

DevOps Tools

Duration: 13 Days (8 hours)

Git and GitHub

Module 1 – 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

Certified Kubernetes Application Developer

Module 1 – Core Concepts

- Overview of Container Orchestration
- Introduction to Kubernetes
- Kubernetes Architecture
- Design a Kubernetes Cluster

Module 2 – Configuration

- Discover and Use Resources that Extend Kubernetes (CRD)
- Understand Authentication, Authorization and Admission Control
- Understand ConfigMaps
- Understand Security Contexts
- Define an application's resource requirements
- Create and consume Secrets
- Understand Service Accounts

Module 3 – Multi Container Pods

- Understanding Multi-Container Pods
- Creating Multi-Container Pods

Module 4 – Observability

- Understand API Deprecations
- Understand Liveness Probes and Readiness Probes
- Understand container logging
- Understand how to monitor applications in Kubernetes
- Understand debugging in Kubernetes

Module 5 – Pod Design

- Define, Build and Modify Container Images
- Use Kubernetes Primitives to Implement Common Deployment Strategies (e.g. Blue/Green or Canary)
- Understand Deployments and how to perform rolling updates

Understand Deployments and how to perform rollbacks
Understand Jobs and CronJobs
Understand how to use Labels, Selectors, and Annotations
Use the Helm Package Manager to Deploy Existing Packages

Module 6 – Services & Networking

Understand Services
ClusterIP
Ingress Networking
Basic understanding of NetworkPolicies

Module 7 – State Persistence

Volumes
Persistent Volumes
Persistent Volume Claims
Using PV and PVC in PODs
Storage Classes
Difference between stateless and stateful sets applications
Stateful Sets
Storage in Stateful Sets

Azure Kubernetes Service (AKS)

Module 1 – Core Concepts

Overview of Container Orchestration
Introduction to Kubernetes
Kubernetes Architecture

Module 2 – Create Azure AKS Cluster

Introduction to Azure AKS Cluster
Create AKS Cluster
Explore AKS Cluster using kubectl
Setup Azure CLI on Local Desktop

Module 3 – Managing Resources

Managing Pods
Managing Labels & Selector
Managing Replication Controller & Replica Set
Managing Service

Module 4 – Scheduling

Manual Scheduling
Taint and Tolerations
Node Selector
Node Affinity

Module 5 – Application Lifecycle Management

Overview of Deployment
Deployment Strategies
Managing Deployment

Module 6 – Environment Variable

Plain Key
Config Map
Secret
Mount Variable as Volume

Module 7 – Storage

Volumes
Persistent Volumes
Persistent Volume Claim
Azure Disks for AKS Storage
Create Storage Class
Managing Persistent Volumes
Managing Persistent Volume Claims
Use AKS Provisioned Storage Class instead of Custom Storage Class

Module 8 – Security

Introduction to Active Directory Authentication for AKS admins
Create AD Group and User and Enable AD for AKS
Access Azure AKS Cluster Resources using Azure AD User
Manage Roles and Rolebindings
Manage ClusterRole and ClusterRoleBindings

Module 9 – Autoscaling

Introduction to Cluster Autoscaler
Create AKS Cluster with Autoscaling enabled using Azure AKS
Introduction to Horizontal Pod Autoscaler
Create Horizontal Pod Autoscaler

Module 10 – Logging and Monitoring

Understand how to Monitor all Cluster Components
Understand how to Monitor Applications
Manage Cluster Components Logs
Manage Application Logs

Module 11 – Networking in Kubernetes

Kubernetes Networking
Understand CNI
Understand Pod Networking Concepts
Configure Manual DNS
Configure and Manage Ingress Rule
Namespace
Load Balancer Service

Jenkins and GitLab with Real Time Projects

Module 1 – Introduction to Jenkins

Introduction to Jenkins
Jenkins Installation
Introduction to Jenkins UI
Create First Job
Add Parameters to your Job

Module 2 – Jenkins and Docker

Configure SSH for Docker Container
Install SSH Plugin in Jenkins
Integrate Docker SSH Server with Jenkins
Run a Jenkins Job on Docker Remote Host through SSH

Module 3 – Jenkins Security

Enable/Disable Login in Jenkins
Allow Users to Sign up
Create Users Manually in the Jenkins DB Create and
Manage Roles for Jenkins Users

Module 4 – Jenkins Email Integration

Install a Mail Plugin Integration
Jenkins and GmailAdd
notifications to your jobs

Module 5 – Jenkins and Maven

Introduction to Jenkins and Maven
Install the Maven Plugin
Install the GIT Plugin
Clone Git repository from Jenkins
Build a JAR using Maven
Test your Code
Deploy your Jar locally
Archive the artifact

Module 6 – Jenkinsfile

Introduction to Pipeline
Introduction to Jenkinsfile
Install the Jenkins Pipeline Plugin
Create first Pipeline
Add multi-steps to your Pipeline
Environment Variables
Post Actions

Module 7 – 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 jobs in the background

Module 8 – Gitlab CI to Build and Deploy Java Application

Introduction to the Java Application Continuous Integration Pipeline
Overview
Building a Java Application Locally
Building a Java Application with Gitlab CI
Deploy to Servers from Gitlab CI

Module 9 – Monitoring

Introduction to Elasticsearch, Logstash, Beats, Fluentd and Kibana
Deploy Elasticsearch, Logstash, Fluentd and Kibana
Configure Elasticsearch
Configure fluentd to collect the logs from Kubernetes Microservices
Configure Index Pattern
Kibana Visualization
Install Prometheus and Grafana
Monitor application with Prometheus and Grafana

Module 10 – Testing

Introduction to Selenium
Set up Selenium Project
Static Analysis of Selenium Source Code
Integrate Selenium with Jenkins
Send notification to Email ID

Module 11 – Projects

Project 1: Integration of SonarCloud with GitLab
Project 2: Automate everything (Continuous Development, Continuous Integration, Testing, Monitoring, Continuous Delivery and Deployment).

Elastic Kubernetes Service

Module 1 – Introduction to EKS

Introduction to EKS
Difference between On prem Kubernetes, AKS and EKS