ARCHITECTURE BRIEF

Lenovo Reference Architecture for SUSE OpenStack Cloud

A cost-effective solution for building a private cloud to enable infrastructure as a service

A Highly Available OpenStack Architecture

Direct OpenStack cloud implementations can be daunting, with hundreds of configuration options and dozens of packages. Such an implementation requires integrating the computing platform, Linux operating system, network switching, storage subsystem and all-important hypervisors into an end-to-end solution. This can exceed the in-house IT skill set for many companies. For these organizations, a pre-tested, optimized OpenStack cloud solution is needed.

The Lenovo Reference Architecture for SUSE OpenStack Cloud enables you to quickly set up and deploy your private infrastructure as a service platform with optimized configurations for hardware, software, networking and storage. To help you simplify your infrastructure and virtualization management, Lenovo offers a reference architecture for tailored interoperability with OpenStack environments. The reference architecture is validated with OpenStack and provides a thoroughly tested architecture that combines the benefits of leading-edge technologies with mature, enterprise-ready features.

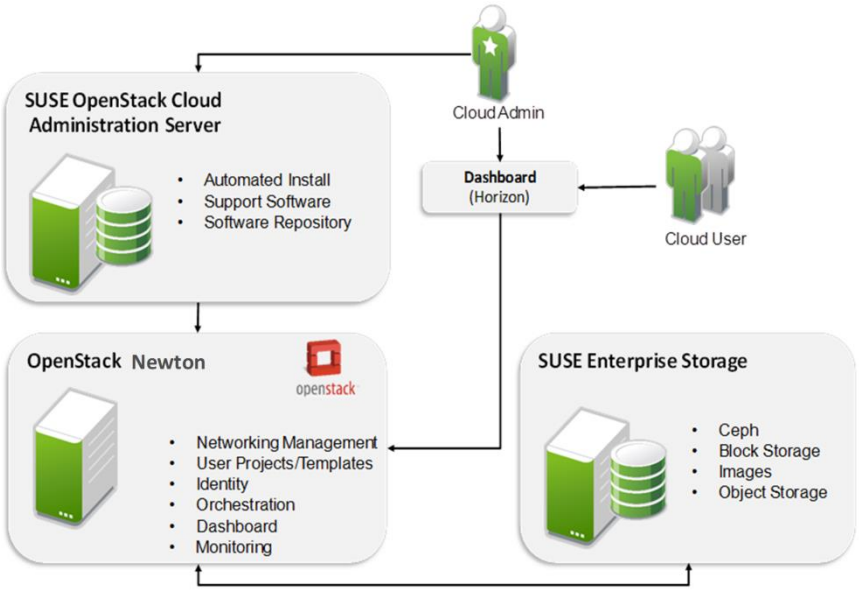
The Lenovo hardware platform provides an ideal infrastructure solution for cloud deployments. Available on Lenovo x86 based x3550 M5 and x3650 M5 Rack Servers, these platforms provide the full range of features and functions that are necessary to meet the needs of small businesses all the way up to large enterprises. With its utilization of industry standards with systems management on these servers, Lenovo enables seamless integration into Openstack cloud management tools.

HIGHLIGHTS

- Provides a cost-effective option to meet critical business needs for virtualized infrastructure management for managed service providers, cloud service providers, and enterprise private clouds
- Includes the latest data center equipment available such as the Lenovo x3650 M5 server, x3550 M5 server and Lenovo RackSwitch Ethernet switches
- This validated and highly optimized reference architecture dramatically reduces the complexity and management of OpenStack private and hybrid cloud implementations

Why Lenovo and Red Hat

Lenovo and SUSE have delivered successful, integrated solutions to customers worldwide through numerous collaborative efforts. These customers recognize Lenovo's leadership in the worldwide server market and SUSE's strong market position with the Linux operating system, OpenStack and software infrastructure.



Lenovo Implementation of SUSE OpenStack Cloud

The Lenovo Reference Architecture for SUSE OpenStack Cloud reduces the complexity of OpenStack 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. These servers deliver the performance and availability required for business-critical cloud infrastructure. The 2U x3650 M5 server can be equipped with two Intel Xeon E5-2600 v4 series processors, and as much as 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.

