HP Z440, Z640, and Z840 Workstation Series

User Guide

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Windows 8: Not all features are available in all editions of Windows 8. This workstation may require upgraded and/or separately purchased hardware, drivers, and/or software to take full advantage of Windows 8 functionality. Go to http://www.microsoft.com for details.

Windows 7: This workstation may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. Go to http://www.microsoft.com for details.

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About this guide

This guide provides setup and troubleshooting information for the HP Z Workstation series. It includes these topics:

Guide topics
Locating HP resources on page 1
Workstation features on page 5
Setting up the workstation on page 12
Setting up, backing up, restoring, and recovering Windows 7 on page 20
Setting up, backing up, restoring, and recovering Windows 8 on page 25
Setting up and restoring Linux on page 33
Diagnostics and minor troubleshooting on page 40
Routine care on page 45

TIP: If you do not find what you are looking for in this guide:

— Find technical details in the *Maintenance and Service Guide* for your workstation at http://www.hp.com/support/workstation_manuals.

— View component installation videos at http://www.hp.com/go/sml.

— See additional information on your workstation at http://www.hp.com/go/workstations.

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1 Locating HP resources

This section provides information on the following resources for your HP workstation:

- Product information
- Product support
- Product documentation
- Product diagnostics
- Product updates

Product information

Topic	Location
Technical specifications	Go to http://www.hp.com/go/quickspecs. In the left pane, select your region and then select **Workstations**.
Regulatory, safety, and environmental notices	See the *Regulatory, Safety and Environmental Notices* for product regulatory information. You can also refer to the regulatory label on the workstation chassis.
Accessories	For complete and current information on supported accessories and components, go to http://www.hp.com/go/workstations.
System board	A diagram of the system board is located on the inside of the chassis. Additional information is located in the workstation *Maintenance and Service Guide* on the Web at http://www.hp.com/support/workstation_manuals/.
Serial number, Certificate of Authenticity (COA), and Genuine Microsoft® Label (GML) (if applicable)	The serial number label is on the top or the side panel and also at the rear of the workstation. The COA (Windows® 7) and GML (Windows 8) are typically located near the serial number label.
Linux	For information on running Linux on HP workstations, go to http://www.hp.com/go/opensource, and then select **Linux on Workstations** from the list on the left.

Product support

Topic	Location
Product support	For U.S. support, go to http://www.hp.com/go/contactHP. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html. Here you can access the following types of support: • Chat online with an HP technician • Obtain email support • Find support telephone numbers • Locate an HP service center
Warranty information	To locate warranty information, go to http://www.hp.com/support/warranty-lookuptool. To locate an existing Care Pack, go to http://www.hp.com/go/lookuptool. To extend a standard product warranty, go to http://h20219.www2.hp.com/services/us/en/warranty/carepack-overview.html. HP Care Pack Services offer upgraded service levels to extend and expand a standard product warranty. You can find the expressly provided HP Limited Warranty applicable to your product located with the user guides on your workstation and/or on the CD or DVD provided in the box. For some countries or regions where the warranty is not provided in printed format, you may request a printed copy from http://www.hp.com/go/orderdocuments or write to: **North America**: Hewlett Packard, MS POD 11311 Chinden Blvd. Boise, ID 83714, USA **Europe, Middle East, Africa**: Hewlett-Packard, POD Via G. Di Vittorio, 9 20063, Cernusco /Naviglio (MI), Italy **Asia Pacific**: Hewlett-Packard, POD, P.O. Box 200 Alexandra Post Office, Singapore 911507 When you request a printed copy of your warranty, please include your product number, warranty period (found on your service label), name, and postal address. **IMPORTANT:** Do NOT return your HP product to the addresses above. For U.S. support, go to http://www.hp.com/go/contactHP. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.

Product documentation

Topic	Location
HP user documentation, white papers, and third-party documentation	User documentation is located on your hard drive. On Windows 7, select **Start**, select **HP**, and then select **HP Documentation**. On Windows 8, from the Start screen, select the **HP Documentation** app. For the latest online documentation, go to http://www.hp.com/support/workstation_manuals. The documentation incudes this user guide and the *Maintenance and Service Guide*.
Removal and replacement videos	To learn how to remove and replace workstation components, go to http://www.hp.com/go/sml.
Product notifications	Subscriber's Choice is an HP program that allows you to sign up to receive driver and software alerts, proactive change notifications (PCNs), the HP newsletter, customer advisories, and more. Sign up at http://www.hp.com/go/subscriberschoice.
Technical specifications	QuickSpecs for HP Workstations include information about the operating system, power supply, memory, CPU, and many other system components. To access the QuickSpecs, go to http://www.hp.com/go/qs/.
Customer Advisories, Security Bulletins, and Notices	To find advisories, bulletins, and notices: 1. Go to http://www.hp.com/go/workstationsupport. 2. Select the desired product. 3. Under the Knowledge Base heading, use the scroll bar to select **Advisories, Bulletins & Notices**.

Product diagnostics

Topic	Location
Windows 7 diagnostics tools	The UEFI Diagnostics utility is preinstalled on select Windows 7 workstations. For additional information, see the workstation *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.
Windows 8 diagnostics tools	The UEFI Diagnostics utility is preinstalled on select Windows 8 workstations. For additional information, see the workstation *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.
Definitions for audible (beep) and light codes	See the workstation *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.
POST error codes	See the workstation *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.

Product updates

Topic	Location
Driver and BIOS updates	Go to http://www.hp.com/go/workstationsupport to find the latest drivers for the workstation. To determine the current workstation BIOS version on your workstation, follow these steps during system startup: 1. Turn on the workstation, and press Esc during startup (boot). 2. Press F10 to enter the F10 Setup utility. 3. Go to **File > System Information**. Note the BIOS version and date and compare it with the BIOS versions at http://www.hp.com/go/workstationsupport. In Windows 7, you can also find the BIOS version number by following these steps: 1. Go to **Start > All Programs > Accessories > System Tools > System Information**. 2. In the right pane, find the line with **BIOS Version/Date**. 3. Note the BIOS version and date and compare it with the versions that appear on the HP website. In Windows 8, you can also find the BIOS version number by following these steps: 1. Point to or swipe from the upper-right or lower-right corner of the Start screen to display the charms. 2. Select **Settings > Change PC Settings**.
Operating systems	For information, go to the following locations: • Go to http://www.hp.com/go/quickspecs. In the left pane, select your region and then select **Workstations**. • Windows operating systems, go to http://www.microsoft.com/support. • Linux operating systems, go to http://www.hp.com/go/opensource.

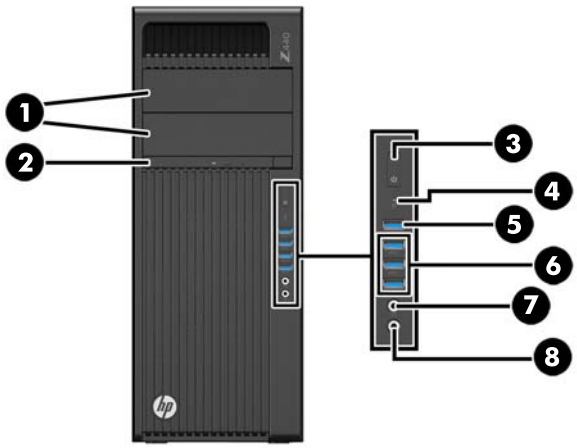
2 Workstation features

For complete and current information on supported accessories and components for your workstation, go to http://partsurfer.hp.com.

- HP Z440 Workstation components
- HP Z640 Workstation components
- HP Z840 Workstation components
- Product specifications

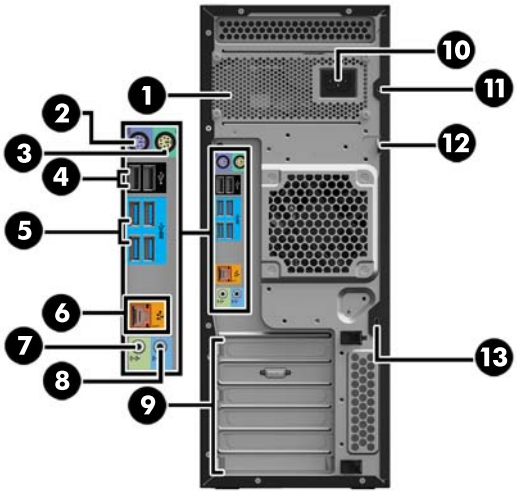
HP Z440 Workstation components

HP Z440 Workstation front panel components



1		Optical drive bays	5	SS	USB 3.0 charging port (1)
2		Optical drive	6	SS	USB 3.0 ports (3)
3		Power button	7		Audio-out (headphone)/Audio-in (microphone) combo jack
4		Hard drive activity light	8		Audio-in (microphone) jack

