



RED HAT ENTERPRISE VIRTUALIZATION FOR SERVERS: COMPETITIVE PRICING GUIDE

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INTRODUCTION TO RED HAT ENTERPRISE VIRTUALIZATION

The Red Hat Enterprise Virtualization portfolio is an end-to-end virtualization solution, with use cases for both servers and desktops, that is designed to overcome these challenges, enable pervasive data-center 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 the kernel-based virtual machine (KVM) hypervisor, the latest generation of virtualization technology, Red Hat Enterprise Virtualization 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:

- **RHEV-H:** A standalone, small footprint, high-performance, secure hypervisor based on the Red Hat Enterprise Linux kernel (included with Red Hat Enterprise Virtualization for Servers).

Or

- **Red Hat Enterprise Linux:** Red Hat Enterprise Linux (purchased separately) 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.



COMPARING RED HAT ENTERPRISE VIRTUALIZATION PRICING TO VMWARE PRICING

Red Hat Enterprise Virtualization uses a pricing model which is different than the models used by VMware® for vSphere® 5. It is important to understand these differences to accurately compare costs across platforms. In a typical virtualization solution, you may have the following elements: hypervisor, management server, and management agent. For each element, you may also need to think about an upfront license fee and a subscription fee for maintenance and support.

RED HAT ENTERPRISE VIRTUALIZATION FOR SERVERS PRICING

All Red Hat products are offered under a subscription model. There are no high, upfront license costs, just an annual subscription based on the level of support you need. Red Hat Enterprise Virtualization for Servers subscription pricing is based on number of managed sockets: 1 managed socket on a virtualization host requires 1 subscription of Red Hat Enterprise Virtualization for Servers.

Each virtualization host that is fully licensed for Red Hat Enterprise Virtualization for Servers is entitled to run the included Red Hat Enterprise Virtualization Hypervisor, a bare-metal hypervisor based on the full Red Hat Linux Kernel. There is no separate management agent in Red Hat Enterprise Virtualization.

VMWARE VSPHERE 5 PRICING

On July 12, 2011, VMware announced new pricing and packaging models for their virtualization platform product, vSphere 5. vSphere licenses now include a per-socket entitlement (like before) and an added entitlement for vRAM (the amount of RAM configured in all running VMs). VMware continues to sell the hypervisor and management agent bundled into different “editions” which give the customer different management functionality. However, the number of vSphere editions has been reduced from four editions in vSphere 4 to three editions in vSphere 5 which are Standard, Enterprise and Enterprise Plus.

Note: On August 4, 2011, due to an overwhelming negative customer response, VMware revised the vSphere 5 pricing and licensing. This document has been updated to reflect those changes. The two major changes were to: 1) Increase the vRAM entitlement associated with each vSphere 5 edition and 2) Limit the amount of vRAM charge to any single VM to 96 GB.

vRAM is something new--something that users didn't used to have to think about. When you create a new VM, you define how many virtual CPUs and how much virtual RAM the VM will “see”. The hypervisor then schedules the VMs so that the physical RAM and CPU are shared among the running VMs.

In a nutshell, vRAM is:

- RAM assigned to a Virtual Machine
- in all Virtual Machines that are powered ON
- NOT Physical RAM
- NOT RAM in VMs that are powered off



Depending on the edition, each vSphere 5.0 CPU license provides a base vRAM capacity entitlement. The vRAM entitlements of vSphere CPU licenses are pooled or aggregated across all CPU licenses of that edition at a customer site to form a total available or pooled vRAM capacity. At any given point in time, the vRAM capacity consumed by all powered-on virtual machines within a pool must be equal or lower than the pooled vRAM capacity. When a virtual machine is powered on, the vRAM in that virtual machine (up to a maximum of 96GB) counts against the pooled vRAM capacity. Therefore, for each edition installed at a site, the customer will need to buy the maximum of (a) the total count of sockets running that Edition or (b) the total vRAM on the VMs running on that Edition.

