

Advanced Docker Concepts and Container Orchestration

Learn to build, manage and orchestrate containers with Docker and Kubernetes, from images and networking to security.

5 Days

DURATION

12

MODULES

63

TOPICS

COURSE OVERVIEW

This course covers Docker installation, architecture and client operations, followed by building custom images, working with registries and examining containers at the cgroup and namespace level. It then addresses storage, container networking, and application definition with Docker Compose before moving into orchestration with Docker Swarm, including cluster creation, services and scaling. The later modules introduce Kubernetes core concepts and cluster installation, followed by working with Kubernetes features such as pods, services and replica sets. It closes with Kubernetes networking, including CNI, DNS and ingress, and Kubernetes security covering RBAC, secrets and network policies.

WHO THIS COURSE IS FOR

Docker Administrators

Kubernetes Administrators

DevOps Engineers

System Administrators

Cloud Engineers

PREREQUISITES

Skill Level

- Beginners on container technology

LEARNING OBJECTIVES

- Describe Docker architecture and its core components
- Manage container lifecycle and execute commands in running containers
- Build custom Docker images using Dockerfiles and Docker Commit
- Configure storage with volumes, bind mounts and tmpfs
- Configure networking with bridges and Docker Compose
- Deploy and manage a Docker Swarm cluster with services and scaling
- Explain Kubernetes cluster architecture and install Kubernetes clusters
- Configure Kubernetes networking, RBAC and network policies

How the Course Is Taught

This hands-on class is approximately 80/20 lab to lecture ratio, combining engaging lecture, demos, group activities and discussions with comprehensive machine-based practical programming labs and project work.

COURSE SYLLABUS

12 Modules, 63 Topics

01

Installation of Docker

TOPICS

- Introduction to Docker
- Docker Architecture
- **Docker Components:** Docker Client, Docker Host and Docker Registry
- Installation of Docker

02

Docker Client Operations

TOPICS

Running a Container · Container Lifecycle · Managing Containers · Executing Commands in Running Containers

03

Building Custom Images and Docker Registry

TOPICS

Creating Docker Images using Docker Commit · Building a Dockerfile · Tagging an Image · Pull and Push Images · Creating Private Registries

04

Container Deep Dive

TOPICS

Cgroups · Namespaces · Container Resource Limits

05

Storage & Container Networking

TOPICS

Storage Overview · Creating and Managing Volumes · Using Bind Mounts · Using tmpfs · Overview of Container Networking · Managing Network Bridges

06

Docker Compose

TOPICS

Understand YAML · Create Docker Compose Files ·
Deploying and configuring applications · Build Images

07

Docker Swarm

TOPICS

Container Orchestration · Creating Swarm Cluster ·
Manage Nodes in Swarm Node Cluster · Manage
Services · Secrets · Rolling Service Updates ·
Monitoring · Scaling

08

Core Concepts of Kubernetes

TOPICS

- Understand the Kubernetes Cluster Architecture
- Master/Node
- Kubectl
- Kubelet
- Kube-Proxy
- Etcd
- Controllers

09

Installation of Kubernetes Cluster

TOPICS

- Design a Kubernetes Cluster
- Install Kubernetes masters and nodes, including the use of TLS Bootstrapping
- Configure Network Solution
- Analyse end-to-end test results

10

Using Kubernetes Features

TOPICS

Kubectl · Understand YAML · Creating and Managing
Pods · Managing Labels · Managing Services ·
Managing Replica Set & Replication Controller ·
Resource Quota

11

Networking in Kubernetes

TOPICS

Kubernetes Networking · Understand CNI ·
Understand Pod Networking Concepts ·
Configure DNS · Configure and Manage Ingress
Rule · Namespace

12

Security in Kubernetes

TOPICS

Managing RBAC · Security Context · Secrets · Work with Image Securely · Configure Network Policies

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.

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