovery media.
  - The creation process can take an hour or more. Do not interrupt this process.
  - If necessary, you can exit the program before you have finished creating all of the recovery media. HP Recovery Manager will finish the current DVD or USB flash drive. The next time you start HP Recovery Manager, you will be prompted to continue.
Creating the recovery media

To create HP Recovery media using HP Recovery Manager:

**IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

1. Type recovery in the taskbar search box, and then select HP Recovery Manager.
2. Select Create recovery media, and then follow the on-screen instructions.

If you need to recover the system, see Recovering using HP Recovery Manager on page 54.

Using the HP Cloud Recovery Download Tool to create recovery media

To create HP Recovery media using the HP Cloud Recovery Download Tool:

2. Select Software and Drivers, and then follow the on-screen instructions.

Restoring and recovery

Restoring and recovery can be performed using one or more of the following options: Windows tools, HP Recovery Manager, or the HP Recovery partition.

**IMPORTANT:** HP Recovery Manager and the HP Recovery partition are not available for Windows 10 S products.

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see Using Windows tools for backing up, restoring, and recovering your computer on page 51.

Restoring using HP Recovery Manager and the HP Recovery partition

You can use HP Recovery Manager and the HP Recovery partition (select products only) to restore the computer to the original factory state:

- **Resolving problems with preinstalled applications or drivers**—To correct a problem with a preinstalled application or driver:
  1. Type recovery in the taskbar search box, and then select HP Recovery Manager.
  2. Select Reinstall drivers and/or applications, and then follow the on-screen instructions.

- **Using System Recovery**—To recover the Windows partition to original factory content, select the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 54. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 52.

- **Using Factory Reset** (select products only)—Restores the computer to its original factory state by deleting all information from the hard drive and recreating the partitions and then reinstalling the operating system and the software that was installed at the factory (select products only). To use the Factory Reset option, you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 52.

**NOTE:** If you have replaced the hard drive in the computer, you can use the Factory Reset option to install the operating system and the software that was installed at the factory.
Recovering using HP Recovery Manager

You can use HP Recovery Manager software to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only).

If you have not already created HP Recovery media, see Creating HP Recovery media (select products only) on page 52.

**IMPORTANT:** HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data that you want to retain. See Using Windows tools for backing up, restoring, and recovering your computer on page 51.

**IMPORTANT:** Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

**NOTE:** When you start the recovery process, only the options available for your computer are displayed.

Before you begin, note the following:

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer’s website or reinstall the software from the media provided by the manufacturer.
- If the computer hard drive fails, HP Recovery media must be used. This media is created using HP Recovery Manager. See Creating HP Recovery media (select products only) on page 52.
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, contact support to obtain recovery media. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

Recovering using the HP Recovery partition (select products only)

The HP Recovery partition allows you to perform a system recovery without recovery discs or a recovery USB flash drive. This type of recovery can be used only if the hard drive is still working.

The HP Recovery partition (select products only) allows System Recovery only.

To start HP Recovery Manager from the HP Recovery partition:

**IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps (select products only).

1. Type recovery in the taskbar search box, select HP Recovery Manager, and then select Windows Recovery Environment.
   - or –
   For computers or tablets with keyboards attached:
     ▲ Press f11 while the computer boots, or press and hold f11 as you press the power button.
   For tablets without keyboards:
     ▲ Turn on or restart the tablet, quickly hold down the volume up button, and then select f11.
2. Select Troubleshoot from the boot options menu.
3. Select Recovery Manager, and then follow the on-screen instructions.
NOTE: If your computer does not automatically restart in HP Recovery Manager, change the computer boot order, and then follow the on-screen instructions. See Changing the computer boot order on page 55.

Recovering using HP Recovery media

If your computer does not have an HP Recovery partition or if the hard drive is not working properly, you can use HP Recovery media to recover the original operating system and software programs that were installed at the factory.

▲ Insert the HP Recovery media, and then restart the computer.

