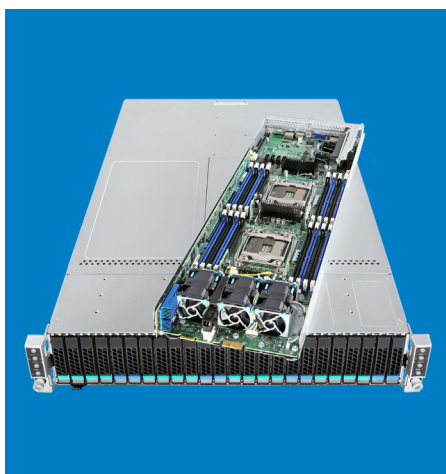


Simplify the Deployment of a Red Hat* OpenStack* Cloud Infrastructure

Intel® Data Center Blocks for Cloud - Red Hat* OpenStack* Platform with Red Hat Ceph* Storage Reference Architecture



Information Technology professionals and resellers today face increasing pressure to architect infrastructure solutions offering enhanced reliability, security, storage, and scalability. For this reason, many companies are planning the move to a cloud-based system to reap the flexible benefits which software-defined infrastructure (SDI) can provide. Predictions suggest that approximately 80% of workloads will be cloud-based by 2024¹.

For some companies, the evolution toward Infrastructure as a Service (IaaS) or deployment of Hyper-Converged Infrastructure (HCI) represents a daunting task. Organizations requiring extensive customization options may find that generic cloud solutions are simply not up to the task. Open source software solutions may be the perfect choice in these cases. Red Hat has optimized their Red Hat* OpenStack Platform for production-ready cloud deployments, offering the flexibility customers need. Resellers choosing Red Hat solutions for their clients rest assured the Linux, and OpenStack software underpinnings are ready for demanding infrastructure requirements. They also have the confidence that Red Hat's ongoing code maintenance, and open source innovations, maximize benefits over time.



Customizing Open Source Cloud Solutions

While these open source implementations do address many special needs, the customization process comes with its challenges. Larger corporations likely have an open source software expert on staff, smaller companies require the help of resellers, or other outside experts, to configure and optimize their new cloud infrastructure. Also, each cloud infrastructure scenario is unique, so a one-size solution does *not* fit all. Red Hat-based cloud solutions are selected by some resellers and their clients for their extreme flexibility, and some resellers often prefer choosing hardware components from various manufacturers to best address specific requirements. Without expert guidance, customers may face problems assembling an effective, holistic, and optimized solution.

Intel and Red Hat recognize these challenges and to assist in these scenarios, Intel engineers have teamed up with Red Hat to develop the *Intel® Data Center Blocks for Cloud – Red Hat* OpenStack* Platform with Red Hat Ceph Storage* reference architecture*. Resellers can directly follow the reference design for a simplified deployment experience or use it as a starting point for a custom solution.

Reference Architecture to Build Your System

The reference architecture for Red Hat OpenStack Platform software, offers hardware stack definition, network topology, node configuration, and best-known methods for deploying a private cloud system. Additional chapters from the guide offer best practices to fine-tune a system for the greatest benchmark performance.

This reference architecture includes a total of 12 nodes for control, compute, storage and controller functions, and uses three 2U Intel® Server Chassis that support up to four nodes each. With this reference architecture in hand, resellers can utilize prescriptive guidance to create a fully-customized solution using off-the-shelf components of their choosing. Regardless of the hardware employed in the system, the implementation guide offers recommendations on the configurations necessary to successfully deploy a private, SDI-based cloud.

Deployment starts with Certified Intel Server Systems

The Red Hat certified Intel® Server System, published on the Red Hat hardware compatibility list, serves as the foundation of the reference architecture hardware configuration. Combined with the guide's implementation details, this template for a validated and co-engineered solution provides a confident and simplified path to deployment. Alternatively, the guide can serve as a starting point for a custom design. Hardware can be procured and assembled through traditional build-your-own means, or resellers can utilize the

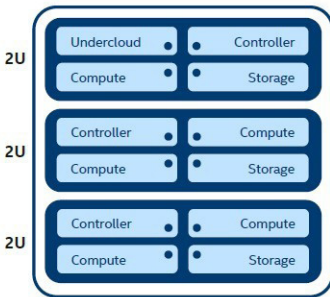


Figure 1. Example Server Distribution

configure-to-order (CTO) option to have Intel build and validate the system. Either way, a rich portfolio of Intel server products like Intel® Xeon® processors, Intel® RAID Controllers, Intel® Solid State Drives, Intel® Network Interface Cards and more, serve as a solid foundation for your cloud solution.

With CTO systems configured as needed to address a particular customer workload, resellers know

the modular elements create cost-effective and streamlined solutions. By utilizing Red Hat pre-certified components and Intel's assistance, resellers can speed the delivery of their customer solution. For additional customer peace of mind, Intel CTO system components are backed by a three-year warranty, with the option of an extension to five years. In the unlikely event a component fails, Intel will repair or replace it to minimize potential network impacts and downtime.

