This document is a guide for users of the Citrix XenClient 2.1 release.
Table of Contents

1. Introduction .......................................................................................................  1

2. Installation .........................................................................................................  2
   2.1. Hardware Requirements ..................................................................................  2
   2.2. Supported Operating Systems .........................................................................  2
   2.3. Installing XenClient ..........................................................................................  2
       2.3.1. Configuring your Device BIOS Settings .........................................................  2
       2.3.2. Installing or Upgrading ................................................................................  4
       2.3.3. Upgrading XenClient Over a Network Using Citrix Receiver for XenClient ..........  6
       2.3.4. Installing XenClient Over a Network Using Preboot eXecution Environment (PXE)....  7
       2.3.5. Updating XenClient Software on VMs in an Upgraded XenClient Installation ..........  7

3. How XenClient Allocates Resources to VMs ......................................................  8
   3.1. CPU ..................................................................................................................  8
   3.2. RAM ...................................................................................................................  8
   3.3. GPU ...................................................................................................................  8
   3.4. Network and Internet Connections ....................................................................  8
   3.5. USB Devices .....................................................................................................  8
       3.5.1. External Optical Media Drives ......................................................................  9
       3.5.2. USB Keyboards and Pointing Devices .............................................................  9
       3.5.3. Other USB Devices ...................................................................................... 10
       3.5.4. Composite USB Devices .............................................................................. 10
       3.5.5. Internal USB Devices .................................................................................. 10
   3.6. Optical Media Sharing ...................................................................................... 11
   3.7. Hard Drive Disk Sharing ................................................................................... 11
   3.8. Manufacturer-Specific Device Features ............................................................ 11
   3.9. External Monitors and Docking Stations ............................................................ 11

4. Using XenClient ................................................................................................ 13
4.1. Installing VMs on XenClient ..........................................................14
4.2. Configuring Networks for the XenClient Device .......................................16
4.3. Switching Between VMs .............................................................. 18
4.4. VM Details ..................................................................................18
4.5. VM Power Controls ......................................................................20
4.6. Working With VMs .......................................................................21
4.7. 3D Graphics Support ......................................................................22
4.8. Secure Application Sharing and Citrix Receiver .....................................23
   4.8.1. Installing Secure Application Sharing and Citrix Receiver ......................24
4.9. Working With a Synchronizer Server ..................................................25
   4.9.1. Registering a XenClient Device With a Synchronizer Server .......................25
   4.9.2. VM Image Modes .....................................................................26
   4.9.3. Uploading a VM .....................................................................26
   4.9.4. VM Backups and Updates .........................................................27
5. Troubleshooting ..............................................................................28
   5.1. Installation Troubleshooting .........................................................31
Installing XenClient Over a Network Using PXE ..................................33
XenClient Administration Tasks ............................................................43
   1. Controlling Which Applications Can Be Shared ..................................43
Licenses ..................................................................................................45
   1. Intel Graphics and Sound Drivers ..................................................45
      1.1. INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User) 45
      1.2. DISCLAIMER ........................................................................47
   2. Intel Wireless Drivers .......................................................................48
   3. 3rd Party Copyrights .......................................................................49
   4. BSD License Variants ......................................................................54
      4.1. 4-clause License (original "BSD License") ............................................54
4.2. 3-clause License ("New BSD License") ................................................................. 55
4.3. 2-clause License ("Simplified BSD License" or "FreeBSD License") .................. 55

Index .................................................................................................................................... 56
Chapter 1. Introduction

Citrix XenClient is a high-performance, bare-metal hypervisor that runs directly on the client device hardware, dividing up the resources of the machine and enabling multiple operating systems to run side by side in complete isolation.

XenClient can run stand-alone, but working together with Synchronizer, the server-based application for IT administrators to manage XenClient virtual machine (VM) images, users, and their XenClient devices, XenClient provides a safe, secure and simple way to provision and administer virtual machine (VM) images, combining performance with ease of use.

Together with Synchronizer, XenClient provides the capacity to radically simplify the deployment and maintenance of VM images and applications to users in a way that provides secure computing and ease of use for users and administrators alike. By enabling multiple operating systems to be installed on a single computer and providing the ability to switch between running operating systems in real time, a user can, for example, have a single computer for both home and office use, with each operating system securely isolated from the other. Additionally, user data can be separated from system data, and the system data refreshed from a single location on a regular basis. This ensures the performance and great user experience of a fresh installation each day, and ease of patch deployment and operating system updates for IT administrators.

Synchronizer is described in detail in the 2.1 Synchronizer Setup and Usage Guide.

The XenClient software is based on bare metal 64-bit Xen virtualization technology. It can be thought of as a software layer that acts as an intermediary between virtual machines (VMs) running on the device and the physical hardware. This allows you to run multiple VMs on a single device simultaneously, and switch between them in real time. The hypervisor layer controls the resources of the physical machine (CPU, RAM, GPU, disk, and so on) and allocates them to VMs according to your settings.

XenClient management capabilities are provided by Citrix Receiver for XenClient. The Citrix Receiver for XenClient user interface is displayed after the XenClient software has been installed and the device has been rebooted to guide you through the process of installing VMs. VMs can be installed using CD or DVD disks, over the network, or by downloading a VM image from Synchronizer. Citrix Receiver for XenClient also provides an easy-to-use network configuration utility, the ability to start, stop and hibernate VMs, and to interact with Synchronizer.

Once you have installed the VMs you want to run on your device and started them, switching between running VMs is as easy as using a keystroke (for example, Ctrl+<2>) or using the XenClient switcher bar, which appears when you click the black bar in the middle of the top of the VM screen.
Chapter 2. Installation

This chapter explains how to install XenClient.

2.1. Hardware Requirements

XenClient runs on the 64-bit hardware platforms listed at the Citrix Ready Products for XenClient website. The additional recommendations are:

- 4GB or more memory (RAM) recommended
- 80GB or more disk drive space recommended

**Note**

XenClient does not support the use of non-symmetric RAM DIMMs.

2.2. Supported Operating Systems

XenClient supports the installation of the following operating systems:

- Microsoft Windows 7 32-bit SP1
- Microsoft Windows 7 64-bit SP1
- Microsoft Windows Vista 32-bit SP3
- Microsoft Windows XP 32-bit SP3
- Ubuntu 11.04 32-bit (experimental)

2.3. Installing XenClient

The first step in installing XenClient is to ensure that your computer has the correct BIOS settings. As a general rule, please ensure that:

- SATA is set up to use AHCI mode.
- Intel (R) Virtualization Technology is enabled.
- The Intel (R) VT-d and VT-x features are enabled.
- Trusted Execution Technology (TXT) and the Trusted Platform Module (TPM) are disabled.

**Note**

TXT and TPM support is available in the XenClient XT product.

With most systems, enabling Virtualization Technology or Intel Virtualization Technology (vPro) in the BIOS will enable both VT-x and VT-d capabilities. In other systems, these may be two separate settings. Please ensure that both are enabled.

2.3.1. Configuring your Device BIOS Settings

The following procedures serve as guides to setting up a Lenovo, Dell, HP, Panasonic or Fujitsu devices.
Note

As device models evolve, the BIOS interfaces are sometimes changed. If in the following procedures a specified setting does not appear where stated, it has probably been moved under another category.

To Prepare a Lenovo Device for Installation:

1. While the machine is booting, press the blue ThinkVantage button and then F1.
2. Set Config > CPU > Intel Virtualization Technology to Enabled.
3. Set Config > CPU > Intel VT-d feature to Enabled.
5. Set Serial ATA (SATA) > SATA Controller Mode Option to AHCI.
6. If the machine has a physical wireless switch, make sure that it is set to turn wireless on.

To Prepare a Dell Device for Installation:

1. While the machine is booting, press F12 and select BIOS Setup.
2. Set System Configuration > SATA Operation > AHCI.
4. Set Virtualization Support > VT for Direct I/O > Enable VT for Direct I/O.
5. Ensure that the Virtualization Support > Trusted Execution checkbox is not checked.
6. Ensure that the Security > TPM Security checkbox is not checked.
7. Ensure that the Power Management > Wireless Radio Control > WLAN checkbox is not checked.
8. Ensure that the Power Management > Wireless Radio Control > WWAN checkbox is not checked.
9. Set Wireless > Wi-Fi Catcher to Disabled.
10. If the machine has a physical wireless switch, make sure that it is set to turn wireless on.

To Prepare an HP Device for Installation:

1. Press Esc and then F10 while the machine is booting to enter BIOS setup.
2. Set System > System Configuration > Virtualization Technology > Enabled.
3. Set System > System Configuration > SATA Device Mode > AHCI.
4. Set System > System Configuration > TXT Technology > Disabled.
5. Press the WiFi icon so it changes color from red to blue.

To Prepare a Panasonic Device for Installation:

1. Press F2 while the machine is booting to enter BIOS setup.
2. Set Advanced > Intel (R) Virtualization Technology > Enabled.
3. Set Advanced > Intel (R) VT-d > Enabled.
4. Set Advanced > Intel (R) Trusted Execution Technology > Disabled.

To Prepare a Fujitsu Device for Installation:

1. Press Enter while the machine is booting and select BIOS setup.
2. Set Advanced > CPU Features > Virtualization Technology > enabled.

3. Set Advanced > CPU Features > Intel (R) VT-d > Enabled.

4. Set Advanced > CPU Features > Intel (R) TXT > Disabled.

2.3.2. Installing or Upgrading

See Section 1: “Known Issues” in Citrix® XenClient™ 2.1 Release Notes for any known issues that might affect your installation.

**Important**

Before upgrading XenClient, ensure that all VMs on the XenClient device are shut down.

XenClient offers two installation modes: quick installation or advanced installation. Use the arrow keys and the Enter key to navigate through the installation wizard. Press Esc to go back a step.

**To Perform a Quick Install or Upgrade:**

Quick install does not include the option to register with a Synchronizer server, or to enable ssh access to the control domain. If you choose Quick install and later decide to use Synchronizer you can connect to your Synchronizer server using Citrix Receiver for XenClient.

