

Cloud Architect Expert Combo Training Course Agenda



Course Outline

Introduction to Cloud Computing

- ❖ Introduction to Cloud Computing
- ❖ Why Cloud Computing?
- ❖ Benefits of Cloud Computing
- ❖ Types of Cloud Computing
- ❖ Deployment Models (Public, Private, Hybrid, and Community)
- ❖ Service Models (iaas, paas, saas)
- ❖ Horizontal vs. Vertical scaling
- ❖ Cloud Computing Issues
- ❖ Security
- ❖ Costing Model
- ❖ Service Level Agreement (SLA)
- ❖ What to migrate
- ❖ Legal and compliance

Virtualization

- ❖ Virtualization and cloud computing
- ❖ Types of virtualization
- ❖ Virtualization terminologies
- ❖ Hypervisor, types & features
- ❖ Creating virtual machines lab
- ❖ Benefits
- ❖ Vendors

Amazon Web Services (Mapped to AWS Certified Solutions Architect Associate & Professional)

- ❖ Introduction to the AWS products & Comparison with other providers
- ❖ Global infrastructure, Regions & Availability Zones
- ❖ Signing up for AWS & AWS Free usage tier

EC2 Instances

- ❖ Introduction to creating scalable instances using AWS EC2
- ❖ Instances & Types
- ❖ Instance purchasing options & Pricing models
- ❖ Amazon Machine Images (AMI) & Custom amis
- ❖ Instance store & EBS Volumes
- ❖ Launching your first AWS Windows Server & Linux Instances
- ❖ EC2 volume types (Instance Store, EBS & EFS)
- ❖ Firewall & Security Groups
- ❖ Snapshots & Recovery, snapshot scheduling
- ❖ Usage reports & limits

- ❖ Elastic IP, BYOIP
- ❖ Key Pairs, Tags
- ❖ Elastic Load Balancing (ALB and NLB)
- ❖ Auto Scaling
- ❖ Troubleshooting Issues

AWS Command Line Interface (CLI)

- ❖ Introduction to AWS CLI
- ❖ Connecting to your AWS account via CLI
- ❖ Other functionalities with CLI

Light Sail

- ❖ Difference between EC2 & Lightsail
- ❖ Advantages & Functionalities
- ❖ Available options on instances and AMIs
- ❖ Migrating Lightsail to EC2
- ❖ DNS records
- ❖ Elastic IP
- ❖ Troubleshooting

Elastic Beanstalk

- ❖ Comparison with EC2, Lightsail & Elastic Beanstalk
- ❖ Hosting a sample application in EB
- ❖ Versioning, rollback, and custom configurations
- ❖ Common issues & troubleshooting

Overview of Other Compute Services

- ❖ ECS (Elastic Container Service)
- ❖ EKS (Amazon Elastic Container Service for Kubernetes)
- ❖ Lambda
- ❖ Outpost
- ❖ Batch

Storage

- ❖ Introduction to storage
- ❖ AWS Storage Tiers
- ❖ Use cases

Simple Storage Service (AWS S3)

- ❖ Buckets & Objects
- ❖ Encryption, Logging
- ❖ S3 durability and redundancy
- ❖ S3 Permissions
- ❖ Hosting a static website in AWS S3
- ❖ Access Control Lists & Bucket Policies
- ❖ S3 Object Versioning & Lifecycle Policies

- ❖ Cross-Region Replication
- ❖ EC2-S3 Integration
- ❖ S3 storage class analysis
- ❖ S3 Glacier Deep Archive
- ❖ Common issues and troubleshooting

AWS FSx

- ❖ Introduction to FSx
- ❖ Concepts
- ❖ Creating a Windows-based file system
- ❖ Mapping storage
- ❖ Troubleshooting

AWS Storage Gateway

AWS Database Services

Relational Database Service (RDS)

