



Windows® Embedded 8 Standard for HP Thin Clients

Quick Reference Guide

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About this book

This guide supplements the Windows Embedded 8 Standard (WES 8) documents supplied by Microsoft Corporation. This document highlights the differences, enhancements, and additional features provided by the latest image of your thin client.

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

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

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1 For more information and updates

HP updates

HP provides periodic updates and add-ons for thin client images. Check the HP support site at <http://www.hp.com/support> for updates and add-ons that apply to your image version. Select the country/region from the map, then select **Drivers & Software**. Type the thin client model in the field and click **Search**.

For more information

For documentation that provides specific information for your image version, check the HP support site at <http://www.hp.com/support>. Select the country/region from the map, and then select **Product Support & Troubleshooting**. Type the thin client model in the field and click **Search**.

2 Introduction

This guide provides information pertaining to HP thin client models that use the WES 8 operating system. These thin clients provide the following flexibility, connectivity, security, multimedia, and peripheral capabilities that make them ideal for most mainstream business use:

- Flexible
 - Win64-based application support
 - Extensive peripheral device support
- Connectivity
 - Microsoft Remote Desktop Protocol (RDP)
 - Citrix XenApp Plug-in for Hosted Applications
 - VMware Horizon View Client
 - HP Remote Graphics Software (RGS)
 - HP TeamTalk
- User interface similar to familiar Windows 8 desktop
- Improved security
 - Microsoft® Firewall
 - Write filter-protected flash drive
- Multimedia
 - Windows Media Player
- Internet browsing
 - Windows Internet Explorer 10

HP provides this client “ready to go” out of the box to meet most common customer requirements. You may customize the thin client using the Programs and Features Control Panel applet or the add-ons provided on the HP support site.

This guide will introduce various features of this client, including some that are not found in the standard Windows operating system.

Typically, a thin client is configured locally and then used as a template for configuring other terminals using local or remote administration tools.

Modern user interface and traditional desktop

This section provides a general overview of WES 8 user and administrator desktop features and functions.

WES 8 allows you to use both the modern UI and the traditional desktop. The modern UI is similar to Windows 8. The traditional desktop is similar to the Windows 7 desktop, including the Windows taskbar at the bottom of the screen, but without the Start Menu. Both interfaces are available in the administrator and user accounts.

The modern UI shows whether you are logged on as a user or as an administrator in the upper right corner.



For instructions on logging on, see [Logging on on page 7](#).

The Charms bar provides access to some of the most frequently used items from any application. The Charms are Search, Share, Start, Devices, and Settings. To access the Charms, move the cursor to the upper or lower right corner. The Charms bar is available in both the modern UI and the traditional desktop.

To open the Control Panel in the traditional desktop, access the Charms, click on the **Settings** Charm, and click **Control Panel**.

A few tips for using the modern UI

The modern UI has several features new to WES:

- Right-click in the modern UI to open the All Apps option in the lower right corner of the desktop.
- To access any application or the Control Panel, begin typing the name of the application or `Control Panel` anywhere on the desktop. Do not use abbreviations or acronyms. Possibilities appear as you type. Click the appropriate tile to open the application.
- Press the Windows key to toggle between the modern UI and traditional desktop. You can also move the mouse cursor to the lower left corner of the screen and click on the window that pops up.

For more information on navigation within the modern UI, go to <http://www8.hp.com/us/en/support-topics/windows8-support/getting-started-win8.html>.

Server environment requirements

HP thin clients use a variety of services accessed through a network. Thin clients require the following:

- Session services
- Support services

Session services

The network to which the thin client is connected requires any of the following session services:


- Citrix Independent Computing Architecture (ICA)
- Microsoft RDP
- Terminal emulation support

Citrix ICA

You can make Citrix ICA available on the network using Presentation Server, XenDesktop, or XenApp for Windows 2003/2008/2012 Server family.

