



# Citrix XenServer® 7.1 Quick Start Guide

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Citrix XenServer ® 7.1 Quick Start Guide

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# Chapter 1. Welcome

The XenServer Quick Start Guide steps through the installation and configuration essentials to get XenServer and its graphical, Windows-based user interface, XenCenter, up and running. After installation, it takes you through the process of creating Windows virtual machines (VMs) and then making customized virtual machine templates from which you can quickly create multiple, similar VMs. Finally, this guide demonstrates how to create a pool of hosts, which provides the foundation to migrate running VMs between hosts using XenMotion.

Focusing on the most basic deployment scenarios, this guide aims to get you set up quickly.

This guide is primarily intended for new users of XenServer and XenCenter. It is intended for those who wish to administer XenServer using XenCenter. For information on how to administer XenServer using the Linux-based `xe` commands through the XenServer Command Line Interface (CLI), please refer to the *XenServer Administrator's Guide*.

This guide will take you through:

- **Installing XenServer and XenCenter**
  - Installing XenServer on a physical host
  - Installing XenCenter
  - Connecting XenCenter to the XenServer host
  - Activating XenServer
- **Creating Virtual Machines**
  - Creating a Windows VM
  - Making VM templates: from an existing VM and from a VM snapshot
  - Creating VMs from VM templates
- **Creating a Pool of XenServer Hosts**
  - Creating a pool of hosts
  - Setting up shared storage for the pool
  - Copying VMs to shared storage
  - Migrating running VMs between hosts in a pool (XenMotion)

## Terminology and Abbreviations

- *Host* — a physical computer that runs XenServer
- *Virtual Machine (VM)* — a computer composed entirely of software that can run its own operating system and applications as if it were a physical computer; a VM behaves exactly like a physical computer and contains its own virtual (software-based) CPU, RAM, hard disk and network interface card (NIC)
- *Pool* — a single managed entity that binds together multiple XenServer hosts and their VMs
- *Storage Repository (SR)* — a storage container in which virtual disks are stored

## XenServer Major Components

**XenServer** is a complete server virtualization platform, optimized for both Windows and Linux virtual servers, with all the capabilities required to create and manage a virtual infrastructure.

XenServer runs directly on server hardware without requiring an underlying operating system, which results in an efficient and scalable system. XenServer works by abstracting elements from the physical machine (such as hard drives, resources and ports) and allocating them to the virtual machines (VMs) running on it.



XenServer lets you create VMs, take VM disk snapshots and manage VM workloads.

**XenCenter** is a graphical, Windows-based user interface. XenCenter allows you to manage XenServer hosts, pools and shared storage, and to deploy, manage and monitor VMs from your Windows desktop machine.

The XenCenter *Online Help* is also a great resource for getting started with XenCenter. Press F1 at any time to access context-sensitive information.

# Chapter 2. Installing XenServer and XenCenter

This chapter steps through installing XenServer on a single physical host, installing XenCenter on a Windows computer, and connecting them to form the infrastructure for creating and running virtual machines (VMs).

To get started, you need at least two separate physical computers: one to be the XenServer host and the other to run the XenCenter application. The XenServer host computer is dedicated entirely to the task of running XenServer — hosting VMs — and is **not** used for other applications. The computer that runs XenCenter can be any general-purpose Windows computer that satisfies the hardware requirements and can be used to run other applications too. For a detailed description of the system requirements, see [Appendix A, System Requirements](#).

You will need the main XenServer installation file which contains the basic packages required to set up XenServer on your host and to install XenCenter on your Windows computer. You can download the installer (ISO file format) and burn it to a CD. To download the installer, visit the [XenServer Downloads](#) page.

In this chapter, you will:

- **Install the XenServer host**
- **Install XenCenter**
- **Connect XenCenter to the XenServer host**
- **Activate XenServer**

## 2.1. Installing the XenServer Host

All hosts have at least one IP address associated with them. If you want to configure a static IP address for the host (instead of using DHCP), it is helpful to have the static IP address on hand before beginning this procedure.

### To install the XenServer host

1. Insert the main installation CD into the DVD drive of the host computer.

**Warning:**

Installing XenServer will overwrite data on any hard drives that you select to use for the installation. Back up any data that you wish to preserve before proceeding.

2. Restart the host computer.
3. Boot from the DVD drive (if necessary, see your hardware vendor documentation for information on changing the boot order).
4. Following the initial boot messages and the **Welcome to XenServer** screen, select your keyboard layout for the installation.

**Tip:**

Throughout the installation, quickly advance to the next screen by pressing **F12**. For general help, press **F1**.

5. When the **Welcome to XenServer Setup** screen is displayed, select **Ok**.
6. Read and accept the XenServer End User License Agreement (EULA).

**Note:**

If you now see a **System Hardware** warning screen and suspect that hardware virtualization assist support is available on your system, check the support site of your hardware manufacturer for BIOS upgrades.



7. Select **Ok** to perform a clean installation.
8. If you have multiple hard disks, choose a Primary Disk for the installation. Select **Ok**.  
Choose which disk(s) you would like to use for virtual machine storage. Choose **Ok**.
9. Select **Local media** as your installation source.  
**Note:**  
For information on using HTTP, FTP, or NFS as your installation source, see the *XenServer Installation Guide*.
10. When prompted about if you would like to install any supplemental packs, choose **No** to continue.
11. Select **Skip Verification**, and then choose **Ok**.  
**Note:**  
If you encounter problems during installation, verify the installation source.
12. Create and confirm a root password, which the XenCenter application will use to connect to the XenServer host.
13. Set up the management interface that will be used to connect to XenCenter.  
If your computer has multiple network interface cards (NICs), select the NIC which you want to use for management traffic (typically the first NIC). A network port that is not tagged as a VLAN is required for the management interface.
14. Configure the Management NIC IP address with a static IP address or use DHCP.
15. Specify the hostname and the DNS configuration manually or automatically through DHCP.  
If you manually configure the DNS, enter the IP addresses of your primary (required), secondary (optional), and tertiary (optional) DNS servers in the fields provided.
16. Select your time zone.
17. Specify how you would like the server to determine local time: using NTP or manual time entry. Choose **Ok**.  
If using NTP, you can then specify if the DHCP sets the time server, or enter at least one NTP server name or IP address in the fields below.
18. Select **Install XenServer**.
19. If you selected to set the date and time manually, you will be prompted to do so.
20. From the **Installation Complete** screen, eject the installation CD from the drive, and then select **Ok** to reboot the server.