1. Boot from the XenClient installation media or network in the case of a PXE boot setup.

2. Choose Quick install.

3. Choose OK and review the software license.

4. Choose OK and Yes to accept the terms of the license.

5. Select the language and choose Select.

6. Select the keyboard layout of the device and choose Select.

7. Choose the location of your installation media:
   - For CD or DVD installation, select CD-ROM.
   - For installation from a location on the network, select Network. You will be prompted to choose the protocol (FTP or HTTP) to use to transfer the installation files and the location of the directory containing the installer.iso file on the network.
   - For installation from a USB device, select USB. XenClient will search for an attached USB device that contains the installer.iso file.
   - For installation from an iSCSI LUN, select iSCSI. You will be prompted to choose whether to use DHCP for networking or a Static IP, and any configuration required. You are then prompted for the location of the iSCSI LUN and a username and password if authentication is required. If you booted the device using iSCSI, the values already entered on the system will be used.

   In all cases the installer.iso file from the XenClient installation CD must be present in the chosen location. For iSCSI or USB installation media, the iso file must be written directly to the USB device or iSCSI LUN. The following uses dd to achieve this for a mounted USB drive:

   ```
   dd if=install.iso of=/dev/sdb
   ```

8. Choose Verify to ensure that the installation media is valid and uncorrupted, or Skip.

9. If an existing XenClient installation is detected, you are presented with the option to Upgrade or perform a Fresh Install. If you select Upgrade, XenClient will be upgraded to the new version of the software and your existing
settings and VMs preserved. When the upgrade is complete, you are prompted to reboot. If you choose Fresh Install, the installation procedure continues below.

10. You are warned that the hard drive partition will be overwritten. Select Continue.

11. Next you are prompted to provide a password for the system. You will need this password to log in to the control domain and generate status reports or perform other diagnostics. Enter the password and choose OK.

12. You are then prompted to confirm your password by entering it again. Enter the password and choose OK.

13. The installation commences, and a progress bar is displayed. When the installation has completed, choose Continue and then Reboot to reboot the machine.

14. When the device has rebooted the Citrix Receiver for XenClient is displayed. If you have performed an upgrade from a previous version of XenClient, update the XenClient software on your VMs as described in Section 2.3.5: “Updating XenClient Software on VMs in an Upgraded XenClient Installation”.

To Perform an Advanced Install or Upgrade:

1. Boot from the XenClient installation media.
2. Choose Advanced Install.
3. Choose OK and review the software license.
4. Choose OK and Yes to accept the terms of the license.
5. Select the language and choose Select.
6. Select the keyboard layout of the device and choose Select.
7. Choose the location of your installation media:
   - For CD or DVD installation, select CD-ROM.
   - For installation from a location on the network, select Network. You will be prompted to choose the protocol (FTP or HTTP) to use to transfer the installation files and the location of the directory containing the installer.iso file on the network.
   - For installation from a USB device, select USB. XenClient will search for an attached USB device that contains the installer.iso file.
   - For installation from an iSCSI LUN, select iSCSI. You will be prompted to choose whether to use DHCP for networking or a Static IP, and any configuration required. You are then prompted for the location of the iSCSI LUN and a username and password if authentication is required. If you booted the device using iSCSI, the values already entered on the system will be used.

In all cases the installer.iso file from the XenClient installation CD must be present in the chosen location. For iSCSI or USB installation media, the iso file must be written directly to the USB device or iSCSI LUN. The following uses dd to achieve this for a mounted USB drive:

```
dd if=install.iso of=/dev/sdb
```

8. Choose Verify to ensure that the installation media is valid and uncorrupted, or Skip to move to the next installation step.

9. If there is an existing XenClient installation detected, you are presented with the option to Upgrade or perform a Fresh Install. If you select Upgrade, click Continue to be upgraded to the new version of the software. Your existing settings and VMs preserved.

When the upgrade is complete, you are prompted to reboot. If you choose Fresh Install, the installation procedure continues below.

10. You are warned that the device hard drive will be overwritten. Select Continue.
Note

If you choose to upgrade from a previous version, please update the Citrix XenClient Tools on all VMs.

11. Choose Continue to begin the installation.

12. Next you are prompted to provide a password for the system. You will need this password to log in to the control domain and generate status reports or perform other diagnostics. Enter the password and choose OK.

13. You are then prompted to confirm your password by entering it again. Enter the password and choose OK.

14. Select Yes to enable remote access to the XenClient device over SSH. This allows you to connect directly to the XenClient hypervisor file system to perform diagnostic tasks.

15. Choose Register to enter a Synchronizer URL.

16. Enter the address of your Synchronizer server and click OK.

17. Enter the path to a root certificate to be used to authenticate your Synchronizer server, or leave the field empty if you do not want to specify a certificate. Choose OK.

If the Synchronizer server is configured to require Registration PINs, you are also prompted to enter the required PIN now. Enter the PIN provided by your system administrator.

If you do not want to register with a Synchronizer, choose Skip.

18. Choose Continue.

19. When the installation has completed, press Continue and then Reboot to reboot the machine.

20. Upon reboot, the Citrix Receiver for XenClient is displayed. If you have performed an upgrade from a previous version of XenClient, update the XenClient software on your VMs as described in Section 2.3.5: “Updating XenClient Software on VMs in an Upgraded XenClient Installation”.

2.3.3. Upgrading XenClient Over a Network Using Citrix Receiver for XenClient

XenClient Citrix Receiver for XenClient can be used to upgrade XenClient. The upgrade is initiated by entering the URL to the location of an installation package available over HTTP. The upgrade process first downloads the package, then prompts the user to restart the XenClient device. The device is then shutdown, the upgrade and installed, and then rebooted.

To Setup the Installation Package:

1. Copy the packages.main directory from the XenClient installation medium to a location accessible over HTTP.

2. Notify the users of the location of this directory. The user will manually enter the location when performing the upgrade.

To Upgrade XenClient Using Citrix Receiver for XenClient:

1. In Citrix Receiver for XenClient, click System > Software.

2. In the Software Update textbox, enter the location of the installation packages provided by your system administrator.

3. Click the Check for Update button. The Software Update dialog is displayed.

4. Click the Download button to download the installation packages.

5. Click Power > Restart to restart your system and install the Citrix Receiver for XenClient update.
2.3.4. Installing XenClient Over a Network Using Preboot eXecution Environment (PXE)

You can also install XenClient over the network using PXE. An example of how to set up PXE that uses PXELINUX is described in Appendix: “Installing XenClient Over a Network Using PXE”.

2.3.5. Updating XenClient Software on VMs in an Upgraded XenClient Installation

If you have upgraded your XenClient installation, you need to update the Citrix XenClient Tools and Secure Application Sharing software installed on the VMs on your XenClient device. To upgrade the Citrix XenClient Tools, first uninstall the existing Citrix XenClient Tools and then run the new Citrix XenClient Tools installer.

Note

If 3D Graphics Support is enabled on your VM, before upgrading the Citrix XenClient Tools, shut down the VM, disable 3D Graphics Support, then boot the VM.
Chapter 3. How XenClient Allocates Resources to VMs

Given that multiple VMs are using the same hardware, XenClient must manage this interaction. This chapter describes how XenClient handles shared hardware resources.

3.1. CPU

XenClient provides virtual CPUs (vCPUs) to the VMs running on it. XenClient automatically shares the computing load over the physical CPUs present on the XenClient device.

In general, VMs running more intense workloads (for example, anything multi-threaded or running in separate processes) should be assigned more vCPUs.

While it is possible to allocate more vCPUs to a VM than the number of physical CPUs on the XenClient hosting them, there is no advantage gained from doing so.

3.2. RAM

You can allocate available RAM to individual VMs. When a VM is started the specified RAM is hard-allocated to it. On shutting down the VM, the memory is freed and made available for other VMs to use. A certain amount of RAM is required for XenClient operation, so not all installed device RAM is available to be allocated to VMs.

3.3. GPU

The physical GPU can optionally be directly allocated to a single VM. This is part of the 3D Graphics Support experience, providing excellent graphics performance to your favored VM.

3.4. Network and Internet Connections

XenClient networking is handled on two levels: host-wide connectivity, and the connectivity of each individual VM. A wired or wireless connection is configured using Network Manager in Citrix Receiver for XenClient for the XenClient host. Each VM can then be configured individually to control the level of access to the network or networks that the host is connected to. All network traffic is routed through a single network interface at any given time. By default Network Manager sets up wired networking so that an address will be obtained by DHCP, if possible.

3.5. USB Devices

USB devices are handled differently according to their type. Human Interface Devices (HID) (for example, the mouse and keyboard) are directly connected to the XenClient platform and exposed in a secure manner to the VM that is currently in active use. Other USB devices, for example external disk drives and CD drives, would potentially suffer from contention issues if more than one VM attempts to write to them simultaneously. Because of this, XenClient attaches such devices to the VM that is being used when they are plugged in to the computer. You can also use Citrix Receiver for XenClient to assign a plugged-in USB device to a different VM.

Important

- Citrix recommends that you take care to eject USB devices as the operating system expects before assigning them to another VM. Not doing this causes XenClient to force-eject the USB device, which can lead to loss of data.
- Citrix highly recommends not updating the firmware or software of any device attached to a XenClient device over USB. Such updates have been known to fail and may render the device unusable.
Note

- Plugging a non-HID USB device into your XenClient computer while switched to Citrix Receiver for XenClient causes the USB device to be mounted in the hypervisor control domain by default. You can then assign the device to a VM using Citrix Receiver for XenClient.

- When using a non-HID USB device with a Secure Application Sharing application, the device must be plugged in when the VM that the application is running from is active and in focus. See Section 4.8: “Secure Application Sharing and Citrix Receiver” for information about Secure Application Sharing.

3.5.1. External Optical Media Drives

To enable the use of external USB optical media drives to install VMs using installation disks, external USB optical media devices behave differently from other USB devices. See the following table for information about how they behave. Examples of this type of device include:

- USB CD drive
- USB DVD drive

The following table describes how this type of USB device interacts with XenClient.

