



# SYMANTEC AND RED HAT: RESILIENT AND COST-EFFICIENT VIRTUALIZED ENVIRONMENTS

## Executive Overview

Red Hat and Symantec together offer enterprise IT organizations a highly available and highly scalable virtualization infrastructure for traditional and cloud-enabled applications.

Red Hat Enterprise Virtualization provides an enterprise-ready virtualization platform derived from oVirt, an open source community developed virtualization platform. The hypervisor in Red Hat Enterprise Virtualization is based on the Kernel based Virtual Machine (KVM), a small form-factor, scalable, high performance hypervisor based on Linux that provides the same security, performance, and scalability as built into Red Hat Enterprise Linux.

Red Hat Enterprise Virtualization includes Red Hat Enterprise Virtualization-Manager (RHEV-M), a GUI based centralized management interface to manage virtual machines (VMs). Red Hat Enterprise Virtualization enables IT organizations to manage a highly scalable virtualization infrastructure for traditional and cloud-enabled workloads—all while maintaining the high business continuity that business needs require.

Symantec™ Storage Foundation High Availability solutions provide storage management, high availability and disaster recovery in heterogeneous storage and server environments. These include Symantec™ Storage Foundation powered by Veritas, Symantec™ Cluster Server powered by Veritas, Symantec™ Storage Foundation Cluster File System, Symantec™ Dynamic Multi-Pathing and Veritas Operations Manager. These solutions enable flexible and agile infrastructures, while maintaining the highest levels of availability and reducing storage costs.

Red Hat Enterprise Virtualization and solutions from the Symantec Storage Foundation High Availability suite combined provide the ability to run enterprise class applications on Red Hat Enterprise Virtualization virtual machines (VMs). These VMs can be live migrated across physical servers and replicated across different data centers, using either SAN or commodity non-shared storage. The latter provides the ability to grow compute and storage together, and for a Red Hat Enterprise Virtualization cluster to host additional applications by simply adding new servers while meeting enterprise class requirements.

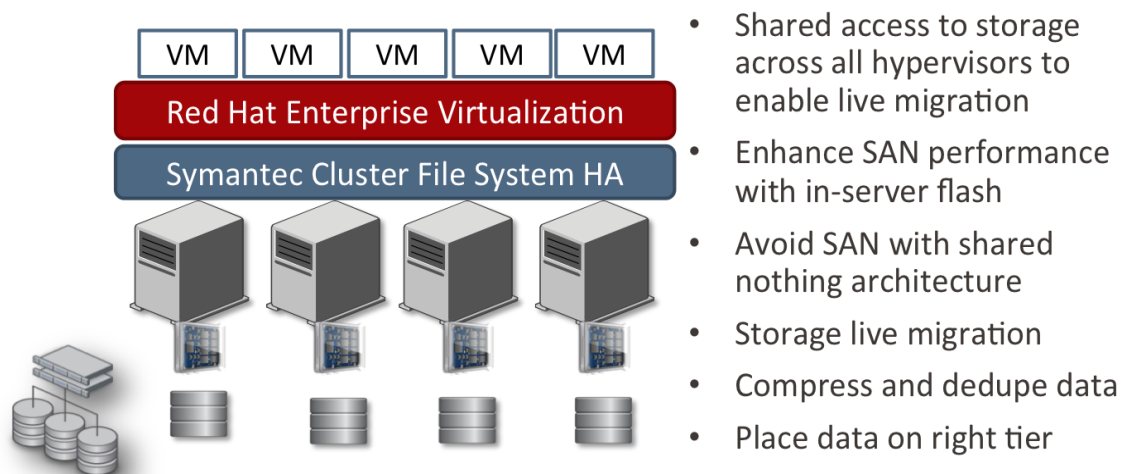
## Enterprise Class Storage Infrastructure

All physical servers hosting Red Hat Enterprise Virtualization clusters need to have access to the same storage in order to allow any VM to be able to run in any server. Features like live migration allow VMs to migrate from one physical server to other without any downtime. Storage Foundation Cluster File System has the capability to provide a single name space where all the VMs will have immediate access, dramatically reducing the time needed to provide storage visibility to each of the physical servers. Storage Foundation Cluster File System can provide that storage to the VMs using any Storage Array or even create a SAN-free architecture using commodity local storage, readily available in large capacity with the new age servers in the form of Hard Disk Drives (HDDs) or Flash to accelerate performance.

