**1. Availability Zones (AZs)**

**Definition:**

An **Availability Zone** is a **physically separate data center** within an AWS **Region**. Each AZ consists of **multiple redundant power, networking, and connectivity** resources

Key Features**:**

* Multiple AZs exist within a **single AWS region**.
* Each AZ is **physically isolated** from other AZs in the same region.
* Connected via **high-speed, low-latency private networking**.
* Helps in **fault tolerance** and **high availability** of applications.

2. Edge Locations

Definition**:**

An **Edge Location** is a **global content delivery endpoint** that AWS uses to **cache data** and reduce latency for users.

Key Features**:**

* Edge locations are **not part of AWS Regions**.
* They are **closer to end users** than Availability Zones.
* Used primarily by **Amazon Cloud Front (CDN)** and AWS Global Accelerator.
* Improves content delivery speed and reduces latency.

As of February 2025, Amazon Web Services (AWS) operates **114 Availability Zones** across **36 geographic regions** worldwide. Additionally, AWS has announced plans to launch **12 more Availability Zones** and **four more AWS Regions** in New Zealand, the Kingdom of Saudi Arabia, Taiwan, and the AWS European Sovereign Cloud

**EC2 classification by payment models:**

1. On demand or capacity reservation:

* These instances work as pay as you go model.
* long time commitment is not required for this instance.
* These are bit costlier

2. Spot instances:

* These are called as bidding instances.
* We can bid these instances as per the requirement.

3. Dedicated hosts:

* Basically, dedicated instances are provided with the hardware configurations.

4. Reserved instances:

* These are utilized for the longer time frame.
* These would be having discounts in terms of pricing because of longer utilization time frame.
* Will get to know platform, tenancy, instance type and payment options for reserved instances.

**Classification of EC2 by configuration:**

**GENERAL PURPOSE:**

These instances are ideal for applications that use these resources in equal proportions such as web servers and code repositories.

**Series: t2, T3, M4 A1.**

**Compute Optimized:**

well suited for High performance computing (HPC), batch processing, ad serving, video encoding, gaming, scientific modelling, distributed analytics, and CPU-based machine learning inference.

**Series: c7g , c6g , c6i , c6a**

**Memory Optimized:**

Memory optimized instances are designed to deliver fast performance for workloads that process large data sets in memory.

Series: R6g, R6i, R5

**Accelerated Computing:**

Machine learning, high performance computing, computational fluid dynamics, computational finance, seismic analysis, speech recognition, autonomous vehicles, and drug discovery.

Series: p4, p3, p2, Dl1.

**Storage Optimized:**

These instances maximize the number of transactions processed per second (TPS) for I/O intensive and business-critical workloads which have medium size data sets and can benefit from high compute performance and high network throughput such as relational databases (MySQL, MariaDB, and PostgreSQL), and NoSQL databases (KeyDB, Scylla DB, and Cassandra).

Series: l4i, l3, I3N, D2, D3.

**AMI:**

**Amazon Machine Image** (or AMI) offers an easy and visual mode of launching instances of your virtual machine on the cloud platform.

Additionally, you can use AMI to create multiple instances of different virtual machines when you require instances of different configurations, **we can also create our own custom AMI**

**Can you illustrate the relationship between an instance and AMI?**

With the help of just a single AMI, you can launch multiple instances and that to even different types.At the same time, an instance type is characterized by the host.

**Can you define EIP?**

EIP stands for Elastic IP address.

It is a static Ipv4 address that is provided by AWS to administer dynamic cloud computing services.

**Can you name some AWS services that are not region-specific?**

* **IAM**
* **Route 53**
* **Web application firewall**
* **CloudFront**
* **S3 bucket**