ComponentSoft
open cloud trainings and consultation

KBS-103: Kubernetes Administration with CKA & CKAD exam prep.

Course Length: 3 days

Course Description:

Kubernetes is the leading open-source system for automating deployment, scaling and management of containerized applications.

This training introduces participants to the basic concepts and architecture of Kubernetes, its Initial install, setup and access control, Kubernetes Pods and Workloads, Scheduling and node management, Accessing the applications, Persistent storage in Kubernetes, its Logging, and finally Monitoring and Troubleshooting facilities.

The course doesn't only prepare delegates for the daily administration of Docker & Kubernetes systems but also for the official Certified Kubernetes Administrator (CKA) Certified Kubernetes Application Developer (CKAD) exams of the Cloud Native Computing Foundation (CNCF).

Structure: 50% theory 50% hands on lab exercises

Target audience: System administrators, developers and devops who want to understand and use Kubernetes in cloud and data center environments

Prerequisites: Proficiency with the Linux CLI. A broad understanding of Linux system administration. Basic knowledge of Linux containers, e.g. Docker.

Detailed Course Outline

Module 1: Introduction

- Cloud computing in general
- Cloud types
- Cloud native computing
- Application containers
- Containers on Linux
- Container runtime
- Container orchestration
- Kubernetes
- Kubernetes concepts
- Kubernetes objects categories
- Kubernetes architecture
- Kubernetes master
- Kubernetes node
- Lab 1

Module 2: Installing Kubernetes

- Picking the right solution.
- One node Kubernetes install
- Kubernetes universal installer
- Install using kubeadm on CentOS
- Kubernetes Networking
- Lab 2

Module 3: Accessing Kubernetes

- Accessing the Kubernetes cluster
- Controlling access to the API
- Authorization
- Role Based Access Control
- Roles and ClusterRoles
- Role bindings
- Lab 3

Module 4: Kubernetes Workloads

- The pod
- RestartPolicy examples
- InitContainers
- Our first Pod
- Operations on pods
- Replication Controller
- Working with Replication Controller
- Deployments
- Working with Deployments
- Jobs, CronJobs
- Jobs example
- CronJobs example
- DaemonSets
- Lab 4

Module 5: Scheduling and node management

- The Kubernetes Scheduler
- Assigning Pods to Nodes
- Assigning Pods to Nodes – node affinities
- Assigning Pods to Nodes – Pod affinities
- Taints and tolerations
- Managing nodes
- Lab 5

Module 6: Accessing the applications

- Services
- Service types
- Working with Services
- Working with Services
- Ingress
- Ingress definition
- Working with Ingress
- Network Policies
- Network Policy example
- Lab 6

Module 7: Persistent storage in Kubernetes

- Volumes
- Volume types
- Persistent Volumes
- Secrets
- Using Secrets as environmental variables
- Using Secrets as volumes
- ConfigMaps
- Lab 7

Module 8: Logging, monitoring and troubleshooting

- Logging architecture
- Monitoring
- Troubleshooting