

FEATURES & BENEFITS

RED HAT ENTERPRISE LINUX 6.3 - WHAT'S NEW

On June 21st Red Hat announced the next minor release of Red Hat Enterprise Linux 6 – Red Hat Enterprise Linux 6.3. Red Hat continues to deliver a predictable lifecycle of new product features and partner enhancements that customers rely on. These innovations originate from many sources including Red Hat engineers, partners and customers themselves, as well as the open source communities in which we lead and participate. Red Hat Enterprise Linux 6.3 provides enterprises with mature, stable technology backed up by our award-winning Global Support Services team.

Red Hat Enterprise Linux validates its position as a leading operating system platform – specifically within hybrid environments that require a combination of physical, virtual, and cloud architectures. In these environments enterprises expect consistency, stability, yet deployment flexibility. Features like secure disk wiping and live volume resizing of virtual guests demonstrate the value of Red Hat Enterprise Linux for hybrid deployment patterns, and represent the confluence of key capabilities for security and storage resource management with next generation architectures like cloud and virtualization.

Also evident with minor releases of Red Hat Enterprise Linux are enhancements that take advantage of advancements from hardware OEMs. Examples include updated device drivers as well as compiler optimizations for the Intel Xeon E5 processor family.

Red Hat Enterprise Linux press blog here: <http://www.redhat.com/about/news/archive/2012/red-hat-enterprise-linux63-globally-available/>

VIRTUALIZATION AND CLOUD SUPPORT

Scalability, Performance, and More Efficient Management

Enhanced KVM Virtualization Features

- KVM scalability enhancements in Red Hat Enterprise Linux 6.3 are bountiful. The maximum supported virtual guest size more than doubled from 64 to 160 virtual CPUs (vCPUs). This new limit is 5x the vCPUs of VMware ESX 5.0. Also vastly increased is the maximum supported memory in a KVM guest. This was upped from 512GB to 2TB. The memory increase is 2x the size of VMware ESX 5.0. These enhanced features enable customers to more efficiently run large scale workloads in a virtual guest when compared to the VMware 5.0 limits.
- Red Hat Enterprise Linux 6.3 features support for new processors in KVM Virtualization. KVM will add support for the latest processors, including the new Intel Xeon Series E5 and AMD 6200 Series. The processor support is inherited directly from Red Hat Enterprise Linux and does not require additional development, as is the case with other hypervisor technologies. The new CPU model definitions in KVM provides the necessary new processor enablement to KVM host and the virtualize guests. This ensures that KVM Virtualization derives the performance benefits associated with the new processors and availability of the new instructions in the latest CPUs.

New KVM Virtualization Features

- New to this release is the support for USB 2.0. KVM supports USB 2.0 host adapter emulation which enables USB 2.0 devices to be used in guests, and supports USB passthrough from host to guest. Devices like USB storage and tablets are now also supported. Remote wakeup support has also been added to the USB host controller, allowing suspended guests to resume from USB 2.0 devices.
- Remote wake-up support has also been added to the USB host controller, allowing suspended guests to resume from USB 2.0 devices. The key benefits of this new feature lie in the dramatic improvement of usability with Virtualization desktop and tablet. USB 2.0 emulation improves the power utilization and the CPU consumption of virtual machines. The speed provided by the new remote wake-up support saves CPU cycles by providing a mechanism for devices to send wake-up requests instead of the old polling method.
- KVM now provides predictable MAC addresses of SR-IOV capable Ethernet cards when the device is assigned to a virtual machine using a PCI device assignment. While previously, a SR-IOV capable Ethernet card was given a new random MAC address each time the card was initialized, this was seen as inefficient. This feature no longer assigns a different MAC address every time the card passes through to a guest. Instead, a fixed MAC address is supplied by the libvirt prior to assigning the device to the guest. The presentation and preservation of a MAC address simplifies virtual guest administration by eliminating the manual process of assigning MAC addresses due to re-booting or restarting of a guest. This feature is supported for both Red Hat Enterprise Linux and Windows guests.
- Another new feature of KVM is the support for block device live re-sizing. KVM is now able to perform live volume re-sizing of a virtual disk, rather than stopping the virtual machine and then re-sizing it offline. This feature is supported with both Red Hat and Windows guests and works on all backing stores and not restricted to LVM/DM. With this feature, guests no longer have to be taken offline to adjust block device size, increasing availability and allowing administrators to better manage their Service Level Agreements.
- The ability to automatically generate unique World Wide Port Names (WWPN) and World Wide Node Names (WWNN) for virtual Host Bus Adapters (vHBAs) is also new in the 6.3 release. When KVM assigns unique WWPNs and WWNNs to the vHBAs, the device XML is automatically updated with the necessary information. This feature grants the benefit of automatic generation of names that is scriptable, eliminating a time-consuming, error-prone manual process.
- Until recently, CPU resources were assigned to migrated guests on an availability basis making migrations easy, but not guaranteeing CPU resources and, therefore, not guaranteeing that the guest performance would be preserved after the migration. Libvirt now gives administrators the option to migrate guests with priority for performance. Libvirt now supports a new host CPU mode that allows a generic guest configuration to use the maximum available CPU resources on the host. By dynamically building the CPU configurations of a virtual machine, a guest can be live migrated and achieve the maximum performance the new host system is capable of delivering.