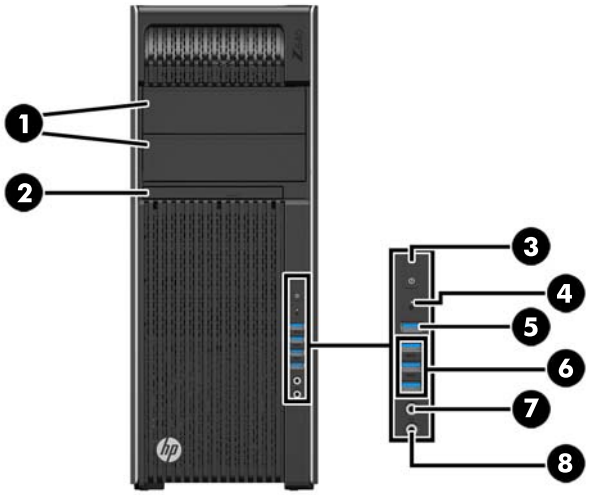
HP Z440 Workstation rear panel components



1		Power supply Built-In Self-Test (BIST) LED	8		Audio line-in jack (blue)
2		PS/2 keyboard connector (purple)	9		PCI/PCIe card slots
3		PS/2 mouse connector (green)	10		Power cord connector
4		USB 2.0 ports (2, black)	11		Universal chassis clamp opening
5	SS	USB 3.0 ports (4, blue)	12		Padlock loop
6		AMT-enabled RJ-45 (network) jack (orange)	13		Security slot
7		Audio line-out jack (light green)			

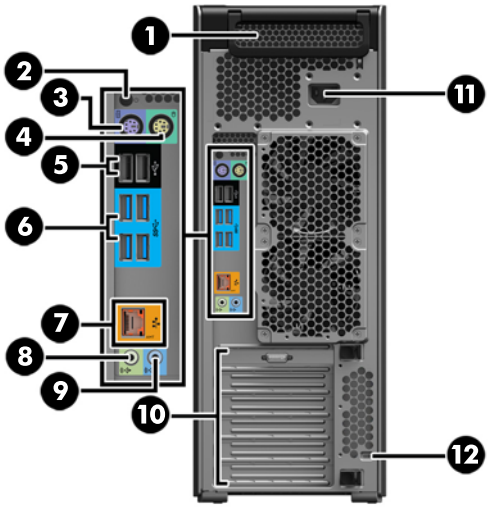
HP Z640 Workstation components

HP Z640 Workstation front panel components



1		Optical drive bays	5	SS	USB 3.0 charging port (1)
2		Optical drive	6	SS	USB 3.0 ports (3)
3		Power button	7		Audio-out (headphone)/Audio-in (microphone) combo jack
4		Hard drive activity light	8		Microphone jack

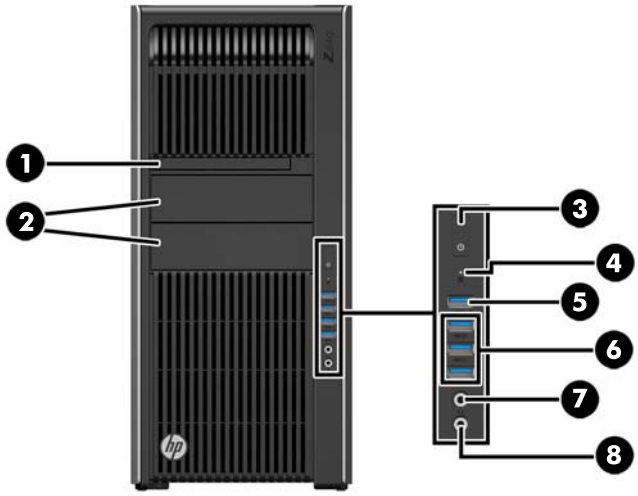
HP Z640 Workstation rear panel components



1		Power supply Built-In Self-Test (BIST) LED	7		AMT-enabled network jack (orange)
2		Rear power button	8		Audio line-out jack (green)
3		PS/2 keyboard connector (purple)	9		Audio line-in jack (blue)
4		PS/2 mouse connector (light green)	10		PCI/PCIe card slots
5		USB 2.0 ports (2, black)	11		Power cord connector
6	SS	USB 3.0 ports (4, blue)	12		Security slot

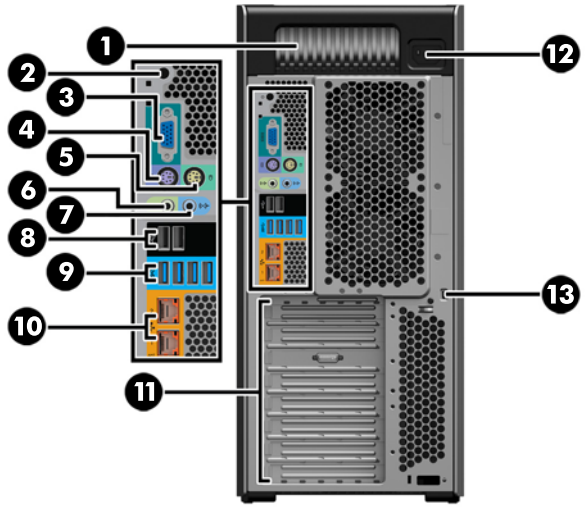
HP Z840 Workstation components

HP Z840 Workstation front panel components



1		Optical drive	5	SS	USB 3.0 charging port (1)
2		Optical drive bays	6	SS	USB 3.0 ports (3)
3		Power button	7		Audio-out (headphone)/Audio-in (microphone) combo jack
4		Hard drive activity light	8		Microphone jack

HP Z840 Workstation rear panel components



1		Power supply Built-In Self-Test (BIST) LED	8		USB 2.0 ports (2, black)
2		Rear power button	9	SS	USB 3.0 ports (4, blue)
3		Serial connector (teal blue)	10		Network jacks (2, orange) *Bottom connector is AMT enabled*
4		PS/2 keyboard connector (purple)	11		PCI/PCIe card slots
5		PS/2 mouse connector (light green)	12		Power cord connector
6		Audio line-out jack (green)	13		Security slot
7		Audio line-in jack (blue)			

Product specifications

Workstation weights and dimensions

Characteristic		HP Z440	HP Z640	HP Z840
Weight	Standard configuration	13.20 kg (29.10 lb)	17.90 kg (39.46 lb)	23.50 kg (51.90 lb)
	Minimum configuration	12.50 kg (27.56 lb)	15.50 kg (34.17 lb)	19.80 kg (43.70 lb)
	Maximum configuration	17.70 kg (39.02 lb)	22.60 kg (49.82 lb)	28.90 kg (63.60 lb)

Characteristic		HP Z440	HP Z640	HP Z840
Chassis dimensions *Tower configuration*	Height	43.18 cm (17.00 in)	44.40 cm (17.50 in)	44.40 cm (17.50 in)
	Width	16.89 cm (6.65 in)	17.15 cm (6.75 in)	20.30 cm (8.00 in)
	Depth	44.47 cm (17.51 in)	46.99 cm (18.50 in)	52.50 cm (20.70 in)

Environmental specifications

Characteristic	HP Z440, Z640, and Z840 Workstations
Temperature	**Operating**: 5°C to 35°C (40°F to 95°F) **Non-operating**: -40°C to 60°C (-40°F to 140°F) **NOTE:** Derate by 1°C (1.8°F) for every 305 m (1,000 ft) altitude over 1,524 m (5,000 ft).
Humidity	**Operating**: 8% to 85% relative humidity, non-condensing **Non-operating**: 8% to 90% relative humidity, non-condensing
Altitude	**Operating:** 0 to 3,048 m (10,000 ft) **Non-operating**: 0 to 9,144 m (30,000 ft)
Shock	**Operating**: ½-sine: 40 g, 2 to 3 ms **Non-operating**: • ½-sine: 160 cm/s, 2 to 3 ms (~100 *g*) • square: 422 cm/s, 20 *g* **NOTE:** Values represent individual shock events and do not indicate repetitive shock events.
Vibration	**Operating Random**: 0.5 *g* (rms), 5 to 300 Hz **Non-Operating**: random: 2.0 *g* (rms), 10 to 500 Hz **NOTE:** Values do not indicate continuous vibration.

3 Setting up the workstation

This chapter describes how to set up your workstation.

