AWS

Training

Outline

- what is cloud computing
- Aws
  - s3 and ec2

Cloud Computing

- **Cloud Computing** is the delivery of **computing services** — like servers, storage, databases, networking, software, and analytics — over the **internet ("the cloud")** instead of using your own physical computer or local server.
- **Key Characteristics:**
  - **On-demand**: Get resources whenever you need them.
  - **Scalable**: Increase or decrease resources based on usage.
  - **Pay-as-you-go**: You only pay for what you use.
  - **Accessible anywhere**: From any device with internet access.
  - **Managed by provider**: The cloud provider handles maintenance, updates, and security.
- **Examples of Cloud Providers:**
  - **Amazon Web Services (AWS)**
  - **Microsoft Azure**
  - **Google Cloud Platform (GCP)**
  - **IBM Cloud**

AWS (Amazon Web Services)

- **AWS** is **Amazon's cloud computing platform** — the **world's largest** and most widely used.
- It provides **over 200 fully featured services**, including:
  - **Compute** → EC2 (servers)
  - **Storage** → S3 (file storage)
  - **Databases** → RDS, DynamoDB
  - **Networking** → VPC, Route 53
  - **AI/ML** → SageMaker
  - **Security** → IAM, KMS
  - **Developer tools** → CodeBuild, CodeDeploy
- **AWS Advantages:**
  - Highly reliable and secure
  - Global infrastructure (data centers around the world)
  - Flexible pricing and scalability
  - Broad set of tools and integrations

..AWS

- **Amazon Web Services (AWS)** is a **comprehensive cloud computing platform** provided by **Amazon.**
- It offers **on-demand access** to computing power, storage, databases, networking, and many other services — all delivered over the **internet.**
- In simple terms:
  - AWS lets you **rent computers, storage, and services** from Amazon's data centers instead of buying and maintaining your own servers.

Features of AWS

- On-Demand
  - Get resources instantly when needed.
- Pay-as-you-go
  - Pay only for what you use — no upfront cost.
- Scalable
  - Scale up or down automatically.
- Secure
  - Built-in encryption, identity management, and compliance.
- Wide Range of Services
  - 200+ services across compute, storage, databases, AI, and more.
- Global Infrastructure
  - Data centers in many countries for low-latency access.

Main Categories of AWS Services

- **Compute**
  - These services provide **processing power** for your applications.
    - **EC2 (Elastic Compute Cloud):** Virtual servers in the cloud.
    - **Lambda:** Run code without managing servers (serverless computing).
    - **Elastic Beanstalk:** Deploy and manage web apps easily.
    - **ECS / EKS:** Run and manage containers (Docker/Kubernetes).
- **Storage**
  - Used to **store and back up data** safely and at scale.
    - **S3 (Simple Storage Service):** Object storage for files, images, and backups.
    - **EBS (Elastic Block Store):** Disk storage for EC2 instances.
    - **Glacier:** Low-cost, long-term data archiving.
- **Database**
  - Manage relational or NoSQL databases.
    - **RDS (Relational Database Service):** Managed SQL databases (MySQL, PostgreSQL, Oracle, etc.)
    - **DynamoDB:** NoSQL database for fast and flexible apps.
    - **Redshift:** Data warehousing for analytics.

Main Categories of AWS Services

- **Networking**
  - Helps connect your resources securely.
    - **VPC (Virtual Private Cloud):** Private network within AWS.
    - **Route 53:** DNS and domain registration service.
    - **CloudFront:** Content delivery network (CDN) for faster website loading.
    - **API Gateway:** Manage and secure APIs.
- **Security and Identity**
  - Protect your applications and data.
    - **IAM (Identity and Access Management):** Control who can access what.
    - **KMS (Key Management Service):** Manage encryption keys.
    - **Cognito:** Authentication for web/mobile apps.
- **Developer Tools**
  - For continuous integration and deployment (CI/CD).
    - **CodeCommit:** Source control (like Git).
    - **CodeBuild:** Build your apps automatically.
    - **CodeDeploy:** Deploy apps to EC2 or on-premises servers.
    - **CodePipeline:** Automate your software release process.

