



Citrix® XenClient™ 1.0 RC User Guide

This document is a guide for users of the Citrix® XenClient™ 1.0 RC release.

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Citrix, Inc.
851 West Cypress Creek Road
Fort Lauderdale, FL 33309
United States of America

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Concepts

Introducing XenClient

XenClient is a bare metal hypervisor that allows you to run multiple operating systems on a computer simultaneously. Together with Synchronizer, it provides a safe, secure and simple way to provision and administer virtual desktops and applications, combining performance and ease of use.

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 the user 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 according to the user's 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. Citrix Receiver for XenClient guides the user through the process of installing VMs. VMs can be installed using physical vendor media or by downloading a desktop 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 the user has installed the VMs they want to run on their 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 the user hovers the mouse in the middle of the top of the screen.

Given that multiple VMs are using the same hardware, XenClient must manage this interaction. The following sections describe how XenClient handles shared hardware resources.

Network and internet connection sharing

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 NetworkManager 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 NetworkManager sets up wired networking so that an address will be obtained by DHCP, if possible.

USB device sharing

USB devices are handled differently according to their type. Human Computer Interaction (HCI) devices (for example mouse and keyboard) are connected to whichever VM the user is currently using. Other USB devices, for example external disk drives and CD drives, would potentially suffer from contention issues if more than one VM attempts to read from them or 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. To use such a USB device with a different VM it is necessary to unplug the device, switch to the desired VM, and plug it in again.

Note:

- Plugging a non-HCI 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.



- When using a non-HCI 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 [the section called "Secure Application Sharing and Citrix Dazzle"](#) for information about Secure Application Sharing.

Optical media sharing

Because it is not possible for one VM to read from an optical device (for example a CD or DVD) while another writes to it, XenClient hides the optical disk from other VMs when a VM is actively writing data to a disk. When the write operation has finished, the optical drive re-appears on other VMs. It is possible for more than one VM to read from an optical device simultaneously, but there may be a decrease in reading speed.

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 allocate more virtual disk space to VMs than is physically available.



Installation

This chapter explains how to install XenClient.

System Requirements

This section lists the supported hardware and operating systems. Please pay particular attention to the WiFi and GPU models that are supported.

Note:

XenClient provides limited experimental support for Broadcom WiFi. If you wish to experiment with using a device with Broadcom WiFi, please ensure that you disable power management as sleep and hibernate do not function correctly on such a device.

Disabling power management in XP

1. Open Control Panel and click **Power Options**.
2. Select the **Power Schemes** tab in the **Power Options Properties** dialog.
3. Set **System Standby** and **System Hibernates** options to *Never* for both the **Plugged in** and **Running on batteries** schemes.

Disabling power management in Vista

1. Open Control Panel and click **System Maintenance**.
2. In the **Power Options** section click **Change when the computer sleeps**.
3. Set the **Put the computer to sleep** setting to *Never*.

Disabling power management in Windows 7

1. Open Control Panel and click **Power Options**.
2. In the **Power saver** section click **Change plan settings**.
3. Select *Never* in both the **Turn off the display** dropdown lists.
4. Click **Change advanced power settings**.
5. Expand **Sleep**.
6. Expand **Hybernate after**.
7. Enter 0 in both the **On battery** and **Plugged in (Minutes)** fields.
8. Click **OK**.

Supported laptop models

Vendor	Product	Type	WiFi	Graphic	CPU	Chipset
Dell	Latitude	E4300	Intel WiFi 5100, Intel WiFi 5300	Intel GM45	Intel Centrino 2	Intel GS45 Express Chipset



Vendor	Product	Type	WiFi	Graphic	CPU	Chipset
Dell	Latitude	E6400	Intel WiFi 5100, Intel WiFi 5300	Intel GM45	Intel Centrino 2	Intel 45 Express Chipset
Dell	Latitude	E6500*	Intel WiFi 5100, Intel WiFi 5300	Intel GM45	Intel Centrino 2	Intel 45 Express Chipset
Dell	OptiPlex	780		Integrated Intel Graphics Media Accelerator 4500	Intel Core2 Quad, Intel Core2 Duo, Intel Pentium Dual Core, Intel Celeron Dual Core, Intel Celeron	Intel Q45 Express Chipset w/ ICH10DO
Dell	Latitude	E6410	Intel Centrino 802.11	Intel HD Graphics	Intel Centrino 2	Mobile Intel QM57 Express Chipset
Dell	Latitude	E6510	Intel Centrino 802.11	Intel HD Graphics	Intel Centrino 2	Mobile Intel QM57 Express Chipset
HP	Elite Book	6930p	Intel WiFi 5300	Intel GM45	Intel Centrino 2	Intel GM45 Express Chipset
HP	Elite Book	2530p	Intel WiFi 5100	Intel GM45	Intel Centrino 2	Intel GM45 Express Chipset
HP	Elite Book	8440p	Intel Corporation Centrino Advanced-N 6200	Intel HD Graphics	Intel Core i7-720QM, Intel Core i7-620M, Intel Core i5-540M, Intel Core i5-520M	Mobile Intel QM57 Express
Lenovo	Think Pad	T400	Intel WiFi 5100, Intel WiFi 5300, Intel WiFi 5350	Intel GM45	Intel Centrino 2	Intel 45 Express Chipset



Vendor	Product	Type	WiFi	Graphic	CPU	Chipset
Lenovo	Think Pad	T500	Intel WiFi 5100, Intel WiFi 5300, Intel WiFi 5350	Intel GM45	Intel Centrino 2	Intel 45 Express Chipset
Lenovo	Think Pad	X200	Intel WiFi 5100, Intel WiFi 5300, Intel WiFi 5350	Intel X4500 HD	Intel Centrino 2	Intel 45 Express Chipset

*The 15.4" Premium, UltraSharp™ WUXGA (1920x1200) Display with High Brightness (Wide View) is not supported. Only the 15.4" Premium WXGA+ (1440x900) LED Display (Wide View) and 15.4" Premium WXGA (1280x800) Display models are supported.

