

# OpenStack Training

Instructor Led Live Virtual Class

Duration: 10 Day (10-20 hours) | Course Number: LF-OS-200



Cloud computing is transforming enterprise IT as well as communication service provider networks and OpenStack is the open source Infrastructure as a Service (IaaS) solution for building and managing shared clouds. This course provides a conceptual understanding of the benefits, capabilities, architecture as well as the high-level architecture of the OpenStack IaaS. Then we explain the functionality provided by each of the key services such as Glance, Keystone, Nova, Glance, Neutron, Cinder, and Swift as well as Heat orchestration. Finally, we will discuss OpenStack orchestration and telemetry services and how it integrates with NFV and SDN.

## Intended Audience

This course is designed for professionals in the industry who need to develop a high-level understanding of OpenStack.

## Learning Objectives

After completing this course, the student will be able to:

- Explain the motivation for implementing IaaS
- Define IaaS and Cloud Computing Options
- Identify the benefits and applications of IaaS and OpenStack.
- Diagram OpenStack's Logical and Physical architectures.
- Discuss roles of various OpenStack Services
- Describe how OpenStack IaaS can provide redundancy for a tenant Virtual Machine
- List capabilities of Role Based Authentication and Control for OpenStack user management
- Discuss how OpenStack integrates with NFV and SDN
- Describe OpenStack orchestration and Telemetry services

## Suggested Prerequisites

- Cloud Computing Technologies such as AWS, Azure and Google Compute
- Virtualization basics
- Linux Fundamentals

## Course Outline

1. Prologue
  - a. Introduction to cloud computing
  - b. Role of OpenStack in NFV and SDN Networks
  - c. OpenStack services highlights
2. OpenStack IaaS Architecture and Services
  - a. Brief history and releases
  - b. OpenStack components and architecture, and supporting systems
  - c. OpenStack services on physical hosts and physical networks
  - d. Cloud segregation techniques
3. Virtualization and Cloud Fundamentals
  - a. Physical vs. Virtualized
  - b. Hypervisor – What and why?
  - c. Resource Virtualization
  - d. Virtual machines vs. containers

4. OpenStack Capabilities and Limitations
  - a. OpenStack Capabilities and Limitations
  - b. Key capabilities
  - c. Multi-tenancy
  - d. Role-based authentication
  - e. Lifecycle management
  - f. VM instantiation
  - g. Message queue (RabbitMQ)
  - h. Storage
  - i. Limitations and disadvantages
  - j. Introduction to OpenStack IaaS
5. Identity Service (Keystone)
  - a. Keystone concepts
  - b. Keystone authentication and authorization policy enforcement.
  - c. Keystone database and service catalogue
6. Compute Service (Nova)
  - a. Nova capabilities, components and service daemons
  - b. Nova under-the-hood VM provisioning trace
  - c. Scheduler and filter algorithms
7. Image Service (Glance)
  - a. Glance overview capabilities and concepts
  - b. Glance services
8. Networking Service (Neutron)
  - a. Networking capabilities, components and service agents
  - b. Network use cases
  - c. Under-the-hood implementation
  - d. Network frame trace
9. Block Storage Service (Cinder)
  - a. Cinder overview
  - b. Cinder architecture
  - c. Cinder volume management, configuration and log files
10. Object Service (Swift)
  - a. Swift capabilities, architecture and service daemons
  - b. Account, Container, Object WalkThrough
  - c. Swift deployment considerations
11. Telemetry Service (Ceilometer)
  - a. Capabilities, components and service daemons
12. Orchestration (Heat)
  - a. Capabilities, components and service daemons
  - b. Heat Stack templates