| Tools | Duration |
|---|---|
| Docker | 7 Hours |
| Kubernetes | 14 hours |

# DOCKER TRAINING PROGRAM

The Docker training program leverages the pedagogical approach of learning by doing with extensive hands-on labs, enterprise-focused scenarios, and practical examples. Docker training courses are updated regularly to ensure that learners are exposed to the latest product releases and current best practices informed by Docker's extensive field experience.

Each course features a variety of assessment instruments from practice quiz questions, lab exercises, to project-based signature assignment for learners to practice and meet the learning objectives of each course.

## Course Description :

The Docker Fundamentals training course features the foundational concepts and practices of containerization on a single Docker node. The course offers learners the opportunity to assimilate basic container orchestration and how to scale Docker across multiple nodes in a simple swarm cluster. This course provides essential foundational knowledge for subsequent Docker courses. Platform Availability: Linux, Windows


## Learning Objectives :

By the end of this course successfull learners will be able to:

- Assess the advantages of a containerized software development & deployment
- Use Docker engine features necessary for running containerized applications
- Utilize Swarm and Kubernetes orchestrators to deploy, maintain, and scale a distributed application

## Docker- Containers :

- **Introduction (Hr 01:00)**
  1. What is a Docker
  2. Use case of Docker
  3. Platforms for Docker
  4. Dockers vs Virtualization
- **Architecture (Hr 01:00)**
  1. Docker Architecture.
  2. Important Docker components
  3. Understanding the Docker components
- **Installation (Hr 01:00)**

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1. Installing Docker on Linux.
2. Understanding Installation of Docker on Windows.
3. Some Docker commands.

- **Provisioning (Hr 02:00)**
    1. Docker Hub.
    2. Downloading Docker images.
    3. Running Docker images
    4. Running commands in container.
    5. Running multiple containers.

- **Custom images (Hr 02:00)**
    1. Creating a custom image.
    2. Running a container from the custom image.
    3. Publishing the custom image.

- **Docker Networking (Hr 03:00)**
    1. Accessing containers
    2. Linking containers
    3. Exposing container ports
    4. Container Routing

- **DockerVolume (Hr 03:00)**
    1. Create and manage volumes
        - Create a volume
        - List volumes
        - Inspect a volume
    2. Start a container with a volume
    3. Backup, restore, or migrate data volumes
    4. Remove volumes
    5. Start a service with volumes

- **DockerCompose (Hr 04:00)**
    1. Networking Overview
    2. The Default Network
    3. Isolating Containers
    4. Aliases & Container Names
    5. Links
        1. How Updates Affect Networking
        2. Using External Networks
        3. Configuring Compose

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4. Bringing an Environment Up
5. Changing a Running Environment
6. Introspecting On An Environment
7. Taking an Environment Down

- **DockerSwarm (Hr 05:00)**
  1. Swarm Intro and Creating a 3-Node Swarm Cluster
  2. Swarm Mode A Built-In Orchestration
  3. Creating Your First Service and Scale It Locally
  4. Creating a 3-Node Swarm Cluster
  5. Swarm Basic Features and How to Use Them In Your Workflow
  6. Scaling Out with Overlay Networking
  7. Create A Multi-Service Multi-Node Web App
  8. Service Placement Preference
  9. Node Availability
- **DockerSecurity (Hr 06:00)**
  1. Docker daemon attack surface
  2. Linux kernel capabilities
  3. Docker Content Trust Signature Verification
  4. Other kernel security features

**(Hr 07:00)**

**Technical Discussion & Interview.**

## KUBERNETES TRAINING PROGRAM

What you'll learn ??

- Improve their odds of succeeding at the CNCF Certified Kubernetes Administrator test

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- Build and administer Kubernetes clusters - on-premise, as well as on all major cloud platforms (AWS, Azure, GCP)
- Understand and employ advanced deployment solutions using Kubernetes
- Master the important aspects of Kubernetes - pods, replicasets, deployments and services

## Domains & Competencies :

The CKA Certification focuses on the skills required to be a successful Kubernetes Administrator in industry today.
The CKA Certification exam includes these general domains and their weights on the exam:

- Application Lifecycle Management – 8%
- Installation, Configuration & Validation – 12%
- Core Concepts – 19%
- Networking – 11%
- Scheduling – 5%
- Security – 12%
- Cluster Maintenance – 11%
- Logging / Monitoring – 5%
- Storage – 7%
- Troubleshooting – 10%


## Kubernets Topics :

A. Introduction to Containers

B. What is Container Orchestration

C. About Kubernetes

D. Kubernetes Architecture

E. Installation

F. Namespaces

G. Pods

H. Labels and Selectors

I. Services Container Image Maintainer

- Replication Controllers and Deployments
- Kubernetes Architecture
- Kubernetes - configurations, CNI and deploying applications
- Pods - Building blocks of Kubernetes
- ReplicaSets - Building High Availability and Fault Tolerance
- Services - Publishing applications, Load Balancing and Service Discovery

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- Deployments, Rollouts and Rollbacks
- ConfigMaps and Secrets - Injecting Application Configurations
- Persistent Storage - PV, PVCs, Storage Class, Provisioners
- HELM Package manager
- Ingress Controllers
- Network Policies and Quotas
- Additional Controllers - Daemonsets, Statefulsets, Jobs and Crons
- Advanced Pod Scheduling
- RBAC - Role Based Access Control