VMWARE vSPHERE 5 EDITION	vRAM BASE ENTITLEMENT
Standard	32 GB
Enterprise	64 GB
Enterprise Plus	96 GB

In addition to the upfront license fees for the per-socket and vRAM entitlement, there is also an annual service and support contract called Support and Subscription or “SnS” (which entitles the customer to support, patches, and upgrades). The customer must also purchase a VMware vCenter Management server license separately. While VMware markets their ESXi bare metal hypervisor as an effectively “free” product, ESXi does not include support, is limited to 8GB vRAM, and does not support advanced multinode management without “upgrading” it to one of the paid editions of vSphere 5.

vSphere 5 pricing is based on a per-socket model for the vSphere nodes, and a per-server model for the vCenter Management Server. Each vSphere node license includes a vCenter Management license. VMware vSphere does not include any Guest Operating system licensing. All guest operating system licenses must be purchased separately. For a typical environment, the customer will need to purchase the following:

PRODUCT	INCLUDES
vCenter Management Server License	<ul style="list-style-type: none">• 1 node of vCenter Management Server• NO MANAGEMENT AGENTS• NO HYPERVISOR
vCenter Management Server Support Subscription	<ul style="list-style-type: none">• 1 year of support and updates for above
vSphere 5 License (editions include Standard, Enterprise, Enterprise Plus)	<ul style="list-style-type: none">• 1 socket of EXSi hypervisor• 1 vRAM entitlement (32 GB, 64 GB, or 96 GB depending on the edition)• Guest Operating System not included• REQUIRES MANAGEMENT SERVER
vSphere 5 Support Subscription	<ul style="list-style-type: none">• 1 year of support and updates for above



STEP-BY-STEP PROCESS TO CALCULATE VSPHERE5 PRICING AND LICENSING

1. Choose Edition (Standard, Enterprise, Enterprise+), based on:
 - Features
 - Limits (vCPU/VM)
 - vRAM entitlement
2. Count sockets of hypervisor server hosts. (minimum purchase)
3. Add all the vRAM in all the running virtual machines planned for that vSphere 5 edition.
Note that the maximum vRAM licensing charge for a single virtual machine is 96GB.
(i.e. a VM with 128GB of vRAM requires only a 96GB vRAM entitlement)
4. Determine number of licenses required for vRAM (vRAM entitlement /CPU: Standard = 32 GB, Enterprise = 64 GB, Enterprise+ = 96 GB)
5. Buy max (sockets, vRAM) Licenses of vSphere Edition + SnS subscription/year
6. As you grow, you may need to buy additional CPU licenses for additional sockets or for using additional vRAM on sockets already purchased

For more information, see the document **vSphere 5 Licensing Model** at:
http://www.vmware.com/files/pdf/vsphere_pricing.pdf

PRICING SCENARIOS

For each of these pricing scenarios, we examine the a first year cost of acquiring and supporting the virtualization management and hypervisor software as well as a three-year cost of ownership. The costs for the hardware and for the guest operating systems have not been included since they are assumed to be the same for both a VMware and a RHEV virtualization deployment.

In all cases, we assume that when there are multiple choices in how to license a product, the customer will choose the lowest price option. From a functionality comparison, RHEV more closely matches the vSphere 5 Enterprise Edition and in all scenarios included in this document, RHEV will be compared to this edition. However, please note that due to the vSphere 5 vRAM entitlement licensing, there will be cases where the vSphere5 Enterprise Plus Edition with its 96 GB vRAM entitlement can work out to have a lower solution price than Enterprise Edition.

Note that with Red Hat Enterprise Virtualization for Servers the customer has two options for the Red Hat Enterprise Virtualization Hypervisor, either the RHEV-H hypervisor or purchasing and Red Hat Enterprise Linux for use as a hypervisor. However, in order to make a more accurate comparison, this model only employs the RHEV-H bare metal hypervisor that comes included with the Red Hat Enterprise Virtualization for Servers product. This streamlined version of RHEL has been engineered to a very small footprint to efficiently and securely manage virtual machines and is directly comparable to VMware's vSphere ESXi hypervisor.



100 VIRTUAL MACHINE GUESTS (SMALL)

For a scenario with 100 virtual machine guests in a virtualization cluster, the following is comparison of three year costs for Red Hat Enterprise Virtualization for Servers and VMware vSphere 5 Enterprise Plus Edition. In this scenario, the size of each virtual machine is considered to be small to medium consuming 2vCPUs and 4 GB vRAM on average.

