

Kubernetes Application

Duration: 4 days (8hrs/day)

Prerequisites:

- Basic knowledge of Linux Server Administration.
- Basic knowledge of Containers

Lab Requirement: Microsoft Azure Account

Module 1 – Core Concepts

- Overview of Container Orchestration
- Introduction to Kubernetes
- Understanding Kubernetes Architecture
- Understand Azure Kubernetes Service
- Lab: Create Azure AKS Cluster
- Lab: Connecting with AKS Cluster

Module 2 – Creating Kubernetes Resources

- Understanding Pods, Labels & Selectors
- Lab: Deploying Applications as a Pod
- Lab: Managing Labels & Selector
- Understanding Replica on Controller & Replica Set
- Lab: Deploying Replica on Controller & Replica Set
- Understanding Services – Cluster IP, Node Port & Load Balancer
- Lab: Creating & Managing ClusterIP, Node Port and Load Balancer
- Understanding Daemon Sets
- Lab: Deploying Applications as Daemon Sets

Module 3 – Scheduling

- Manual Scheduling of Pods
- Taint and Tolerations
- Lab: Using Manual Scheduling or Taints and Tolerations
- Node Selector
- Lab: Using Node Selector to Deploy Pods
- Node Affinity
- Lab: Using Node Affinity to Deploy Pods

Module 4 – Application Lifecycle Management

- Overview of Deployment
- Deployment Strategies – Blue/Green & Canary
- Lab: Deploying Applications as Deployment
- Lab: Implementing Blue-Green Deployment Strategy

Module 5 – Environment Variable

- Plain Key
- Config Map
- Secret
- Lab: Using Plain Keys, Config Map & Generic Secret as Environment Variables
- Lab: Mount Environment Variable as Volumes

Module 6 – Storage

- Understanding Volume Management in AKS
- Types of Volumes Provisioning
- Persistent Volumes
- Persistent Volume Claim
- Lab: Using PV & PVC to ach Persistent Volume to a Pod using Azure Disk
- Understanding Storage Class
- Lab: Use AKS Provisioned Storage Class instead of Custom Storage Class

Module 7 – Security

- Introduction to Active Directory Authentication for AKS admins
- Lab: Create AD Group and User and Enable AD for AKS
- Lab: Access Azure AKS Cluster Resources using Azure AD User
- Understanding Role, ClusterRole, RoleBinding& ClusterRoleBinding
- Lab: Managing Roles and Role Binding
- Lab: Managing Cluster Role and Cluster Role Binding

Module 8 – Autoscaling

- Introduction to Cluster Autoscaler
- Lab: Create AKS Cluster with Autoscaling enabled using Azure AKS
- Introduction to Horizontal Pod Autoscaler
- Lab: Create Horizontal Pod Autoscaler

Module 9 – Logging and Monitoring

- Understand how to Monitor Applica on and Cluster Components

- Lab: Understand how to Read Application & Cluster Component Logs
- Lab: Deploying Prometheus & Grafana to Monitor K8s Cluster

Module 10 – Networking in Kubernetes

- Understand Basics of Kubernetes Networking
- Understand CNI
- Understand Pod Networking Concepts
- Understanding Ingress
- Lab: Configure and Manage Ingress Rule
- Lab: Configure and Manage Ingress with TLS
- Understanding Namespace & Use-Cases
- Lab: Creating Namespace & Deploying K8s resources in Different Namespaces

Module 11 – Readiness and Liveness Probe

- Understanding Readiness Probe
- Lab: Readiness Probe
- Understanding Liveness Probe
- Lab: Liveness Probe

Module 12 – Helm Package Manager

- Introduction to Helm
- Lab: Installing Helm
- Working with Chart Repositories
- Lab: Work with Helm Charts
- Lab: Commands – Helm template, Helm history, Helm Rollback,
- Create Helm Charts
- Lab: Create Helm Charts
- Upgrade and Downgrade Helm Charts
- Lab: Deploying Kubernetes Resources using Helm Package Manager