After the server reboots, XenServer displays **xsconsole**, a system configuration console.

**Note:**

Make note of the IP address displayed. You will use this when you connect XenCenter to the host.



## 2.2. Installing XenCenter

XenCenter is typically installed on your local workstation or laptop.

### To install XenCenter

1. Insert the main installation CD into the DVD drive of the computer which you want to run XenCenter.
2. Open the `client_install` folder on the CD. Double-click `XenCenterSetup.exe` to begin the installation.
3. Follow the Setup wizard, which allows you to modify the default destination folder and then to install XenCenter.

## 2.3. Connecting XenCenter to the XenServer Host

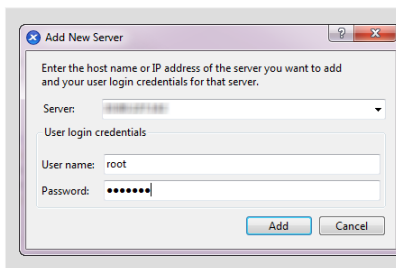
This procedure lets you add a host to XenCenter.

### To connect XenCenter to the XenServer host

1. Launch XenCenter.

The program opens to the **Home** tab.

2. Click the **ADD a server** icon to open the **Add New Server** dialog box.



In the **Server** field, enter the IP address of the host.

Enter the root username and password that you set during XenServer installation.

Choose **Add**.

### Note:





The first time you add a new host, the **Save and Restore Connection State** dialog box appears. This enables you to set your preferences for storing your host connection information and automatically restoring server connections.

### 2.3.1. Licensing XenServer

XenServer 7.1 is available in two commercial editions:

- Standard
- Enterprise

The **Standard** edition is our entry-level commercial offering, with a range of features that will suit the needs of those customers who want a robust and high performing virtualization platform, but do not require the premium features offered by the Enterprise edition; while still wishing to benefit from the assurance of comprehensive Citrix support and maintenance.

The **Enterprise** edition is our premium offering, optimized for desktop, server and cloud workloads. In addition to the Standard edition, the Enterprise edition offers the following features:

- Automated Windows VM Driver Updates
- Automatic updating of the Management Agent
- Support for SMB storage
- Direct Inspect APIs
- Dynamic Workload Balancing
- GPU Virtualization (vGPU) with NVIDIA GRID and Intel GVT-g
- VMware vSphere to XenServer Conversion utilities
- Intel Secure Measured Boot (TXT)
- Export Pool Resource Data
- In-memory Read Caching
- PVS-Accelerator
- Automated Updates using XenCenter
- XenServer Live Patching

Customers who have purchased XenApp or XenDesktop continue to have an entitlement to XenServer, which includes all the features listed above. Note that in XenServer 7.1, all XenApp/XenDesktop customers are able to use the In-memory Read Caching feature (previously available to Platinum customers only).

### Applying a license

XenServer uses the same licensing mechanism, as used by many other Citrix products. XenServer 7.1 licensing requires Citrix License Server 11.13.1.2 or higher. You can download the License Server from [Citrix Licensing](#). After purchasing a license, you will be provided with a .LIC license key. This license key should be installed on either:

- a Windows server running the **Citrix License Server** software.
- the Linux-based **Citrix License Server** virtual appliance.

Customers should allocate product licenses using a Citrix License Server, as with other Citrix components. From version 6.2.0 onwards, XenServer (other than through the XenDesktop licenses) is licensed on a per-socket basis. Allocation of licenses is managed centrally and enforced by a standalone Citrix License Server, physical or virtual, in the environment. After applying a per-socket license, XenServer will display as Citrix XenServer Per-Socket Edition. All hosts in a pool must be licensed. Mixed pools of licensed and unlicensed hosts will behave as if all hosts were unlicensed.



**Note:**

Upgrades to the Enterprise edition are available from the Standard edition. Click [here](#) to purchase a XenServer 7.1 license.

For instructions on applying a XenServer license to a Citrix License Server Virtual Appliance, see [CTX200159](#).

# Chapter 3. Creating a Pool of XenServer Hosts

A resource pool is composed of multiple XenServer host installations, bound together as a single managed entity.

Resource pools let you view multiple hosts and their connected shared storage as a single unified resource, enabling flexible deployment of virtual machines based on their resource needs and business priorities. A pool may contain up to 16 hosts running the same version of XenServer software, at the same patch level, and with broadly compatible hardware.

One host in the pool is designated as the *pool master*, and provides a single point of contact for all of the servers in the pool, routing communication to other members of the pool as necessary. Every member of a resource pool contains all the information necessary to take over the role of master if required. The pool master is the first host listed for the pool in the XenCenter Resources pane. You can find the pool master's IP address by selecting the pool master and clicking the **Search** tab.

When combined with shared storage, a pool enables VMs to be started on *any* XenServer host in the pool that has sufficient memory, and then dynamically moved between hosts while running (XenMotion), and with minimal downtime. If an individual XenServer host suffers a hardware failure, you can restart the failed VM(s) on another host in the same pool.

If the High Availability (HA) feature is enabled, protected VMs are *automatically* moved in the event of a host failure. On an HA-enabled pool, a new pool master is automatically nominated if the master is shut down.

**Note:**

For a description of heterogeneous pool technology, see [Section A.2, “Pool Requirements”](#).

After you create a pool, this chapter then steps you through setting up shared storage. While XenServer accommodates many storage solutions, this chapter focuses on two common types — NFS and iSCSI.

In this chapter, you will:

- **Create a pool of hosts**
- **Set up shared storage for the pool**
- **Copy VMs to shared storage**

## 3.1. Creating a Pool

To create a pool, you first need to install XenServer on a second host, typically with similar processor type, and then connect XenCenter to the new host. To get you started quickly, this section focuses on creating *homogeneous* pools. Within a homogeneous pool, all hosts must have compatible processors and be running the same version of XenServer, under the same type of XenServer product license. For a full list of homogeneous pool requirements, see [Section A.2, “Pool Requirements”](#).