NOTE: If your computer does not automatically restart in HP Recovery Manager, change the computer boot order, and then follow the on-screen instructions. See Changing the computer boot order on page 55.

Changing the computer boot order

If your computer does not restart in HP Recovery Manager, you can change the computer boot order. This is the order of devices listed in BIOS where the computer looks for startup information. You can change the selection to an optical drive or a USB flash drive, depending on the location of your HP Recovery media.

To change the boot order:

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

1. Insert the HP Recovery media.

2. Access the system Startup menu.

   For computers or tablets with keyboards attached:

   ▲ Turn on or restart the computer or tablet, quickly press esc, and then press f9 for boot options.

   For tablets without keyboards:

   ▲ Turn on or restart the tablet, quickly hold down the volume up button, and then select f9.

   or

   Logo screen: Turn on or restart the tablet, quickly hold down the volume down button, and then select f9.

3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

Removing the HP Recovery partition (select products only)

HP Recovery Manager software allows you to remove the HP Recovery partition (select products only) to free up hard drive space.

IMPORTANT: After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media. Before removing the Recovery partition, create HP Recovery media. See Creating HP Recovery media (select products only) on page 52.

Follow these steps to remove the HP Recovery partition:

1. Type recovery in the taskbar search box, and then select HP Recovery Manager.

2. Select Remove Recovery Partition, and then follow the on-screen instructions.
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 that is supplied and approved by HP for use with this computer.

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

<table>
<thead>
<tr>
<th>Input power</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage and current</td>
<td>5 V dc @ 2 A / 12 V dc @ 3 A / 15 V dc @ 3 A – 45 W USB-C</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 2.31 A – 45 W</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 3.33 A – 65 W</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 4.62 A – 90 W</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 6.15 A – 120 W</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 6.9 A – 135 W</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 7.70 A – 150 W</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 10.3 A – 200 W</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 11.8 A – 230 W</td>
</tr>
<tr>
<td></td>
<td>19.5 V dc @ 16.92 A – 330 W</td>
</tr>
<tr>
<td>DC plug of external HP power supply (select products only)</td>
<td>![DC plug diagram]</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Factor</th>
<th>Metric</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>5°C to 35°C</td>
<td>41°F to 95°F</td>
</tr>
<tr>
<td>Nonoperating</td>
<td>-20°C to 60°C</td>
<td>-4°F to 140°F</td>
</tr>
<tr>
<td><strong>Relative humidity</strong> (noncondensing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>10% to 90%</td>
<td>10% to 90%</td>
</tr>
<tr>
<td>Nonoperating</td>
<td>5% to 95%</td>
<td>5% to 95%</td>
</tr>
<tr>
<td><strong>Maximum altitude</strong> (unpressurized)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>-15 m to 3,048 m</td>
<td>-50 ft to 10,000 ft</td>
</tr>
<tr>
<td>Nonoperating</td>
<td>-15 m to 12,192 m</td>
<td>-50 ft to 40,000 ft</td>
</tr>
</tbody>
</table>
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.

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

Accessibility

HP is working to weave diversity, inclusion and work/life into the fabric of our company, so it is reflected in everything we do. Here are some examples of how we are putting differences to work 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 60.

Our commitment

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

Our 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 our goal, this Accessibility Policy establishes seven key objectives to guide our actions as a company. 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 our company, and provide our 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 our 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 will improve assistive technology relevant to our 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.
HP is a founding member, and we joined to participate with other organizations to advance the field of accessibility. This commitment supports our company's accessibility goal of designing, producing, and marketing products and services that can be effectively used by people with disabilities.

IAAP will make our 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 may 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, may 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 on 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 65.

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)
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 multi-media, 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. This section provides links to information on key legislation, regulations, and standards.

- **United States**
- **Canada**
- **Europe**
United Kingdom
Australia
Worldwide

United States

Section 508 of the Rehabilitation Act specifies that agencies must identify which standards apply to the procurement of ICT, perform market research to determine the availability of accessible products and services, and document the results of their market research. The following resources provide assistance in meeting Section 508 requirements:

- www.section508.gov
- Buy Accessible

The U.S. Access Board is currently updating the Section 508 standards. This effort will address new technologies and other areas where the standards need to be modified. For more information, go to Section 508 Refresh.

