

Duration- (25 Hours)

1. Introduction to AKS Architecture and Advanced Features

- Review of AKS components and architecture.
- Understanding the control plane and node pools.
- Advanced networking options (e.g., Azure CNI, Kubernetes network policies).
- Integration with Azure services (e.g., Azure AD, Key Vault, Monitor).

2. Advanced Kubernetes Networking

- In-depth exploration of Kubernetes networking concepts.
- Configuring and managing network policies.
- Service mesh implementations (e.g., Istio, Linkerd) on AKS.
- Working with ingress controllers and load balancers.

3. Security in AKS

- Best practices for securing AKS clusters.
- Implementing Azure Active Directory (AAD) for cluster authentication.
- Securing applications with pod security policies and network policies.
- Secrets management using Azure Key Vault and Kubernetes secrets.

4. Monitoring and Logging

- Setting up monitoring with Azure Monitor and Azure Log Analytics.
- Configuring Prometheus and Grafana for AKS.
- Troubleshooting common issues using logs and metrics.
- Implementing alerting and notifications.

5. Scaling and Performance Tuning

- Horizontal Pod Autoscaling (HPA) and Vertical Pod Autoscaling (VPA).
- Cluster autoscaler and node pool management.
- Performance tuning for AKS clusters.
- Best practices for resource requests and limits.

6. CI/CD Pipeline Integration

- Integrating AKS with Azure DevOps and GitHub Actions.
- Implementing continuous deployment with Kubernetes manifests, Helm charts, or Kustomize.
- Blue/green deployments, canary releases, and A/B testing.

7. Disaster Recovery and High Availability

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- Designing AKS clusters for high availability.
- Backup and restore strategies for AKS.
- Disaster recovery planning with AKS.
- Multi-region and multi-cluster setups.

8. Advanced Helm and Operators

- In-depth usage of Helm for managing Kubernetes applications.
- Creating and managing Helm charts.
- Understanding and deploying Kubernetes operators.
- Custom resource definitions (CRDs) and extending Kubernetes.

9. Service Mesh and Advanced Networking

- Introduction to service mesh concepts.
- Deploying and managing Istio or Linkerd on AKS.
- Advanced traffic management and policy enforcement.
- Observability and security in a service mesh.

10. AKS Best Practices and Cost Management

- Best practices for managing AKS clusters at scale.
- Cost optimization techniques for AKS.
- Governance and policy enforcement with Azure Policy and OPA (Open Policy Agent).
- FinOps considerations for AKS deployments.

11. Hands-on Labs

- Deploying and scaling complex applications on AKS.
- Implementing security and compliance in real-world scenarios.
- Troubleshooting and resolving common AKS issues.
- End-to-end CI/CD pipeline setup with AKS.