Hardware requirements

XenClient runs on the 64 bit hardware platforms listed above only. The additional hardware requirements are:

- Intel Core 2 Duo series processor with Intel VT-x Technology and VT-d Technology (Intel vPro Technology)
- 4GB or more memory recommended
- 160GB or more disk drive space recommended
- Intel Integrated Graphics 4500MHD

Note:

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

Supported operating systems

XenClient supports the installation of the following operating systems:

- Microsoft Windows 7 32bit

Note:

If you prefer to use Windows XP Mode to run your Windows XP applications on your Windows 7 VM, (instead of using a separate Windows XP VM) please ensure that you download the latest version of the Windows XP Mode software from <http://www.microsoft.com/windows/virtual-pc/>. Some earlier versions of the Windows XP Mode software used Intel VT-x virtualization technology in a way that conflicted with XenClient operation. The latest version of Windows XP Mode does not use Intel VT-x virtualization technology.

- Microsoft Windows Vista 32bit SP2
- Microsoft Windows XP 32bit SP3

Note:

The installation or modification of software directly on the XenClient host file system is not supported.



Installing XenClient

The following table lists the BIOS versions that have been tested, by device model:

Vendor	Device	Suggested BIOS version(s)
Dell	Latitude E4300	A12, A07
Dell	Latitude E6400	A14, A19, A20
Dell	Latitude E6500	A13, A19
Dell	OptiPlex 780	A01, A03
Lenovo	ThinkPad T500	3.09 (6FET79WW), 3.11, 3.12
Lenovo	ThinkPad T400	3.09 (7UET79WW)
Lenovo	ThinkPad X200	3.10 (7XET60WW), 3.12
HP	EliteBook 6930p	68PCU Ver. F.13, 68PSU Ver. F.16
HP	EliteBook 2530p	68PSU Ver. F.10, F.08

Warning:

- TXT and TPM are not supported. Please ensure that they are disabled in the BIOS.
- A BIOS version less than F.10 is not supported on a HP EliteBook 6390p.
- BIOS version 3.12-1.06 is not supported on a Lenovo device.

The first step in installing XenClient is to ensure that your computer has the correct settings. Please ensure that:

- SATA is setup to use AHCI mode.
- Intel (R) Virtualization Technology is enabled.
- The Intel (R) VT-d and VT-x features are enabled.

Note:

- With most systems enabling Virtualization Technology or Intel Virtualization Technology 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.
- Disable TXT (Trusted Execution Technology) and TPM (Trusted Platform Module) on all device models.

Additionally, please perform the following laptop model-specific setup steps:

Preparing a Lenovo device for installation

1. While the machine is booting, press the blue ThinkVantage button and then **F1**.
2. Set **Config > CPU > Intel Virtualisation Technology** to **Enabled**.



3. Set **Config > CPU > Intel VT-d feature** to **Enabled**.
4. Set **Security > Security Chip > Security Chip** to **Disabled**.
5. Move the wireless switch to the rightmost position (green).

Preparing a Dell device for installation

1. While the machine is booting, press **F12** and select **BIOS**.
2. Set **Wireless > Wi-Fi Catcher** to **Disabled**.
3. Set **Virtualisation Support > Virtualization > Enable Intel Virt-n Technology**.
4. Set **Virtualisation Support > VT for Direct I/O > Enable VT for Direct I/O**.
5. Move the wireless switch away from the screen to turn wireless on.

Preparing an HP device for installation

1. Press Esc, F10, while the machine is booting.
2. Set **System > Configuration > Device Configuration > Virt-n Technology > Enabled**.
3. Press the WiFi icon so it changes color from red to blue.

Installing XenClient using the installer CD

See Known Issues in *Citrix® XenClient™ 1.0 RC Release Notes* for any known issues that might affect your installation.

Warning:

Installing XenClient erases the entire contents of the hard disk on the target device.

XenClient offers two installation modes: quick installation or advanced installation. Use the arrow keys and the **Enter** button to navigate through the installation wizard.

Quick Install

Quick install does not include the option to register with a Synchronizer server. 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.
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 keyboard layout of the device and choose **Select**.
6. Choose **Verify** to ensure that the installation media is valid and uncorrupted, or **Skip** to begin the installation.



7. Next you are prompted to provide a password for the system. Enter the password and choose **OK**.
8. You are then prompted to confirm your password by entering it again. Enter the password and choose **OK**.
9. Choose **Continue** to begin the installation.
10. When the installation has completed, press **Continue** and then **Reboot** to reboot the machine.

Note:

The initial boot into Citrix Receiver for XenClient can take a few minutes to complete. Subsequent boots are faster.

11. Citrix Receiver for XenClient is displayed.

Advanced Install

Advanced install includes the option to specify a Synchronizer instance for XenClient to connect to.

1. Boot from the XenClient Installer CD.
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. Choose **Verify** to ensure that the installation media is valid and uncorrupted, or **Skip** to move to the next installation step.
6. Choose **OK** and review the software license.
7. Choose **OK** and **Yes** to accept the terms of the license.
8. Select the keyboard layout of the device and choose **Select**.
9. Choose **Continue** to begin the installation.
10. Choose **Configure** to enter a Synchronizer URL, or choose **Skip**.
11. Enter the full path to your Synchronizer server and click **Continue**.
12. 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**.
13. Choose **Continue**.
14. When the installation has completed, press **Continue** and then **Reboot** to reboot the machine.

Note:

The initial boot into Citrix Receiver for XenClient can take a few minutes to complete. Subsequent boots are faster.

15. Citrix Receiver for XenClient is displayed.

Note:

Please allow some time for the UI to load.

