



# Kubernetes Administration Using Docker

**Duration: 40 Hours (5 Days)**

## Overview

The Kubernetes Administration Using Docker course is an in-depth training program designed to equip learners with the skills needed to manage containerized applications with Kubernetes and Docker. This comprehensive program covers everything from the basics of containers and Docker to advanced Kubernetes features, ensuring that participants can effectively deploy, manage, and scale applications in a Kubernetes environment. Throughout the course, learners will explore key concepts such as Docker commands, Image management, container orchestration, Kubernetes architecture, Resource management, application lifecycle, security, storage, networking, and monitoring. By integrating practical examples and hands-on exercises, the course prepares students for real-world scenarios. Participants aiming for a Kubernetes master course can expect to gain a robust understanding of container technologies, making this program an excellent pathway to certification on Docker and Kubernetes. Upon completion, individuals will be well-prepared to manage modern, dynamic environments, enhancing their professional credentials and career prospects in the rapidly evolving field of cloud-native technologies.

## Audience Profile

Koenig Solutions' Kubernetes Administration Using Docker course offers in-depth training on container orchestration and management, tailored for IT professionals.

- DevOps Engineers
- System Administrators
- Cloud Professionals
- Software Developers
- IT Managers
- Technical Leads
- Infrastructure Architects
- Application Developers
- Site Reliability Engineers (SREs)
- QA Engineers/Testers involved in automation
- Network Engineers seeking containerization skills
- Security Professionals with an interest in deployment security
- Technical Support Engineers looking to upgrade their skills
- IT graduates aiming to build a career in cloud and container technologies

## Course Syllabus

**Prerequisites:** Basic knowledge of Linux.

**Course Objective:** In this course you will learn about Docker Administration, Orchestrate containers, automate the deployment, scaling, and management of applications in the software industry.

**Docker Version:** Latest

**Kubernetes Version:** Latest



**Lab Requirement:** Koenig DC (CentOS 9)

## **Module 1 - Docker Administration**

- Introduction to Containers
- Introduction to Docker
- Docker Engine
- Understanding Docker Images
- Private Registry
- Understand Storage Methods
- **Lab:** Downloading and Installing Docker
- **Lab:** Docker Essential Commands
- **Lab:** Building Docker Images
- **Lab:** Storing and Retrieving Docker Images from Docker Hub
- **Lab:** Building Containers from Images
- **Lab:** Networking Docker Containers
- **Lab:** Data Persistence with Volumes
- **Lab:** Linux Capabilities

## **Module 2 - Core Concepts**

- Overview of Container Orchestration
- Introduction to Kubernetes
- Kubernetes Architecture

## **Module 3 - Managing Resources**

- Describe Pods
- Describe Labels and Selector
- Describe Replica Set
- Describe Services
- Describe Daemon Sets
- Describe Namespaces
- **Lab:** Managing Pods
- **Lab:** Managing Labels & Selector
- **Lab:** Managing Replica Set
- **Lab:** Managing Cluster IP, Node Port
- **Lab:** Installing Metal LoadBalancer and Using LoadBalancer Service
- **Lab:** Managing Daemon Sets
- **Lab:** Managing Namespaces

## **Module 4 - Application Lifecycle Management**

- Overview of Deployment
- Deployment Strategies
- **Lab:** Managing Deployment
- **Lab:** Blue-Green Deployment Strategy

## **Module 5 - Environment Variable**



- Overview of Environment Variable
- **Lab:** Plain Key as Variable in Pod
- **Lab:** Config Map as Variable in Pod
- **Lab:** Config Map as Volume
- **Lab:** Secret as Variable in Pod
- **Lab:** Secret as Volume

## Module 6 - Storage

- Describe Storage
- **Lab:** Volumes
- **Lab:** Creating Persistent Volume
- **Lab:** Creating Persistent Volume Claim

## Module 7 - Security

- Kubernetes Authentication
- **Lab:** Managing Users in Kubernetes
- **Lab:** Service Account
- **Lab:** Managing Roles and Role Binding
- **Lab:** Managing Cluster Role and Cluster Role Binding
- **Lab:** Basic Security Context

## Module 8 - Logging and Monitoring

- Understand how to Monitor all Cluster Components
- Understand how to Monitor Applications
- **Lab:** Read Cluster Component Logs
- **Lab:** Using Elasticsearch and Kibana for Logging
- **Lab:** Prometheus and Grafana Monitoring Tool

## Module 9 - Networking in Kubernetes

- Kubernetes Networking
- Understand CNI
- **Lab:** Configure and Manage Ingress Rule