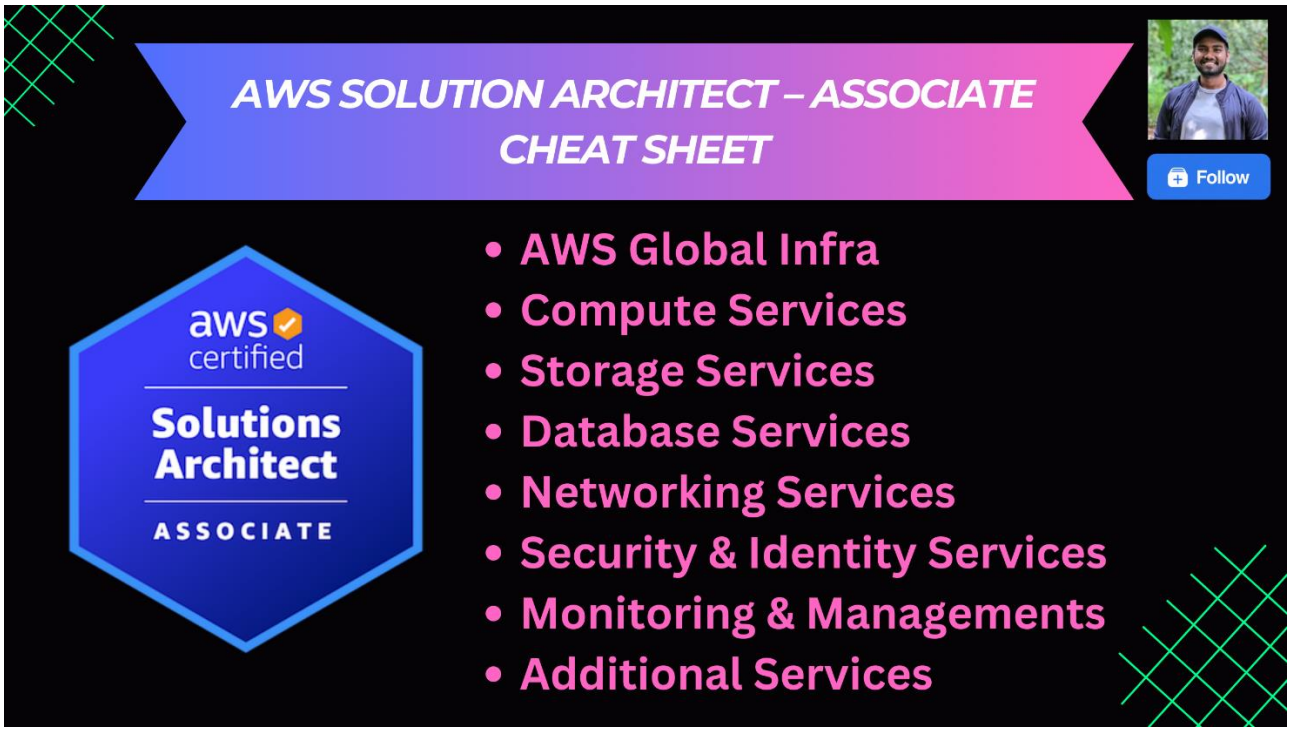
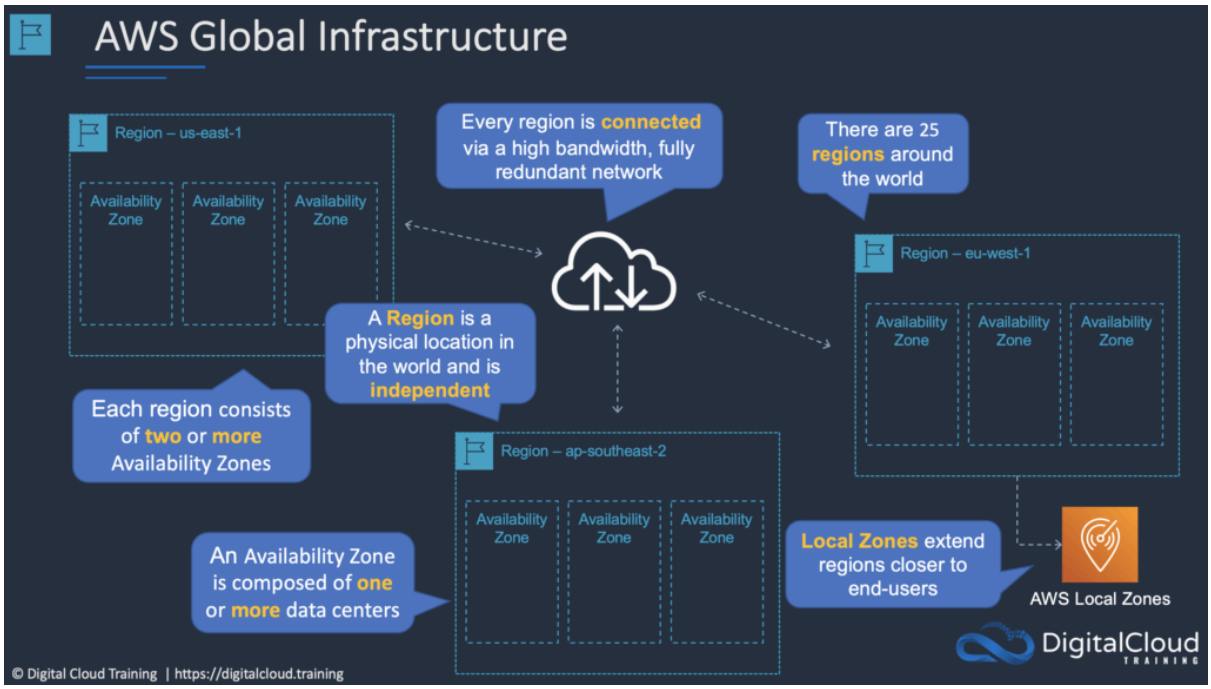
AWS Solution Architect – Associate Cheat Sheet



