Advanced Docker Concepts and Container Orchestration

Duration: 5 Days

Skill Level: Beginners on container technology

Hands-On Format: 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.

Module 1 - Installation of Docker

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

Module 2 – Docker Client Operations

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

Module 3 – Building Custom Images and Docker Registry

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

Module 4 – Container Deep Dive

Cgroups
Namespaces
Container Resource Limits

Module 5 – Storage & Container Networking

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

Module 6 – Docker Compose

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

Module 7 – Docker Swarm

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

Module 8 – Core Concepts of Kubernetes

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

Module 9 – Installation of Kubernetes Cluster

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

Module 10 – Using Kubernetes Features

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

Module 11 – Networking in Kubernetes

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

Module 12 – Security in Kubernetes

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