CITRIX®

Citrix XenServer v4

Overview

Citrix XenServer™ enables businesses to deploy high-performance Windows and Linux virtual machines rapidly and easily, and to manage them and their related storage and networking resources from a single easy-to-use management console.

The family includes three virtualization products that are fully compatible, with additional capacity and features enabled by license key. The products include:

- Citrix XenServer Express Edition: a free starter package for bringing virtualization to every server (formerly XenExpress)
- Citrix XenServer Standard Edition: high-performance rich-featured server virtualization with multi-server management, with capacity for most business-critical workloads (formerly XenServer)
- Citrix XenServer Enterprise Edition: a powerful platform managing virtualization as a flexible aggregated pool of compute and storage resources, for dynamic managed virtualization environments for the enterprise (formerly XenEnterprise)

(For details about the capacities and features supported by each product, consult the feature comparison on the last page of this datasheet.)

The foundation of Citrix XenServer is the open source Xen™ hypervisor, an open, proven and fully supported engine for server virtualization.

What is Xen?

The Xen hypervisor is a unique open source technology invented by a team led by Ian Pratt at the University of Cambridge (who subsequently founded XenSource) and developed cooperatively by the world's best engineers at over 20 of the most innovative data center solution vendors. With Xen virtualization, a thin software layer (known as the Xen hypervisor) is installed directly on the hardware, or "bare metal," and is thereby inserted between the server's hardware and the operating system. This provides an abstraction layer that allows each physical server to run one or more "virtual servers," effectively decoupling the operating system and its applications from the underlying physical server. Xen's paravirtualization technology is widely acknowledged as the fastest and most secure virtualization software in the industry, and is enhanced by taking full advantage of the latest Intel VT and AMD-V hardware virtualization assist capabilities. Xen is exceptionally lean-- less than 50,000 lines of code – which translates to extremely low overhead and near-native performance for guests.

Introducing Citrix XenServer v4

The inventors and lead developers of Xen, with the rest of the Citrix XenServer product team, take this powerful virtualization engine and build out a full managed virtualization platform around it, designed for efficient management of Windows and Linux virtual machines. Citrix XenServer v4 combines the performance, security, and openness of the Xen technology with XenCenter comprehensive management – a platform perfect for rapid adoption of virtualization for server consolidation, software development and test, virtual desktops, and business continuity.
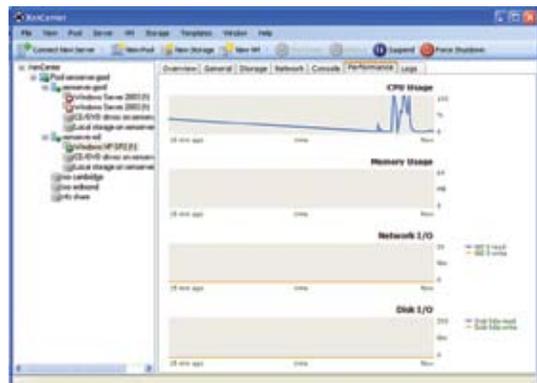
Citrix XenServer v4 is a native 64-bit virtualization platform, with the scalability required by business-critical applications. The highest host and guest CPU and memory limits available, coupled with fine-grained controls for CPU, network and disk (in Enterprise Edition), enable it to deliver optimal quality of service.

With Citrix XenServer v4 virtualization, businesses can increase server and storage utilization, reducing costs of equipment, power, cooling, and real estate. By combining servers and storage into resource pools that can be apportioned to the applications with the highest business need, IT operations can be aligned to changing demand and business priorities. With XenMotion, running virtual machines can be migrated to new servers with no service interruption, allowing essential workloads to get needed resources and enable zero-downtime maintenance.

Citrix XenServer v4 products install directly on bare metal servers, requiring no dedicated host operating system. Open command-line (CLI) and programming (API) interfaces make it easy for vendors and enterprises to integrate XenServer virtualization with existing processes and management tools, rather than requiring rip-and-replace reimplementation.