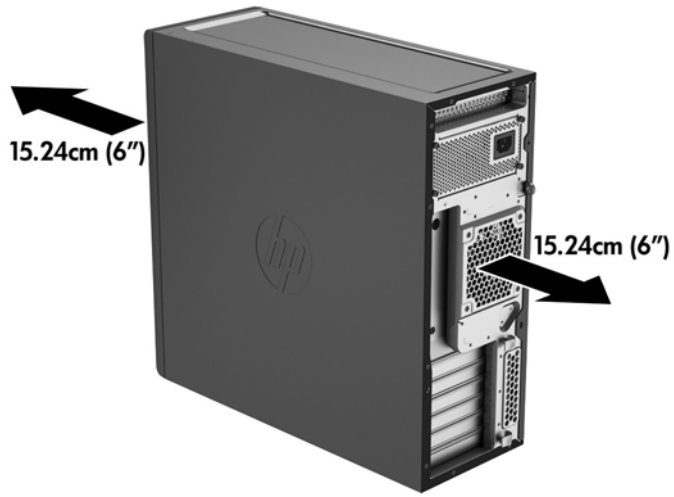
- Ensuring proper ventilation
- Setup procedures
- Adding monitors
- Installing optional components
- Security
- Product recycling

Ensuring proper ventilation

Proper ventilation for the system is important for workstation operation. Follow these guidelines:

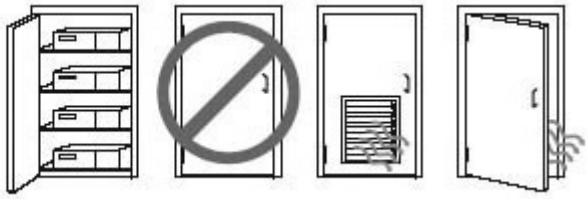
- Operate the workstation on a sturdy, level surface.
- Provide at least 15.24 cm (6.00 in) of clearance at the front and back of the workstation. (This is the *minimum* distance for all workstation models.)

NOTE: Your workstation may look slightly different from the illustration in this section.



- Ensure that the ambient air temperature falls within the specifications listed in Environmental specifications on page 11.
- For cabinet installation, ensure adequate cabinet ventilation and ensure that the ambient temperature within the cabinet does not exceed specified limits.

- Never restrict the incoming or outgoing airflow of the workstation by blocking any vents or air intakes, as shown in the following figure.



Setup procedures

WARNING! To reduce the risk of electric shock or damage to your equipment, observe these practices:

• Plug the power cord into an AC outlet that is easily accessible.

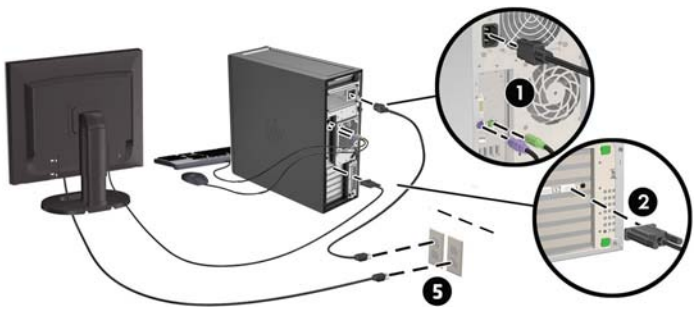
• Disconnect power from the workstation by unplugging the power cord from the AC outlet (not by unplugging the power cord from the workstation).

• Plug the cord into a grounded (earthed) three-pin outlet. Do not disable the power cord grounding pin (for example, by attaching a two-pin adapter). The grounding pin is an important safety feature.

NOTE: An HP Z840 Workstation with a 1125 W power supply might require more power than the typical office environment can supply. For details, see the *Site Preparation Guide* for the workstation at http://www.hp.com/support/workstation_manuals.

To set up the workstation:

1. Connect the mouse, keyboard, and power cord to the workstation.
2. Connect the monitor to the workstation.
3. Connect other peripheral components (such as a printer) according to the instructions included with the device.
4. Connect a network cable to the workstation and to a network router or LAN device.
5. Plug the workstation power cord and monitor power cord into an AC outlet.



Adding monitors

Planning for additional monitors

All graphics cards provided with HP Z series Workstations support two simultaneous-display monitors (see Connecting and configuring monitors on page 17). Cards that support more than two monitors are available. The process for adding monitors depends on your graphics card(s) and the type and number of monitors you add.

Use this process to plan for adding more monitors.

1. Assess your monitor needs.
   - Determine how many monitors you require.
   - Determine the kind of graphics performance you want.
   - Note the type of graphics connector used by each monitor. HP provides graphics cards with DisplayPort (DP) and DVI interfaces, but you can use adapters and third-party cards to interface to other graphics formats, including DVI-I, HDMI, or VGA.

   TIP: Some adapters for older legacy hardware may cost more than others. You may want to compare the cost of acquiring adapters with the cost of getting a newer monitor that doesn't need adapters.
2. Determine whether you need additional graphics cards.
   - Consult the graphics card documentation to determine how many monitors you can connect to the card.

     You may need to acquire adapters to match the card output to the monitor connector. (SeeMatching graphics cards to monitor connectors on page 16.)
   - If necessary, plan to acquire a new graphics card to support additional monitors.
   - The maximum number of monitors that a graphics card supports depends on the card. Most cards provide outputs for two monitors. Some provide three or four outputs.

NOTE: Monitors with resolutions above 1920 x 1200 pixels at 60 Hz require a graphics card with either Dual Link DVI (DL-DVI) or DisplayPort output. To get native resolution with DVI, you must use a DL-DVI cable, not standard DVI-I or DVI-D cables.

HP workstations do not support all graphics cards. Be sure that a new graphics card is supported before purchasing it. See Finding supported graphics cards on page 15.

Many graphics cards provide more than two monitor outputs but limit you to using only two at a time. Consult the graphics card documentation or look up information on the card according to the procedure in Finding supported graphics cards on page 15.

Some graphics cards support multiple monitors by multiplexing the monitor signal across multiple outputs. This might reduce graphics performance. Consult the graphics card documentation or look up information on the card according to the procedure in Finding supported graphics cards on page 15.

Make sure the card outputs match the input required by the monitors. (See Identifying monitor connection requirements on page 16.)

The different models of HP Z series Workstations have different limits on the mechanical size, data speed, and power available for additional graphics cards. Note that the usual practical limit for graphics cards is two per workstation. See the *Maintenance and Service Guide* for expansion card slot identification to make sure a new graphics card will work for your workstation.

3. If you want to add a new graphics card or cards:

   a. Determine which supported graphics card best fits your needs in terms of number of monitors, compatibility with the monitors you plan to use, and performance. See Finding supported graphics cards on page 15.

   b. Make sure you have the correct drivers for the card. See http://www.hp.com for HP-qualified drivers.

   c. Install the graphics card according to the video instructions for your workstation at http://www.hp.com/go/sml.

   d. Configure the monitor. For details, refer to Microsoft® Help or to http://www.microsoft.com, or to your Linux Help website, http://www.hp.com/go/opensource.

   TIP: To simplify troubleshooting of possible problems, enable the monitors one at a time: enable the first monitor and make sure it works properly before enabling the next monitor.

Finding supported graphics cards

To find information about graphics cards supported for your workstation:

1. Go to **http://www.hp.com/go/qs/**.
2. In the left navigation pane under **QuickSpecs**, click your country, and then select **Workstations**.
3. Choose your model to view the specifications.
4. Click the link for **Technical Specifications-Graphics** to display expanded technical information for supported graphics cards, including how many monitors the card supports, connectors, power consumption, drivers, and other details.

Matching graphics cards to monitor connectors

The following table describes monitor configuration scenarios.

Graphics card interface connector	Monitor connector				
	VGA	DVI	Dual Link DVI	DisplayPort (DP)	HDMI
DISPLAYPORT	DisplayPort to VGA adapter (sold separately)	DP to DVI adapter	DP to DL DVI adapter	DP cable	DP to HDMI adapter
DVI—I (WHITE)	DVI to VGA adapter	DVI cable	DL DVI cable	N/A	N/A
VGA (BLUE)	No adapter required	DVI-I to VGA adapter	N/A	N/A	N/A
DMS-59*	DMS-59 to VGA adapter	DMS-59 to DVI adapter	N/A	DMS-59 to DP adapter	N/A

* This interface is a dual-monitor graphics interface card that supports two VGA or two DVI monitors.

NOTE: HP graphics cards include monitor cable adapters unless otherwise indicated.

DisplayPort connections have the highest performance; VGA connections have the lowest.

Identifying monitor connection requirements

The following are various scenarios for connecting monitors. (See Matching graphics cards to monitor connectors on page 16 for more information about the different graphics cards):

- **Graphics card with DisplayPort output** — If the graphics card has four DisplayPort outputs, you can connect a monitor to each connector. Use the proper adapters if required.
- **Graphics card with DVI output** — If you have a graphics card with two DVI outputs, you can connect a monitor to each connector. Use the proper adapters if required.

NOTE: Models that have only one DVI port always have a second graphics output option (Display Port or VGA).

Many graphics cards provide more than two monitor outputs but limit you to using only two at a time. Consult the graphics card documentation or look up information on the card according to the procedure in Matching graphics cards to monitor connectors on page 16.

On a system with two DVI connections, port number 1 provides the primary display, which is where the BIOS POST screen appears after a system boot. (Only one card is used during BIOS POST unless you change the BIOS setting.)

