Lenovo Cloud Reference Architecture for Red Hat OpenStack Platform

Elastic Cloud with Performance and Resiliency

The Fast Path to an Elastic Cloud

Worry less about deploying cloud and focus more on developing innovative applications with the Lenovo Cloud Reference Architecture (RA) for Red Hat OpenStack Platform. Lenovo's pre-tested, validated, and co-engineered private cloud solution simplifies private cloud configuration, deployment, and management. Our end-to-end solution for Red Hat OpenStack Platform delivers the following benefits:

- Fully consolidated and integrated hardware resources with balanced workloads for compute, network, and storage
- Aggregated compute and storage infrastructure delivering virtualized resource pools easily customized to meet specific compute and storage ratio needs
- Simplified scalability with the ability to extend compute and storage at run time
- Elimination of single points of failure in every layer of the infrastructure stack, delivering continuous access to virtual machines
- Rapid OpenStack cloud deployment, including updates, patches, security, and usability enhancements with enterprise-grade support from Lenovo and Red Hat
- Unified management and monitoring for kernel-based VMs

HIGHLIGHTS

- Provides guidance for deploying Lenovo systems with a complete Red Hat OpenStack solution that span cloud environments for Managed Service Providers, Cloud Service Providers, and enterprise private clouds
- Includes the latest data center equipment available such as the Lenovo x3650 M5 and x3550 M5 and Lenovo RackSwitch Ethernet switches
- Simplifies OpenStack deployment by outlining a validated configuration that scales and delivers an enterprise level of redundancy across servers, storage, and networking

Why Lenovo and Red Hat

Lenovo and Red Hat have collaborated to deliver successful, integrated solutions to customers worldwide. These customers recognize Lenovo's leadership in the worldwide server market[1,2] and Red Hat's leadership in Linux operating system, cloud, and management software platforms and tools.

Overview

The Lenovo Cloud RA for Red Hat OpenStack Platform reduces the complexity of cloud by outlining a validated configuration that scales and delivers an enterprise-level of redundancy across servers, storage, and networking to help enable high availability.

At the core of this architecture reside the Lenovo System x3650 M5 and x3550 servers.[3] These servers deliver the performance and availability required for business-critical cloud infrastructure. The 2U x3650 M5 can be equipped with two 18-core Intel Xeon E5-v4 series processors, and up to 1.5 TB of 2133MHz TruDDR4 memory,[4] 8 expansion slots, and 26 2.5-inch hot-swappable SAS/SATA HDDs/SSDs, or 14 3.5-inch HDDs, with 12Gbps SAS connectivity. The 1U x3550 M5 is similar, but with 4 expansion slots and 12 2.5-inch or 8 3.5-inch 8 bays.

For compute, control and storage services, 10 GbE is standard for this architecture, with the Lenovo RackSwitch G8124E. For management services, also integrated into this architecture is the Lenovo RackSwitch G7028. It is a 1 GbE top-of-rack switch that delivers line-rate Layer 2 performance. It typically uses only 45 W of power which helps improve data center energy efficiency.

The Lenovo Cloud RA for Red Hat OpenStack Platform can utilize a wide range of storage solutions, including block-oriented storage. To enable these storage options without adding additional networking equipment, the Lenovo RackSwitch G8124E switch supports 8 Gbps Fibre Channel SAN and iSCSI/Fibre Channel over Ethernet (FCoE) connection on a 10 GbE network.

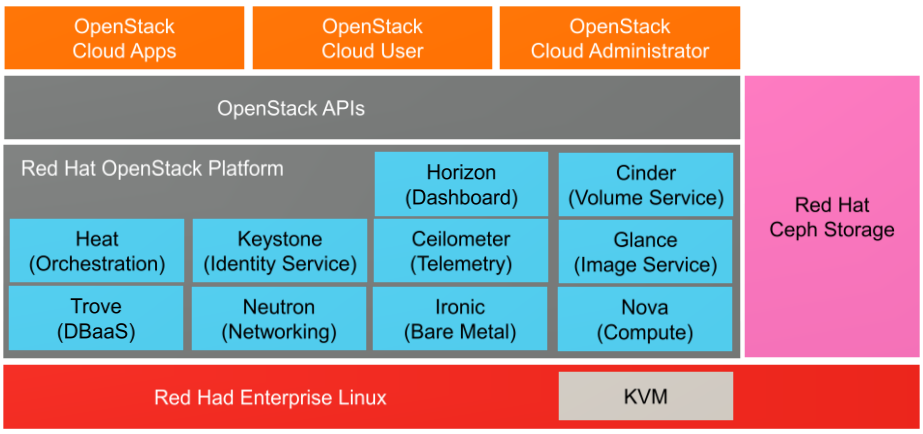
This reference architecture combines the latest systems management features of the Lenovo XClarity Administrator software with the Red Hat OpenStack Platform cloud management suite. Lenovo XClarity provides foundational systems management for Lenovo servers, network, storage, and cloud solutions. Through an uncluttered, dashboard-driven GUI, XClarity provides automated discovery, monitoring, firmware updates, pattern-based configuration management, and installation of hypervisors and operating systems to bare metal servers. The advanced level of integration between Lenovo and Red Hat OpenStack Platform allows you to control your private cloud implementation with confidence and enhances your total system reliability.