Summary

As a long-standing partner of the open source community and OpenStack* Foundation Platinum Member, Intel has heard from many resellers who seek new ways to grow their businesses and overcome implementation challenges which may impede other value-add revenue opportunities.

To address these challenges, Intel continuously delivers technologies and guidance to foster innovation, simplify cloud infrastructure implementation, and help resellers differentiate themselves in the market. Intel Datacenter Blocks for Cloud - Red Hat OpenStack Platform with Red Hat Ceph Storage reference architecture provides an opportunity for resellers and partners to help their clients make the critical move to a cloud infrastructure solution in the way that best meets their needs.

For those resellers seeking support from a reference architecture to plan a cloud solution built from scratch, Red Hat and Intel's collaboration on the infrastructure implementation guide offers practical, step-by-step recommendations. Resellers can design their solution or opt for Intel's rapid deployment assistance with CTO systems, giving them more freedom to support their customers with other value-add services.

Regardless of a reseller's preference, they are empowered equally to help today's businesses realize all the benefits of IaaS faster and easier than ever before.



Figure 2. Intel® Server Chassis H2224XXKR2 w/ 4 Nodes + 2 PSUs Installed



Figure 3. Intel® Server Chassis H2224XXKR2 w/ 4 Nodes + 2 PSUs Installed



Default Reference Configuration of Nodes

Learn more at:

<http://www.intel.com/content/www/us/en/data-center-blocks/cloud/cloud-blocks.html>

<https://www.redhat.com/en/technologies/linux-platforms/openstack-platform>

<https://access.redhat.com/ecosystem/search/#/category/Server>

For additional information, please contact your Intel sales representative or authorized distributor.

(Endnotes)

1 Intel & Bain Analysis 2016

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at <http://www.intel.com/content/www/us/en/data-center-blocks/data-center-block...>

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Table 1. Server chassis specification

Description	Product Type	Intel Product Code	MM#	Quantity
Intel® Server Chassis H2224XXKR2	Chassis Only	H2224XXKR2	943478	3

Table 2. Controller node specification

Component	Description	Intel Product Code	MM#	Quantity
Compute module	Intel® Compute Module HN-S2600TP24SR	HNS2600TP24SR	945609	1
Processor	Intel® Xeon® E5-2660 v4 (14 Cores, 35M Cache, 2.00 GHz)	CM8066002031201	947617	2
Memory	32 GB DDR4 DIMM (384GB total)	-	-	12
Network adapter	10 GbE SFP+ Dual Port Intel® Ethernet Converged Network Adapter	X710DA2	933206	1
Boot device	Intel® SSD DC S3500 Series (340GB, M.2)	SSDSCKHB340G401	932266	1
Remote management module	Intel® Remote Management Module 4 Lite	AXRMM4LITE2	946514	1
Local storage	Intel® SSD DC S3710 Series (800 GB, SATA)	SSDSC2BA800G401	937745	2

Table 3. Compute node specification

Component	Description	Intel Product Code	MM#	Quantity
Compute module	Intel® Compute Module HN-S2600TP24SR See section 3.2.1 for details	HNS2600TP24SR	945609	1
Processor	Intel® Xeon® E5-2660 v4 (14 Cores, 35M Cache, 2.00 GHz)	CM8066002031201	947617	2
Memory	32 GB DDR4 DIMM (384GB total)	-	-	12
Network adapter	10 GbE SFP+ Dual Port Intel® Ethernet Converged Network Adapter	X710DA2	933206	1
Boot device	Intel® SSD DC S3500 Series (340GB, M.2)	SSDSCKHB340G401	932266	1
Remote management module	Intel® Remote Management Module 4 Lite	AXRMM4LITE2	946514	1
Local storage	Intel® SSD DC P3700 Series (1.6TB, PCIe* NVMe*)	SSDPE2MD016T401	933081	2

Table 4. Storage node specification

Component	Description	Intel Product Code	MM#	Quantity
Compute module	Intel® Compute Module HN-S2600TP24SR See section 3.2.1 for details	HNS2600TP24SR	945609	1
Processor	Intel® Xeon® E5-2640 v4 (10 Cores, 25M Cache, 2.40 GHz)	CM8066002032701	948123	2
Memory	16 GB DDR4 DIMM (128 GB total)	-	-	8
Network adapter	10 GbE SFP+ Dual Port Intel® Ethernet Converged Network Adapter	X710DA2	933206	1
Boot device	Intel® SSD DC S3500 Series (340GB, M.2)	SSDSCKHB340G401	932266	1
Remote management module	Intel® Remote Management Module 4 Lite	AXRMM4LITE2	946514	1
Data storage (all-flash node)	Intel® SSD DC S3710 Series (800 GB, SATA)	SSDSC2BA800G401	937745	5
Data storage (hybrid node)	Seagate® Enterprise Capacity 2.5 HDD (2TB, SAS)	ST2000NX0433	-	5
Journaling storage	Intel® SSD DC P3700 Series (1.6TB, PCIe* NVMe*)	SSDPE2MD016T401	933081	1

Note: The storage nodes can be either all-flash or hybrid. The difference is the data capacity drives which are SATA SSDs for all-flash and SAS HDDs for hybrid. In both cases, the journaling drive is NVMe*.