Koenig Crafted – Kubernetes for Administrator and Developer (CKA + CKAD)

Duration: 7 Days

Hands-On Format: This hands-on class is approximately 80/20 lab to lecture ratio, combining engaging lecture, demos, group activities and discussions with comprehensive machine-based practical programming labs and project work.

Module 1 – Core Concepts

Overview of Container Orchestration
Introduction to Kubernetes
Kubernetes Architecture

Module 2 – Installation, Configuration & Validation

Design a Kubernetes Cluster
Installation of Kubernetes Master and Nodes
Choose a Network Solution
Verify Installation

Module 3 – Managing Resources

Managing Pods
Managing Labels & Selector
Managing Replication Controller & Replica Set
Managing Service – ClusterIP, NodePort, LoadBalancer

Module 4 – Scheduling

Manual Scheduling
Taint and Tolerations
Node Selector
Node Affinity

Module 5 – Application Lifecycle Management

Overview of Deployment
Deployment Strategies
Managing Deployment
Canary Deployment
Blue-Green Deployment

Module 6 – Environment Variable

Plain Key
Config Map
Secret
Mount Variable as Volume

Module 7 – Storage

Volumes
Persistent Volumes

Persistent Volume Claim

Module 8 – StatefulSet

Introduction to StatefulSET
Use cases of StatefulSet
Manage StatefulSet
Storage in StatefulSet
Headless Service

Module 9 – Security

Kubernetes Authentication
Managing Users in Kubernetes
Service Account
Managing Roles and Role Binding
Managing Cluster Role and Cluster Role Binding
Security Context
Network Policies

Module 10 – Cluster Maintenance

OS Upgrade
Upgrade Cluster Version
Static Pod
ETCD Backup
Jobs and Cron Job

Module 11 – Logging and Monitoring

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

Module 12 – Networking in Kubernetes

Kubernetes Networking
Understand CNI
Understand Pod Networking Concepts
Configure and Manage Ingress Rule
Configure Ingress with TLS
Namespace
Metal Load Balancer

Module 13 – Multi Container Pod Design

Init Container
Side Car Container
Adaptor Container
Ambassador Container

Module 14 – Helm Package Manager

Introduction to Helm
Work with Helm Charts
Create Helm Charts
Upgrade and Downgrade Helm Charts

Module 15 – Building Docker Images

Introduction to Dockerfile
Dockerfile Instructions
Build Image
Push Image to Centralized Registry

Module 16 – Readiness and Liveness Probe

Introduction to Readiness and Liveness Probe
Implement Readiness and Liveness in Pod

Module 17 – Troubleshooting

Troubleshoot ETCD Failure
Troubleshoot Kubelet Failure
Troubleshoot Container Runtime Failure
Troubleshoot Scheduler Failure