Section 255 of the Telecommunications Act requires telecommunications products and services to be accessible to people with disabilities. FCC rules cover all hardware and software telephone network equipment and telecommunications equipment used in the home or office. Such equipment includes telephones, wireless handsets, fax machines, answering machines, and pagers. FCC rules also cover basic and special telecommunications services, including regular telephone calls, call waiting, speed dialing, call forwarding, computer-provided directory assistance, call monitoring, caller identification, call tracing, and repeat dialing, as well as voice mail and interactive voice response systems that provide callers with menus of choices. For more information, go to Federal Communication Commission Section 255 information.

21st Century Communications and Video Accessibility Act (CVAA)

The CVAA updates federal communications law to increase the access of persons with disabilities to modern communications, updating accessibility laws enacted in the 1980s and 1990s to include new digital, broadband, and mobile innovations. Regulations are enforced by the FCC and documented as 47 CFR Part 14 and Part 79.

- FCC Guide on the CVAA

Other U.S. legislation and initiatives

- Americans with Disabilities Act (ADA), Telecommunications Act, the Rehabilitation Act and others

Canada

The Accessibility for Ontarians with Disabilities Act was established to develop and implement accessibility standards to make goods, services, and facilities accessible to Ontarians with disabilities and to provide for the involvement of persons with disabilities in the development of the accessibility standards. The first standard of the AODA is the customer service standard; however, standards for transportation, employment, and information and communication are also being developed. The AODA applies to the Government of Ontario, the Legislative Assembly, every designated public sector organization, and to every other person or organization that provides goods, services, or facilities to the public or other third parties and that has at least one employee in Ontario; and accessibility measures must be implemented on or before January 1, 2025. For more information, go to Accessibility for Ontarians with Disability Act (AODA).
Europe

EU Mandate 376 ETSI Technical Report ETSI DTR 102 612: "Human Factors (HF); European accessibility requirements for public procurement of products and services in the ICT domain (European Commission Mandate M 376, Phase 1)" has been released.

Background: The three European Standardization Organizations have set up two parallel project teams to carry out the work specified in the European Commission "Mandate 376 to CEN, CENELEC and ETSI, in Support of Accessibility Requirements for Public Procurement of Products and Services in the ICT Domain."

ETSI TC Human Factors Specialist Task Force 333 has developed ETSI DTR 102 612. Further details about the work performed by STF333 (e.g., Terms of Reference, specification of the detailed work tasks, time plan for the work, previous drafts, listing of comments received and means to contact the task force) can be found at the Special Task Force 333.

The parts relating to the assessment of suitable testing and conformity schemes were carried out by a parallel project, detailed in CEN BT/WG185/PT. For further information, go to the CEN project team website. The two projects are closely coordinated.

- CEN project team
- European Commission mandate for e-accessibility (PDF 46KB)
- Commission takes low profile on e-accessibility

United Kingdom

The Disability Discrimination Act of 1995 (DDA) was enacted to ensure that websites are accessible to blind and disabled users in the United Kingdom.

- W3C UK Policies

Australia

The Australian government has announced their plan to implement Web Content Accessibility Guidelines 2.0. All Australian government websites will require Level A compliance by 2012, and Double A by 2015. The new standard replaces WCAG 1.0, which was introduced as a mandated requirement for agencies in 2000.

Worldwide

- JTC1 Special Working Group on Accessibility (SWG-A)
- G3ict: The Global Initiative for Inclusive ICT
- Italian accessibility legislation
- W3C Web Accessibility Initiative (WAI)
Useful accessibility resources and links

The following organizations may 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 may 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
- Business & Disability network
- EnableMart
- European Disability Forum
- Job Accommodation Network
- Microsoft Enable
- U.S. Department of Justice - A Guide to disability rights Laws

HP links

- [Our contact webform](#)
- [HP comfort and safety guide](#)
- [HP public sector sales](#)
Contacting support

NOTE: Support is in English only.