- An important new feature is the secure wipe of retired virtual machines. The current practice used to wipe and verify traces of data from a retired virtual machine was to issue a wipe command, then read a volume and ensure only zeros were returned. An industry accepted method of securely wiping disk for physical systems was to use the “scrub” command, which wipes, then re-writes a data device. In Red Hat Linux Enterprise 6.3, we have introduced the scrub command to KVM and providing the same level of security to virtualized environments that has been long enjoyed by physical systems. This is of importance to all users of virtualization who demand the most secure operating environment, especially those that require full compliance with the Payment Card Industry Data Security Standards (PCI-DSS).
- The Red Hat Enterprise Linux 6.3 release introduces the informative “Steal Time” feature. This is the time that a virtual CPU waits for a real CPU while the hypervisor is servicing another virtual processor. KVM Virtual Machines can now calculate and report steal time, visible through tools like ‘top’ and ‘vmstat,’ which provides a guest accurate CPU utilization data. The KVM steal time provides users with additional data to improve their application run time performance.

HIGH AVAILABILITY/CLUSTERING



Enhanced Support for VMware vSphere 5.x Feature

- Support for High Availability and Resilient Storage Add-Ons for VMware vSphere has been extended to include VMware vSphere 5.x with Red Hat Enterprise Linux 6.3. Customers electing to deploy guests on VMware vSphere 5.x can also use the available Add-Ons. In prior releases this feature was limited to KVM and vSphere 4.x installations.



Enhanced GFS2 Feature

- The shared storage file system, GFS2 has received several enhancements with the Red Hat Enterprise Linux 6.3 release. GFS2 now includes read-ahead capabilities for sequentially reading directories. The data write speed has been improved even when data writes are simultaneously targeting the same node. In addition, file system check utilities for GFS2 can now be used to check the integrity of the older GFS1 file system. Along with the benefit of easing the transition from GFS1 to GFS2, this enhanced file system check results in much faster data reads and writes data than in previous releases and works on all generations of the file system.

INSTALLATION

New LVM Snapshot Feature

- When provisioning a new Red Hat Enterprise Linux system, a system administrator can reserve unused disk space to take advantage of the Logical Volume Manager's snapshot merge capability. This functionality is supported for both attended and unattended scripted installations. When using LVM, the ability to provide merge snapshots with their origin provides a very useful backup-restore mechanism. To take advantage of the snapshots, free space must be reserved when a system is deployed, especially when the exact size of the disk is not known to the system administrator configuring a kickstart file. Using this new feature, a customer can specify unused space either by an absolute size or by a percentage before configuring the LVM snapshots to utilize this space.

NETWORKING

Faster and More Efficient Data Transmission

Enhanced IP Sets Feature

- With the Red Hat Enterprise Linux 6.3 release, firewalls can now be configured using fewer rules. These rules can be dynamically updated without incurring a performance penalty. The storage of IP addresses, port numbers or IP addresses with MAC addresses has been improved to provide extremely fast look-ups. This makes it easier to define rules and process them at enforcement time.

Enhanced EAP-FAST Authentication Feature

- Users now have the flexibility to deploy a strong authentication protocol without the overhead of digital certificates. This is possible thanks to the Extensible Authentication Protocol Flexible Authentication via Secure Tunneling (EAP-FAST). This alternative to the LEAP protocol provides customers with support for an array of user and password database types.

