CITRIX®

XenServer 7.4 Technical FAQ

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Product Overview

What is XenServer?

XenServer® is an industry leading, open-source platform for cost-effective desktop, server, and cloud virtualization infrastructures. XenServer enables organizations of any size or type to consolidate and transform compute resources into virtual workloads for today's data center 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's 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 performs 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, and so on. The Linux Foundation Xen Project™ community develops and maintains the Xen Project hypervisor as free software licensed under the GNU General Public License. For more information, visit the Linux Foundation Xen Project.

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, and so on.

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, and user authentication. It also 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 use the XenAPI include:

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

What's New in XenServer 7.4?

For details about the new features and ongoing improvements in this release, see the *XenServer 7.4 Release Notes*.

What are the minimum system requirements for running XenServer?

For the minimum system requirements for this release, see the *XenServer 7.4 Installation Guide*.

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. For more information about XenServer host system requirements,

see the *XenServer 7.4 Installation Guide*.

Do I need a system with hardware virtualization support?

To run Windows operating systems or HVM Linux guests, 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 7.4 Virtual Machine User's Guide*.

What systems are certified to run XenServer?

For a complete list of XenServer certified systems, see the XenServer Hardware Compatibility List (HCL).

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

Yes. XenServer supports 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 runs on many notebook or desktop-class systems that conform to the minimum CPU requirements. However, Citrix only supports systems that have been certified and listed on the XenServer Hardware Compatibility List. Customers can choose to run on unsupported systems for demonstration and testing purposes; however, some features, such as power management capabilities, do not work.

Product Limits

Note: For a complete list of XenServer supported limits, see the *XenServer 7.4 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 5 TB of physical memory.

How many processors can XenServer use?

XenServer supports up to 288 logical processors per host. The maximum number of logical processors supported differs by CPU. For more information, see XenServer Hardware Compatibility List.

How many virtual machines can run on XenServer concurrently?

The maximum number of virtual machines (VMs) supported to run on a XenServer host is 1000[1].

For any particular system, the number of VMs that can run concurrently and with acceptable performance depends 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

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[1] For systems running more than 500 VMs, Citrix recommends allocating 8 GB of RAM to Dom0. For information about configuring Dom0 memory, see CTX134951.

available.

Note: If there are more than 50 VMs per host and the host physical memory is **less** than 48 GB, it might be advisable to override this setting. For more information, see the *XenServer 7.4 Administrator's Guide*.

How many physical network interfaces does XenServer support?

XenServer supports up to 16 physical NIC ports. These NICs can be bonded to create up to 8 logical network bonds. Each bond can include up to 4 NICs.

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

XenServer supports up to 32[2] vCPUs per VM. The number of vCPUs that can be supported varies by the guest operating system.

How much memory can XenServer allocate to a VM?

XenServer supports up to 1.5 TB[3] per guest. The amount of memory that 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 255[4] 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 that can be supported varies by the guest operating system.

Resource Sharing

How are processing resources split between VMs?

XenServer splits processing resources between vCPUs using a fair-share balancing algorithm. This algorithm ensures that all VMs get their share of the processing resources of the system.

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

XenServer doesn't statically allocate physical processors to any specific VM. Instead, XenServer dynamically allocates, depending on load, any available logical processors to the VM. This dynamic allocation ensures that processor cycles are used efficiently because the VM can run wherever there is spare capacity.

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[2] Consult your guest OS documentation to ensure that you do not exceed the supported limits

[3] 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 can lead to performance issues within your guest. Some 32-bit Windows operating systems can support more than 4 GB of RAM through use of the physical address extension (PAE) mode. The limit for 32-bit PV Virtual Machines is 64 GB. For more information, see your guest operating system documentation and the *Citrix XenServer 7.4 Virtual Machine User's Guide*.

[4] The maximum number of VDIs supported depends on the guest operating system. Consult your guest OS documentation to ensure that you do not exceed the supported limits.

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

XenServer uses a fair-share resource split for disk I/O resources between VMs. 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. You can also control bandwidth-throttling limits per VM by using the Open vSwitch.

Guest Operating Systems

Can XenServer run 32-bit operating systems as guests?

Yes. For more information, see the *XenServer 7.4 Virtual Machine User's Guide*.

Can XenServer run 64-bit operating systems as guests?

