

Contents

Product Overview
Hardware
Product Limits
Resource Sharing
Guest Operating Systems
XenCenter
Command-line Interface (CLI)
VMs
Storage
Networking
Memory
Resource Pools
XenMotion (Live Migration)
High Availability
Performance Metrics
Installation
Licensing
Technical Support

Product Overview

What is XenServer?

XenServer® is an industry leading, open source platform for cost-effective cloud, server, and desktop virtualization infrastructures. XenServer enables organizations of any size or type to consolidate and transform compute resources into virtual workloads for today's datacenter requirements, while ensuring a seamless pathway for moving workloads to the cloud.

What is Virtualization?

Virtualization is a method of running multiple independent virtual operating systems on a single physical computer. It is a way of fully utilizing physical resources available in modern powerful servers, which reduces the total cost of ownership (TCO) for server deployments.

What is the difference between XenServer and the open source Xen Project™ Hypervisor?

The [Xen Project™](#) hypervisor is used by XenServer. Xen technology is widely acknowledged as the #1 open source virtualization platform in the industry.

In addition to the open source Xen Project™ hypervisor, Citrix XenServer includes:

- Control domain (Dom0)
- XenCenter – A Windows client for VM management
- VM Templates for installing popular operating systems as VMs
- Storage Manager – built-in support for a wide-range of storage types, both file and block based
- Tapdisk3 – an advanced, high-performance storage datapath
- Support for Software Defined Networking (SDN) through the Open Virtual Switch
- Graphics Virtualization - where one physical GPU can be concurrently used by multiple VMs
- Resource pools for simplified management of hosts, storage, and networking
- Enterprise-level support

What is a hypervisor?

A hypervisor is the basic abstraction layer of software. The hypervisor is responsible for low-level tasks such as CPU scheduling and is responsible for memory isolation for resident VMs. The hypervisor abstracts the hardware for the VMs. The hypervisor has no knowledge of networking, external storage devices, video, etc. The Linux Foundation Xen Project™ community develops and maintains the Xen Project hypervisor as free software licensed under the GNU General Public License. Refer to the [Linux Foundation Xen Project](#) for more details.

What is the Control Domain (Dom0)?

The Control Domain, also called Domain 0 or *Dom0*, is a secure, privileged VM that runs the XenServer management toolstack known as *xapi*. Besides providing XenServer management functions, Dom0 also runs the physical device drivers for networking, storage etc.

What is xapi, what does it do, is it the same as the XenAPI?

xapi is the software stack that controls VM lifecycle operations, host and VM networking, VM storage, user authentication, and allows the management of XenServer resource pools.

xapi provides the publicly documented [XenAPI Management Interface](#) which is used by all tools that manage VMs and resource pools.

Examples of internal and external tools that make use of the XenAPI include:

- XenCenter management GUI
- xs management console
- xe command-line interface
- Apache CloudStack Cloud orchestration software

What's New in XenServer 7.0?

Refer to the [XenServer 7.0 Release Notes](#) for details about the new features and ongoing improvements in this release.

What are the minimum system requirements for running XenServer?

The minimum system requirements are described in the [XenServer 7.0 Installation Guide](#).

What are the maximum capabilities of XenServer?

The maximum supported capabilities of XenServer are described in the [XenServer 7.0 Configuration Limits](#) document.

Hardware

Do I need a system with a 64-bit x86 processor to run XenServer?

Yes, either an Intel VT or AMD-V 64-bit x86-based system with one or more CPUs is required to run all supported guest operating systems. See the [XenServer 7.0 Installation Guide](#) for more details on XenServer host system requirements.

Do I need a system with hardware virtualization support?

In order to run Windows operating systems, or HVM Linux guest, you need a 64-bit x86 processor-based system that supports either Intel VT or AMD-V hardware virtualization technology in the processor and BIOS. For more information about HVM Linux guests, see the [XenServer 7.0 Virtual Machine User's Guide](#).

What systems are certified to run XenServer?

Click [here](#) for a complete list of XenServer certified systems.

Does XenServer support AMD Rapid Virtualization Indexing and Intel Extended Page Tables?