FILE SYSTEM

Performance and Reliability

New File System User Space Feature

- Red Hat Enterprise Linux 6.3 features new file system benefits as well. The release brings the feature of direct I/O support for the File System User Space (FUSE), which provides an abstraction layer for developing file systems that are not tightly coupled with kernel interfaces. This enhancement introduces support for I/O Direct for FUSE. With this added feature, FUSE based file systems can now take advantage of Direct I/O functionality. This will prevent page caching and send all reads and writes directly to the storage. The user will benefit from the consistent response time and more predictable available data to multiple accessors. The feature is particularly useful for database and duplication applications.

STORAGE

New Expanded RAID Feature

- The 6.3 release also brings a new storage feature to the table with expanded software RAID support through the Logical Volume Manager (LVM). LVM now has the capability to create RAID 4/5/6 logical volumes and supports a new implementation of mirroring. The MD (software RAID) modules provide the back-end support for these new features.
- The new RAID types are capable of handling transient failures and automated drive replacement, or Hot Spares. LVM management of logical volumes frees the user from having to layer LVM on top of MD, simplifying administrative tasks such as volume creation, re-sizing and snapshotting.

Enhanced Fibre Channel of Ethernet Feature

- In terms of storage enhancements, Red Hat Enterprise Linux 6.3 brings Full Support for Fibre Channel of Ethernet (FCoE) target. This feature was just bumped up from Technology Preview Status. Because of this feature, it is now possible to deploy Red Hat Enterprise Linux as a FCoE based storage server providing the same high level of reliability and performance as native Fibre Channel but at significantly lower cost.



SECURITY

New OpenSSH Security Features

- Strong authentication is quickly becoming a standard industry practice and the availability of a two factor authentication mechanism introduces a higher level of security. This release will leverage this capability within OpenSSH to utilize two distinct inputs for authentication such as a password and a public key. Two-factor authentication will enable easier compliance with the Payment Card Industry Data Security Standards and other security regulations.
- Another new security feature in the Red Hat Enterprise Linux 6.3 release is support for AES Counter Mode (AES-CTR) in OpenSSH. The Advanced Encryption Standard, also known as Rijndael specification, now includes AES-CTR Cipher for OpenSSH. Among the benefits of this feature are high-speed networking capabilities through pipelining, parallelization and key stream pre-computation. CTR mode is particularly well suited to operate on a multiprocessor machine where blocks can be encrypted in parallel.

Enhanced IBM System Z Features

- The package called OpenSSL-IBMCA has been introduced with Red Hat Enterprise Linux 6.3, which makes calls directly to the hardware provided cryptography. One can now run OpenSSL and use currently available cryptography standards such as FIPS 140-2 available on System Z running Red Hat Enterprise Linux.
- The feature makes currently available cryptography standards such as FIPS 140-2 available on System Z running Red Hat Enterprise Linux. It simplifies configuration because all cryptography dependencies are available in the base product.

Enhanced SELinux Feature

- The documentation for SELinux has been significantly expanded. This update provides detailed and up-to-date documentation and will make it easier for users and systems administrators to tackle day-to-day SELinux issues. For example, 400 man pages have been added to SELinux Confined System domains like httpd. These man pages can be accessed with the command 'man -k selinux'.

IDENTITY MANAGEMENT

Reduced Administrative Overhead with Increased Interoperability

New Identity Management Features

- Identity Management was updated with the Red Hat Enterprise Linux 6.3 release. Support Managed Entries Management which provides the option to disable automatic private group creation for users was added. This feature simplifies the migration from NIS to IdM environments while preserving security best practices regarding UID/GID assignments.
- The Red Hat Enterprise Linux 6.3 release delivers new IdM features.
 - Auto-membership plug-in: When users or hosts are added to the Directory Server, the administrator needs to assign them to a particular group. This plug-in automatically places users into user groups and hosts into host groups. By virtue of this feature, managing identities is easier and faster for the administrator.
 - Session data caching provides performance improvements over constant GSSAPI re-notification on every request in Web UI. The feature will reduce the load on identification/authentication servers for better performance.

- Native support of Netgroups and the services map in SSSD. SSSD provides a set of daemons to manage access to remote directories and authentication mechanisms, including Identity Management. SSSD now understands the internal Identity Management format for Netgroups.