When you have completed the XenClient software installation and booted into Citrix Receiver for XenClient, ensure that your device is connected to a network before you install any VMs. If you are connected to a physical network, XenClient automatically sets up a network connection. You can also use NetworkManager



to configure wireless networks. These network settings apply to the XenClient host device. Each VM can be given full, limited or no access to the networks you configure for the host.

Installing XenClient over a network using PXE

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

The first step is to copy the `package.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.

The following is an example answerfile:

```
<interactive>>false</interactive>
<mode>fresh</mode>
<source type="url">http://192.168.1.1/xenclient_packages_dir</source>
<primary-disk>sda</primary-disk>
<network-interface mode="dhcp"></network-interface>
<password>xenclient</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:

```
DEFAULT verbose
PROMPT 1
TIMEOUT 50

LABEL verbose
kernel mboot.c32
append xen.gz max_cstate=0 iommu=1 iommu_inclusive_mapping=1 \
--- vmlinuz quiet root=/dev/ram rw start_install=new \
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 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.

Tag name	Description	Example(s)	Required?
interactive	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.	<pre><interactive>>true</interactive> <interactive>>false</interactive></pre>	no
quick-option	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, i.e., between <code><quick-option></code> and <code></quick-option></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.	<pre><quick-option> # other answerfile tags go here for quick # install </quick-option></pre>	no

Tag name	Description	Example(s)	Required?
source	The installation package source. The URL option can specify either http or ftp. The local option is for optical media installs. The verify attribute determines whether or not the media should be verified before performing the installation. If you specify the bootmedia 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.	<pre><source type="url"> \ http://127.0.0.1/foo/bar</source> <source type="bootmedia"></source> <source type="local" verify="true"> \ </source></pre>	sometimes
mode	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 modify an existing install.	<pre><mode>fresh</mode> <mode>reinstall</mode></pre>	yes
primary-disk	Required for automated installation if more than one disk is detected on the machine. Specify the UNIX disk name.	<pre><primary-disk>sda</primary-disk></pre>	sometimes
network-interface	Specifies the network device for use by the installer. Required for automated installs performed over the network.	<pre><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"> \ </network-interface></pre>	sometimes
password	Used to set the system password.	<pre><password></password> <password>foobar</password></pre>	yes for non-interactive installation

Tag name	Description	Example(s)	Required?
enable-ssh	Used to enable or disable the dom0 (control domain) ssh server. Warning: Disabling the ssh server prevents any access to dom0 to obtain system status reports.	<pre><enable-ssh>>true</enable-ssh> <enable-ssh>>false</enable-ssh></pre>	no
backend	Used to supply the URL specifying the location of the Synchronizer server.	<pre><backend> \ http://my.backend.url/is/here \ </backend></pre>	yes
skipready	If this tag is present, the Are you ready to install? screen is not displayed.	<pre><skipready></skipready></pre>	yes
preinstall	Used to supply a script to be executed prior to installation. Warning: Including answerfile tags in the pre-install script can cause the answerfile parser to produce unpredictable results.	<pre><preinstall>#!/bin/ash touch /tmp/i.was.here </preinstall></pre>	yes
postinstall	A post install script, executed at the end of a successful installation.	<pre><postinstall>#!/bin/ash touch /tmp/no.i.wasnt </postinstall></pre>	yes

Configuring XenClient networks for the device

Citrix Receiver for 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 NetworkManager to configure your device networks. See [Using XenClient](#) for more information about Citrix Receiver for XenClient.

To configure a wired network connection

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 on the NetworkManager icon. 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 wireless network connection

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

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.

Installation Troubleshooting

This section describes some troubleshooting scenarios. You may also want to visit the XenClient Forums at <http://forums.citrix.com/category.jspa?categoryID=209> for solutions.

When performing a XenClient installation 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 terminal window. Log in as `root`, with no password.

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. Type 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.

