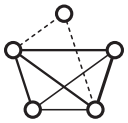
RED HAT®
HYPERCONVERGED
INFRASTRUCTURE

RED HAT HYPERCONVERGED INFRASTRUCTURE FOR VIRTUALIZATION

OVERVIEW



Built from open standards and application programming interfaces (APIs) with a vibrant community of contributors.

Integrates seamlessly with the broader Red Hat stack, including Red Hat CloudForms.

Delivered in an open source subscription model, removing costly proprietary licenses and lock-in while dramatically lowering life-cycle costs.

Provides workflow integration and optimization, as well as integrated fault management through a single-pane-of-glass management solution.

facebook.com/redhatinc
@redhat
linkedin.com/company/red-hat

redhat.com

INTRODUCTION

Hyperconverged infrastructure (HCI) is growing in popularity due to its ability to consolidate and simplify compute, storage, and network infrastructure for business-critical applications. As organizations contemplate HCI investments, many are looking to avoid proprietary lock-in—and traditional proprietary storage solutions.

Red Hat® Hyperconverged Infrastructure for Virtualization is an ideal solution for business-critical applications in virtualized environments, as well as for various tactical edge deployment scenarios. Built on the strengths of Red Hat Virtualization, Red Hat Gluster® Storage, and Red Hat Ansible® Automation, Red Hat Hyperconverged Infrastructure for Virtualization simplifies planning and procurement, streamlines deployment and management, and provides a single life-cycle experience for virtual compute and virtual storage resources. Compute, storage, and management components are all open source, and organizations can choose among industry-standard hardware or implement validated configurations that best meet their workload needs.

With advanced data reduction capabilities, virtual graphics processing unit (vGPU) support, and software-defined networking functionality, Red Hat Hyperconverged Infrastructure for Virtualization empowers organizations to:

- Deploy an open and versatile software-defined infrastructure with minimum footprint.
- Easily virtualize business applications, maximizing resource utilization through infrastructure consolidation and resulting operational efficiencies.
- Manage integrated compute-plus-storage resources with a single management interface.

RED HAT HYPERCONVERGED INFRASTRUCTURE FOR VIRTUALIZATION

Virtualized compute and storage resources are increasingly in demand by a broad range of internal corporate stakeholders, including departmental and lines of business teams, DevTest operators, and teams running remote facilities in industries such as retail or manufacturing. Often these remote operations include untrained IT professionals or individuals whose primary responsibility is not IT. These organizations are in need of solutions with a reduced physical footprint. They also require simplified procurement, deployment, manageability, and backup.

Red Hat Hyperconverged Infrastructure for Virtualization is comprised of industry-proven components of the Red Hat stack. These components are specially configured to be deployed on the same servers, reducing physical footprint, saving deployment time, and streamlining the overall operations process. As an enterprise open source solution fueled by a thriving community, Red Hat Hyperconverged Infrastructure for Virtualization offers considerable flexibility in the range of configurations that it can deploy. It achieves that flexibility in part by using the proven foundation of:

- **Red Hat Virtualization**, an open, software-defined platform that virtualizes Linux® and Microsoft Windows workloads. Built on Red Hat Enterprise Linux and the Kernel-based Virtual Machine (KVM), it virtualizes resources, processes, and applications—yielding a stable foundation for a cloud-native and containerized future.

ALIGN TO BUSINESS AND TECHNICAL GOALS FOR DECENTRALIZED IT REQUIREMENTS:

- ☐ Get more power, flexibility, and reliability in a smaller footprint from software-defined infrastructure.
- ☐ Simplify operations with unified management.
- ☐ Streamline planning, design, and procurement with a single subscription.

- **Red Hat Gluster Storage**, a software-defined storage platform designed to handle high-capacity tasks like virtualization. Unlike traditional storage systems, Red Hat Gluster Storage scales across bare metal, virtual, container, and cloud deployments.
- **Red Hat Ansible Automation**, a simple, agentless IT automation technology that can improve current processes, migrate applications for better optimization, and provide a single language for DevOps practices across the organization.

As depicted in Figure 1, Red Hat Hyperconverged Infrastructure for Virtualization dramatically simplifies traditional network, compute, and storage infrastructure, yielding substantial benefits that include:

- Savings from infrastructure consolidation, standardization, and price.
- Smaller initial investment for proofs of concept.
- Easier procurement via a prepackaged product.
- Simplified deployment, management, and upgrades.
- Streamlined purchasing and support with a single vendor relationship.
- Built-in predictability from use case-specific performance and testing.