With Storage Foundation Cluster File System's High Availability solution, as shown in the diagram below, the VMs access SAN or local storage directly just as in case of a physical server without requiring additional protocol stacks like NFS and iSCSI, thus providing a consistent and predictable high performing storage backend without sacrificing on agility to move the VMs across physical servers and across data center sites.



Storage consumption costs can significantly minimize all the cost savings achieved with server virtualization. An enterprise solution like Storage Foundation will improve storage utilization with deduplication, compression and tiering capabilities, making sure that the data is placed in the storage that is aligned to its real business value. Backing up and having instant copies of VMs is possible using clone and snapshots technologies within Storage Foundation High Availability, independently of the underline storage used. Storage Foundation High Availability complements Red Hat Enterprise Virtualization, virtualizing the backend storage and unlocking the infrastructure from any array vendor. It also provides replication capabilities to have copies of the VMs in another data center independently of the storage used.



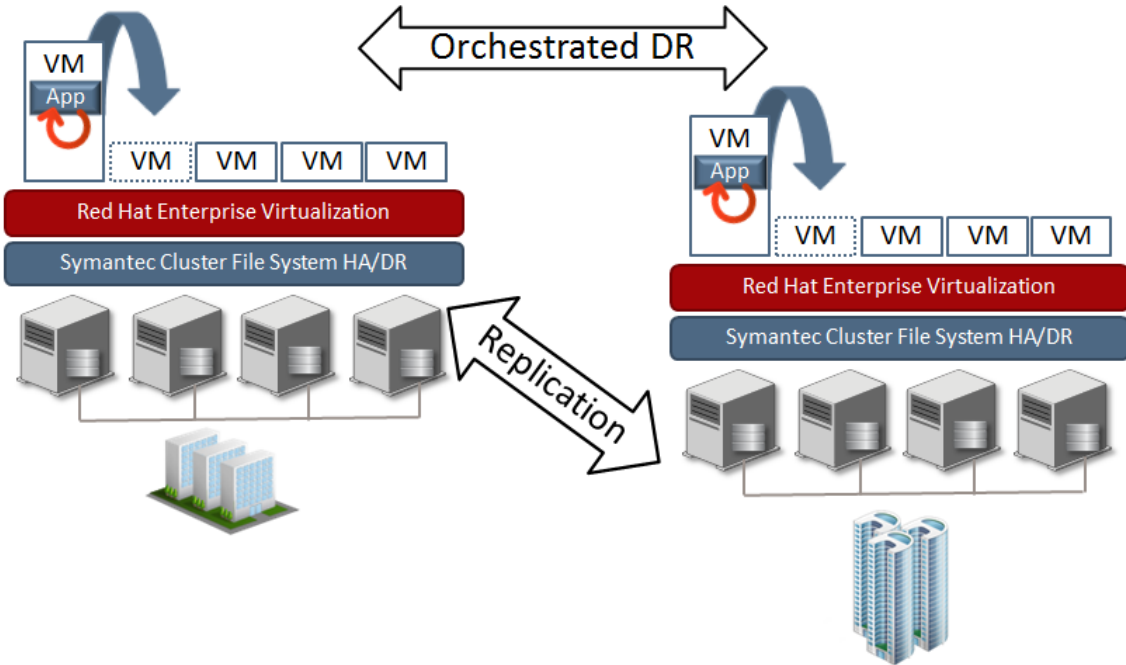
## Enterprise Class High Availability

Downtime is not an option when critical applications are virtualized. The combination of Red Hat Enterprise Virtualization and Cluster Server within the Storage Foundation High Availability suite provides best in class high availability for VMs across Red Hat Enterprise Virtualization clusters and disaster recovery sites. These solutions integrate with Red Hat Enterprise Virtualization to monitor individual VMs health and initiate a recovery as soon as any service disruption is detected. The recovery can be performed automatically across the Red Hat Enterprise Virtualization cluster or even the complete disaster recovery site. Upon a disaster, Cluster Server can orchestrate the failover of the Red Hat Enterprise Virtualization manager (RHEV-M) and any multi-tiered applications running on either physical or virtualized environments, providing a single pane of glass solution for disaster recovery. Cluster Server uses intelligent work load management policies to decide on the best hypervisor to run VMs based on current workloads.