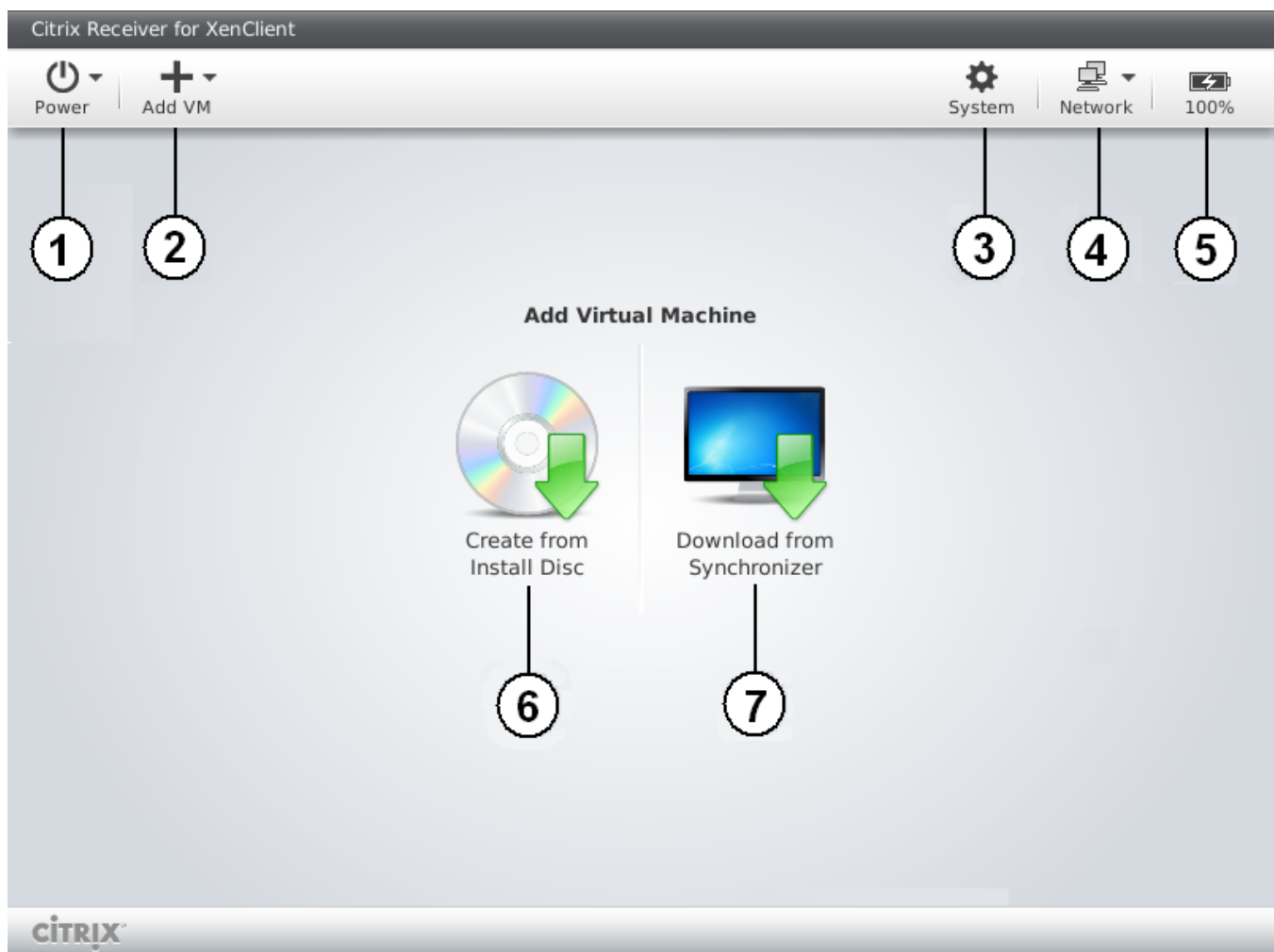
Using XenClient

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:

- Install VMs, edit VM properties, and delete VMs
- Connect to Synchronizer, download, publish, and backup VMs
- Setup 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.

Figure 1, "Citrix Receiver for XenClient with no VMs installed" shows XenClient as it appears before any VMs are installed.

Figure 1. Citrix Receiver for XenClient with no VMs installed



Legend for Figure 1, "Citrix Receiver for XenClient with no VMs installed"

1. **Device power state button** Provides power management 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 install a VM from Microsoft Windows install disks, 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. **NetworkManager button** Click here to setup wired and wireless networking for your XenClient device. You can control which of the networks you setup here each VM has access to by editing the VM properties. Left-click on this icon to create a new network connection. Right-click on this icon to edit your network connections.
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.

Installing VMs on XenClient

You can install VMs on XenClient either by using an installation disc or by downloading a VM from Synchronizer.

Creating a VM using an installation disc

You can create a VM using the vendor installation media or, if you have are using Synchronizer and have available desktops images you can get your desktop image from Synchronizer.

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 optionally a description. Select an icon to represent the VM.
4. Click the **Next** button.
5. Choose the amount of RAM to assign to the VM.
6. Choose the number of virtual CPUs (VCPUs) to assign to the VM.
7. Click the **Next** button.
8. Select the size of the virtual disk to assign to the VM.
9. Select the wired network 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.

The wireless network mode defaults to **Shared**.



10. Click the **Next** button.
11. 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. See the [To enabling VM installation from OEM installation media](#) procedure for information about how to do this.

12. Click the **Finish** button.
13. If you are installing Windows from an OEM version of the Windows installation media, use this procedure to enable OEM installation:

To enabling VM installation from OEM installation media

1. In Citrix Receiver for XenClient, switch to VM detail view.
 2. Click **View Details** for the relevant VM. If your device is registered with Synchronizer you may be prompted to provide your Synchronizer user credentials.
 3. Click the **Advanced** tab.
 4. Click **Edit**.
 5. From the **Allow OEM Windows installs** dropdown list, select **Enabled**.
 6. Click **Save**.
 7. Restart XenClient. When XenClient has restarted, start the VM and continue with the standard VM installation procedure.
14. The new VM will take focus and start to boot into the operating system installation procedure. For a network PXE boot, press **F12** and select the appropriate boot device.
 15. Complete the operating system installation as you would do on any other physical machine.

Note:

Do not enable automatic Windows updates or 3D Graphics Support until you have installed the Citrix XenClient Tools.

16. If you are installing a Windows XP VM, download and install the Windows Installer 3.1 Redistributable from <http://www.microsoft.com/downloads/details.aspx?familyid=889482FC-5F56-4A38-B838-DE776FD4138C&displaylang=en>, or run Windows Update before proceeding to the next step to install Windows Installer 3.1.
17. 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, and optionally experimental Secure Application Sharing functionality.
18. Run Windows Update. For sound in Windows 7, be sure to install the optional update `Microsoft driver update for Intel(r) 82801AA AC'97 Audio Controller`.
19. 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 [the section called "3D Graphics Support"](#) for more information.

Creating a VM from Synchronizer

1. Ensure that you are connected to your Synchronizer server. See [the section called "Working 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** screen is displayed.
5. Click the **Select a new VM** radio button if you want to install 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 **Next**.
8. Provide a name for the VM and click **Finish**.
9. 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.

Note:

If the VM you have downloaded is setup as a Application Subscribing VM, please perform the following workaround to get Secure Application Sharing to function correctly:

Re-enabling Secure Application Sharing after VM download from Synchronizer

1. In Citrix Dazzle, got to **Application Store > Manage Stores...** and delete the existing stores.
2. In Windows XP, go to `<disk_drive>:\Documents and Settings\All Users\Application Data` and delete all subdirectories.

In Windows 7 and Windows Vista, go to `<disk_drive>:\programdata\citrix\xci\applications` and delete all subdirectories.

Note:

These directories are hidden by Windows by default.