Main Categories of AWS Services

- **Analytics**
  - Turn your data into insights.
    - **Athena:** Query S3 data using SQL.
    - **EMR:** Big data processing (Hadoop, Spark).
    - **QuickSight:** Business intelligence and dashboards.
- **Machine Learning / AI**
  - Add AI to your apps without building models from scratch.
    - **SageMaker:** Train and deploy ML models.
    - **Rekognition:** Image and video analysis.
    - **Polly:** Text-to-speech.
    - **Comprehend:** Natural language processing.
- **AWS Global Infrastructure**
  - AWS operates in multiple **Regions** around the world.
  - Each Region contains several **Availability Zones (AZs)** — separate data centers for reliability.
  - Example:
    - Region: Asia Pacific (Mumbai)
    - ├── AZ-1a
    - ├── AZ-1b
    - └── AZ-1c
  - This design ensures **high availability and disaster recovery**.

Steps: Hosting a Website on AWS

- **Store static files** (HTML, CSS, JS) in **S3**.
- **Host backend app** (Java, Node.js, Python, etc.) on **EC2**.
- **Use RDS** for the database.
- **Route traffic** with **Route 53** (DNS).
- **Speed up delivery** with **CloudFront (CDN)**.

Amazon S3 (Simple Storage Service)

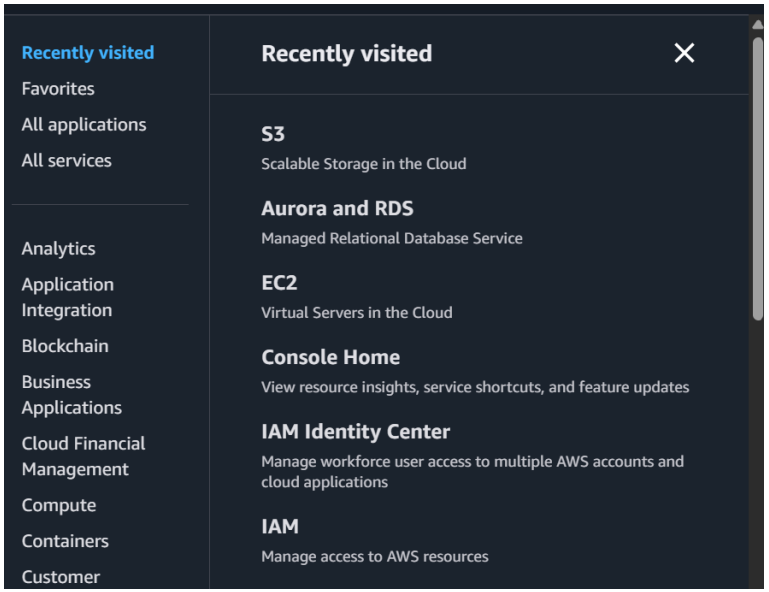
- **Amazon S3** is a **cloud storage service** used to store and retrieve any amount of data — like files, images, videos, backups, or logs.
- **Key Features:**
  - **Object-based storage** (not block or file-based)
  - **Scalable** — store unlimited data
  - **Durable** — 99.999999999% (11 nines) durability
  - **Secure** — access control, encryption
  - **Used for** → Backup, static websites, big data analytics, etc.
- **Example:**
  - You can upload files to S3 buckets (like folders), for example:
  - my-bucket/
  - ├── images/
  - │ └── logo.png
  - └── videos/
  - └── intro.mp4
  - You can then access them from anywhere via a URL.