What's New in Citrix XenServer v4?

- **XenMotion**: Seamlessly move virtual machines without downtime

- **XenCenter**: Unified virtualization management interface, including servers, storage and networking

- **Native 64-bit hypervisor**: Scalability and support for enterprise applications

- **ResourcePools**: Efficient configuration, allocation and authentication for virtualization resources

- **XenAPI**: Integration with existing management invesments, infrastructure, and processes

Enterprise Ready Performance and Scalability

"Bare metal" implementation: Citrix XenServer resource pool virtualization runs directly on the hardware, rather than on top of a separate host operating system, allowing it to deliver the highest levels of performance and scalability.

Hardware virtualization assist: The latest optimizations offered by Intel and AMD in their processors are utilized for excellent performance, even when running operating systems that are not delivered virtualization-ready.

XenSource Tools: These I/O enhancements that are a standard component of the products provide optimized disk and network performance.

Xen64: The fully native 64-bit guest support enables use of the large memory needed by many essential applications, as well as the ability to run the most recent 64-bit-only releases of popular server software such as Microsoft Exchange and Microsoft SQL Server.

SMP virtual machines: Support for up to 8 virtual CPUs in each virtual machine makes it possible to deploy even the most processor-intensive applications, such as messaging and database servers, and to take advantage of today's multi-core processors.

32GB RAM per virtual machine: Citrix XenServer v4 offers server-class virtual memory capacity to deliver support for the most memory-intensive workloads.

> *"XenEnterprise is a strategic platform for Burgmann Industries delivering significant cost efficiencies for our time critical Windows 2003 and Linux based services." – Franz Kneissl, Burgmann Industries*

Simple Deployment and Installation

Flexible product installer: Citrix XenServer v4 product installations can be initiated from a CD, via PXE-based network boot, or using popular server "lights-out" server management subsystems with remote CD or ISO access.

Easy virtual machine deployment: Initial installation of Windows and Linux guests can be performed using using CDs or DVDs, via ISO images on dedicated or shared storage, or from network-accessible repositories. Once created, virtual machines can be converted to templates which can be used for replicated installation.

Broad hardware support: The unique architecture by which Xen can leverage standard Linux device drivers while using them with optimized guest drivers and high-speed data exchange delivers the hardware support benefits of hosted products with the I/O performance comparable to "fat" hypervisors.

Rich local storage support: By supporting a wide variety of local storage (including IDE, SATA, SCSI, SAS and more), Citrix XenServer resource pools allow customers to choose their hardware from a wider range of server options and price points.
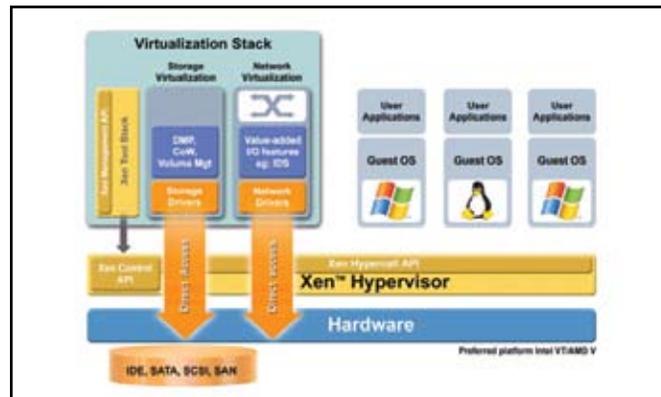
> *"Moving to XenEnterprise virtualized servers has made a massive difference to our remote hosting environment. Last week our last remaining 'legacy' server had an irreplaceable hardware failure. We were down a few minutes rather than 2 days." – Simon Buchanan, New Media Limited*

Flexible Shared Infrastructure

Pooled server and storage resources (Enterprise Edition only): Citrix XenServer resource pools allow the IT organization to view multiple servers and their connected shared storage as unified resource pools, enabling flexible deployment of virtual machines based on their resource needs and business priorities.

