DevOps Tools Fundamentals and Implementing DevOps Solutions and Practices using Cisco Platforms

Linux + Docker + GitHub + Docker + Kubernetes + CICD with GitLab + DevOps on Cisco Platforms

Course Introduction

This course is designed for professionals who want to learn Devops on Cisco platform. The course has all the essential tools like docker, Github, Kubernetes and CICD. The course also teaches you how to automate application deployment, enable automated configuration, enhance management, and improve scalability of cloud microservices and infrastructure processes on Cisco® platforms. You will also learn how to integrate Docker and Kubernetes to create advanced capabilities and flexibility in application deployment. This course prepares you for the 300-910 Implementing DevOps Solutions and Practices using Cisco Platforms (DEVOPS) certification exam.

Duration: 10 Days (8 hours)

DevOps Overview

Module 1 – DevOps Overview

What is DevOps
Why DevOps
DevOps Lifecycle

Basic Linux

Module 2 – Linux Fundamentals

What is Linux
Basic Linux Commands
Understanding Linux File System Structure
Creating Files and Directories
Copying Files and Directories
Basics of VIM Editor
Managing Users
Understand Linux File System Permissions
Changing Permissions
Managing Services
Installing and Updating Software Packages with YUM

Docker

Module 3 – Docker Administration

Introduction to Containers
Introduction to Docker
Downloading and Installing Docker
Docker Essential Commands
Understanding Docker Images
Building Docker Images using Dockerfile
Storing and Retrieving Docker Images from Docker Hub
Pusing Image to Docker Registry

Git and GitHub

Module 4 – Git

Introduction to Version Control System
History of Git
Git Basics
States in Git
Installing Git
Configuration of Git
Working with Repositories
Basic Git Commands
Working with Remotes
Tagging
Git Branching

Kubernetes

Module 5 – Core Concepts

Overview of Container Orchestration
Introduction to Kubernetes

Kubernetes Architecture

Module 6 – Managing Resources

Managing Pods
Managing Labels & Selector

Managing Replica Set
Managing Service

Module 7 – Application Lifecycle Management

Overview of Deployment

Deployment Strategies
Managing Deployment

Module 8 – Environment Variable

Plain Key
Config Map
Secret

Module 9 – Logging and Monitoring

Understand how to Monitor all Cluster Components
Understand how to Monitor Applications
Manage Cluster Components Logs
Manage Application Logs
Integrate ELK with Kubernetes
Integrate Prometheus and Grafana with Kubernetes

GitLab

Module 10 – Gitlab CI Fundamentals

Introduction to Gitlab
Create a New Project
Building the project locally
Building the project using Gitlab CI
Adding a test stage
Running jobs in parallel Running

Module 11 – Gitlab CI to Build Docker Image and Deploy to Kubernetes

Create pipeline to automatically build image then push to Docker Registry
Create pipeline to automatically deploy image to Kubernetes

Implementing DevOps Solutions and Practices using Cisco Platforms

Outline

- Introducing the DevOps Model
- Introducing Containers
- Packaging an Application Using Docker
- Deploying a Multitier Application
- Introducing CI/CD
- Building the DevOps Flow
- Validating the Application Build Process
- Building an Improved Deployment Flow
- Extending DevOps Practices to the Entire Infrastructure
- Implementing On-Demand Test Environments at the Infrastructure Level
- Monitoring in NetDevOps
- Engineering for Visibility and Stability
- Securing DevOps Workflows
- Exploring Multicloud Strategies
- Examining Application and Deployment Architectures
- Describing Kubernetes
- Integrating Multiple Data Center Deployments with Kubernetes
- Monitoring and Logging in Kubernetes

Lab outline

- Interact with GitLab Continuous Integration (CI)
- Explore Docker Command-Line Tools
- Package and Run a WebApp Container
- Build and Deploy Multiple Containers to Create a Three-Tier Application
- Explore Docker Networking
- Build and Deploy an Application Using Docker Compose
- Implement a Pipeline in Gitlab CI
- Automate the Deployment of an Application
- Validate the Application Build Process
- Validate the Deployment and Fix the Infrastructure
- Build a Yaml Ain't Markup Language (YAML) Infrastructure as Code (IaC) Specification for the Test Environment
- Manage On-Demand Test Environments with Terraform
- Build Ansible Playbooks to Manage Infrastructure
- Integrate the Testing Environment in the CI/CD Pipeline
- Implement Pre-deployment Health Checks
- Set Up Logging for the Application Servers and Visualize with Kibana
- Create System Dashboard Focused on Metrics
- Use Alerts Through Kibana
- Instrument Application Monitoring
- Use Alerts and Thresholds to Notify Webhook Listener and Cisco Webex® Teams™ Rooms

- Secure Infrastructure in the CI/CD Pipeline
- Explore Kubernetes Setup and Deploy an Application
- Explore and Modify a Kubernetes CI/CD Pipeline
- Kubernetes Monitoring and Metrics—Elasticsearch, Logstash, and Kibana (ELK