### To create a pool

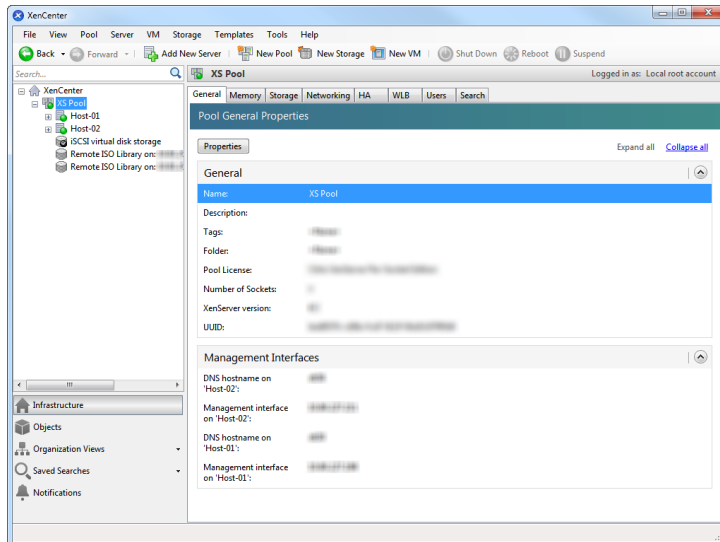
1. On the toolbar, click the **New Pool** button.



2. Enter a name for and optional description of the new pool.

3. Nominate the pool master by selecting a host from the **Master** list.
4. Select the second host to place in the new pool from the **Additional members** list.
5. Click **Create Pool**.

The new pool appears in the **Resources** pane.



## 3.2. Setting Up Networks for the Pool

When you install XenServer, you create a network connection—typically on the first NIC in the pool where you specified an IP address (during XenServer installation).

However, you may need to connect your pool to VLANs and other physical networks. To do so, you must add these networks to the pool. You can configure XenServer to connect each NIC to one physical network and numerous VLANs.

Before creating networks, note that the cabling must match on each host in the pool. That is, the NICs on each host must be plugged in to the same physical networks as the corresponding NICs on the other hosts in the pool.

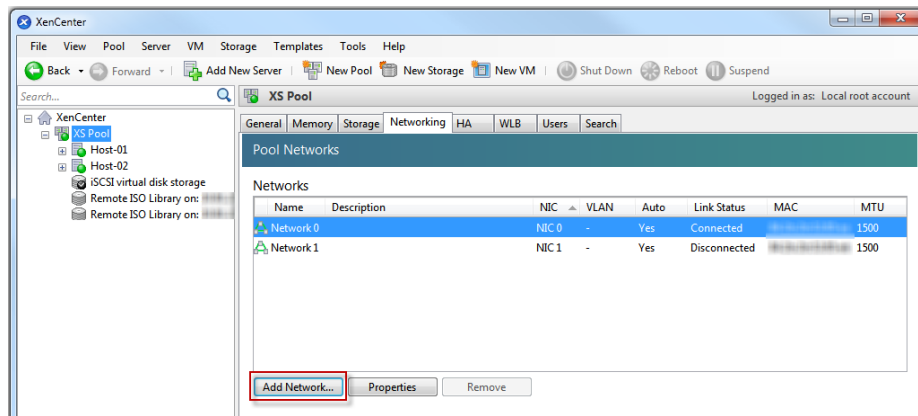
### Note:

If the NICs were not plugged in to the NICs on the host when you installed XenServer, plug them in and rescan them by selecting **<your host> > NICs** tab and clicking **Rescan** for them to appear.

For additional information about configuring XenServer networking, see the *XenCenter Help* and the *XenServer 7.1 Administrator's Guide*.

### To add a network to XenServer

1. In the **Resources** pane in XenCenter, select the pool.
2. Click the **Networking** tab.
3. Click **Add Network**.



4. On the **Select Type** page, select **External Network**, and click **Next**.
5. On the **Name** page, enter a meaningful name for the network and description.
6. On the **Network settings** page, specify the following:
  - **NIC.** Select the NIC that you want XenServer to use to send and receive data from the network.
  - **VLAN.** If the network is a VLAN, enter the VLAN ID (or "tag").
  - **MTU.** If the network uses jumbo frames, enter a value for the Maximum Transmission Unit (MTU) between 1500 to 9216. Otherwise, leave the MTU box at its default value of 1500.

If you will be configuring many virtual machines to use this network, you may want to select the **Automatically add this network to new virtual machines** check box so the network is added by default.

7. Click **Finish**. When you add a network or change networking using XenCenter, the same networks and settings are automatically configured on all the other hosts in the pool.

### 3.2.1. Bonding NICs

*NIC bonding*, also known as *NIC teaming*, can improve server resiliency by using two or more physical NICs as if they were a single, high-performing channel. This section only provides a very brief overview of bonding. Before configuring bonds for use in a production environment, Citrix recommends reading more in-depth information about bonding, such as that in the *Designing XenServer Network Configurations* guide.

XenServer supports three bond modes: Active/active, active/passive (active/backup), and LACP. Active/active provides load balancing and redundancy for VM-based traffic. For other types of traffic (storage and management), active/active cannot load balance traffic. As a result, LACP or multipathing are better choice for storage traffic. For information about multipathing, see the *Configuring iSCSI Multipathing Support for XenServer* guide or the *XenServer Administrator's Guide*. For more information about bonding, see the *Designing XenServer Network Configurations* guide.

LACP options are not visible or available unless you configure the vSwitch as the network stack, as described in the *XenServer Administrator's Guide*. Likewise, your switches must support the IEEE 802.3ad standard. The switch must contain a separate LAG group configured for each LACP bond on the host. For more details about creating LAG groups, see *XenServer Administrator's Guide*.