- **Graphics card with VGA and DL-DVI output** — If the workstation does not have a PCIe graphics card, but has one or more SVGA *and/or* DL-DVI outputs, you can connect a monitor to each output.
- **Graphics card with DMS-59 output** — If the workstation has a PCIe graphics card with a DMS-59 output, use the appropriate adapter to connect your monitor.

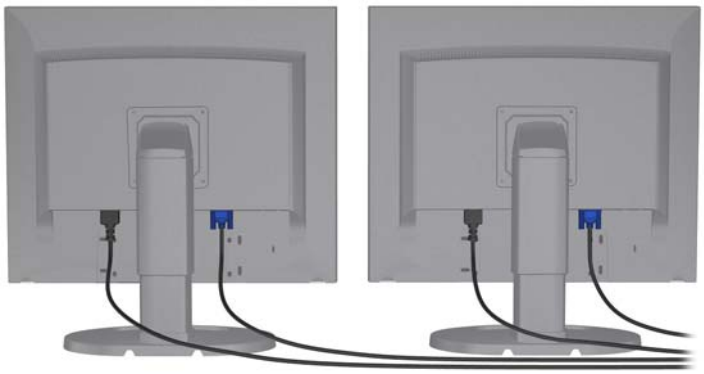
  Adapters are available to connect the DMS-59 output to two DVI or two VGA monitors.

Connecting and configuring monitors

NOTE: The supported graphics cards typically allow at least two monitors, as shown in this section; some supported cards allow more monitors. Refer to the graphics card documentation for details.

1. Connect the monitor cable adapters (1) (if required) to the workstation, then connect the appropriate monitor cables to the adapters (2) or directly to the graphics card.

2. Connect the other ends of the monitor cables to the monitors.



3. Connect one end of the monitor power cord to the monitor and the other end to an AC outlet.
4. Configure the monitor. For details, refer to Microsoft Help or to http://www.microsoft.com, or to your Linux Help or website, http://www.hp.com/go/opensource.

Using a third-party graphics configuration utility

Third-party graphics cards may include a monitor configuration utility. Upon installation, this utility is integrated into Windows. You can select the utility and use it to configure multiple monitors with your workstation.

Refer to your graphics card documentation for details.

NOTE: Some third-party configuration utilities require that you enable the monitors in Windows before using the configuration tool. Refer to your graphics card documentation for more information.

NOTE: Monitor configuration utilities are also often available on the HP support website.

Customizing the monitor display (Windows)

You can manually select or change the monitor model, refresh rates, screen resolution, color settings, font sizes, and power management settings.

- To change display settings in Windows 7, right-click a blank area on the desktop, and then click **Screen Resolution**.
- To change display settings in Windows 8, point to the upper-right or lower-right corner of the Start screen to display the charms, and then click **PC Settings > PC and Devices > Display**.
- For Windows 8, you can also change the display settings by pointing to the upper-right or lower-right corner of the Start screen to display the Charms menu, and then clicking **Search > Settings**, typing `resolution` in the **Settings** search field, and clicking **Change the Screen Resolution**.

For more information about customizing your monitor display, see the following resources:

- Online documentation provided with the graphics controller utility
- Documentation included with your monitor

Installing optional components

Depending on the workstation model, additional components (such as memory, hard drives, optical drives, PCIe cards, or a second processor) can be installed on your workstation.

- To view component installation videos, go to http://www.hp.com/go/sml.
- For installation guidelines and technical information, see the *Maintenance and Service Guide* for your workstation at http://www.hp.com/support/workstation_manuals.

Security

Some HP workstations have a lock on the side access panel. The key for this lock is shipped attached to the back panel of the workstation chassis.

Additional security features reduce the risk of theft and alert when there has been a chassis intrusion. See the *Maintenance and Service Guide* for your workstation at http://www.hp.com/support/workstation_manuals for information about additional hardware and software security features available for your system.

Product recycling

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries.

For information about recycling HP components or products, go to http://www.hp.com/go/recycle.

4 Setting up, backing up, restoring, and recovering Windows 7

This chapter provides setup and update information for the Windows 7 operating system. It includes these topics:

- Setting up the Windows 7 operating system
- Backing up, restoring, and recovering Windows 7

⚠ **CAUTION:** Do not add optional hardware or third-party devices to the HP workstation until the operating system is successfully installed. Adding hardware might cause errors and prevent the operating system from installing correctly.

NOTE: After you set up the operating system, be sure that the latest BIOS, drivers, and software updates are installed on the workstation. See Updating the workstation on page 38.

Setting up the Windows 7 operating system

⚠ **CAUTION:** After installation has started, do *not* turn off the workstation until the process is complete. Turning off the workstation during installation can damage the installation and operation of the software.

For complete installation and configuration instructions, go to http://windows.microsoft.com/en-US/windows7/help. Additional information is available in the Windows 7 online Help after you successfully install the operating system.

Installing or upgrading device drivers

You must install the appropriate device drivers before you install hardware devices. Follow the installation instructions that came with each device. For optimum performance, your operating system must have the most recent updates, patches, and service packs. See http://www.hp.com for HP-qualified drivers. For additional driver and software update information, see Updating the workstation on page 38.

Transferring files and settings

The Windows operating system offers data migration tools that help you select and transfer files and data from one Windows-based workstation to another.

For information about these tools, go to http://www.microsoft.com.

Backing up, restoring, and recovering Windows 7

Your workstation includes tools provided by HP and Windows to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your workstation to a proper working state or even back to the original factory state, all with simple steps.

This section provides information about the following processes:

- Creating backups
- Restoring and recovering your system

NOTE: For more details about the Windows Backup and Restore tools provided, see Help and Support. To access Help and Support: select **Start**, and then select **Help and Support**.

Recovery after a system failure is only as good as your most recent backup.

1. After you successfully set up the workstation, use Windows tools to create recovery media. In Windows 7, select **Start > Control Panel > System and Security > Backup and Restore > Create a system image**.
2. As you add hardware and software programs, create system restore points. A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A system restore point contains information that Windows uses, such as registry settings. Windows creates a system restore point for you automatically during a Windows update and during other system maintenance activities (such as a software update, security scanning, or system diagnostics). You can also manually create a system restore point at any time. For more information and steps for creating specific system restore points, see Help and Support. To access Help and Support: select **Start**, and then select **Help and Support**.
3. As you add photos, video, music, and other personal files, create a backup of your personal information. If files are accidentally deleted from the hard drive and they can no longer be restored from the Recycle Bin, or if files become corrupted, you can restore the files that you backed up. In case of system failure, you can use the backup files to restore the contents of your workstation. See Backing up your information on page 22.

NOTE: HP recommends that you print the recovery procedures and save them for later use, in case of system instability.

Backing up your information

NOTE: Windows includes the User Account Control feature to improve the security of your workstation. You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, see Help and Support: select **Start** and then select **Help and Support**.

You should create your initial backup immediately after initial system setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

NOTE: For detailed instructions on various backup and restore options, perform a search for these topics in Help and Support. To access Help and Support: select **Start** and then select **Help and Support**.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up your information:

- Store personal files in the Documents library, and back it up regularly.
- Back up templates that are stored in their associated directories.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.
- When backing up to discs, number each disc after removing it from the drive.

To create a backup using Windows Backup and Restore:

NOTE: The backup process may take over an hour, depending on file size and the speed of the workstation.

1. Select **Start** > **All Programs** > **Maintenance** > **Backup and Restore**.
2. Follow the on-screen instructions to set up your backup.

System Restore

If you have a problem that might be due to software that you installed on your workstation, use System Restore to return the workstation to a previous restore point. You can also set restore points manually.

NOTE: Always use this System Restore procedure before you use the System Recovery feature.

To start System Restore:

1. Close all open programs.
2. Select **Start**, select **Computer**, and then select **Properties**.
3. Select **System protection** > **System Restore** > **Next**, and then follow the on-screen instructions.

System Recovery

CAUTION: This procedure will delete all user information. To prevent loss of information, be sure to back up all user information so you can restore it after recovery.

Always use the System Restore procedure before you use the System Recovery program. See System Restore on page 22.

System Recovery completely erases and reformats the hard disk drive, deleting all data files that you have created, and then reinstalls the operating system, programs, and drivers. However, you must reinstall any software that was not installed on the workstation at the factory. This includes software that came on media included in the workstation accessory box, and any software programs that you have installed.

You can order a recovery media set from support. For U.S. support, go to http://www.hp.com/support. For worldwide support, go to http://www8.hp.com/us/en/contact-hp/ww-contact-us.html. You can also order the recovery media set by calling support.

NOTE: Some features might not be available on systems that are shipped without a Windows operating system.

You must choose one of the following methods to perform a System Recovery:

- Recovery image — Run System Recovery from a recovery image stored on your hard disk drive. The recovery image is a file that contains a copy of the original factory-shipped software. To perform a System Recovery from a recovery image, see System Recovery from a recovery partition image on page 23.
- Recovery media — Run System Recovery from recovery media that you have purchased separately.

