KOENIG
step forward

KOENIG SOLUTIONS · COURSE OUTLINE

CKAD on Azure

Learn to design, deploy and manage Kubernetes applications, from cluster installation and scheduling to networking, storage and Helm packaging.

5 Days	16	51	38
8 HOURS A DAY	MODULES	TOPICS	HANDS-ON LABS

COURSE OVERVIEW

This comprehensive Kubernetes course, covering container orchestration, cluster design, installation, resource and application management, multi-container pod design, networking, as well as state persistence, is designed to equip learners with the skills needed to successfully clear the Certified Kubernetes Application Developer exam.

WHO THIS COURSE IS FOR

- **Application Developers**
- **Kubernetes Administrators**
- **DevOps Engineers**
- **Cloud Engineers**
- **System Administrators**

PREREQUISITES

- Basic knowledge of Linux Server Administration.
- Basic knowledge of Containers

TOOLS AND REQUIREMENTS

Lab Requirement

- Customer Azure Account

LEARNING OBJECTIVES

- Explain Kubernetes architecture and container orchestration concepts
- Install and validate a multi-node Kubernetes cluster
- Deploy pods, replica sets, services and daemon sets
- Apply scheduling controls such as node affinity and taints
- Configure environment variables with config maps and secrets
- Manage persistent volumes, claims and storage classes
- Implement namespaces, role bindings and security contexts
- Configure ingress rules and StatefulSets with headless services

COURSE SYLLABUS

16 Modules, 51 Topics

01

Core Concepts

TOPICS

Overview of Container Orchestration · Introduction to Kubernetes · Understanding Kubernetes Architecture

02

4 Labs

Installation, Configuration & Validation

TOPICS

Design a Kubernetes Cluster · Metal Load Balancer

03

5 Labs

Creating Kubernetes Resources

TOPICS

- Understanding Pods, Labels & Selectors
- Understanding Replication Controller & Replica Set
- Understanding Services - ClusterIP, NodePort & LoadBalancer
- Understanding Daemon Sets

04

3 Labs

Scheduling

TOPICS

Manual Scheduling of Pods · Taint and Tolerations · Node Selector · Node Affinity

05

2 Labs

Application Lifecycle Management

TOPICS

Overview of Deployment · Deployment Strategies - Blue/Green & Canary

06

2 Labs

Environment Variable

TOPICS

Plain Key · Config Map · Secret

07

Lab

Storage

TOPICS

Understanding Volume Management in K8s · Types of Volumes Provisioning · Persistent Volumes · Persistent Volume Claim · Understanding Storage Class

08

4 Labs

Security

TOPICS

- Understanding Namespace & Use-Cases
- Understanding Role, ClusterRole, RoleBinding & ClusterRoleBinding
- Understanding Security Context

09

2 Labs

Networking in Kubernetes

TOPICS

Understand Basics of Kubernetes Networking · Understand CNI Overview · Understand Pod Networking Concepts · CoreDNS Overview of K8s · Understanding Ingress

10

3 Labs

StatefulSet

TOPICS

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

11

Lab

Readiness and Liveness Probe

TOPICS

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

12

2 Labs

Logging and Monitoring

TOPICS

- Understand how to Monitor Application and Cluster Components

13

5 Labs

Multi Container Pod Design & Jobs

TOPICS

Understanding Multi-Container Pods · Creating Multi-Container Pods · CronJob

14

2 Labs

Helm Package Manager

TOPICS

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

15

2 Labs

Building Docker Images

TOPICS

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

16

Additional Topics

TOPICS

- Overview - Migration of Different Applications in AKS
- Troubleshooting (Performance Based)

NOTES

- Kubernetes Version: Latest

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
02	**Installation, Configuration & Validation**	■ Installation of Kubernetes 1-Master and 2-Nodes Cluster ■ Choose a Network Solution and Configure ■ Verify Installation with Kubectl command ■ Deploying Metal Load Balancer
03	**Creating Kubernetes Resources**	■ Deploying Applications as a Pod ■ Managing Labels & Selector ■ Deploying Replication Controller & Replica Set ■ Creating & Managing ClusterIP, Node Port and LoadBalancer ■ Deploying Applications as Daemon Sets
04	**Scheduling**	■ Using Manual Scheduling or Taints and Tolerations ■ Using Node Selector to Deploy Pods ■ Using Node Affinity to Deploy Pods
05	**Application Lifecycle Management**	■ Deploying Applications as Deployment ■ Implementing Blue-Green Deployment Strategy
06	**Environment Variable**	■ Using Plain Keys, Config Map & Generic Secret as Environment Variables ■ Mount Environment Variable as Volumes

#	MODULE	ACTIVITY
07	**Storage**	Using PV & PVC to attach Persistent Volume to a Pod as HostPath
08	**Security**	■ Creating Namespace & Deploying K8s resources in Different Namespace ■ Creating Service Accounts ■ Managing Cluster Role and Cluster Role Binding ■ Adding Security Context to Pod to enable ping
09	**Networking in Kubernetes**	■ Controlling Pod Communication using Network Policies ■ Configure and Manage Ingress Rule
10	**StatefulSet**	■ Deploying and Managing Stateful Sets ■ Creating Persistent Storage in Stateful Sets ■ Headless Service
11	**Readiness and Liveness Probe**	Creating Liveness and Readiness Probe for Pod
12	**Logging and Monitoring**	■ Understand how to Read Application & Cluster Component Logs ■ Deploying Prometheus & Grafana to Monitor K8s Cluster
13	**Multi Container Pod Design & Jobs**	■ Sidecar Pattern ■ Deploying Init Container ■ Ambassador Pattern ■ Adapter Pattern ■ Deploying Pod as a CronJob
14	**Helm Package Manager**	■ Installing Helm Package Manager ■ Deploying Kubernetes Resources using Helm Package Manager
15	**Building Docker Images**	■ Building Container images using Dockerfile ■ Pushing Container Image to a Public Registry

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training | Live Online Classes (ILO) | Fly-Me-A-Trainer (FMAT) | Flexi (Self-Paced) | 1-on-1 Training

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