#### To bond NICs

1. Ensure that the NICs you want to bind together (the bond slaves) are not in use: you must shut down any VMs with virtual network interfaces using the bond slaves prior to creating the bond. After you have created the bond, you will need to reconnect the virtual network interfaces to an appropriate network.
2. Select the server in the **Resources** pane then click on the **NICs** tab and click **Create Bond**.
3. Select the NICs you want to bond together. To select a NIC, select its check box in the list. Up to four NICs may be selected in this list. Clear the check box to deselect a NIC. To maintain a flexible and secure network,

You can bond either two, three, or four NICs when vSwitch is the network stack, whereas you can only bond two NICs when Linux bridge is the network stack.

4. Under **Bond mode**, choose the type of bond:
  - Select **Active-active** to configure an active-active bond, where traffic is balanced between the bonded NICs and if one NIC within the bond fails, the host server's network traffic automatically routes over the second NIC.
  - Select **Active-passive** to configure an active-passive bond, where traffic passes over only one of the bonded NICs. In this mode, the second NIC will only become active if the active NIC fails, for example, if it loses network connectivity.
  - Select **LACP with load balancing based on source MAC address** to configure a LACP bond, where the outgoing NIC is selected based on MAC address of the VM from which the traffic originated. Use this option to balance traffic in an environment where you have several VMs on the same host. This option is not suitable if there are fewer virtual interfaces (VIFs) than NICs: as load balancing is not optimal because the traffic cannot be split across NICs.
  - Select **LACP with load balancing based on IP and port of source and destination** to configure a LACP bond, where the source IP address, source port number, destination IP address, and destination port number are used to allocate the traffic across the NICs. Use this option to balance traffic from VMs in an environment where the number of NICs exceeds the number of VIFs.

**Note:**

LACP bonding is only available for the vSwitch, whereas active-active and active-passive bonding modes are available for both the vSwitch and Linux bridge. For information about networking stacks, see the *XenServer Administrator's Guide*.

5. To use jumbo frames, set the Maximum Transmission Unit (MTU) to a value between 1500 to 9216.
6. To have the new bonded network automatically added to any new VMs created using the New VM wizard, select the check box.
7. Click **Create** to create the NIC bond and close the dialog box.

XenCenter will automatically move management and secondary interfaces from bond slaves to the bond master when the new bond is created. Note that a server with its management interface on a bond will not be permitted to join a pool. You will need to reconfigure the server's management interface and move it back on to a physical NIC before it can join a pool.

Note that a server with its management interface on a bond will not be permitted to join a pool. You will need to reconfigure the server's management interface and move it back on to a physical NIC before it can join a pool.

### 3.3. Setting Up Shared Storage for the Pool

To connect the hosts in a pool to a remote storage array, create a XenServer Storage Repository (SR), which is the storage container in which a VM's virtual disks are stored. SRs are persistent, on-disk objects that exist independently of XenServer. SRs can exist on different types of physical storage devices, both internal and external, including local disk devices and shared network storage.

You can configure a XenServer SR for a number of different types of storage, including:

- NFS
- Software iSCSI
- Hardware HBA
- SMB
- Fibre Channel
- Software FCoE

This section steps through setting up two types of shared SRs for a pool of hosts: NFS and iSCSI. Before you create a new SR, you need to configure your NFS or iSCSI storage array. Setup differs depending on the type of storage solution that you use, so refer to your vendor documentation for details. Generally, before you begin, if you are creating:

- **iSCSI SR:** You must have created a volume and a LUN on the storage array.
- **NFS SR:** You must have created the volume on the storage device.
- **Hardware HBA:** You must carry out the configuration required to expose the LUN before running the New Storage Repository wizard
- **Software FCoE SR:** You must manually complete the configuration required to expose a LUN to the host, including configuring the FCoE fabric and allocating LUNs to your SAN's public world wide name (PWWN).

If you are creating an SR for IP-based storage (iSCSI or NFS), you can configure one of the following as the storage network: the NIC that handles the management traffic or a new NIC for the storage traffic. If you want to configure a different a NIC for storage traffic, you must assign an IP address to a NIC by creating a *management interface*.

When you create a new management interface, you must assign it an IP address that (a) is on the same subnet as the storage controller, if applicable, (b) is on a different subnet than the IP address you specified when you installed XenServer, and (c) is not on the same subnet as any other management interfaces.

### To assign an IP address to a NIC

1. Ensure that the NIC is on a separate subnet, or routing is configured to suit your network topology in order to force the desired traffic over the selected NIC.
2. In the **Resource** pane of XenCenter, click on the pool (or standalone server). Click the **Networking** tab, and then click the **Configure** button.
3. In the **Configure IP Address** dialog, in the left pane, click **Add IP address**.
4. Give the new interface a meaningful name (for example, *yourstoragearray\_network*) and select the **Network** associated with the NIC you will use for storage traffic.
5. Click **Use these network settings**, and enter a static IP address you want to configure on the NIC, the subnet mask, and gateway, and click **OK**. The IP address must be on the same subnet as the storage controller the NIC is connected to.

#### Note:

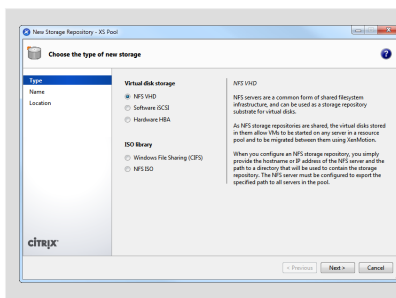
Whenever you assign a NIC an IP address, it must be on a different subnet than any other NICs with IP addresses in the pool, including the primary management interface.

### To create a new shared NFS or iSCSI storage repository

1. On the **Resources** pane, select the pool. On the toolbar, click the **New Storage** button.



The **New Storage Repository** wizard opens.



Under **Virtual disk storage**, choose NFS or iSCSI as the storage type.

Click **Next** to continue.

2. If you choose NFS:



- a. Enter a name for the new SR and the name of the share where it is located. Click **Scan** to have the wizard scan for existing NFS SRs in the specified location.

**Note:**

The NFS server must be configured to export the specified path to all XenServer hosts in the pool.

- b. Click **Finish**.

The new SR appears in the **Resources** pane, within the pool.

3. If you choose iSCSI:

- a. Enter a name for the new SR and then the IP address or DNS name of the iSCSI target.