3. Restart all Application Publishing VMs.

Switching between VMs

The XenClient Switcher bar is displayed when you hover your mouse over 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.

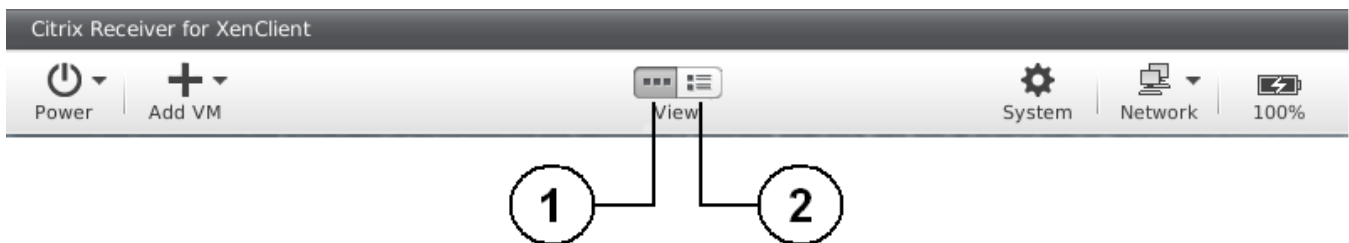
Note:

The ability to switch between VMs is disabled when a VM with 3D Graphics Support enabled is booting, or when logging in to it. See [the section called "3D Graphics Support"](#) for more information about 3D Graphics Support.

VM view modes

When you have installed a VM, the **View** modes are enabled. Use the **View** mode buttons to switch between the default icon view of VMs to the detail view. The detail view allows you to edit VM properties.

Figure 2. VM view mode controls



Legend for Figure 2, "VM view mode controls"

1. **VM icon view button** This is the default VM view mode.
2. **VM detail view button** Click here to switch to VM detail view mode.

VM icon view shows a summary of the installed VMs. The current power state (asleep, on, and so on) of each VM is shown below it. To switch to a VM, click on the VM icon.

Figure 3. VMs in Citrix Receiver for XenClient in VM icon view mode



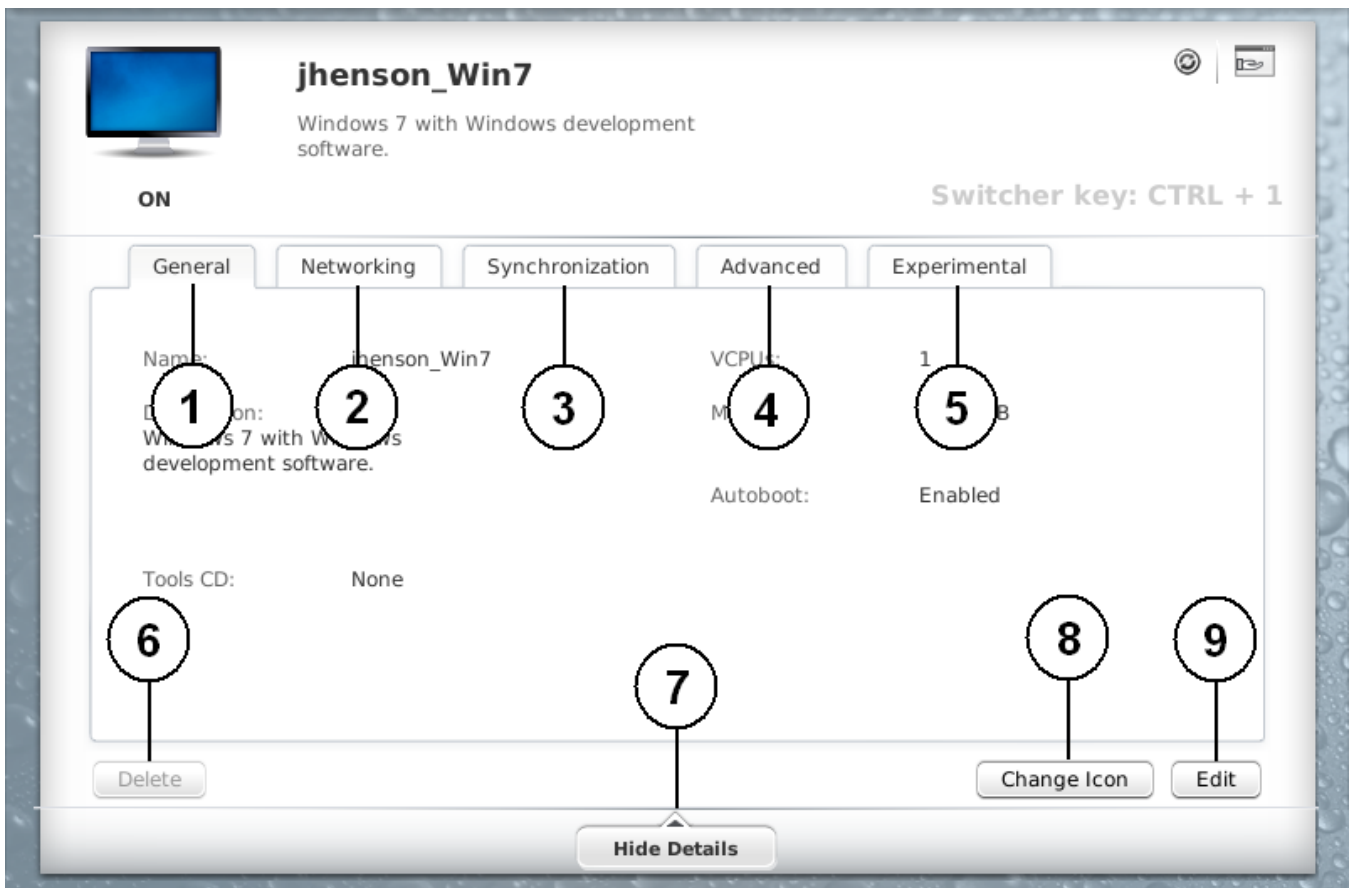
Switching to VM detail view shows more information about the installed VMs. The Switcher key is displayed along with a description of the VM. Icons at the top right indicate which features are enabled for the VM. In the following example the icons indicate that the VM is managed by Synchronizer and has Application Publishing enabled. Hover your mouse over the icons for more information.

