

Introduction to Dockers & Containers

Learning Objective

This module introduces containers and the benefits of using containers as opposed to VMs. You will learn use cases of Containers and Docker and be able to describe Docker architecture and its components.

Topics

- Evolution of Dockers & Containers
- Differences between VM's and Containers
- Docker Use Cases
- Benefits of using Containers
- Working with Docker Commands
- Case Study

Hands-on:

Learn various Docker Commands for creating, stopping, removing, and copying containers.

Docker Installation & Architecture

Learning Objective

In this module, you will explore the prerequisites for installing Dockers. Learn to install & configure Docker toolbox on Windows OS and install & configure Docker on Amazon EC2. Validate the Docker installation. Get deeper into Docker Architecture and components.

Topics

- Installing & Configuring Docker toolbox on Windows
- Installing & configuring Docker in Amazon Linux EC2

Hands-on:

Installing & Configuring Dockers.

Docker Images, Docker Volumes & Docker Networking

Learning Objective

Create images by starting a container using a base image and interactively make changes to it, create a Docker file that will let Docker build the image automatically. Learn to create and work with Docker Volumes. Understand the three types of Docker Network – Local, Host and Bridge.

Topics

- Images & Layers
- Container Layers
- Working with Docker Images
- Building own Images using Dockerfile
- Working with Docker Volumes and Docker Networking
- Case Study

Hands-on:

Pulling and pushing images. Creating own images using Dockerfile and push to Docker Hub, Creating Automated Build using Docker Hub, Creating Docker Volumes and copying the data, Creating Bridge Network for container communication.

Docker Registries

Learning Objective

Learn to create Public and Private Repositories using Docker Hub. You will also be able to share your image using Docker Hub, deploy your own Docker images registry and set up your own automated build.

Topics

- Overview of Registries- Public and Private
- Deep Dive into Docker Hub
- Other Public & Private Registries
- Case Study

Hands-on:

- Creating Public and Private Repositories using Docker Hub
- Share your image using Docker Hub
- Deploy your own Docker images registry
- Set up your own automated build
- Creating Organizations and teams in Docker Hub

Docker Orchestration

Learning Objective

Get an overview of Docker Compose & Swarm. Learn to build High Availability Structures needed for critical applications, and understand how to filter and schedule nodes for optimal deployment

Topics

- Overview of Docker Compose
- Defining and running multi-container applications
- Overview of Docker Swarm
- Build your own Docker Swarm Cluster
- Filtering & Scheduling Containers
- Case Study

Hands-On:

- Building multi-container applications using Docker Compose.
- Creating Swarm cluster and adding the worker nodes.
- Creating Services and scheduling nodes for optimal deployment

Introduction to Kubernetes

Learning Objectives:

Learn what / why Kubernetes is required and study Kubernetes Use Cases.

Topics

- Evolution of Kubernetes

- What is Kubernetes
- Kubernetes Use Cases
- Differences between Kubernetes and Docker Swarm

Kubernetes Architecture

Learning Objective

Understand the key components of Kubernetes Cluster- Master, Nodes and AddOns.

Topics

- Understand Kubernetes Architecture
- Introduction to Kubernetes Master
- Components of Kubernetes Master
- Introduction to Node Components

Installing Kubernetes

Learning Objective

Gain knowledge on installing & Kubernetes Cluster on VirtualBox, AWS Cloud, and Google Cloud Platforms.

Topics

- Installing & Configuring Kubernetes locally via Minikube
- Creating Kubernetes Cluster in Google Cloud
- Creating Kubernetes Cluster in AWS Cloud
- Case Study

Hands-on:

- Creating 2 VM's in Virtual Box
- Download kubectl and minikube and install them
- Start Minikube & Deploy sample deployment and expose to and external network
- List all the nodes of the clusters

- Stopping and deleting the cluster
- Working with Kubernetes Dashboard

Deploying applications on Kubernetes Cluster

Learning Objective

Here you will understand about Pods and how to deploy an app using kubectl commands.

Topics

- Introduction to Pods
- Pods Lifecycle
- Working with Pods to manage multiple containers
- Deploying Pods via Replication Controllers
- Case Study

Hands-on:

- Deploy containerized application image in minikube
- Viewing Pods and Nodes

Services, Labels and Replica Sets

Learning Objective

This module helps you to learn what is a Service, how to scale up and down the application replicas, provide updates to the application and autoscaling containers.

Topics

- Overview of Services
- Labels and Selectors
- Scale out deployment using Replicas
- Horizontal Pod Autoscaling
- Load Balancing
- Rolling Updates

- Case Study

Hands-on:

- Creating a Service
- Using Service to expose App
- Working with labels
- Scale Up / Down the deployment to maximum and minimum replicas
- Check the rollout status and rollback an update
- Delete the services created

Managing State with Deployments

Learning Objective

On completing this module, you will be able to deploy both stateless applications and stateful applications. You will also be able to scale the stateful sets and provide rolling updates.

Topics

- Working with StatefulSet
- Pod Management policies
- OnDelete & Rolling Update Strategies
- Cluster DNS
- Persistent Volumes

Hands-On:

- Deploy Stateful and Stateless applications
- Creating Persistent Volumes