Red Hat Hyperconverged Infrastructure

Datasheet

Red Hat Hyperconverged Infrastructure for Virtualization

Tested and validated server configurations

Easily virtualize your business applications, maximizing resource utilization.

Manage integrated compute-plus-storage resources with a simplified single management interface.

Increase productivity by focusing on applications instead of infrastructure.

Reduce risk and achieve predictable performance with tested and validated clusters of industry-standard servers.

Hewlett Packard Enterprise
Server Tested

Validated server configurations for Red Hat® Hyperconverged Infrastructure simplify and reduce the risk of designing and deploying hyperconverged computing infrastructure (HCI). Tested and optimized, these validated server configurations combine with Red Hat Hyperconverged Infrastructure for Virtualization to yield platforms that are durable and highly available. The validated server configurations help predictably consolidate infrastructure, producing operational efficiencies through optimized management workflows. In addition, unified storage and compute resources provide simplified, low-touch operations.

Red Hat Hyperconverged Infrastructure for Virtualization

Red Hat Hyperconverged Infrastructure for Virtualization offers an open, simple, and optimized platform for your application workloads in a small footprint. The platform integrates Red Hat Virtualization, Red Hat Storage, and Red Hat Ansible® Automation Platform in a single solution to simplify deployment and management for remote office, small datacenter, and enterprise edge environments. By eliminating the need for a discrete storage tier, the solution removes many of the traditional burdens associated with acquisition, setup, and day-to-day operations—letting you focus on more valuable tasks. The benefits of open hyperconverged infrastructure include:

- **Infrastructure consolidation.** Open hyperconverged infrastructure lets you consolidate to a smaller physical footprint. Deploying a smaller set of servers saves space and creates greater efficiencies.
- **Reduced risk.** Red Hat Hyperconverged Infrastructure for Virtualization is built on a mature Red Hat infrastructure stack, including operating system, virtualization, software-defined storage, and automation technology.
- **Innovation without proprietary lock-in.** Upstream communities deliver continuous open source innovation, yielding greater flexibility and lower costs without arbitrary proprietary limitations.
- **Datacenter transformation.** Hyperconverged infrastructure is the first step toward more flexible and highly scalable datacenter management, allowing organizations to start small and grow over time without rip-and-replace upgrades.
- **Cost optimization.** Hyperconverged infrastructure leads to lower operational costs by managing compute and software-defined storage resources together through a single, easy-to-use interface, with the ability to manage remote sites from a central location.
- **Containerization and virtualization.** Open hyperconverged infrastructure lets you run virtualized workloads and containers on the same infrastructure, making them more straightforward and cost-effective to manage.

Red Hat Hyperconverged Infrastructure

Validated industry-standard configurations

Tested and validated server configurations help provide predictable performance and reduce risk for organizations adopting hyperconverged infrastructure. Configurations are based on HPE ProLiant DL360 Gen10 and HPE ProLiant DL380 Gen10 servers (Figure 1), configured as shown in Table 1.[1]

Figure 1. HPE ProLiant DL360 Gen10 (top) and HPE ProLiant DL380 Gen10 servers

For the testing, three-node Red Hat Hyperconverged Infrastructure for Virtualization clusters were assembled and validated using the different HPE ProLiant servers and distinct workloads. Red Hat evaluated both capacity-optimized and throughput-optimized server configurations to determine ideal server configurations for building clusters to serve different workload categories, as follows:

- **Capacity-optimized clusters for general server consolidation.** Organizations increasingly want to consolidate general-purpose servers and proprietary storage appliances—particularly at edge locations—into a single hyperconverged server cluster. The cluster can replace special-purpose storage appliances and bare-metal servers while providing flexible, highly available virtual machines (VMs) with corresponding data protection. This workload category does not typically exhibit particularly demanding input/output (I/O) characteristics, instead requiring only basic I/O performance with adequate storage capacity.
- **Throughput-optimized clusters for demanding I/O operations.** Throughput-optimized clusters must handle significant I/O requirements, such as ingesting a steady stream of data at an edge location. Operators deploying infrastructure to address this workload category typically seek to capture data from remote sensors and data acquisition equipment at the rate of data generation, while protecting against data loss through highly available VMs and protected storage. This workload category typically has high I/O throughput needs.

1 *Red Hat anticipates that **similarly configured industry-standard servers from other vendors would yield similar results.***

Table 1. Validated server configurations

	Capacity optimized	Throughput optimized
Server platform	HPE ProLiant DL360 Gen10	HPE ProLiant DL380 Gen10
Dual-socket processor (tested)	Intel Xeon Silver 4116 (12 cores per socket)	Intel Xeon Gold 6130 (16 cores per socket)
Memory/RAM (tested/ maximum)	128GB/256GB	512GB/512GB
Network adaptor	HPE Ethernet 10Gb 2-port 562FLR-SFP+	HPE Ethernet 10/256Gb 2-port 640FLR-SFP28
Input/output (I/O) controller	HPE Smart Array P816i-a SR Gen10 (16 internal lanes, 4GB cache/ SmartCache) 12G SAS Modular Controller	
Data drives	HPE 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3-year warranty, 512e digitally signed firmware hard disk drive (HDD)	HPE 6TB SAS 12G Midline 7.2K LFF (3.5in) SC 1-year warranty, 512e digitally signed firmware HDD
Data drive quantity	8	12
Operating system (OS) drives	HPE 960GB SATA 6G Read Intensive SFF (2.5in) SC 3-year warranty digitally signed firmware solid-state drive (SSD)	
OS drive quantity and data protection	2 (RAID 1)	2 (RAID 2)
Virtual machine (VM) density (3-node cluster example*)	42	90
Maximum ingest throughput (3-node cluster example**)	320MiB/s	705MiB/s

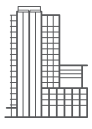
** VM density calculated assuming average of four virtual central processing units (vCPUs) and 16GiB RAM per VM, with 300% CPU oversubscription and 150% memory oversubscription. This example also assumes that all VMs are high availability. In other words, all VMs can continue to run following the loss of one node in a three-node cluster.*

*** Ingest throughput was measured at 90/10 write/read I/O ratio via the fio open source benchmark utility.*

Server testing approach

To validate the server configurations, Red Hat used the fio and the DVD Store 3 tools to test the capabilities of the three-node hyperconverged clusters. Tests measured both I/O throughput and latency at increasing workload scales. All experiments were performed from VM clients running within the Red Hat Hyperconverged Infrastructure for Virtualization cluster, transacting I/O with virtual disks backed by Quick EMUlator (QEMU) Copy on Write (qcow2) images stored within the hyperconverged trusted storage pool. Dual 10GbE network connections ran between cluster nodes, one for front-end VM access and one for back-end VM management, migration, and storage traffic.

Throughput tests were performed with the fio tool as 30-minute timed tests using 4GiB file sizes, 4MiB block sizes, a 90%/10% write/read mix, and the *direct=1* setting. Each Red Hat Hyperconverged Infrastructure for Virtualization host ran one load-client VM while each client executed one fio job. Total write throughput was calculated as the sum of the three concurrent client jobs. Read throughput results were discarded. Following a warm-up test run, final results were then derived from an average of three test runs.



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

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.

North America
1 888 REDHAT1
www.redhat.com

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
#F23388_0420