Figure 4. VMs in Citrix Receiver for XenClient in VM detail view mode



Click the **View Details** button to view and edit detailed VM properties.

Figure 5. VM with details displayed



Legend for Figure 5, "VM with details displayed"

1. **General tab** Contains 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 is required for this setting to take effect.



2. **Networking tab** Allows you to edit how the VM can use networks configured for your device.
3. **Synchronization tab** If this VM is managed by Synchronizer, contains scheduling settings that control how frequently the VM is backed up and how frequently XenClient should contact Synchronizer to look for updates to this VM. If you have VM authoring rights, also allows you to upload the VM as a new desktop or desktop version. The VM must be shut down before this button is active.
4. **Advanced tab** Allows you to edit the VM boot devices and various other settings that may be useful for experimenting with XenClient
5. **Experimental tab** Allows you to enable various experimental features.

Warning:

To enable Intel Active Management Technology (AMT), follow the procedure [To enable AMT](#). Failure to do so can cause serious networking failure, VM switching failures, and the inability of VMs to boot.

6. **Delete VM button** Click this button to delete the VM. The VM must be shut down before this button is active.
7. **Hide VM details button** Click here to hide the VM details.
8. **Change VM icon button** Click here to select a new icon for the VM.
9. **Edit VM properties button** Click here to edit the properties on the currently active tab.

Note:

Certain settings may not be editable if the policy set in Synchronizer for this VM does not allow it.

To enable AMT

Note:

Enabling AMT on a Dell E6510, Dell E6410 or HP 8840p causes maximum wired networking speed to be cut to 10Mbps.

1. In Citrix Receiver for XenClient, press **Shift + Ctrl + t** to bring up the control domain terminal window.
2. Enter the user name and password you entered during XenClient installation.
3. Run the command:

```
mv /lib/modules/*/extra/e1000e.ko /lib/modules/
```
4. Close the terminal window.
5. In XenClient, click **Power** and select **Restart**.
6. When your device has rebooted, switch to VM detail view.
7. On the VM you want to enable AMT on, click **View Details**.
8. Click the **Advanced** tab.
9. Click **Edit**.
10. From the **Intel AMT ME Pass-through** dropdown list, select **Enabled**.
11. In XenClient, click **Power** and select **Restart**.

VM power saving management

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

Figure 6. VM power management controls



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.

Working with VMs

To edit VM properties

1. Switch to VM detail view.
2. Click **View Details** below the VM icon.
3. Click the relevant tab.
4. Click **Edit** and make your changes.
5. 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. Click **View Details**.
3. Click **Delete**, and confirm that you want to delete the VM.

Working 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

Warning:

If you are not a user with Administrator rights, you must have a desktop assigned to you before you can connect to Synchronizer.

1. In Citrix Receiver for XenClient, click the **System** button. The **System Properties** window is displayed.
2. Click **Synchronizer**.
3. Click **Connect with Synchronizer**.
4. Enter the URL or host name of your Synchronizer server in the **Synchronizer Address** textbox. If you have been given an activation ID, enter it in the **Activation Id** textbox.
5. Click **Register**.
6. Enter your Synchronizer user name and click **Next**.
7. Press **Ctrl + Alt + Backspace** to begin the process of securely authenticating with your Synchronizer server.
8. Enter your Synchronizer user name and password and press **Enter**.
9. Click **Close** to exit the **System Settings** window.


To publish a VM to Synchronizer

Note:


Only Synchronizer users with Administrator rights can publish VMs to Synchronizer. See the *Citrix XenClient Synchronizer Administrator Guide* for more information.

1. Shutdown the VM you want to publish.
2. In VM detail view, click **View Details**.
3. Click the **Synchronization** tab.
4. Click **Upload**. The **Publish Desktop to Synchronizer** wizard is displayed.
5. Enter a name and description for the VM. Click **Next**.
6. Enter a name for the local VM that will be created as a managed VM.
7. Click **Finish**.

To backup a Synchronizer-managed VM

1. While connected to Synchronizer, hover your mouse over the  icon of the VM you want to backup. An information message is displayed with the details of when the VM was last updated and backed up.
2. Click the **Backup Now** button.

To check for updates to a Synchronizer-managed VM

1. While connected to Synchronizer, hover your mouse over the  icon of the VM you want to backup. An information message is displayed with the details of when the VM was last updated and backed up.
2. Click the **Check Now** button.

Experimental XenClient features

3D Graphics Support

3D Graphics Support provides support for hi-fidelity 3D applications by providing direct access to the XenClient device's graphics processor. Only one running VM can have 3D Graphics Support enabled. A VM that uses the 3D Graphics Support feature can not publish applications to other VMs.

Note:

The latest graphics drivers from Intel will not install unless 3D Graphics Support is enabled.

Enabling 3D Graphics Support

Warning:

Do not attempt to resize the display of an XP VM, and do not let Windows do this automatically, until you have installed the latest Intel graphics drivers.