System Recovery from a recovery partition image

CAUTION: System Recovery deletes all data and programs that you have created or installed.

A Windows system from the HP factory ships with a recovery partition. You can use the recovery partition to recover the factory operating system.

1. Turn off the workstation. If necessary, press and hold the power button until the workstation turns off.
2. Disconnect all peripheral devices from the workstation except the monitor, keyboard, and mouse.
3. Press the power button to turn on the workstation.
4. As soon as you see the HP logo screen, repeatedly press the F11 key on your keyboard until the *Windows is Loading Files...* message appears on the screen.
5. At the HP Recovery Manager screen, follow the on-screen instructions to continue.
6. When Windows has loaded, shut down the workstation, reconnect all peripheral devices, and then turn the workstation back on.

Using HP Recovery Disc operating system discs

CAUTION: Using a Windows 7 operating system DVD completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the workstation are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as the original drivers. Software that came with the system can be downloaded at http://www.hp.com.

Use the steps provided in this section if you ordered a Windows 7 operating system DVD and Driver DVD.

To order a Windows 7 operating system DVD and Driver DVD, go to the HP website. For U.S. support, go to http://www.hp.com/cgi-bin/hpsupport/index.pl. For worldwide support, go to http://www8.hp.com/us/en/contact-hp/ww-contact-us.html. You can also order the DVDs by calling support.

To initiate recovery using a Windows 7 operating system DVD:

NOTE: This recovery process takes several minutes.

1. Backup all personal files.
2. Restart the workstation, and then insert the Windows 7 operating system DVD into the optical drive.

   NOTE: If the workstation does not boot to the DVD, restart the workstation and press Esc as the workstation is powering on to see the startup menu. Use the arrow keys to select the boot menu and press enter. Use the arrow keys to select the location where the recovery DVD is inserted to boot from that device. Booting the DVD from UEFI Boot sources will result in a GPT boot partition. Booting from Legacy Boot sources will result in an MBR boot partition.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.

After the operating system installation has completed:

1. Eject the Windows 7 operating system DVD, and insert the Driver DVD once the system is booted into the OS for the first time.

   NOTE: The Driver DVD will load prerequisite software, and then allow you to load drivers.
2. Install the Hardware Enabling Drivers. HP recommends installing all available drivers.
3. You can download applications that came with the workstation at http://www.hp.com.

5 Setting up, backing up, restoring, and recovering Windows 8

This chapter provides setup and update information for the Windows 8 operating system. It includes these topics:

- Supplementary information
- Setting up the Windows 8 operating system
- Downloading Windows 8 updates
- Backing up, restoring, and recovering Windows 8

CAUTION: Do not add optional hardware or third-party devices to the HP workstation until the operating system is successfully installed. Adding hardware might cause errors and prevent the operating system from installing correctly.

NOTE: After you set up the operating system, be sure that the latest BIOS, drivers, and software updates are installed on the workstation. See Updating the workstation on page 38.

Supplementary information

Additional information is available in Help and Support after you customize the operating system.

Setting up the Windows 8 operating system

The first time you turn on the workstation you can customize the operating system. When you are connected to the Internet, Microsoft activates your operating system. This process takes about 15 to 30 minutes. Carefully read and follow the instructions on the screen.

We recommend that you register your workstation with HP, so you can receive important software updates, request support, and sign up for special offers.

CAUTION: After the initial setup process has begun, DO NOT TURN OFF THE workstation UNTIL THE PROCESS IS COMPLETE. Turning off the workstation during this process may damage the software that runs the workstation or prevent its proper installation.

NOTE: Windows includes the User Account Control feature to improve the security of your workstation. You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, see Help and Support: from the Start screen type `help` and then select **Help and Support**.

Downloading Windows 8 updates

Microsoft may release updates to the operating system. To help keep the workstation running optimally, HP recommends checking for the latest updates during the initial installation and periodically throughout the life of the workstation.

Run Windows Update as soon as possible after you set up your workstation.

1. Point to the upper-right or lower-right corner of the Start screen to display the charms.
2. Select **Settings** > **Change PC Settings** > **Update and Recovery** > **Windows Update**.

Backing up, restoring, and recovering Windows 8

Your workstation includes tools provided by HP and Windows to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your workstation to a proper working state or even back to the original factory state, all with simple steps.

This section provides information about the following processes:

- Creating recovery media and backups
- Restoring and recovering your system

NOTE: For more details about the tools provided, see Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

HP recommends that you print the recovery procedures and save them for later use, in case of system instability.

Backing up your information

NOTE: Windows includes the User Account Control feature to improve the security of your workstation. You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, from the Start screen type `help` and then select **Help and Support**.

Recovery after a system failure is as good as your most recent backup. You should create system repair media and your initial backup immediately after initial system setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. The system repair media is used to start up (boot) the workstation and repair the operating system in case of system instability or failure. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

NOTE: For detailed instructions on various backup and restore options, perform a search for these topics in Help and Support. To access Help and Support: from the Start screen, type `help` and then select **Help and Support**.

From the Start screen, type `backup`, and then select **Save backup copies of your files with File History**.

You can back up your information to an optional external hard drive or a network drive.

Note the following when you perform a backup:

- Store personal files in the Documents library, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

To create a backup using Windows Backup and Restore:

NOTE: The backup process may take more than an hour, depending on file size and the speed of the workstation.

1. From the Start screen, type `backup`, and then select from the list of displayed options.
2. Follow the on-screen instructions to set up your backup, create a system image, or create system repair media.

Creating recovery media and backups

Recovery after a system failure is only as good as your most recent backup.

⚠ **CAUTION:** Use a flash drive with a capacity of at least 8 GB. Any information on the USB flash drive will be erased before the recovery media is created.

1. After you successfully set up the workstation, create recovery media. This step creates a backup of the recovery partition on the workstation. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced.

   You will use a USB flash drive to create a bootable recovery drive that can be used to troubleshoot a Windows 8 workstation that is unable to start. The USB flash drive can be used to reinstall the original operating system and the programs that were installed at the factory.

   ⚠ **CAUTION:** If you select **Copy contents from the recovery partition to the recovery drive**, you will have the option to delete the recovery partition when the Recovery Media creation is finished. On most systems, this partition is 10 GB in size. HP recommends that you not delete this recovery partition. If the partition is deleted, you will be unable to restore the Windows 8 factory recovery partition to the hard drive using the recovery USB drive. You can free up drive space by deleting the recovery partition, but you won't be able to refresh or reset the PC again.

   To create the recovery media, from the Start screen, type `create a recovery drive`, and then select **Create a recovery drive**. Follow the on-screen instructions to continue.

2. As you add hardware and software programs, create system restore points. A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A system restore point contains information that Windows uses, such as registry settings. Windows automatically creates a system restore point for you during a Windows update and during other system maintenance activities (such as a software update, security scanning, or system diagnostics). You can also manually create a system restore point at any time. For more information and steps for creating specific system restore points, see Windows Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

3. As you add photos, video, music, and other personal files, create a backup of your personal information. Windows File History can be set to regularly and automatically back up files from libraries, desktop, contacts, and favorites. If files are accidentally deleted from the hard drive and they can no longer be restored from the Recycle Bin, or if files become corrupted, you can use File History to restore the files that you backed up. Restoring files is also useful if you ever choose to reset the workstation by reinstalling Windows.

   NOTE: File History is not enabled by default, so you must turn it on.

   For more information and steps for enabling Windows File History, see Windows Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

Restoring and recovering using Windows 8 tools

Windows recovery tools provide access to several options for recovering your system. Choose the method that best matches your situation and level of expertise:

- If you need to restore your personal files and data, you can use Windows File History to restore your information from the backups you created. For more information and steps for using File

History, see Windows Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

- If you want to restore the system to a previous state without losing any personal information, Windows System Restore is an option. System Restore allows you to restore without the requirements of Windows Refresh or a reinstallation. Windows creates system restore points automatically during a Windows update and other system maintenance events. Even if you did not manually create a restore point, you can choose to restore to an automatically created restore point. For more information and steps for using Windows System Restore, see Windows Help and Support. From the Start screen, type `help`, and then select **Help and Support**.
- If you want a quick and easy way to recover the system without losing your personal information, settings, or the apps that came preinstalled on your workstation or were purchased from the Windows Store, Windows Refresh is an option. This method does not require backing up data to another drive. See Using Windows 8 Refresh on page 29.
- If you want to reset your workstation to its original state, Windows Reset provides an easy way to remove all personal data, apps, and settings, and reinstall Windows. The Reset recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled. Any personal files must be restored from backups you made. See Using Windows 8 Reset on page 30.
- If the workstation is unable to start, you can use the Windows recovery USB flash drive you created to recover the system. See Recovery using the Windows 8 recovery USB flash drive on page 31.
- If the workstation is unable to start and you did not create a recovery USB flash drive or the one you created does not work, see Recovery using Windows 8 restore media on page 32.