Yes. XenServer provides support for AMD Rapid Virtualization Indexing and Intel Extended Page Tables. Rapid Virtualization Indexing provides an implementation of nested tables technology used to further enhance performance of the Xen hypervisor. Extended Page Tables provide an implementation of hardware assisted paging used to further enhance performance of the Xen hypervisor.

Can XenServer run on a notebook or desktop-class systems?

XenServer will run on many notebook or desktop-class systems as long as they conform to the minimum CPU requirements. However, Citrix only supports systems which have been certified and listed on [Hardware Compatibility List \(HCL\)](#). Customers may choose to run on unsupported systems for demonstration and testing purposes; however, some features, such as power management capabilities will not work.

Product Limits

Note: A complete list of XenServer supported limits may be found in the [XenServer 7.0 Configuration Limits](#) document.

What is the maximum size of memory that XenServer can use on a host system?

XenServer host systems can use up to 5TB of physical memory.

How many processors can XenServer use?

XenServer supports up to 288¹ logical processors per host.

How many Virtual Machines can run on XenServer concurrently?

The maximum number of Virtual Machines (VMs) supported to run on a XenServer host is 1000².

For any particular system, the number of VMs that can run concurrently and with acceptable performance will depend on the available resources and the VM workload. XenServer automatically scales the amount of memory allocated to the Control Domain (Dom0) based on the physical memory available.

Note: In certain circumstances it may be advisable to override this setting if there are more than 50 VMs per host and the host physical memory is **less** than 48GB. See *section 7.1.1* in the [XenServer 7.0 Administrator's Guide](#).

How many physical network interfaces does XenServer support?

XenServer supports up to 16 physical NIC ports. These may be bonded to create up to 8 logical network bonds, with a limit of 4 NICs per bond.

How many virtual processors (vCPUs) can XenServer allocate to a VM?

The number of vCPUs which can be supported varies by the guest operating system. XenServer supports up to 32³ vCPUs per VM.

How much memory can XenServer allocate to a VM?

XenServer supports up to 1.5TB⁴ per guest. The amount of memory which can be supported varies by the guest operating system.

How many Virtual Disk Images (VDIs) can XenServer allocate to a VM?

XenServer can allocate up to 255⁵ VDIs including a virtual DVD-ROM device per VM.

How many virtual network interfaces can XenServer allocate to a VM?

XenServer can allocate up to 7 virtual NICs per VM. The number of virtual NICs which can be supported varies by the guest operating system.

Resource Sharing

¹ The maximum number of logical processors supported differs by CPU. Consult the [XenServer Hardware Compatibility List](#) (HCL) for more details.

² For systems running over 500 VMs, Citrix recommends allocating 8GB RAM to Dom0. For information about configuring Dom0 memory, see [CTX134951](#).

³ Consult your guest OS documentation to ensure that you do not exceed the supported limits

⁴ The maximum amount of physical memory addressable by your operating system varies. Setting the memory to a level greater than the operating system supported limit may lead to performance issues within your guest. Some 32-bit Windows operating systems can support more than 4GB of RAM through use of the physical address extension (PAE) mode. The limit for 32-bit PV Virtual Machines is 64GB. Please consult your guest operating system Administrators Guide and the [Citrix XenServer 7.0 Virtual Machine User's Guide](#) for more details.

⁵ The maximum number of VDIs supported is dependent on the guest operating system. Consult your guest OS documentation to ensure you do not exceed the supported limits.

How are processing resources split between VMs?

Processing resources are split between vCPUs using a fair share balancing algorithm. This algorithm ensures that all VMs get their share of the system's processing resources.

How does XenServer choose which physical processors it allocates to the VM?

XenServer does not statically allocate physical processors to any specific VM. Instead, XenServer dynamically allocates, depending on load, any available logical processors to the VM. This ensures that processor cycles are used efficiently as the VM can run wherever there is spare capacity.

How are disk I/O resources split between the VMs?

XenServer uses a fair share resource split for disk I/O resources between VMs. Additionally, you can also provide a VM higher or lower priority access to disk I/O resources.

How are network I/O resources split between the VMs?

XenServer uses a fair share resource split for network I/O resources between the VMs. Additionally, you can control bandwidth throttling limits per VM using the Open vSwitch.