1. AWS Global Infrastructure



- **Regions**: Geographical areas with multiple data centers.
    - **Use Case**: Deploy applications closer to users for low latency.

- **Example**: Deploy a web server in us-east-1 for users in North America.

- **Availability Zones (AZs)**: Isolated locations within regions for fault tolerance.
  - **Use Case**: Distribute applications across AZs for high availability.

  - **Example**: Use multi-AZ deployment for RDS to ensure database availability.
- **Edge Locations**: Points of presence for low-latency content delivery.
  - **Use Case**: Serve static content quickly to users globally.
  - **Example**: Use CloudFront with edge locations to cache and deliver website assets.

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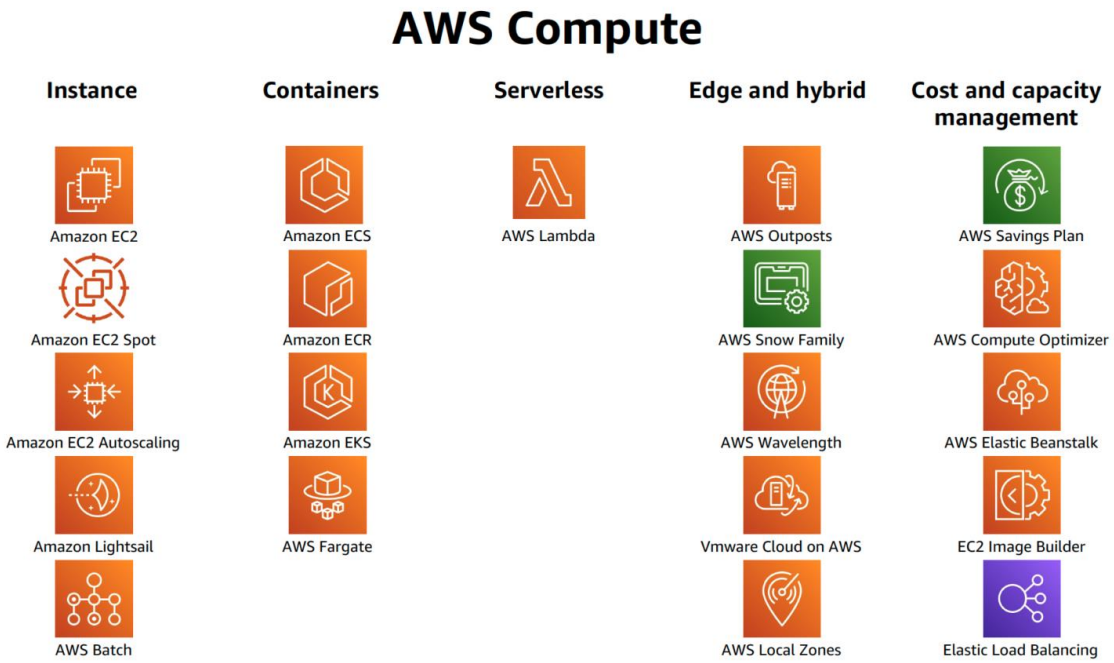
2. Compute Services