Using Windows 8 Refresh

IMPORTANT: Refresh removes any traditional applications that were not originally installed on the system at the factory.

NOTE: You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, see Help and Support: from the Start screen type `help`, and then select **Help and Support**.

If Windows is responding, use these steps to start Refresh:

NOTE: During Refresh, a list of removed traditional applications will be saved so that you have a quick way to see what you might need to reinstall. See Help and Support for instructions on reinstalling traditional applications. From the Start screen, type `help`, and then select **Help and Support**.

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Select **Settings**.
3. Select **Change PC settings** in the bottom-right corner of the screen, and then select **Update and Recovery** > **Recovery** from the PC settings screen.
4. Under **Refresh your PC without affecting your files**, select **Get started**, and follow the on-screen instructions.

If Windows is not responding, use these steps to start Refresh:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: from the Start screen, type `This PC`, and then select **This PC**.

NOTE: If the HP Recovery partition is not listed, or you cannot check for its presence, you must recover using the recovery media that you created. See Recovery using the Windows 8 recovery USB flash drive on page 31. If you did not create recovery media, you must use the Windows 8 restore media (available separately). See Recovery using Windows 8 restore media on page 32.

3. If the HP Recovery partition is listed, restart the workstation, and then press Esc while the company logo is displayed. The workstation Startup Menu opens.
4. Press F11 to select the **System Recovery** option.
5. Choose your keyboard layout.
6. Select **Troubleshoot**.
7. Select **Refresh**.
8. Follow the on-screen instructions to continue.

Using Windows 8 Reset

IMPORTANT: Reset does not provide backups of your information. Before using Reset, back up any personal information you want to retain.

If Windows is responding, use these steps to start Reset:

NOTE: You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, see Help and Support: from the Start screen type `help`, and then select **Help and Support**.

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Select **Settings**.
3. Select **Change PC settings** in the bottom-right corner of the screen, select **Update and Recovery** then select **Recovery**.
4. Under **Remove everything and reinstall Windows**, select **Get started**, and follow the on-screen instructions.

If Windows is not responding, use these steps to start Reset:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: from the Start screen, type `This PC`, and then select **This PC**.

NOTE: If the HP Recovery partition is not listed, or you cannot check for its presence, you must recover using the recovery media that you created. See Recovery using the Windows 8 recovery USB flash drive on page 31. If you did not create recovery media, you must use the Windows 8 restore media (available separately). See Recovery using Windows 8 restore media on page 32.

3. If the HP Recovery partition is listed, restart the workstation, and then press Esc while the company logo is displayed. The workstation Startup Menu opens.

4. Press F11 to select the **System Recovery** option.
5. Choose your keyboard layout.
6. Select **Troubleshoot**.
7. Select **Reset**.
8. Follow the on-screen instructions to continue.

Recovery using the Windows 8 recovery USB flash drive

CAUTION: Using F11 completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the workstation are permanently removed. The F11 recovery tool reinstalls the operating system and the HP programs and drivers that were installed at the factory. You must reinstall all other software.

To recover your system using the recovery USB flash drive you previously created:

NOTE: If you did not create a recovery USB flash drive or the one you created does not work, see Recovery using Windows 8 restore media on page 32.

1. If possible, back up all personal files.
2. Insert the recovery USB flash drive into a USB port on your workstation.
3. Restart the workstation and as soon as you see the HP logo screen, press F9 to display a list of boot devices. Use the arrow keys to select your USB flash drive from the UEFI Boot Sources list. Press enter.
4. Choose your keyboard layout.
5. Select **Troubleshoot**.
6. Select **Refresh your PC**.
7. Follow the on-screen instructions.

Recovery using Windows 8 restore media

This recovery process requires Windows 8 restore discs, which can be ordered from the support website. The Windows 8 restore media consists of a Windows 8 operating system disc and a Windows 8 driver disc.

For U.S. support, go to http://www.hp.com/support. For worldwide support, go to http://www8.hp.com/us/en/contact-hp/ww-contact-us.html. You can also order the media by calling support.

CAUTION: Using the Windows 8 operating system disc completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the workstation are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers.

Begin recovery using the Windows 8 operating system disc:

NOTE: It can take several minutes to load the operating system disc.

1. Back up all personal files.
2. Restart the workstation, and then follow the instructions provided with the Windows 8 operating system disc to install the operating system.
3. When prompted, press any keyboard key.

   NOTE: If the workstation does not boot to the DVD, restart the workstation and press Esc as the workstation is starting to see the Startup menu. Use the arrow keys to select the boot menu, and then press enter. Use the arrow keys to select the location where the recovery DVD is inserted to boot from that device. Booting the DVD from UEFI Boot sources will result in a GPT boot partition. Booting from Legacy Boot sources will result in an MBR boot partition. It is recommended that you boot Windows 8 from UEFI Boot sources to take full advantage of the features available in Windows 8.
4. Follow the on-screen instructions.

After the repair is completed and the Windows 8 desktop appears:

1. Remove the Windows 8 operating system disc, and then insert the driver disc.

   NOTE: The driver disc will load prerequisite software, and then allow you to load drivers.
2. Install the Hardware Enabling Drivers first. HP recommends installing all available drivers.
3. You can download applications that come with the workstation at http://www.hp.com.

6 Setting up and restoring Linux

HP offers a variety of Linux solutions for HP workstation customers:

- HP certifies and supports Red Hat® Enterprise Linux (RHEL) on HP workstations.
- HP certifies and supports SUSE Linux Enterprise Desktop (SLED) on HP workstations.
- HP offers a SLED 11 preload on some Z series Workstations.

This chapter describes how to set up and restore the Linux operating system. It includes these topics:

- HP Linux Support Matrix
- HP Installer Kit for Linux (HPIKL)
- Setting up Red Hat Enterprise Linux
- Setting up SUSE Linux Enterprise Desktop (SLED)
- Proprietary graphics drivers

NOTE: After you set up the operating system, be sure that the latest BIOS, drivers, and software updates are installed. See Updating the workstation on page 38.

CAUTION: Do not add optional hardware or third-party devices to the workstation until the operating system is successfully installed. Adding hardware might cause errors and prevent the operating system from installing correctly.

HP Linux Support Matrix

Not all release streams are supported on particular platforms. To find out which streams are supported on your workstation. see the *Linux certification and support matrix*:

1. Go to http://www.hp.com/support/linux_hardware_matrix.
2. Find your workstation model and determine what versions of Linux are supported.

HP Installer Kit for Linux (HPIKL)

The HP Installer Kit for Linux helps users install certified versions of RHEL or SLED on HP workstations. It is available as an operating system option on all HP workstations.

- The kit contains tested drivers that augment and/or replace those found in RHEL or SLED, to enable proper use and behavior on HP workstations.
- The kit does **not** include the Linux operating system, which must be purchased separately from Red Hat or SUSE. To view supported configurations and operating systems, go to http://www.hp.com/support/linux_hardware_matrix.

The HPIKL option includes a FreeDOS preload. This operating system option accommodates those who have a customized Linux distribution or who have a licensed version of RHEL or SLED and would like to install the HP-recommended driver additions.

The kit also can be downloaded using the following steps:

1. Go to http://www.hp.com/support/workstation_swdrivers.
2. Select your workstation model.
3. Select the desired operating system.
4. Select your software/driver language, and then click the **Software** quick jump link.
5. Select the **Obtain Software** link for the appropriate package (typically the most recent revision).
6. Click **I Accept** to accept the terms of the license agreement.
7. Download the software ISO image and save it on a disc. This disk is your *HP driver disc*.

Setting up Red Hat Enterprise Linux

HP Z series Workstations are certified and supported on RHEL streams appropriate to the hardware technology.

- For details of RHEL support for a particular platform, see the *Hardware Support Matrix for HP Linux Workstations* at http://www.hp.com/support/linux_hardware_matrix.
- For information about Red Hat certifications on HP workstations, go to https://hardware.redhat.com.

HPIKL driver disc

Recent versions of Red Hat Linux typically require only driver updates with minor fixes to support HP workstations. These releases can usually be supported with the HPIKL driver disc, which can be used as a post-installation utility for the standard Red Hat Linux install.

After you complete the standard Red Hat install and restart the system, a Red Hat *first-boot* utility runs. After you specify a number of settings (such as the security level, time and date, root password, and user accounts), the utility lets you load an additional disc.

The driver disc is used during this phase. All content added by HP is in the **/HP** directory on the disc. You can use it to build your own image or to browse the HP content.

NOTE: Some installations may encounter problems if they are performed with a DisplayPort connection to the monitor. This is because the default drivers that the OS installers use do not support DisplayPort functionality. If you experience problems, try overriding the monitor choice for DisplayPort during the start of the install and using the VESA driver instead. You can then set up the DisplayPort monitor later.

