DevOps bootcamp for Beginners

Duration: 6 days (8hrs/day)

Prerequisites:

- Basic knowledge of Linux Server Administration.

Course Objective: This comprehensive DevOps course, covering DevOps introduction, Continuous Integration (CI) and Continuous Deployment (CD) using Jenkins or Gitlab, – Infrastructure as Code (IaC) using Terraform, container management using Docker, container orchestration using Kubernetes, Collaboration and Communication using Git and GitHub and Observability using Prometheus is designed to equip learners with the skills needed to start working as DevOps engineer.

Tools: Latest version

Lab Requirement: Koenig-DC (https://linuxlab.koenig-solutions.com) + Student's Azure and Github account

Module 1 – Introduction to DevOps

Overview of DevOps

Introduction to DevOps

DevOps Tools and Ecosystem

Module 2 – Continuous Integration (CI) and Continuous Deployment (CD)

Ch:1 Jenkins

Introduction to Continuous Integration

Introduction to Jenkins

Jenkins Installation

Jenkins Management

Build Java Program

Run Jobs on Remote Machines

Junit Testing

Graphical View of Tests

Saving Artifacts in Jenkins

Introduction to Jenkins Pipeline

Jenkins Pipeline with Maven

Lab: All above topics will be covered with Lab Demonstration

Module 3 – Infrastructure as Code (IaC): Terraform

Ch:1 Getting Started & Setting Up Labs

Introduction to Infrastructure as Code and Terraform

Lab: Installation of Terraform on Windows

Comparison between Terraform and Ansible

Introduction to Azure CLI

Understanding Terraform Providers

Authenticate Azure with Terraform

Lab: Setting Up Terraform on Windows and Azure Authentication

Basic Terraform commands: init, plan, apply

Lab: Defining Provider & Using Basic Terraform commands

Ch:2 Building Cloud Infrastructure with Terraform

Lab: Creating Resource Groups in Azure

Lab: Provisioning Virtual Networks, Subnets, Public IPs, and Network Interfaces

Lab: Deploying Windows and Linux VMs

Understanding Terraform State file

Understanding Working of State file – Desired State & Current State

Module 4 – Containerization (Docker)

Ch:1 - Docker Administration

Introduction to Containers

Introduction to Docker

Docker Engine

Understanding Docker Images

Private Registry

Understand Storage Methods

Lab: Downloading and Installing Docker

Lab: Docker Essential Commands

Lab: Building Docker Images using docker commit

Lab: Storing and Retrieving Docker Images from Docker Hub

Lab: Building Containers from Images

Lab: Data Persistence with Volumes

Module 5 - Containerization Orchestration: Kubernetes

Ch:1 - Core Concepts

Overview of Container Orchestration

Introduction to Kubernetes

Kubernetes Architecture

Ch:2 – Installation, Configuration & Validation

Design a Kubernetes Cluster

Lab: Installation of Kubernetes 1-Master and 2-Nodes Cluster

Lab: Verify Installa9on with Kubectl command

Ch:3 - Managing Resources

Describe Pods

Describe Labels and Selector

Describe Replica Set

Describe Services

Describe Daemon Sets

Describe Namespaces

Lab: Managing Pods

Lab: Managing Labels & Selector

Lab: Managing Replica Set

Lab: Managing Cluster IP, Node Port

Lab: Installing Metal Load Balancer and Using Load Balancer Service

Lab: Managing Daemon Sets

Lab: Managing Namespaces

Module 6 - Collaboration and Communication: Git and GitHub

Ch:1 Introduction to Git

Get started with Git

Install Git

Using command line

Configure Git

Git folder

Initialize git

Ch:2 Creating files/folder with Git

Add new files to Git

Git staging

Git commits

Git Help

Working with Git Branches

Ch:3 Introduction to GitHub

GitHub Account

Repository on GitHub

Push Local Repo to GitHub

Editing in GitHub

Pulling from GitHub

Pushing to GitHub

Lab: All topics will be covered with Lab demonstration

Module 7 – Observability: Prometheus and Grafana

Ch:1 Core Concepts of Prometheus:

Introduction to Prometheus

Metrics

Targets

Scraping

PromQL

Alerting

Lab: Install and explore Prometheus on Linux based machine

Ch:2 Core Concepts of Grafana:

Introduction to Grafana

Data Sources

Dashboards

Queries

Alerting

Lab: Install and explore Grafana on Linux based machine

Ch:3 Integrating Prometheus with Grafana:

Prometheus as a data source

visualize and analyze metrics collected by Prometheus.

create custom dashboards displaying metrics collected by Prometheus.

Lab: Integrating Prometheus with Grafana