# RED HAT ENTERPRISE VIRTUALIZATION

**FREQUENTLY ASKED QUESTIONS**

*"We see a clear return on investment from our use of Red Hat Enterprise Virtualization, not only from the hardware savings, but also from manpower efficiencies due to how fast we can spin up clusters and deploy virtual machines. And our software licensing costs are dramatically less with Red Hat Enterprise Virtualization as well."*

MICHEAL WALTZ
UNIX/LINUX ENGINEERING GROUP,
QUALCOMM

## INTRODUCTION

Red Hat® Enterprise Virtualization is a complete management solution for virtualized servers and workstations. Co-engineered with Red Hat Enterprise Linux®, it provides the performance advantages, including an integrated platform with your existing infrastructure, competitive pricing, and the trusted, stable environment you expect from Red Hat.

With Red Hat Enterprise Virtualization, you can:

• Confidently virtualize any mission-critical application.

• Build and seamlessly manage an integrated cloud infrastructure.

• Standardize storage, infrastructure, and networking services.

• Realize workload performance efficiencies.

• Take advantage of existing people skills and investments.

• Decrease total cost of ownership (TCO) and accelerate return on investment (ROI)

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## NEW FEATURES

**QUESTION:** What are the new feature highlights of Red Hat Enterprise Virtualization 3.6?

**ANSWER:** Red Hat Enterprise Virtualization 3.6 includes more than 250 new features. There are three key components of Red Hat Enterprise Virtualization 3.6: enhanced critical performance, orchestrated management, and a simplified, modern cloud transformation integration. Some of the highlights include:

### ENHANCED CRITICAL PERFORMANCE

Red Hat Enterprise Virtualization 3.6 leverages the scale and the performance that Kernel-based Virtual Machine (KVM) technologies are known for and delivers key features, including:

- Scale-up CPU, memory, disk, and network for any workload with the addition of hot plug memory support.

- Ability to assign PCI devices, including GPUs, directly to a guest operating system using Virtual Function I/O (VFIO) capabilities introduced in Red Hat Enterprise Linux 7.

- Significant storage throughput improvements that can be accessed by applying I/O thread scaling through the use of virtio-blk data plane.

- Increased network throughput with decreased latency and CPU overhead for near bare-metal performance using Single Root I/O Virtualization (SR-IOV) for your virtual machine network.

- Increased performance and stability of live migration of virtual workloads.

- Virtual machines with large memory footprints will benefit from the ability to transfer compressed memory pages to the target host, which minimizes the amount of data that must migrate across the network during live migration compression.

- If virtual machines have memory pages that update faster than they can be transferred over the network, live migration auto convergence will trigger a temporarily throttled in page performance — allowing time to complete and finalize the workload cutover to the destination host.

### ORCHESTRATED MANAGEMENT

Red Hat Enterprise Virtualization 3.6 simplifies the management, control, and update of virtual machines and their components. Key orchestration management features include:

- Pinning individual virtual machines (VMs) to a set of hosts so customers with specialized hardware or licensing requirements can specify which hosts VMs can run on.

- Simplifying updates to host hypervisor servers using the host update manager. The deeper integration with Red Hat Satellite allows the querying of errata information from the hypervisors, virtual machines, and Red Hat Enterprise Virtualization manager's operating system. These updates provide a complete view into critical updates for the infrastructure life-cycle management.

- Modifying the health status of host, storage domain, or virtual machine objects based on external factors such as hardware failure or OS monitoring alerts. Users can quickly perform an impact analysis of their environment in the event an object beyond Red Hat Enterprise Virtualization's normal visibility is at risk of failure.

- Improving hosts' service level agreement (SLA) by setting the quality of service of host network interfaces. This completes the SLA control on both VM and host networks.

### CLOUD TRANSFORMATION

Red Hat Enterprise Virtualization 3.6 continues to innovate the traditional datacenter, providing datacenter modernization efforts with the following capabilities:

- Seamless workload migration from VMware vSphere directly into Red Hat Enterprise Virtualization using the integrated virt-v2v interface.

- Red Hat Enterprise Virtualization continues to integrate a common software-defined infrastructure layer to share and deploy services across both OpenStack® and Red Hat Enterprise Virtualization. Red Hat Enterprise Virtualization 3.6 provides a tech preview of Ceph storage integration through OpenStack Cinder.