THREE YEAR TCO ANALYSIS	RED HAT ENTERPRISE VIRTUALIZATION	VMWARE vSPHERE ENTERPRISE
Number of Servers	4	4
Number of Processors	8	8
Total amount of vRAM	400 GB	400 GB
License Costs (One Time)		
Virtualization Software	\$0	\$27,995
Annual Support/Subscription Costs		
Virtualization Software	\$5,992	\$7,001
Total First Year Costs	\$5,992	\$34,996
Three Year Costs	\$17,976	\$48,998

FIRST YEAR COSTS	QTY	PRICE	TOTAL PRICE
RHEV for Servers (per socket) with 7 x 24 Support	8	\$749	\$5,992
vSphere Enterprise for 1 processor	8	\$2,875	\$23,000
vSphere Enterprise for 1 processor SnS 7 x 24 (1 year)	8	\$719	\$5,752
vCenter Server Standard	1	\$4,995	\$4,995
vCenter Server SnS 7 x 24 (1 year)	1	\$1,249	\$1,249
Total vSphere 5 First Year Cost			\$34,996

The pricing scenarios use the following parameters and values.

PARAMETER	VALUE
Server processors	Two processors with 8 cores per processor
Server memory	Support up to 256 GB RAM
Target host utilization	75%
Virtual machines	Average of 2 vCPU and 4 GB vRAM
Total vCPU and vRAM	200 vCPU and 400 GB vRAM
vCPU/pCore	5
vRAM/pRAM	1
Support	7 x 24 (production)



100 VIRTUAL MACHINE GUESTS (MEDIUM)

For a scenario with 100 virtual machine guests in a virtualization cluster, the following is comparison of three year costs for Red Hat Enterprise Virtualization for Servers and VMware vSphere 5 Enterprise Plus Edition. In this scenario, the size of each virtual machine is considered to be medium consuming 4vCPUs and 8 GB vRAM on average.

THREE YEAR TCO ANALYSIS	RED HAT ENTERPRISE VIRTUALIZATION	VMWARE vSPHERE ENTERPRISE
Number of Servers	7	7
Number of Processors	14	14
Total amount of vRAM	800 GB	800 GB
License Costs (One Time)		
Virtualization Software	\$0	\$45,245
Annual Support/Subscription Costs		
Virtualization Software	\$10,486	\$11,315
Total First Year Costs	\$10,486	\$56,560
Three Year Costs	\$31,458	\$79,190

FIRST YEAR COSTS	QTY	PRICE	TOTAL PRICE
RHEV for Servers (per socket) with 7 x 24 Support	14	\$749	\$10,486
vSphere Enterprise for 1 processor	14	\$2,875	\$40,250
vSphere Enterprise for 1 processor SnS 7 x 24 (1 year)	14	\$719	\$10,066
vCenter Server Standard	1	\$4,995	\$4,995
vCenter Server SnS 7 x 24 (1 year)	1	\$1,249	\$1,249
Total vSphere 5 First Year Cost			\$56,560

The pricing scenarios use the following parameters and values.

PARAMETER	VALUE
Server processors	Two processors with 8 cores per processor
Server memory	Support up to 256 GB RAM
Target host utilization	75%
Virtual machines	Average of 4 vCPU and 8 GB vRAM
Total vCPU and vRAM	400 vCPU and 800 GB vRAM
vCPU/pCore	5
vRAM/pRAM	1
Support	7 x 24 (production)



250 VIRTUAL MACHINE GUESTS (SMALL)

For a scenario with 250 virtual machine guests in a virtualization cluster, the following is comparison of three year costs for Red Hat Enterprise Virtualization for Servers and VMware vSphere 5 Enterprise Plus Edition. In this scenario, the size of each virtual machine is considered to be small to medium consuming 2vCPUs and 4 GB vRAM on average.