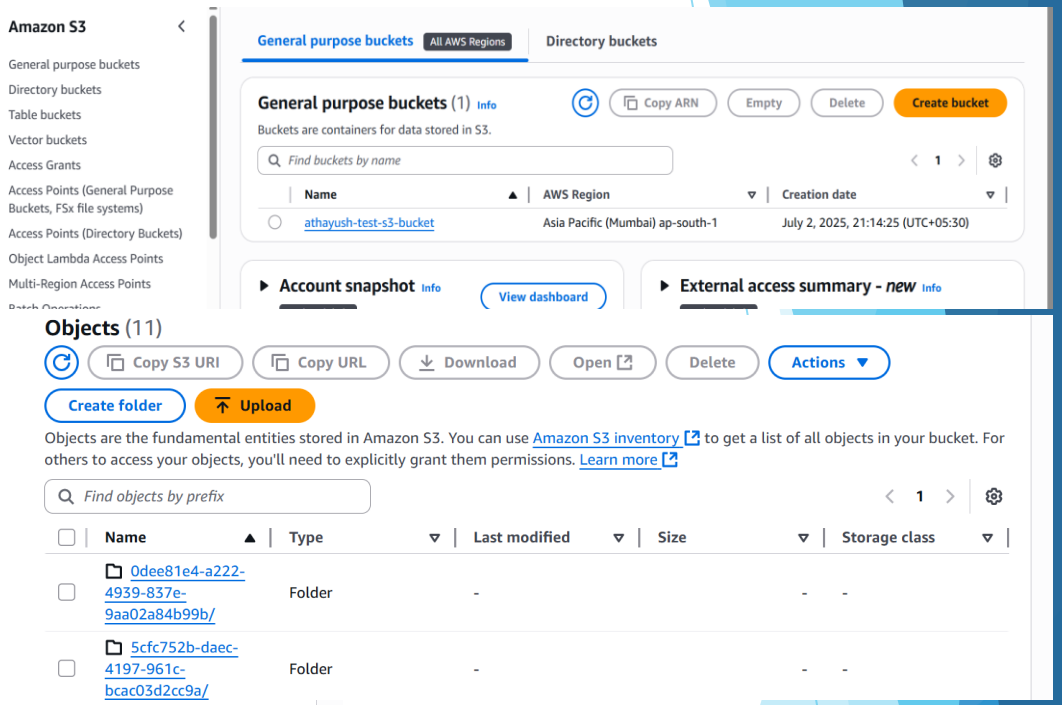
Steps S3

- Create bucket (name + region)
- Upload a test file (index.html)
- Decide public vs private → set Block Public Access / bucket policy
- (Optional) Enable static website hosting
- Enable versioning (if needed)
- Add lifecycle rules to manage cost
- Confirm default encryption set
- Enable access logging / CloudTrail

S3 buckets

https://athayush-test-s3-bucket.s3.ap-south-1.amazonaws.com/0dee81e4-a222-4939-837e-9aa02a84b99b/2025-09-21T14%3A31%3A15.767Z-function+randomUUID()+%7B+%5Bnative+code%5D+%7D





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AWS Region
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Last modified
September 21, 2025, 20:01:17 (UTC+05:30)

Size
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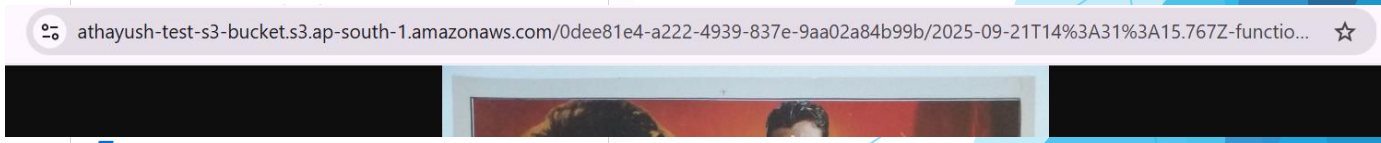

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Amazon EC2 (Elastic Compute Cloud)

- **Amazon EC2** provides **virtual servers (instances)** in the cloud that you can use to run your applications.
- **Key Features:**
  - **Compute service** → provides CPU, memory, storage, and OS
  - **Elastic** → start/stop/resize instances anytime
  - **Customizable** → choose instance types (e.g., t2.micro, m5.large)
  - **Pay only for usage** (hourly or per second billing)
  - **Secure and isolated** from other users
- **Example:**
  - You can:
    - Launch an **EC2 instance** (like a Linux or Windows server)
    - Deploy your web app or API there
    - Connect via SSH or RDP
    - Scale automatically with **Auto Scaling** and **Load Balancer**

