WIND™
EDUCATION SERVICES

LINUX FOUNDATION

OPENSTACK CLOUD ARCHITECTURE AND DEPLOYMENT

COURSE DESCRIPTION

OpenStack is growing at an unprecedented rate, and there is incredible demand for individuals who have experience managing this cloud platform. In this course you will become adept at managing and using private and public clouds with OpenStack, and develop hands-on experience with essential commands, automation, and troubleshooting.

OpenStack Cloud Architecture and Deployment teaches you how to deploy, administer, and use the core OpenStack services. Each objective focuses on practical requirements for managing and using an OpenStack cloud. The course emphasizes both architectural concepts and practical demonstrations, with students performing hands-on labs for each objective.

The course covers full lifecycle OpenStack services, including deployment, administration, usage, and distributed storage. Core OpenStack services covered include computing (using Nova), networking (using Neutron), distributed storage (using Ceph), orchestration (using Heat), telemetry (using Ceilometer), imaging (using Glance), and identity (using Keystone).

The course introduces the OpenStack Horizon GUI, and provides extensive coverage of command line tools and automation with Heat templates. It also covers service administration across all core services.

After taking this course, participants will be able to perform the following:

- Evaluate OpenStack's capabilities for private and public cloud services
- Use OpenStack to create and deploy enterprise infrastructure-as-a-service
- Orchestrate virtual machine provisioning and management
- Administer and troubleshoot OpenStack Neutron, Ceph, and Nova services

PRODUCTS SUPPORTED

- OpenStack KILO release

Course title:	**OpenStack Cloud Architecture and Deployment**
Duration:	Three days
Format:	Instructor-led lectures and hands-on lab sessions delivered as Live Remote classes
Content:	**Day 1:** Introduction; Cloud Fundamentals; Managing Guest Virtual Machines with OpenStack Compute; Components of an OpenStack Cloud **Day 2:** : Reference Architecture; Deploying Prerequisite Services; Deploying Services Overview; Advanced Software-Defined Networking with Neutron **Day 3:** Distributed Cloud Storage with Ceph; High Availability in the Cloud; Cloud Security with OpenStack; Monitoring and Metering; Cloud Automation; Conclusion

COURSE FORMAT

- This three-day expert-led course consists of lectures and lab sessions.
- Participants examine and exercise simulated network topologies in hands-on labs.
- Participants receive individual guidance from an expert engineer who has extensive experience with OpenStack technologies.

AUDIENCE

- Architects, system administrators, and DevOps staff who design, deploy, and operate OpenStack clouds
- Administrators and developers deploying applications and infrastructure on OpenStack
- IT professionals in sales, marketing, and services seeking to expand their knowledge of cloud services and OpenStack

PREREQUISITE SKILLS

- Knowledge of Linux system administration, concepts, and administration for networking, storage, and virtual systems
- Basic Linux command line skills

PREREQUISITE COURSES

- None

RELATED COURSES

- Wind River Titanium Server Essentials

SYLLABUS

Day 1

INTRODUCTION

- Linux Foundation
- Linux Foundation training
- Logistics
- **LAB: Class Registration**

CLOUD FUNDAMENTALS

- The cloud
- Conventional data center architecture
- Virtualization
- Cloud architecture
- Basic tenets of open cloud computing
- **LAB: Accessing the Lab Environment**
- **LAB: Installing DevStack OpenStack Software**
- **LAB: Starting OpenStack**

MANAGING GUEST VIRTUAL MACHINES WITH OPENSTACK COMPUTE

- Using the OpenStack dashboard
- Using the python-novaclient command line interfaces
- **LAB: Deploying and Managing an Instance**
- **LAB: Adding a Compute Host**
- **LAB: Exploring Command Line Tools**
- **LAB: Decommissioning a Compute Node**

COMPONENTS OF AN OPENSTACK CLOUD

- General introduction to OpenStack components
- OpenStack compute: Nova
- Overview of hypervisor back ends
- OpenStack image service: Glance
- OpenStack identity: Keystone
- OpenStack block storage: Cinder
- OpenStack dashboard: Horizon

COMPONENTS OF AN OPENSTACK CLOUD—PART TWO

- OpenStack object storage: Swift
- OpenStack networking: Networking
- OpenStack monitoring: Ceilometer
- OpenStack orchestration: Heat
- OpenStack DBaaS: Trove
- The Oslo framework

Day 2

REFERENCE ARCHITECTURE

- Node roles
- Best practices
- Scalability

DEPLOYING PREREQUISITE SERVICES

- Time management: NTP
- Relational database
- AMQP server: RabbitMQ

DEPLOYING SERVICES OVERVIEW

- Deploying a service
- Deploying the Glance image service
- Deploying networking with Neutron
- **LAB: Installing and Configuring the RDO OpenStack Deployment**

ADVANCED SOFTWARE-DEFINED NETWORKING WITH NEUTRON

- An introduction to SDN
- Layer 2 networking primer
- An introduction to OpenFlow
- An introduction to Open vSwitch
- L3 and DHCP primer
- An introduction to Linux network namespaces
- Understanding Neutron packet flows
- OpenStack routing models
- Alternative Neutron back ends
- The Neutron ML2 framework
- **LAB: Deploying Neutron Networks**
- **LAB: Launching an Instance and CLI Tasks**
- **LAB: Connecting from One Instance to Another**

Day 3

DISTRIBUTED CLOUD STORAGE WITH CEPH

- An introduction to Ceph
- RADOS block device
- RADOS gateway
- Deploying a three-node Ceph cluster
- Using Ceph RBD for Glance image storage
- Using Ceph RBD for Cinder block storage
- Radosgw for Swift-compatible object access
- **LAB: Deploying Ceph into RDO OpenStack**
- **LAB: Deploying a Monitor**
- **LAB: Deploying Two OSD Nodes**
- **LAB: Adding and Removing an OSD in the Cluster**
- **LAB: Configuring Glance to Use Ceph**
- **LAB: Advanced System Creation**

HIGH AVAILABILITY IN THE CLOUD

- An introduction to high availability
- An introduction to the Pacemaker high availability stack
- Resource management in Pacemaker
- Highly available OpenStack reference architecture
- OpenStack VM high availability

CLOUD SECURITY WITH OPENSTACK

- Keystone authentication model
- Network security
- Hypervisor security

MONITORING AND METERING

- Deployment considerations for cloud monitoring
- OpenStack Ceilometer
- Metering
- Billing

CLOUD AUTOMATION

- Cloud deployment
- Cloud configuration management
- Puppet
- Heat

CONCLUSION

- Further resources

GLOBAL REACH OF WIND RIVER EDUCATION SERVICES

With more than 30 years of experience in intelligent connected systems, Wind River provides education services in every region of the world. Our private classes can be tailored to your needs by adding or removing topics from multiple courses. If you have more specific project challenges, Wind River Mentoring provides coaching by experienced engineers to help you integrate Wind River solutions into your environment. And when you're too busy to attend a whole class, our On-Demand Learning options provide around-the-clock access to advanced and specialized topics. All of our education services are led by expert engineers who are closely connected to the Wind River technical community for access to specific expertise.

CONTACT US

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