

DOCKER - KUBERNETES COURSE SYLLABUS

Section 1: Dockers & Containers Introduction

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

Section 2: Installation and Architecture of Docker

- Installation and configuration of Docker in GCP VM
- Learn to installing & configuring Docker on GCP VM instance
- Validating the Docker installation

Section 3: Docker Images, Volumes & Networking

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

Section 4: Registries in Docker

- Overview of Registries in Docker- Public and Private
- Deep Dive into Docker Hub
- Other Public and Private Registries

Section 5: Docker - Orchestration

- Overview of Docker Compose
- Docker Defining and running multi-container applications

- Overview Docker Swarm
- Build your own Docker Swarm Cluster
- Filtering and Scheduling Containers

Section 6: Kubernetes Introduction

- Kubernetes Evolution
- What is Kubernetes ?
- Use Cases of Kubernetes
- Differences between Kubernetes and Docker Swarm

Section 7: Architecture of Kubernetes

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

Section 8: Installation Kubernetes

- Installation & Configuration of Kubernetes locally on VM machine
- Creating Kubernetes Cluster in Google Cloud

Section 9: Kubernetes Cluster - Deploying applications

- Pods Introduction
- Lifecycle of Pods
- Working with Pods to manage multiple containers
- Deploying Pods via Replication Controllers
- Testing resiliency

Section 10 : Services, Labels & Replica Sets

- Services Overview
- Labels and Selectors

- Scale out deployment using Replicas
- Horizontal Pod Autoscaling
- Load Balancing
- Rolling Updates

Section 11 : **Managing State with Deployments**

- Working with StatefulSet
- Explain Deployment strategies
- Define Pod Management policies
- On Delete & Rolling Update Strategies
- Explain nodeSelector
- Node Affinity/Pod Affinity
- About Taints and tolerations

Section 12 : **Kubernetes Templating Resources**

- Creating reusable templates
- Helm's templating engine
- Understanding the Helm architecture
- Managing releases with Helm
- Reverting changes with Rollbacks

Section 13 : **Kubernetes - Managing state**

- Manage configurations
- Manage secrets
- Use Kubernetes Volumes
- Creation of Persistent Volumes
- Creation of Persistent Volume Claims
- Provisioning volumes dynamically
- Managing stateful application

Section 14 : **Kubernetes - Autoscaling**

- Auto Scaling Introduction
- The Horizontal Pod Autoscaler
- The Kubernetes metrics registry
- Exposing metrics from your apps
- Installation and configuration Prometheus
- Understanding custom and external metrics adapters
- Tuning the Horizontal Pod Autoscaler

Section 15 : **Additional Topics - Docker & Kubernetes**

- Jenkins Setup
- Configuration CI/CD pipeline for automated Kubernetes deployment
- Configuration CI/CD pipeline for automated Docker deployment



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