Microsoft RDP

The Microsoft Remote Desktop Connection (RDC), formerly known as Terminal Services Client, application on the thin client accesses Microsoft Remote Desktop Services, formerly known as Terminal Services. You can make RDP available on the network using Windows Server 2003/2008/2012 with Remote Desktop Services (Terminal Services) installed.

 **NOTE:** If a Windows Server 2003/2008/2012 is used for both ICA and RDP session services, a Terminal Service Client Access License (TSCAL) server must also reside somewhere on the network. Client Access Licenses permit clients to use the terminal, file, print, and other network services provided by the Windows server. The server grants temporary licenses—on an individual device basis—that are good for 90 days. After 90 days, you must purchase TSCALs and install them in the TSCAL server. You cannot make a connection without a temporary or permanent license.

For more information about Microsoft Remote Desktop Services, see the Microsoft website at <http://technet.microsoft.com/en-us/windowsserver>.

Terminal emulation support

All WES-based thin client models include TeemTalk terminal emulation software to support computing on legacy platforms. The terminal emulation software uses the Telnet protocol to communicate with the remote computing platform.

Thin client management services

HP has a comprehensive suite of management solutions. This allows you to choose solutions that will work best in your environment.

HP ThinState Capture

For more information, go to [HP ThinState on page 14](#).

HP Device Manager

For more information, go to [HP Device Manager on page 19](#).

3 Activation

Activation is required for full functionality.

The Windows Embedded 8 Standard operating system installed on this thin client can be activated in three ways:

- **Internet:** Connect the thin client to the Internet and turn it on. For your convenience, HP has set up the thin client to automatically communicate with a Microsoft server, obtain the key, and activate Windows Embedded 8.



NOTE: There is no need to disable the write filter for the Activation to persist after a reboot.

- **Telephone:** Click the **Settings** Charm > **Change PC Settings**, select **Activate Windows**, click **Activate by phone**, and follow the on-screen instructions.
- **Proxy server:** Set up a proxy server to handle activation for multiple thin clients. For detailed information on and instructions, see *Managing Activation Using the Volume Activation Management Tool (VAMT)* at http://technet.microsoft.com/en-us/library/ff686876.aspx#_Toc254001283.


4 Configuration

Logging on

You can log on to the thin client either automatically or manually.

Automatic logon

The administrator can use the HP Logon Manager in the Control Panel to enable/disable auto logon and change the auto logon user name, password, and domain. Only the administrator account can change the auto logon properties.

 **NOTE:** To save changes, please perform the appropriate action depending on the write filter selections. Please consult [HP Unified Write Filter on page 16](#) for detailed instructions.

Enabling automatic logon bypasses the Log On to Windows dialog box.

Manual logon

When the automatic logon is disabled, thin client displays the Log On to Windows dialog box at startup. Type the logon information in the **User Name** and **Password** text boxes. Note the following:

- For a user account, the factory-default user name and password are both **User**.
- For an administrator account, the factory-default user name and password are both **Administrator**.
- For security purposes, HP recommends that you change the passwords from their default values. An administrator can change passwords by clicking on the **Settings** Charm > **Change PC Settings** > **Users**, and then selecting **Change Your Password** from the **Sign In Options** list. You cannot save the password when logged on as a user.
- Passwords are case-sensitive.
- The administrator may create additional user accounts by going to User Accounts in the Control Panel. HP recommends you keep the additional users to a minimum because of local memory constraints.

Administrator logon access

To access Administrator logon regardless of the state of the thin client user mode:

1. Click the user account in the upper right corner of the modern UI and click **Sign out**.
2. When a screen with date and time appears, press any key or click the mouse to bring up the logon screen.

The screen for Administrator logon is displayed.


 **NOTE:** The default password for the Administrator account is **Administrator**. The default user name and password for the user account is **User**.

You can use the HP Logon Manager to permanently modify the default login user. This application is located in the Control Panel and can be accessed only by the Administrator.