Amazon EC2 (Elastic Compute Cloud)

- **Definition**: Provides resizable compute capacity in the cloud.
- **Instance Types**:
  - **General Purpose**: Balanced compute, memory, and networking resources.
    - **Example**: t2.micro for small web servers.
  - **Compute Optimized**: High-performance processors for compute-intensive tasks.
    - **Example**: c5.large for batch processing.
  - **Memory Optimized**: High-performance for memory-intensive applications.

        - **Example**: r5.large for in-memory databases.
    - **Storage Optimized**: High, sequential read and write access to large datasets.
        - **Example**: i3.large for data warehousing.
- **Purchasing Options**:
    - **On-Demand**: Pay-as-you-go, no upfront cost.
    - **Reserved Instances**: Significant discount for 1 or 3-year commitments.
    - **Spot Instances**: Unused EC2 capacity at reduced costs.
    - **Dedicated Hosts**: Physical server dedicated to your use.
- **Key Features**:
    - **Security Groups**: Virtual firewalls to control inbound/outbound traffic.
    - **Elastic IPs**: Static IPv4 addresses for dynamic cloud computing.
    - **Auto Scaling**: Automatically adjust the number of EC2 instances.

AWS Lambda

- **Definition**: Run code without provisioning or managing servers.
- **Use Cases**: Event-driven compute, automatic scaling.
- **Example**: Automatically resize images uploaded to an S3 bucket.

Elastic Beanstalk

- **Definition**: Platform as a Service for deploying and managing applications.
- **Use Cases**: Quickly deploy applications without managing infrastructure.
- **Example**: Deploy a Node.js application with automatic scaling.

3. Storage Services

	Amazon Simple Storage Service (Amazon S3)	A service that provides scalable and highly durable object storage in the cloud.
	Amazon Glacier	A service that provides low-cost highly durable archive storage in the cloud.
	Amazon Elastic File System (Amazon EFS)	A service that provides scalable network file storage for Amazon EC2 instances.
	Amazon Elastic Block Store (Amazon EBS)	A service that provides block storage volumes for Amazon EC2 instances.
	Amazon EC2 Instance Storage	Temporary block storage volumes for Amazon EC2 instances.
	AWS Storage Gateway	An on-premises storage appliance that integrates with cloud storage.
	AWS Snowball	A service that transports large amounts of data to and from the cloud.
	Amazon CloudFront	A service that provides a global content delivery network (CDN).

Amazon S3 (Simple Storage Service)

- **Definition**: Object storage service with high durability and availability.
- **Features**:
  - **Buckets**: Containers for objects.
  - **Versioning**: Keep multiple versions of an object.
  - **Lifecycle Policies**: Automate transitions between storage classes.
  - **Encryption**: Secure data at rest.
- **Storage Classes**:
  - **Standard**: General-purpose storage for frequently accessed data.
  - **Intelligent-Tiering**: Automatically moves data to the most cost-effective access tier.
  - **IA (Infrequent Access)**: For data accessed less frequently.
  - **Glacier**: Archival storage for data accessed infrequently.

