INTRODUCTION TO AMAZON WEB SERVICES

AGENDA

What is AWS?

Global Infrastructure

Regions

Availability Zones

Edge Location

Free Tier

What is EC2?
EC2 use cases
EC2 instance types
Launching instance
What is S3?
Bucket
Objects
S3 UI

Use cases
What is IAM?
IAM users
Roles
Policies
Permissions

WHAT IS AWS?

- It is a Cloud Computing Platform by Amazon
- It was launched in 2006, now it is the most used cloud service provider.
- It offers 200+ services like Compute, Storage, Database etc
- It is used by companies like Netflix, NASA, Airbnb and more
- It Allows “pay-as-you-go” billing — no need to buy hardware

BENEFITS OF USING AWS

- Cost Saving : No need to buy costly physical servers
- Scalability : Easily handles sudden traffic spikes
- Global reach : Users can access services from anywhere with low latency
- Reliability : Servers run even if one data centre fails.
- Security : Encryption , IAM, MFA.

AWS GLOBAL INFRASTUCTURE

- AWS Global Infrastructure is the physical foundation behind all AWS services. It includes Regions, Availability Zones, Edge Locations, and Local Zones. These are spread across the world to help deliver AWS services with high speed, better reliability, and low downtime. It's designed in such a way that even if one part fails, others can still keep running smoothly

AWS REGIONS

- A Region is a specific location in the world where AWS has its data centers.
- Each Region includes multiple data centers, which are called Availability Zones
- Regions are completely separate from each other to avoid failures spreading.
- We can choose a Region that is closest to our users for better performance.

AVAILABILITY ZONES(AZ)

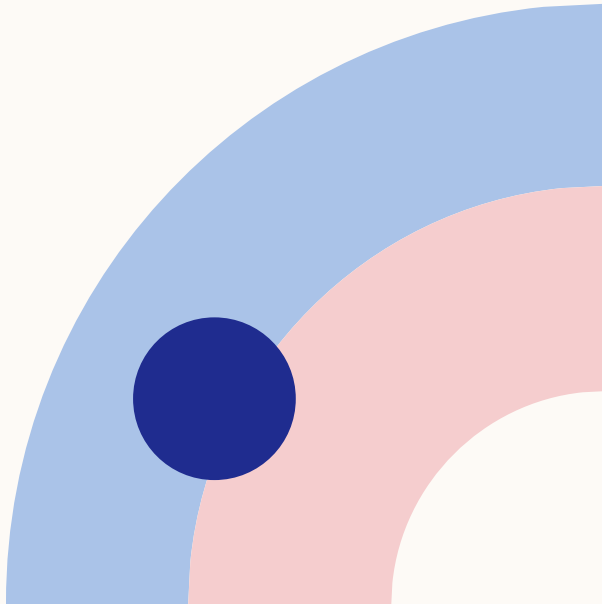
- An Availability Zone is a separate data centre inside a Region.
- Each Region has 2 or more AZs (for backup and high availability).
- AZs are physically separated, but they are connected with fast networks.
- If one AZ has a problem, the others can still keep the service running
- Example AZs in Mumbai region- ap-south-1a,ap-south-1b,ap-south-1c