Guest Operating Systems

Can XenServer run 32-bit operating systems as guests?

Yes. Refer to the [XenServer 7.0 Virtual Machine User's Guide](#) for more details.

Can XenServer run 64-bit operating systems as guests?

Yes. Refer to the [XenServer 7.0 Virtual Machine User's Guide](#) for more details.

Which versions of Microsoft Windows can run as guests on XenServer?

Refer to the [XenServer 7.0 Virtual Machine User's Guide](#) for a list of supported guest operating systems.

Which versions of Linux can run as guests on XenServer?

Refer to the [XenServer 7.0 Virtual Machine User's Guide](#) for a list of supported guest operating systems.

Can I run different versions of the supported operating systems or other un-listed operating systems?

Citrix only supports operating systems (OS) under OS vendor support. While they may continue to function, customers may be asked to upgrade to a supported OS service pack before issues can be investigated.

OS versions not explicitly supported may not have applicable drivers available, and therefore will not function with optimized performance.

It is often possible to install other distributions of Linux. However, Citrix can only support the operating systems listed in the [XenServer 7.0 Virtual Machine User's Guide](#) and customers may be asked to switch to a supported OS before issues can be investigated.

Does XenServer support FreeBSD, NetBSD, or any other BSD variants as a guest operating system?

XenServer does not support any BSD-based guest operating systems for general-purpose virtualization deployments. However, FreeBSD VMs running on XenServer have been certified for use in specific Citrix products.

What are the XenServer Tools?

The XenServer Tools are software packages for Windows and Linux-based guest operating systems. The Tools include high-performance I/O drivers (PV drivers) and the Management Agent for Windows operating systems, and a Guest Agent for Linux-based operating systems that provides additional information about the VM to the XenServer host. Refer to the [XenServer 7.0 Virtual Machine User's Guide](#) for details.

XenCenter

Do I need to run XenCenter on a Windows computer?

Yes. The XenCenter management console runs on a Windows operating system. Refer to the [XenServer 7.0 Installation Guide](#) for details about the system requirements. Customers who do not wish to run Windows can manage their XenServer hosts and pools using the *xe* command-line Interface (CLI), installed locally or running on the XenServer host, or by using *xsconsole*, a system configuration console.

Can I log on to XenCenter using my Active Directory user accounts?

Yes. You can set up XenCenter login requests to use Active Directory on all editions of XenServer.

Can I restrict access of certain functions within XenCenter, to certain users?

Yes. The *Role Based Access Control* feature combined with Active Directory authentication can restrict users' access in XenCenter.

Can I use a single XenCenter console to connect to multiple XenServer hosts?

Yes. You can use a single XenCenter console to connect to multiple XenServer host systems.

Can I use XenCenter to connect to multiple hosts running different versions of XenServer?

Yes. XenCenter is backward compatible with multiple host systems running different versions of XenServer.

Can I use XenCenter to connect to multiple resource pools?

Yes. You can connect to multiple resource pools from a single XenCenter console.

How can I gain access to the console of Linux-based VM?

The 'Console' tab in XenCenter provides access to the text-based and graphical consoles of VMs running

Linux-based operating systems. Before you can connect with the Linux VM's graphical console, you need to ensure that the VNC server and an X display manager are installed on the VM and properly configured. Alternatively, customers may choose to connect directly to their guests through SSH using a third-party SSH client or an external VNC client.

How can I gain access to the console of a Windows-based VM?

XenCenter provides access to the emulated graphics for a Windows VM. Additionally, if remote desktop capabilities are detected on the VM, a quick connect button is provided to launch and connect to the VM using a built-in RDP client. Alternatively, customers may choose to connect directly to their guests using external remote desktop software.

Command-line Interface (CLI)

Does XenServer include a CLI?

Yes. All editions of XenServer include a full command-line interface (CLI) – known as “xe”.

Can I access the XenServer CLI directly on the host?

Yes. The CLI can be accessed using a screen and keyboard connected directly to the host, or through a terminal emulator connected to the host's serial port.

Can I access the XenServer CLI from a remote system?

Yes. Citrix ships the xe CLI which can be installed on Windows and 64-bit Linux machines to remotely control XenServer. Additionally, access to the host's console can be achieved by using the host's 'Console' tab in XenCenter.