Yes. For more information, see the *XenServer 7.4 Virtual Machine User's Guide*.

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

For a list of supported Windows guest operating systems, see the *XenServer 7.4 Virtual Machine User's Guide*.

Which versions of Linux can run as guests on XenServer?

For a list of supported Linux guest operating systems, see the *XenServer 7.4 Virtual Machine User's Guide*.

Can I run different versions of the supported operating systems or other unlisted operating systems?

Citrix only supports operating systems (OS) under OS vendor support. Although unsupported operating systems might continue to function, we might ask you to upgrade to a supported OS service pack before we can investigate any issues.

Applicable drivers might not be available for OS versions that are unsupported. Without the drivers, these OS versions do not function with optimized performance.

It's often possible to install other distributions of Linux. However, Citrix can only support the operating systems listed in the *XenServer 7.4 Virtual Machine User's Guide*. We might ask you to switch to a supported OS before issues we can investigate any issues.

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

XenServer doesn't 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.

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What are the XenServer Tools?

The XenServer Tools are software packages for Windows and Linux-based guest operating systems. For Windows operation systems, the XenServer Tools include high-performance I/O drivers (PV drivers) and the Management Agent. For Linux-based operating systems, the XenServer Tools include a Guest Agent that provides additional information about the VM to the XenServer host. For more information, see the *XenServer 7.4 Virtual Machine User's Guide*.

XenCenter

Do I have to run XenCenter on a Windows computer?

Yes. The XenCenter management console runs on a Windows operating system. For information about the system requirements, see the *XenServer 7.4 Installation Guide*. If you don't want to run Windows, you can manage your XenServer hosts and pools by using the *xe* CLI 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 access for users 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 that are currently supported.

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 graphical console of a Linux VM, ensure that the VNC server and an X display manager are installed on the VM and properly configured.

XenCenter also enables you to connect to Linux VMs over SSH by using the **Open SSH Console** option on the **Console** tab of the VM.

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

XenCenter provides access to the emulated graphics for a Windows VM. If XenCenter detects remote desktop capabilities on the VM, XenCenter provides a quick connect button to launch a built-in RDP client that connects to the VM. Or, you can connect directly to your guests by 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. You can access the CLI by using a screen and keyboard connected directly to the host, or through a terminal emulator connected to the serial port of the host.

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 control XenServer remotely. You can also use XenCenter to access the console of the host from the **Console** tab.

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 user access on the XenServer CLI.

VMs

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

Yes. You can export and import VMs using the industry-standard OVF format.

You can also convert VMs in batches using *XenServer Conversion Manager*. Third-party tools are also available. For more information, see 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 CD-ROM drive of the host
- 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, see the *XenServer 7.4 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 more 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. For more information, see the *XenServer 7.4 Administrator's Guide*.

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. For more information, see the *XenServer 7.4 Administrator's Guide* and the *XenServer Hardware Compatibility List*.

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. XenServer currently does not support NFS over User Datagram Protocol (UDP).

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

Yes. Although Citrix recommends using a dedicated 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 doesn't support software RAID.

Does XenServer support HostRAID or FakeRAID solutions?

No. XenServer doesn't 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, in addition to NFS and SMB storage repositories.

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

No. XenServer doesn't support DRBD.

Does XenServer support ATA over Ethernet?

No. XenServer doesn't 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. With the vSwitch Controller appliance, you also can create private networks that span multiple hosts with or without encryption.

Does XenServer support multiple physical network connections?

Yes. You can connect to or associate multiple physical networks that attach to different network interfaces on the physical host system.

Can VMs connect to multiple networks?

Yes. VMs can connect to any network available to the host.

Does XenServer support IPv6?

Guest VMs hosted on XenServer can use any combination of IPv4 and IPv6 configured addresses. However, XenServer doesn't support the use of IPv6 in its Control Domain (Dom0). You can't use IPv6 for the host management network or the storage network. IPv4 must be available for the XenServer host to use.

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 uses Open vSwitch (OVS), which acts as a Layer 2 switch. A VM only sees traffic for that VM. Additionally, the multitenancy 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. For more information about promiscuous mode configuration, see the following Knowledge Center articles 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. For more information, see the *XenServer 7.4 Administrator's Guide*.

Memory

How much memory is consumed by running XenServer?