- **Use Case**: Store and serve static assets for a website.

Amazon EBS (Elastic Block Store)

- **Definition**: Block-level storage volumes for use with EC2 instances.
- **Types**:
    - **General Purpose SSD (gp2)**: Balanced price/performance for a wide variety of workloads.
    - **Provisioned IOPS SSD (io1)**: Designed for high I/O applications.
    - **Throughput Optimized HDD (st1)**: Low-cost, high-throughput storage.
    - **Cold HDD (sc1)**: Lowest cost storage for infrequently accessed data.
- **Use Case**: Attach an EBS volume to an EC2 instance for persistent storage.

Amazon EFS (Elastic File System)

- **Definition**: Scalable file storage for use with AWS Cloud services and on-premises resources.
- **Use Case**: Shared file storage for multiple EC2 instances.

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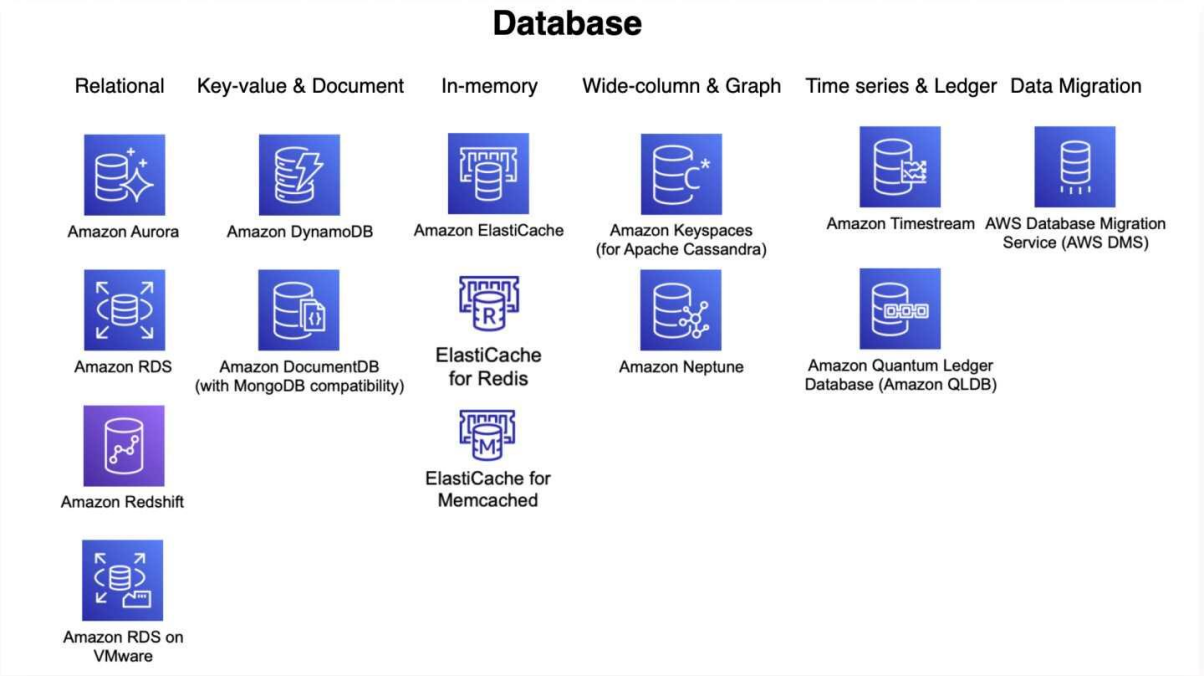
4. Database Services



Amazon RDS (Relational Database Service)

- **Definition**: Managed relational database service.
- **Engines**: MySQL, PostgreSQL, MariaDB, Oracle, SQL Server.
- **Features**:

  - **Multi-AZ**: Automatic failover to a standby.
  - **Read Replicas**: Improve read scalability.
  - **Automated Backups**: Point-in-time recovery.
- **Use Case**: Host a transactional database with automated backups.