Can I use the XenServer CLI using my Active Directory user accounts?

Yes. You can log in using Active Directory on all editions of XenServer.

Can I restrict access the use of certain CLI commands to certain users?

Yes. You can restrict users' access on the XenServer CLI.

VMs

Can VMs created with VMware or Hyper-V run on XenServer?

Yes. VMs can be exported and imported using the industry-standard OVF format.

Additionally VMs can be converted in batches using *XenServer Conversion Manager*. Third-party tools are also available.

For more information refer to the [XenServer Conversion Manager Guide](#).

What types of installation media can I use to install a guest operating system?

You can install a guest operating system by using:

- A CD in the host's CD-ROM drive
- A virtual CD-ROM drive using technology such as iLO or DRAC
- Placing ISO images on to a shared network drive
- Network install where supported by the specific guest.

For more information refer to the [XenServer 7.0 Virtual Machine User's Guide](#).

Can I make a clone of an existing VM?

Yes. Any VM created on XenServer can be cloned or converted into a VM template. A VM template can then be used to create additional VMs.

Can VMs be exported from one version of XenServer and moved to another?

Yes. VMs exported from older versions of XenServer can be imported to a newer version.

Can I convert a VM from the open source version of Xen to XenServer?

No.

Does XenServer provide disk snapshot capabilities for VMs?

Yes, XenServer supports snapshotting in all editions. Refer to [XenServer 7.0 Administrator's Guide](#) for more information.

Storage

What types of local storage can be used with XenServer?

XenServer supports local storage such as SATA and SAS.

What type of SAN/NAS storage can be used with XenServer?

XenServer supports Fibre Channel, FCoE, Hardware-based iSCSI (HBA), iSCSI, NFS and SMB storage repositories. Refer to the [XenServer 7.0 Administrator's Guide](#) and the [XenServer Hardware Compatibility List](#) (HCL) for more details.

Does XenServer support software-based iSCSI?

Yes. XenServer includes a built-in software-based iSCSI initiator (open-iSCSI).

What version of NFS is required for remote storage use?

XenServer requires NFSv3 or NFSv4 over TCP for remote storage use. NFS over UDP is not currently supported by XenServer.

Can I use software-based NFS running on a general-purpose server for remote shared storage?

Yes, although Citrix recommends using a dedicated network attached storage (NAS) device with NFSv3 or NFSv4 with high-speed non-volatile caching to achieve acceptable levels of I/O performance.

Can I boot a XenServer host system from an iSCSI, Fibre Channel or FCoE SAN?

Yes, XenServer supports Boot from SAN using Fibre Channel, FCoE or iSCSI HBAs.

Can I boot a XenServer host using UEFI?

Yes, XenServer supports booting from BIOS and UEFI.

Does XenServer support Multipath I/O (MPIO) for storage connections?

Yes, Citrix recommends using multipath for resilient storage connections.

Does XenServer support a software-based RAID implementation?

No, XenServer does not support software RAID.

Does XenServer support HostRAID or FakeRAID solutions?

No, XenServer does not support proprietary RAID-like solutions, such as HostRAID or FakeRAID.

Does XenServer support thin cloning of existing VMs?

Yes. Thin Cloning is available on local disks formatted as EXT3, as well as NFS and SMB storage repositories.

Does XenServer support Distributed Replicated Block Device (DRBD) storage?

No, XenServer does not support DRBD.

Does XenServer support ATA over Ethernet?

No, XenServer does not support ATA over Ethernet based storage.

Networking

Can I create private networks that isolate groups of VMs?

Yes. You can create a private network on a single host for resident VMs. Additionally, with the vSwitch Controller appliance, you can create private networks that span multiple hosts with or without encryption.

Does XenServer support multiple physical network connections?

Yes, you can connect to and/or associate multiple physical networks that attach to different network interfaces on the physical host system.

Can VMs connect to multiple networks?

Yes. VMs are able to connect to any network available to the host.

Does XenServer support VLANs on a physical network interface?

Yes. XenServer supports assigning VM networks to specified VLANs.

Do XenServer virtual networks pass all network traffic to all VMs?