<table>
<thead>
<tr>
<th>Action</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug in and turn on your XenClient device</td>
<td>Device is not assigned to anything</td>
</tr>
<tr>
<td>Plug in when Citrix Receiver for XenClient is on the screen</td>
<td>Device is assigned to the control domain, and can be used to install VMs</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug in when a VM is on the screen</td>
<td>Device is assigned to the VM on screen</td>
</tr>
<tr>
<td>Plug in when previously assigned to a VM, without the Always checkbox checked in Citrix Receiver for XenClient</td>
<td>Device is assigned as per one of the previous 3 actions</td>
</tr>
<tr>
<td>Plug in when previously assigned to a VM, with the Always checkbox checked in Citrix Receiver for XenClient</td>
<td>The device is assigned to the VM it was previously assigned to if it is running, or when it is booted</td>
</tr>
</tbody>
</table>

3.5.2. USB Keyboards and Pointing Devices

When such a device is plugged in it can be used to control any virtual machine. For examples, keystrokes from a USB keyboard are directed to whichever VM is currently being displayed. A pointing device (for example, a mouse or trackpad) can alternately be assigned to a particular VM if desired, for example, to take advantage of pointing device functionality that is not passed through by XenClient. Doing this might take a short while to take effect if the VM that the device is assigned to does not yet have the required drivers to use the device. If you do assign a pointing device to a particular VM it will be made available to other VMs when the VM it is assigned to is shut down.
USB 3.0 pointing devices (mouse and keyboard) have been tested and found to work with XenClient. In addition to this most USB storage devices should work when attached to a USB 3.0 port. There is limited support for other devices. In particular, isochronous devices such as USB webcams are known not to work.

**Note**

- If you assign a pointing device to a particular VM, it will not be available for use in Citrix Receiver for XenClient or any other VMs.
- USB devices are released from a VM when the VM enters the sleep state.

### 3.5.3. Other USB Devices

The following table describes how this type of USB device interacts with XenClient.

<table>
<thead>
<tr>
<th>Action</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug in and turn on your XenClient device or plug in when Citrix Receiver for XenClient is on the screen</td>
<td>Device can be assigned to a VM</td>
</tr>
<tr>
<td>Plug in when a VM is on the screen</td>
<td>Device is assigned to the VM on screen</td>
</tr>
<tr>
<td>Plug in when previously assigned to a VM, without the <strong>Always</strong> checkbox checked in Citrix Receiver for XenClient</td>
<td>Device is assigned as per one of the previous 3 actions</td>
</tr>
<tr>
<td>Plug in when previously assigned to a VM, with the <strong>Always</strong> checkbox checked in Citrix Receiver for XenClient</td>
<td>The device is assigned to the VM it was previously assigned to if it is running, or when it is booted</td>
</tr>
</tbody>
</table>

### 3.5.4. Composite USB Devices

Composite USB devices expose interfaces to more than one USB device function. An example of this sort of composite device is a USB webcam with an integrated microphone. If you are using XenClient with Synchronizer, USB policy will only prevent you from using a composite USB device if all of the individual USB device functions are disallowed by assignment policy.

### 3.5.5. Internal USB Devices

Some built-in hardware devices present themselves to XenClient as USB devices. Examples of this type of USB device include built-in Bluetooth receivers and fingerprint readers. As this type of USB device is rarely unplugged (which in most cases would require physically altering the device), the following behavior occurs:

<table>
<thead>
<tr>
<th>Action</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>On XenClient boot, when previously assigned to a VM, without the <strong>Always</strong> checkbox checked in Citrix Receiver for XenClient</td>
<td>Device is unassigned</td>
</tr>
<tr>
<td>On XenClient boot, when previously assigned to a VM, with the <strong>Always</strong> checkbox checked in Citrix Receiver for XenClient</td>
<td>The device is assigned to the VM it was previously assigned to if it is running, or when it is booted</td>
</tr>
</tbody>
</table>
3.6. Optical Media Sharing

Optical media drives are not shared between VMs. When a disk is inserted, it is accessible from the VM that is in focus at the time. Other VMs are not able to access the disk contents and appear to have an empty optical media drive. To use the disk with a different VM, eject it, switch to the intended VM, and insert the disk.

3.7. Hard Drive Disk Sharing

XenClient uses a thin-provisioning strategy for VM virtual disks. This means that disk space is only taken up when the virtual disk is written to. It is therefore possible to assign more virtual disk space to VMs than is physically available, and equally possible to fill the entire hard drive should you take this approach. Please exercise caution not to end up in a position where a VM attempts to write to a full disk, as this can cause catastrophic XenClient failure.

To recover from the situation where you have filled the XenClient disk, follow the Procedure: “Recovering from a Full Disk”.

Note

Synchronizer does not support VM disks with multiple user-defined partitions.

3.8. Manufacturer-Specific Device Features

Supported XenClient devices often come with manufacturer-specific features, such as fingerprint readers, screen brightness control buttons, sound volume control buttons and so on. Some of these devices require software from the manufacturer to be installed in order to get them working correctly. Additionally, most of these features have not been designed for use with multiple VMs running on a device. For example, a sound volume level control button could conceivably increase the volume of all running VMs, or instead just increase the volume of the VM currently in focus, or alternately manipulate the sound volume of all running VMs to be the same as the new value for VM currently in focus. Conversely, when a user manipulates the volume of a VM from within the VM, the question arises whether this should affect the volume of the device as a whole and all the VMs currently running. As this example shows, even simple buttons to increase and decrease volume behave in very complicated fashion when multiple VMs are involved. Many manufacturer-specific devices are simply not designed to function on more than one VM.

XenClient provides the following features and guidance for using manufacturer-specific features:

• If a 3D Graphics Support VM is running, features are likely to work best when used when the 3D Graphics Support VM is in focus.

• For best results when running an 3D Graphics Support VM, pass through the manufacturer’s hardware and hardware information to the 3D Graphics Support VM.

• Some features will only work if passed through directly to a single VM. To do this, in the Advanced tab of the VM’s Details window, set Expose Physical OEM Hardware to Enabled. This will cause the feature to only work with that VM.

• Some features require software to be installed which can only be installed if the manufacturer’s hardware and hardware information passed through directly to a single VM. To do this, in the Advanced tab of the VM’s Details window, set Expose Physical OEM Hardware to Enabled and Expose Physical Hardware Information to Enabled. This will cause the feature to only work with that VM.

3.9. External Monitors and Docking Stations

XenClient supports attaching external monitors to mirror the laptop display. When hotplugging a monitor when a 3D Graphics Support VM is running, always switch to the 3D Graphics Support VM first before attaching the monitor.
The same applies when docking a XenClient device to a docking station. This ensures that optimal native resolutions are chosen for all screens.
Chapter 4. Using XenClient

When you start your XenClient device, the Citrix Receiver for XenClient UI is displayed. This is the user interface that allows you to manage your XenClient device and the VMs installed on it. Using Citrix Receiver for XenClient you can:

- Create VMs, edit VM properties, and delete VMs.
- Connect to Synchronizer, download, publish, and backup VMs.
- Set up networking.
- Control the power saving functions of VMs and the device as a whole.
- Manage XenClient device settings, including authentication, touchpad sensitivity and speed, and Citrix Receiver for XenClient wallpaper.
- Manage USB devices.

**Note**

If one or more VMs have been set to start automatically on device startup, you can return to Citrix Receiver for XenClient by either:

- Pressing Ctrl + 0.
- Clicking Home in the switcher bar located in the middle of the top of the VM display.

*Figure 4.1: “Citrix Receiver for XenClient With No VMs Installed”* shows XenClient as it appears before any VMs are installed.

*Figure 4.1. Citrix Receiver for XenClient With No VMs Installed:*
Legend for Figure 4.1: “Citrix Receiver for XenClient With No VMs Installed”

1. **Device power state button** Provides power controls for the device and the VMs running on it, allowing you to shut down, sleep, hibernate and restart XenClient and all the VMs running on it.

2. **Add VM button** Click here to create a new VM, or to download a VM from Synchronizer.

3. **System settings button** Click here to open the System Settings window. In the System Settings window you can control a variety of the properties of your XenClient device.

4. **Network button** Click here to set up wired and wireless networking for your XenClient device. You can control which networks each VM has access to by editing the VM properties.

5. **Battery power** Battery power gauge, which shows how much power is left in the case of a battery powered laptop.

6. **Create from Install Disc button** Click here to add a VM using an installation disk.

7. **Download from Synchronizer button** Click here to download a VM from Synchronizer.

### 4.1. Installing VMs on XenClient

You can create VMs on XenClient by using an installation disc, over the network, or by downloading a VM from Synchronizer.

**Note**

- If you are installing from an external optical drive that was connected to your XenClient device when XenClient booted, please unplug the optical drive and plug it in again before continuing.
- Installation using an external optical media device is not supported if your device has an internal optical media drive.
- XenClient only supports operating systems installed on the primary partition.

**To Create a VM Using an Installation Disc:**

1. Click **Add VM** and choose **Install from Disc**. The Create from Install Disc wizard is displayed.

2. Select the operating system type from the **Type** dropdown list.

3. Enter a name for the VM and an optional description, if desired. Select an icon to represent the VM.

4. Click the **Next** button.

5. Choose the amount of RAM to assign to the VM. See Section 3.2: “RAM” for more information about how XenClient handles device memory.

6. Choose the number of Virtual CPUs (VCPUs) to assign to the VM. See Section 3.1: “CPU” for more information about how XenClient handles VCPUs.

7. Click the **Next** button.

8. Select the size of the virtual disk to assign to the VM. See Section 3.7: “Hard Drive Disk Sharing” for more information about how XenClient handles virtual disks.

9. Select the wireless networking mode. The options are:

   - **Shared Wireless**, which gives the VM full access to the wireless network(s) that the XenClient host device is connected to using a wireless network card.
   - **Shared 3G (experimental)**, which gives the VM access to any 3G networks that the XenClient host device is connected to.

10. Select the wired networking mode. The options are:
• **Bridged**, which gives the VM full access to the networks that the XenClient host computer is connected to.

• **Shared**, which creates a private network on the Citrix Receiver for XenClient system and allows outgoing connections using NAT (Network Address Translation). In this case, incoming connections to the VM are not possible.

• **Internal**, which only allows for network communication between VMs.

**Note**

Bridged mode requires that each virtual NIC is appropriately configured. Either the physical network will have to provide DHCP to allow the interface to establish an IP address and associated configuration, or you will need to statically configure the network settings on that interface from within the VM.

11. Click the **Next** button.

12. If you would prefer to install the operating system at a later time, select the **Create VM & Install OS later** radio button.