- ❖ Selecting the Database type
- ❖ Configuring & creating the database
- ❖ DB Security groups
- ❖ Snapshots
- ❖ Recovering a DB instance from the snapshot
- ❖ Configuring backups
- ❖ Configuring the maintenance windows
- ❖ Connecting to the database
- ❖ RDS Security

Dynamo DB

- ❖ Creating a dynamoDB
- ❖ Advantages of using dynamoDB
- ❖ Configuring alarms
- ❖ Connecting to Dynamo DB

Other database services

- ❖ ElastiCache
- ❖ Neptune
- ❖ Redshift

Migration & Transfer

- ❖ AWS Server Migration Service
- ❖ AWS Database Migration Service
- ❖ Migration Hub
- ❖ Snowball

Identity access management (IAM)

- ❖ IAM Concepts, Design Principles
- ❖ Users, Groups & Roles
- ❖ AWS Credentials

- ❖ Custom Roles and policies
- ❖ Cross account access
- ❖ STS and temporary credentials
- ❖ SSO, Federation & Cognito
- ❖ AWS Resource Access Manager (RAM)

AWS Secrets Manager

AWS Guard Duty

AWS Inspector

AWS Certificate Manager (ACM)

AWS Directory Service

- ❖ Introduction to AWS Directory service
- ❖ Concepts of AD
- ❖ Configuring EC2 instances with Directory Services

AWS Organizations

- ❖ Importance of creating and managing multiple accounts in a corporate scenario
- ❖ Creating an organization
- ❖ Adding OUs
- ❖ Billing & management

Web Application Firewall (WAF) & Shield

Cloud Formation

- ❖ Introduction to Infrastructure as a Code
- ❖ CF stacks & templates
- ❖ Creating an S3 bucket etc.
- ❖ Saving, managing & importing templates
- ❖ Updating & Versioning

Cloud Watch

- ❖ Cloud watch dashboard
- ❖ Configuring Monitoring services
- ❖ Setting thresholds
- ❖ Configuring actions
- ❖ Creating a cloud watch alarm
- ❖ Getting statistics for ec2 instances
- ❖ Monitoring other AWS services
- ❖ Configuring Notifications
- ❖ Integrating cloud watch with Autoscaling

X-Ray

Autoscaling & Load Balancing

- ❖ Introduction to Load Balancing
- ❖ Types & scenarios
- ❖ Launch configuration
- ❖ Configuring a Load balanced web server
- ❖ Introduction to Autoscaling
- ❖ Configuring auto-scaling with EC2
- ❖ Rules & Alarms
- ❖ Troubleshooting

Cloud trail

- ❖ Introduction to Logging
- ❖ Creating a trail
- ❖ Event History

AWS Systems Manager

- ❖ Introduction to AWS Systems Manager
- ❖ Session manager
- ❖ Resource Group manager
- ❖ Remote Execution
- ❖ OS Patch management

AWS Trusted Advisor

AWS KMS

- ❖ Encryption and Key Management
- ❖ CMK with Custom Key Material
- ❖ Key Rotation and Security in KMS
- ❖ CloudHSM

API Gateway

AWS Inspector

AWS Macie

AWS Guard Duty

AWS License Manager

AWS Personal Health Dashboard

AWS Amplify

Cloud Front

- ❖ CDN Concepts
- ❖ Creating a cloud front distribution
- ❖ Hosting a website of cloud front distribution
- ❖ Implementing restrictions
- ❖ Configuring origins and behaviors

AWS ElastiCache

AWS Route53

- ❖ DNS Concepts and Working
- ❖ Domain registration
- ❖ Configuring recordset
- ❖ Configuring DNS with web servers & CDN
- ❖ Troubleshooting

AWS Virtual Private Cloud (VPC)

- ❖ What is VPC?
- ❖ VPC configuration
- ❖ Public & Private subnets
- ❖ Internet gateway & NAT gateway
- ❖ VPC security
- ❖ Elastic IP's
- ❖ Inbound and outbound ACL's
- ❖ Designing a VPC
- ❖ Gateways
- ❖ Routing Tables