The Lenovo RA for Red Hat OpenStack Platform provides all the components needed to build and run a Red Hat OpenStack Platform infrastructure that uses a software-defined data center (SDDC) architecture.

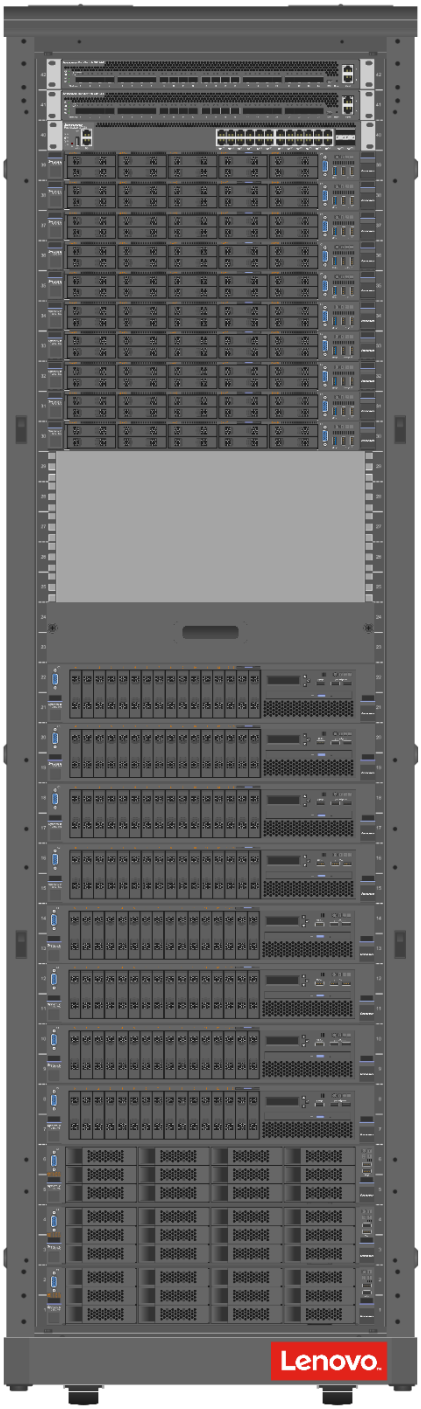
The entire server configuration can be combined into a single rack containing a balanced configuration of compute, storage, networking, and power. The Lenovo Reference Architecture for Red Hat OpenStack Platform provides the speed, scalability and reliability that enterprise data centers and multitenant service providers need for high-performance, high availability, and ease of management.

Architecture

The example below shows the full engineered rack solution configuration and Red Hat OpenStack Platform conceptual diagram. Configurations may also be customized to best suit the workloads running in your environment. To accelerate time to value, Lenovo offers professional services offerings and expertise to assess, design, implement, and support this solution.



The Lenovo x3650 M5 and x3550 M5 nodes, with Lenovo RackSwitch networking, form the foundation of the Lenovo Cloud Reference Architecture for Red Hat OpenStack Platform



Why Lenovo

Lenovo is a leading provider of x86 servers for the data center. Featuring rack, tower, blade, dense and converged systems, the Lenovo server portfolio provides excellent performance, reliability and security. Lenovo also offers a full range of networking, storage, software, solutions, and comprehensive services supporting business needs throughout the IT lifecycle. With options for planning, deployment, and support, Lenovo offers expertise and services needed to deliver better service-level agreements and generate greater end-user satisfaction.

For More Information

To learn more about the Lenovo Cloud Reference Architecture for Red Hat OpenStack Platform, contact your Lenovo Business Partner or visit:

www.lenovo.com/systems/solutions

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1 #1 x86 Reliability; ITIC 2014-2015 Global Server Hardware, Server OS Reliability Report, May 2014 (latest report); lenovo.com/images/products/system-x/pdfs/analyst-reports/XSL03126USEN.PDF. (2015 survey results pending)
2 1 Customer Satisfaction; TBR Customer Satisfaction Survey, May 2015 (latest report); lenovo.com/images/products/system-x/pdfs/white-papers/tbr_x86servers_top_csat_1q15_wp.pdf
3 Other servers supported by this RA include ThinkServer RD650 and RD550.
4 2133MHz DDR4 memory at 2 DIMMs per channel (2DPC) is a Lenovo exclusive.

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CRN: BDACLDSXX63 12/2016