**QUESTION:** What are the benefits of integrating Red Hat Enterprise Virtualization with OpenStack?

**ANSWER:** The integration of Red Hat Enterprise Virtualization and OpenStack[1] makes the transition to cloud-enabled workloads easier. It allows organizations to deploy both traditional and cloud-enabled workloads on common and shared services such as the KVM hypervisor. The integration also eliminates duplication and streamlines the architecture.

## PRODUCT OVERVIEW

**QUESTION:** What sets Red Hat Enterprise Virtualization apart from competitors?

**ANSWER:**

- **Security.** Red Hat Enterprise Virtualization provides unmatched, military-grade security with the hardened, kernel-level Security-Enhanced Linux (SELinux) and sVirt security technologies. These technologies were developed in conjunction with the United States Department of Defense and ensure isolation between VMs and between each machine and the Red Hat Enterprise Virtualization Hypervisor.

- **No proprietary lock-in.** Red Hat Enterprise Virtualization is the only open source virtualization platform. Therefore, its customers are not limited to what one company believes they need—and are not forced into vendor lock-in.

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1  *Technical preview feature*

- **Cost.** Based on open source software and offered through a subscription model, the pricing of Red Hat Enterprise Virtualization is significantly lower than other virtualization offerings. There are no complicated product editions or costly add-ons. All features and components are included in a single subscription. Learn more at **redhat.com/rhev**.

- **Scalability and performance.** The KVM hypervisor in Red Hat Enterprise Virtualization is an industry-leading platform capable of supporting the highest possible VM density, based on independent, public SPECvirt benchmarks.[2] This translates to fewer server hosts and lower infrastructure costs.

- **Enterprise management.** Red Hat Enterprise Virtualization offers a feature-rich server virtualization management system that provides advanced capabilities for hosts and guests—including high availability, live migration, storage live migration, storage management, and system scheduler.

- **Integrated VDI.** Red Hat Enterprise Virtualization integrates the features and functionality for deploying both virtualized servers and workstations within the same cluster, at no additional cost. Choose to deploy both Linux and Windows servers and/or workstations.

- **Red Hat Enterprise Linux with smart virtualization.** An integrated co-engineered solution with Red Hat Enterprise Linux, it helps customers maximize the benefits of their virtualized infrastructure with Linux workloads. The solution combines the innovation, performance, scalability, reliability, and security features of Red Hat Enterprise Linux with the advanced virtualization management capabilities of Red Hat Enterprise Virtualization.

- **Bimodal IT strategy.** Red Hat Enterprise Virtualization, a core component of Red Hat Cloud Infrastructure, is a comprehensive solution that supports organizations moving from traditional datacenter virtualization to OpenStack-powered clouds. Red Hat Cloud Infrastructure is a single subscription that includes Red Hat CloudForms, Red Hat Satellite, Red Hat OpenStack Platform, and Red Hat Enterprise Virtualization.

**QUESTION:** In what key use cases is Red Hat Enterprise Virtualization most effective?

**ANSWER:** Customers deploy Red Hat Enterprise Virtualization to confidently virtualize any workload or application. Key use cases include:

### Dev/test automation

- Red Hat Enterprise Virtualization's simple self-service portal allows IT organizations to provide infrastructure resources to developers.

### Essential virtualization

- Red Hat Enterprise Virtualization delivers unparalleled performance and scale capabilities, enabling the virtualization of demanding workloads such as SAP.

### Cloud transition

- Red Hat Enterprise Virtualization is co-engineered with Red Hat Enterprise Linux and OpenStack to deliver a smooth transition into private or public clouds.

### Managed virtualization

- Red Hat Enterprise Virtualization, combined with Red Hat CloudForms, lets IT organizations simplify IT operations, deploy multi-tier virtualization solutions, and provide unified management and operations in a hybrid environment.