EDGE LOCATION

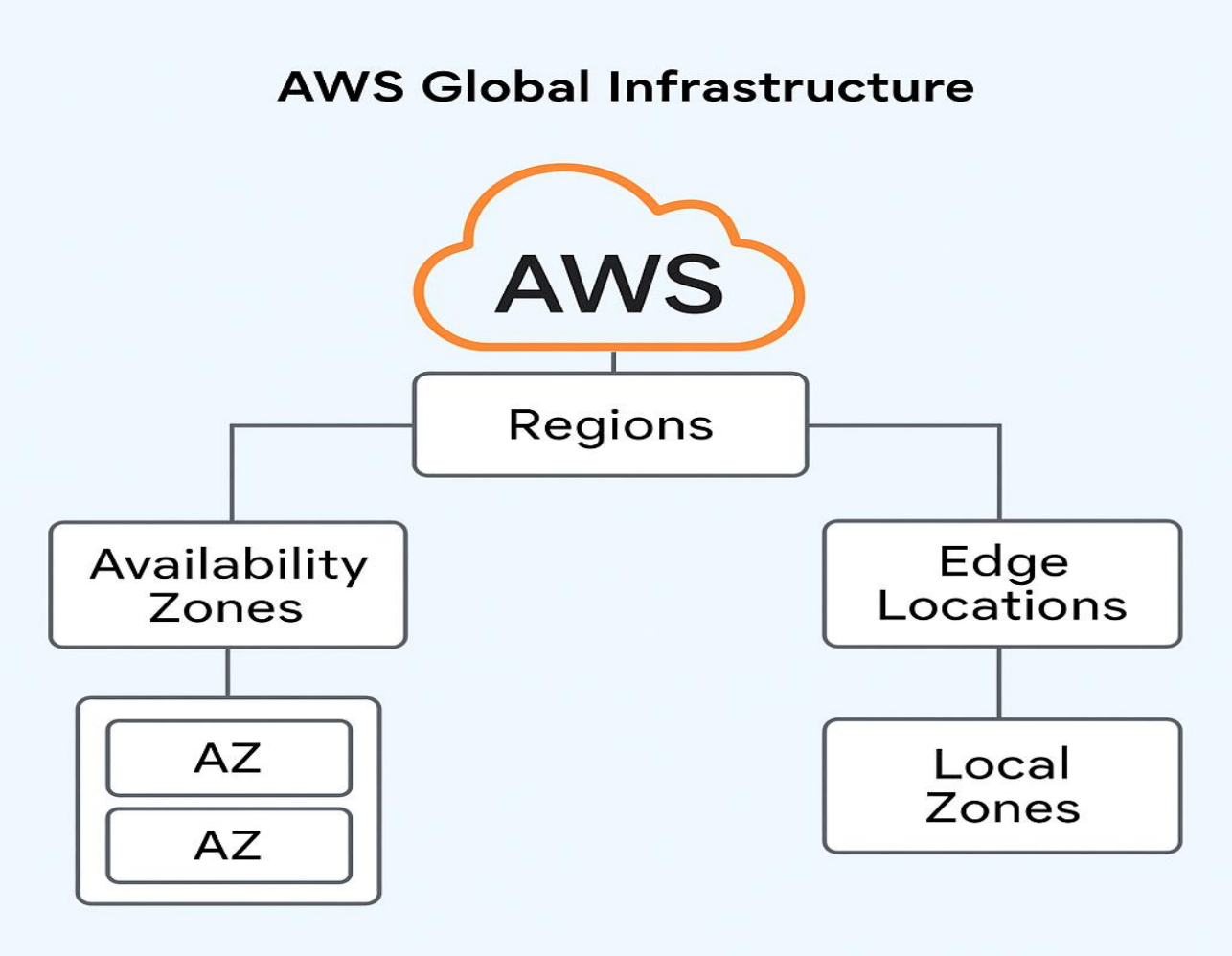
- An Edge Location is a mini data center that is placed close to users.
- It is used by Amazon CloudFront (AWS's CDN service).
- It stores cached data like images, videos, HTML files near users for faster loading
- Helps reduce latency (delay) and improves speed.
- There are 400+ Edge Locations around the world.

AWS FREE TIER

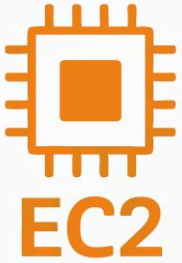
- Free Tier valid for 12 months for new users
- Includes 750 hours/month EC2 usage
- 5 GB S3 storage, 750 hours RDS usage
- Also includes Lambda, CloudFront etc.
- Explore services without charges



ARCHITECTURE



AMAZON EC2(ELASTIC COMPUTE CLOUD)



What is EC2?

