

Advanced Kubernetes (Cloud Native Computing Foundation (CNCF))

Learn to install, configure and manage advanced Kubernetes clusters, covering storage, StatefulSets, networking, Helm and Istio.

4 Days

32 HOURS

8

MODULES

56

TOPICS

COURSE OVERVIEW

The Advanced Kubernetes course is designed to deepen learners' expertise in Orchestrating containerized applications using Kubernetes, focusing on advanced concepts and best practices. Throughout the course, participants will gain hands-on experience with complex Kubernetes features and tools. Module 1 lays the foundation with the installation and configuration of a Kubernetes cluster, including the setup of ETCD clusters, Control plane components, Worker nodes, and kubectl configuration. This is critical for understanding the underlying architecture of a highly available Kubernetes setup. Module 2 revisits the essentials of managing resources such as Pods, Services, and Deployments, essential for maintaining applications in a Kubernetes cluster. In Module 3, storage solutions are explored, including Storage classes and Persistent volumes, which are crucial for stateful applications. Module 4 focuses on managing stateful applications using StatefulSets, which is a key component of Kubernetes' advanced concepts. Module 5 covers Logging and monitoring, essential for maintaining the reliability and efficiency of a Kubernetes cluster. Module 6 delves into the networking aspect of Kubernetes, including DNS management, Ingress, and Load balancing, which are fundamental for application accessibility. Module 7 introduces Helm, a package manager that simplifies the deployment of applications on Kubernetes. Finally, Module 8 educates learners on Istio service mesh, which provides advanced Traffic management capabilities and observability into microservices. This course is instrumental for professionals aiming to master advanced Kubernetes techniques, ensuring they are equipped to design, deploy, and manage complex Kubernetes ecosystems efficiently.

Who Should Attend

The Advanced Kubernetes course by Koenig Solutions is tailored for IT professionals aiming to master orchestration and management of containerized applications.

DevOps Engineers

System Administrators

Cloud Engineers

Software Developers with a focus on microservices architecture

IT Project Managers overseeing containerization projects

Site Reliability Engineers (SREs)

Technical Leads responsible for maintaining high-availability systems

Infrastructure Architects designing scalable cloud solutions

Application Developers looking to understand the deployment environment

Security Professionals involved in container security

Network Engineers interested in Kubernetes networking aspects

Technical Support Specialists seeking to enhance their troubleshooting skills

IT Professionals preparing for Kubernetes certification exams

LEARNING OBJECTIVES

- Configure a Kubernetes cluster including ETCD and control plane
- Manage core resources such as Pods, Deployments and DaemonSets
- Configure storage classes and persistent volumes for applications
- Manage StatefulSets, headless services and associated storage
- Implement cluster logging and monitoring with Prometheus and Kibana
- Configure cluster networking including CoreDNS and Ingress
- Deploy and manage applications using Helm charts
- Implement Istio service mesh for traffic management and tracing

8 Modules, 56 Topics

01

Installation, Configuration and Validation

TOPICS

- Design a Kubernetes Cluster
- Installation of Kubernetes Master and Nodes using Hard Way Method
- Bootstrapping the ETCD Cluster
- Bootstrapping the Kubernetes Control Plane
- Configure API Server
- Configure Scheduler
- Configure Controller Manager
- Bootstrapping the Kubernetes Worker Nodes
- Configure Container Runtime
- Configure Kubelet
- Configure Kube Proxy
- Configure CNI Networking
- Configure kubectl
- Verify Installation

02

Revise Managing Resources

TOPICS

- Managing Pods
- Managing Labels and Selectors
- Managing Replication Controller and Replica Set
- Managing Service
- Managing Deployments
- Managing DaemonSet

03

Storage

TOPICS

- Understand storage classes
- Persistent Volume - HostPath
- Persistent Volume - NFS
- Understand volume mode, access modes and reclaim policies for volumes
- Understand persistent volume claims primitive
- Know how to configure applications with persistent storage

04

Managing StatefulSet

TOPICS

What is StatefulSet · Why StatefulSet · Manage StatefulSet · Managing Headless Service · StatefulSet DNS Entry · Storage with StatefulSet

05

Logging and Monitoring

TOPICS

- Understand how to monitor all cluster components
- Prometheus Tool
- Integration of Elastic Search and Kibana with Kubernetes

06

Networking in Kubernetes

TOPICS

Understand CoreDNS · Configure Custom DNS for Pod · Ingress - Host Based · Ingress - Path Based · Ingress with TLS · Metal Load Balancer

07

Helm

TOPICS

- Understand Helm and Helm Charts
- Helm Commands
- Deploy Kubernetes Dashboard using Helm
- Create Helm Chart and Deploy Applications using Helm Chart
- Test Helm Chart
- Upgrade Application using Helm Chart
- Downgrade Application using Helm Chart

08

Istio

TOPICS

- Istio Installation
- Understand Istio Architecture
- Deploy Application and Work with Kiali
- Understand Destination Rule and Virtual Service
- Create Application with Istio
- Microservices Tracing
- Ingress Host Based and Path Based with Istio
- Ingress - Subdomain with Istio

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

Ready to Get Started?

Talk to a learning advisor about schedules, group training and customised delivery.

Visit koenig-solutions.com

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