Signing out, restarting, and shutting down the thin client

To sign out, restart, or shut down from the thin client:

1. Access the **Settings** charm and click **Power**. Choose **Shut down** or **Restart**.
2. Sign off by clicking the user account tile in the upper right corner and clicking **Sign out**.

 **NOTE:** If automatic logon is enabled, when you log off (without shutting down), the thin client immediately logs on the predefined user account set up in HP Logon Manager. For instructions for logging on as a different user, see [Logging on on page 7](#).

The following utilities are affected by restarting or shutting down the thin client:

- [HP Unified Write Filter on page 16](#)
- [System date and time on page 8](#)

Unified write filter

HP WES 8 thin clients include the Unified Write Filter (UWF) to protect the operating system.

For detailed information, see [HP Unified Write Filter on page 16](#). To save changes to system configuration settings, you must disable the write filter, make the changes, reenable the write filter, and then restart the computer. Otherwise, the new settings will be lost when the thin client is shut down or restarted.

The write filter cache contents are not lost when you log off and on again (as the same or a different user). You may disable the write filter cache after the new logon and still retain the changes.


Only the administrator has the necessary privileges to disable the write filter.

System date and time

The time service is set to Manual (Trigger Start). By default, the time service attempts to synchronize its time with the Microsoft time server (time.windows.com) every seven days. If the thin client is joined to a domain, the service tries to sync its time with an available DC or an NTP server, if one is available.

To open the system date and time properties:

- ▲ Open the **Control Panel** and select **Date and Time**.

 **NOTE:** The only thing you can change in the modern UI is the time zone.

Local drives

The following sections describe the local drives located on the thin client. In the modern UI, type `Computer` and click the **Computer** tile.

Drive Z


Drive Z is the onboard volatile memory (RAMDRIVE) on the logic board of the thin client. HP recommends that you do not use this drive to save data that you want to retain. For RAMDisk configuration instructions, see [HP RAMDisk Manager on page 18](#). For information about using the Z drive for roaming profiles, see [Roaming profiles on page 9](#).

Drive C and flash

Drive C is in the onboard flash drive. HP recommends that you do not allow the free space on Drive C to drop below 10% of the flash size.

A write filter is used by the thin client for security and to prevent excessive flash write activity. Changes to the thin client configuration are lost when the thin client is restarted unless the write filter is disabled. See [HP Unified Write Filter on page 16](#) for instructions to disable the cache. Enable the write filter when you do not want permanent changes.

Saving files

 **CAUTION:** The thin client uses an embedded operating system with a fixed amount of flash memory. HP recommends that you save files that you want to retain on a server rather than on the thin client. Be careful of application settings that write to the C drive, which resides in flash memory (in particular, many applications by default write cache files to the C drive on the local system). If you must write to a local drive, change the application settings to use the Z drive. To minimize writing to the C drive, update configuration settings as described in [User accounts on page 10](#).

Mapping network drives

You must be logged on as Administrator to map network drives.


To retain the mappings after the thin client is restarted:

1. Disable the write filter cache during the current boot session.
2. Select **Reconnect at Logon**.

You can also assign the remote home directory by using a user manager utility.

Roaming profiles

Write roaming profiles to the C drive. The profiles need to be limited in size and will not be retained when the thin client is rebooted.

 **NOTE:** For roaming profiles to work and be downloaded, there must be sufficient flash space available. In some cases, it may be necessary to remove software components to free up space for roaming profiles.

User accounts

This section describes how to create a new user account and user profile.

User profiles

A new user's profile is based on the Default User profile template, which includes policies similar to the factory-defined Administrator account. This new account will default to membership within the local Users group. If the Default User profile settings are changed from those set at the factory, the changed settings are automatically applied to any newly created user profile—local or domain. Any local accounts created or cached domain accounts logged into this device prior to changes made to the Default User profile are unaffected by these changes—only accounts logged in or cached after the changes are affected.