Live migration via XenMotion (Enterprise Edition only): Virtual machines can be moved from server to server within a Citrix XenServer resource pool without service interruption, making zero-downtime server maintenance possible, and enabling administrators to move resource-hungry running applications to take advantage of available compute power.

Pool-based configuration (Enterprise Edition only): Common settings for many components, such as physical and virtual NICs and virtual switches, can be set on a pool-wide basis, and are applied automatically to all servers in the pool, simplifying reconfiguration.

Citrix XenServer uses a unique architecture to take advantage of the wide range of devices supported by Linux drivers while delivering high-performance I/O.

On-Demand Deployment of Windows and Linux Virtual Machines

Templates: Virtual machines can be converted into templates, and used for rapid provisioning of multiple like systems on a server (or, with Enterprise Edition, within a resource pool). With file-backed local or NFS storage repositories, or other storage systems supporting advanced capabilities via the storage management API, thin provisioning can make new cloned guests available in seconds.

Import/export: Virtual machines can be backed up, copied or transported into XenServer export format using any management interface (XenCenter, "xe" CLI, or XenAPI), copied or transported to remote locations, archived, used as a basis for disaster recovery sites, and restored via import. In addition, the import operation can be used with a format that is supported by many virtual appliance vendors and tools.

Bundled Linux P2V tool: Popular Linux distributions can be migrated from physical systems into XenServer virtual machines for consolidation. (Powerful tools for physical-to-virtual migration of Windows and other Linux systems are available from XenServer technology partners; see the website for details.)

Virtual Machine Migration Tool: Citrix makes available to XenServer users an evolving tool that can be used to convert many VMware and Microsoft virtual machines to XenServer format.

each other and from other physical servers, reducing network load, increasing security, and simplifying reconfiguration.

XenCenter allows administrators powerful control over shared and dedicated storage used in their virtualized environment.

Powerful Storage Management

Shared iSCSI and NFS NAS storage (Enterprise Edition only): Storage connected to IP networks can be configured as shared pools, from which disk resources can be allocated to virtual machines, allowing IT administrators to make the best use of storage infrastructure.

Dedicated Fibre Channel and iSCSI networked storage: Central storage resources can be partitioned among servers with all Citrix XenServer editions.

Optimized file-backed virtual disks: Virtual machines stored on dedicated file systems or NFS NAS storage use the proven Microsoft VHD format, making available transparent access to backup snapshots and thin provisioning.

Unified server/storage management with Veritas Storage Foundation by Symantec (Enterprise Edition only – coming in Q4/2007): The integration of the most popular online storage management tool used by business today makes it possible for IT organizations to preserve their investments in tools and processes while taking advantage of the data and I/O path availability protection, automated volume recovery, and storage provisioning benefits directly from XenSource management tools, and offering certification for many storage arrays.

Backup integration and certification with Symantec NetBackup (coming in a future update to Enterprise Edition): By running the NetBackup Agent in the server's control domain, IT organizations can optimize backup and recovery of their servers and virtual machines using the most popular enterprise backup software.

Storage Management API: This interface is used by storage vendors to make the advanced capabilities of their arrays and controllers (including cloning, thin provisioning, and snapshots) directly accessible from XenServer administrative interfaces.
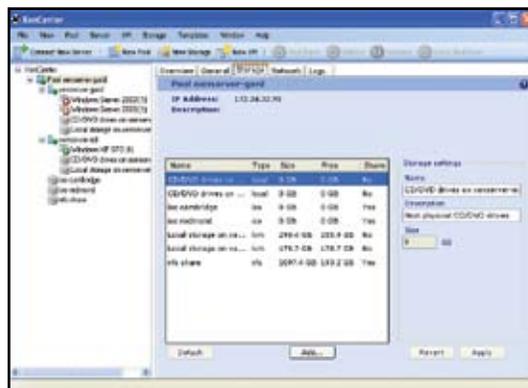
Efficient, Secure Virtual Networking

Virtual NICs: Each virtual machine can be configured with one or more virtual NICS, each having its own IP and MAC addresses. Virtual machines appear as if they were independent physical systems on the network.