**Warning**

If you are using a Windows installation disk that originated from a OEM supplier, do not start the VM automatically. You will first need to enable OEM installation for the VM so that system properties are presented in a manner that allows the OEM installation disk to verify that it is being installed on genuine hardware. See the Procedure: **“To Enable VM Installation from OEM Installation Media”** for information about how to do this.

13. Click the **Finish** button. Now that you have created a new VM, the next step is to install an operating system on it as described in the Procedure: **“To Install an Operating System onto a VM”**.

**To Enable VM Installation from OEM Installation Media:**

If you are installing Windows from an OEM version of the Windows installation media, use this procedure to enable OEM installation:

1. Hover your mouse over the VM icon and click **Details** to open the VM details window.
2. Click the **Advanced** menu item.
3. Click **Edit**.
4. From the **Allow OEM Windows installs** dropdown list, select **Enabled**.
5. Click **Save**.
6. Restart XenClient. When XenClient has restarted, start the VM and continue with the standard VM installation procedure.

**To Install an Operating System onto a VM:**

1. Insert the installation media into the optical media drive. For a network boot installation, skip to the next step.
2. Start the VM. The new VM takes focus and begins to boot into the operating system installation procedure. For a network boot, press **F12** (or the relevant key) and select the appropriate boot device.

**Note**

For security reasons the optical media drive is only accessible from one VM at a time. If a VM is running that has the optical drive assigned to it, it is necessary to shut down that VM before you can boot into the operating system installation medium.
3. Complete the operating system installation as you would do on a physical machine.

Note

Citrix recommends not enabling automatic Windows updates until you have installed the Citrix XenClient Tools.

4. When installation is complete, install the Citrix XenClient Tools by running `setup.exe` from the `xc-tools` disk, which is usually mounted as the `E:` drive. This installs high performance virtualization-aware drivers, the XenClient Switcher Bar to allow switching between the VMs using a mouse, and optionally the Secure Application Sharing functionality.

Warning

Installation of any software that uses low-level drivers to monitor disk operations before installing the Citrix XenClient Tools (for example, antivirus software) will result in problems when hibernating, rebooting, or shutting down the VM. The installation of the Citrix XenClient Tools is required for a VM to run on XenClient.

For an Ubuntu VM, first update the operating system software, and then install the `xenclient-linuxtools.deb` package.

5. For a Windows VM, run Windows Update.

6. Once the installation is complete and updates have been installed you can press **Ctrl + 0** to return to Citrix Receiver for XenClient.

You can now optionally enable 3D Graphics Support for this VM. Only one running VM can benefit from 3D Graphics Support technology. See Section 4.7: “3D Graphics Support” for more information.

To Install a VM from Synchronizer:

1. Ensure that you are connected to your Synchronizer server. See Section 4.9.1: “Registering a XenClient Device With a Synchronizer Server” for information about how to connect.

2. In Citrix Receiver for XenClient, click Add VM and choose Download From Synchronizer.

3. If you have not recently securely authenticated with Synchronizer you are prompted to provide your password.

4. The Download from Synchronizer wizard is displayed.

5. Click the Select a new VM radio button if you want to create a new VM, or the Restore VM from backup radio button to create a new VM from a VM backup.

6. For a new VM, click the VM you want to install. For a new VM from backup, select the VM and the VM backup version.

7. Click Finish.

8. Wait for the VM to download to XenClient. You can check the download progress in Citrix Receiver for XenClient by switching to VM detail view.

4.2. Configuring Networks for the XenClient Device

XenClient device networks can be used by all VMs installed on the XenClient device. Each individual VM can be configured to allow or disallow access to the configured networks. Use the Citrix Receiver for XenClient Network Manager to configure your XenClient device networks. See Chapter 4: “Using XenClient” for more information about Citrix Receiver for XenClient.
To Configure a Wired Network Connection for XenClient:

A wired connection is automatically created if the computer is plugged in to a network. To confirm that a wired connection exists:

1. In Citrix Receiver for XenClient, click the **Network** button. A list of available and already connected network connections is displayed.
2. Ensure that the **Wired Ethernet Connection** entry is not grayed out.

To Configure a Static IP Address for XenClient:

1. In Citrix Receiver for XenClient, click on the **Network** button and select **Edit Connections**... The **Network Connections** dialog is displayed.
2. Select the network to edit and click the **Edit** button. The **Editing <network_name>** dialog is displayed.
3. Click the **IPv4 Settings** tab.
4. Select **Manual** from the **Method** dropdown list.
5. Click the **Add** button.
6. Click in the **Address** field and enter the desired static IP address.
7. Click in the **Netmask** field and enter the desired netmask.
8. Click in the **Gateway** field and enter the desired gateway address.
9. Click in the **DNS Servers:** text box and enter the desired DNS server address.
10. Click the **Apply** button.

To Configure a Wireless Network Connection for XenClient:

1. In Citrix Receiver for XenClient, click the **Network** button.
2. Choose your preferred wireless network from the list and enter your security credentials.

To Import a Certificate for Use in Wireless Network Authentication:

1. In Citrix Receiver for XenClient, press **Ctrl + Shift + t** to open a control domain console window.
2. Run the following command to determine the IP address of the control domain:

   ```
   ifconfig
   ```

   The relevant IP address is named `brbridged`.
3. Copy the certificate to the control domain using the control domain IP address, for example:

   ```
   scp company.ca.cer root@10.80.249.175:/root
   ```

   On Windows you could use PSCP, the PuTTY Secure Copy client, or WinSCP to transfer the certificate to the control domain.
4. In the Citrix Receiver for XenClient console, run the following command:

   ```
   scpv4v <certificate_filename> uivm:/root/.gconf
   ```

   You will now be able to enter the path to the certificate in Network Manager when connecting to your wireless network. The certificate will be available in `/root/.gconf`.  

17
To Change a VM MAC Address:

1. In Citrix Receiver for XenClient, press Ctrl + Shift + t to open a control domain console window.
2. Run the command:

   ```
   xec-vm -n <vm_name> -c 0 set mac "<new_mac_address>"
   ```

4.3. Switching Between VMs

The XenClient Switcher bar is displayed when you click the small black bar in the middle of the top of your VM screen. You can use the switcher bar or one of the other methods listed below to switch between VMs.

To switch from Citrix Receiver for XenClient to a VM, you can:

- Press Ctrl + `<vm_switcher_key>`, for example, Ctrl + 1. This is known as the VM Switcher key. To return to Citrix Receiver for XenClient at any time, press Ctrl + 0.
- Click on a VM icon.

To switch between VMs, you can:

- Use VM Switcher keys.
- Click on a VM icon in the Switcher bar. You can also click Home to return to Citrix Receiver for XenClient.
- Press Windows Key + Alt to cycle through all running VMs, in a manner similar to the way Alt + Tab switches between Windows applications.

**Note**

The ability to switch between VMs is disabled when a VM with 3D Graphics Support enabled is booting, shutting down, or when logging in to it. This includes when Windows is installing updates before shutting down. See Section 4.7: “3D Graphics Support” for more information about 3D Graphics Support.

4.4. VM Details

Citrix Receiver for XenClient provides a simple intuitive interface that you can use to install, start and stop VMs. However, more powerful advanced options are also available that allow you to fine-tune and enhance your XenClient VM user experience.

**Figure 4.2. VM Icons:**

To access the advanced VM options, hover your mouse over a VM icon. The icon will increase in size. Then click the Details button.
Figure 4.3. Mouse over VM icon:

The VM details window is displayed.

Figure 4.4. VM Details Window:

1. **Power controls** allow you to shut down, reboot, sleep or hibernate the VM.
2. **Synchronizer controls** Click **Upload VM** to upload a new version of the VM. The VM must be shut down for this function to be used. Click **Check Now** to check for available VM updates.
3. **Add Device** Click here to attach a USB device to the VM.

4. **Delete VM** Click this button to delete the VM. The VM must be shut down before this button is active.

5. **General** Contains the VM name, description, allocated memory and VCPUs. Enabling **Autoboot** causes the VM to be started automatically when you start your XenClient device. Setting **Tools CD** to **Attached** mounts the Citrix XenClient Tools installer as an extra optical drive in the VM so that you can easily install the Citrix XenClient Tools on a new VM. A reboot may be required for this setting to take effect.

6. **Devices** Allows you to assign USB devices to VMs.

7. **Hardware** Allows you to view and edit various hardware settings, such as 3D Graphics Support graphics, networking, and memory.

8. **Power** Allows you to edit VM power management.

9. **Icon** Allows you to select a VM icon.

10. **Advanced** Allows you to change advanced VM features.

   **Note**

   Some settings may not be editable if the policy set in Synchronizer for this VM does not allow it. Some settings can also only be changed when the VM is powered off.

4.5. **VM Power Controls**

When a VM is running, Citrix Receiver for XenClient displays a set of power and configuration controls.

**Figure 4.5. VM Power Controls:**

![VM Power Controls Image]

**Force Shut Down** performs a hard shut down of the VM, similar to disconnecting the power source from a bare metal device. **Shut Down, Reboot and Hibernate** perform the same function as if they were initiated from within the VM. You can also use any one of the following combinations to achieve the power action effect you desire:
Click a VM icon  
This will start the VM if it is not already started.

Shift + click a VM icon  
This will start the VM without switching focus to it.

Shift + click a Start icon  
This will start the VM without switching focus to it.

The Autoboot property controls whether this VM is started automatically when the XenClient device is started. The Power Down property controls whether the XenClient device is shut down automatically when the VM is shut down.

Note
Sleeping a 3D Graphics Support VM is equivalent to sleeping the entire device, except that the other VMs are not put into the sleep state. Attempting to switch away from a sleeping 3D Graphics Support VM results in the 3D Graphics Support VM leaving the sleep state.

4.6. Working With VMs

This section contains procedures for working with VMs.

To Edit VM Properties:
1. Hover your mouse over the VM icon and click Details to open the VM details window.
2. Click the relevant tab.
3. Click Edit and make your changes.
4. Click Save. Most configuration items only take effect on the next boot of the VM.

To Delete a VM:

Use the following procedure to delete a VM.

Warning
There is no way to recover a deleted VM.