For a new user to match the characteristics of the predefined User account, the Administrator must add the new user to the Power Users group; otherwise, the new user will not be able to add a local printer. The user's actions are still limited while the user is in the Power Users group. The Administrator may also want to apply specific Windows policies to the new account to restrict certain actions or behaviors.

Creating a new user account

You must log on as Administrator to create user accounts locally or remotely. HP recommends keeping the number of additional users to a minimum because of local flash and disk space constraints.

To add a user:

1. Access the **Settings** charm > **Change PC settings** and select **Users**.
2. Select **Add a user** and follow the on-line instructions to create the user and user profile.

User Accounts utility

The User Accounts utility allows the administrator to create, delete, and maintain user accounts.

To access the User Accounts utility:

- ▲ Open the **Control Panel** and select **User Accounts**.

Keyboard, regional, and language options

To set keyboard, regional, and language options:

- ▲ Open the **Control Panel**. Select the **Keyboard**, **Region**, and **Language** apps and set the desired configuration.

The keyboard, region, and language options are preset at the factory. Should you need to make a change, the keyboard language selection is made through the Language applet in the Control Panel. From this program, you can select the type of keyboard you are using as well as the layout/Input Method Editor (IME) settings. Click Options in the right column to see the available IME options.

Administrative tools

To gain access to the available administrative tools:

- ▲ Open the **Control Panel** and select **Administrative Tools**.

Wireless network configuration

To add a wireless network:

1. Access the **Settings** charm and select the wireless icon.
2. Select the network from the list of available Wi-Fi networks.

5 Applications

The latest WES image has the following preinstalled applications:

- [Windows Firewall on page 12](#)
- [Citrix Receiver Client on page 13](#)
- [Microsoft RDC on page 13](#)
- [HP Remote Graphics Software Receiver on page 13](#)
- [HP TeemTalk terminal emulation on page 13](#)
- [VMware Horizon View Manager on page 14](#)
- [HP ThinState on page 14](#)
- [Windows Internet Explorer 10 on page 15](#)
- [Windows Media Player on page 15](#)
- [Enterprise features in Windows Embedded 8 Standard on page 15](#)
- [HP Velocity on page 15](#)
- [PDF Complete on page 15](#)

Additional applications in the form of add-ons are provided and can be downloaded from the HP website.

Check the HP support site for these applications or for other important updates or documentation: <http://www.hp.com/support>. Select the country/region from the map, then select **Product Support & Troubleshooting** or **Drivers & Software**. Type the thin client model in the field and click **Search**.

Windows Firewall

The HP WES 8 image includes the Windows Firewall.

To configure firewall settings:

- ▲ Open the **Control Panel** and select **Windows Firewall**.

For more detailed information about the firewall, visit <http://www.microsoft.com/>.

Citrix Receiver Client

The Citrix Receiver Client (Citrix on-line Plug-in) is used where Citrix Presentation Server or XenApp is deployed with Web Interface. This client enables placing icons on the desktop of the thin client for seamless integration of published applications.

To access Citrix Receiver:

- ▲ Type `Citrix` in the modern UI or select **Citrix Receiver** in **All Apps**.

Documentation for the Citrix Receiver application is available from the Citrix Corporation website at <http://www.citrix.com>.

Microsoft RDC

Use the RDC application to establish a connection to a Windows Terminal Server or to access a remote application using RDP.

Refer to the Microsoft website for a detailed explanation and instructions on how to use the RDC application.

- ▲ Type `Remote Desktop` in the modern UI or select **Remote Desktop Connection** in **All Apps**.

HP Remote Graphics Software Receiver

Remote workstations are breaking free of network limitations with HP Remote Graphics Software (RGS). HP RGS is the collaboration and remote desktop solution for serious workstation users and their most demanding applications. All applications run natively on the remote workstation and take full advantage of its graphics resources. The desktop of the remote workstation is transmitted over a standard network to a window on a local computer using advanced image compression technology specifically designed for digital imagery, text, and high frame rate video applications. A local keyboard and mouse are supported, as well as redirection of most USB devices to provide an interactive, high-performance workstation experience.