- ❖ VPC Peering
- ❖ Best Practices

Simple Notification Service (SNS)

- ❖ What is SNS
- ❖ Creating a topic
- ❖ Create subscription
- ❖ Subscribed to the subscription

WorkSpaces

- ❖ Introduction to Desktop as a Service
- ❖ Creating & configuring a workspace
- ❖ Connecting to a workspace
- ❖ Integration

AWS Kinesis

- ❖ Kinesis Data Streams
- ❖ Kinesis Data Firehose
- ❖ Kinesis Data Analytics
- ❖ Streaming Architectures

Athena & Quick sight

SQS

SWF

Workdocs

Work email

App stream

Billing & Cost Management

Service & Support

Microsoft Azure Architecting (Mapped to Microsoft Azure Solutions Architect Expert)

Manage Azure AD objects

- ❖ Create users and groups
- ❖ Manage user and group properties
- ❖ Manage device settings
- ❖ Perform bulk user updates
- ❖ Manage guest accounts
- ❖ Configure Azure AD Join
- ❖ Configure self-service password reset

Manage role-based access control (RBAC)

- ❖ Create a custom role
- ❖ Provide access to Azure resources by assigning roles
 - Subscriptions
 - Resource groups
 - Resources (VM, disk, etc.)
- ❖ Interpret access assignments
- ❖ Manage multiple directories

Design authentication

- ❖ Recommend a solution for single-sign on
- ❖ Recommend a solution for authentication

- ❖ Recommend a solution for conditional access, including multi-factor authentication
- ❖ Recommend a solution for network access authentication
- ❖ Recommend a solution for a hybrid identity including azure ad connect and azure ad Connect Health
- ❖ recommend a solution for user self-service
- ❖ recommend and implement a solution for B2B integration

Design authorization

- ❖ Choose an authorization approach
- ❖ Recommend a hierarchical structure that includes management groups, subscriptions and resource groups
- ❖ Recommend an access management solution including RBAC policies, access reviews,
- ❖ Role assignments, physical access, privileged identity management (PIM), azure ad
 - Identity protection, just in time (jit) access

Design governance

- ❖ Recommend a strategy for tagging
- ❖ Recommend a solution for using azure policy
- ❖ Recommend a solution for using azure blueprint

Manage subscriptions and governance

- ❖ Configure Azure policies
- ❖ Configure resource locks
- ❖ Apply tags
- ❖ Create and manage resource groups
 - Move resources
 - Manage subscriptions
- ❖ Configure Cost Management
- ❖ Configure management groups

Implement cloud infrastructure monitoring

- ❖ Monitor security
- ❖ Monitor performance
 - Configure diagnostic settings on resources
 - Create a performance baseline for resources
 - Monitor for unused resources
 - Monitor performance capacity
 - Visualize diagnostics data using Azure Monitor
- ❖ Monitor health and availability
 - Monitor networking
 - Monitor service health
- ❖ Monitor cost
 - Monitor & report spends
 - Recommend a solution for cost management and cost reporting
 - Recommend solutions to minimize cost
- ❖ Configure advanced logging
 - Recommend & Plan for integration with monitoring tools including Azure Monitor and Azure Sentinel
 - Implement and configure Azure Monitor insights, including App Insights, Networks, Containers

- Configure a Log Analytics workspace
- ❖ Configure logging for workloads
 - Initiate automated responses by using Action Groups
- ❖ Configure and manage advanced alerts
 - Collect alerts and metrics across multiple subscriptions
 - View Alerts in Azure Monitor logs
- ❖ Choose a mechanism for event routing and escalation
- ❖ Configure and interpret metrics
- ❖ Analyze metrics across subscriptions
- ❖ Configure & implement Log Analytics
- ❖ Configure diagnostic settings
- ❖ Query and analyze logs
- ❖ Create a query & save a query to the dashboard
- ❖ Interpret graphs
- ❖ Set up alerts and actions
- ❖ Create and test alerts
- ❖ Create action groups
- ❖ View alerts in Azure Monitor
- ❖ Analyze alerts across subscriptions
- ❖ Configure Application Insights