**Note:**

The iSCSI storage target must be configured to enable every XenServer host in the pool to have access to one or more LUN(s).

- b. If you have configured the iSCSI target to use CHAP authentication, enter the username and password.
- c. Click the **Scan Target Host** button, and then choose the iSCSI target IQN from the Target IQN list.

**Warning:**

The iSCSI target and all servers in the pool must have *unique* IQNs.

- d. Click **Target LUN**, and then select the LUN on which to create the SR from the Target LUN list.

**Warning:**

Each individual iSCSI storage repository must be contained entirely on a single LUN, and may not span more than one LUN. Any data present on the chosen LUN will be destroyed.

- e. Click **Finish**.

The new SR appears in the **Resources** pane, within the pool.

The new shared SR now becomes the default SR for the pool.



# Chapter 4. Creating Virtual Machines

Through XenCenter, you can create virtual machines in a number of ways, according to your deployment needs. Whether you need to deploy individual VMs with distinct configurations and features or groups of multiple, similar VMs, XenCenter can get you up and running in a just a few steps.

XenServer also provides an easy way to convert batches of virtual machines from VMware. For information, see the *Citrix XenServer Conversion Manager Guide*.

This chapter focuses on a few methods by which to create Windows VMs. To get started quickly, the procedures use the simplest setup of XenServer: a single XenServer host with local storage (after you connect XenCenter to the XenServer host, storage is automatically configured on the local disk of the host).

This chapter also demonstrates how to use XenMotion to live migrate VMs between hosts in the pool.

After explaining how to create and customize your new VM, this chapter demonstrates how to convert that existing VM into a VM template. A VM template preserves your customization so you can always use it to create new VMs to the same (or to similar) specifications. It also reduces the time taken to create multiple VMs.

You can also create a VM template from a snapshot of an existing VM. A snapshot is a record of a running VM at a point in time. It saves the storage, configuration and networking information of the original VM, which makes it useful for backup purposes. Snapshots provide a fast way to make VM templates. This chapter demonstrates how to take a snapshot of an existing VM and then how to convert that snapshot into a VM template. Finally, this chapter describes how to create new VMs from a VM template.

In this chapter, you will:

- **Create a Windows VM**
- **Use XenMotion for live migration of VMs between hosts**
- **Make a VM template from:**
  - **An existing VM**
  - **A VM snapshot**
- **Create VMs from a VM template**

## 4.1. Creating a Windows 8 (32-bit) VM

### Note:

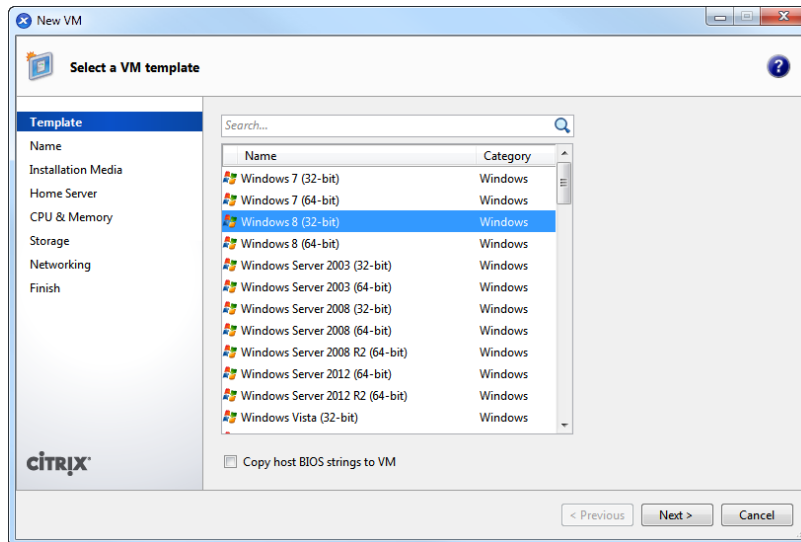
The following procedure provides an example of creating Windows 8 (32-bit) VM. The default values may vary depending on the operating system that you choose.

### To create a Windows VM:

1. On the toolbar, click the **New VM** button to open the New VM wizard.



The New VM wizard allows you to configure the new VM, adjusting various parameters for CPU, storage and networking resources.



2. Select a VM template and click **Next**.

Each template contains the setup information needed to create a new VM with a specific guest operating system (OS), and with optimum storage. This list reflects the templates that XenServer currently supports.

**Note:**

If the OS that you intend to install on your new VM is compatible only with the original hardware (for example, an OS installation CD that was packaged with a specific computer), check the **Copy host BIOS strings to VM** box.

3. Enter a name for and optional description of the new VM.
4. Choose the source of the OS media to install on the new VM.

Installing from a CD/DVD is the simplest option for getting started. To do so, choose the default installation source option (DVD drive), insert the disk into the DVD drive of the XenServer host, and choose **Next** to proceed.

XenServer also allows you to pull OS installation media from a range of sources, including a pre-existing ISO library.

To attach a pre-existing ISO library, click **New ISO library** and indicate the location and type of ISO library. You can then choose the specific operating system ISO media from the drop-down list.

5. The VM will run on the installed host. Choose **Next** to proceed.
6. Allocate processor and memory resources.

For a Windows 8 VM, the default is 1 virtual CPU, 1 socket with 1 core per socket and 2 GB of RAM. You may choose to modify the defaults if required. Click **Next** to continue.

**Note:**

Each OS will have different configuration requirements which will be reflected in the templates.

7. Assign a graphics processing unit (GPU).

The New VM wizard prompts you to assign a dedicated GPU or a virtual GPU to the VM. This enables the VM to use the processing power of the GPU, providing better support for high-end 3D professional graphics applications such as CAD/CAM, GIS, and Medical Imaging applications.

**Note:**

GPU Virtualization is available for XenServer Enterprise edition customers, or those who have access to XenServer through their XenApp/XenDesktop entitlement.

8. Configure storage for the new VM.

Click **Next** to select the default allocation (24 GB) and configuration, or you may wish to:

- a. Change the name, description or size of your virtual disk by clicking **Properties**.
- b. Add a new virtual disk by selecting **Add**.