- Customers who are deaf or hard of hearing that 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.
Index

A
AC adapter and battery light, identifying 5
accessibility 59
accessibility needs assessment 60
action keys
  airplane mode 12
  identifying 11, 12
  keyboard backlight 12
  mute 12
  next track 12
  pause 12
  play 12
  privacy screen 12
  screen brightness 12
  speaker volume 12
  switch screen image 12
  using 12
airplane mode 18
airplane mode key 12, 18
antivirus software, using 42
assistive technology (AT)
  finding 60
  purpose 59
AT (assistive technology)
  finding 60
  purpose 59
audio 22
  adjusting volume 12
  headphones 22
  headsets 23
  sound settings 23
  speakers 22
audio-out (headphone)/audio-in (microphone) combo jack, identifying 5

B
backing up software and information 43
backups 51
battery
  conserving power 33
  discharging 33
  factory-sealed 34
  finding information 33
  low battery levels 33
  resolving low battery level 34
  battery charge 32
  battery information, finding 33
  battery power 32
  best practices 1
BIOS
  determining version 44
  downloading an update 45
  starting the Setup Utility 44
  updating 44
Bluetooth device 18, 20
Bluetooth label 16
boot order, changing 55
bottom components 14
buttons
  left TouchPad 8
  power 6
  right TouchPad 8

C
camera
  identifying 4, 7
  using 22
  camera light, identifying 7
  caps lock light, identifying 9
  caring for your computer 37
  cleaning your computer 37
  components
    bottom 14
    display 7
    keyboard area 8
    left side 6
    right side 4
  connecting to a network 18
  connecting to a wireless network 18
  connecting to a WLAN 19
  connecting to LAN 21
  connector, power 4, 5
  corporate WLAN connection 19
  critical battery level 33
  customer support, accessibility 65

D
data transfer 24
Disk Cleanup software 36
Disk Defragmenter software 36
display components 7

electrostatic discharge 58
esc key, identifying 11
external power, using 34

F
factory-sealed battery 34
fingerprint reader, identifying 10
fingerprint, registering 42
firewall software 42
fn key, identifying 11
four-finger tap TouchPad gesture 27

G
GPS 20

H
hardware, locating 3
headphones, connecting 22
headsets, connecting 23
Hibernation
  exiting 31
  initiated during critical battery level 33
  initiating 31
high-definition devices, connecting 24
HP 3D DriveGuard 36
HP Assistive Policy 59
HP Device as a Service (HP DaaS) 43
HP Fast Charge 32
HP Mobile Broadband
  activating 20
  IMEI number 20
  MEID number 20
HP PC Hardware Diagnostics UEFI
  downloading 48
starting 48
using 47
HP PC Hardware Diagnostics Windows downloading 46
installing 47
using 46
HP Recovery Manager correcting boot problems 55
starting 54
HP Recovery media recovery 55
using 52
HP Recovery partition recovery 54
removing 55
HP resources 2
HP Touchpoint Manager 43

I
IMEI number 20
initiating Sleep and Hibernation 30
input power 56
installing optional security cable 43
internal microphones, identifying 7
International Association of Accessibility Professionals 59
Internet security software, using 42

J
jacks audio-out (headphone)/audio-in (microphone) 5

K
keyboard and optional mouse using 29
keyboard backlight action key 12
keys
action 11
airplane mode 12
esc 11
fn 11
Windows 11

