

Certified Kubernetes Administrator (CKA) Prep Course

Course CKA 5 Days Instructor-led, Hands-on

Introduction

This class prepares students for the Certified Kubernetes Administrator (CKA) exam. Kubernetes is a Cloud Orchestration Platform providing reliability, replication, and stability while maximizing resource utilization for applications and services. By the conclusion of this hands-on, vendor agnostic training you will go back to work with the knowledge, skills, and abilities to design, implement, and maintain a production-grade Kubernetes cluster. We prioritize covering all objectives and concepts necessary for passing the Certified Kubernetes Administrator (CKA) exam. You will be provided the components necessary to assemble your own high availability Kubernetes environment and configure, nexpand, and control it to meet the demands made of cluster administrators. Your week of intensive, hands-on training will conclude with a mock CKA exam that simulates the real exam.

Who Should Attend?

- Professionals who need to maintain or set up a Kubernetes cluster
- Container Orchestration Engineers
- DevOps Professionals

Prerequisites

Students should be familiar with basic data concepts and terminology.

Outline

Module 1: Becoming a Certified Kubernetes Administrator

Lecture: The CKA Exam

Lecture: CKA Exam Strategy: Using Kubernetes Documentation Effectively

Module 2: Introduction to Cluster Architecture

Lecture: Kubernetes Architecture

Lecture: Pods and the Control Plane

 Kubernetes the Alta3 Way

Lecture + Lab: Deploy Kubernetes using Ansible

Contact ISInc for more information at 916.920.1700 or by visiting our website at <http://www.isinc.com>

Module 3: Containers

Lecture: Container Essentials

Lecture + Lab: Creating a Docker Image

Module 4: Pod Basics

Lecture: YAML

Lecture: Manifests

Lecture + Lab: Basic Pods

Lecture: Namespaces

Lecture + Lab: Namespaces

Lecture: API Versioning and Deprecations

Module 5: Kubectl

Lecture: Kubectl get and sorting

Lecture + Lab: kubectl get

Module 6: Resource Management

Lecture + Lab: Kubectl Top and Application Monitoring

Lecture: Limits, Requests, and Namespace ResourceQuotas

Lecture + Lab: Resource Requests and Limits

Lecture + Lab: Namespace Resource Quota

Lecture: Pod Quality of Service Levels

Lecture: Admission Controller

Lecture + Lab: Create a LimitRange AdmissionController

Module 7: User Administration

Lecture: Contexts

Lecture + Lab: Contexts

Lecture: Role Based Access Control

Lecture + Lab: Role Based Access Control

Lecture + Lab: RBAC Distributing Access

Module 8: Advanced Pod Design

Lecture: Readiness and Liveness Probes

Lecture + Lab: Implement Probes and Health Checks

Lecture: ConfigMaps and Volume Mounting

Lecture + Lab: Persistent Configuration with ConfigMaps

Lecture: Secrets

Lecture + Lab: Create and Consume Secrets

Lecture: Multi-Container Pods

Lecture + Lab: Creating Ephemeral Storage For Fluentd Logging Sidecar

Lecture: Init Containers

Lecture + Lab: Understand the Init Container Multi-Container Pod Design Pattern

Lecture: Taints, Tolerations, and Pod Affinity

Lecture + Lab: Tainted Nodes and Tolerations

Module 9: Logging and Troubleshooting

Lecture: Logging with kubectl log

Lecture + Lab: Utilize Container Logs

Lecture: Advanced Logging Techniques

Lecture + Lab: Troubleshooting Worker Nodes

Module 10: Labels

Lecture: Labels

Lecture + Lab: Labels and Selectors

Lecture: Annotations

Module 11: Replica and Daemon Sets

Lecture: ReplicaSets

Lecture + Lab: Create and Configure a ReplicaSet

Lecture: DaemonSets

Module 12: Deployments

Lecture: Deployments- Purpose and Advantages

Lecture + Lab: Writing a Deployment Manifest

Lecture: Deployments- Version Control

Lecture + Lab: Performing Rolling Updates and Rollbacks with Deployments

- Lecture: Blue/Green and Canary Deployment Strategies
- Lecture + Lab: Advanced Deployment Strategies
- Lecture: Deployments- Horizontal Scaling
- Lecture + Lab: Horizontal Pod Autoscaling

Module 13: Persistent Storage

- Lecture: Persistent Volumes, Claims, and StorageClasses
- Lecture: PVC, PV, and StorageClass config
- Lecture + Lab: Persistent Storage with NFS

Module 14: Extending Kubernetes

- Lecture: Custom Resource Definitions
- Lecture + Lab: Introduction to CRDs

Module 15: Helm and Kustomize

- Lecture: Helm
- Lecture + Lab: Making Charts and Templates with Helm
- Lecture + Lab: Deploy Existing Packages via Helm
- Lecture + Lab: Using Kustomize

Module 16: Services & Networking

- Lecture: NetworkPolicy
- Lecture + Lab: Deploy a NetworkPolicy
- Lecture + Lab: Namespace Network Policy
- Lecture: Services- LoadBalancer, NodePort, and ClusterIP
- Lecture + Lab: Access to applications via services
- Lecture: Networking Plugins
- Lecture: Ingress Controllers
- Lecture + Lab: Expose Applications via Ingress Controllers

- Lecture + Lab: Gateway API Routing
- Lecture + Lab: Network Troubleshooting

Module 17: DNS

- Lecture: Hostnames and FQDNs
- Lecture + Lab: Hostnames and FQDNs
- Lecture: CoreDNS
- Lecture + Lab: Install CoreDNS
- Lecture: Configure CoreDNS
- Lecture + Lab: Configure CoreDNS
- Lecture + Lab: Revert CoreDNS to KubeDNS

Module 18: StatefulSets

- Lecture + Lab: Stable Identity and Persistent Storage with StatefulSets

Module 19: Cluster Building with Kubeadm

Lecture: Kubeadm Prerequisites

Lecture + Lab: Kubeadm Prerequisites

Lecture: Configure Network Plugin Requirements

Lecture + Lab: Configure Network Plugin Requirements

Lecture: Kubeadm Basic Cluster

Lecture + Lab: Installing Kubeadm

Lecture: Join Node to Cluster

Lecture + Lab: Join Node to Cluster

Module 20: Cluster Administration

- Lecture: Kubeadm Cluster Upgrade
- Lecture + Lab: Kubeadm cluster upgrade
- Lecture: ETCD Snapshot and Restore
- Lecture + Lab: ETCD Snapshot and Restore
- Lecture + Lab: Lecture: Purge Kubeadm
- Lecture + Lab: Purge Kubeadm