Cluster Server can also monitor the health of applications running inside VMs, restarting the applications upon failures or triggering VMs migration to recover the service. This combination provides a truly end to end High Availability solution, covering the application down to the underline storage.

## Automated and Orchestrated Disaster Recovery

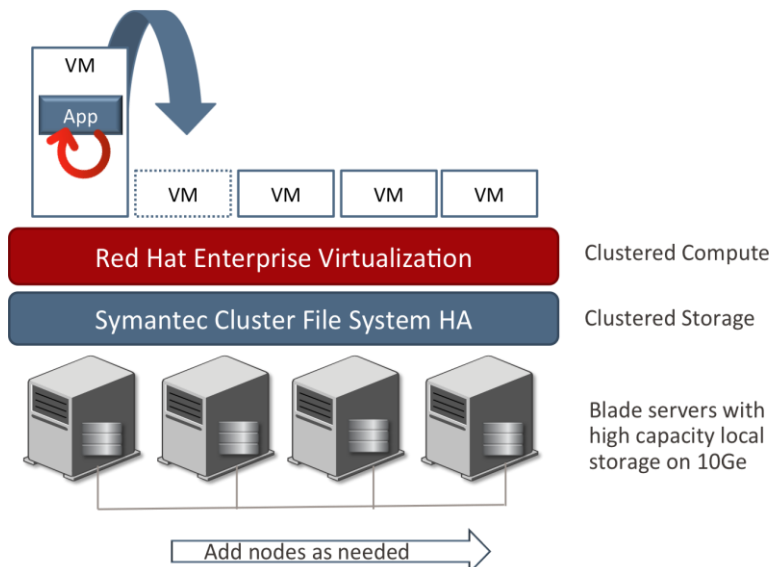
Quick recovery from an unplanned downtime event is essential. However to ensure business continuity, an orchestrated disaster recovery plan must be in place. VMs and their dependencies need to come up in the right sequence. The combined solution of Cluster Server and Red Hat Enterprise Virtualization, or through a Cluster File System HA/DR Option, provides automated VM failover to multiple sites with push button recovery. This recovery includes RHEV-M, guests, guest networks and storage reconfiguration.



## A Complete Cost Effective Solution for Virtualized Environments

Storage Foundation provides a cost effective solution by being able to run on commodity non-shared storage without the requirement of expensive shared storage infrastructure within a data center and across data centers for disaster recovery configurations. When using SANs, it can reduce the storage requisites by accelerating performance by seamlessly using SSDs on the server to boost performance and reducing SAN costs.

Also with a large hardware compatibility list, Storage Foundation provides the ability to choose from a wide range of storage arrays avoiding any vendor locking. The ability to replace storage arrays without any disruption, or even avoid SAN completely using commodity local storage, improve storage efficiency, reduce storage consumption are key functions to provide an agile and cost effective virtualization solution.





Additionally, disaster readiness can be established using non-symmetric storage configuration. The primary site can use SAN based storage while the secondary site can use only cheaper or even local storage without sacrificing the DR capability.

Customers deploying Red Hat Enterprise Virtualization benefit from an open, fast innovating virtualization platform that provides unparalleled performance, scalability, security, and flexibility, while significantly scaling-out and reducing costs.

## Summary

Red Hat Enterprise Virtualization offers an open source virtualization solution that is enhanced with the Storage Foundation High Availability suite of solutions to improve availability levels and reduce costs with local storage capabilities. Advanced storage functions enable storage sharing across hypervisors even without the need of a SAN. When SANs are used, performance can be accelerated by using caching technologies at the host level. High Availability and end-to-end disaster recovery are fully integrated within the solution.

## More Information and Contacts

For more information on the Red Hat and Symantec partnership and solutions:

Visit Symantec's Linux Page at [go.symantec.com/missioncritical](http://go.symantec.com/missioncritical)

To speak with a Symantec Product Specialist in the U.S. call toll-free 1 (800) 745 6054.

To speak with a Symantec Product Specialist outside the U.S. please visit the website <http://enterprise.symantec.com> for specific country offices and contact numbers.

Visit Red Hat's page at <http://www.redhat.com/rhev> or contact your local Red Hat representative at 1 888 REDHAT1.