Virtual switches: Virtual NICs can be connected to virtual switches that offer network isolation. Each virtual switch can connect to the physical network via a physical NIC, or can be configured as a fully virtual network for private guest-to-guest traffic at memory speeds.

VLAN support: As with physical systems, virtual machines can be bound to separate VLANs to isolate their traffic from

XenCenter Management

Easy to use: XenCenter provides a single point of management for all Citrix XenServer editions. Whether systems are managed one at a time (Express Edition), as multiple independent servers (Standard Edition), or as unified pools of servers and storage (Enterprise Edition), the same tool can be used, protecting training investment.

Full VM lifecycle management: With XenCenter, administrators can create, start, stop, reboot, suspend, resume, migrate, and uninstall virtual machines, and reboot and shut down physical servers, securely from any location.

Performance monitoring: Administrators can access real-time and trended performance information of virtual machine and server performance metrics for CPU, memory, disk and network utilization.

Resource management (XenEnterprise only): XenCenter provides easy access to quality-of-service controls that allow users configure priority and limits for CPU, memory, disk and network I/O.

Flexible console support: Administrators can connect to Windows virtual machines either via the built-in graphical interface or the native Windows RDP protocol, and access the graphical and text consoles of Linux virtual machines, directly from within XenCenter.
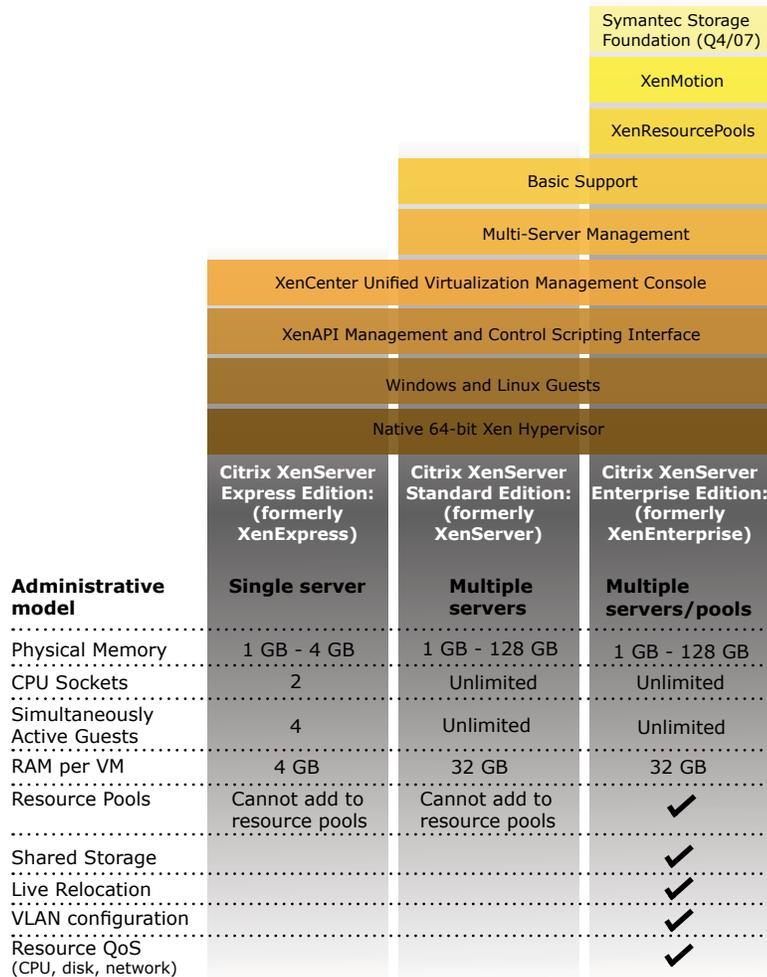
Interfaces for Management Integration and Scripting

XenAPI: The open source XML-RPC interface for Xen management, extended to include advanced XenSource storage repository and XenResourcePool management, allows developers of management software, including system and software vendors and IT organizations, to integrate XenSource virtualization management into their tools with the same interface used by XenCenter.