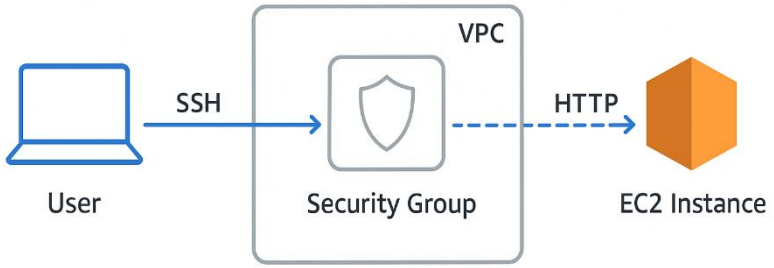
Key Concepts

Term	Meaning
Instance	A virtual server running on AWS
AMI (Amazon Machine Image)	A template that contains OS + software configuration
Instance Type	Defines hardware (CPU, RAM, network speed) e.g., t2.micro, m5.large
EBS (Elastic Block Store)	Persistent storage (virtual hard disk) attached to an instance
Key Pair	SSH keys for securely connecting to your instance
Security Group	A virtual firewall that controls inbound/outbound traffic
Elastic IP	A static, public IPv4 address for your instance
User Data	A script that runs automatically when instance launches (used for setup)

Steps : Amazon EC2

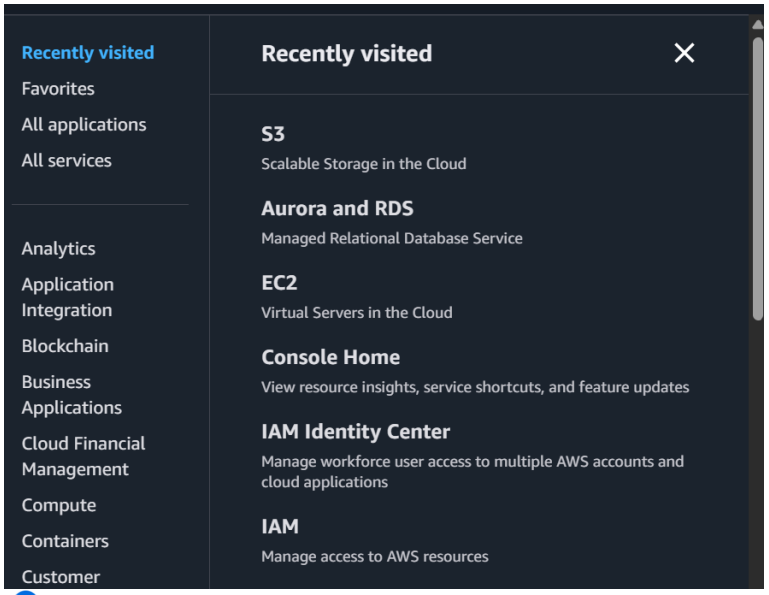
Step	Action	Description
Log in	Open AWS Console → EC2	Access the EC2 dashboard from AWS.
Launch Instance	Click **Launch Instance**	Start creating your virtual server.
Choose AMI	Select OS (Amazon Linux, Ubuntu, Windows)	Defines what operating system your instance runs.
Choose Instance Type	e.g., **t2.micro**	Select CPU and memory size (Free Tier eligible).
Configure Details	Set networking, IAM role, user data	Choose VPC/subnet, enable public IP, optionally add startup script.
Add Storage	Specify disk size (EBS)	Default is 8 GB; you can increase if needed.
Configure Security Group	Set firewall rules	Open ports like **22 (SSH)** and **80 (HTTP)** as needed.
Create Key Pair	Download .pem file	Used to securely connect to your instance.
Launch Instance	Click **Launch**	AWS provisions the virtual server for you.
Connect to Instance	SSH (Linux/Mac) or PuTTY (Windows)	Use your key pair and public IP to log in.
(Optional)	Host a web app	Install web server (Apache/Nginx) to serve content.
Stop/Terminate	Manage costs	Stop to pause billing or terminate to delete.

