



ENTERPRISE HYPERVISOR COMPARISON

Version 5.5

A feature comparison of the hypervisors from Citrix, Microsoft, RedHat and VMware. Updated to the latest version, Citrix XenServer 6.2, Microsoft Hyper-V 2012, RedHat RHEV 3.2 and VMware vSphere 5.5.

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Introduction

At manufacturer's websites and in the blogosphere there are many hypervisor comparisons which only compare hypervisors based on a single driver (performance, features or cost). In my opinion it's a bit more complicated than that. After the everlasting discussion on make-believe cheaper Microsoft Hyper-V and Citrix XenServer implementations, I spend a fair deal of my time explaining to colleagues and clients that this is a hoax and that cost is not the only reason to base their decision on. Especially in the case of XenServer the choice and the long term effects make it a little bit more complicated.

Now you probably think *'These VMGuru.nl guys are VMware fans so here we go again'* but the opposite is true. Like Chris I think every situation has its own ideal solution and you should select the hypervisor based on well-considered selection criteria and because my employer, Imtech ICT, focuses on clients with 500+ workstations/employees these criteria are Enterprise-class hypervisor selection criteria.

Because of this we published multiple *'Enterprise Hypervisor comparisons'* during the last four years and we got very positive comments and feedback on it. Since my last comparison I received a lot of requests to add RedHat to the chart. Although I've never encountered it in enterprise environments, I decided to add it to the hypervisor comparison as a service to our readers.

Keep in mind:

- The versions used are the platinum/ultimate/fully-featured versions of the hypervisors. Product features can be limited by lower license versions;
- No free versions have been used in this comparison.

I hope you find the new Enterprise Hypervisor comparison useful and feel free to contact us when you have feedback for us to improve the list.

Good luck finding the ideal hypervisor for your situation.

Special thanks to:

- *Stu Fox for supplying me with the correct Microsoft Server 2012 features;*
- *Rob van der Helm for supplying me with the RedHat RHEV 3.1 information;*
- *Frank Aldridge for supplying me with the XenServer 6.1 information.*
- *Keith Mayer for supplying me with the information on Microsoft Server 2012 (R2)*

Version history

Version	Date	Description
1.0	Apr 2009	Initial document with VMware VI3.5 and vSphere 4, Microsoft Hyper-V 1.0 and 2.0, Citrix XenServer 4.5 and 5.0
1.1	Apr 2009	Minor bug fixes on version 1.0
1.2	May 2009	Minor bug fixes on version 1.1
1.3	June 2009	Removed the free versions of Microsoft Hyper-V and VMware VI3.5
2.0	Aug 2010	Complete new layout. Changed to 'Production/enterprise-class' hypervisors Removed Citrix XenServer 4.5 and Microsoft Hyper-V 1.0. Added Citrix XenServer 5.6 and Microsoft Hyper-V R2
2.1	Aug 2010	Minor bug fixes on version 2.0
3.0	Nov 2011	Removed Citrix XenServer 5.0 and VMware VI3.5. Added Citrix XenServer 6 and VMware vSphere 5.0
3.1	Nov 2011	Minor bug fixes on version 3.0
3.2	Dec 2011	Minor bug fixes on version 3.1
4.0	Sept 2012	Removed VMware vSphere 4.1. Added VMware vSphere 5.1
4.1	Sept 2012	Minor bug fixes on version 4.0
4.2	Dec 2012	Added additional hypervisor features.
4.3	Dec 2012	Added RedHat RHEV 3.1. Removed the old versions Citrix XenServer 5.6, Microsoft Hyper-V 2008 R2 SP1 and VMware vSphere 5.0. From now on only the current versions are used and maintained.
5.0	Dec 2012	Added Microsoft Server 2012 Hyper-V.
5.1	Feb 2013	Changed the Microsoft Server 2012 Hyper-V features after release of SCCM 2012 SP1
5.2	Apr 2013	Minor bug fixes on version 5.1
5.3	Apr 2013	Added Citrix XenServer 6.2, removed Citrix XenServer 6.1
5.4	Jun 2013	Added RedHat RHEV 3.2, removed RedHat RHEV 3.1 (beta)
5.5	Aug 2013	Added VMware vSphere 5.5, removed VMware vSphere 5.1



