



Red Hat Integrated Virtualization: Storage Virtualization

Enterprise IT organizations struggle with effective utilization of both server and storage resources. Utilization of these separate resources can be individually improved through the use of virtualization technologies. Coordination of server and storage virtualization can make these improvements even greater.

Red Hat plays a leading role in the development and support of storage virtualization technologies for the open source community. Capabilities that were at one time only available from proprietary vendors such as VERITAS (now Symantec) and Sun are now part of the standard Red Hat® Enterprise Linux® distributions and Red Hat layered software applications.

Logical Volume Management

Red Hat's support of Logical Volume Manager 2 (LVM2) demonstrates the company's commitment to open source storage management virtualization. Red Hat engineers are the maintainers and major contributors to the development of LVM2.

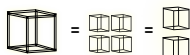
LVM2 works by transforming physical block-level storage devices into manageable virtualized logical volumes. This improves performance, reliability, and resource utilization.

Logical volume management software has traditionally been controlled by the proprietary UNIX® platform vendors and one major proprietary software vendor—VERITAS.

Today, customers are choosing Red Hat Enterprise Linux. Red Hat provides enterprise-ready logical volume management and the ability to virtualize different commodity storage hardware platforms.

In addition to logical volume management, LVM2 also offers logical multipathed storage I/O. LVM2, in coordination with the Red Hat maintained device-mapper, offers enterprise-ready multipathing for all types of hardware storage arrays.

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Customers who are locked-in to high-cost proprietary storage arrays because of the bundled multipathing software now have other options. They can choose from multiple commodity storage hardware providers when they use multipathing and logical volume management virtualization technologies offered by Red Hat.

Global File Systems

Partitioning individual servers into multiple independent Red Hat Enterprise Linux instances is the cornerstone of server virtualization. The ability to share data between these partitions as well as between separate physical servers is the foundation of Red Hat's storage virtualization message.

Red Hat GFS is a global file system that allows applications on individual Red Hat Enterprise Linux instances to share data. Traditionally, this type of clustering occurs over a collection of physical servers connected to a storage area network. GFS separates the data from the server, allowing system resources to be added, updated, or deleted as needed without data loss. Organizations can begin to treat their servers and data pools as flexible resources—systems ready to be used whenever and however they are needed. This is frequently called utility computing.

With the addition of server-based virtualization, individual Red Hat Enterprise Linux instances can be clustered on one server or across several servers, offering an even finer grain of provisioning.

But how does one manage all of these servers? And how does one increase the availability of these Red Hat Enterprise Linux instances?

GFS offers a single system image (SSI) view of data that is shared across all the Red Hat Enterprise Linux instances, providing a virtual Symmetric Multiprocessing (SMP) server effect. Since data stored with GFS is shared between tens (or even hundreds) of Red Hat Enterprise Linux instances, any changes made on one server are instantaneously seen by all of the others in the cluster.

Applications like Oracle®, NFS services, and Apache® can support this type of clustered data sharing. This allows Red Hat-based virtual SMP servers to replace costly proprietary real UNIX-based SMP servers.

GFS also allows for easier management of Red Hat Enterprise Linux instances. Since multiple instances are accessing a common pool of data, individual instances can be created, destroyed, or even fail with no impact on the whole virtual SMP server-based application. This capability brings high availability and disaster recovery to virtualized Red Hat Enterprise Linux-based mission-critical applications.

Red Hat is leading the way by providing virtualized storage management capabilities to users of open source software. The integration of Red Hat Enterprise Linux with new technologies like Xen and existing data management tools like LVM2 and GFS allows Red Hat to offer enterprise customers leading-edge, highly-supported utility computing environments.

For more information:

Red Hat Integrated Virtualization
<http://www.openvirtualization.com>

Red Hat GFS
http://www.redhat.com/en_us/USA/home/solutions/gfs/

