



RED HAT ENTERPRISE VIRTUALIZATION FOR SERVERS: COMPETITIVE FEATURES

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Server virtualization offers tremendous benefits for enterprise IT organizations – server consolidation, hardware abstraction, and internal clouds deliver a high degree of operational efficiency. However, today, server virtualization is not used pervasively in the production enterprise datacenter. Some of the barriers preventing wide-spread adoption of existing proprietary virtualization solutions are performance, scalability, security, cost, and ecosystem challenges.

Red Hat Enterprise Virtualization for Servers is an end-to-end virtualization solution that is designed to overcome these challenges, enable pervasive datacenter virtualization, and unlock unprecedented capital and operational efficiency.

The Red Hat Enterprise Virtualization portfolio builds upon the Red Hat Enterprise Linux platform that is trusted by millions of organizations around the world for their most mission-critical workloads. Combined with KVM, the latest generation of virtualization technology, Red Hat Enterprise Virtualization for Servers delivers a secure, robust virtualization platform with unmatched performance and scalability for Red Hat Enterprise Linux and Windows guests.

The Red Hat Enterprise Virtualization for Servers product consists of the following components:

Red Hat Enterprise Virtualization Manager for Servers: A feature-rich server virtualization management system that provides advanced management capabilities for hosts and guests, including high availability, live migration, storage management, system scheduler, and more.

Red Hat Enterprise Virtualization Hypervisor: A modern hypervisor based on KVM which can be deployed either as:

- the included standalone, small footprint, high performance, secure hypervisor based on the Red Hat Enterprise Linux kernel.

Or

- **Red Hat Enterprise Linux 5.4:** The latest Red Hat Enterprise Linux platform release (purchased separately) that integrates KVM hypervisor technology, allowing customers to increase their operational and capital efficiency by leveraging the same hosts to run both native Red Hat Enterprise Linux applications and virtual machines running supported guest operating systems.

FEATURES & BENEFITS

When you are choosing a virtualization platform for your datacenter, your architecture and capabilities may be limited by the features offered by each product. This document details the features and benefits of the Red Hat Enterprise Virtualization for Servers product in comparison with VMware® vSphere® 4 (currently shipping as of the date of publication), Microsoft® Hyper-V® 2008 R2 (expected to ship in the second half of 2009), and VMware Virtual Infrastructure® 3.5 (widely deployed in existing virtualized environments).

This document is designed to give you information about Red Hat Enterprise Virtualization for Servers, and to allow you to compare features and benefits across multiple virtualization platforms.



FEATURE	Red Hat Enterprise Virtualization for Servers	VMware vSphere 4.0	Microsoft Hyper-V 2008 R2	VMware Virtual Infrastructure 3
Hypervisor Features				
Bare Metal Hypervisor: A bare metal hypervisor is one that installs directly on the server hardware without requiring a full operating system to reside on. RHEV leverages the Red Hat Enterprise Linux kernel and sufficient drivers and applications to provide hypervisor functionality without the entire RHEL operating system.	X	Yes, with ESXi 4	NO. Server Core and Hyper-V Server 2008R2 installations are minimum 3GB disk space.	Yes, with ESXi 3.x
Small Footprint: The RHEV hypervisor is <100MB, suitable for installation on local flash storage, boot from SAN, or PXE booting for diskless hosts.	X	X	NO	X
Security: Only RHEV leverages open source, enterprise grade security developed in partnership with government agencies for high security. RHEV uses the SELinux standard for security, and is backed by Red Hat Network for security updates.	X	NO	NO	NO
Resource Virtualization				
CPU Virtualization: RHEV-H is able to virtualize up to 256 logical CPUs (combination of cores and hyperthreading) on each host for presentation to virtual machines. Each VM can use up to 16 vCPUs for maximum efficiency.	Maximum 256 vCPUs per host. 256 logical CPUs per host. 16 vCPUs per VM.	Maximum 512 vCPUs per host. 64 logical CPUs per host. 8 vCPUs per VM	Maximum 64 vCPUs per host. 64 logical CPUs per host. 8 vCPUs per VM	Maximum 192 vCPUs per host. 32 logical CPUs per host. 4 vCPUs per VM
Memory Management				
Memory Overcommitment: RHEV can allocate more virtual memory to its VMs than the host has physical memory. RHEV accomplishes this through use of a sophisticated memory manager that allocates memory resources to VMs as needed. For example, you can run several virtual machines with a total memory commitment of 64 GB on a single physical server with only 32 GB RAM installed.	X	X	NO	X
Page Sharing: Memory page sharing allows VMs with like operating systems to share physical memory to store redundant memory pages. For example, multiple virtual guests running RHEL 5.4	X	X	NO	X