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	VMware vSphere	Microsoft Hyper-V Server	Citrix XenServer	RedHat RHEV
Version	5.5	2012	6.2	3.2
Host				
Bare metal deployment	✓	✓	✓	✓
Intel-VT or AMD-V required	✓	✓	✓	✓
Hardware compatibility	Comprehensive HCL	Windows Ecosystem	Limited HCL	Identical to RHEL
Max logical processors	320	320	160	160
Max cores per processor	Unlimited	Unlimited	Unlimited	Unlimited
Max virtual processors	4.096	2.048	4.000 Windows / 12.000 Linux	[unknown]
Max Memory support	4 TB	4 TB	1 TB	2 TB
Memory overcommitment	✓	✓*1	✓	✓
Memory page sharing	✓	✗	✗	✓
Guest				
Max virtual CPU's	64 vCPU's	64 vCPU's	16 vCPU's	160 vCPU's
Max virtual memory	1 TB	1 TB	128 GB	2 TB
Max virtual disk size	62TB	64 TB	2 TB – 4GB	unlimited
Hot add support	CPU, memory, disk, NIC	disk, memory	disk, NIC	disk, NIC
GPU pass-through	✓	✓*10	✓	✓
Performance				
Max network I/O	>36Gb/s per VM	[unknown]	[unknown]	[unknown]
Max storage I/O	>1.0M per VM	>1.0M per VM	[unknown]	[unknown]
Management				
Management product	vCenter Server 5.5	SCCM 2012	XenCenter 6	RHEV Manager
Host power management	✓	✓	✗ (retired)	✓
Role based management	✓	✓	✓	✓
P2V migration	✓	✓	✗ (retired)	✓
Resource pools	✓	✓	✗	✗
Auto VM placement while running	✓	✓	✗ (retired)	✓
Auto VM placement at startup	✓	✓	✓	✓
Auto storage placement while running	✓	✗	✗	✓
Auto storage placement at startup	✓	✗	✗	✓
Performance Monitoring	✓	✓*3 (SCOM)	✓	✓
Host profiles	✓	✓*2	✗	✗



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VMware vSphere

Microsoft Hyper-V Server

Citrix XenServer

RedHat RHEV

Version	5.5	2012	6.2	3.2
Cloud				
Cloud integration	Cloud API	SC 2012 SP1 Service Provider Foundation	OpenStack API	REST API
Cloud extension	vCloud Director	SC 2012 SP1 Service Provider Foundation	Cloud Connect	CloudForms
Image portability	OVF	OVF	OVF	OVF
Business continuity				
High Availability	✓	✓	✓	✓
Auto VM reset	✓	✓	✗	✓
Application High Availability	✓	✓	✗	✗
Restart prioritization	✓	✓	✓	✓
Fault tolerance (zero downtime HA)	✓	✗	✗	✗
Disaster/site recovery	✓*3 (SRM)	✓	✓	✓
Live migration	✓	✓	✓	✓
Long distance live migration	✓	✓	✗	✗
Live migration without shared storage	✓	✓	✗	✗
# hosts per cluster	32	64	16	200
# VM's per host	512	1.024	500 Windows / 650 Linux *7	[unknown]
# VM's per cluster	4.000	8.000	800	[unknown]
Storage				
Local storage	✓	✓	✓	✓
Shared storage - FC, iSCSI	✓	✓	✓	✓
Shared storage - NFS	✓	✓	✓	✓
Shared storage - FCoE	✓	✓	✓	✗
Live storage migration (no downtime)	✓	✓	✓	✓
Thin provisioning	✓	✓	✓*4	✓
Linked images	✓*3 (View, vCD)	✓	✓	✓
Storage I/O control	✓	✗	✓*5	✗
Storage replication	✓	✓	✗	✗
Storage profiles	✓	✓*8	✗	✗
Back-up integration	✓	✓	✗ (retired)	✗
Integrated storage tiering (vFlash)	✓	✗	✗	✗