Amazon DynamoDB

- **Definition**: Fully managed NoSQL database service.
- **Features**:
  - **Single-digit millisecond latency**.
  - **DAX**: In-memory caching for read-intensive workloads.
- **Use Case**: Store session state for a web application.

Amazon Redshift

- **Definition**: Fast, fully managed data warehouse.
- **Use Case**: Analyze large datasets using SQL queries.

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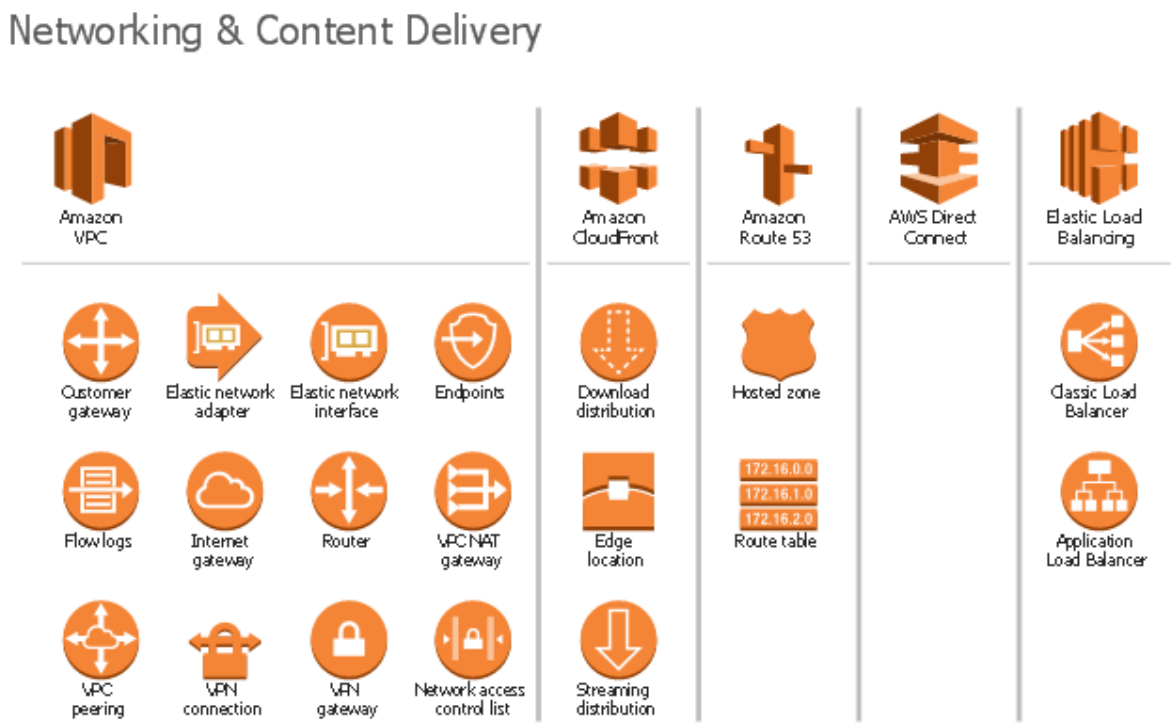
5. Networking Services



Amazon VPC (Virtual Private Cloud)

- **Definition**: Logically isolated section of the AWS Cloud where you can launch AWS resources.
- **Components**:
  - **Subnets**: Segment the VPC's IP address range.
  - **Route Tables**: Determine where network traffic is directed.
  - **Internet Gateway**: Allows communication between instances in your VPC and the internet.
  - **NAT Gateway**: Allows instances in a private subnet to connect to the internet.
- **Use Case**: Create a secure network environment for your applications.