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will have many of the same memory pages. These redundant pages are stored only once, with the remaining virtual machines getting pointers to the single copy of the redundant memory page. This reduces the amount of physical memory required to host systems.				
Processor Hardware Memory Assist: Reduces the time required to exchange memory resources between the host and the virtual machine using extensions built into the latest x86 processors.	X	X	NO	NO
Large Memory Pages: Large memory pages are an option for providing memory to the virtual machine guests that can improve performance for certain high IO applications (database, messaging, etc.)	X	X	NO	X
Networking				
Virtual NICs: The hypervisor can present to each virtual machine multiple virtual network interface cards, each of which can map to different virtual networks and physical NICs on the host machine. Each NIC can have its own IP addresses and MAC addresses.	X	X	X	X
Virtual Switch: The management system provides a virtual switch that coordinates network traffic between the virtual machines as if they were physical machines on a physical switch. The virtual switch interfaces with the physical NICs on the host for communications outside the host.	X	X	Requires Host OS and VM OS configuration	x
vLANs: Support for virtual LANs on the virtual NICs inside the virtual infrastructure.	X	X	Requires Host OS and VM OS configuration	X
IPv6 Support: RHEV supports IPv6 within the RHEV infrastructure as well as within guest virtual machines.	X	X	X	Limited guest support only
Network Offload: Reduces CPU resources needed to process virtual networking and network IO by offloading to compatible NIC hardware.	X	X	X	X



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Jumbo Frames	X	X	R2 only	X
Red Hat Enterprise Virtualization Ecosystem				
Server Hardware: Red Hat Enterprise Virtualization is supported on all hardware currently certified for Red Hat Enterprise Linux 5, including systems from Cisco®, Dell®, Fujitsu®, Fujitsu Siemens®, Hewlett Packard®, Hitachi®, IBM®, Intel®, Lenovo®, NEC®, SGI®, Sun Microsystems®, Tyan®, Unisys®, and others.	X	X	X	X
Storage: RHEV is supported on all storage hardware certified for RHEL 5.	X	X	X	X
Networking: RHEV includes support for network hardware and interfaces certified for RHEL 5.	X	X	X	X
Guest Operating Systems: RHEV supports Windows 2003, 2008, XP guests and RHEL 3,4,5+.	X	X	Windows 2003, 2008 (certain SPs only), RHEL 5+ only	X
ISV Applications: Enterprise ready software from Red Hat's ISV partners are certified ready-to-run on RHEV.	All Red Hat ISVs are certified on RHEV (**)	Limited	Limited to Hyper-V certified, mostly Microsoft	Limited
Management Features				
High Availability				
Intelligent Failover: RHEV high availability ensures that high priority virtual machines are automatically restarted on failure of the VM itself or the host on which it resides.	X	Requires Advanced or higher	Requires Windows Clustering	Requires Standard or Enterprise
Maintenance Mode: RHEV hosts undergoing maintenance automatically have their guest VMs migrated to other available hosts and are removed as targets for migration until maintenance is complete.	X	X	NO	X
Migration				
Live Migration RHEV can automatically or manually migrate running virtual machines from one host to another without downtime when the virtual disk files reside on a shared storage substrate.	X	Requires Advanced or higher	Yes in R2, requires Windows Clustering	Requires Enterprise



