

AWS Certified Solution Architect Associate – Study Guide

Identity and Access Management

AWS Identity and Access Management (IAM) allows you to control and manage access to AWS services and resources for your Users and Groups. In addition to Users and Groups, you can create and manage roles and policy documents.

Account Management:

- Managing the credentials for your AWS account.
- Password Policy and Multi Factor Authentication (MFA)

IAM Users and Group:

- Fundamental of IAM and AWS account management
- Root Account vs Power user
- Default Permissions for a new user
- Usage of Access Key Id and how it differs from account login credentials

Policy Document:

- Format of policy document
- Difference between managed and inline policies.
- Understand JSON structure

Roles: Highly asked exam topic, Expect between 2 to 4 Questions.

- Creation of a role
- Relationship with policy document
- Difference between trust and permission policies
- Three types of roles: Service Roles, Cross Account Access and Identity Provider Access
- Cross account access for Billing and S3 Buckets
- Granting access to web identity and Single Sign-On (WebSSO) providers

Simple Storage Services (S3)

Amazon Simple Storage Service (Amazon S3), provides secure, durable, highly-scalable object based storage. Expect between 3 to 6 Questions.

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Storage Tiers and Classes.

- Use cases for Standard S3, S3-IA, RRS and Glacier
- Size limitations, availability and durability numbers
- Read after Write and Eventual Consistency models
- Namespace and URL of a bucket
- Static website hosting topics

Access Control.

- Difference between bucket and user policies.
- Usage of access control lists (ACLs)

Versioning and Lifecycle Management.

- Overview of Lifecycle Management
- Protecting an object from accidental deletion using versioning and MFA
- Object size and transition duration limitations
- Cross region Replication

Encryption. Highly asked exam topic.

- Difference between client vs server side encryption
- Three server side or encryption at rest options

Cross region replication and Static website hosting topics

Other Storage and Content Delivery Topics (Non S3)

CloudFront. It is a global content delivery network (CDN) service. It integrates with other Amazon Web Services products.

- Origin Types
- Difference between web and RTMP distribution
- Geo Restriction features
- Time To Live (TTL)
- Using Signed URL (Highly asked exam topic)

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- Integration with Route53 apex records

Import and Export: Snowball is a petabyte-scale data transfer device used to import/export data from/to amazon cloud.

- Snowball use cases (against direct connect or internet)
- Difference between snowball and Import/Export Disk
- Limitation on amount of data transfer
- Availability of Import/Export with different storage classes

Storage Gateway: It is a service connecting an on-premises software appliance with AWS's storage infrastructure.

- Difference between Gateway-Cached Volumes, Gateway-Stored Volumes, and Gateway-Virtual Tape Library (VTL)
- Maximum size of volumes

Amazon Elastic Compute Cloud (Amazon EC2)

It is a web service that provides resizable compute capacity in the cloud. It is the backbone of AWS. Expect between 7 to 10 Questions.

EC2 Instance Types:

- Pros and Cons of General Purpose, Computer Optimized, Memory Optimized, GPU and Storage Optimized
- Current generation models of instance types
- Support of Virtualization Type, Enhanced Networking, EBS Opt and High I/O
- Use cases for spot and reserved purchase options
- Limitations of migrating instances between regions
- Termination Protection

EBS Volume Types:

Pros and Cons of General Purpose, Provisioned IOPS and Magnetic Standard.

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- Performance and Availability Numbers
- RAID setup (0,1,5 and 10) for EBS and limitations of each RAID type
- Instance store vs EBS backed storage for the root device (Highly asked exam topic)
- Possibility of attaching the same EBS volume to multiple EC2 Instances
- Status of volume data when EC2 instance restarts or terminates (Highly asked exam topic)
- Encryption of EBS volumes

EBS Snapshots:

- Creating and sharing snapshots between regions
- Status of EC2 instance during snapshot creation
- Volume vs Snapshot
- Encryption of Snapshots and its impact on sharing
- Application consistent snapshot from RAID array

Security Groups and IAM Role:

- Creating a security group, IAM role and launching EC2 instance with it
- EC2 Using role vs access key to connect to other AWS services
- Possibility of changing security group and IAM role after instance launch
- Default security group inbound/outbound rules, and various ports used

Amazon Machine Image:

- Types of AMIs
- Creating and sharing AMIs between regions

Elastic Load Balancer:

- Configure ELB with Health Check
- Use of DNS address vs Static IP
- Associate load balancer with an auto scaling groups
- Healthy and Unhealthy thresholds

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Launch configuration and Auto scaling:

- Launch configuration parameters
- Auto scaling with multi AZs
- Three types of auto scaling policies: simple, step and scheduled
- Warmup and cool down period

Others:

- Use Case for Placement Groups
- Obtaining instance Meta-Data from EC2 Instance
- Number of EC2 instances per account or region

Amazon Route 53(DNS)

It is a highly available and scalable cloud Domain Name System (DNS) web service.