**Note:**

When you create a pool of XenServer hosts, as you do in the next chapter, you can configure shared storage at this point if creating a new VM.

9. Configure networking on the new VM.

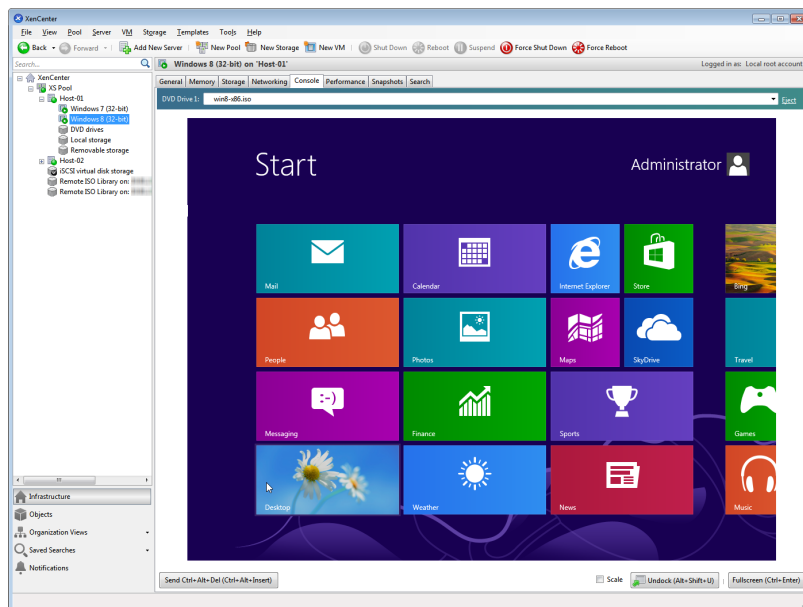
Click **Next** to select the default network interface card (NIC) and configurations, including an automatically-created unique MAC address for each NIC, or you may want to:

- a. Change the physical network, MAC address or quality-of-service (QoS) priority of the virtual disk by clicking **Properties**.
- b. Add a new virtual network interface by selecting **Add**.

XenServer uses the virtual network interface to connect to the physical network on the host. Be sure to select the network that corresponds with the network the virtual machine requires. To add a physical network, see [Section 3.2, “Setting Up Networks for the Pool”](#)

10. Review settings, and then click **Create Now** to create the new VM and return to the **Search** tab.

An icon for your new VM appears under the host in the **Resources** pane.



On the **Resources** pane, select the VM, and then click the **Console** tab to see the VM console.

11. Follow the OS installation screens and make your selections.
12. Once the OS installation completes and the VM reboots, install the XenServer Tools. See [Section 4.2, “Installing XenServer Tools”](#) for more information

## 4.2. Installing XenServer Tools

XenServer Tools provide high performance I/O services without the overhead of traditional device emulation. XenServer Tools consists of I/O drivers (also known as Paravirtualized drivers or PV drivers) and the Management Agent. XenServer Tools must be installed on each VM in order for the VM to have a fully-supported configuration. A VM will function without them, but performance will be significantly hampered. XenServer Tools also enable certain functions and features, including cleanly shutting down, rebooting, suspending and live migrating VMs.

**Warning:**

You must install XenServer Tools for each Windows VM. Running Windows VMs without XenServer Tools is *not* supported.

**To install XenServer Tools:**

1. Select the VM in the Resources pane, right-click, and then click **Install XenServer Tools** on the shortcut menu. Alternatively, on the VM menu, click **Install XenServer Tools**.

Or

On the General tab of the VM, click **Install I/O drivers and Management Agent**.

**Note:**

When you install XenServer Tools on your VM, you will be installing both I/O drivers (PV drivers) and the Management Agent

2. If AutoPlay is enabled for the VM's CD/DVD drive, installation will start automatically after a few moments. The process installs the I/O drivers and the Management Agent, and reboots the VM as required.
3. If AutoPlay is not enabled, the XenServer Tools installer displays the installation options. Click **Install XenServer Tools** to continue with the installation. This mounts the XenServer Tools ISO (guest-tools.iso) on the VM's CD/DVD drive.
4. Click **Run setup.exe** to begin XenServer Tools installation and restart the VM when prompted to complete the installation process.

**Note:**

I/O drivers will be automatically installed on a Windows VM that has the ability to receive updates from Windows Update. However, we recommend that you install the XenServer Tools package to install the Management Agent, and to maintain supported configuration.

The ability to receive I/O drivers from Windows Update and the automatic updating of the Management Agent features are available for XenServer Enterprise edition customers, or those who have access to XenServer through XenApp/XenDesktop entitlement. For more information about updating XenServer Tools from Windows Updates, see the *XenServer Installation Guide*.

Once you have installed the XenServer Tools, you can customize your VM by installing applications and performing any other configurations. If you would like to create multiple VMs with similar specifications, you can do so quickly by making a template from the existing VM and then creating new VMs from that template. For more information, see [Section 4.4, "Creating VM Templates"](#).

## 4.3. Migrating Running VMs between Hosts in a Pool

Using XenMotion (live migration), you can move a running VM from one host to another in the same pool, and with virtually no service interruption. Where you decide to migrate a VM to depends on how you configure the VM and pool.

**To migrate a running VM**

1. On the **Resources** pane, select the VM that you want to move.

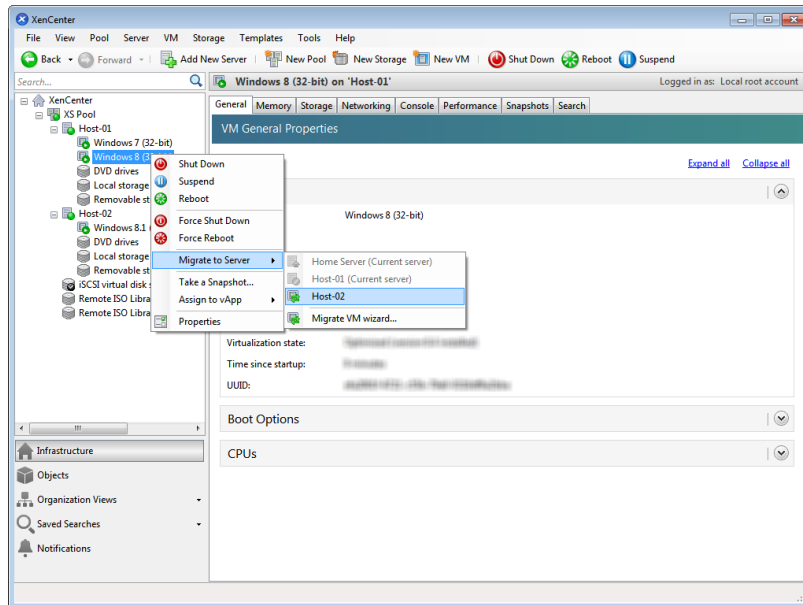
**Note:**

Make sure that the VM you migrate does not have local storage.