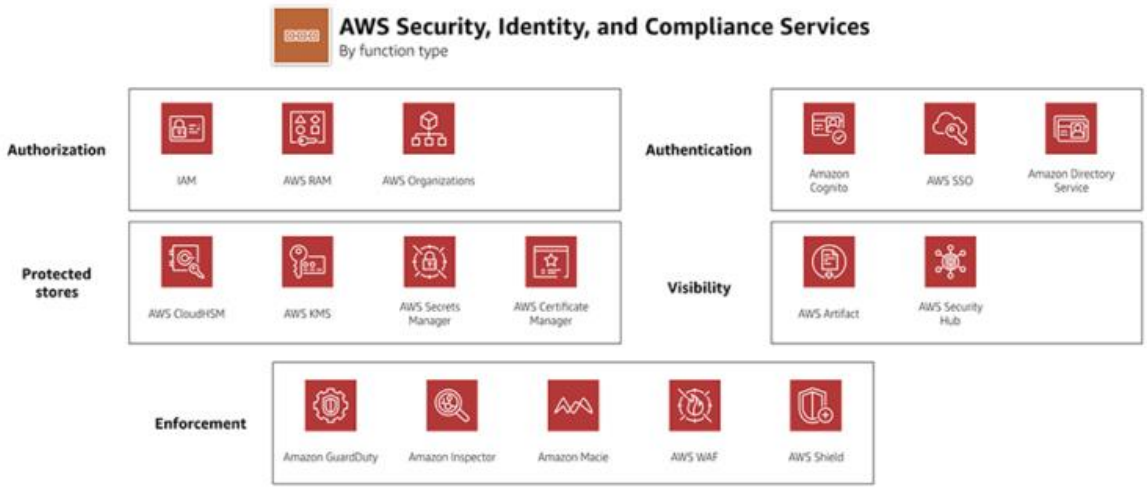
Amazon Route 53

- **Definition**: Scalable and highly available Domain Name System (DNS) web service.
- **Routing Policies**:
  - **Simple**: Single record with optional health check.
  - **Weighted**: Multiple records with weights.
  - **Latency**: Route traffic to the region with the lowest latency.
  - **Failover**: Route traffic to a healthy resource.
- **Use Case**: Manage DNS for a global web application.

Amazon CloudFront

- **Definition**: Content Delivery Network (CDN) service.
- **Use Case**: Deliver static and dynamic content with low latency.

6. Security & Identity Services



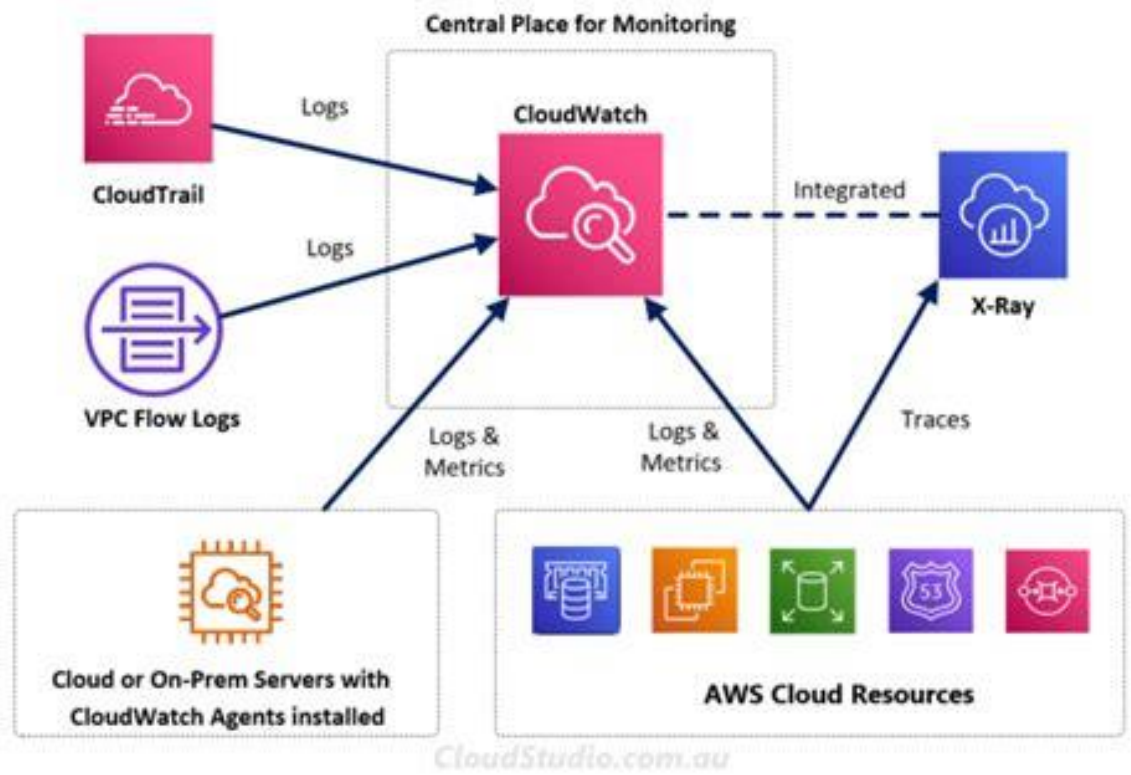
AWS IAM (Identity and Access Management)