L
labels Bluetooth 16
regulatory 16
serial number 15
service 15
wireless certification 16
WLAN 16
left side components 6
lights
AC adapter and battery 5
camera 7
caps lock 9
mute 9
low battery level 33
M
maintenance
Disk Cleanup 36
Disk Defragmenter 36
updating programs and drivers 37
managing power 30
MEID number 20
microSD card, inserting 16
minimized image recovery 54
minimized image, creating 54
Miracast 24
mobile broadband activating 20
IMEI number 20
MEID number 20
mute light, identifying 9
mute volume action key 12
N
next track action key 12
O
one-finger slide touch screen gesture 29
operating environment 57
operating system controls 18
original system recovery 54
P
passwords
Setup Utility (BIOS) 41
Windows 40
pause action key 12
play action key 12
ports
USB SuperSpeed port with HP Sleep and Charge 6
USB Type-C 25
USB Type-C power connector and Thunderbolt port with HP Sleep and Charge 4, 5
power battery 32
external 34
power button, identifying 6
power connector identifying 4, 5
Power icon, using 32
power settings, using 32
privacy screen action key 12
privacy screen action key, identifying 12
product name and number, computer 15
public WLAN connection 19
R
recovery discs 52, 55
HP Recovery Manager 54
HP Recovery partition 53
media 55
starting 54
supported discs 52
system 54
USB flash drive 55
using HP Recovery media 53
recovery media creating using HP Cloud Recovery Download Tool 53
creating using HP Recovery Manager 53
creating using Windows tools 51
discs 53
HP Recovery partition 52
USB flash drive 53
using 52
recovery partition, removing 55
regulatory information
regulatory label 16
wireless certification labels 16
Remote HP PC Hardware Diagnostics UEFI settings customizing 49
using 49
resources, accessibility 64
right side components 4

Index 67
screen brightness action keys 12
Section 508 accessibility standards 61, 62
security cable, installing 43
serial number, computer 15
service labels, locating 15
Setup Utility (BIOS) passwords 41
shipping the computer 38
shutdown 31
SIM card, inserting 16
SIM slot, identifying 4
Sleep
exiting 30
initiating 30
Sleep and Hibernation, initiating 30
slots
SIM card 4
slots (select products only)
MicroSD memory card reader 4
software
Disk Cleanup 36
Disk Defragmenter 36
locating 3
software installed
locating 3
software updates, installing 43
sound. See audio
sound settings, using 23
speaker volume action keys 12
speakers
connecting 22
identifying 10, 14
special keys, using 11
standards and legislation,
accessibility 61
supported discs, recovery 52
switch screen image action key 12
system recovery 54
system restore point, creating 51

Thunderbolt, connecting USB Type-C 23
touch screen gestures
one-finger slide 29
TouchPad
using 26
TouchPad and touch screen gestures
tap 26
two-finger pinch zoom 27
TouchPad buttons
identifying 8
TouchPad gestures
four-finger tap 27
three-finger swipe 28
two-finger slide 27
two-finger tap 27
TouchPad zone, identifying 8
transfer data 24
traveling with the computer 16, 38
turning off the computer 31
two-finger pinch zoom TouchPad and
touch screen gesture 27
two-finger slide TouchPad gesture 27
two-finger tap TouchPad gesture 27

U
unresponsive system 31
updating programs and drivers 37
USB SuperSpeed port with HP Sleep
and Charge, identifying 6
USB Type-C port, connecting 23, 25
USB Type-C power connector and
Thunderbolt port with HP Sleep and
Charge, identifying 4, 5
using passwords 40
using the keyboard and optional
mouse 29
using the TouchPad 26

V
vents, identifying 14
video
Thunderbolt port device 23
USB Type-C 25
wireless displays 24
video, using 23
volume
adjusting 12
mute 12

Windows
system restore point 51
Windows Hello 22
using 42
Windows key, identifying 11
Windows passwords 40
wired network (LAN) 21
wireless antennas, identifying 7
wireless button 18
wireless certification label 16
wireless controls
button 18
operating system 18
wireless light 18
wireless network (WLAN)
connecting 19
corporate WLAN connection 19
functional range 19
public WLAN connection 19
wireless network, securing 43
WLAN antennas, identifying 7
WLAN device 16
WLAN label 16
WWAN antennas, identifying 7
WWAN device 20