1. Shutdown the VM.
2. Hover your mouse over the VM icon and click Details to open the VM details window.
3. Click Delete, and confirm that you want to delete the VM.

To Assign a USB Device to a VM:
1. Ensure that the VM you want to assign the USB device to is running.
2. Hover your mouse over the VM icon and click Details to open the VM details window.
3. Click Add a Device. The Connect a Device dialog is displayed.
4. Select the USB device in the list.
5. If the USB device you want to re-assign is currently in use by a running VM you will be warned to eject the device first.
6. Click Connect.
7. If you want the assignment to persist across reboots, check the Always use with this VM checkbox.
To Change the VM Switcher Key:

1. Hover your mouse over the VM icon and click Details to open the VM details window.
2. Click General.
3. Click Edit.
4. Select the new switcher key from the Switcher Key dropdown list. If you select a switcher key that is already in use by another VM, the switcher keys of the two VMs will be swapped.
5. Click Save.

### 4.7. 3D Graphics Support

3D Graphics Support provides support for hi-fidelity 3D applications by providing direct access to the graphics processor of the XenClient device. Only one running VM can have 3D Graphics Support enabled.

**Important**

Ensure that your XenClient device is not connected to a second screen when enabling or disabling 3D Graphics Support.

**To Enable 3D Graphics Support:**

1. Hover your mouse over the VM icon and click Details to open the VM details window.
2. If you are enabling 3D Graphics Support on a Vista VM, navigate to Start > Control Panel > Classic View > System > Advanced System Settings > Hardware > Windows Update Driver Settings and select Ask me each time I connect a new device before checking for drivers.
3. Shut down the VM.
4. Click Hardware.
5. Click Edit.
6. From the 3D Graphics dropdown list, select Enabled.
7. Click Save.
8. Restart the VM. A newly enabled 3D Graphics Support VM boots and automatically installs the required graphics drivers. A reboot is required after the drivers have installed. When the 3D Graphics Support VM has booted, an optimum graphics resolution is automatically chosen.

**Note**

If you are using a supported ATI graphics card on a laptop with an AMD CPU, please download and install the graphics drivers from the support section of your laptop manufacturer's website, not from the ATI website.

If you install the drivers on a Vista VM, the graphics drivers will not install automatically. Use the following procedure to install graphics drivers on a Vista VM.

**To Install Graphics Drivers on Vista:**

1. Navigate to Start > Control Panel > Classic View > Device Manager.
2. Right-click on Standard VGA Graphics Adapter and select Update Driver Software....
3. Select Search automatically for updated driver software and then Don't search online. This will cause the correct graphics drivers to be installed. A reboot will be required after the drivers have been installed.
**Warning**

It has been observed that sometimes the installation of the graphics drivers on Vista can end with a black screen and unresponsive device. Should this occur, wait for all hard drive activity to cease, and manually reboot your XenClient device.

### 4.8. Secure Application Sharing and Citrix Receiver

One of the features of XenClient is the ability of a user to work mainly in one VM, but use applications running in other VMs without switching display focus. This functionality is known as Secure Application Sharing.

To use the Secure Application Sharing functionality you need to install the Application Subscribing tools on the Application Subscribing VM and the Secure Application Sharing\_SHARE; software on the Application Publishing VM. You can install these tools using the XenClient Tools Setup wizard.

The following diagram shows Secure Application Sharing in action. The Application Subscribing VM is currently active and in focus. The shared application is displayed on the Application Subscribing VM, but is actually running on the Application Publishing VM that is not currently in focus (that is, not currently displayed on the device screen). Any changes made to data with a shared applications is reflected in the VM on which it is actually running.

![Diagram 1](image1)

The following image illustrates a similar scenario, except that in this case an application is being published from XenApp to the Application Publishing VM, which in turn is publishing it to the Application Subscribing VM. The applications from XenApp are subscribed to using the Citrix Receiver store in the Application Subscribing VM, in the same way as locally installed applications would be subscribed to from the Application Publishing VM. This is sometimes referred to as a double hop scenario.

![Diagram 2](image2)
Citrix Receiver is a self-service application store which you can use in the Application Subscribing VM to subscribe to applications published by Application Publishing VMs. Once Citrix Receiver has been installed and the Secure Application Sharing software has been setup, VMs are inspected to discover which applications are available to be subscribed to. These applications are listed in the Citrix Receiver store. The user can select which applications they want to share. These chosen applications then become available from the Windows Start menu under the Dazzle Apps entry.

From a security point of view, although the application is shared, keystrokes and mouse movements are forwarded by the XenClient hypervisor directly to the Application Publishing VM. The Application Publishing VM (that is actually running the application) simply sends the updated graphical display to the XenClient hypervisor, which in turn forwards it to the Application Subscribing VM.

**Warning**

The Application Subscribing VM and Application Publishing VM must not have the same hostname.

### 4.8.1. Installing Secure Application Sharing and Citrix Receiver

Secure Application Sharing allows you to share application windows from Application Publishing VMs to a chosen Application Subscribing VM. Once the software is installed, shared applications are available through the Citrix Receiver store. The applications you subscribe to in Citrix Receiver are automatically added to the Windows Start menu, and can be launched from the Start menu just like any locally installed application.

**Warning**

Citrix recommends not setting the Windows task bar to auto-hide in a Application Subscribing VM, as the task bar may not appear as expected when a Secure Application Sharing session is active.

To setup Secure Application Sharing, first choose an Application Subscribing VM. To set up this VM for Application Subscribing, follow the the Procedure: “Setting up a VM for Application Subscribing” procedure. Then, for each Application Publishing VM, follow the the Procedure: “Setting up a VM for Application Publishing” procedure.

**Warning**

Each VM in your Secure Application Sharing setup must have a unique host name.

Please ensure that you have installed all available Windows updates before installing Secure Application Sharing, and also the Citrix XenClient Tools. Also ensure that the Citrix XenClient Tools are mounted in the VM. To do this:

**Mounting the Citrix XenClient Tools installer in a VM:**

1. Hover your mouse over the VM icon and click Details to open the VM details window.
2. Click Hardware.
3. Click Edit.
4. From the Tools CD dropdown list, select Attached
5. Click Save.

**Setting up a VM for Application Publishing:**

1. Navigate to the xc-tools disk, which is usually mounted as the E: drive.
2. Double-click Setup. The Citrix XenClient Setup installer is displayed.
3. Accept the software license agreement and click Next.
4. Check the Publish Applications checkbox and click Next and Install.
5. When the installation has finished, restart the VM.

Setting up a VM for Application Subscribing:

1. Navigate to the xc-tools disk, which is usually mounted as the E: drive.
2. Double-click Setup. The Citrix XenClient Setup installer is displayed.
3. Accept the software license agreement and click Next.
4. Check the Subscribe to Applications checkbox and click Next and Install.
5. When the software has finished installing, switch to the Windows Black mouse pointer scheme with pointer shadow enabled. This will eliminate any problems with multiple mouse pointers.
6. Switch to Citrix Receiver for XenClient by pressing Ctrl + 0 or using the VM switcher bar.
7. Hover your mouse over the VM icon and click Details to open the VM details window.
8. Click the General tab.
9. Click Edit.
10. In the Seamless Application Support dropdown list, select Enabled.
11. Restart the VM.

Now that you have installed the required software, switch back to the Application Subscribing VM. From the Start menu, select Select more apps.... The Citrix Receiver application is displayed.

Citrix Receiver displays all the applications that are available to be subscribed to. Click Add to add an application to the Start menu. Chosen applications are placed in the start menu at All Programs > Dazzle Apps. When you launch one of these applications it will be displayed with a green border around it to identify it as a Citrix Receiver application.

Note

- You cannot open an application directly using Citrix Receiver. You must first add the application and then launch it from the Start menu.
- An Application Publishing VM must be running to share the applications on it.
- Some windows, for example non-rectangular windows and application child windows, are not displayed with a green border.

4.9. Working With a Synchronizer Server

This section describes how to use your XenClient with a Synchronizer server.

4.9.1. Registering a XenClient Device With a Synchronizer Server

Before XenClient can interact with Synchronizer you must register your XenClient device with a Synchronizer server.

To Register XenClient With a Synchronizer Server:

Important

If you are not a user with Admin rights, you must have a VM image assigned to you before you can connect to Synchronizer.

1. In Citrix Receiver for XenClient, click the System button. The System Settings window is displayed.
2. Click Synchronizer.
3. Click Register.

4. Enter the host name of your Synchronizer server in the Synchronizer Address text box.

5. Click Next.

6. An authorization code is displayed. Please ensure that the authentication code is the same as the one provided by your system administrator. Cancel the connection process if the codes do not match, and alert your system administrator.

   If the Synchronizer server is configured to require Registration PINs, you are also prompted to enter the required PIN now. Enter the PIN provided by your system administrator.

7. Press Ctrl + Alt + Backspace to securely authenticate with your Synchronizer server.

8. Enter your Synchronizer user name and password and press Enter.

9. Click Close to exit the System Settings window.

4.9.2. VM Image Modes

A XenClient VM image stored on a Synchronizer server exists in one of the following managed modes:

- **Static VM Image Mode**

  A traditional image of the entire VM stored as a single VHD file. You can make changes to a VM based on this image (for example, installing software or updating the operation system) without affecting other users, and your changes remain when you reboot the device. With this type of VM Image, initial deployment of the image is made with Synchronizer and ongoing updates can be made in the traditional manner using existing Windows distribution tools.

- **Static VM Image Mode with User Profile only backed up**

  The user profile of the VM alone is uploaded to the Synchronizer as a separate VHD from the rest of the system. You can make changes to a VM based on this image (for example, installing software or updating the operation system) without affecting other users, and your changes remain when you reboot the device. With this type of VM Image, initial deployment of the image is made with Synchronizer, and the user profile is backed up to the Synchronizer. Ongoing operating system and application updates can be made in the traditional manner using existing Windows distribution tools.

- **Dynamic VM Image Mode**

  The user profile of the VM is stored as a separate VHD from the rest of the system. You can make changes to a VM based on this image without affecting other users, but only changes made in the user profile remain when you reboot the device; the operating system and applications revert to the state they were stored at when the image was last saved. With this type of VM Image, deployment and ongoing image updates are made with Synchronizer. Existing Windows distribution tools are not useable in this mode.

