Docker Certified Associate

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 – Getting Started with Dockers

Installation Methods for Docker
Installing Docker in Linux
Installing Docker Desktop
Docker Image vs Docker Containers
Container Identification
Port Binding
Attached and Detached Modes
Removing Docker Containers
Docker Container Exec
Importance of IT Flags
Default Container Commands
Overriding Default Container Commands
Restart Policies in Docker
Removing Docker Container Images
Disk Usage Metrics for Docker Components
Automatically Delete Containers on Exit

Module 2 – Image Creation, Management and Registry

Working with Docker Images
Overview of Dockerfile
COPY vs ADD Instructions
EXPOSE Instruction
HEALTHCHECK Instruction
ENTRYPOINT Instruction
WORKDIR Instruction
WORKDIR Code
ENV Instruction
Tagging Docker Images
Docker Commit
Layers of Docker Image
Managing Images with CLI
Inspecting Docker Images
Pruning Docker Images
Flattening Docker Images
Overview of Docker Registries
Pushing Images to Central Repository
Applying Filters for Docker Images
Moving Image Across Hosts
Build Cache

Module 3 – Networking

Overview of Docker Networking
Understanding Bridge Networks
Implementing User-Defined Bridge Networks
Understanding Host Network
Implementing None Network
Publish All Argument for Exposed Ports
Legacy Approach for Linking Containers

Module 4 – Orchestration

Overview of Container Orchestration
Overview of Docker Swarm & Building Labs
Initializing Docker Swarm
Services, Tasks and Containers
Scaling Swarm Service
Multiple Approaches to Scale Swarm Services
Replicated vs Global Service
Draining Swarm Node
Inspecting Swarm Service and Nodes
Adding Network and Publishing Ports to Swarm Tasks
Overview of Docker Compose
Deploying Multi-Service Application in Swarm
Locking Swarm Cluster
Troubleshooting Swarm Service Deployments
Mounting Volumes via Swarm
Control Service Placement
Overview of Overlay Networks
Creating Custom Overlay Networks for Swarm
Secure Overlay Networks
Creating Swarm Services Using Templates
Split Brain and Importance of Quorum
High Availability of Swarm Manager Nodes
Running Manager-Only Nodes in Swarm
Recover from Losing the Quorum
Docker System Commands
Introduction to Kubernetes
Installation Options for Kubernetes
Using Managed Kubernetes Service from CSP
Overview of kubectl
Installing and configuring kubectl
Understanding Pods
Understanding Kubernetes Objects
Creating First Pod
Managing ReplicaSet
Managing Deployment
Managing Secrets
Managing ConfigMaps
Understanding Services
Service – ClusterIP
Service – NodePort
Kubernetes Networking Model
Understanding Liveness Probe
Understanding Readiness Probe
Understanding Daemonsets
Taint and Tolerations

Introduction to Labels and Selectors
Implementing Labels and Selectors
Request and Limits in Kubernetes
Network Policies

Module 5 – Installation and Configuration of Docker EE

Overview of Docker EE
Installing Docker EE
Universal Control Plane
Deploying Global Services in Swarm via UCP
UCP - Access Control
Overview of Docker Trusted Registry
Installing DTR and Integrating with UCP
Un-installation steps for DTR
Configuring Trusted CA and Pushing Images to DTR
Overview of DTR Backup
DTR Backup – Images
Overview of Swarm Routing Mesh
Implementing Swarm Routing Mesh
DTR – Storage Backends
Implementing S3 Storage Backend for DTR
DTR – High Availability
Immutable Tags in DTR
DTR – Caching
Setting Orchestrator in UCP

Module 6 – Security

Overview of Container Security Scanning
Configuring Container Scan with DTR
DTR Webhooks
Overview of UCP Client Bundle
Integration CLI with UCP Client Bundle
Overview of LDAP
Integration LDAP with UCP
Linux Namespaces
Control Groups
Limiting CPUs for Containers
Reservation vs Limits
Swarm MTLS
Managing Secrets in Docker Swarm
Docker Content Trust
Overview of Docker Groups
Overview of Linux Capabilities for Docker
Privileged Containers

Module 7 – Storage and Volumes

Overview of Docker Storage Drivers
Block vs Object Storage
Changing Storage Drivers
Overview of Docker Volumes
Bind Mounts
Automatically Remove Volume on Container Exist
Overview of Device Mapper
Logging Drivers

Creating Volumes in Kubernetes
PV vs PVC
Volume Expansion in Kubernetes
Reclaim Policy
Understanding Retain Reclaim Policy
Storage Class