The RGS Receiver is included in the latest HP thin client WES image. Visit <http://www.hp.com/go/rgs> for information on RGS Sender licensing, installation, and use.

- ▲ Type `RGS` in the modern UI or select **HP RGS Receiver** in **All Apps**.

HP TeemTalk terminal emulation

All WES-based thin client models include terminal emulation software to support computing on legacy platforms. The software uses the Telnet protocol to communicate with the computing platform. Refer to the terminal emulation documentation (supplied separately) for instructions. To access HP TeemTalk:

- ▲ Type `TeemTalk` in the modern UI or select **TeemTalk** in **All Apps**.

VMware Horizon View Manager

View Manager, a key component of VMware Horizon View, is an enterprise-class desktop management solution, which streamlines the management, provisioning, and deployment of virtual desktops. View Manager provides secure and easy access to virtual desktops, terminal servers, blade PCs, and remote physical PCs hosted on VMware infrastructure.

For additional information and to obtain the latest VMware Horizon View client, contact VMware or see <http://www.vmware.com/products/view>.


- ▲ Type `VMware` in the modern UI or select **VMware** in **All Apps**.


HP ThinState

The HP ThinState Capture tool is a very simple wizard-based tool that you can use to capture an HP thin client WES image, which you can then deploy to another HP thin client of identical model and hardware.

You need:

- An HP WES-based thin client that contains the latest HP-provided image.
- An HP-qualified USB flash drive (Disk-On-Key). Consult the thin client quick specs for the latest approved USB flash drives.

 **CAUTION:** By default, the First Boot Device in the F10 System BIOS is first set to USB, then ATA Flash, and finally to Network boot. If the default boot order settings have been changed, it is critical that you set the First Boot Device in the Advanced BIOS Features section of the F10 System BIOS to USB before using the HP ThinState Capture tool.

 **NOTE:** HP ThinState Capture now uses `ibrpe.exe` for imaging. Any flash drives created containing `ibr.exe` can no longer be used.

HP ThinState Capture

To perform an HP ThinState capture:

1. Disable the write filter prior to launching the ThinState Capture tool.
2. At the **Welcome** screen, click **Next** and follow the onscreen instructions.

You can use the USB flash drive to deploy the captured image to another HP thin client of the exact same model and hardware.

HP ThinState Deploy

To perform an HP ThinState deployment:

1. Set the boot order in the F10 System BIOS to **USB boot**.
2. Attach the USB flash drive to the thin client unit you wish to deploy the captured image to, and then power on the unit.
3. Follow the onscreen instructions.

After you remove the USB flash drive and cycle power to the system, the image will unbundle. This process can take 3–5 minutes, depending on flash drive speed and internal flash size. Do not interrupt or cycle power to the unit during this process.

Windows Internet Explorer 10

The Windows Internet Explorer browser is installed locally on the thin client. The factory settings for the browser options limit writing to the flash memory. These settings prevent exhaustion of the limited amount of flash memory available and should not be modified. You may access another browser through an ICA or RDP account if you need more browser resources.

Internet Explorer provides a built-in facility to manage pop-up windows, prevents scripts from moving or resizing windows and status bars—to hide them or obscure other windows—and includes a block unsafe file transfers feature. For more information, go to <http://www.microsoft.com>.

Windows Media Player

The latest Windows Media Player contains security, performance, and functionality improvements. For more information about improvements to Windows Media Player, refer to the Windows Media Player home page at <http://windows.microsoft.com/en-US/windows/products/windows-media-player>.

Enterprise features in Windows Embedded 8 Standard



NOTE: An additional volume license must be obtained from Microsoft to enable these features.