- It is a cloud b based Virtual server that allows to run application without having to buy and maintain physical servers.
- Quickly launch , configure and scale servers
- Uses pay-as-you-go model
- It integrates with other AWS services for storage , scaling and traffic handling.
- Provides control over the operating system

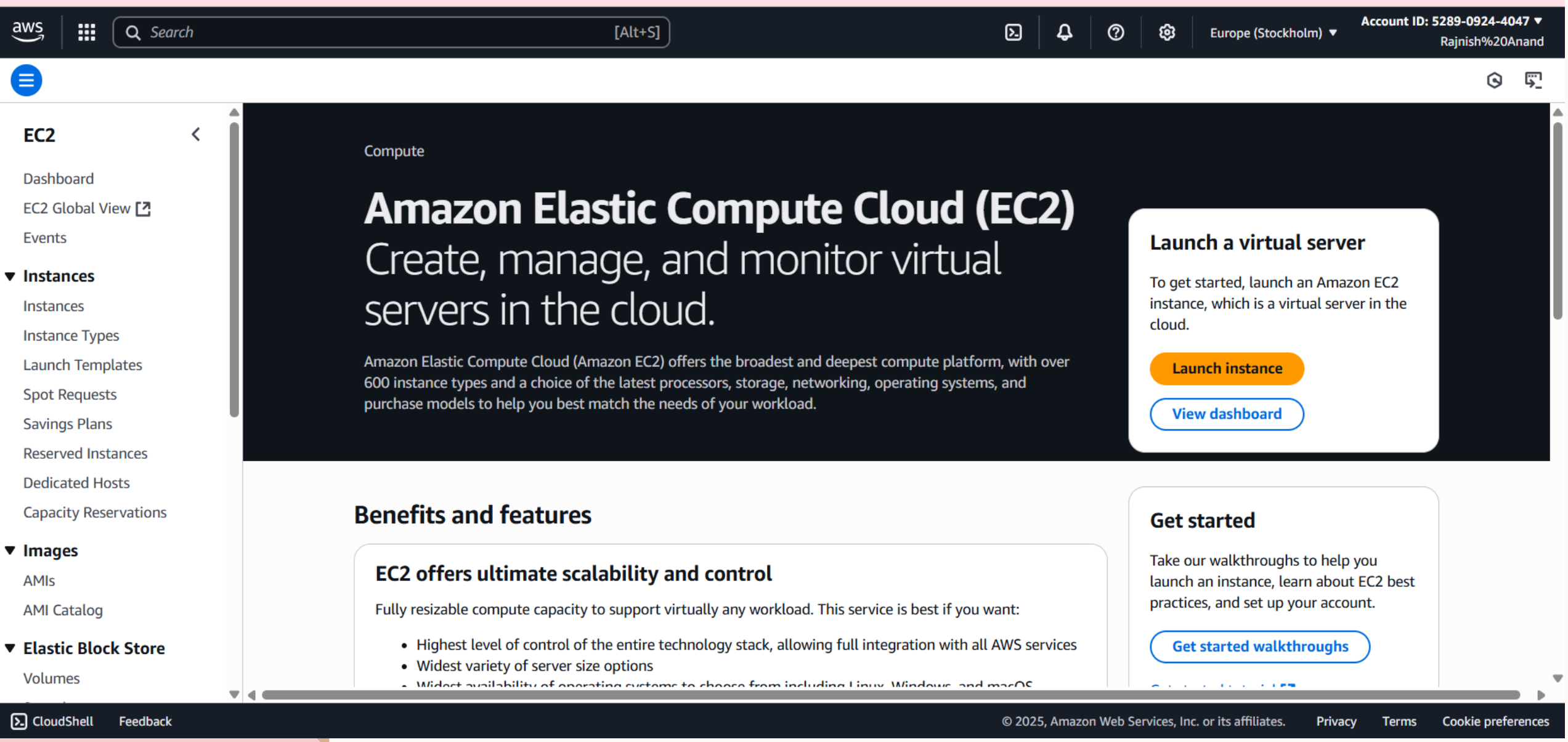
EC2 USE CASES

- Web hosting: Host websites and web apps without on premise hardware.
- Application hosting: Run backend services , APIs or enterprise applications.
- Data procession: Big data analytics , machine learning, model training
- Disaster recovery: Keep backup servers ready in other locations.
- Development and testing: Quickly spin up test environment and delete when done.
- Batch processing: Automating large number of jobs.

