

Red Hat Hyperconverged Infrastructure for Virtualization

Benefits

Adopt open hyperconverged infrastructure that lets you consolidate to a smaller footprint, reducing everything onto a smaller set of servers.

Capitalize on open source community efforts like virtualization, software-defined storage, and open network technologies.

Transform your datacenter with open hyperconverged infrastructure without the fear of proprietary vendor lock-in.

Enjoy lower operation costs by managing compute and software-defined storage resources together.

Run virtualized workloads and containers side by side, making them easier and more cost-effective to operate.

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 infrastructure edge deployment scenarios. Built on the strengths of [Red Hat Virtualization](#), [Red Hat Storage](#), and [Red Hat Ansible® Automation Platform](#), 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 and 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 a minimal 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.
- Deploy a standard operating environment for independent software providers.

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, banking, and manufacturing. Often these remote operations include untrained IT professionals or individuals whose primary responsibility is not IT. These organizations need solutions with a reduced physical footprint and require simplified procurement, deployment, manageability, and backup.

Red Hat Hyperconverged Infrastructure for Virtualization consists of industry-proven components of the Red Hat stack. These components are specially integrated 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 deployable configurations. It achieves that flexibility with the proven foundation of:



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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 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.
- **Red Hat Storage**, a software-defined storage platform for high-capacity tasks like virtualization. Unlike traditional storage systems, Red Hat Storage scales across bare-metal, virtual, and container deployments.
- **Red Hat Ansible Automation Platform**, a simple, agentless IT automation technology that offers simplified deployment and the ability to manage remote clusters centrally.

As depicted in Figure 1, Red Hat Hyperconverged Infrastructure for Virtualization 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.

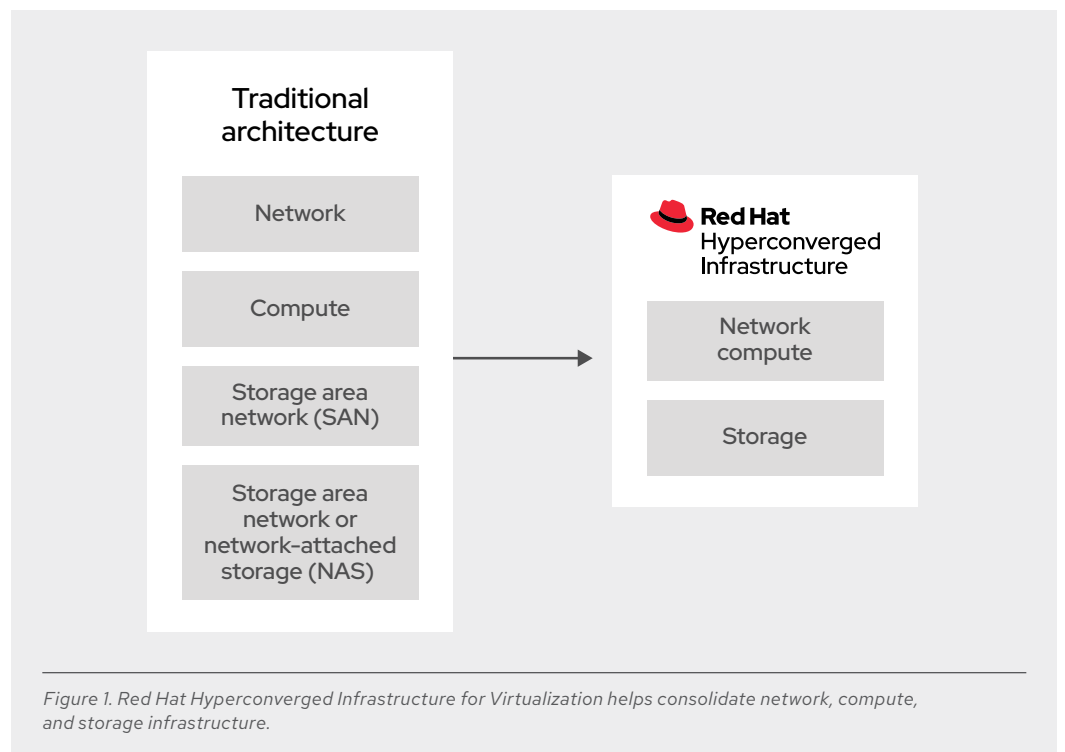


Figure 1. Red Hat Hyperconverged Infrastructure for Virtualization helps consolidate network, compute, and storage infrastructure.

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 can reduce the costs associated with the accumulation of large amounts of data. The solution integrates the virtual data optimizer (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, 3 virtualization hosts and 3 storage hosts – with their management infrastructure – can be consolidated into 3 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

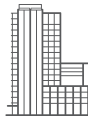
Feature	Functionality
Central virtual resource management	The solution provides central management for compute, network, and storage resources via integration with web-based Red Hat Virtualization Manager.
Security and hardening	Secure virtualization (sVirt) and Security-Enhanced Linux (SELinux) technologies 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 available resources	Preconfiguration of Red Hat Virtualization Manager and 3-way replication with Red Hat Storage provide high availability and data protection.

Feature	Functionality
Automation and integration	Red Hat Ansible Automation Platform offers configuration and management automation of virtual resources, such as compute, network, and storage.
Support for multiple guest operating systems	Full support is provided for Red Hat Enterprise Linux 5, 6, 7, and 8 guests. 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 application programming interface (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 enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers integrate new and existing IT applications, develop cloud-native applications, standardize on our industry-leading operating system, and automate, secure, and manage complex environments. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500. As a strategic partner to cloud providers, system integrators, application vendors, customers, and open source communities, Red Hat can help organizations prepare for the digital future.



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