



# OS250: OpenStack Accelerated Bootcamp

**UPDATE! The OpenStack Accelerated Bootcamp (OS250) has been updated for the OpenStack Rocky release.**

This course provides a complete preparation for the OpenStack Certified Administrator (COA) exam and includes one free attempt at the COA exam.

The OpenStack Accelerated Bootcamp (OS250) extends beyond our OpenStack Bootcamp I (OS100) with additional workshops, at a rapid pace. This course is intended for advanced students. All topics in the OpenStack Bootcamp I (OS100) are covered with additional workshops providing hands-on experience with installation and configuration of OpenStack. The OS250 provides participants with a detailed understanding of all of the steps necessary to operate an OpenStack environment.

The course is broken up into two sections: **lectures** and **labs**.

The **lectures** provide students with an overview of OpenStack and its Architecture, OpenStack Networking, and Orchestration using Heat templates, including integration with Telemetry services.

The **labs** provide hands-on experience in an all-in-one OpenStack environment. Students will be given opportunities to use and administer OpenStack using the Dashboard UI (Horizon) and the command line. Each lecture is followed by a series of lab exercises. During the lab exercises, students get to practice and engage with all core components of OpenStack. The labs conclude with a comprehensive review to solidify the hands-on skills that are required to operate an OpenStack environment.

The **certification** exam tests candidates' ability to create, configure, and manage OpenStack. You will be provided with a COA exam voucher upon completing the class.)

## Course Duration

- 4 Days

## Audience & Prerequisites

- Systems Administrators
- Deployment Engineers
- Technical IT Professionals
- Strong experience using Linux command line
- Experience editing conf files with vi
- Proficient with Linux, Networking, and Storage

## Objectives

The OpenStack Accelerated Bootcamp (OS250) covers the critical skills needed to operate, troubleshoot, and install an OpenStack environment. Upon completion of the course, students will have gained an extensive understanding of the objectives below:

- Describe the architecture of an OpenStack cloud environment
- Define the key features of OpenStack
- Identify suitable use-cases for OpenStack
- Use the image, identity, network, and block storage/volume services
- Use the compute service to launch instances and manage quotas
- Use the orchestration service to deploy instances
- Use the CLI and Dashboard UI (Horizon)
- Create and manage users, projects, roles, permissions, and ACLs
- Manually install and configure OpenStack from scratch

## Outline

- Cloud fundamentals
- OpenStack business values
- OpenStack overview and architecture
- OpenStack Identity (Keystone), Image (Glance), Block Storage (Cinder), Compute (Nova), Orchestration (Heat) services
- OpenStack networking deep dive
- OpenStack operations through the Dashboard UI and CLI
- Install and configure supporting services plus many OpenStack components (Keystone, Glance, Neutron, Heat, and so on)

## Course Syllabus

### Module 1

Introduction to OpenStack

#### Theory

- What is Cloud?
- OpenStack business value
- What is OpenStack?
- Introducing the OpenStack projects
- OpenStack deployment considerations

#### Workshops

- Understanding the classroom environment
- Exploring the Dashboard UI (Horizon)

### Module 2

OpenStack Architecture -  
VM Request Process Flow

#### Theory

- Identity service (Keystone)
- Compute service (Nova)
- Image service (Glance)
- Network service (Neutron)
- Block Storage/Volume service (Cinder)

#### Workshops

- Create, manage, and access Virtual Machines
- Create and manage images
- Create and manage volumes
- Create and manage projects and users

### Module 3

Networking Basics

#### Theory

- OpenStack networks
- Network/device/switch virtualization
- Overlay networks

#### Workshops

- There are no workshops for this lecture

### Module 4

OpenStack networking (Neutron) deep dive

#### Theory

- Neutron overview: Abstractions and architecture with plugins
- ML2 plugin
- IPAM, DHCP, L3 agents
- Floating IP addresses
- Network namespaces
- Load Balancer as a Service (LBaaS) v2 - Octavia
- Introduction to Linux Bridge
- Introduction to Open vSwitch (OVS)
- Security groups

#### Workshops

- Configuring a software load balancer using Octavia
- OpenStack networking and admin operations
- Create and manage networks
- Using security groups to allow ingress traffic
- Using Floating IPs for ingress traffic
- Administering policy controlling user permissions

### Module 5

Orchestration (Heat) and Telemetry services

#### Theory

- Heat overview and architecture
- Heat Orchestration Template (HOT) syntax and examples
- Using Heat and cloud-init to customize VMs at boot time
- Validating Heat templates
- Autoscaling with Heat/Ceilometer/Gnocchi/Aodh

#### Workshops

- Become familiar with Heat template format
- Launch and manage Heat stacks from the CLI and dashboard
- Create a Heat template

### Module 6

Comprehensive Practice Workshops

#### Workshops

- Re-enforcing practical skills with comprehensive exercises

## Module 7

OpenStack Manual  
Deployment

### Workshops

- Configuring the operating system (Ubuntu 18.04 LTS) and networking
- Installing and configuring database (MySQL) and messaging (RabbitMQ) servers  
Installing and configuring the OpenStack Identity service (keystone)
- Installing and configuring the OpenStack Image service (glance)
- Installing the OpenStack Networking (neutron) services
- Installing and configuring the Neutron networking agents (ML2, L3, DHCP) to work with Open vSwitch
- Installing and configuring the OpenStack Block Storage service (Cinder)
- Installing and configuring the OpenStack Compute service (Nova)
- Installing and configuring the OpenStack dashboard UI (Horizon)
- Installing and configuring the OpenStack Orchestration service (Heat)