Course Title: Dockers Essentials, Intermediate & Advanced

Course Description:

Docker Essential/Fundamental Training Program to developers and system administrators with professional and experienced Docker instructor/trainer. Docker is one of the popular and container based tool used to create, deploy and run applications on cloud and on premises. Docker is a key component for the strategic investment in any company. An organization can take advantage of the agility and portability benefits that Docker containers provide across the application lifecycle, organizations planning to optimize these applications for their digital and hybrid cloud initiatives require a broader containerization strategy.

Course Duration: 3 Days (24 Hrs.)

Course Objective:

- Create Linux Container
- Docker Client and Server running In Single or Distributed mode
- You will also learn basics of virtualization

Pre Requisites:

- No experience required
- Suitable for all types of businesses (digital product, physical product, service, B2B, B2C).

Course Contents:

Day 1: Dockers Essentials

Required components of Running Software Environment

- Introduction of Hardware
- Introduction of KERNAL
    - Namespaces
    - Cgroups
    - Capabilities
    - Filesystem
- Filesystem
    - Boot Filesystem
    - Root Filesystem
    - User Filesystem
    - App Filesystem

What is Docker?

- Introduction of Docker
- Introduction of Container?
- Components of Containers & How Containers works?

- History & Origin of Docker
- Types of Release in Docker
- Latest version of Docker
- Technology used in Docker development
- Official Website & Reference
- Major Use Cases of Docker
- Major Feature and Advantage of Docker
- Terminology used in Docker
- Components of Docker
    - Docker Engine
    - Docker Registry
    - Docker Image
    - Docker Container
- Architecture of Docker & How Docker works?
- Workflow of Docker
- Best Alternative **of Docker**

Installing and Configuring Docker

- Installing Docker in Centos 7
- Installing Docker in Ubuntu 20
- Installing Docker in Windows 2019
- Configuring Docker

Basic Workflow of Container using Docker

- Commonly used commands in Docker
- Create a Docker Container
- Start a Docker Container
- Stop a Docker Container
- Restart a Docker Container
- Pause a Docker Container
- Unpause a Docker Container
- Remove a Docker Container
- Kill a Docker Container
- Difference between Docker Stop & Docker Start
- Difference between Docker Pause & Docker Unpause
- Difference between Docker Stop & Docker Kill

Differences & Comparison of Docker Container with

- Docker Container vs Virtual Machines
- Docker Container vs Kubernetes pod
- Docker Container vs Podman Container
- dockerd vs Containerd
- dockerd vs CRI-O
- CRI-O vs runc

Course Contents: Git Intermediate Training

Duration: 2 Day (16 Hrs.)

Day 1: Dockers Essentials Topics +

Day 2: Dockers Intermediate

Advance Workflow of Containers using Docker

- Importance of PID 1 of container?
- docker run command with example
- docker run command with example
- How to use containers on a daily basis?
    - docker exec command with example
    - docker attach command with example
- How to de-attached from container?
- How to set the name of the container?
- Copying a files/dir with container using docker cp
- docker diff command with example & use cases
- Rename a container using Docker rename
- Inspect a container using Docker inspect
- List port mappings or a specific mapping for the container
- Update configuration of one or more containers using "docker update"
- Use cases & example of "docker wait"

Monitoring & Troubleshooting Docker Containers

- Docker Container - Fetch the logs of a container
- Docker Container - Display a live stream of container(s) resource usage statistics
- Docker Container - Display the running processes of a container
- Docker Server - Get real time events from the docker server
- Docker Server - dockerd service process Troubleshooting
- Docker Server - Logging of Docker Server
- Docker Server - Configuration of a docker server

Working with Docker Volume

- Storage Overview
- Why do I need docker volume?
- What are docker volumes?
- Types of docker volumes?
- Overview of Docker Volume Mount
- Overview of Docker Bind Mounts
- Overview of Docker tmpfs Mounts
- Creating & Using Docker Volume Mount with Container
- Creating & Using Docker Bind Mount with Container
- Creating & Using Docker tmpfs Mount with Container

- Troubleshoot Volume problems

Understanding a Networking with Docker Containers

- Networking overview
- Types of default Networking driver in docker
- Use bridge networks with docker container
- Use overlay networks with docker container
- Use host networking with docker container
- Use IPvlan networks with docker container
- Use Macvlan networks with docker container
- Disable networking for a container
- Configure the daemon and containers

Course Contents: Dockers Advanced Training

Duration: 3 Day (24 Hrs.)

Day 1: Dockers Essentials Topics +

Day 2: Dockers Intermediate Topics +

Day 3: Dockers Advance

Building & Troubleshooting Docker Images

- Understanding a Docker image
- Deep dive into Docker Layers & filesystems
- Internal & Anatomy of Docker image
- How to create docker image?
    - Using Existing Docker Container
    - Using Dockerfile
- Create a docker image using Existing Docker Container
- Show the history of an image
- List images
- Create a docker image using Dockerfile
- Deep dive into Dockerfile
- Dockerfile best practices
- Use multi-stage builds
- Create your own base image (advanced)

Share a docker images using registry

- Introduction of docker registry
    - Introduction of docker hub

  - Introduction of jfrog artifactory
  - Introduction of Sonatype Nexus
  - Introduction of AWS ECR
  - Introduction of Azure Container Registry
- Export a container's filesystem as a tar archive
- Import the contents from a tarball to create a filesystem image
- Load an image from a tar archive or STDIN
- Save one or more images to a tar archive (streamed to STDOUT by default)
- Difference between docker Import & docker save
- Difference between docker export & docker Load
- Working with docker tag for docker images
- Sharing(Pull/Push) a docker images using docker hub
- Sharing(Pull/Push) a docker images using jfrog artifactory
- Sharing(Pull/Push) a docker images using Sonatype Nexus
- Sharing(Pull/Push) a docker images using AWS ECR
- Sharing(Pull/Push) a docker images using Azure Container Registry

Introduction of Docker Desktop

- Docker Desktop Installation and Configurations
- Introduction of Docker Compose
- Installation of Docker Compose and running hello world program
- Introduction of Docker Registry
- Docker Desktop vs Docker Engine
- Introduction of containerd
- Introduction of Docker Swarm