

CANONICAL



OpenStack Fundamentals

Training Curriculum

Prepared For: Customers

Prepared By: Canonical

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Table of Contents

Introduction & Scope	2
Audience	2
Prerequisites	2
Objectives	3
Outline	3
Additional Topics	5

Introduction & Scope

The OpenStack Fundamentals Training is designed to give new users and administrators a practical, hands-on introduction to using OpenStack clouds.

This training provides a solid foundation in OpenStack concepts, architecture, and workflows, while also showcasing Canonical's unique approach to building and operating OpenStack with tools such as ROCKS, Snaps, Charms, and Sunbeam.

Over the course of the training, participants will:

- Explore the OpenStack ecosystem and Canonical's role within it.
- Gain an understanding of the core OpenStack services—including Keystone, Glance, Neutron, Nova, Cinder, Octavia, and others—through both theory and guided labs.
- Learn how Canonical tools—MAAS, Juju, Landscape, etc.—and other open source projects—KVM, OVN, Ceph, etc.—integrate with OpenStack to deliver a complete production-ready cloud.
- Practice deploying, configuring, and accessing OpenStack resources via the command line, and dashboard.
- Experiment with deploying workloads and cloud-native applications on top of OpenStack using a variety of tools, including Heat, Juju, Ansible, and Terraform.

The course combines lectures with extensive lab exercises, ensuring participants build real, practical skills. By the end of the training, attendees will be able to confidently launch, manage, and scale applications in an OpenStack environment, and will understand the key building blocks required to operate Canonical OpenStack in production.

Audience

- OpenStack users
- OpenStack administrators with no previous experience with OpenStack

Prerequisites

- General knowledge of Linux system fundamentals
- Familiarity with the terminal and basic UNIX commands

Objectives

- Learn OpenStack
- Learn how to use OpenStack:
 - Tenant-level access
 - API-level access

Outline

- What is OpenStack?
 - Overview
 - Canonical's role in the OpenStack ecosystem
 - Exercise: launch sample instance and log into it:
 - via SSH
 - via OpenStack dashboard
- OpenStack architecture:
 - Components
 - API Endpoints
 - Backends/drivers
 - Projects
 - Resources
- OpenStack components and their functions:
 - Services
 - Dashboard
 - Usage
 - Client
 - Usage
 - SQL databases
 - Message queues
- Canonical OpenStack architecture:
 - ROCKS
 - Snaps
 - Charms
 - Sunbeam
- Canonical OpenStack components and their functions
 - MAAS
 - Juju
 - Canonical Kubernetes
 - KVM
 - OVN
 - Ceph

- Vault
- COS
- Landscape
- OpenStack services:
 - Keystone:
 - Overview
 - Usage (CLI and GUI)
 - Glance:
 - Overview
 - Usage (CLI and GUI)
 - Neutron:
 - Overview
 - Usage (CLI and GUI)
 - Nova:
 - Overview
 - Usage (CLI and GUI)
 - Placement:
 - Overview
 - Usage (CLI and GUI)
 - Cinder:
 - Overview
 - Usage (CLI and GUI)
 - Octavia:
 - Overview
 - Usage (CLI and GUI)
 - Designate:
 - Overview
 - Usage (CLI and GUI)
 - Barbican:
 - Overview
 - Usage (CLI and GUI)
 - Heat:
 - Overview
 - Usage (CLI and GUI)
- Using OpenStack:
 - Deploying cloud-ready applications:
 - Templates:
 - Images
 - Flavors
 - SSH keys
 - Customizing images with cloud-init
 - Various types of storage and when to use them
 - Security groups and how to use them

- Scaling applications out and in
- Deploying across multiple availability zones
- Deploying in a specific region
- with Heat:
 - Overview
 - Sample application deployment
- with Juju:
 - Overview
 - Sample application deployment
- with Ansible:
 - Overview
- with Terraform:
 - Overview

Additional Topics

If there is any remaining time during the Training, the trainer will make efforts to cover additional topics or provide clarifications based on questions from the customer during the training session.