Introduction to AWS

- Amazon launched AWS, a cloud computing platform to allow the different organizations to take advantage of reliable IT infrastructure.

- Based on the concept of **Pay-As-You-Go**, AWS provides the services to the customers.

- AWS offers a wide range of services and tools that can be easily combined to build and deploy a variety of applications, making it highly flexible.

History of AWS

2002: Amazon launched internally
2004: Simple Queue Service(SQS) launched
**2006: Amazon officially Launched AWS (S3, EC2)**

Features of AWS

- Flexibility (in customizing resources like CPU, RAM, Storage type..etc)
- Cost-effective (because of pay as you go model)
- Scalable and elastic (increase and decrease resources)
- Secure
- Experienced

AWS Global Infrastructure

The following are the components that make up the AWS infrastructure:

- Regions
- Availability Zones
- Edge locations
- Regional Edge Caches
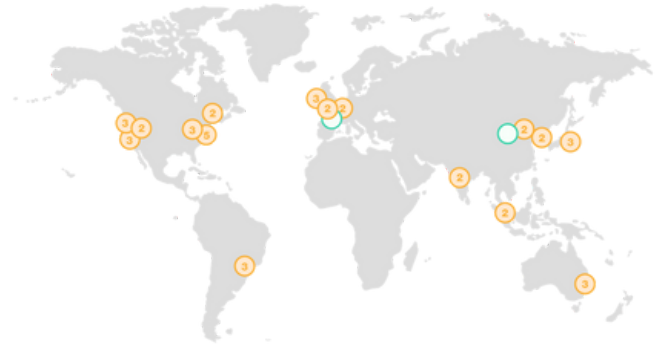
Region

A Region is a cluster of Data Centers

How to choose Region

- Data governance and legal requirements
- Low latency
- New services and New features aren't available in every Region
- pricing varies region to region

Availability Zone

- Availability Zone is a Single Data Center or a group of Data Centers in a region

- Each region has many availability zones (usually 3, min is 3, max is 6)

- Data Centers are separate from each other, so that they're isolated from disasters

Edge Location

- Egde Location is the Data Center used to deliver content fast to users.

- Content is delivered to end users with lower latency

- Amazon has 550+ Points of Presence (550+ Edge Locations & 13 Regional Caches)

AWS Services

AWS provides wide range of cloud services that enable businesses and individuals to build, deploy, and manage applications and infrastructure in the cloud.

Here are some of the main AWS services and categories:

- **Compute Services**
- **Storage Services**
- **Database Services**
- **Networking Services**
- **Security, Identity, and Compliance**
- **Analytics and Big Data**
- **Machine Learning and AI**
- **Containers and Orchestration**
- **Serverless and Application Integration**
- **Developer Tools**

Compute Services

- **Amazon EC2 (Elastic Compute Cloud)**: Provides scalable virtual servers (instances) that can run a wide range of operating systems and applications.
- **AWS Lambda**: A serverless compute service that allows you to run code in response to events without provisioning or managing servers.

Storage Services

- **Amazon S3 (Simple Storage Service):** Object storage service for storing and retrieving data, including files, documents, images, and backups.
- **Amazon EBS (Elastic Block Store):** Provides block-level storage volumes for use with EC2 instances.
- **Amazon Glacier:** A low-cost, long-term storage service designed for archiving and data backup.

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Database Services

- **Amazon RDS (Relational Database Service):** Managed relational database service supporting various database engines like MySQL, PostgreSQL, Oracle, and SQL Server.
- **Amazon DynamoDB:** A fully managed NoSQL database service that offers fast and flexible data storage.
- **Amazon Redshift:** A fully managed data warehousing service designed for high-performance analytics.

Networking Services

- **Amazon VPC (Virtual Private Cloud):** Provides a private network within the AWS cloud, allowing you to isolate and secure resources.
- **Amazon Route 53:** A scalable domain name system (DNS) web service for routing domain traffic to AWS resources.
- **AWS Direct Connect:** Allows for dedicated network connections between on-premises data centers and AWS.

Security, Identity and Compliance

- **AWS Identity and Access Management (IAM):** Allows you to control access to AWS resources and services.
- **Amazon Cognito:** Provides user identity and access management for web and mobile applications.
- **AWS Key Management Service (KMS):** Manages encryption keys and provides secure key storage.

Analytics & Big Data

- **Amazon EMR (Elastic MapReduce):** A big data platform for processing and analyzing vast amounts of data.
- **Amazon Athena:** An interactive query service that makes it easy to analyze data stored in Amazon S3.
- **Amazon Kinesis:** A platform for real-time streaming data ingestion and processing.

Machine Learning & AI

- **Amazon SageMaker:** A fully managed service for building, training, and deploying machine learning models.
- **AWS Rekognition:** A service for image and video analysis using deep learning models.
- **Amazon Comprehend:** Natural language processing service for text analysis.

Containers & Orchestration

- **Amazon ECS (Elastic Container Service):** A fully managed container orchestration service.
- **Amazon EKS (Elastic Kubernetes Service):** Managed Kubernetes service for container orchestration.

Serverless & Application Integration

- **AWS Step Functions:** Coordinates serverless workflows and applications.
- **Amazon SQS (Simple Queue Service):** Fully managed message queuing service.
- **Amazon SNS (Simple Notification Service):** Pub/Sub messaging service for building distributed systems.

Developer Tools

- **AWS CodeCommit:** A source code repository service.
- **AWS CodeBuild:** A fully managed build service.
- **AWS CodeDeploy:** Automates code deployments to various compute services.