

Kubernetes Administration (CKA)

Course Summary

Description

This Kubernetes Administration course covers the topics of the CKA (Certified Kubernetes Administrator) exam.

Topics covered include installation, application lifecycle management, networking, storage, security, scheduling, logging, maintenance, and troubleshooting of Kubernetes.

Topics

- Core Concepts
- Installation
- Application Lifecycle Management
- Networking
- Storage
- Scheduling
- Jobs and Cronjobs
- Linux Containers

Audience

This course is designed for Systems Administrators and DevOps Professionals.

Prerequisite

- Proficiency with the Linux CLI (GL120 "Linux Fundamentals")
- A broad understanding of Linux system administration (GL250 "Enterprise Linux Systems Administration").
- Basic knowledge of Linux containers, e.g. Docker (GL340 "Docker")

Duration

Three Days

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Course Outline

I. Core Concepts

- A. CKA Objectives Covered
- B. Kubernetes Architecture
- C. Cluster Communication
- D. Objects
- E. Object Properties
- F. Labels & Selectors
- G. Annotations
- H. Object Management
- I. Object Management (cont.)
- J. Image Fundamentals
- K. Container Fundamentals
- L. Pod Fundamentals
- M. Working with Pods
 - Lab Tasks
 - Container and Pod Fundamentals
 - Single Node Install
 - Pod Fundamentals

II. Installation

- A. CKA Objectives Covered
- B. Installing HA Control Plane (DEMO)
 - Lab Tasks
 - Kubernetes HA Masters Install
 - Kubernetes Install
 - Joining Worker Nodes

III. Application Lifecycle Management

- A. CKA Objectives Covered
- B. Pod Lifecycle
- C. Container Lifecycle
- D. Init Containers
- E. Container: command and args
- F. Container: Defining Environment
- G. ReplicaSet
- H. Deployments
- I. Working with Deployments
- J. Deployment Rollouts
 - Lab Tasks
 - Pod Lifecycle
 - Init Containers
 - Deployments

IV. Networking

- A. CKA Objectives Covered
- B. Network Overview
- C. Service Discovery & CoreDNS
- D. Container Network Interface (CNI)
- E. Services
- F. Ingress Objects
 - Lab Tasks
 - Ingress Controller
 - Port-Forwarding

- Services
- Ingress

V. Storage

- A. CKA Objectives Covered
- B. Storage
- C. Volume Types
- D. Volume Types
- E. Static Volumes (DEMO)
- F. ConfigMaps
- G. ConfigMaps
- H. Secrets
 - Lab Tasks
 - (DEMO) Static Volumes
 - (DEMO) ConfigMaps & Secrets
 - Static Volume Provisioning
 - ConfigMaps and Secrets

VI. Scheduling

- A. CKA Objectives Covered
- B. Controlling and Tracking Resources
- C. Scheduler Operation
- D. DaemonSet
- E. Node Affinity & Anti-affinity
- F. Pod Affinity & Anti-affinity
- G. Taints & Tolerations
 - Lab Tasks
 - (DEMO) Affinity and Taints
 - Pod Resources and Scheduling
 - Static Scheduling and Daemonsets
 - Pod and Node Affinities

VII. Jobs and Cronjobs

- A. Jobs
- B. CronJobs
 - Lab Tasks
 - Jobs
 - CronJobs

VIII. Linux Containers

- A. Application Management Landscape
- B. Application Isolation
- C. Resource Measurement and Control
- D. Container Security
- E. OverlayFS Overview
- F. Container Security
- G. Open Container Initiative
 - Lab Tasks
 - Container Concepts runC