- **Definition**: Manage AWS users and permissions.
- **Components**:
  - **Users**: Individual identities.
  - **Groups**: Collections of users.
  - **Roles**: Define permissions to make AWS service requests.
  - **Policies**: Define permissions using JSON.
- **Best Practices**:
  - Use the principle of least privilege.
  - Enable MFA for root and IAM users.
  - Use roles for granting permissions.

AWS KMS (Key Management Service)

- **Definition**: Manage cryptographic keys.
- **Use Case**: Encrypt sensitive data stored in S3 or RDS.

7. Monitoring & Management Services



Amazon CloudWatch

- **Definition**: Monitoring and observability service.
- **Features**:
  - **Metrics**: Collect and track metrics.
  - **Alarms**: Set alarms for specific metric thresholds.
  - **Logs**: Monitor and store logs.
- **Use Case**: Monitor EC2 instance performance and set alarms for high CPU usage.

AWS CloudTrail

- **Definition**: Log, continuously monitor, and retain account activity.
- **Use Case**: Audit API calls made in your AWS account.

AWS CloudFormation

- **Definition**: Model and set up your Amazon Web Services resources.
- **Use Case**: Automate infrastructure deployment using templates.

8. Additional Services

AWS Elasticache

- **Definition**: In-memory data store and cache.
- **Use Case**: Improve the performance of web applications by caching session data.

AWS SQS (Simple Queue Service)

- **Definition**: Managed message queuing service.
- **Use Case**: Decouple and scale microservices, distributed systems, and serverless applications.

AWS SNS (Simple Notification Service)

- **Definition**: Fully managed messaging service for both application-to-application and application-to-person communication.
- **Use Case**: Send notifications to subscribers via email or SMS.

Study Tips

- **Hands-On Practice**: Use the AWS Management Console to implement these solutions.
- **Review Whitepapers and FAQs**: AWS provides detailed documentation for deeper understanding.
- **Take Practice Exams**: Simulate exam conditions to build confidence and identify knowledge gaps.

This cheat sheet provides a detailed overview of key AWS services, their use cases, and examples to help you prepare for the AWS Certified Solutions Architect Associate exam. Use it as a quick reference and supplement it with hands-on practice and additional study materials. Good luck!

Exam Details

- **Duration**: 120 minutes
- **Questions**: Approximately 60
- **Passing Score**: 720 out of 1000
- **Format**: Multiple choice, multiple response

Understanding how to leverage AWS tools and features will enhance your capabilities, support certification preparation, and boost confidence in real-world problem-solving for DevOps, cloud engineering, and SRE roles. In the up-coming parts, we will discussion on more such practical challenges along with steps for the different AWS based scenarios. So, stay tuned for the and follow @Prasad Suman Mohan for more such posts.

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