Container Orchestration using Kubernetes

Trainer: Swaminathan G

**Basics**

Container Evolution

Container Runtime Engine

Docker Basics

Creating application images and tagging

Continuous Integration with Images

**Core Concepts**

Kubernetes Architecture

Master Node initialisation

Worker Nodes initialization - Worker1 & 2

Basic commands of Kubernetes

**Cluster Administration**

Verify Cluster setup

Deep-dive into Master setup

Registering Working Nodes

Kubernetes API

Deploying the first pod and accessing it

Working with Kubeadm

Kubernetes Dashboard

ETCD - Backup & Restore

Upgrading Kubernetes Cluster

**Workloads**

Pod

One-container-per-Pod

Multi-Container-Pod

Init-Container

Static-Pod

Resource Limits

Deployment

Update Deployment

Rolling Back to a Previous Revision

Scaling deployment

Deploying multi-tier application - WordPress, Gogs, Voting App

Daemon Set

Jobs

CronJobs

Configuration basics

Env

ConfigMaps

Secrets

Labels & Selectors

Set-based selectors

Annotations

Monitoring Pods/Nodes: Metrics Server

Horizontal Pod Autoscaling(HPA)

Self Healing Pods - Probes: Liveness and Readiness

Namespaces

**Templating Tool - Helm**

Deploying tools

Deploying application

Quick view of CI/CD

**Scheduling**

NodeName

NodeSelector

Node Affinity

Pod Affinity

Taints and Tolerations

Security Context

Pod Priority

Deploying Python Flask application

**Networking**

DNS for Services and Pods

Service

Service Types

Ingress

Load Balancer

Network Policies: DENY and LIMIT traffic to application

**Storage**

Non-Persistent/Ephemeral Volume

emptyDir

Host Directory

Volume Config

ConfigMap

Secret

Persistent Volume

Persistent Volume Claim

Access Modes

ReadWriteOnce

ReadWriteMany

**RBAC & Quota**

Roles and Role Binding

Cluster Role and Binding

RBAC with Namespaces

Validating RBAC as Cluster Admin

Resource Quota

**Azure Kubernetes Service**

Create AKS Cluster

Workloads

Deployment - Rolling update and rollback

Service

Creating Load Balancer - Service

Storage - PV and PVC

Creating PVC with dynamic PV

Upgrade AKS cluster

**Troubleshooting**

Kubernetes cluster

Troubleshooting the control plane

Logs: Master, Worker Nodes, and Pods

Worker Nodes

Application Troubleshooting

Basics

2-Tier App

**CKA & Misc**

CKA Certification FAQs

Planning for certification

Near real exam Question discussion

CICD - Multiple Microservices in Kubernetes

Project: ECommerce application with 12 Microservices

Simplilearn CKA Certification

**Course Plan**

Day 1 - Basics, Core Concepts

Day 2 - Cluster Administration, Workloads

Day 3 - Workloads

Day 4 - Workloads, Helm

Day 5 - Scheduling

Day 6 - Networking

Day 7 - Storage

Day 8 - RBAC & Quota, AKS

Day 9 - Troubleshooting

Day 10 - CKA & Misc