



## Preface

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OpenStack is a free and open source Infrastructure-as-a-Service (IaaS) cloud computing project released under the Apache License. It enables enterprises and service providers to offer on-demand computing resources by provisioning and managing large networks of virtual machines. Red Hat's OpenStack technology uses upstream OpenStack open source architecture and enhances it for Enterprise and service provider customers with better support structure. The Cisco Unified Computing System with Cisco Nexus is a next-generation data center platform that unites computing, network, storage access, and virtualization into a single cohesive system. Cisco UCS with nexus is an ideal platform for the OpenStack architecture.

- Combination of Cisco UCS platform, Nexus and Red Hat Enterprise Linux OpenStack Platform architecture accelerates your IT.
- Transformation by enabling faster deployments, greater flexibility of choice, efficiency, and lower risk.
- This Cisco Validated Design document focuses on the Red Hat Enterprise Linux Platform on UCS and Nexus Platform for small to medium size business segments.

## Introduction

Virtualization is a key and critical strategic deployment model for reducing the Total Cost of Ownership (TCO) and achieving better utilization of the platform components like hardware, software, network and storage. However choosing the appropriate platform for virtualization can be a tricky task. The platform should be flexible, reliable, and cost effective to facilitate the virtualization platform to deploy various enterprise applications. Also the ability to slice and dice the underlying platform to size the application is an essential requirement for a virtualization platform to utilize compute, network, and storage resources effectively.

In this regard, the Cisco UCS solution implementing Red Hat Enterprise Linux OpenStack Platform provides a very simplistic yet fully integrated and validated infrastructure for you to deploy VMs in various sizes to suite your application needs. The Cisco Nexus® Switches are high-performance, high-density Ethernet switches that are part of the Cisco Network portfolio. These compact one-rack-unit (1RU) form-factor 10 Gigabit Ethernet switches provide line-rate Layer 2 and 3 switching. They run the industry-leading Cisco® NX OS Software operating system, providing customers with comprehensive features and functions that are widely deployed globally. They support both forward and

reverse airflow schemes with AC and DC power inputs. The Cisco Nexus 3064 switches are well suited for data centers that require cost-effective, power-efficient, line-rate Layer 2 and 3 top-of-rack (ToR) switches.

## Audience

The reader of this document is expected to have the necessary training and background to install and configure Red Hat Enterprise Linux, Cisco Unified Computing System (UCS), Cisco Nexus and Unified Computing Systems Manager as well as high level understanding of OpenStack components. External references are provided where applicable and it is recommended that the reader be familiar with these documents.

Readers are also expected to be familiar with the infrastructure and network and security policies of the customer installation.

## Document Purpose

This document describes the steps required to deploy and configure Red Hat Enterprise Linux OpenStack Platform architecture on Cisco UCS and Cisco Nexus platform to a level that will allow for confirmation that the basic components and connections are working correctly. The document addresses Small- to Medium-sized Businesses; however the architecture can be very easily expanded with predictable linear performance. While readers of this document are expected to have sufficient knowledge to install and configure the products used, configuration details that are important to this solution's deployment s are specifically mentioned.

## Solution Overview

This Red Hat Enterprise Linux OpenStack Platform architecture on a Cisco UCS and Cisco Nexus platform solution provides an end-to-end architecture with Cisco, Red Hat, and OpenStack technologies that demonstrate high availability and server redundancy along with ease of deployment and use.

The following are the components used for the design and deployment:

- Cisco Nexus Top of Rack Switch
- Cisco Unified Compute System (UCS) 2.1(3b)
- Cisco C-Series Unified Computing System servers for compute and storage needs
- Cisco UCS VIC adapters
- Red Hat Enterprise Linux OpenStack Platform 4.0 architecture
- CEPH storage module supported by Ink Tank

# References

The following references are available for consideration.

- [Cisco UCS](#)
- [Cisco UCSM 2.1 Configuration Guides](#)
- [Red Hat OpenStack 4 Reference Architecture](#)
- [Ceph Installation and Configuration](#)
- [Cisco Nexus 3k Series Switch](#)
- [Cisco Nexus 3064 Switch](#)

