

# Module 01 - Infrastructure Setup

## 1.1 EC2 Walkthrough

## 1.2 Installation of DevOps Tools in the Cloud

- Git
- Docker
- Selenium
- Jenkins
- Puppet
- Ansible
- Kubernetes
- ELK

# Module 02 - Introduction to DevOps

## 2.1 What is Software Development?

- 2.2 Software Development Life Cycle
- 2.3 Traditional Models for SDLC
- 2.4 Why DevOps?
- 2.5 What is DevOps?
- 2.6 DevOps Lifecycle
- 2.7 DevOps Tools

## **Module 03 - Version Control with Git**

- 3.1 What is Version Control?
- 3.2 Types of Version Control System
- 3.3 Introduction to SVN
- 3.4 Introduction to Git
- 3.5 Git Lifecycle
- 3.6 Common Git Commands
- 3.7 Working with Branches in Git
- 3.8 Merging Branches
- 3.9 Resolving Merge Conflicts
- 3.10 Git Workflow

## **Hands-on Exercise –**

1. Git Life cycle Commands
2. Pushing Code to GitHub
3. Stashing Code in Git
4. Creating, Deleting Git Branches
5. Reverting a Push to GitHub
6. Merging branches using git merge
7. Merging branches using git rebase
8. Resolving merge conflicts using the git merge tool

## **Module 04 - Containerization Using Docker - 1**

- 4.1 Introduction to Docker
- 4.2 Understanding Docker Lifecycle
- 4.3 Components of Docker Ecosystem
- 4.4 Common Docker Operations

4.5 Creating a DockerHub Account

4.6 Committing changes in a Container

4.7 Pushing a Container Image to

DockerHub

4.8 Creating Custom Docker Images using

Dockerfile

## **Hands-on Exercise –**

1. Common Docker Operations

2. Creating a DockerHub Account

3. Committing Changes to a Container

4. Pushing container to DockerHub

5. Creating Local Image Repository

6. Building an Image using Dockerfile

## **Module 06 - Ansible**

6.1 What is Ansible?

6.2 Ansible vs Puppet

6.3 Ansible Architecture

6.4 Setting up Master-Slave using Ansible

6.5 Ansible Playbook

6.6 Ansible Roles

6.7 Applying configuration using Ansible

## **Hands-on Exercise –**

1. Installing Ansible on AWS

2. Creating a Playbook using YAML

3. Creating an Ansible Role

4. Using Roles in Playbook

# **Module 07 - Continuous Testing using Selenium**

7.1 What is Continuous Testing?

7.2 What is Maven?

7.3 Introduction to Selenium

7.3 Running Test Cases on Chromium Web

Driver

7.4 What is Headless Mode?

**Hands-on Exercise –**

1. Using Maven to import dependencies in Eclipse
2. Implementing a headless test using Chrome WebDriver

## **Module 08 - Continuous Integration with Jenkins**

- 8.1 Introduction to Continuous Integration
- 8.2 Jenkins Master-Slave Architecture
- 8.3 Understanding CI/CD Pipelines
- 8.4 Creating an end-to-end automated CI/CD Pipeline

**Hands-on Exercise –**

1. Creating a Jenkins Master-Slave on AWS
2. Installing Plug-ins in Jenkins
3. Creating Jenkins Builds
4. Creating Scheduled Builds
5. Triggering Jobs using Git Webhooks
6. Using the Pipeline Plugin in Jenkins

## **Module 09 - Introduction to Kubernetes Part 1**

- 9.1 Introduction to Kubernetes
- 9.2 Docker Swarm vs Kubernetes
- 9.3 Kubernetes Architecture
- 9.4 Deploying Kubernetes using Kubeadms
- 9.5 Alternate ways of deploying Kubernetes
- 9.6 YAML Files
- 9.7 Creating a Deployment in Kubernetes using YAML
- 9.8 Services in Kubernetes
- 9.9 Ingress in Kubernetes

## 9.10 Case Study – Kubernetes Architecture

### Hands-on Exercise –

1. Setting up Kubernetes using kubectl
2. Installing Kubernetes using kops and GCK
3. Creating a Deployment
4. Creating Services
5. Creating an Ingress
6. Demonstrating the use of Ingress, services, and deployments together

## Module 10 - Introduction to Kubernetes Part 2

- 10.1 What are volumes?
- 10.2 Types of volumes
- 10.3 Persistent volumes
- 10.4 Introduction to secrets

- 10.5 Taints and tolerations
- 10.6 Introduction to Federation
- 10.7 Kubernetes Monitoring
- 10.8 Setting up Prometheus
- 10.9 Setting up Grafana

## **Hands-on Exercise –**

1. Creating volumes
2. Creating Persistent Volumes
3. Creating and working with secrets, Taints, and Tolerations
4. Controlling clusters from the outside
5. Setting up and working with Prometheus
6. Setting up and working with Grafana

# **Module 11 - Continuous Monitoring using ELK**

- 11.1 Agenda

11.2 What is ELK?

11.3 Components of ELK

11.4 ELK Flow

11.5 Features of ELK

11.6 ELK installation

## **Hands-on Exercise –**

1. Analyzing Apache Logs with Logstash & Kibana

2. Analyzing .csv logs with Logstash & Kibana

3. Analyzing Real-Time Web Logs with Beats & Kibana

# **Module 12 - Terraform Modules & Workspaces**

12.1 What is Infrastructure as a code

12.2 IaC vs Configuration Management

12.3 Introduction to Terraform

12.4 Installing Terraform on AWS

12.5 Basic Operations in Terraform

- init
- plan
- apply
- destroy

12.6 Terraform Code Basics

12.7 Deploying an end-to-end architecture on AWS using Terraform

**Hands-on Exercise –**

1. Installing Terraform
2. Initializing AWS Terraform Provider
3. Creating an EC2 instance using

# Terraform

4. Updating changes to EC2 using Terraform

5. Destroying EC2 using Terraform

6. Deploying EC2 inside a custom VPC using Terraform