

CANONICAL



OpenStack Fundamentals

Training Curriculum

Prepared For:	Canonical
Prepared By:	Nicholas Dimotakis/Dan Ardelean
Prepared On:	02/04/2019
Version:	1.0

Table of Contents

Introduction & Scope	2
Agenda	2
Day 1	3
1. Introduction to an Ubuntu OpenStack Cloud	3
2. Install and Configure MAAS	3
Lab I	3
3. Install and Configure Juju	4
Lab II	4
4. Configure an OpenStack Cloud	4
Day 2	4
5. Deploy and OpenStack Cloud with Juju and MAAS	4
Lab III	5
6. Work with Software-Defined Networks	5
Lab IV	5
7. Work with Cloud Images	5
Lab V	5
8. Configure an OpenStack Project	5
Lab VI	5
9. Work with Cloud Workload Instances	6
Lab VII	6
Day 3	6
10. Work with OpenStack Storage	6
Lab VIII	7
11. Configure Juju to Manage a Tenant in an OpenStack Cloud	7
Lab IX	7
Additional Topics	7

Introduction & Scope

This document provided a high level overview of the topics which are covered during the 3 days under the curriculum of the OpenStack Fundamentals Training.

The Ubuntu OpenStack Fundamentals Training programme is an intensive 3-day hands-on course that will give students the best introduction to setting up and running Ubuntu OpenStack clouds.

The 3-day training course will cover everything you need to know about Ubuntu Server in the cloud and will focus on building an Openstack environment using Ubuntu OpenStack and our best in industry cloud tools:

- MAAS for bare-metal provisioning
- Juju for fast and easy deployment of OpenStack and cloud services

Starting with a single standard installation of Ubuntu Server, the instructor will lead the students through the process of creating a complete cloud infrastructure with MAAS and Juju. Students will go through a complete OpenStack installation and configuration, and also learn how to use Ubuntu cloud tools to deploy workloads quickly and efficiently.

All sessions are a combination of theory and lab work.

Agenda

The following items will be covered throughout the course of the three-day training:

1. Introduction to an Ubuntu OpenStack Cloud
2. Install and Configure MAAS
3. Install and Configure Juju
4. OpenStack Cloud Components
5. Deploy and Ubuntu OpenStack Cloud with Juju and MAAS
6. Work with Software-Defined Networks
7. Work with Cloud Images
8. Configure an OpenStack Project

9. Work with Cloud Workload Instances
10. Work with OpenStack Storage
11. Configure Juju to use a Private OpenStack Cloud

Day 1

1. Introduction to an Ubuntu OpenStack Cloud

- Understand OpenStack
- Understand Ubuntu's Approach to OpenStack

2. Install and Configure MAAS

- Understand MAAS Features and Functionality
- Understand MAAS Configuration Commands
- Install a MAAS Server
- Configure a MAAS Cluster
- Commission Machines with MAAS
- Work with Tags

Lab I

Prepare the Controller and Compute Nodes that will be part of the OpenStack cloud

- Install MAAS packages
- Perform initial configuration of a MAAS Server
- Configure a MAAS Rack Controller to Manage DHCP
- Enable MAAS to manage Libvirt Virtual Machines
- Create a Cloud Infrastructure of Virtual Machines
- Enlist and Commission Virtual Machines in MAAS
- Defines Tags for the Clouds Nodes

3. Install and Configure Juju

- Understand Juju Features and Functionality
- Understand Charms
- Understand Juju Configuration Commands
- Install and Configure Juju
- Deploy and Configure Services with Juju
- Understand Juju Service Deployment Troubleshooting

Lab II

Prepare the OpenStack deployment with Juju app modeller

- Install the Juju client
- Bootstrap Juju for MAAS
- Create Model for Ubuntu OpenStack Deployment
- Access Juju GUI
- Use juju ssh to connect to a Node

4. Configure an OpenStack Cloud

- Understand OpenStack
- Understand OpenStack Deployment Architecture
- Understand OpenStack Deployment Sizes
- Understand General OpenStack Configuration Commands
- Configure the Global OpenStack Environment

Day 2

5. Deploy and OpenStack Cloud with Juju and MAAS

- Understand OpenStack Deployment with Juju
- Understand Relationships Between Cloud Services
- Prepare OpenStack for Use

Lab III

Deploy OpenStack cloud in two methods, each charm individually or from a Bundle

- Deploy each OpenStack charm component individually
- Configure OpenStack CLI access
- Deploy OpenStack Cloud from a Bundle

6. Work with Software-Defined Networks

- Understand OpenStack Networking
- Understand Neutron Configuration Commands

Lab IV

Define the external network that will be used to communicate outside the Cloud

- Define the OpenStack external network

7. Work with Cloud Images

- Understand Glance Features and Functionality
- Understand Glance Configuration Commands

Lab V

Create the Images that are used to Instance creation

- Upload Images into Glance

8. Configure an OpenStack Project

- Understand OpenStack Tenants/Projects
- Understand Keystone Configuration Commands
- Understand Key Pairs, Security Groups and Quotas
- Understand Tenant/Project Networking

Lab VI

Create and define user Projects in OpenStack

- Create an OpenStack Project
- Configure Access to a Project in OpenStack
- Generate Key Pairs for Workloads Instances Access
- Define Security Groups for ICMP traffic
- Define Security Groups for SSH traffic
- Define Quotas for a Project
- Configure Virtual Networks for a Project
- Assign Public IP Addresses to a Project

9. Work with Cloud Workload Instances

- Understand Nova Features and Functionality
- Understand Nova Configuration Commands

Lab VII

Create and define Workload Instances

- Define Custom Instance Sizing Flavors
- Define Host Aggregates
- Define a Custom Instance Sizing Flavor for a Host Aggregate
- Create a Cloud Instance
- Expose the Cloud Instance to the External Network

Day 3

10. Work with OpenStack Storage

- Understand OpenStack Storage
- Understand Cinder Features and Functionality
- Understand Cinder Configuration Commands
- Understand Swift Features and Functionality
- Understand Swift Configuration Commands
- Understand Ceph Features and Functionality

Lab VIII

Work with Object and Block Storage

- Attach Volume Storage to a Cloud Workload Instance
- Upload Objects into Swift
- Download an Object from the Object Store

11. Configure Juju to Manage a Tenant in an OpenStack Cloud

- Configure Juju to Work with OpenStack

Lab IX

Use the deployed OpenStack Cloud as a Provider for Juju

- Generate Simplestreams Metadata for a Private Cloud
- Configure Juju to use OpenStack as a Provider
- Deploy a Ghost Application Stack on the OpenStack Cloud
- Remove the Stack
- Create and deploy the Stack from a Bundle

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.