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**2** *https://www.spec.org/virt_sc2013/results/specvirt_sc2013_perf.html*

**QUESTION:** What guest operating systems does Red Hat Enterprise Virtualization support?

**ANSWER:** Red Hat Enterprise Virtualization supports the most common server and desktop operating systems as well as IBM PowerPC (PPC) guests. Current support includes:

- For X86_64 hosts:

  - Red Hat Enterprise Linux 3, Tier 1, 32- and 64-bit

  - Red Hat Enterprise Linux 4, Tier 1, 32- and 64-bit

  - Red Hat Enterprise Linux 5, Tier 1, 32- and 64-bit

  - Red Hat Enterprise Linux 6, Tier 1, 32- and 64-bit

  - Red Hat Enterprise Linux 7, Tier 1, 32- and 64-bit

  - Microsoft Windows 10, Tier 1, 32- and 64-bit

  - Microsoft Windows 7, Tier 1, 32- and 64-bit

  - Microsoft Windows 8, Tier 1, 32- and 64-bit

  - Microsoft Windows 8.1, Tier 1, 32- and 64-bit

  - Microsoft Windows Server 2008, Tier 1, 32- and 64-bit

  - Microsoft Windows Server 2008 R2, Tier 1, 64-bit

  - Microsoft Windows Server 2012, Tier 1, 64-bit

  - Microsoft Windows Server 2012 R2, Tier 1, 64-bit

  - SUSE Linux Enterprise Server 10, Tier 2, 32- and 64-bit

  - SUSE Linux Enterprise Server 11, Tier 2, 32- and 64-bit

  - SUSE Linux Enterprise Server 12, Tier 2, 32- and 64-bit

- For PPC hosts:

  - Red Hat Enterprise Linux 7, Tier 1, LE\BE

  - Red Hat Enterprise Linux 6, Tier 1, BE

  - SUSE Linux Enterprise Server 12, Tier 2, LE

  - SUSE Linux Enterprise Server 11 SP4, Tier 2, BE

**QUESTION:** What are the scalability limits of Red Hat Enterprise Virtualization?

**ANSWER:**

- Up to 200 hypervisor hosts in one cluster

- Host supports up to 288 CPUs and 12TB of memory

- Guests support up to 240 vCPUs and 4TB memory.

**QUESTION:** Is there a demo or evaluation version?

**ANSWER:** Yes, there is a free and supported 60-day downloadable evaluation available at https://access.redhat.com/products/red-hat-enterprise-virtualization/evaluation.

**QUESTION:** Does Red Hat offer training and certifications for Red Hat Enterprise Virtualization?

**ANSWER:** Yes, Red Hat offers a four-day course, Red Hat Enterprise Virtualization (RH318), which explores Red Hat Enterprise Virtualization features. Students acquire the skills and knowledge to effectively create, deploy, manage, and migrate Linux and Microsoft Windows VMs. Students who successfully complete this course are also prepared to take the Red Hat Enterprise Virtualization Certification Exam (EX318) and earn the Red Hat Certified Virtualization Administrator (RHCVA) certification.

**QUESTION:** What companies use Red Hat Enterprise Virtualization to support their critical applications?

**ANSWER:** Red Hat Enterprise Virtualization customers come from a range of industries, and include familiar enterprises and government organizations such as Sky News, Sears, British Airways, Qualcomm, DreamWorks, Department of Defense, IBM, Bonhams, and more. Read their stories at http://www.redhat.com/en/success-stories.

**QUESTION:** My Red Hat Enterprise Linux subscription includes the KVM hypervisor. Can I use this subscription without purchasing Red Hat Enterprise Virtualization?

**ANSWER:** The virtualization technology included in Red Hat Enterprise Linux supports low-density virtualization running Red Hat Enterprise Linux VMs. While Microsoft Windows VM drivers are included, Microsoft does not recognize them as a supported configuration. As an alternative, Red Hat Enterprise Virtualization provides the certifications, third-party support, and advanced features required for large-scale and high-density virtualization.

Storage live migration, live snapshots, multi-node management capabilities, and full Microsoft Windows support make Red Hat Enterprise Virtualization a high-performing, secure, and scalable hypervisor solution.

**QUESTION:** Does Red Hat offer an all-in-one subscription that provides a hypervisor, virtualization management tools, and a guest operating system?