Installing with the HP Red Hat Linux driver disc

1. If you do not have the appropriate HP driver disc for a supported stream, create one (see HP Installer Kit for Linux (HPIKL) on page 34.)
2. Install the operating system using the optical media included in the Red Hat Linux box-set.
3. If you have a Red Hat driver disk for the OS version you are installing, enter `linux dd` when the initial install splash screen appears, and then press **Enter**.
4. When asked if you have a driver disc, select **Yes**. Place the Red Hat driver disc in the drive, and select the appropriate `drive:hd[abcd]`. Continue the normal installation.
5. After successfully installing the operating system, reboot the workstation.
   - RHEL 6: Insert your HP driver disc. The HPIKL installation software automatically starts. Follow the on-screen instructions to install the contents.

Setting up SUSE Linux Enterprise Desktop (SLED)

HP offers a 64-bit SLED 11 preload on some Z series Workstations and supports 64-bit SLED 11 on other workstations.

Various versions of SLED are certified and supported by SUSE on HP workstations. For more information, go to the SUSE certification bulletin search page at https://www.suse.com/yessearch/Search.jsp.

Setting up preloaded SLED

To set up SLED on systems preloaded with the operating system:

1. Start the workstation.
2. When prompted, enter the workstation installation settings: password, network, graphics, time, keyboard settings, and SUSE Customer Center Configuration.

NOTE: You can activate your SUSE subscription from the SUSE Customer Center Configuration screen. To view the full SUSE Customer Center documentation, go to http://www.suse.com/documentation, and select your operating system.

Installing SLED with the DVD Installer Kit

1. If an HP driver disc did not come with your workstation, create one (see HP Installer Kit for Linux (HPIKL) on page 34).
2. Install the operating system using the discs included in the SUSE box-set.
3. After successfully installing the operating system, reboot the workstation.
4. Insert your HP driver disc. The HPIKL installation software automatically starts. Follow the on-screen instructions to install the contents.

Restoring SLED (preloaded systems only)

To restore SLED, you must use the SLED restore media. To create restore media:

1. Click the SUSE ISO icon on the desktop to go to the */iso* folder. This folder contains all ISO images used to preload your workstation.
2. Follow the instructions in the readme file in this folder to copy the ISO image file onto optical media.
3. Store the media in a safe place. If your workstation experiences a hard drive failure, use the ISO recovery images to restore your operating system.

⚠ **CAUTION:** Restoring the operating system does **not** restore data. Back up your data using the method and media of your choice.

Proprietary graphics drivers

Most HP workstations can be ordered with graphics cards that have been through extensive verification by HP. See the *Hardware Support Matrix for HP Linux Workstations* at http://www.hp.com/support/linux_hardware_matrix for a list of supported cards.

NOTE: Not all graphics cards are available on every workstation. Limitations generally occur for cards that consume large amounts of power in lower-power workstations.

Proprietary graphics drivers supported by HP and the graphics vendors are available with the HP Installer Kit for Linux, with the SLED 11 preload on Z series Workstations, and from HP Workstation Support at http://www.hp.com/go/workstationsupport.

These proprietary drivers are not a standard part of the RHEL or SLED distributions because they are not open source. Driver revisions more recent than those at the HP support website are supported directly by the vendor.

7 Updating the workstation

- Updating the workstation after first boot
- Updating the BIOS
- Upgrading device drivers

HP is constantly working on improving your total workstation experience. To ensure that the workstation leverages the latest enhancements, HP recommends that you install the latest BIOS, driver, and software updates on a regular basis.

Updating the workstation after first boot

After successfully booting the workstation for the first time, follow these guidelines to be sure that the workstation is up-to-date:

- Be sure that you have the latest system BIOS version loaded. See Updating the BIOS on page 38.
- Be sure that you have the latest drivers for your system. See Upgrading device drivers on page 39.
- Become familiar with your available HP resources.
- Consider a subscription to Driver Alerts at http://www.hp.com/go/subscriberschoice.

Updating the BIOS

For optimum performance, determine the BIOS version on the workstation, and upgrade it if necessary.

Determining the current BIOS version

To determine the current BIOS version:

1. Press Esc during startup (boot).
2. Press F10 to enter the F10 Setup utility.
3. Select **File > System Information**. Note the workstation BIOS version.

NOTE: For procedures for upgrading the BIOS as well as the F10 Setup utility BIOS Menu settings, see the *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.

Upgrading BIOS

To find and download the latest available BIOS version, which includes the latest enhancements:

1. Go to http://www.hp.com/go/workstationsupport.
2. In the left navigation pane under **Tasks**, select **Download Drivers and Software**.
3. Follow the instructions to locate the latest BIOS version available for the workstation.
4. Compare the BIOS version on your workstation to the BIOS versions on the website (see Determining the current BIOS version on page 38). If the BIOS version on the website is the same as the version on your system, no further action is required.
5. If the BIOS version on the website is a version later than the one on your system, download the appropriate version for the workstation. Follow the instructions in the release notes to complete the installation.

Upgrading device drivers

If you install a peripheral device (such as a printer, display adapter, or network adapter), confirm that you have the latest device drivers loaded. If you purchased your device through HP, go to the HP website to download the latest drivers for your device. These drivers have been tested to ensure the best compatibility between your device and your HP workstation.

If you did not purchase your device from HP, HP recommends that you go to the HP website first to see if your device and its drivers have been tested for HP workstation compatibility. If no driver is available, go to the device manufacturer's website to download the latest drivers.

To upgrade device drivers:

1. Go to http://www.hp.com/go/workstationsupport.
2. In the left navigation pane under **Tasks**, select **Download Drivers and Software**.
3. Follow the instructions to find the latest drivers available for the workstation.

If a required driver is not found, see the website of the manufacturer of the peripheral device.

8 Diagnostics and minor troubleshooting

- Calling support
- Locating ID labels
- Locating warranty information
- HP troubleshooting resources and tools

Calling support

At times you might encounter an issue that requires support. Before you call support, do the following:

- Have the workstation readily accessible.
- Write down the workstation serial numbers, product numbers, model names, and model numbers and have them in front of you.
- Note any applicable error messages.
- Note any add-on options.
- Note the operating system.
- Note any third-party hardware or software.
- Note the details of any blinking LEDs on the front of the workstation (tower and desktop configurations) or on the side of the workstation (all-in-one configurations).
- Note the applications you were using when you encountered the problem.

NOTE: When calling in for service or support, you might be asked for the product number (example: PS988AV) of the workstation. If the workstation has a product number, it is generally located next to the 10- or 12-digit serial number of the workstation.

NOTE: On most models, the serial number and product number labels can be found on the top or side panel and at the rear of the workstation (tower and desktop configurations) or on a pull-out card on the side of the display (all-in-one configurations).

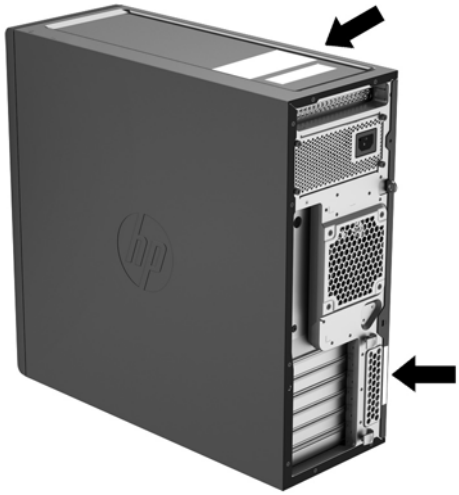
For a listing of all worldwide support phone numbers, go to http://www.hp.com/support, select your region, and click **Connect with HP** in the upper-right corner.

Locating ID labels

To assist in troubleshooting, identification labels are available on each workstation.

- All workstations have a serial number (unique for each workstation) and product number. Have these numbers available when you contact support.
- The Certificate of Authentication (COA) is used for Windows 7-preinstalled systems only.
- The Genuine Microsoft Label (GML) is used for Windows 8-preinstalled systems only.
- A service label shows the build ID and Feature Byte strings, which are needed for system board replacement.

NOTE: Your workstation may look slightly different from the illustration in this section.



Locating warranty information

To locate warranty information, go to http://www.hp.com/support/warranty-lookuptool.

To locate an existing Care Pack, go to http://www.hp.com/go/lookuptool.

To extend a standard product warranty, go to http://www.hp.com/hps/carepack. HP Care Pack Services offer upgraded service levels to extend and expand a standard product warranty.

HP troubleshooting resources and tools

This section provides information to guide you in troubleshooting your system.

Online support

Online support resources include web-based troubleshooting tools, technical knowledge databases, driver and patch downloads, online communities, and product change notification services.

The following websites are also available to you:

- http://www.hp.com—Provides useful product information.
- http://www.hp.com/support/workstation_manuals—Provides the latest online documentation.