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	VMware vSphere	Microsoft Hyper-V Server	Citrix XenServer	RedHat RHEV
Version	5.5	2012	6.2	3.2
Networking				
VLAN support (802.1q)	✓	✓	✓	✓
Link aggregation (803.2ad)	✓	✓	✓	✓
Jumbo frame support	✓	✓	✓	✓
Distributed switch	✓	✓	✓	✗
Third party distributed switch	✓	✓	✗	✓
Network I/O control	✓	✓	✓	✗
Traffic filtering	✓	✓	✓	✓
Guest operating system support				
Windows NT 4 Server	✓	✗	✗	✗
Windows 2000 Server	✓	✓*9	✓ (no x64)	✗
Windows Server 2003	✓	✓*6	✓	✓
Windows Server 2003 R2	✓	✓*6	✓ (no x64)	✓
Windows Server 2008	✓	✓	✓	✓
Windows Server 2008 R2	✓	✓	✓	✓
Windows Server 2012	✓	✓	✓	✓
Windows XP	✓	✓ (> SP3, no x64)	✓	✓ (> SP3, no x64)
Windows 7	✓	✓	✓	✓
Windows 8	✓	✓	✓	✗
FreeBSD 7	✓	✗	✗	✗
FreeBSD 8	✓	✗	✗	✗
Mandrake Linux	✓	✗	✗	✗
Ubuntu Linux 12	✓	✓ (only v12.04-12.10)	✓	✗
Ubuntu Linux 13	✓	✓		
SUSE Linux Enterprise 10	✓	✗	✓	✗
SUSE Linux Enterprise 11	✓	✓	✓	✗
Oracle Enterprise Linux 5	✓	✗	✓	✗
Red Hat Enterprise Linux 4	✓	✗	✓ (no x64)	✓
Red Hat Enterprise Linux 5	✓	✓*9 (only v5.7-5.8)	✓	✓
Red Hat Enterprise Linux 6	✓	✓*9	✓	✓



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	VMware vSphere	Microsoft Hyper-V Server	Citrix XenServer	RedHat RHEV
Version	5.5	2012	6.2	3.2
Guest operating system support				
Novell NetWare 5	✓	✗	✗	✗
Novell NetWare 6	✓	✗	✗	✗
CentOS 5	✓	✓*9 (only v5.7-5.8)	✓	✗
CentOS 6	✓	✓*9	✓	✗
SUN Solaris 10	✓	✗	✗	✗
Apple Mac OSX 10	✓	✗	✗	✗

1. Only for Windows Server 2008 R2, Windows Server 2008 (SP2), Windows Server 2003 R2, Windows Server 2003 (SP2), Windows 7 (Enterprise and Ultimate only), Windows Vista (Enterprise and Ultimate only).
2. The host profile can however not be used to check and update compliance of hosts after the initial deployment
3. With add-on.
4. Only on supported storage arrays, if not supported only on local storage.
5. QoS setting are applied to virtual disks accessing the LUN from the same host. QoS is not applied across hosts in the pool.
6. Min SP2, max 2 vCPU's.
7. 500 concurrent protected VMs per host with HA enabled.
8. Only 'user defined' storage profiles, no automated discovery of storage capabilities.
9. Using Linux/Windows Integration services.
10. RemoteFX does not allow the GPU to be passed directly to a VM, RemoteFX does GPU virtualization which enables it to be shared across multiple VMs. Not real GPU-pass-through but worth a green checkmark with a comment