**ANSWER:** Yes: Red Hat Enterprise Linux with Smart Virtualization. It gives you the functionality of Red Hat Enterprise Virtualization (hypervisor and virtualization management tools) as well as the ability to run unlimited Red Hat Enterprise Linux guest workloads. This single subscription includes a hypervisor, virtualization management tools, and a guest operating system at a very competitive price.

**QUESTION:** What applications are certified to run on Red Hat Enterprise Virtualization?

**ANSWER:** Any application that is certified for Red Hat Enterprise Linux is certified on Red Hat Enterprise Virtualization.

**QUESTION:** What configuration do I need to run Red Hat Enterprise Virtualization?

**ANSWER:**

**RED HAT ENTERPRISE VIRTUALIZATION MANAGER HARDWARE REQUIREMENTS:**

| RESOURCE | MINIMUM | RECOMMENDED |
|---|---|---|
| CPU | A dual-core CPU | A quad-core CPU or multiple dual core CPUs |
| Memory | 4GB of available system RAM if data warehouse is not installed and if memory is not being consumed by existing processes | 16GB of system RAM |

| RESOURCE | MINIMUM | RECOMMENDED |
|---|---|---|
| Hard Disk | 25GB of locally accessible, writable disk space | 50GB of locally accessible, writable disk space |
| Network Interface | 1 Network Interface Card (NIC) with bandwidth of at least 1 Gbps | 1 NIC with bandwidth of at least 1 Gbps |

The following browser versions and operating systems can be used to access the administration portal and the user portal. Browser support is divided into the following tiers:

- Tier 1: Browser and operating system combinations that are fully tested and fully supported. Red Hat Engineering is committed to fixing issues with browsers on this tier.

- Tier 2: Browser and operating system combinations that are partially tested, and are likely to work. Limited support is provided for this tier. Red Hat Engineering will attempt to fix issues with browsers on this tier.

- Tier 3: Browser and operating system combinations that are not tested, but may work. Minimal support is provided for this tier. Red Hat Engineering will attempt to fix only minor issues with browsers on this tier.

Virtual machine consoles can only be accessed using supported Remote Viewer (virt-viewer) clients on Red Hat Enterprise Linux machines and Windows machines. SPICE console access is available on other operating systems – for example, OS X – only via the unsupported SPICE HTML5 browser client.

Supported QXL drivers are available on Red Hat Enterprise Linux machines and Windows 7 machines.

## BROWSER REQUIREMENTS

| SUPPORT TIER | OPERATING SYSTEM FAMILY | BROWSER | PORTAL ACCESS |
|---|---|---|---|
| Tier 1 | Red Hat Enterprise Linux | Mozilla Firefox Extended Support Release (ESR) version | Administration portal and user portal |
| Tier 2 | Windows | Internet Explorer 10 or later | Administration portal and user portal |
| | Any | Most recent version of Google Chrome or Mozilla Firefox | Administration portal and user portal |
| Tier 3 | Any | Earlier versions of Google Chrome or Mozilla Firefox | Administration portal and user portal |
| | Any | Other browsers | Administration portal and user portal |

For the minimal requirements for hypervisors:

**RED HAT ENTERPRISE VIRTUALIZATION MANAGER HARDWARE REQUIREMENTS:**

| RESOURCE | MINIMUM |
|---|---|
| CPU | All CPUs must have support for the Intel 64 or AMD64 CPU extensions, and the AMD-V or Intel VT hardware virtualization extensions enabled<br><br>Support for the No eXecute flag (NX) is also required |
| Memory | 2GB of RAM |
| Hard Disk | 21GB of locally accessible, writable disk space |
| Network Interface | 1 NIC with bandwidth of at least 1 Gbps |

**QUESTION:** What is the self-service power user portal?

**ANSWER:** This portal is a cloud computing portal designed to give end users self-provisioning capabilities. Depending on permissions, the portal allows users to perform tasks that were previously available only through the administrator console. The portal lets administrators configure specific access and maintain control over both virtual and physical infrastructure resources of users or groups based on their self-service requirements or needs. Empowering users to create, run, and test environments on their own time with restricted access to the needed environments reduces IT and administrator requests.

## CUSTOMIZATION CAPABILITIES

**QUESTION:** What is the purpose of the RESTful API?

**ANSWER:** The RESTful application programming interface (API) allows users to integrate Red Hat Enterprise Virtualization Manager with their own applications. All management functionality is exposed in the API. A Python- and Java-based command line interface allows for scripting and automation.