2. Right-click the VM icon, point to **Migrate to Server**, and then select the new VM host.

**Tip:**

You can also drag and drop the VM onto the target host.



3. The migrated VM displays under the new host in the **Resources** pane.

## 4.4. Creating VM Templates

There are a number of ways to create a VM template from an existing Windows VM, each with its individual benefits. This section focuses on two methods: converting an existing VM into a template, and creating a template from a snapshot of a VM. In both cases, the VM template preserves the customized configuration of the original VM or VM snapshot and can then be used to quickly create new, similar VMs. This section demonstrates how to make new VMs from these templates.

Before you create a template from an existing VM or VM snapshot, Citrix recommends that you run the Windows utility *Sysprep* on the original VM. In general, running *Sysprep* prepares an operating system for disk cloning and restoration. Windows OS installations include many unique elements per installation (including, Security Identifiers and computer names), and these elements must stay unique and not be copied to new VMs. If copied, confusion and problems are likely to arise. Running *Sysprep* avoids these problems by allowing the generation of new, unique elements for the new VMs.

**Note:**

Running *Sysprep* may not be as necessary for basic deployments or test environments as it is for production environments.

For more information about *Sysprep*, see your Windows documentation. It is also best to refer to your product documentation for a detailed procedure of running this utility, as it will differ depending on the version of Windows installed.

### 4.4.1. Creating a VM Template from an Existing VM

To create a VM template from an existing VM:

**Warning:**

When you create a new template from an existing VM, the original VM will be *replaced* by the new template. The VM will no longer exist.

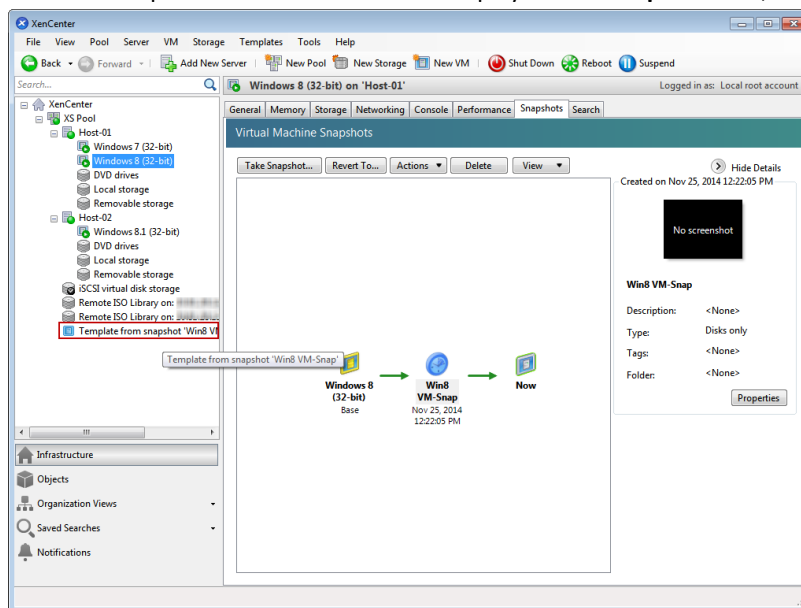
1. Shut down the VM that you wish to convert.
2. On the **Resources** pane, right-click the VM, and select **Convert to Template**.
3. Click **Convert** to confirm.

Once you create the template, the new VM template appears in the **Resources** pane, replacing the existing VM.

### 4.4.2. Creating a VM Template from a VM Snapshot

To create a template from a snapshot of a VM:

1. On the **Resources** pane, select the VM. Click the **Snapshots** tab, and then **Take Snapshot**.
2. Enter a name and an optional description of the new snapshot. Click **Take Snapshot**.
3. Once the snapshot finishes and the icon displays in the **Snapshots** tab, select the icon.



4. On the **Actions** drop-down list, choose **Save as a Template**.
5. Enter a name for the template, and then click **Create**.

### 4.5. Creating VMs from a VM Template

To create a new VM from a customized VM template:

1. On the XenCenter **Resources** pane, right-click the template, and select **New VM wizard**.  
The New VM wizard opens.
2. Follow the New VM wizard to create a VM from the selected template.

**Note:**



When the wizard prompts you for an OS installation media source, select the default and continue.

The new VM will appear in the **Resources** pane.

If you are using a template created from an existing VM, you also have the option to select **Quick Create**. This option does not take you through the New VM wizard, but rather instantly creates and provisions a new VM using all the configuration settings specified in your template.

# Appendix A. System Requirements

## A.1. System Requirements

XenServer requires at least two separate physical x86 computers: one to be the XenServer host and the other to run the XenCenter application. The XenServer host computer is dedicated entirely to the task of running XenServer — hosting VMs — and is **not** used for other applications.

**Warning:**

The installation of any third party software directly on the XenServer host (i.e. into the dom0 control domain) is not supported, except where it is supplied as a supplemental pack and is explicitly endorsed by Citrix.

The computer that runs XenCenter can be any general-purpose Windows computer that satisfies the hardware requirements and can be used to run other applications.

### A.1.1. XenServer Host System Requirements

While XenServer will generally be deployed on server-class hardware, XenServer is also compatible with many models of workstations and laptops. For a comprehensive XenServer hardware compatibility list, see <http://www.citrix.com/xenserver/hcl>. The following describes the recommended XenServer hardware specifications.