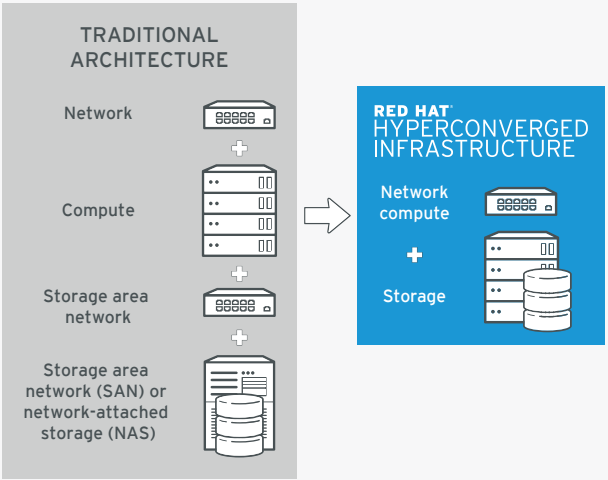


Figure 1. Red Hat Hyperconverged Infrastructure for Virtualization helps consolidate network, compute, and storage infrastructure.

DATA REDUCTION, vGPU SUPPORT, AND VIRTUAL NETWORKING

Red Hat Hyperconverged Infrastructure for Virtualization includes robust data reduction capabilities provided by deduplication and compression. The solution also adds support for vGPUs and software-defined networking, as described in the sections that follow.

- **Data reduction.** Organizations with large numbers of virtual machines need ways to reduce the redundancy of the data they store. Red Hat Hyperconverged Infrastructure for Virtualization is designed to reduce the costs associated with the accumulation of large amounts of data. The

solution integrates the Virtual Data Optimization (VDO) module for the Linux device mapper as supplied in Red Hat Enterprise Linux. The VDO module provides in-line, real-time, block-level deduplication and compression at the 4KB level as well as management of VDO data reduction.

- **vGPU support**. Oil and gas companies and others need ways to deliver complex graphics with strong performance in virtualized environments. By supporting vGPUs, the solution allows organizations to increase visual clarity, improve performance, and decrease lag time when delivering virtualized graphics to users at remote sites.
- **Open Network Virtualization (OVN)**. Software-defined networking is a critical component of hyperconverged infrastructure. OVN is an open source virtual switching project that separates the physical network topology from the logical network. OVN improves scalability and facilitates live migration of virtual networking components without hypervisor intervention.

DEPLOYMENT AND MANAGEMENT

Red Hat Hyperconverged Infrastructure for Virtualization improves operational efficiencies through the consolidation of underlying servers. For example, three virtualization hosts and three storage hosts—with their management infrastructure—can be consolidated into three physical servers with a single management interface. Table 1 lists deployment and management features of Red Hat Hyperconverged Infrastructure for Virtualization.

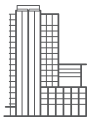
TABLE 1. RED HAT HYPERCONVERGED INFRASTRUCTURE FOR VIRTUALIZATION FEATURES AND FUNCTIONALITY

FEATURE	FUNCTIONALITY
Central virtual resource management	The solution provides central management for compute, network, and storage resources via integration with web-based Red Hat Virtualization Manager, with a RESTful application programming interface (API) that also extends management and orchestration capabilities to tools such as Red Hat CloudForms®.
Security and hardening	Secure virtualization (sVirt) and Security-Enhanced Linux (SELinux) technologies help protect the hypervisor against attacks aimed at the host or virtual machines. Red Hat Virtualization Manager also supports network encryption, using transport layer security (TLS) and secure sockets layer (SSL) for authentication and authorization at both virtualization and storage layers.
Highly availalabe resources	Preconfiguration of Red Hat Virtualization Manager and three-way replication with Red Hat Gluster Storage provides high availability and data protection.
Automation and integration	Red Hat Ansible Automation offers configuration of virtual resources, such as compute, network, and storage. Red Hat CloudForms can orchestrate and monitor events for an even more streamlined operation.

Support for multiple guest operating systems	Full support is provided for Red Hat Enterprise Linux 5, 6, and 7. Support is also available for Windows Server 2008, 2008 R2, 2012, 2016, and desktop systems Windows 7 and 10. SUSE Linux Enterprise Server 10, 11, and 12 are also supported.
Automation and customization	A RESTful API allows for automation management and programmatic configuration.

CONCLUSION

Delivered in an open software subscription model and built on robust and proven elements of the Red Hat stack, Red Hat Hyperconverged Infrastructure for Virtualization helps avoid costly proprietary licensing and lock-in. Beyond infrastructure consolidation, the solution offers sophisticated data reduction, vGPU support, and software-defined networking to make the most of virtualized environments. Organizations can depend on Red Hat Hyperconverged Infrastructure for Virtualization for their important infrastructure consolidation projects.



ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

facebook.com/redhatinc
@redhat
linkedin.com/company/red-hat

NORTH AMERICA
1 888 REDHAT1

EUROPE, MIDDLE EAST, AND AFRICA
00800 7334 2835
europe@redhat.com

ASIA PACIFIC
+65 6490 4200
apac@redhat.com

LATIN AMERICA
+54 11 4329 7300
info-latam@redhat.com

redhat.com
#F15168_1118