XenAPI language bindings: Inclusion of C, Python, and C# language binding libraries offer flexibility to developers.

Remotable Command Line Interface: The "xe" command line interface may be run on the managed XenServer or on any Windows or Linux system, and, with its more than 180 supported operations, provides a powerful tool for character-based administration sessions as well as for script integration.

A XenServer v4 Choice for Every Server

Symantec Storage Foundation (Q4/07)		
XenMotion		
XenResourcePools		
Basic Support		
Multi-Server Management		
XenCenter Unified Virtualization Management Console		
XenAPI Management and Control Scripting Interface		
Windows and Linux Guests		
Native 64-bit Xen Hypervisor		

Administrative model	Citrix XenServer Express Edition: (formerly XenExpress) Single server	Citrix XenServer Standard Edition: (formerly XenServer) Multiple servers	Citrix XenServer Enterprise Edition: (formerly XenEnterprise) Multiple servers/pools
Physical Memory	1 GB - 4 GB	1 GB - 128 GB	1 GB - 128 GB
CPU Sockets	2	Unlimited	Unlimited
Simultaneously Active Guests	4	Unlimited	Unlimited
RAM per VM	4 GB	32 GB	32 GB
Resource Pools	Cannot add to resource pools	Cannot add to resource pools	✔
Shared Storage			✔
Live Relocation			✔
VLAN configuration			✔
Resource QoS (CPU, disk, network)			✔

System Requirements

For the XenServer server:
- 64-bit x86 server-class system
- CPU: 1.5 GHz minimum, 2 GHz or faster multicore recommended
  o Intel VT or AMD-V required or support of Windows guests
  o All systems in Enterprise Edition resource pool must have identical CPUs and network configuration
- 1GB-128GB physical memory
- 100Mb/s or faster NIC
- Local or Fibre Channel boot disk with 16GB of space minimum, 60GB or more recommended

For the XenCenter management interface:
- x86-based system running Windows 2000, Windows XP, Windows Server 2003, or Windows Vista
- .NET Framework 2.0 or above
- CPU Speed 750 MHz minimum, 1 GHz or faster recommended
- RAM 1 GB minimum, 2 GB or more recommended
- Disk space 100 MB minimum
- Network interface card

Citrix XenServer supports the following operating systems:

Microsoft Windows
(supported only on systems equipped with Intel VT-enabled or AMD-V CPUs)
- 64-bit:
o Windows Server 2003 Standard, Enterprise, Datacenter Edition SP2
o Windows Small Business Server 2003 SP2
- 32-bit :
o Windows Server 2003 Web, Standard, Enterprise, Datacenter SP0/ SP1/SP2/R2
o Windows Small Business Server 2003 SP0/SP1/SP2/R2
o Windows XP SP2
o Windows 2000 SP4

Linux
- 32-bit:
- Red Hat Enterprise Linux (and derivatives): 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 5
- Novell SUSE Linux Enterprise Server: 9SP2, 9SP3, 10SP1
- Debian: Sarge (3.1), Etch (4.0)

About Citrix

Citrix Systems, Inc. (Nasdaq:CTXS) is the global leader and the most trusted name in application delivery infrastructure. More than 200,000 organizations worldwide rely on Citrix to deliver any application to users anywhere with the best performance, highest security and lowest cost. Citrix customers include 100% of the Fortune 100 companies and 98% of the Fortune Global 500, as well as hundreds of thousands of small businesses and prosumers. Citrix has approximately 6,200 channel and alliance partners in more than 100 countries. Annual revenue in 2006 was $1.1 billion. Learn more at www.citrix.com.

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