The mode is chosen when you first upload the VM to a Synchronizer.

4.9.3. Uploading a VM

**To Upload a VM to Synchronizer:**

- **Note**

  Only Synchronizer users with Admin rights can upload VMs to Synchronizer. See the XenClient 2.1 Synchronizer Setup and Usage Guide for more information.

1. Shut down the VM you want to upload and click the Details button.
2. Click **Upload VM** near the top right side of the VM details box. An **Upload to Synchronizer** dialog box appears.

3. Enter a VM Image Name and a Description for the VM.

4. Select the desired Image Mode. (For a description of the available image modes, see Section 4.9.2: “VM Image Modes” for more information.

5. Click **Finish**.

While a VM is being published or uploaded to Synchronizer, a status bar is displayed in the VM details window, as shown below. You can pause, cancel or restart the transfer at any time.

```
State:       Transferring
Progress:   23%  8.63 MB/s

Pause  Cancel
```

### 4.9.4. VM Backups and Updates

**To Backup a Synchronizer-Managed VM:**

Only users who have been authorized to make manual backups are able to perform this procedure.

**Note**

When a VM is backed up it is given a timestamp which is derived from the time in the BIOS of the device. When a new VM image version is created in Synchronizer, it is given a timestamp which is derived from the NTP server Synchronizer uses to get accurate time information. Please note that this may cause some discrepancies in timestamps.

1. Hover your mouse over the VM icon and click **Details** to open the VM details window.

2. Click the **Backup Now** button.

**To Check for Updates to a Synchronizer-managed VM:**

1. Hover your mouse over the VM icon and click **Details** to open the VM details window.

2. Click the **Check Now** button.

3. If updates are available, they immediately begin to download. The updates could consist of VM assignment policy updates or, in the case of a Dynamic VM Image Mode VM, system disk updates to a new version.

4. If the message **Shutdown Required** is displayed, shut down the VM. Do not perform a VM restart instead. When the VM has shut down, the VM configuration is updated. It is then safe to start the VM again.
Chapter 5. Troubleshooting

If you experience a technical issue with XenClient, please immediately generate a system status report, to capture essential information from the system that will enable diagnosis. The status report can be supplied to a technical support representative. You may also want to visit the XenClient Forums at http://forums.citrix.com/forum.jspa?forumID=1292 for solutions.

To Open a Control Domain Console:

- In Citrix Receiver for XenClient, press Ctrl + Shift + t to open a control domain console window. Alternately press Ctrl + Shift + h to open a larger control domain terminal window.

  Note

  Use Alt + Tab to bring the console back into focus should it end up behind Citrix Receiver for XenClient.

To Generate a XenClient Status Report:

Important

VMs must be running for the status report to be able to gather important VM-specific diagnostic information.

1. In Citrix Receiver for XenClient, click System > Status Report, then click the Create Status Report button. Alternately, press Ctrl + Alt + r. The Create Status Report wizard is displayed.

2. Select what information you would like to include in the status report. Screenshots and diagnostic information about the VMs running on the Citrix Receiver for XenClient device can be extremely helpful with the diagnosis of technical issues, but you may prefer not to divulge this information. If you do not want to include screenshots of VMs in the status report, uncheck the Include screenshots of the VMs in this report checkbox. If you do not want any other diagnostic information about your VMs to be included, uncheck the Include other diagnostic information from the VMs in this report checkbox.

3. Click the Next button.

4. Enter a short (8 words or less if possible) summary of the problem you have encountered in the Summary text box.

5. Enter a more detailed description of the problem in the Description text area.

6. Click the Next button.

7. Enter the steps that you think are required to reproduce the problem in the Steps to Reproduce text area.

8. If you have contacted Citrix with regard to this issue and have been given a technical support case number or a ticket number, enter the number you have been given in the Support Number text box.

9. Click the Next button.

10. Click the Next button again to start generating the report. The report is saved as a .tar.gz file on the control domain file system in the /storage/status-report directory. The file is named after the summary of the issue.

Because the status report might contain sensitive information, no direct download link is provided. It is instead required to log in to a control domain console as the root user in order to access the status report. Contact your system administrator if you do not access to the root user password to arrange for the status report to be retrieved. To retrieve the status report, either use SCP, WinSCP, or an equivalent tool. Alternately, take the following steps:

a. Ensure that the device is connected to a network, either wired or wireless.
b. In Citrix Receiver for XenClient, press **Ctrl + Shift + t** to open a control domain console window.

c. Run the `status-server` command:

```
status-server
```

d. Use a web browser on another device or in a VM to download the status report from the URL indicated by the `status-server` command.

e. Press **Enter** to shut down the status server.

**Recovering from a Full Disk:**

1. Reboot the XenClient host.
2. While the XenClient boot screen is displayed, press **Esc**.
3. Boot into the **console access** option.
4. When a console is available, log in as **root**.
5. Delete the file `/storage/xc_reserved`:

```
rm /storage/xc_reserved
```

This will free up sufficient disk space to allow you to boot into XenClient and backup your VMs to Synchronizer.

**To Turn on ATAPI Logging to Debug CD / DVD Issues:**

1. Open a console from Citrix Receiver for XenClient.
2. Run the command:

```
touch /etc/debugcdrom
```

3. Logs will be written to `/var/log/cdrom-<VM_slot_number>.log` until the `/etc/debugcdrom` file is removed.

**To Boot Into a Control Domain Console:**

1. Reboot the XenClient host.
2. While the XenClient boot screen is displayed, press **Esc**.
3. Boot into the **console access** option.
4. When a console is available, log in as **root**.

**To Refresh Citrix Receiver for XenClient:**

- In Citrix Receiver for XenClient, press **Ctrl + Q**.

**To Change the Control Domain Root Password:**

1. In Citrix Receiver for XenClient, press **Ctrl + Shift + t** to open a control domain console window.
2. Create a text file containing your old password.
3. Create a text file containing your new password.
4. Run the following command:

```
sec-change-root-credentials <new_password_file_path> \n```

<old_password_file_path>

Both files will be securely deleted when you run the `sec-change-root-credentials` command.

To Troubleshoot Ubuntu Driver Issues:

Ubuntu in XenClient 2.1 uses paravirtualized drivers to increase performance by eliminating CPU cycles previously used to emulate devices. Should you experience problems, you can try reverting to the emulated drivers using this procedure:

1. In Citrix Receiver for XenClient, press **Ctrl + Shift + t** to open a control domain console window.
2. Run the command:
   ```
   xec-vm -n <vm_name> set viridian true
   ```
3. Reboot your Ubuntu VM.

WIFI Connections and Ubuntu VMs:

- In Ubuntu VMs, wifi connections appear as wired connections. The connection will show a NAT’d IP address in the VM because host wifi is always shared (that is, NAT’d), rather than bridged, due to the way wifi networks work.

To Troubleshoot PXE Installation Issues:

- XenClient 2.1 uses a customized `pxelinux.0` file, which can be found on the installer CD at `/isolinux/pxelinux.0`. This file must be copied to your PXE server.

Masking SSEs in the VM CPUID:

Some PXE servers require that some Streaming SIMD Extensions (SSEs) are masked in the CPUID of a VM. To do this:

1. In Citrix Receiver for XenClient, press **Ctrl + Shift + t** to open a control domain console window.
2. Run the following command to disable SSE, SSE 4.2, SSE 4.1, SSE 3 and SSE2:
   ```
   xec-vm -n <vm_name> set cpuid 1:ecx=xxxxxxxxxxx00xxxxxxxxx0xxxxxxxx0,edx=xxxxx00xxxxxxxxxxxxxxxxxxxxxxxxx
   ```
   In this command, 0 causes the corresponding bit to be unset and x sets the corresponding bit to a safe default.
   
   To reset the CPUID back to default at a later stage, run the command:
   ```
   xec-vm -n <vm_name> set cpuid ""
   ```

To Return to Citrix Receiver for XenClient from an Unresponsive VM (Force Switching):

Use this procedure to return to Citrix Receiver for XenClient if a VM with 3D Graphics Support enabled becomes unresponsive to attempts to switch away from it.

**Warning**

Forcing a switch should only be attempted as a last resort. Particularly, forcing a switch while a 3D Graphics Support VM is booting or shutting down can lead to the VM graphics becoming corrupt. Citrix highly recommends immediately shutting down any VM you have force switched away from and restarting it.

1. Press and hold **Ctrl + 0** for 15 seconds.
2. If Citrix Receiver for XenClient is still not displayed, press **Ctrl + 0** once again to switch to Citrix Receiver for XenClient.
To Determine the IP Address of a XenClient Device:

1. In Citrix Receiver for XenClient click on the Network Manager icon at the top-right of the screen, and select Connection Information from the popup menu.
2. The details of all active network connections are displayed, including the IP address.

To Ensure That the Select more apps... Shortcut Appears in the Start Menu:

- Run the `<drive_letter>:\Program Files\Citrix\SelfServicePlugin\SelfService.exe` executable in the Application Subscribing VM:

To Ensure Application Publishing Applications Appear in Citrix Receiver:

1. Ensure the Application Subscribing VM is running.
2. Start or restart all Application Publishing VMs and log in.
3. Run the following command in the Application Subscribing VM:
   
   `<disk_letter>:\Program Files\Citrix\XCI\XciAppUpdater.exe`


5.1. Installation Troubleshooting

This section describes some troubleshooting scenarios. You may also want to visit the XenClient forums at http://forums.citrix.com/forum.jspa?forumID=1292 for solutions.

While running the XenClient installer you can switch what you see using the following key strokes:

Alt + F1
   Switch back to the installer.

Alt + F2
   Show the installation log file.

Alt + F3, Alt + F5 or Alt + F6.
   Show a login prompt to a console window. Log in as root.

   **Note**

To use this functionality external SSH access must be enabled. To enable SSH, run the following command in a terminal window in Citrix Receiver for XenClient: `xec -x enable-ssh true`.

Alt + F4
   Show the system log file.

Alt + F7
   Enter the interactive status-report generation tool.

To Generate an Installation Status Report:

1. During installation, press Alt + F7 and select Continue.
2. Enter a description of the issues you are experiencing with the installation and select OK. The system will start to generate a status report.
3. When report generation is complete, the status report filename is displayed. Select Web Server.
4. The URL of a web server is displayed. Point your web browser to the address displayed to download the installation status report.
Installing XenClient Over a Network Using PXE

This appendix describes how to set up PXE boot and enable the installation of XenClient over a network. This section describes how to use PXELINUX.

XenClient 2.1 uses a customized pxelinux.0 file, which can be found on the installer CD at /isolinux/pxelinux.0. This file must be copied to your PXE server.

The first step is to copy the packages.main directory from the XenClient installer CD to a location on an FTP or HTTP server. The location URL of the parent directory of the packages.main directory is specified in the answerfile created in the next step.

The second step is to create an answerfile and put it in the same directory as the packages.main folder. The answerfile specifies the answers to questions asked by the Citrix Receiver for XenClient installer, and the location of the required packages.

Note

Please ensure that your networking configuration is set up to enable PXE boot. For example, if you are using DHCP please ensure that your DHCP server is configured to provide the route to your TFTP server.

The following is an example answerfile:

