KOENIG SOLUTIONS · COURSE OUTLINE

Docker and Rancher Overview – Fast Track Mode

Learn to install Docker, manage containers and images, use Docker Compose, and explore Kubernetes, Rancher, security and storage.

3 Days	8	45	32
8 HOURS A DAY	MODULES	TOPICS	HANDS-ON LABS

COURSE OVERVIEW

The Docker Customized course teaches you how to use Docker for managing containers, images, and networks. You will learn how to install Docker, work with containers, create custom images, and use Docker Compose for running multiple containers together. The course also gives you an overview of Kubernetes and Rancher for managing Kubernetes. Additionally, you'll explore container security, storage, and logging to ensure you can handle Docker containers.

WHO THIS COURSE IS FOR

- **Docker Administrators**
- **DevOps Engineers**
- **System Administrators**
- **Kubernetes Administrators**
- **Container Platform Engineers**

PREREQUISITES

- Basic knowledge of Linux.

TOOLS AND REQUIREMENTS

- Docker Version: Latest
- Kubernetes Version: Latest
- Lab Requirement: Koenig DC (CentOS 9)

LEARNING OBJECTIVES

- Explain the difference between containers and virtual machines
- Install and configure the Docker Engine
- Manage container lifecycle, ports and disk usage
- Build and optimise custom images with a Dockerfile
- Manage image repositories including tagging and pushing
- Deploy multi-container applications with Docker Compose
- Describe Kubernetes core concepts and Rancher management
- Apply security, storage and logging practices to containers

COURSE SYLLABUS

8 Modules, 45 Topics

01

Lab

Introduction to Containers & Installation

INTRODUCTION TO CONTAINERIZATION

- What Are Containers?
- Difference Between VMs & Containers
- Benefits of Using Containers

DOCKER INSTALLATION & SETUP

- Sizing Requirements for Installation
- Setting Up Repositories & Selecting a Storage Driver
- Installing the Docker Engine
- Understanding Docker Images vs. Containers

02

8 Labs

Working with Docker Containers

MANAGING CONTAINERS

Running & Stopping Containers · Understanding Container Identification · Understanding Port Binding · Default Container Commands

EXECUTING COMMANDS INSIDE CONTAINERS

Using docker exec & docker attach · Overriding Default Commands

CONTAINER LIFECYCLE & CLEAN UP

Removing Containers & Images · Managing Disk Usage

03

6 Labs

Docker Image Management

UNDERSTANDING DOCKER IMAGES

- Layers & UnionFS
- Difference Between Base & Custom Images

BUILDING & OPTIMIZING DOCKER IMAGES

- Writing an Efficient Dockerfile
- Using ADD, COPY, EXPOSE, ENTRYPOINT & WORKDIR
- Environment Variables & Arguments

MANAGING IMAGE REPOSITORIES

- Overview of Docker Registries (DockerHub, Private Repos)
- Pushing & Pulling Images
- Image Versioning & Tagging

04

3 Labs

Docker Networking

DOCKER NETWORKING OVERVIEW

Bridge, Host & None Networks · Understanding Container Communication

05

4 Labs

Docker Compose

INTRODUCTION TO DOCKER COMPOSE

Overview of Docker Compose

DEPLOYING MULTI-CONTAINER APPLICATIONS

Understanding docker-compose.yml · Defining Services in Compose

SCALING & NETWORKING WITH COMPOSE

Scaling Services · Networking in Docker Compose

06

5 Labs

Kubernetes & Rancher Overview

TOPICS

Why Kubernetes?

KUBERNETES CORE CONCEPTS

Understanding Pods · Understanding Kubernetes Objects · Understanding Services

INTRODUCTION TO RANCHER (FOR KUBERNETES MANAGEMENT)

What is Rancher? · Rancher vs. Other Kubernetes Management Tools

07

2 Labs

Security Best Practices

CONTAINER SECURITY FUNDAMENTALS

Docker Daemon & Default Security Settings · Managing Capabilities of Containers

NETWORK & ACCESS CONTROL

Understanding Docker Network Security · Implementing RBAC in Kubernetes

08

3 Labs

Storage & Data Management

UNDERSTANDING DOCKER STORAGE DRIVERS

Block vs. Object Storage · Changing Storage Drivers

VOLUMES & PERSISTENT STORAGE

Docker Volumes vs. Bind Mounts · Overview of Device Mapper

LOGGING & MONITORING

Understanding Docker Logging Drivers

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
01	**Introduction to Containers & Installation**	Installing Docker on Linux
02	**Working with Docker Containers**	■ Running Containers in Attached & Detached Modes ■ Port Binding ■ Restart Policies in Docker ■ Running Commands in a Container ■ Overriding Default Container Commands ■ Automatically Deleting Containers on Exit ■ Removing Docker Containers & Images ■ Monitoring Docker Disk Usage
03	**Docker Image Management**	■ Creating Docker Images Using Dockerfile ■ COPY vs. ADD Instructions ■ ENTRYPOINT & WORKDIR Instructions ■ Tagging & Inspecting Docker Images ■ Pushing Images to a Private Registry ■ Pruning Unused Images
04	**Docker Networking**	■ Creating User-Defined Bridge Networks ■ Configuring a Host Network ■ Exposing & Publishing Ports
05	**Docker Compose**	■ Writing a docker-compose.yml File ■ Deploying Multi-Service Applications with Docker Compose ■ Scaling Services with Docker Compose ■ Networking custom networking Docker Compose

#	MODULE	ACTIVITY
06	**Kubernetes & Rancher Overview**	■ Deploying a Simple Kubernetes Pod ■ Understanding Kubernetes Networking (NodePort & ClusterIP) ■ Accessing Rancher UI ■ Importing an Existing Kubernetes Cluster into Rancher ■ Managing Kubernetes Workloads via Rancher
07	**Security Best Practices**	■ Managing Capabilities ■ Setting Up Docker Network Security
08	**Storage & Data Management**	■ Managing Volumes in Docker ■ Automatically Removing Volumes on Container Exit ■ Configuring Logging Drivers using Syslog and Journald

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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