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System Scheduler				
Shared Resource Pools: Pools of resources such as CPU, memory, and storage are aggregated and managed at the datacenter or cluster level rather than machine-by-machine.	X	X	NO	X
Business-Rule Resource Utilization: RHEV allows administrators to set cluster policies for resource smoothing or power savings with a single click, allowing businesses to immediately benefit from cost saving technology.	X	Enterprise and Enterprise Plus only (DRS)	NO	Enterprise only (DRS)
Power Saver				
Host-Level Power Management: RHEV takes advantage of the latest power saving technology built into the newest x86 CPUs to allow power savings when host resources are not being used.	X	X (DPM)	Limited	X (DPM)
Image Management				
Thin Provisioning: Allows the creation of virtual machines with virtual disks that do not take up all of their allowed space upon creation. This allows better use of storage resources as needed.	X	X	X	NO
Templates: Virtual machines can be deployed from master installations. This saves time and disk space, as template-driven virtual machines can be stored with only the differences between the template and the VM on disk.	X	X	X	X
Control, Monitoring and Reporting				
Central Control and Visibility: RHEV Manager is your single-view management GUI for your entire enterprise virtualization infrastructure.	X	X	Requires multiple products to fully manage	X
Host and VM Management: RHEV Manager provides host and VM management	X	X	X	X
System Monitoring: System status can be monitored from RHEV Manager.	X	X	Requires SCOM	X



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Alerts and Notifications: RHEV Manager can report errors and warnings to administrators via email	X	X	X	X
Remote Console: RHEV Manager allows console access to virtual machines using secure VNC or desktop-optimized SPICE® remote desktop technology.	X	X	X	X
Access Control: Administrative and user access to your virtual datacenter can be controlled and managed from RHEV Manager	X	X	X	X
Active Directory Integration: RHEV Manager interfaces with your existing Microsoft Active Directory for user access and authentication.	X	X	X	X
Roles and Permissions: Users and administrators can be assigned granular security access to your datacenter from the RHEV Manager interface.	X	X	X	X
Central Licensing: Red Hat Network (RHN) provides central license access for your RHEV hosts and management servers.	X	X	X	X
PXE Boot Support: RHEV Manager supports PXE boot for network installation of virtual machines.	X	X	X	X
Logging: RHEV Manager provides extensive logging for troubleshooting and research.	X	X	X	X
Open and Extensible API	X	X	Limited	X
Virtual Storage				
Storage Virtualization: RHEV aggregates and distributes storage resources to maximize flexibility and utilization.	X	X	X	X
Virtual Disk Files: Virtual disks are stored as disk files on the various storage domains.	X	X	X	X
Shared Storage: RHEV can use NFS, iSCSI and Fibre Channel shared storage for the storage of virtual machines.	X	X	Limited	X
Raw Device Mapping: RHEV requires	NA	X	NA	X



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no special clustering file system to be installed on storage.				
Storage Multipathing	X	X	X	X
Recovery				
VM snapshots: RHEV virtual machine snapshots allow administrators to apply patches and upgrades in a transactional way, and roll back to a known good snapshot if the patch runs into an issue.	X	X	X	X

WHAT NEXT?

For more information, please go to <http://www.redhat.com/virtualization> or contact your local Red Hat Enterprise Virtualization reseller.

ADDITIONAL INFORMATION

All information in this document concerning Red Hat Enterprise Virtualization for Servers was true and correct as of October, 2009. There may be changes in the current

release—please reference the release notes for your installed version.

All information concerning products from other manufacturers was taken from publicly available materials as of October, 2009 with no warranty as to its accuracy. Please check manufacturers' websites for the latest information and specification on their products.