- AppLocker
- BranchCache
- DirectAccess
- Sideloading
- Services for Network File System (NFS)

For detailed information, go to <http://www.microsoft.com>.

HP Velocity

HP Velocity is a quality of service (QoS) system that dramatically improves the user experience for real-time, networked applications by reducing packet loss on IP-based networks used to carry the application traffic.

For more information, go to <http://www.hp.com/go/velocity>.

PDF Complete

PDF Complete Special Edition enables you to view, search, and print existing PDF documents and to copy PDF documents to the clipboard.

For more information on this application, go to <http://www.pdfcomplete.com>.

6 Control Panel extended selections

To access the Control Panel:

- ▲ Type `Control Panel` in the modern UI.

Some of the extended selections available on the Control Panel are discussed in the following sections:

- [HP Unified Write Filter on page 16](#)
- [HP RAMDisk Manager on page 18](#)

HP Unified Write Filter

HP Unified Write Filter (UWF) is a new feature for WES 8, and is not available as part of Windows 8. UWF integrates the functionality previously available in Enhanced Write Filter (EWF), File-Based Write Filter (FBWF), and Registry Filter in WES 7.

UWF is a sector-based write filter that you can use to protect your storage media. UWF intercepts all write attempts to a protected volume and redirects those write attempts to a virtual overlay. This improves the reliability and stability of your device and reduces the wear on write-sensitive media, such as flash memory media like solid-state drives. You can also use UWF to use read-only media to start and run WES 8.

With UWF, you can specify that certain files, directories, or registry keys are excluded from being filtered. Excluded files and directories are tracked in a file exclusion list, and excluded registry entries are tracked in a registry exclusion list. Writes to items in an exclusion list are written directly to the protected volume.

HP UWF command-line tool

WES 8 includes the UWF command-line tool, `uwfmgr.exe`. It helps to configure and retrieve settings for UWF.

The use of `uwfmgr.exe` and the corresponding commands are enabled by default. To access the UWF command-line tool:

- ▲ Type `command` in the modern UI and type `uwfmgr.exe` in the Command Prompt.

HP UWF GUI tools

In addition to the command-line tool, HP WES 8 image includes two HP UWF GUI tools providing a subset of UWF command-line tool functions to help customer do UWF common settings in a convenient way.

The two GUI tools are UWF System Tray and HP Write Filter Configuration.

HP UWF System Tray

The HP UWF System Tray is located in the notification area of the taskbar on the traditional desktop. The tray icon shows the status of the UWF: a red lock when UWF is disabled, a green lock when UWF is enabled, and a yellow lock when the state is set to change on the next restart.



Status	Description
Red Open Lock	Disabled
Green Lock	Enabled
Yellow Lock	To be changed by restarting
Yellow Lock with Red 'X'	UWF Corrupted (UWF is not usable on the computer)

If you are logged-on as Administrator, you can change the status of the UWF by right-clicking the icon and selecting the desired UWF state.

HP UWF Configuration

The HP UWF Configuration can be accessed only on the administrator account.

To access the HP UWF Configuration:

1. Log on as an administrator and open the traditional desktop.
2. Use the **Settings** Charm, open the **Control Panel**, and select **HP Unified Write Filter Configuration**.

Or

Double-click the **HP UWF System Tray**.

HP UWF Configuration is a property sheet with four property tabs:

- **General**

The General property tab contains the general UWF settings. You can choose to enable/disable UWF or enable/disable UWF Servicing mode for next reboot session.

- **UWF Main**

The UWF Main property tab contains the basic UWF configuration information. Use it to customize the threshold size and configure the Low Memory (cache consumption) warning with the appropriate percentage values.

- **File Exclusion List**

The File Exclusion List property tab contains the UWF file exclusion list. Use it to add or remove files from UWF protection.

- **Registry Exclusion List**

The Registry Exclusion List property page containing the UWF Registry exclusion list. Use it to add or remove registry entries from UWF protection.