THREE YEAR TCO ANALYSIS	RED HAT ENTERPRISE VIRTUALIZATION	VMWARE vSPHERE ENTERPRISE
Number of Servers	9	9
Number of Processors	18	18
Total amount of vRAM	1000 GB	1000 GB
License Costs (One Time)		
Virtualization Software	\$0	\$56,745
Annual Support/Subscription Costs		
Virtualization Software	\$13,482	\$14,191
Total First Year Costs	\$13,482	\$70,936
Three Year Costs	\$40,446	\$99,318

FIRST YEAR COSTS	QTY	PRICE	TOTAL PRICE
RHEV for Servers (per socket) with 7 x 24 Support	18	\$749	\$13,482
vSphere Enterprise for 1 processor	18	\$2,875	\$51,750
vSphere Enterprise for 1 processor SnS 7 x 24 (1 year)	18	\$719	\$12,942
vCenter Server Standard	1	\$4,995	\$4,995
vCenter Server SnS 7 x 24 (1 year)	1	\$1,249	\$1,249
Total vSphere 5 First Year Cost			\$70,936

The pricing scenarios use the following parameters and values.

PARAMETER	VALUE
Server processors	Two processors with 8 cores per processor
Server memory	Support up to 256 GB RAM
Target host utilization	75%
Virtual machines	Average of 2 vCPU and 4 GB vRAM
Total vCPU and vRAM	500 vCPU and 1000 GB vRAM
vCPU/pCore	5
vRAM/pRAM	1
Support	7 x 24 (production)



250 VIRTUAL MACHINE GUESTS (MEDIUM)

For a scenario with 250 virtual machine guests in a virtualization cluster, the following is comparison of three year costs for Red Hat Enterprise Virtualization for Servers and VMware vSphere 5 Enterprise Plus Edition. In this scenario, the size of each virtual machine is considered to be medium consuming 4vCPUs and 8 GB vRAM on average.

THREE YEAR TCO ANALYSIS	RED HAT ENTERPRISE VIRTUALIZATION	VMWARE vSPHERE ENTERPRISE
Number of Servers	17	17
Number of Processors	34	34
Total amount of vRAM	2000 GB	2000 GB
License Costs (One Time)		
Virtualization Software	\$0	\$102,745
Annual Support/Subscription Costs		
Virtualization Software	\$25,466	\$25,695
Total First Year Costs	\$25,466	\$128,440
Three Year Costs	\$76,398	\$179,830

FIRST YEAR COSTS	QTY	PRICE	TOTAL PRICE
RHEV for Servers (per socket) with 7 x 24 Support	34	\$749	\$25,466
vSphere 5 Enterprise for 1 processor	34	\$2,875	\$97,750
vSphere 5 Enterprise for 1 processor SnS 7 x 24 (1 year)	34	\$719	\$24,446
vCenter Server Standard	1	\$4,995	\$4,995
vCenter Server Production SnS 7 x 24 (1 year)	1	\$1,249	\$1,249
Total vSphere 5 First Year Cost			\$128,440

The pricing scenarios use the following parameters and values.

PARAMETER	VALUE
Server processors	Two processors with 8 cores per processor
Server memory	Support up to 256 GB RAM
Target host utilization	75%
Virtual machines	Average of 4 vCPU and 8 GB vRAM
Total vCPU and vRAM	1000 vCPU and 2000 GB vRAM
vCPU/pCore	5
vRAM/pRAM	1
Support	7 x 24 (production)



SUMMARY

The subscription pricing and licensing for Red Hat Enterprise Virtualization for Servers has been designed to simplify the specification and purchasing of your virtualization solution. The Red Hat subscription model offers benefits to both new and existing Red Hat customers, and the straightforward per-socket management subscription and single enterprise-ready edition of Red Hat Enterprise Virtualization Manager for Servers make specification and cost forecasting easy.

Compared to VMware vSphere 5 products, the pricing of Red Hat Enterprise Virtualization is compelling, and the licensing far more straightforward.

To help you compare, Red Hat has developed an online TCO calculator and configurator for Red Hat Enterprise Virtualization. For more information, go to <http://www.redhat.com/rhev/server/cost>

Red Hat product offerings, pricing, terms and conditions are accurate as of July 31, 2011 and are subject to change. Pricing for non-Red Hat virtualization platforms and guest operating systems are based on published retail or volume license pricing in the United States as of July 31, 2011 and is subject to change and local pricing.

For more information on Red Hat Enterprise Virtualization for Servers pricing and configuration, please contact your local Red Hat sales office or Red Hat authorized partner.

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