Record Types:

- Different types of DNS record types support including A,CNAME and ALIAS
- Difference between A and CNAME records
- Use case for ALIAS record (Highly asked exam topic) and Zone Apex Record
- Cost association with record types
- Alias record integration with other AWS services mainly ELB, S3 and Cloud Front
- Policy Records
- Number of Domains per Account

Routing Policies:

- Simple, Weighted, Latency, Failover and Geolocation routing policies and use cases
- Difference between routing policies

DNS Failover:

- DNS failover components

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- Associating ELB and Health Check with failover scenarios
- Multi region failover support

Amazon Relational Database Service (Amazon RDS)

It is a managed service to set up, operate, and scale a relational database in the AWS cloud.

RDS Basics:

- 6 different database technologies and database engines RDS supports.
- Multi AZ deployment
- RDS Maintenance window and activities performed
- Impact of Multi AZ on Maintenance activities
- DB Subnet Groups
- Replication Multi AZ failover with Primary and Standby
- Use cases for Read Replica and limitations
- RDS console and available metrics
- BYOL and license included model

Backup and Snapshots:

- Creating automated backup and Database Snapshots
- Retention period and restore process
- Backup storage cost
- Availability of DBs during backup
- Deletion process of automated backup and DB snapshots

Encryption:

- Support of encryption at rest
- Integration with Key Management Service(KMS)
- Hardware Security Module (HSM) support for Oracle and SQL server

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RDS in VPC.

- RDS setup in VPC
- Usage of VPC security groups for RDS

Other DB Services

DynamoDB.

- DB format and types of data stored
- Consistency models for read
- Overview of pricing
- Scaling advantage against RDS
- Read and write capacity units

Redshift.

- OLAP vs OLTP
- Single vs Multi node
- Overview of columnar data storage, data compression and MPP
- Encryption using KMS and HSM
- Availability of Redshift

Elastic Cache.

- Overview and two engine types used
- Basic of Memcached vs Redis
- Use cases for elastic cache

Amazon Virtual Private Cloud (Amazon VPC)

It is a logically isolated section of the Amazon Web Services (AWS) cloud function as your own data center.

VPC Basics.

- Default vs Custom VPC
- Private and Public subnet creation with valid CIDR block

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- Create and Assign Internet Gateway
- VPC tenancy
- Routing tables for private and public subnets
- Launching instances inside VPC
- Behavior of Public and Private IPs
- Use cases of Elastic IP
- Requirements for EC2 instance to connect with Internet
- No of allowed VPCs, IGW and EIPs per region
- Use cases for Elastic Network Interface
- VPC endpoint for S3

NAT Instance.

- Use case for NAT instance
- Configure NAT instance with right security group configurations
- Performance tuning of NAT
- Use of Source/Destination Check Option
- Routing table configuration for Private subnet with NAT

Network Access Control List.

- Security groups vs Network Access Control List
- Stateful vs Stateless rules
- Rules evaluation order
- Default rules
- Association with Subnet

VPC Peering.

- Limitation of peering in the context of region
- Cross account Peering
- IP address range impacts on peering
- Transitive peering

VPN Connection.

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- Setting up hardware VPN
- Components of VPN
- Customer and Private Gateways
- Failover scenarios
- Static vs Dynamic routed VPN
- Pricing for VPN connections

Direct Connect:

- Direct connect use cases and advantages.
- Pricing and consolidated billing
- Connection speeds
- Failover scenarios
- Direct Connect vs VPN
- Connecting Virtual Interfaces of VPC

Application Services

AWS provides a variety of managed services to use with your applications.

Simple Queue Service:

- Overview of SQS queue with use case of decoupling an application
- Size of SQS message and billing method
- Integration with Lambda and Auto Scale
- Support of First In First Out
- “at least once delivery” concept
- Message Visibility Timeout
- Long poll vs short poll
- Retention period of SQS messages
- Concept of “Pull” or clients to “Poll”

Simple Workflow Service:

- Overview of SWS with use cases
- Definition of Domains, Workflow, Tasks, Workers, Deciders and Starters

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- SWS interaction with Humans
- Retention period
- Difference between SQS and SWS

Simple Notification Service.

- Overview of SNS with use cases
- Supported protocols
- Concept of “Push”
- SNS Message format
- Size of SNS message and Pricing Model
- Difference between SQS and SNS

AD Integration.

- Steps Involved in AD Federation Service integration with AWS console
- AssumeRolewithSAML API usage
- Overview of Simple AD and AD Connector
- Use cases for all three features

Miscellaneous Topics

Basic understanding of:

- Lambda
- Cloud Trail
- Cloud Watch
- Data Migration Service
- Aurora
- Elastic Transcoder
- Kinesis
- Opsworks
- Elastic File System (EFS)
- Consolidated Billing
- Resource Groups and Tags

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AWS Cloud Computing Whitepapers (aws.amazon.com/whitepapers)

- Overview of Amazon Web Services
- Overview of Security Processes
- AWS Risk & Compliance Whitepaper
- Storage Options in the Cloud
- Architecting for the AWS Cloud: Best Practices