Amazon EC2

EC2 is one of the most popular of AWS' offering
Infrastructure as a Service
It mainly consists in the capability of :

- Renting virtual machines (EC2)
- Storing data on virtual drives (EBS)
- Distributing load across machines (ELB)
- Scaling the services using an auto-scaling group (ASG)

EC2 sizing & configuration options

- Operating System (OS): Linux, Windows or Mac OS
- How much compute power & cores (CPU)
- How much random-access memory (RAM)
- How much storage space:
  Network-attached (EBS & EFS)
  hardware (EC2 Instance Store)
- Network card: speed of the card, Public IP address
- Firewall rules: security group
- Bootstrap script (configure at first launch): EC2 User Data

Types of Instances

Amazon EC2 (Elastic Compute Cloud) offers a wide range of instance types
Here are some of the common EC2 instance families

- General Purpose (T2, M5, M6g, etc.)
- Compute Optimized (C4, C5, C6g, etc.)
- Memory Optimized (R4, R5, R6g, etc.)
- Storage Optimized (I3, I4, D2, etc.)
- Accelerated Computing (P3, P4, G4, etc.)
- High Performance Computing (HPC, HPC6g)

General Purpose (T2, M5, M6g, etc.)
Great for a diversity of workloads such as web servers or code repositories
Balance between:
• Compute
• Memory
• Networking

Compute Optimized (C4, C5, C6g, etc.)

Great for compute-intensive tasks that require high performance processors
• Media transcoding
• High performance web servers
• High performance computing (HPC)
• Dedicated gaming servers

Memory Optimized (R4, R5, R6g, etc.)

Advantages: Memory-optimized instances are ideal for applications that require a large amount of RAM, such as in-memory databases, data caching, and analytics. They offer a high memory-to-CPU ratio.

Storage Optimized (I3, I4, D2, etc.)

Advantages: Storage-optimized instances are tailored for applications that require high disk I/O performance and large storage capacities, such as NoSQL databases, data warehousing, and big data processing.

Accelerated Computing (P3, P4, G4, etc.)

Advantages: These instances are equipped with specialized GPUs or FPGAs, making them well-suited for machine learning, deep learning, high-performance computing (HPC), and graphics-intensive applications.

High Performance Computing (HPC, HPC6g)

Advantages: These instances are designed for high-performance computing workloads, such as simulations, modeling, and scientific research. They offer low-latency networking and high CPU/GPU capabilities

Advantages of AWS EC2-Instances

- EC2 instances can be easily scaled up or down as per the requirement.
- EC2 instances are charged based on usage
- It can be easily deployed and managed using Amazon Web Services (AWS) management console, APIs, or CLI.
- It can be deployed in multiple availability zones to ensure high availability and data durability.
- It can be customized with different operating systems, applications, and network configurations.

INTRO TO

AMAZON S3

- Amazon S3 (Simple Storage Service) is a highly scalable and durable object storage service provided by Amazon Web Services (AWS).

- It is designed to store and retrieve large amounts of data and is widely used for various use cases across industries.

AMAZON S3 USE CASES

- Backup and storage
- Archive
- Application hosting
- Media hosting
- Data lakes & big data analytics
- Static website

AMAZON S3 BUCKETS

- Amazon S3 allows people to store objects (files) in "buckets" (directories)
- Buckets must have a globally unique name (across all regions all accounts)
- Buckets are defined at the region level
- S3 looks like a global service but buckets are created in a region
- Creating Bucket follows Naming convention

AMAZON S3 - OBJECTS

- Object values are the content of the body:
  Max. Object Size is 5TB (5000GB)
- Objects (files) have a Key
- Metadata (list of text key / value pairs – system or user metadata)
- Tags (Unicode key / value pair – up to 10) – useful for security / lifecycle
- Version ID (if versioning is enabled)