- http://www.hp.com/go/workstationsupport—Provides technical support information for workstations.
- http://www8.hp.com/us/en/contact-hp/phone-assist.html—Provides a listing of the worldwide technical support telephone numbers. Select your region.
- http://www.hp.com/support/workstation_swdrivers—Provides access to software and drivers for workstations.

HP Support Center

To help you troubleshoot problems yourself, HP provides the HP Support Center. The HP Support Center is a portal to an extensive selection of online tools. To access the HP Support Center, complete the following steps:

1. Go to http://www.hp.com/go/workstationsupport.
2. Search for your product.
3. In the left navigation pane under **Tasks**, select **Troubleshoot a problem**.
4. Select the problem that you are troubleshooting.

HP Chat Support

HP Chat Support is a set of web-based support tools that automate and speed up the resolution of problems concerning desktop computing, tape storage, and printing.

HP Chat Support enables you to electronically submit a support ticket to HP over the web. When you submit a support ticket, HP Chat Support collects information about the workstation and passes it to an online support specialist. The collection of information might take up to 30 seconds, depending on the workstation configuration. When you submit a support ticket, you receive a confirmation message containing your case ID, the support hours for your location, and the estimated time of response.

For more information about HP Chat Support, go to http://instantsupport.hp.com/.

NOTE: This feature is not available for Linux.

Customer Advisories, Customer and Security Bulletins, and Customer Notices

To find advisories, bulletins, and notices:

1. Go to http://www.hp.com/go/workstationsupport.
2. Search for your product.
3. In the left navigation pane under **Knowledge Base**, select **Advisories, Bulletins & Notices**.
4. Select an item for viewing.

Product Change Notifications

Product Change Notifications (PCNs) are proactive notifications for product changes occurring within a 30- to 60-day window of the effective date of the change in the manufacturing process. PCNs give customers advance notice of changes to their product, such as an updated BIOS version that they might need to decide whether to download prior to the change taking place. To view a list of PCNs, go to the **Advisories, Bulletins & Notices** page for your product.

Helpful hints

If you encounter a problem with the workstation, monitor, or software, the following general suggestions might help you isolate and focus on the problem before taking further action.

At startup

- Verify that the workstation is plugged into a functional AC outlet.
- Remove all optical discs and USB flash drives before starting the workstation.
- Verify that the workstation is on and the power light is on.
- If you have installed an operating system other than the factory-installed operating system, confirm that it is supported on your system by going to http://www.hp.com/go/quickspecs.
- Verify that the internal display panel is lit.
- If the internal display panel is dim, turn up the brightness.
- If you have an external monitor:
  - Verify that the monitor is plugged into a functional AC outlet.
  - Verify that the monitor is on and the green monitor light is on.
  - If the monitor is dim, turn up the brightness and contrast controls.

During operation

- Beeps and blinking lights on the workstation are error codes that can help you diagnose problems. For more information on interpreting these codes, see the *Diagnostic LED and audible (beep) codes* section in the *Maintenance and Service Guide* for your workstation.
- Press and hold any key. If the system beeps, your keyboard is operating correctly.
- Check all cables for loose or incorrect connections.
- Wake the workstation by pressing the power button or any key on the keyboard. If the system remains in suspend mode, shut down the system by pressing and holding the power button for at least four seconds. Then press the power button again to restart the system.

  If the system does not shut down, unplug the power cord, wait a few seconds, and then plug it in again. If the system does not restart, press the power button.
- After installing a non-PnP expansion board or other option (such as a diskette drive), restart the workstation.
- Be sure that all required device drivers have been installed. For example, if you have connected a printer, you must install a printer driver.
- If you are working on a network, use another cable to plug your workstation into the network connection. If you still cannot connect, there might be a problem with the network plug.
- If you recently added new hardware, remove the hardware to see whether the workstation functions properly.
- If you recently installed new software, uninstall the software to see whether the workstation functions properly.
- If the internal display panel on an all-in-one workstation is blank, open the workstation and be sure that both ends of the cable between the system board and the internal display panel are connected. If you are using a graphics card, verify that the card is properly installed.

- Upgrade the BIOS. A new release of the BIOS might have been released that supports new features or fixes your problem.
- For more detailed information, see the troubleshooting chapter in the *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.

Customer Self Repair

Under the Customer Self Repair programs, you can order a replacement part and install the part without on-site HP technical assistance. Customer Self Repair might be required for some components. For more information, go to http://www.hp.com/go/selfrepair and select your product.

NOTE: Some components are not eligible for Customer Self Repair and must be returned to HP for service. Call support for further instructions before attempting to remove or repair these components.

More troubleshooting options

The following additional information about troubleshooting techniques and tools is provided in the *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals:

- POST Error Codes.
- Diagnostic lights and audible (beep) codes.
- Troubleshooting scenarios and solutions.
- HP PC Hardware Diagnostics (UEFI) — A set of diagnostic tests that helps determine whether the hardware is functioning properly.

9 Routine care

- General cleaning safety precautions
- Recommended cleaning products
- Cleaning the chassis
- Cleaning the keyboard
- Cleaning the monitor
- Cleaning the mouse

General cleaning safety precautions

- Never use solvents or flammable solutions to clean the workstation.
- Never immerse any component in water or cleaning solutions; apply any liquids to a clean cloth and then use the cloth on the component.
- Always unplug the workstation before cleaning the keyboard, mouse, or air vents.
- Always disconnect the keyboard before cleaning it. If the keyboard has an on/off switch, turn it off before disconnecting the keyboard.
- Wear safety glasses equipped with side shields when using compressed air, to prevent dust and debris from getting into your eyes.

Recommended cleaning products

Use the following products to safely clean your workstation:

- Dimethyl benzyl ammonium chloride 0.3 percent maximum concentration, usually in the form of disposable wipes in a variety of brand names
- Alcohol-free glass cleaning fluid
- Water with mild soap solution
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

⚠ **CAUTION:** Avoid strong cleaning solvents that can permanently damage your workstation. If you are not sure if a cleaning product is safe for your workstation, check the product contents to be sure that ingredients such as alcohol, acetone, ammonium chloride, methylene chloride, and hydrocarbons are not included.

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

Cleaning the chassis

- Follow the safety precautions in the *Maintenance and Service Guide* for your workstation before cleaning the workstation.
- To remove light stains or dirt, use plain water with a clean, lint-free cloth or swab.
- For heavier stains, use a soft microfiber cloth or chamois moistened with mild dish washing liquid diluted with water. Rinse well by wiping the surface with a cloth or swab dampened with clear water.
- After cleaning, always wipe the workstation with a clean, lint-free cloth.
- Occasionally, clean the air vents on the workstation. Lint and other foreign matter can block the vents and limit the airflow.

Cleaning the keyboard

- Always disconnect the keyboard before cleaning it. If the keyboard has an on/off switch, turn it off before disconnecting the keyboard.
- Follow the safety precautions in the *Maintenance and Service Guide* for your workstation before cleaning the keyboard.
- Visible debris underneath or between the keys can be removed by vacuuming or shaking.
- Canned, pressurized air can be used to clean debris from under the keys. Use caution because too much air pressure can dislodge lubricants applied under the wide keys.
- If you remove a key, use a specially designed key remover to prevent damage to the keys. This tool is available from many electronics supply outlets.

⚠ **CAUTION:** Never remove a wide key (like the space bar key) from the keyboard. If these keys are improperly removed or installed, the keyboard might not function properly.

- Clean under a key with a swab moistened with one of the products mentioned in Recommended cleaning products on page 45 of this guide. Be careful not to wipe away lubricants necessary for proper key functions. Allow the parts to air dry before reassembly.
- Use tweezers to remove any fibers or dirt in confined areas.

Cleaning the monitor

- Follow the safety precautions in the *Maintenance and Service Guide* for your workstation before cleaning the monitor.
- Gently wipe the display using a soft, lint-free cloth moistened with water or an alcohol-free glass cleaner.

⚠ **CAUTION:** Do not use sprays or aerosols directly on the screen—the liquid might seep into the housing and damage a component.

Never use solvents or flammable liquids on the monitor because display or housing damage may result.

Cleaning the mouse

1. Follow the safety precautions in the *Maintenance and Service Guide* for your workstation before cleaning the mouse.
2. If the mouse has an on/off switch, turn it off.
3. Wipe the body of the mouse with a soft microfiber cloth or chamois moistened with alcohol-free glass cleaning fluid or water with mild soap solution.
4. Note these guidelines:
   - Laser or light: use a cotton swab dampened with cleaning solution to gently brush out any dust around the laser or light, and then wipe again with a dry swab. Do not wipe the laser or light directly with the swab.
   - Scroll wheel: spray canned, pressurized air into the gap between the scroll wheel and the click buttons. To avoid condensation, do not blow air directly on one spot for an extended period.
   - Roller ball: remove and clean the roller ball, remove any debris from the ball socket, wipe out the socket with a dry cloth, and reassemble the mouse.