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

1. The Xen hypervisor

2. The Control Domain on the host (dom0)

3. The XenServer Crash Kernel

The amount of memory required to run dom0 is adjusted automatically. The amount of memory allocated is based on the amount of physical memory on the host as shown in the following table:

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 in the preceding table. However, you must only increase this allocation under the guidance of Citrix Support.

In XenCenter, the **Xen** field in the **Memory** tab reports the memory used by the Control Domain, by the Xen hypervisor itself, and by the XenServer Crash Kernel. The amount of memory used by the

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hypervisor is larger for hosts with more memory.

For more information, see the *XenServer 7.4 Administrator's Guide*.

Does XenServer optimize VM memory usage?

Yes. XenServer uses Dynamic Memory Control (DMC) to adjust automatically the memory of running VMs. These adjustments keep the amount of memory allocated to each VM between specified minimum and maximum memory values, guaranteeing performance and permitting greater VM density. For more information, see the *XenServer 7.4 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 shares some amount of networked storage to allow VMs to be rapidly migrated from one host to another within the pool. For more information, see the *XenServer 7.4 Administrator's Guide*.

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 design means that there is no external single point of failure. If the Pool Master fails, other hosts in the pool continue to operate, and the resident VMs continue to run as normal. If the Pool Master cannot come back online, XenServer promotes one of the other hosts in the pool to master to regain control of the pool.

This process is automated with the *High Availability* feature. For more information, see the *XenServer 7.4 Administrator's Guide*.

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 data 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. When a configuration is shared on the Resource Pool, the master system automatically propagates configuration changes to all the member systems.

Are new host systems added to a Resource Pool automatically 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. Citrix recommends that the same CPU type is used throughout the pool (homogeneous resource pool). However, it is possible for hosts with different CPU types to join a pool (heterogeneous), provided

the CPUs are from the same vendor. For more information, see the *XenServer 7.4 Administrator's Guide*.

For updated information about the support for feature masking for specific CPU types, see the XenServer Hardware Compatibility List (HCL).

XenMotion (Live Migration) and 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 that do not share storage. VMs can be migrated within or across pools.

High Availability

Does XenServer offer High Availability features?

Yes. If 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 is automatically shut down. This action allows for VMs to be restarted safely on an alternative healthy host.

Does XenServer High Availability support local storage?

No. If you want to use HA, shared storage is required. This shared storage enables VMs to be relocated if a host fails. However, HA allows VMs that are stored on local storage to be marked for *automatic* restart when the host recovers after a reboot.

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

Yes. HA configuration allows you to define the order that VMs are started. This capability enables VMs that depend on one another to be sequenced automatically.

Performance Metrics

Do the XenServer management tools collect performance information?

Yes. XenServer provides detailed monitoring of performance metrics. These metrics include 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. Performance 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, see the *XenServer 7.4 Administrator's Guide*.

How are XenServer performance metrics gathered?

Data for the XenServer performance metrics are collected from various sources. These sources include 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 for the XenServer host. You can customize the metrics that are displayed.

Does XenCenter store and display historic performance metrics?

Yes. XenServer keeps performance metrics from the last year (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.

Can I upgrade an existing XenServer installation to a newer version?

Yes. If you have already installed XenServer you can update or upgrade to a newer version of XenServer instead of doing a fresh installation. For more information, see the *XenServer 7.4 Installation Guide*.

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

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

Can I use PXE to do 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 that 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 runs on a wide variety of hardware and storage devices. However, Citrix recommends that you use certified device drivers. For more information, see the XenServer HCL.

Licensing

How do I license XenServer?

For information about XenServer licensing, see *XenServer 7.4 Licensing FAQ*.

Technical Support

Does Citrix provide direct technical support for XenServer?

Yes. For more information, visit http://www.citrix.com/support.

Can I get 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. For more information, visit Citrix Support and Services.

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

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

Are there alternative channels for getting technical support for XenServer?

Yes. There are several alternative channels for getting technical support for XenServer. You can also use Citrix Support Knowledge Center, visit our 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 doesn't provide technical support for the open-source Xen project. For more information, visit http://www.xen.org/.

Can I open a technical support incident with Citrix if I'm experiencing a non-technical issue?

No. Raise any non-technical issues with XenServer through Citrix Customer Service. For example, issues to do with software maintenance, licensing, administrative support, and order confirmation.

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