```xml
<interactive>false</interactive>
<mode>fresh</mode>
<source type="url">http://192.168.1.1/xenclient_packages_dir</source>
<primary-disk>sd/a</primary-disk>
<network-interface mode="dhcp"></network-interface>
<password>3oUQYK4w4dCB.</password>
<enable-ssh>true</enable-ssh>
<license-key></license-key>
```

Next, copy the contents of the isolinux directory into the PXE directory on your TFTP server, for example, /tftpboot/pxe. Finally, create a file called pxelinux.cfg in the same directory. The following file is a working example:

```ini
DEFAULT xenclient
PROMPT 1
TIMEOUT 50

LABEL xenclient
kernel mboot.c32
append xen.gz console=com1,vga max_dom0_vcpus=1 com1=115200/921600,8n1,magic \
--- vmlinuz quiet console=xencons root=/dev/ram rw start_install \
eject_cdrom=0 \
answerfile=http://192.168.1.1/xenclient_packages_dir/my_answerfile \
--- rootfs.gz
```

Note

- The line beginning with append is one long line that should not be broken. The backslash (\) characters at the end of the lines should be removed in the actual configuration file.
- The manner in which PXELINUX selects which pxelinux.cfg to use when a machine boots on the network is determined by a number of factors. This example simply places the configuration in the
default location where it will be used by all machines served by DHCP on the network when they network boot.

The following table describes the allowable syntax of a XenClient answerfile.

**Warning**

The answerfile uses a pseudo-XML syntax and is not parsed by an XML parser. With the exceptions of the `preinstall`, `postinstall` and `quick-option` tags which may span multiple lines, all tags should be on one line only with no extraneous whitespace.

The backslash (\) characters used in examples to indicate the continuation of a line must be removed in the actual configuration file.

<table>
<thead>
<tr>
<th>Tag name</th>
<th>Description</th>
<th>Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>interactive</td>
<td>Determines whether the installer will interact with the user or not. If <code>false</code> the answerfile must contain all mandatory tags or the installation will fail. If <code>true</code> the user will be prompted to provide information where answerfile entries do not exist.</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td><code>&lt;interactive&gt;true&lt;/interactive&gt;</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;interactive&gt;false&lt;/interactive&gt;</code></td>
<td></td>
</tr>
<tr>
<td>quick-option</td>
<td>Used as a parent for other answerfile tags. If this tag is in the answerfile, the user will be prompted to choose whether they want to perform a quick install or an advanced install. If the user selects to do a quick install, the answerfile tags that are children of this tag, that is, between <code>&lt;quick-option&gt;</code> and <code>&lt;/quick-option&gt;</code>, are used, as well as all the other tags in the answerfile. If the user chooses the advanced install, this tag is ignored and the options specified elsewhere in the answerfile are used.</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td><code>&lt;quick-option&gt;</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td># other answerfile tags go here</td>
<td></td>
</tr>
<tr>
<td></td>
<td># for quick install</td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;/quick-option&gt;</code></td>
<td></td>
</tr>
<tr>
<td>eula</td>
<td>Set the <code>accept</code> parameter of the <code>eula</code> element to <code>yes</code> to automatically accept the XenClient end-user license agreement (EULA). Set the parameter to <code>defer</code> to cause the user to be prompted to accept the EULA when first booting the XenClient device.</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td><code>&lt;eula accept=&quot;defer&quot;&gt;</code></td>
<td></td>
</tr>
<tr>
<td>Tag name</td>
<td>Description</td>
<td>Required?</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>source</td>
<td>The installation package source. The URL option can specify either http or ftp. The local option is for optical media installs. The verify=&quot;true&quot; attribute determines whether or not the media should be verified before performing the installation. If you specify the type=&quot;harddisk&quot; attribute, the installer initrd must be repacked to include a copy of the packages.main repository at the root of the filesystem. A copy of this repository can be found on the installation ISO. This option enables PXE-only network installation in situations where network installation using the other options is not feasible. If you specify the type=&quot;bootmedia&quot; attribute, the installer will attempt to install from a bootable partition. To prepare a bootable partition, boot from the XenClient installation media, then press Alt + F3 to open a console window. In the console, log in as root and run the prepare-hd-install script to copy the installer and the repository from the CD-ROM to the partition. Specify the oem=&quot;true&quot; attribute if you want the installer to treat the prepared partition as an OEM partition when partitioning the disk.</td>
<td>no</td>
</tr>
<tr>
<td>mode</td>
<td>Required for automated installation. Indicates whether to perform a destructive fresh installation in which all data on the primary drive will be destroyed, or to upgrade an existing installation.</td>
<td>yes</td>
</tr>
<tr>
<td>primary-disk</td>
<td>Required for automated installation if more than one disk is detected on the machine. Specify the UNIX disk name.</td>
<td>sometimes</td>
</tr>
<tr>
<td>Tag name</td>
<td>Description</td>
<td>Required?</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>partition-mode</td>
<td>Determines what changes are made to the partition layout of the primary disk when performing a fresh installation.</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td>The <strong>overwrite</strong> option will overwrite an existing installation. All other partitions on the disk will be preserved. This option is only available if there is an existing installation on the disk.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The <strong>use-free-space</strong> option will install into the available free space on the disk. All existing partitions on the disk will be preserved. This option is only available if free space exists on the disk, a new primary partition can be created and there is no existing installation on the disk.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The <strong>erase-non-oem</strong> option will preserve any OEM partitions, erasing all other partitions on the disk and installing into the available space. (At present only Dell Utility Partitions are detected as OEM partitions.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The <strong>erase-entire-disk</strong> option will erase all partitions on the disk and install into the free space. All existing partitions will be erased.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If no option is specified for an automated installation, the installer will attempt to use the following options in order:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. overwrite</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. use-free-space</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. erase-non-oem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. erase-entire-disk</td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;partition-mode&gt;overwrite \&lt;/partition-mode&gt;</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;partition-mode&gt;use-free-space \&lt;/partition-mode&gt;</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;partition-mode&gt;erase-non-oem \&lt;/partition-mode&gt;</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;partition-mode&gt;erase-entire-disk \&lt;/partition-mode&gt;</code></td>
<td></td>
</tr>
<tr>
<td>install-mbr</td>
<td>Determines whether a new master boot record is installed on the target disk.</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>The <strong>auto</strong> option will install a new master boot record unless an OEM master boot record is found on the target disk. Only Dell master boot records are detected. Defaults to <strong>auto</strong> if no option is specified.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;install-mbr&gt;true&lt;/install-mbr&gt;</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;install-mbr&gt;false&lt;/install-mbr&gt;</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;install-mbr&gt;auto&lt;/install-mbr&gt;</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>&lt;install-mbr&gt;&lt;/install-mbr&gt;</code></td>
<td></td>
</tr>
<tr>
<td>Tag name</td>
<td>Description</td>
<td>Required?</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>network-interface</td>
<td>Specifies the network device for use by the installer. Required for automated installs performed over the network.</td>
<td>sometimes</td>
</tr>
</tbody>
</table>
|               | `<network-interface mode="dhcp"> 
|               |    </network-interface>`                                                                                                                     |           |
|               | `<network-interface mode="static" 
|               |    address="10.0.0.1" 
|               |    netmask="255.255.255.0" 
|               |    gateway="10.0.0.2" dns="10.0.0.3"> 
<p>|               |    &lt;/network-interface&gt;<code>                                                                                                                    |           | | language      | Used to set the user interface language. The following languages are supported:                                                            | no        | |               | • en-us (English)                                                                                                                             |           | |               | • fr-fr (French)                                                                                                                                 |           | |               | • de-de (German)                                                                                                                             |           | |               | • ja-ja (Japanese)                                                                                                                           |           | |               | • zh-cn (Simplified Chinese)                                                                                                                 |           | |               | • es-es (Spanish)                                                                                                                            |           | |               | *Example:*                                                                                                                                    |           | |               |</code>&lt;language&gt;fr-fr&lt;/language&gt;<code>                                                                                                                  |           | |               | Specify the</code>defer<code>option to cause the user to be prompted to set the language on first boot.                                               |           | |               |</code>&lt;language defer=&quot;true&quot;&gt;&lt;/language&gt;`                                                                                                         |           |
|               | If the language element is not included in the answer file, the language defaults to en-us (US English).                                     |           |</p>
<table>
<thead>
<tr>
<th>Tag name</th>
<th>Description</th>
<th>Required?</th>
</tr>
</thead>
</table>
| keyboard | Used to set the keyboard layout. The following keyboard layouts are supported:  
  - cn (China)  
  - fr (France)  
  - de (Germany)  
  - it (Italy)  
  - jp (Japan)  
  - es (Spain)  
  - ch (Switzerland)  
  - gb (United Kingdom)  
  - us (United States)  
  *Example:*  
  ```xml  
  <keyboard>us</keyboard>  
  ```  
  Specify the `defer` option to cause the user to be prompted to set the keyboard layout on first boot.  
  ```xml  
  <keyboard defer="true"></keyboard>  
  ```  
  If the keyboard element is not included in the answer file, the keyboard layout defaults to us (United States). | no |
| password | Used to set the system password. The value is assumed to be an encrypted password. Setting an empty password permits access without entering a password.  
  Specify the `defer` option to cause the user to be prompted to set the password on first boot.  
  ```xml  
  <password defer="true"/></password>  
  ``` | no |
<table>
<thead>
<tr>
<th>Tag name</th>
<th>Description</th>
<th>Required?</th>
</tr>
</thead>
</table>
| recovery-public-key | Specifies a public/private key pair that enables the user to recover a forgotten password for an encrypted virtual disk.  