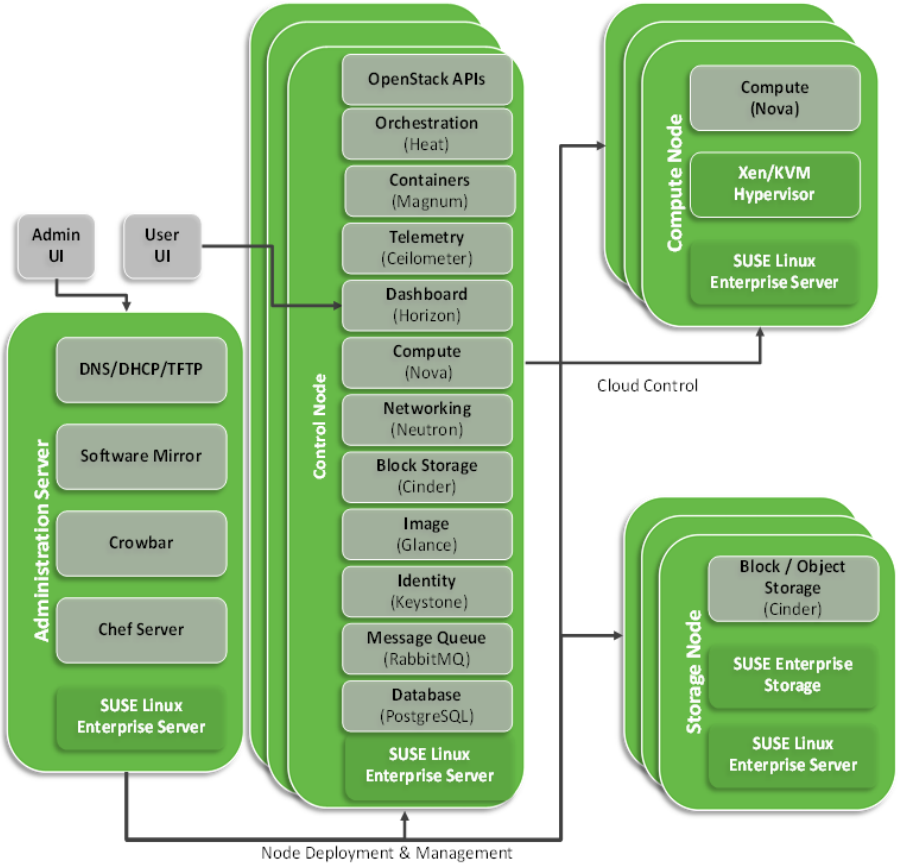
For compute, control and storage services, 10 GbE networking connectivity is standard for this architecture with the Lenovo RackSwitch G8124E. The Lenovo RackSwitch G8124E delivers exceptional performance that is lossless, low-latency, provides high availability and provides enterprise-class Layer 2 and Layer 3 functionality. 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.

The Lenovo Reference Architecture for SUSE OpenStack Cloud is a certified OpenStack Powered Platform which has been validated through testing to provide API compatibility for OpenStack core services. Additional benefits to this solution include heterogeneous hypervisor support for Windows Hyper-V, VMware, Xen, and KVM as well as centralized resource tracking for optimized and automated deployment of services.

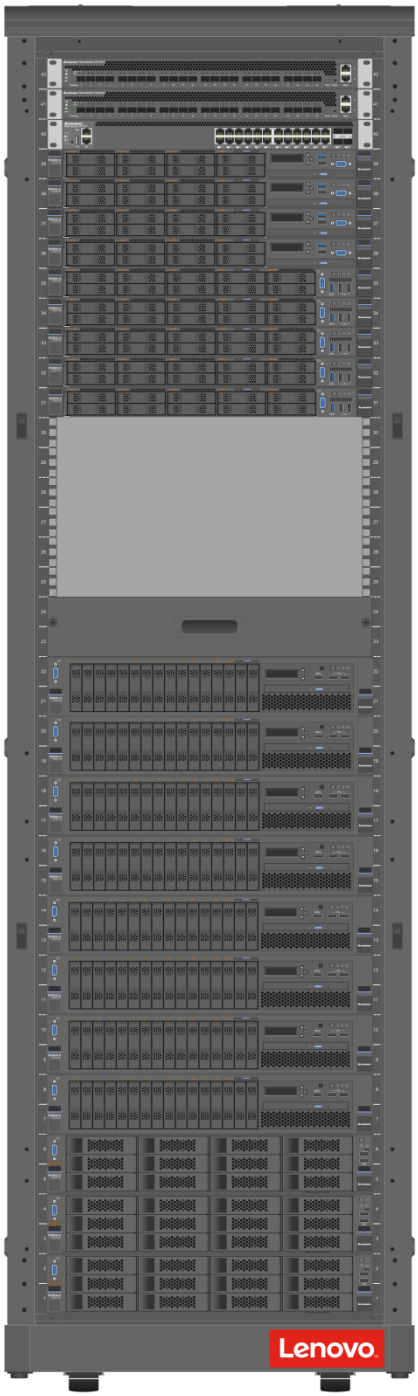
To simplify installation and deployment, this solution features automated installation, configuration, and deployment processes for Control, Compute and Storage Nodes, via Crowbar and Chef. To address reliability, it features a highly available control plane for keeping all core OpenStack services running and available. This solution also features a distributed software defined storage solution providing block, image, and object storage, via SUSE Enterprise Storage based on the open source Ceph project.

This reference architecture combines the latest systems management features of the Lenovo XClarity Administrator software with the management suite for SUSE OpenStack Cloud. Lenovo XClarity is an agentless centralized resource management solution that that is aimed at reducing complexity, speeding response, and enhancing the availability of Lenovo server systems. The solution seamlessly integrates into Lenovo M5 rack servers. Through an uncluttered, dashboard driven GUI, XClarity provides automated discovery, monitoring, firmware updates, pattern-based configuration management, hypervisor operating system deployments. The advanced level of integration between Lenovo and SUSE OpenStack Cloud allows you to control your private cloud implementation with confidence and enhances your total system reliability.

The Lenovo Reference Architecture for SUSE OpenStack Cloud provides the speed, scalability and reliability that cloud service providers and multitenant service providers need for high-performance, high availability, and ease of management. The example below shows the full rack system configuration for this reference architecture. Configurations may also be customized to best suit the workloads running in your environment. To accelerate time to value, Lenovo has service offerings and expertise to implement this reference architecture and to accommodate customization.



Lenovo Featured SUSE OpenStack Cloud Nodes



Cloud-optimized Lenovo x3650 M5 and x3550 M5 servers, along with Lenovo G8272 and G8124E RackSwitch networking, form the foundation of the Lenovo Reference Architecture for SUSE OpenStack Cloud

Architecture Brief

Lenovo Reference Architecture for SUSE OpenStack Cloud

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 Reference Architecture for SUSE OpenStack Cloud, contact your Lenovo Business Partner or visit:

www.lenovo.com/systems/solutions

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