AWS Module 3

Global Infrastructure Overview

Topics

→ AWS Global Infrastructure

→ AWS Service & Service Category Overview

(I) AWS Global Infrastructure

- The AWS global infrastructure is designed & built to deliver a flexible, reliable, scalable & secure cloud computing environment, with high quality global network performance.

→ **AWS Region** : A physical geographical area.

- Data replication accross regions is done by user.
- Communication b/w regions uses AWS backbone network infrastructure.

A/E.

- Each region provides full redundancy & connectivity check.
- A region typically consists of two or more Availability zones.

Q How to select a Region?

Determine the right region for your services/apps & data based on these factors :-

1. Data Governance, legal requirements
2. Proximity to customers
3. Services available within the region
4. Costs (vary by region).

→ Each region has multiple availability zones.

→ Each Availability zone is fully isolated partition of AWS infrastructure.

↳ 69 Av. Zones worldwide

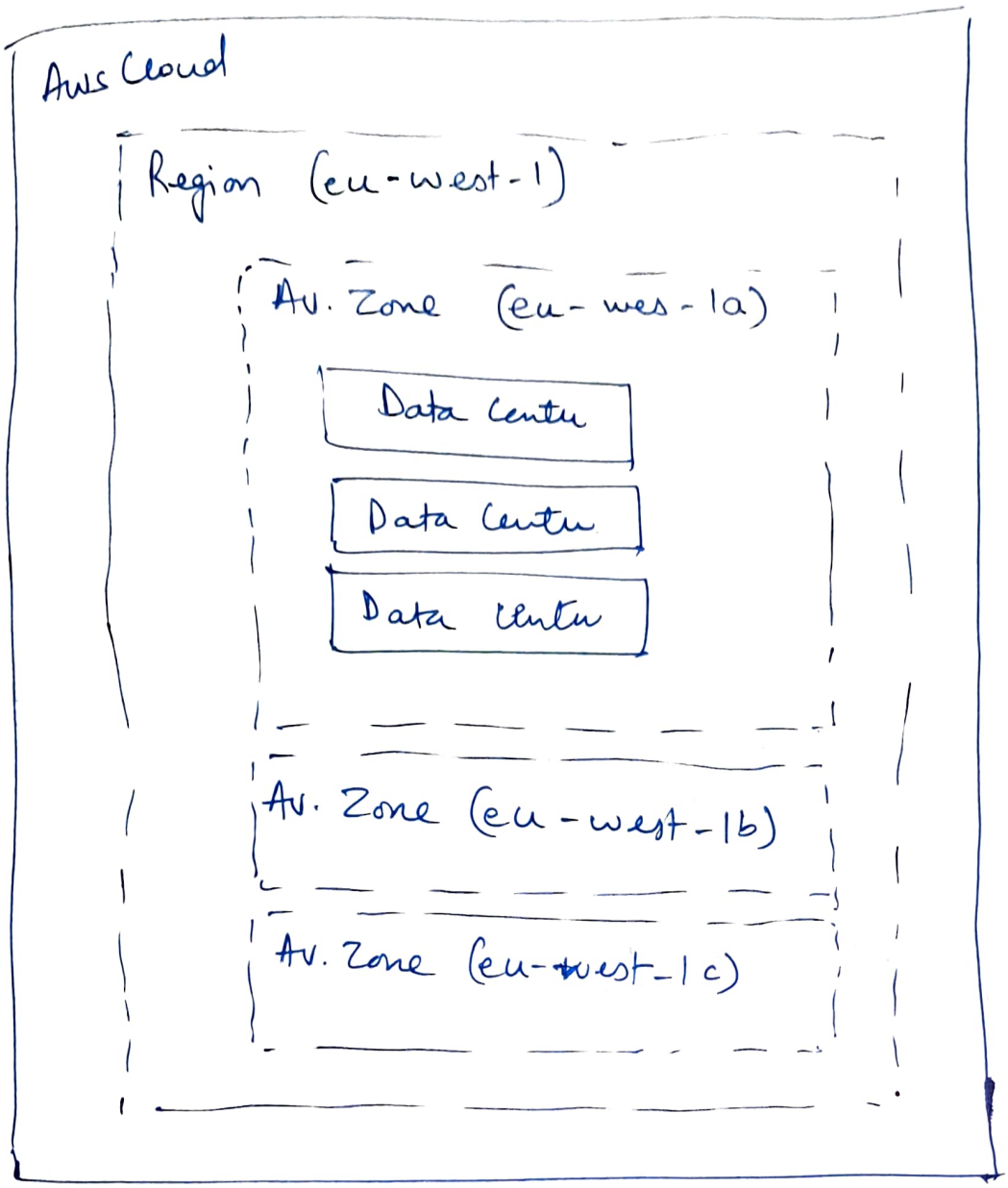
↳ Av zone consists of data centers

↳ Data centers are designed for fault isolation

↳ They are inter-connected with other Availability Zones by using high-speed private networking

↳ We choose Av. zone

↳ Replicate data across Av. Zones for Resiliency.