DEVELOPER TOOLS

New OpenJDK 7 Feature

- Red Hat Enterprise Linux 6.3 introduces OpenJDK 7. This is the latest open source Java implementation and it includes extensions to support dynamically-typed languages. These can run on the JVM, class loader enhancements, support for Unicode 6.0 and updated I/O and networking APIs. Customers will be able to develop and test applications on the most current open source Java implementation, which is provided as an integral part of the operating system for customer convenience.

SUBSCRIPTION MANAGEMENT

Subscription Manager Features

- Red Hat Enterprise Linux 6.3 delivers improvements, including a redesign of the Subscription Manager UI and the addition of the customer's Service Level Agreement (SLA) to the subscription process in Subscription Management. It is now easier for customers to choose subscriptions based on SLA. Users may also select an SLA for their system to control which service level is selected during auto-subscribe events.
- Another enhanced feature comes in the form of server side deletes. Systems will no longer check in with certificate-based RHN if the profile has been deleted. Machines which are deleted from the Customer Portal will now appear unregistered.
- New features introduced with Red Hat Enterprise Linux 6.3 include:
 - Client-based tooling to aid in the migration of a machine from RHN Classic to Certificate-based RHN. The new tool will unsubscribe the system from channels in RHN Classic and automatically resubscribe it to subscriptions in the new Certificate-based RHN. The introduction of Subscription Asset Manager. (SAM) This tool allows users to manage subscriptions locally by moving them from Certificate-based RHN to a locally running instance of SAM. Using SAM benefits users because it vastly improves subscription management capability.

HARDWARE ENABLEMENT

Reliability, Scalability and Performance

New USB 3.0 Software Bandwidth Management Feature

- New with Red Hat Enterprise Linux 6.3 is the ability to manage hot plug devices via software bandwidth management for USB 3.0 in Intel Series 7 systems. Software implementation on Intel Series C60x chipset will calculate and manage USB bus bandwidth.

Enhanced Compiler Optimization Feature

- Red Hat Enterprise Linux 6.3 has improved the compiler optimization for Intel Xeon E5 processor family. This processor family supports an improved REP MOVSB and REP STOSB instruction set for copy/set operations. The enhancements span memory and I/O breakpoint execution operations. It will vastly improve string operation performance.

DESKTOP AND GRAPHICS

Enhanced Wacom Support Feature

- The Wacomcpl configuration utility has been replaced by a new configuration tool that is fully integrated with the other desktop configuration tools. Users of the Wacom tablets now get a convenient user interface to configure their hardware. The new tool makes use of an extensive database of tablet models to support the capabilities of the various Wacom tablets.

New LibreOffice Feature

- LibreOffice replaced OpenOffice as the standard office productivity suite in Red Hat Enterprise Linux 6. The 6.3 upgrade offers a new set of LibreOffice packages to replace remaining OpenOffice packages. There will be complete compatibility of documents between the older packages and LibreOffice's newer ones. This offers faster bug fixes and improved MS Office compatibility.

EXECUTIVE SUMMARY

Red Hat demonstrates its commitment to continuously delivering value and innovation to our customers with the availability of Red Hat Enterprise Linux 6.3. This release builds upon the rich enterprise platform that has set the standard in flexibility, efficiency and control that our customers worldwide rely on for their business. For more information on Red Hat Enterprise Linux visit <http://www.redhat.com/rhel>.

PURCHASING ADD-ON SUPPORT WITH YOUR CURRENT SUBSCRIPTION

The purchase process for Red Hat Add-On products may be materially different than the purchase process for the underlying Red Hat Enterprise Linux subscription. The differences may include both service levels (Standard versus Premium) as well as the channel where they were purchased (OEM partner, VAR or Reseller, directly from Red Hat). These differences may create a mixed support situation for the customer. In such situations, the customer should expect two things: 1) a best effort from their primary support organization to manage their support experience, and 2) that the support organization provide the most appropriate service level to resolve the issue brought forth.

ABOUT RED HAT

Red Hat was founded in 1993 and is headquartered in Raleigh, NC. Today, with more than 60 offices around the world, Red Hat is the largest publicly traded technology company fully committed to open source. That commitment has paid off over time, for us and our customers, proving the value of open source software and establishing a viable business model built around the open source way.

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