Implement & Manage storage accounts

- ❖ Select storage account options based on a use case
- ❖ Configure Azure Files and blob storage
- ❖ Configure network access to the storage account
- ❖ Implement Shared Access Signatures and access policies
- ❖ Implement Azure AD authentication for storage
- ❖ Manage access keys
- ❖ Implement Azure storage replication
- ❖ Implement Azure storage account failover
- ❖ Azure Storage Explorer and AZ Copy
- ❖ Create an Azure file share
- ❖ Create and configure Azure File Sync service
- ❖ Configure Azure blob storage
- ❖ Configure storage tiers for Azure blobs

Implement VMs for Windows and Linux

- ❖ Configure High Availability
- ❖ Configure storage for vms
- ❖ Select virtual machine size
- ❖ Implement Azure Dedicated Hosts
- ❖ Deploy and configure scale sets
- ❖ Configure Azure Disk Encryption
- ❖ Recommend a solution for compute provisioning

Design a compute solution

- ❖ Recommend a solution for compute provisioning

- ❖ Determine appropriate compute technologies, including virtual machines, app services, service fabric, azure functions, windows virtual desktop, and containers
- ❖ Recommend a solution for containers
 - AKS versus ACI and the configuration of each one
- ❖ Recommend a solution for automating compute management

Automate deployment and configuration of resources

- ❖ Save a deployment as an Azure Resource Manager template
- ❖ Modify Azure Resource Manager template
- ❖ Evaluate location of new resources
- ❖ Configure a virtual disk template
- ❖ Deploy from a template
- ❖ Manage a template library
- ❖ Create and execute an automation runbook

Implement virtual networking

- ❖ Setting up and configuring vnets
- ❖ Implement vnet to vnet connections
- ❖ Implement vnet peering
- ❖ Configure private and public IP addresses, network routes, network interface, subnets, and virtual network
- ❖ Monitor on-premises connectivity
- ❖ Use Network Performance Monitor
- ❖ Use Network Watcher
- ❖ Troubleshoot external networking & virtual network connectivity

Configure name resolution

- ❖ Configure Azure DNS
- ❖ Configure custom DNS settings
- ❖ Configure a private or public DNS zone

Secure access to virtual networks

- ❖ Create security rules
- ❖ Associate an NSG to a subnet or network interface
- ❖ Evaluate effective security rules
- ❖ Deploy and configure Azure Firewall
- ❖ Deploy and configure Azure Bastion Service

Design a network solution

- ❖ Recommend a solution for network addressing and name resolution
- ❖ Recommend a solution for network provisioning
- ❖ Recommend a solution for network security
 - Private endpoints
 - Firewalls
 - Gateways
- ❖ Recommend a solution for network connectivity to the Internet, on-premises networks, and other

Azure virtual networks

- ❖ Recommend a solution for automating network management
- ❖ Recommend a solution for load balancing and traffic routing

Implement Azure Active Directory

- ❖ Add custom domains
- ❖ Configure Azure AD Identity Protection
- ❖ Implement self-service password reset
- ❖ Implement Conditional Access including MFA
- ❖ Configure user accounts for MFA
- ❖ Configure fraud alerts
- ❖ Configure bypass options
- ❖ Configure Trusted ips
- ❖ Configure verification methods
- ❖ Implement and manage guest accounts
- ❖ Manage multiple directories

Implement and manage hybrid identities

- ❖ Install and configure Azure AD Connect
- ❖ Identity synchronization options
- ❖ Configure and manage password sync and password writeback
- ❖ Configure single sign-on
- ❖ Use Azure AD Connect Health