```
<recovery-public-key> 
-----BEGIN PUBLIC KEY-----  
.  
-----END PUBLIC KEY----- 
</recovery-public-key>  

<recovery-private-key> 
-----BEGIN RSA PRIVATE KEY-----  
.  
-----END RSA PRIVATE KEY----- 
</recovery-private-key>  
``` | no         |
| enable-ssh        | Used to enable or disable the control domain ssh server, which allows external ssh access for diagnostic purposes.  

```
<enable-ssh>true</enable-ssh>  
<enable-ssh>false</enable-ssh>  
``` | no         |
| backend           | Used to supply the host name or IP address of the Synchronizer server.  

```
<backend>my.backend.host.name</backend>  
``` | no         |
| backend-pin       | Used to supply a registration PIN for the Synchronizer server.  

```
<backend-pin>1234567</backend-pin>  
``` | no         |
<table>
<thead>
<tr>
<th>Tag name</th>
<th>Description</th>
<th>Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>vhds</td>
<td>Installs a precreated virtual hard disk on to the system.</td>
<td>no</td>
</tr>
</tbody>
</table>

Each vhd block specifies a virtual hard disk to be installed. (At present only one virtual hard disk can be specified.) A new UUID (universally unique identifier) will be assigned to the virtual hard disk on installation.

The label option specifies a unique label for the virtual hard disk which can be referenced in the vms element. This label is only used during the installation process.

The vhd-source tag specifies the source of the virtual hard disk image. Valid prefixes include:

- http://
- ftp://
- file://
- dev://

Note that the image will be retrieved after partitioning the target disk, so if the dev:// prefix is used, it must not refer to a partition which is erased during the installation process.

If the vhd-source tag is specified multiple times, it is assumed that the image has been split into fragments (for example, to work around a file size limit on the source filesystem) which must be concatenated to recover the original image.

The compress option indicates that the image has been compressed. Valid values are gzip and bzip2. If the image has also been split, it is assumed that the image was split after compression.

```xml
<vhds>
  <vhd label="vhd1" compress="gzip">
    <vhd-sources>
      <vhd-source>
        dev://sda1/my.vhd.part1 
      </vhd-source>
      <vhd-source>
        dev://sda1/my.vhd.part2 
      </vhd-source>
    </vhd-sources>
  </vhd>
</vhds>
```
<table>
<thead>
<tr>
<th>Tag name</th>
<th>Description</th>
<th>Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>vms</td>
<td>Installs a precreated virtual machine on to the system.</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>Each vm element specifies a virtual machine to be installed. (At present only one virtual machine can be specified.) A new UUID is assigned to the virtual machine on installation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The vm-source tag specifies the source of the configuration file for the virtual machine. Valid prefixes include:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• http://</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ftp://</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• file://</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• dev://</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Warning</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The file is retrieved after partitioning the target disk, so if the dev:// prefix is used, it must not refer to a partition which is erased during the installation process.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The configuration file will automatically be updated to reflect the virtual machine's new UUID.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The optional vm-vhds block allows the configuration file to be updated to reflect the new UUIDs of any virtual hard disks used by the virtual machine. Each vm-vhd tag specifies the index of the disk as listed within the configuration file and the label of the disk as specified in the vhd block.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;vms&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;vm&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;vm-source&gt;<a href="http://my.url/my-vm.db">http://my.url/my-vm.db</a> \</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;/vm-source&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;vm-vhds&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;vm-vhd index=&quot;0&quot; label=&quot;vhd1&quot;&gt; \</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;/vm-vhd&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;/vm-vhds&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;/vm&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;/vms&gt;</td>
<td></td>
</tr>
<tr>
<td>skipready</td>
<td>If this tag is present, the Are you ready to install? screen is not displayed.</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>&lt;skipready&gt;&lt;/skipready&gt;</td>
<td></td>
</tr>
<tr>
<td>Tag name</td>
<td>Description</td>
<td>Required?</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>preinstall</td>
<td>Used to supply a script to be executed prior to installation.</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td><strong>Warning</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;preinstall&gt;#!/bin/bash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>touch /tmp/i.was.here</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;/preinstall&gt;</td>
<td></td>
</tr>
<tr>
<td>postinstall</td>
<td>A post install script, executed at the end of a successful installation.</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>&lt;postinstall&gt;#!/bin/ash -e</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mkdir -p /mnt/storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mount /dev/xenclient/storage /mnt/storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mkdir -p /mnt/storage/hello-from-postinstall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cd /mnt/storage/hello-from-postinstall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ls -l .. &gt;postinstall-sample</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cd /</td>
<td></td>
</tr>
<tr>
<td></td>
<td>umount /mnt/storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;/postinstall&gt;</td>
<td></td>
</tr>
</tbody>
</table>
XenClient Administration Tasks

1. Controlling Which Applications Can Be Shared

The application spidering process is controlled by a configuration file which can be found in the following locations on the Application Publishing VMs:

Windows 7
   C:\ProgramData\Citrix\Xci\Applications\XciDiscoveryConfig.xml

Windows Vista
   C:\ProgramData\Citrix\Xci\Applications\XciDiscoveryConfig.xml

Windows XP
   C:\Documents and Settings\All Users\Application Data\Citrix\Xci\Applications\XciDiscoveryConfig.xml

The following is an example of this configuration file:

```xml
<?xml version="1.0" encoding="utf-8"?>
<XciDiscoveryConfig
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xmlns:xsd="http://www.w3.org/2001/XMLSchema">
   <DiscoveryPaths>
      <DiscoveryPath Enabled="true" Recurse="true" Wildcard="*.lnk">
         C:\Users\username\AppData\Roaming\Microsoft\Windows\Start Menu
      </DiscoveryPath>
      <DiscoveryPath Enabled="true" Recurse="true" Wildcard="*.lnk">
         C:\ProgramData\Microsoft\Windows\Start Menu
      </DiscoveryPath>
   </DiscoveryPaths>
   <Whitelists>
      <Whitelist IgnoreCase="true">
         ^\windows\explorer.exe
      </Whitelist>
   </Whitelists>
   <Blacklists>
      <Blacklist IgnoreCase="true">
         ^\windows\
      </Blacklist>
   </Blacklists>
</XciDiscoveryConfig>
```

The `DiscoveryPaths` element contains details of which directories to search for applications, and which file type to search for, specified by one or more `DiscoveryPath` elements. The following table describes the attributes of the `DiscoveryPath` element.

<table>
<thead>
<tr>
<th>Attribute name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enabled</td>
<td>If false the directory path is ignored.</td>
</tr>
<tr>
<td>Recurse</td>
<td>If true the application spider will recurse into sub-directories of the specified directory.</td>
</tr>
<tr>
<td>Attribute name</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wildcard</td>
<td>A file name matching wildcard.</td>
</tr>
<tr>
<td>Category</td>
<td>Specifies the category under which the discovered applications will be grouped in Citrix Receiver, for example, Office Application. If no category is specified the applications will be grouped under their containing folder name.</td>
</tr>
<tr>
<td>Keywords</td>
<td>Space-delimited string of keywords for the discovered applications. The keyword Recommended causes found applications to be put into the FEATURED category in Citrix Receiver.</td>
</tr>
</tbody>
</table>

The Whitelists element contains one or more Whitelist elements. Each Whitelist element contains a regular expression that matches application to be included in the shareable list. The Whitelist element can have an IgnoreCase attribute which, if true, causes the regular expression to be evaluated case-insensitively.

The BlackLists element specifies the regular expressions that match applications to be excluded. An application that matches both a Whitelist and a Blacklist element will be included in the list of shareable applications.
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Index

Symbols
3D Graphics Support
   enabling, 22
XenClient
   installing, 2
   registering with Synchronizer, 25

C
Citrix Receiver
   about spidering, 24
   security, 24
Citrix Receiver for XenClient
   using, 13
Citrix XenClient Tools
   installing, 16
   mounting in a VM, 24
Console, control domain, 28
Control domain
   changing root password, 29
   opening a console, 28

I
Installation status report, 31
Installing XenClient, 2
Installing XenClient using PXE, 33

N
Networking
   configuring, 16
   static IP address, 17
   wireless
      importing authentication certificate, 17
      wireless connection setup, 17

P
Preparing devices for XenClient installation, 2
PXE, installing XenClient via , 33

R
Registration PIN, 6, 26

S
Secure Application Sharing
   about, 23
   installing, 24
Status report
   generating, 28
Synchronizer
   overview, 1
   troubleshooting, 31
   using optical media, 4
   using PXE, 33

T
Troubleshooting, 28

U
Uploading VM to Synchronizer, 26
USB devices
   composite, 10
   external optical media drives, 9
   internal, 10
   keyboards, 9
   other, 10
   pointing devices, 9

V
VM Image modes
   Dynamic VM Image Mode, 26
   Static VM Image Mode, 26
   Static VM Image Mode with user profile only backed up, 26
VMs
   assigning USB devices, 21
   backing up, 27
   changing MAC address, 18
   checking for updates, 27
   deleting, 21
   details, 18
   editing properties, 21
   Image modes, 26
   installing, 14
      from optical media, 14
   installing from Synchronizer, 16
   power controls, 20
   Setting up for Application Publishing, 24
   Setting up for Application Subscribing, 25
   switching, 18
   Uploading to Synchronizer, 26
   uploading to Synchronizer, 26

W
Wired networking
   setup, 17

X
Xen, 1
XenClient
   about, 1
   installing
      advanced, 5
      quick, 4
      troubleshooting, 31
   using optical media, 4
   using PXE, 33
networking, 8
overview, 1
troubleshooting, 28
upgrading
  advanced, 5
  using Citrix Receiver for XenClient, 6
USB device handling, 8
using, 13
XenClient device sharing
  CPU, 8
  GPU, 8
  network and internet connection, 8
  RAM, 8
  USB devices, 8
XenClient devices
  hard drive, 11
  optical media, 11
XenClient resource allocation
  computing resources, 8