**QUESTION:** What are hooks?

**ANSWER:** Hooks are a mechanism for customization so that the administrators can define scripts to modify VM definitions or run system commands. For example, administrators can use these hooks to add extra options such as CPU pinning, watchdog devices, direct logical unit number (LUN) access, and more. Sample hooks of common custom features are included in the solution as examples.

**QUESTION:** What are the back-end storage requirements?

**ANSWER:** Red Hat Enterprise Virtualization centralized storage system can use POSIX, GlusterFS, NFS, iSCSI, or Fibre Channel storage protocols. Red Hat Enterprise Virtualization also supports Red Hat Gluster Storage, including built-in GlusterFS node management through the administrator portal. Physical storage systems supported on Red Hat Enterprise Linux are also supported on Red Hat Enterprise Virtualization.

## MIGRATION PROCESS

**QUESTION:** Are there tools to migrate VMs from other vendors such as ESX/ESXi to Red Hat Enterprise Virtualization?

**ANSWER:** Yes, Red Hat Enterprise Virtualization 3.6 has an integrated virt-v2v interface that allows seamless migration of workloads from VMware vSphere directly into Red Hat Enterprise Virtualization.

This tool can automatically export the VM image, pull out the disk image, and complete modifications to that image—for example, moving from the VMware Virtual Machine Disk (VMDK) format to a native KVM format, pulling out VMware drivers, inserting the KVM drivers, removing VMware tools, and inserting Red Hat Enterprise Virtualization tools.

## WORKSTATION FUNCTIONALITY

**QUESTION:** What key workstation-related features are included in Red Hat Enterprise Virtualization?

**ANSWER:**

- Power user portal that provides self-publishing functionality so designated users can create, access, and manage virtual resources (VMs, templates, snapshots, storage, and more) based on configured privileges

- Support for smart card authentication into the Red Hat Enterprise Virtualization user portal.

- Copy-and-paste support between guest VMs and the client.

- Support for Windows and Linux virtual workstations from Windows or Linux clients—in any combination.

- SPICE remote-rendering protocol that provides a user experience comparable to a local workstation.

- Automated policies and features for workstations pooling, templates, thin provisioning, user access, pre-starting VMs, and more.

## PRODUCT PRICING

**QUESTION:** How is Red Hat Enterprise Virtualization packaged and priced?

**ANSWER:** The Red Hat Enterprise Virtualization subscription includes both workstations and server virtualization. Each subscription costs US$999/per managed hypervisor socket pair each year for business-hour (standard) support. A 24x7x365 (premium) subscription is available for US$1,499/per managed hypervisor socket pair.

Red Hat Enterprise Virtualization Manager, the Red Hat Enterprise Virtualization Hypervisor, all product features, and product support are included in the subscription fee.

Like all Red Hat products, there is no up-front license fee. Rather, Red Hat Enterprise Virtualization is sold on a subscription basis that costs the same each year and includes product access, support, updates, and patches. The Red Hat Enterprise Virtualization subscription comprises all product features—with no multiple editions, add-ons, or virtual RAM usage charges.

**QUESTION:** How do I purchase the Red Hat Enterprise Linux operating system and deploy it as a virtual guest in my Red Hat Enterprise Virtualization environment?

**LEARN MORE**

For more information, visit **www.redhat.com/rhev**.

**ANSWER:** You have two options:

1. Purchase Red Hat Enterprise Linux with Smart Virtualization – a combined offering of Red Hat Enterprise Linux and Red Hat Enterprise Virtualization – which allows users to virtualize an unlimited number of guests

2. Choose one of several Red Hat Enterprise Linux product SKUs for two-socket, four-socket, and eight-socket servers that entitle the customer to run an unlimited number of Red Hat Enterprise Linux virtual instances. For more information, visit **redhat.com/store**.
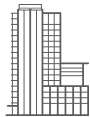
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|---|---|---|---|
| 1 888 REDHAT1 | 00800 7334 2835 | +65 6490 4200 | +54 11 4329 7300 |
| | europe@redhat.com | apac@redhat.com | info-latam@redhat.com |