→ AWS Data Centres

- Designed for Security
- It is where data resides & its processing occurs
- Each data centre has redundant power, networking, connectivity & is housed in separate facility
- A data centre typically has 50,000 to 80,000 physical servers.

→ Points of Presence

- AWS Provides a global network of 187 points of presence locations
  - ↳ 176 edge locations
  - ↳ 11 regional egde caches

Amazon Cloudfront: A Global Content delivery Network (CDN), that delivers content to end users with reduced latency.

- Regional Edge caches used for content with infrequent acces.

→ Benefits of AWS Global Infrastructure.

1) Elasticity & Scalability
   - Elastic infrastructure, dynamic adaptation of capacity
   - Scalable infrastructure, adapts to accomodate growth

2) Fault Tolerance
   - Continues operating properly in presence of a failure.
   - Built in redundancy of components

3) High Availability
   - High level of operational performance
   - Minimized Downtime
   - No human Intervention

11. AWS Sevices & Sevice Categories

~~AWS Global~~

→ AWS fondational sevices:

Applications: Virtual Desktops | Collaboration & shasing

Platform Sevices: Databases | Analytics | App's Sevices | Deployment & mangement | Mobile Sevices

foundation Sevices: Compute | Networking | Storage

Infrastructure: Regions | Av. Zones | Edge Locations

→ AWS Storage Sevice Category

- Amazon Simple Storage Sevice (S3) → Basic
- Amazon Elastic Block Storage (EBS) → High Performance to use with EC2.
- Amazon Elastic file System (EFS) → Scalable NFS (Network File System)
- Amazon Simple Storage Sevice Glacier → Low cost S3 storage for data archiving & longterm backup.

→ AWS Compute Services Category

- Amazon EC2 → Resizable compute capacity as VMs in cloud.
- Amazon EC2 Auto Scaling → Add/remove EC2 instances
- Amazon ECS (Elastic Container Service) → Scalable container orchestration service for Docker containers.
- Amazon EC2 Container Registry → Docker container Registry to help developers store, manage & deploy docker container images.
- AWS Elastic Beanstalk → to deploy & scale web apps on Apache, IIS, etc.
- AWS Lambda → Run code without managing servers.
- Amazon Elastic Kubernetes Service (EKS) → Deploy, manage, scale apps using Kubernetes, on AWS.
- Amazon Fargate. → for Amazon ECS to run containers without managing servers or clusters.

→ AWS Database Services Category

- Amazon Relational Database Service (RDS) RDS in cloud.
- Amazon Aurora → MySQL & PostgreSQL compatible relational Database.
- Amazon Redshift → Enables you to run analytics queries against petabytes of data stored in Amazon
- Amazon DynamoDB → NoSQL Database

→ AWS Networking & Content Delivery Service Category

↳ Amazon VPC → Provisioning logically isolated sections of AWS cloud to launch resources in a virtual network defined by us.

↳ Elastic Load Balancing – Distributes incoming traffic across multiple targets like EC2 instances, containers, IP addresses & Lambda fun^n's.

↳ Amazon CloudFront → Fast CDN, delivers data globally

↳ AWS Transit Gateway → Connect Amazon VPC & on premises networks to a central gateway.

↳ Amazon Route 53 → Scalable cloud domain name system.

↳ AWS Direct Connect → Provides way to establish dedicated private network connection from your data Center / office to AWS.

↳ ~~Amazon~~ AWS VPN.

↳ Secure private tunnel for your device to AWS global network.

→ AWS Security, Identity & compliance Service Category.

↳ AWS IAM → for Allow/Deny users/groups/roles in an AWS Account

↳ AWS Organizations → For Allow/deny access to services of AWS accounts.

↳ Amazon Cognito → Helps add user Auth. & access control to web & mobile Apps

↳ AWS Artifact → On demand access to AWS security & compliance reports

↳ AWS Key Management Service → Helps create & manage encryption keys

↳ AWS Shield → Managed distributed denial of service protection Service.

→ AWS Cost Management Services Category

↳ AWS Cost & Usage Report → Comprehensive AWS cost & usage Data

↳ AWS Budgets → Set Budgets & Alerts

↳ AWS Cost Explorer ↳ Interface to visualize AWS cost & usage overtime.

→ AWS Management & Governance Service Category

↳ AWS Mangement Console. → web interface. to access AWS Account

↳ AWS Config → to track resource inventory & changes.

↳ AWS Cloudwatch → Monitor resources & Apps

↳ AWS Auto Scaling → Scale multiple resources

↳ AWS Command Line Interface → Unified tool to manage AWS.

↳ AWS trusted advisor → Helps optimize Performance & Security.

↳ AWS well-Architected tool ↳ Helpin reviewing & improving your workloads

↳ AWS Cloudtrail.

↳ Tracks user activity & API usage across AWS accounts.