No. XenServer's Open vSwitch (OVS) acts as a Layer 2 switch; a VM will only see traffic designated for that VM. Additionally the multi-tenancy support in XenServer enables increased levels of isolation and security.

Do the virtual network interfaces and networks support promiscuous mode?

Yes. Virtual network interfaces can be configured for promiscuous mode, which enables you to see all traffic on a virtual switch. Refer to the following Knowledge Center articles for more information about promiscuous mode configuration, [CTX116493](#) and [CTX121729](#). Additionally, the Open vSwitch enables configuration of RSPAN to capture network traffic.

Does XenServer support bonding or teaming of physical network interfaces?

Yes, XenServer supports physical network interface bonding for failover and link aggregation with optional LACP support. Refer to the [XenServer 7.0 Administrator's Guide](#) for details.

Memory

How much memory is consumed by running XenServer?

Three components contribute to the memory footprint of a XenServer host.

Firstly, there is the memory consumed by the Xen hypervisor itself; secondly there is the memory consumed by the Control Domain on the host, and finally the XenServer Crash Kernel. The amount of memory required to run the Control Domain is adjusted automatically and is based on the amount of physical memory on the host as shown in the table below:

Host Memory (GB)	Control Domain Memory Allocated (MB)
<24	752
24 - 47	2048
48 - 63	3072
64 - 1024	4096

Note: The amount of memory allocated to the Control Domain can be increased beyond the amounts shown above. However, this should only ever be carried out under the guidance of Citrix Support.

The **Xen** field in XenCenter's **Memory** tab will report the memory used by the Control Domain, the Xen hypervisor itself, and the XenServer Crash Kernel. The amount of memory used by the hypervisor will be larger for hosts with more memory.

Refer to the [XenServer 7.0 Administrator's Guide](#) for more details.

Does XenServer optimize VM memory usage?

Yes. XenServer's Dynamic Memory Control (DMC) works by automatically adjusting the memory of running VMs, keeping the amount of memory allocated to each VM between specified minimum and maximum memory values, guaranteeing performance and permitting greater VM density. Refer to the [XenServer 7.0 Administrator's Guide](#).

Resource Pools

What is a Resource Pool?

A resource pool is a collection of a set of XenServer hosts managed as a unit. Typically, a resource pool will share some amount of networked storage to allow VMs to be rapidly migrated from one host to another within the pool. Refer to the [XenServer 7.0 Administrator's Guide](#) for details.

Does XenServer require a dedicated host to manage a resource pool?

No. A single host in the pool must be specified as the *Pool Master*. The Pool Master controls all administrative activities required on the pool. This means that there is no external single point of failure. If the Pool Master fails, other hosts in the pool will continue to operate, and the resident VMs will continue to run as normal. If the Pool Master cannot be brought back online, one of the other hosts in the pool can be promoted to master to regain control of the pool.

This process is automated with the *High Availability* feature. Refer to the [XenServer 7.0 Administrator's Guide](#) for more details.

Where is the configuration data for a resource pool stored?

A copy of the configuration data is stored on every host in the resource pool. If the current pool master fails, this enables any host in the resource pool to become the new pool master.

What types of configurations can be made at the Resource Pool level?

Shared remote storage and networking configurations can be made at the resource-pool level. Once a configuration is shared on the Resource Pool, the master system automatically propagates configuration changes to all of the member systems.

Will new host systems added to a Resource Pool automatically be configured with shared settings?

Yes. Any new host systems added to a Resource Pool automatically receive the same configurations for shared storage and network settings.

Can I use different types of CPUs in the same XenServer resource pool?

Yes. Although Citrix recommends that the same CPU type is used throughout the pool (homogeneous resource pool), it is possible for hosts with different CPU types to join pool (heterogeneous), provided they are from the same vendor. Refer to the [XenServer 7.0 Administrator's Guide](#) for details.

For updated information about the support for feature masking for specific CPU types, refer to the [XenServer Hardware Compatibility List](#) (HCL).

XenMotion (Live Migration) & Storage XenMotion

Can I move a running VM from one host to another?

XenMotion allows live migration of running VMs when hosts share the same storage (in a pool). Additionally, Storage XenMotion allows migration between hosts which do not share the same storage. VMs can be migrated within or across pools.