Manage workloads in Azure

- ❖ Migrate workloads using Azure Migrate
 - Assess infrastructure
 - Select a migration method
 - Prepare the on-premises for migration
 - Recommend target infrastructure
- ❖ Solutions for migrating applications, VMs and Databases
- ❖ Implement Azure Backup for vms
- ❖ Implement disaster recovery
- ❖ Implement Azure Update Management

Implement load balancing and network security

- ❖ Implement Azure Load Balancer
- ❖ Implement an application gateway
- ❖ Implement a Web Application Firewall
- ❖ Implement Azure Firewall
- ❖ Implement the Azure Front Door Service
- ❖ Implement Azure Traffic Manager
- ❖ Implement Network Security Groups and Application Security Groups
- ❖ Implement Bastion

Implement and manage Azure governance solutions

- ❖ Create and manage hierarchical structure that contains management groups, subscriptions and resource groups
- ❖ Assign RBAC roles
- ❖ Create a custom RBAC role
- ❖ Configure access to Azure resources by assigning roles
- ❖ Configure management access to Azure
- ❖ Interpret effective permissions
- ❖ Set up and perform an access review
- ❖ Implement and configure an Azure Policy
- ❖ Implement and configure an Azure Blueprint

Manage security for applications

- ❖ Implement and configure keyvault
- ❖ Implement and configure Azure AD Managed Identities
- ❖ Register and manage applications in Azure AD

Implement an application infrastructure

- ❖ Create and configure Azure App Service
- ❖ Create an App Service Web App for Containers
- ❖ Create and configure an App Service plan
- ❖ Configure an App Service
- ❖ Configure networking for an App Service
- ❖ Create and manage deployment slots
- ❖ Implement Logic Apps
- ❖ Implement Azure Functions
- ❖ Implement solutions for API Integration

Implement container-based applications

- ❖ Create a container image
- ❖ Configure Azure Kubernetes Service
- ❖ Publish and automate image deployment to the Azure Container Registry
- ❖ Publish a solution on an Azure Container Instance

Create and configure Web Apps

- ❖ Create and configure App Service
- ❖ Create and configure App Service Plans

Implement nosql databases

- ❖ Configure storage account tables
- ❖ Select appropriate cosmosdb apis
- ❖ Set up replicas in cosmosdb

Implement Azure SQL databases

- ❖ Configure Azure SQL database settings
- ❖ Implement Azure SQL Database managed instances

- ❖ Configure HA for an Azure SQL database
- ❖ Publish an Azure SQL database

Design a solution for databases

- ❖ Select an appropriate data platform based on requirements
- ❖ Recommend database service tier sizing
- ❖ Recommend a solution for database scalability; recommend a solution for encrypting data at rest, data in transmission, and data in use

Design a solution for backup and recovery

- ❖ Recommend a recovery solution for Azure hybrid and on-premises workloads that meets recovery objectives (RTO, RLO, RPO)
- ❖ Design and Azure Site Recovery solution
 - Recommend a site recovery replication policy
 - Recommend a solution for site recovery capacity
 - Recommend a solution for site failover and failback (planned/unplanned)
 - Recommend a solution for the site recovery network
- ❖ Recommend a solution for recovery in different regions
- ❖ Recommend a solution for Azure Backup management
- ❖ Design a solution for data archiving and retention
 - Recommend storage types and methodology for data archiving
 - Identify business compliance requirements for data archiving
 - Identify requirements for data archiving
 - Identify SLA(s) for data archiving
 - Recommend a data retention policy

Design for high availability

- ❖ Recommend a solution for application and workload redundancy, including compute, database, and storage
- ❖ Recommend a solution for autoscaling
- ❖ Identify resources that require high availability
- ❖ Identify storage types for high availability
- ❖ Recommend a solution for geo-redundancy of workloads

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