1. In Citrix Receiver for XenClient, switch to detail view.
2. Shut down the VM, and click **View Details**.
3. Select the **Experimental** tab.
4. Click **Edit**.
5. From the **3D Graphics support** dropdown list, select **Enabled**.
6. Click **Save**.
7. Restart the VM.
8. The next step is to install the latest Intel graphics driver on the VM. Failure to install these drivers degrades the 3D Graphics Support experience and can cause 3D Graphics Support to not function.
9. Navigate to <http://downloadcenter.intel.com/default.aspx>.
10. Select **Graphics** from the **Select a product family** list.
11. Select **Laptop graphics controllers** from the **Select a product line** list.
12. Select **Mobile Intel 4 Series Express Chipset Family** from the **Select a product name** list.
13. Select your operating system from the **Select an Operating System** list.
14. The required graphics drivers are displayed in the search results. Download and install the latest graphics driver. Depending on your operating system, the name of the drivers you need are:

Microsoft Windows XP 32bit SP3

Intel® Graphics Driver for Windows XP, version 14.42.1.5248 (6.14.10.5248). The filename of the download is winxp_14421.zip.

Microsoft Windows Vista 32bit SP2

Intel® Graphics Driver for Windows 7 and Windows Vista (exe), version 15.17.3.2104 (8.15.10.2104). The filename of the download is WinVista7_15173.exe.

Microsoft Windows 7 32bit

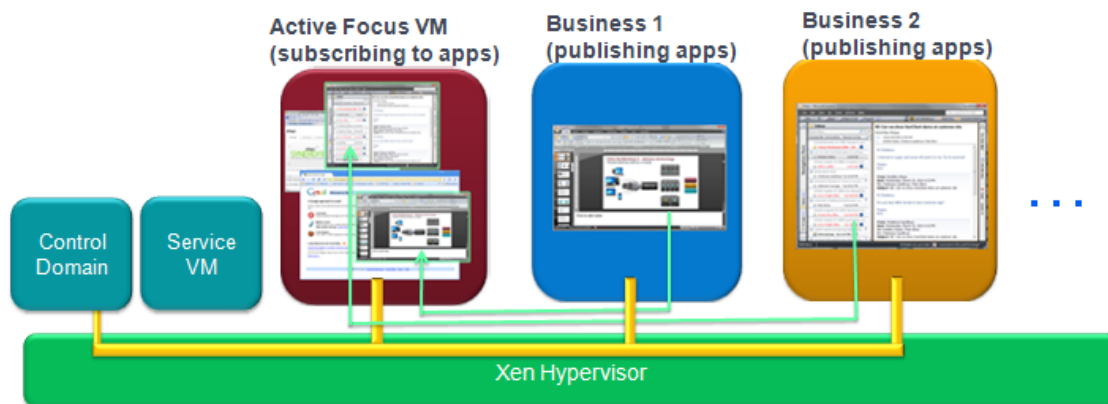
Intel® Graphics Driver for Windows 7 and Windows Vista (exe), version 15.17.3.2104 (8.15.10.2104). The filename of the download is WinVista7_15173.exe.

Secure Application Sharing and Citrix Dazzle

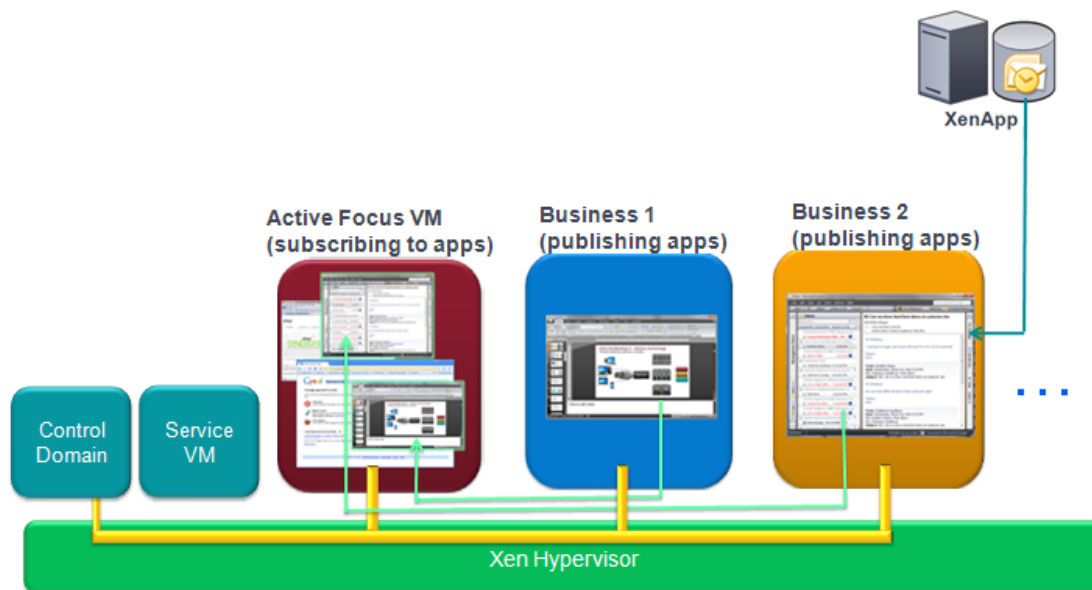
One of the experimental features of XenClient is the ability of a user to work mainly in one VM, but use applications running in other VMs without switching display focus. This functionality is known as Secure Application Sharing. The VM on which shared applications are displayed is called the *Application Subscribing VM*. The VM on which the applications are running is called the *Application Publishing VM*.

To enable Secure Application Sharing, the Application Publishing tools must be installed on the Application Publishing VM and the Application Subscribing tools must be installed on the Application Subscribing VM. These tools can be installed using the XenClient Tools Setup wizard.

The following diagram shows Secure Application Sharing in action. In it, three VMs are running. The red Application Subscribing VM is currently active and in focus. Applications are running as normal on the Application Subscribing VM, but with additional applications, which appear on the screen surrounded by a green border. These applications are running on the Application Publishing VMs that are not currently in focus (that is, not currently the 'owner' of the device screen). Any changes made to data with these applications is reflected in the VM on which it is actually running.



The following illustrates a similar scenario, except that in this case an application is being published from XenApp to the orange Application Publishing VM, which in turn is publishing it to the Application Subscribing VM that is active and in focus. The applications from XenApp are subscribed to using the Citrix Dazzle 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.