HP RAMDisk Manager

The RAMDisk is volatile memory space set aside for temporary data storage. It is the Z drive shown in the My Computer window.

The following items are stored on the RAMDisk:

- Browser web page cache
- Browser history
- Browser cookies
- Browser cache
- Temporary Internet files
- Print spooling
- User/system temporary files

You can also use the RAMDisk for temporary storage of other data (such as roaming profiles) at the administrator's discretion (see [Local drives on page 9](#)).

Use the HP RAMDisk Manager dialog box to configure the RAMDisk size. If you change the size of the RAMDisk, you will be prompted to restart for changes to take effect. To permanently save the change, make sure to disable the write filter cache before restarting.



NOTE: The default RAMDisk size is set to 256 MB. The maximum RAMDisk size that you can set with the HP RAMDisk Manager depends upon the total RAM in the system. At 4 GB RAM, the maximum is 512 MB. The minimum is 16 MB. When installing an application that requires greater than 256 MB, you may want to temporarily increase the size of the RAMDisk..

7 Administration and image upgrades

This section highlights and discusses the remote administration capabilities and firmware upgrade methods applicable to HP thin clients.

HP Device Manager

HP Device Manager (HPDM) is a server-based application that provides centralized administration capabilities for HP thin client devices. It accesses the thin client through the HPDM Agent that is embedded in the standard thin client WES image to enable HPDM to manage devices out-of-the-box (HPDM Agents on older devices, however, may need to be upgraded).



NOTE: HP Device Manager on WES8 has limited functionality. Check for an update for full functionality on WES 8.

For additional information concerning HPDM, please check the HP support site for these applications or for other important updates or documentation: <http://www.hp.com/support>. Select the country/region from the map, then select **Product Support & Troubleshooting** or **Drivers & Software**. Type `HP Device Manager` in the field and click **SEARCH**.

HP ThinState Capture and Deploy

The HP ThinState Capture tool is a very simple wizard-based tool that can be used to capture an HP thin client WES image, which can then be deployed to another HP thin client of identical model and hardware. For more information about the HP ThinState Capture tool, see [HP ThinState on page 14](#).

HP add-ons

If you want to install an add-on module, you can use HPDM to manage the thin client or go to <http://www.hp.com/support>. Disable/enable the write filter as needed to save the changes.

8 Peripherals

Depending on the ports available, the thin client can provide services for USB, serial, parallel, and PCI devices, as long as the appropriate software is installed. Factory-installed software is described in the following section. As they become available, you can install add-ons for other services using HPDM solution software. For more information, see [HP Device Manager on page 19](#).

For more information about available peripherals, go to <http://www.hp.com/support> and search for the specific thin client model. Select the model, and then select **Product overview** below it. On the **Specifications** tab, click the **QuickSpec html** or **pdf** link.

Printers

A generic universal print driver is installed on the thin client to support text-only printing to a locally connected printer. To print full text and graphics to a locally connected printer, install the driver provided by the manufacturer and follow the manufacturer's instructions. Be sure to disable the write filter cache to save the installation. You can print to network printers from ICA and RDP applications through print drivers on the servers.

HP Universal Print Driver

The HP Universal Print Driver (UPD) simplifies the management of your printers—making it easier to use, support, certify, and deploy HP LaserJet devices in your environment. Driver management is simple with a single-driver solution.

The HP UPD is preinstalled on WES 8 images. This driver supports PCL 6 and Postscript. For detailed information, go to <http://www.hp.com/go/upd>.

Adding printers using generic text-only print driver

Follow these steps to add a printer using the text-only print driver:

1. Connect the printer to the parallel port.
2. Open the **Control Panel**, select **Devices and Printers**, click **Add a device**, and follow the onscreen instructions.

Using manufacturer print drivers

Install the driver provided by the manufacturer and follow the manufacturer's instructions. Be sure to disable the write filter to save the installation.

Audio

You can redirect audio from applications to the audio jacks on the thin client.

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