Xerxez Solutions
Cooperate Training Road Map
On
Docker for the Absolute Beginner – Hands On - DevOps

This document provides the curriculum outline of the Knowledge, Skills, and Abilities that a **System Administrator**, **Cloud Infrastructure Engineers and Developers** can be expected to demonstrate on Microservice Platform.

Prerequisite:

- Basic Understanding of Operating System (Windows & Linux)
- Fundamentals of Programming Language and Data Structure.
- Basic Understanding of Cloud Technologies (Amazon Web Services)
- Basic Understanding Visual Studio Framework and Notebook Instance.

Out Come:

Docker is an open platform for developers and sysadmins to build, ship, and run distributed applications, whether on laptops, data center VMs, or the cloud. This course introduces Docker to an Absolute Beginner using simple and easy to understand lectures. Lectures are followed by demos showing how to set up and get started with Docker. The coding exercises that accompany this course will help you practice Docker commands and developing your own images using Dockerfiles and practice Docker Compose.

- You should understand what Docker is and Dockerfile.
- You should understand how to create Docker Images.
- You should understand how to map ports between Docker and the Host OS
- You should understand the basics of Docker Networking
- You should understand how to use volumes for persistent storage.
- You should be able to tag images.

Local setup (Physical Mode)	General Requirement	Cloud Account
Laptop/Desktop with high-speed internet connection, Windows 10 and above	64-bit kernel and CPU support for virtualization.	Amazon Web Service (AWS)
Memory: 4 GB RAM	KVM Virtualization	
CPU: 1 CPU Cores	Systemd init system	
Storage: 20 GB	QEMU version 5.2 or abv	

Topics Covered:

1. Introduction to Docker & Container:

- What is Hypervisors and Docker.
- Docker Architecture
- Docker Components.
- Docker Daemon.
- Docker Editions

Hands-on:

Lab No. 1: Installing and Configuring Docker

2. Docker Installation & Docker on Windows

- Docker on Windows and System Requirements
- Docker Installation on Linux/Ubuntu/CentOS
- Install Docker using the Script.
- Docker Container Lifecycle
- Docker Management Commands

Hands-on:

Lab No. 2: Installing and Configure Docker in Windows and Linux/Ubuntu/CentOS

3. Docker Images

- Docker Images Overview
- Image vs Container
- Image Layers and Sharing Layers
- Registry and Creating Images from Container

- What is Dockerfile

Lab 3: Managing Docker Containers and Images

4. Docker Registry
- Docker Registry overview
- Image Naming & Docker Hub
- Pushing and Pulling Docker Hub
- Run and Remove the Local Registry
- Basic Commands

Hands-on:

Lab 4: Docker Hub and Registry

Lab 5: Building an Image using Dockerfile

5. Docker Volume Service
- Storage for Container
- Manage Data in Docker
- Docker Volume and its Lifecycle
- Bind Mounts
- Use case for Volumes.
- Container size on disk
- Start a Container with a Volume

Hands-on:

Lab 6: Docker Volume

6. Docker Networking
- Network Driver
- Bridge Driver
- Host
- Disable Networking for Container
- Basic Docker Network Commands.

Hands-on:

Lab 6: Docker Network

7. Docker Compose
- Docker Compose Overview

- Docker Compose Features
- Docker Compose Use-Case
- Docker Compose Example
- Understanding docker-compose file.

Lab 8: Docker Compose

8. Docker Swarm
- Container Orchestration System
- How does Docker Swarm Work
- Docker Swarm Architecture
- Swarm in a Nutshell
- Swarm Nodes and Filters

Lab 9: Template for deploying Streamlit and other Python apps in Docker Swarm Mode

9. Docker Security Best Practices
- Securing the Host OS
- Securing the Container Images
- Securing the Container Runtime
- Docker Defender and Twistcli

Lab 10: Docker Defender and Twistcli

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