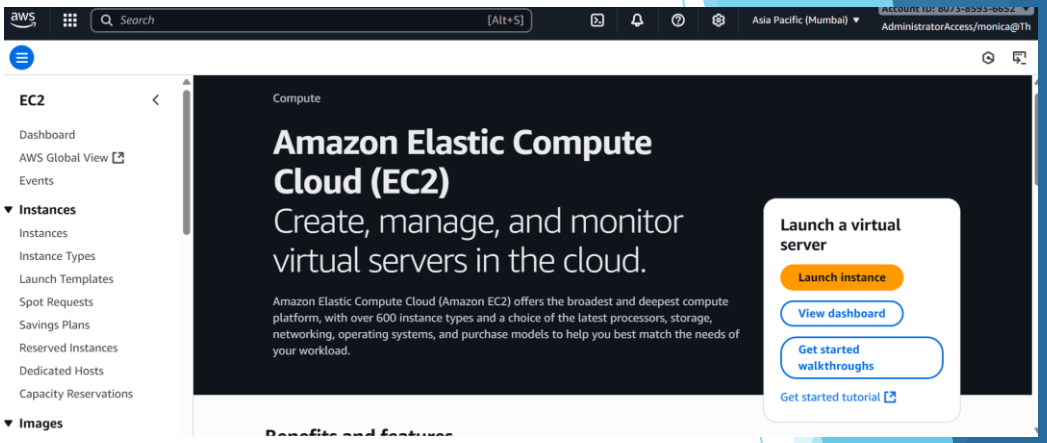
EC2

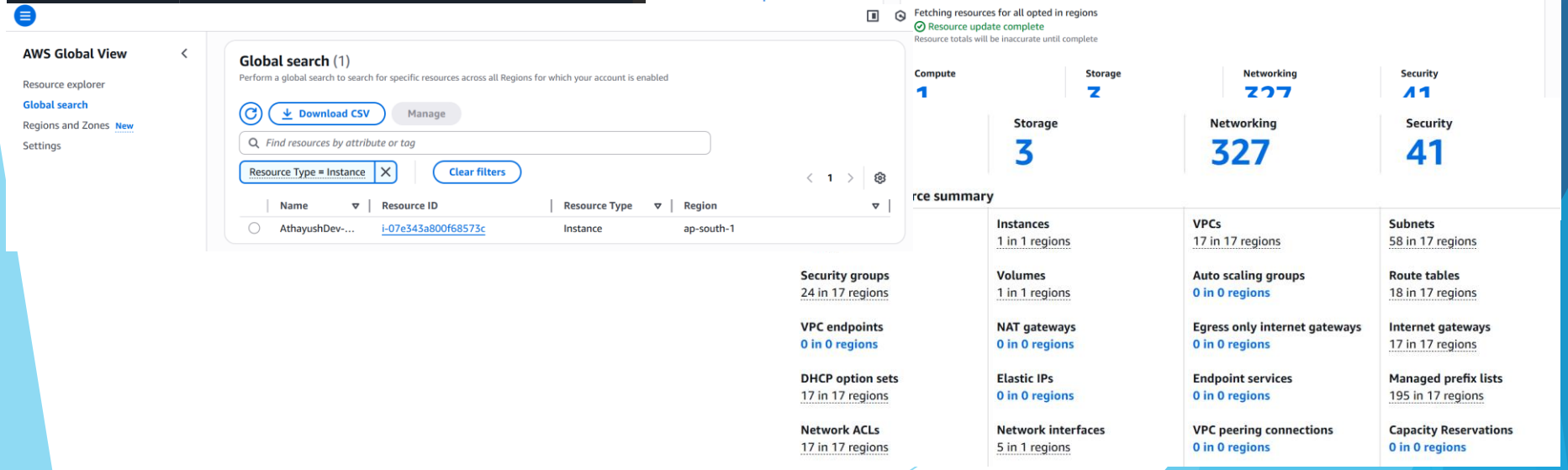


- **Amazon EC2** lets you launch, configure, and manage virtual servers in the cloud — choose an AMI, instance type, security, and storage, then connect via SSH to run applications securely and on demand.
- **Security Groups** → control inbound/outbound traffic.
- **EBS (Elastic Block Store)** → your instance's persistent hard drive.
- **Elastic IP** → a fixed public IP you can attach to an instance.
- **User Data** → scripts run automatically at launch (for setup).

