

Certified Kubernetes Administrator

This document provides the curriculum outline of the Knowledge, Skills and Abilities that a Certified Kubernetes Administrator (CKA) can be expected to demonstrate.

Duration: 5 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

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

Module 8 – Security

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

Module 9 – Cluster Maintenance

OS Upgrade
Upgrade Cluster Version
Static Pod
ETCD Backup
Cron Job

Module 10 – 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 11 – Networking in Kubernetes

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

Module 12 – Troubleshooting

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

Module 13 – High Availability Cluster

Multi-Master Setup