High Availability

Does XenServer offer High Availability features?

Yes. When High Availability (HA) is enabled, XenServer continually monitors the health of the hosts in a pool. If HA detects that a host is impaired, the host will be automatically shut down. This allows for VMs to be restarted safely on an alternative healthy host.

Does XenServer High Availability work with local storage?

No. To use HA, shared storage is required. This enables VMs to be relocated in the event of a host failure. However, HA allows VMs that are stored on local storage to be marked for *automatic* restart if the host recovers after a reboot.

Can I use HA to automatically sequence the restart of recovered VMs?

Yes, HA configuration allows VMs to be started in a predefined order. This enables VMs that depend upon one another to be automatically sequenced.

Performance Metrics

Do the XenServer management tools collect performance information?

Yes. XenServer provides detailed monitoring of performance metrics, including CPU, memory, disk, network, C-state/P-state information and storage. Where appropriate, these metrics are available on a per-host and a per-VM basis. These metrics are available directly (exposed as Round Robin Databases), or can be accessed and viewed graphically in XenCenter or other third party applications. For more information, refer to the [XenServer 7.0 Administrator's Guide](#).

How are XenServer performance metrics gathered?

Data for the XenServer performance metrics are collected from a variety of sources including the Xen hypervisor, Dom0, standard Linux interfaces, and standard Windows interfaces such as WMI.

Does XenCenter display performance metrics in real-time?

Yes. XenCenter displays real-time performance metrics on the **Performance** tab for each running VM as well as the XenServer host. The displayed metrics can be customized.

Does XenCenter store and display historic performance metrics?

Yes. XenServer retains the last years' worth of performance metrics (with decreasing granularity). XenCenter provides a visualization of these metrics in real-time graphical displays.

Installation

Does XenServer install on top of systems that are already running an existing operating system?

No. XenServer installs directly on bare-metal hardware avoiding the complexity, overhead, and performance bottlenecks of an underlying operating system.

How much local storage does XenServer require for installation on the physical host system?

XenServer requires a minimum of 46GB of local storage on the physical host system.

Can I use PXE to perform a network installation of XenServer on the host system?

Yes. You can install XenServer on the host system using PXE. You can also automatically install XenServer using PXE by creating a pre-configured answer file.

Does the Xen hypervisor run on Linux?

No. [Xen](#) is a Type 1 hypervisor which runs directly on the host hardware ("bare metal"). After the hypervisor loads, it starts the privileged management domain – the [Control Domain](#) which contains a minimal Linux environment.

Where does XenServer get its device driver support?

XenServer uses the device drivers available from the Linux kernel. As a result, XenServer will run on a wide variety of hardware and storage devices. However, Citrix recommends that you use certified device drivers, refer to the [XenServer HCL](#) for more details.

Licensing

How do I license XenServer?

For information about XenServer licensing, see [XenServer 7.0 Licensing FAQ](#).

Technical Support

Does Citrix provide direct technical support for XenServer?

Yes, go to <http://www.citrix.com/support> for more details.

Can I obtain technical support for XenServer and other Citrix products on a single support contract?

Yes. Citrix provides Technical Support [contracts](#) that allow you to open support incidents on XenServer, as well as other Citrix products, such as XenDesktop and NetScaler. Click [here](#) for more details.

Do I have to purchase a Citrix technical support contract at the same time as I purchase XenServer?

No. You can purchase a technical support contract from Citrix either at product point-of-sale or at another time.

Are there alternative channels for obtaining technical support for XenServer?

Yes. Citrix recommends a number of alternative channels for obtaining technical support for XenServer. You can also use Citrix's [Knowledge Center](#), [forums](#) or contract with authorized XenServer [partners](#) who offer technical support services.

Does Citrix provide technical support for the open source Xen project?

No. Citrix does not provide technical support for the open source [Xen](#) project.

Do I need to open a technical support incident with Citrix if I am experiencing a non-technical issue?

No. Any non-technical issues with XenServer including, [Subscription Advantage](#) program support, [licensing](#), administrative support, and order confirmation, can be raised through [Citrix Customer Service](#).

Click [here](#) for more details on Customer Service.

About Citrix

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