

Advanced Azure Kubernetes Service

Duration: 5 days (8hrs/day)

Prerequisites: Must complete Azure Kubernetes Service course.

Course Objective: This comprehensive Azure Kubernetes Service course, covering container orchestration, cluster design, installation, resource and application management, security, networking, maintenance, logging, and monitoring on Azure, is designed to equip learners with the skills needed to successfully clear the Certified Kubernetes Administrator exam.

Kubernetes Version: Latest

Lab Requirement: Customer Azure Account Required

Module 1 - Core Concepts

AKS architecture

Introduction to Kubernetes

Understanding Kubernetes Architecture

Module 2 - Installation, Configuration & Validation

Introduction to Azure AKS Cluster

Lab: Create AKS Cluster

Lab: Explore AKS Cluster using kubectl

Lab: Setup Azure CLI on Local Desktop

Module 3 – Comparing AKS Public and Private Clusters

Introduction to clusters access modes

Architecture of a public cluster

Lab: Private cluster with Private Endpoint

Public cluster with VNET integration

Private cluster with VNET integration

Module 4 – Network plugins for AKS: Kubenet and Azure CNI

Kubenet (basic) network mode

Azure CNI (advanced) network mode

Kubenet vs Azure CNI

Azure CNI Overlay mode

Module 5 – Kubernetes External DNS

Introduction to External DNS on the Lightboard

Lab: Managing domain names using External DNS

Module 6 – StatefulSet for data persistence

Introduction to StatefulSet

Lab: Creating a StatefulSet

Statefulset for a MySQL cluster with many replicas

Lab: Creating a MySQL cluster with primary and replica instances

Module 7 – Persist AKS data using Azure Disk

Introduction to Azure Disk

Using Azure Disk with Local Redundent Storage (LRS)

Lab: Creating Azure Disk with Local Redundent Storage (LRS)

Introduction to Azure Disk with Zone Redundant Storage (ZRS)

Lab: Creating Azure Disk with Zone Redundant Storage (ZRS)

Introduction to Azure Shared Disk with Zone Redundant Storage (ZRS)

Lab: Creating Azure Shared Disk with Zone Redundant Storage (ZRS)

Module 8 – AKS Backup using Azure Backup Vault

Introduction to AKS Backup

Lab: Preparing the environment

Lab: Installing the Backup extension

Lab: Deploying sample app (PV, Deploy) for backup

Lab: Configuring AKS Backup Policy and Instance

Lab: Triggering manual Backup

Lab: Restore an AKS cluster & Verifying Restore errors

Module 09 – Logging and Monitoring

Understand how to Monitor Application and Cluster Components

Lab: Understand how to Read Application & Cluster Component Logs

Lab: Deploying Prometheus & Grafana to Monitor K8s Cluster

Module 10 – Networking

Understand Basics of Kubernetes Networking

Understand Azure CNI

Understand Pod Networking Concepts

Understanding Ingress

Lab: Configure and Manage Ingress Rule

Understanding Namespace & Use-Cases

Lab: Creating Namespace & Deploying K8s resources in Different Namespaces

Lab: Load Balancer Service

Lab: Bring your own VNET/subnet, NSG and Route Table in AKS

Understand VNET Peering

Lab: Create AKS with NAT Gateway

Module 11 – High Availability in AKS

Free and Standard tiers for AKS cluster management

Lab: Availability Zones in AKS

Use Azure Front Door to route traffic between multiple AKS clusters

Module 12 – Deploy to AKS using Azure DevOps

Initial setup: Create a project, a service connection, add files, create ACR+AKS

Lab: Use a preconfigured Pipeline to build/push to ACR and deploy to AKS

Module 13 – AKS Access and Identify

AKS Authorization and Authentication

Lab: Generate kubeconfig for admins

Lab: Generate kubeconfig for users

Admin vs User - Security concerns

Module 14 – Disaster Recovery

Introduction the Kubernetes Snapshot API

Lab: Creating a Snapshot for a persistent volume

Introduction to Velero

Lab: Creating AKS cluster backup using Velero

Lab: Restore an AKS cluster from backup