The XenServer host must be a 64-bit x86 server-class machine devoted to hosting VMs. XenServer creates an optimized and hardened Linux partition with a Xen-enabled kernel which controls the interaction between the virtualized devices seen by VMs and the physical hardware.

XenServer can make use of:

- up to 5TB of RAM
- up to 16 NICs
- up to 288 logical processors per host.

**Note:**

The maximum number of logical processors supported differs by CPU. Consult the [XenServer Hardware Compatibility List](#) (HCL) for more details.

The system requirements for the XenServer host are:

CPUs	<p>One or more 64-bit x86 CPU(s), 1.5GHz minimum, 2 GHz or faster multicore CPU recommended</p> <p>To support VMs running Windows, an Intel VT or AMD-V 64-bit x86-based system with one or more CPU(s) is required.</p> <p><b>Note:</b></p> <p>To run Windows VMs, hardware support for virtualization must be enabled on the XenServer host. This is an option in the BIOS. It is possible your BIOS might have virtualization support disabled. Consult your BIOS documentation for more details.</p> <p>To support VMs running supported paravirtualized Linux, a standard 64-bit x86-based system with one or more CPU(s) is required.</p>
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RAM	2GB minimum, 4GB or more recommended
Disk Space	Locally attached storage (PATA, SATA, SCSI) with 46GB of disk space minimum, 70GB of disk space recommended, or SAN via HBA (not through software) if installing with multipath boot from SAN (see <a href="http://hcl.vmd.citrix.com">http://hcl.vmd.citrix.com</a> for a detailed list of compatible storage solutions).
Network	100Mbit/s or faster NIC. One or more gigabit, or 10 gigabit NIC(s) is recommended for faster P2V and export/import data transfers and VM live migration.  For redundancy, multiple NICs are recommended. The configuration of NICs will differ depending on the storage type. See vendor documentation for details.

**Note:**

In some support cases, serial console access is required for debug purposes. Therefore, when setting up a XenServer configuration, it is recommended that serial console access is configured. For hosts that do not have physical serial port (such as a Blade server) or where suitable physical infrastructure is not available, customers should investigate if an embedded management device, such as Dell DRAC or HP iLO can be configured. For more information on setting up serial console access, see CTX121442, [How to Set Up a Serial Cable for Troubleshooting on XenServer](#).

### A.1.2. XenCenter System Requirements

The system requirements for XenCenter are:

Operating System	Windows 10, Windows 8.1, Windows 8, Windows 7 SP1, Windows Vista SP2, Windows Server 2012R2, Windows Server 2012, Windows Server 2008R2 SP1, Windows Server 2008 SP2
.NET Framework	Version 4.6
CPU Speed	750MHz minimum, 1GHz or faster recommended
RAM	1GB minimum, 2GB or more recommended
Disk Space	100MB minimum
Network	100Mb or faster NIC
Screen Resolution	1024x768 pixels, minimum

XenCenter is compatible with all versions of XenServer from 6.0 onwards.

### A.1.3. Supported Guest Operating Systems

For a list of supported VM operating systems, see the *XenServer Virtual Machine User's Guide*.

## A.2. Pool Requirements

A resource pool is a homogeneous or heterogeneous aggregate of one or more servers, up to a maximum of 16. Before you create a pool or join a server to an existing pool, you should make sure that the requirements identified below are satisfied for all the servers in the pool.



## Hardware requirements

All of the servers in a XenServer resource pool must have broadly compatible CPUs, that is:

- The CPU vendor (Intel, AMD) must be the same on all CPUs on all servers.
- To run HVM virtual machines, all CPUs must have virtualization enabled.

## Other requirements

In addition to the hardware prerequisites identified above, there are a number of other configuration prerequisites for a server joining a pool:

- It must have a consistent IP address (a static IP address on the server or a static DHCP lease). This also applies to the servers providing shared NFS or iSCSI storage.
- Its system clock must be synchronized to the pool master (for example, through NTP).
- It may not be a member of an existing resource pool.
- It may not have any running or suspended VMs or any active operations in progress on its VMs, such as shutting down or exporting; all VMs must be shut down before a server can join a pool.
- It may not have any shared storage already configured.
- It may not have a bonded management interface. You will need to reconfigure the joining server's management interface and move it back on to a physical NIC before joining the pool, then reconfigure it again once the server has successfully joined the pool.
- It must be running the same version of XenServer, at the same patch level, as servers already in the pool.
- It must be configured with the same supplemental pack(s) as the servers already in the pool. Supplemental packs are used to install add-on software into the XenServer control domain, dom0. To prevent inconsistencies in the user experience across a pool, it is necessary to have the same supplemental packs at the same revision installed on all the servers in the pool.
- It must have the same XenServer license as the servers already in the pool. For example, you cannot add a server with XenServer Standard license to an existing resource pool containing servers with XenServer Enterprise or other licenses. You can change the license of any pool members after joining the pool. The server with the lowest license determines the features available to all members in the pool.

XenServer hosts in resource pools may contain different numbers of physical network interfaces and have local storage repositories of varying size. In practice, it is often difficult to obtain multiple servers with the exact same CPUs, and so minor variations are permitted. If you are sure that it is acceptable in your environment for hosts with varying CPUs to be part of the same resource pool, then you can force join a pool together using the CLI. For information on forcing the joining operation, see the *XenServer Administrator's Guide*.

### Note:

Servers providing shared NFS or iSCSI storage for the pool must have a static IP address or be DNS addressable.

## Homogeneous pool

A homogeneous resource pool is an aggregate of servers with identical CPUs. In addition to the pool requirements stated above, CPUs on a server joining a homogeneous resource pool must be the same (in terms of vendor, model, and features) as the CPUs on servers already in the pool.

## Heterogeneous Pools

Heterogeneous pool creation is made possible by leveraging technologies in Intel (FlexMigration) and AMD (Extended Migration) CPUs that provide CPU "masking" or "leveling". These features allow a CPU to be configured



to *appear* as providing a different make, model, or functionality than it actually does. This enables you to create pools of hosts with disparate CPUs but still safely support live migrations.

For details on creating heterogeneous pools, see the *XenServer Administrator's Guide*.