Citrix Dazzle 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 Dazzle has been installed and the Secure Application Sharing software has been setup, applications spidering is performed on all Application Publishing VMs to discover which applications are available to be subscribed to. These applications are listed in the Citrix Dazzle 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.

Installing Secure Application Sharing and Citrix Dazzle

Secure Application Sharing enables 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 Dazzle store. The applications you subscribe to in Citrix Dazzle are automatically added to the Windows **Start** menu, and can be launched from the **Start** menu just like any locally installed application.

To setup Secure Application Sharing, first choose an Application Subscribing VM. To set up this VM for Application Subscribing, follow the [Setting up a VM for Application Subscribing](#) procedure. Then, for each Application Publishing VM, follow the [Setting up a VM for Application Publishing](#) procedure.

Warning:

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. In Citrix Receiver for XenClient, switch to VM detail view.



2. Click **View Details** on the relevant VM.
3. Click the **General** tab.
4. Click **Edit**.
5. From the **Tools CD** dropdown list, select **Attached**
6. Click **Save**.

You may need to reboot the VM before the Citrix XenClient Tools are made available.

Setting up a VM for Application Publishing

Note:

Applications running on a VM using 3D Graphics Support cannot be shared.

1. Navigate to the `xc-tools` disk, which is usually mounted as the `E:` drive. Right-click on the icon and select **Open**. Double-click on the `SecureApplicationSharing` folder.
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. Right-click on the icon and select **Open**. Double-click on the `SecureApplicationSharing` folder.
2. Double-click `Setup`. The **Citrix XenClient Setup** installer is displayed.
3. Accept the software license agreement and click **Next**.
4. Check the **Application Subscribing** checkbox and click **Next** and **Install**.
5. Switch to Citrix Receiver for XenClient by pressing **Ctrl + 0** or using the VM switcher bar.
6. Switch to VM detail view.
7. For the VM on which you have just installed the Application Subscribing software, click **View Details**.
8. Click the **Experimental** tab.
9. Click **Edit**.
10. In the **Subscribe to Applications** dropdown, 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 **All Programs > Dazzle Apps > Select more apps**. The Citrix Dazzle application is displayed. Click **Get Started** to continue.

Citrix Dazzle 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 Dazzle application.

Note:



You cannot open an application directly using Citrix Dazzle. You must first add the application and then launch it from the **Start** menu.

Note:

An Application Publishing VM must be running to share the applications on it.

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 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.

Attribute name	Description	Default
Enabled	If <code>false</code> the directory path is ignored.	true

Attribute name	Description	Default
Recurse	If <code>true</code> the application spider will recurse into sub-directories of the specified directory.	<code>true</code>
Wildcard	A file name matching wildcard.	<code>*.lnk</code>
Category	Specifies the category under which the discovered applications will be grouped in Citrix Dazzle, for example, <code>Office Application</code> . If no category is specified the applications will be grouped under their containing folder name.	By default there is no category.
Keywords	Space-delimited string of keywords for the discovered applications. The keyword <code>Recommended</code> causes found applications to be put into the FEATURED category in Citrix Dazzle.	By default there are no keywords.

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 a `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.

Troubleshooting

When experiencing a technical issue with XenClient, it is very important to 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/category.jspa?categoryID=209> for solutions.

Generating a XenClient status report

1. Press **Ctrl + Shift + t** to access the console in the Citrix Receiver for XenClient UI, and enter the password you created during the XenClient installation process.

2. Run the **status-report** command:

```
status-report
```

3. Type **yes** to include screenshots in the status report or **no** to suppress the creation of screenshots, and press **Enter**.
4. Please enter a short (8 words or less) title as a summary of the problem you have encountered, and press **Enter**.
5. Please enter a more detailed description of the problem you have encountered, and press **Enter** twice when done.
6. Please enter the steps you think are required to reproduce the problem. Press **Enter** twice when done.
7. Make sure that the machine is connected to a network, either wired or wireless.

8. Run the **status-server** command:

```
status-server
```

9. Use a web browser on another machine or in a VM to download the status report from the URL indicated by the `status-server` command.
10. Press **Enter** to shut down the status server.
11. Include the status report file with any query to a support representative.

Turning 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 open a terminal window when in Citrix Receiver for XenClient

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

Note:

Use **Alt + Tab** to bring a terminal window into focus should it end up behind Citrix Receiver for XenClient.



To refresh Citrix Receiver for XenClient if Citrix Receiver for XenClient hangs

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

To return to Citrix Receiver for XenClient from a unresponsive VM with 3D Graphics Support enabled

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.

1. Press and hold **Ctrl + 0** for 15 seconds.
2. If Citrix Receiver for XenClient is still not displayed, press **Ctrl + 0** once to switch to Citrix Receiver for XenClient.

To determine the IP address of a XenClient device

1. In Citrix Receiver for XenClient right-click on the NetworkManager 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 Application Publishing applications appear in Citrix Dazzle

1. Ensure the Application Subscribing VM is running.
2. Start or restart all Application Publishing VMs.
3. Wait for disk activity in Application Publishing VMs to stop.
4. Run `c:\program files\citrix\xci\xciappupdater.exe` in the Application Subscribing VM.
5. Start Citrix Dazzle.

Troubleshooting Driver Protocol error when attempting to launch Secure Application Sharing applications

1. Close Citrix Dazzle.
2. Shutdown the Application Subscribing VM.
3. Shutdown the Application Publishing VMs.
4. Start the Application Subscribing VM.
5. Start the Application Publishing VMs.
6. Wait until the disk activity in the Application Publishing VMs has stopped.
7. Restart Citrix Dazzle.



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Intel Graphics and sound drivers

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Citrix Worldwide

Worldwide headquarters

Citrix Systems, Inc.
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Regional headquarters

Americas

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USA
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