AWS INSTANCE TYPES

Type	Description	Example Use Case
General Purpose(t3,m6g)	Balanced compute, memory, storage	Web servers, dev environments
Compute Optimized(c7g,c6i)	High-performance processors	Gaming, ML inference
Memory Optimized(r6g,x2idn)	Large memory size	In-memory databases
Storage Optimized(i4i,d3en)	High storage throughput	Big data, analytics
Accelerated Computing(p4,g5)	GPU/FPGA support	AI/ML training, video processing

LAUNCHING AN INSTANCE



Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name

RajnishEC2

Add additional tags

Application and OS Images (Amazon Machine Image) Info

An AMI contains the operating system, application server, and applications for your instance. If you don't see a suitable AMI below, use the search field or choose **Browse more AMIs**.

Search our full catalog including 1000s of application and OS images

Quick Start

Amazon Linux | macOS | Ubuntu | Windows | Red Hat | SUSE Linux | Debian

Browse more AMIs

Including AMIs from AWS, Marketplace and the Community

Summary

Number of instances Info

1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.8.2...read more
ami-09d840fad48a1395e

Virtual server type (instance type)
t3.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Cancel | Launch instance | Preview code

16

Instance type Info | Get advice

Instance type

t3.micro — Free tier eligible

Family: t3 2 vCPU 1 GiB Memory Current generation: true
On-Demand Ubuntu Pro base pricing: 0.0143 USD per Hour
On-Demand RHEL base pricing: 0.0396 USD per Hour On-Demand SUSE base pricing: 0.0108 USD per Hour
On-Demand Linux base pricing: 0.0108 USD per Hour On-Demand Windows base pricing: 0.02 USD per Hour

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

Proceed without a key pair (Not recommended) — Default value

Create new key pair

Network settings Info

Edit

Network Info

vpc-0cfb8ace5c76d8ecf

Summary

Number of instances Info

1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.8.2...read more
ami-09d840fad48a1395e

Virtual server type (instance type)
t3.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Cancel

Launch instance

Preview code

Success
Successfully initiated launch of instance (i-0f08b6bbed2ff85d7)

▶ Launch log

Next Steps

What would you like to do next with this instance, for example "create alarm" or "create backup"

1 2 3 4 5 6

Create billing usage alerts

To manage costs and avoid surprise bills, set up email notifications for billing usage thresholds.

Create billing alerts

Connect to your instance

Once your instance is running, log into it from your local computer.

Connect to instance

Learn more

Connect an RDS database

Configure the connection between an EC2 instance and a database to allow traffic flow between them.

Connect an RDS database

Create a new RDS database

Learn more

Create EBS snapshot policy

Create a policy that automates the creation, retention, and deletion of EBS snapshots

Create EBS snapshot policy

AMAZON S3(SIMPLE STORAGE SERVICE

What is S3?

- Amazon S3 is an object storage service that offers industry-leading scalability, data availability, security, and performance.
- It stores data as object inside buckets.
- Each object contains:
  - Data (your file)
  - Metadata (information about the file)
  - Unique key (identifier)

BUCKETS

- Buckets are the container for objects.
- For each bucket, you can control access to it (who can create, delete, and list objects in the bucket)
- You can view access logs for it and its objects, and choose the geographical region where Amazon S3 will store the bucket and its contents.