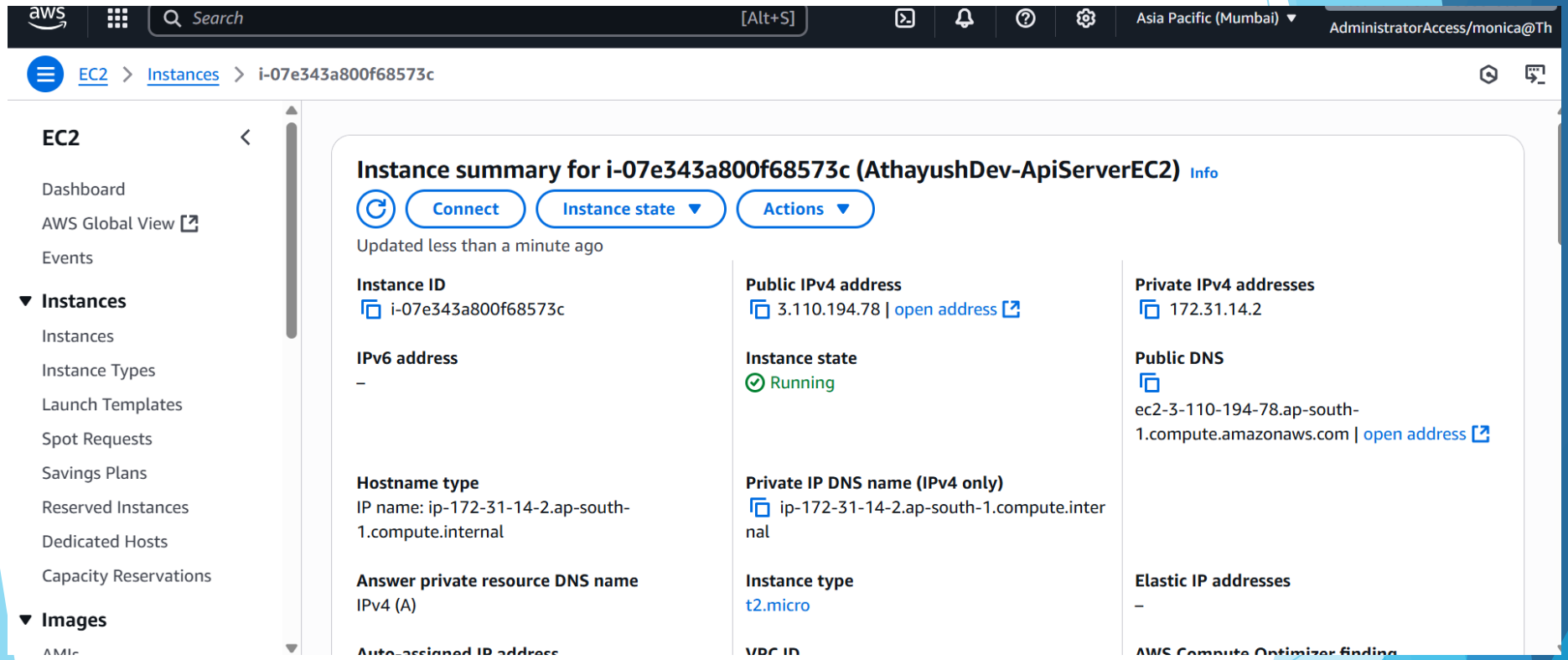
EC2 Services







EC2 Instance



Thank you

EO Session