

Docker Advanced (FI-DoA)

Course Description

This course is intended for any IT professionals who is familiar with basic Docker concepts and want to learn how to deploy Docker for real-world applications. In this course we will present the inner workings of how to run containerized applications spanning multiple Docker hosts. We will discuss orchestration and scheduling. We will present Docker Swarm and see it in action on an actual microservices architecture. We will give recipes to implement cleanly various ops tasks including logging, backups, monitoring, and more

Course Duration:

2 days

Prerequisites:

Students should first have a basic understanding of Docker components that includes:

- Interacting with Docker containers from the command line (start and stop containers, attach, exec, etc.)
- Working with Docker bridge networks and volumes
- Creating Docker images (Dockerfiles)
- Recommended training: Docker Fundamentals

Objectives:

After completing this course, students will be able to:

- Initializing, extending, and putting the Docker Swarm to work.
- Configuring Prometheus and Grafana for Monitoring your Swarm
- Apply proper container security
- image management with multi-stage build and automated builds

And also, students will have a firm understanding of many Docker technologies and key features including the Docker Compose, Docker Swarm, Dockerfile, Docker Containers, Docker Network, Monitoring Docker, Logging Docker, Container Security, Swarm Security, Private Registries, Multi-Stage Build, Docker Content Trust and Signing Images

Course Outline:

Chapter 01: Building a secure Docker Swarm

- What is Docker Swarm?
- Docker Secure Swarm Cluster
- Docker Modes
- Creating and deleting a Swarm Cluster
- Orchestration
- Creating, updating, inspecting and deleting a Service
- Hands-on Lab

Course 02: Labels and Filters

- What are Labels?
- Keys and Values
- Label behavior
- Filtering Images, Containers and other Objects
- Hands- on Lab

Chapter 03: Network services

- Docker Networking
- Swarm Networking
- Customizing the Ingress Network
- Hands-on Lab

Chapter 04: Compose Files & Docker Stack

- Docker Compose vs. Docker Stack
- Installing Docker Compose
- Supported Compose Commands
- Environment Variables
- Docker Stack
- Inspecting the Stack Deployment
- Updating a Running Stack
- Hands-on Lab

Chapter 05: Advanced Node Management.

- Container Resource Restriction
- Swarm - Service Resource Constraints
- Swarm Service Placement Preference
- Swarm Auto-Restart and health check
- Health Check

Chapter 06: Monitoring, logging with InfluxDB/Grafana and Prometheus

- Logging Plugins
- Simple Monitoring
- Docker Events
- Configuring Prometheus – Docker Engine
- Prometheus – Runtime Metrics, App Metrics
- Grafana – Prometheus Configuration
- Configuring Grafana
- Hands-on Lab

Chapter 07: Docker Security

- Container Security
- Network Encryption
- Swarm Security
- Hands-on Lab

Chapter 08: Advanced Docker Topics.

- Private Registries
- Containerized Private Registry
- Multi-Stage Builds
- Docker Content Trust



- Signing Images
- Github – Triggered Builds
- Hands-on Lab

Who should attend:

- DevOps engineers
- Linux system administrators
- Virtualization Engineers
- Systems design engineers
- Architects