OBJECTS

- Objects are the fundamental entities stored in Amazon S3
- Objects consist of object data and metadata
- Every object is contained in a bucket
- The metadata is a set of name-value pairs that describe the object
- Files + metadata stored in buckets.
- An object is uniquely identified within a bucket by a key (name) and a version ID (if S3 Versioning is enabled on the b[illegible])

USE CASES

- Data backups & archiving.
- Hosting static websites.
- Storing big data for analytics.
- Media storage (images, videos, documents).
- Disaster recovery & replication.

S3 UI

Gmail YouTube Maps All Bookmarks

aws Search [Alt+S] Europe (Stockholm) Account ID: 5289-0924-4047 Rajnish%20Anand

Storage

Amazon S3

Store and retrieve any amount of data from anywhere

Amazon S3 is an object storage service that offers industry-leading scalability, data availability, security, and performance.

Create a bucket

Every object in S3 is stored in a bucket. To upload files and folders to S3, you'll need to create a bucket where the objects will be stored.

Create bucket

Pricing

With S3, there are no minimum fees. You only pay for what you use. Prices are based on the location of your S3 bucket.

Estimate your monthly bill using the AWS Simple Monthly Calculator

View pricing details

How it works

23

Create bucket Info

Buckets are containers for data stored in S3.

General configuration

AWS Region

Europe (Stockholm) eu-north-1

Bucket type Info

- (●) **General purpose**
  Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.
- ( ) **Directory**
  Recommended for low-latency use cases. These buckets use only the S3 Express One Zone storage class, which provides faster processing of data within a single Availability Zone.

Bucket name Info

demo-bucket

Bucket names must be 3 to 63 characters and unique within the global namespace. Bucket names must also begin and end with a letter or number. Valid characters are a-z, 0-9, periods (.), and hyphens (-). Learn More

Copy settings from existing bucket - *optional*

Only the bucket settings in the following configuration are copied.

Choose bucket

Format: s3://bucket/prefix

Object Ownership Info

24

Successfully created bucket "demo-bucket-rajnish"
To upload files and folders, or to configure additional bucket settings, choose **View details**.

View details

General purpose buckets | All AWS Regions | Directory buckets

General purpose buckets (1) Info

Copy ARN | Empty | Delete | Create bucket

Buckets are containers for data stored in S3.

Find buckets by name

1

Name	AWS Region	Creation date
demo-bucket-rajnish	Europe (Stockholm) eu-north-1	August 10, 2025, 10:33:54 (UTC+05:30)

Account snapshot Info

View dashboard

Updated daily

Storage Lens provides visibility into storage usage and activity trends.

External access summary - *new* Info

Updated daily

External access findings help you identify bucket permissions that allow public access or access from other AWS accounts.

IAM(IDENTITY ACCESS MANAGEMENT)

- Identity and access management is the security service that securely manages AWS resources.
- It enables the right individual to access the right resource at the right time for right reasons.
- Using IAM you can create and manage users and groups and use permissions to allow and deny their access to the resources.

IAM USERS

- Can have username/password to login to AWS console.
- Can have AWS credential to making API calls to interact with AWS services.
- New IAM users have no permission to do anything
- Permission must be explicitly granted

IAM ROLES

- Identities with temporary permission.
- They don’t have permanent credentials.
- Allows cross-account access without sharing long-term keys
- Grants AWS services (like EC2, Lambda) the ability to access other AWS resources securely

IAM POLICIES

- A policy is like a rulebook for AWS.
- It is written in JSON format.
- It can be attached to users, groups, or roles.
- AWS evaluates these policies to decide whether to allow or deny a request

Policy structure

```
{
  "Version": "2025-08-10",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "s3:ListBucket",
      "Resource": "arn:aws:s3:::demo-bucket-rajnish"
    }
  ]
}
```

IAM PERMISSIONS

Permissions define what actions a user, role, or service can perform on which resources, and under what conditions. {

"Effect": "Allow",

"Action": "s3:PutObject",

"Resource": "arn:aws:s3:::demo-bucket-rajnish"

}

ARCHITECTURE