Placement Empowerment Program

Cloud Computing and DevOps Centre

Back Up and Restore a Cloud Instance: Take a snapshot of your cloud VM. Terminate the VM and restore it from the snapshot.

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Introduction

In today's cloud-driven world, ensuring data availability and reliability is paramount. This Proof of Concept (POC) focuses on the Backup and Restore process for a cloud instance, showcasing how critical data can be safeguarded and restored efficiently in AWS. By taking a snapshot, terminating the instance, and restoring it from the snapshot, this POC demonstrates the ease and reliability of AWS Elastic Block Store (EBS).

Overview

This POC involves working with Amazon Web Services (AWS) to perform the following tasks:

1. **Launching an EC2 Instance:** Creating a cloud-based virtual machine.
2. **Creating an EBS Snapshot:** Backing up the instance's volume.
3. **Terminating the Instance:** Simulating failure or cost-saving scenarios.
4. **Restoring from Snapshot:** Creating a new volume and attaching it to a fresh EC2 instance.

The step-by-step approach ensures no unnecessary charges while maintaining data integrity and availability.

Objectives

The objective of this POC is to:

1. Demonstrate the process of creating and managing backups in AWS.
2. Explore the capabilities of EBS snapshots for disaster recovery.
3. Understand how to restore a terminated instance and verify data integrity.
4. Highlight cost-saving techniques using AWS Free Tier while ensuring operational readiness.

Importance

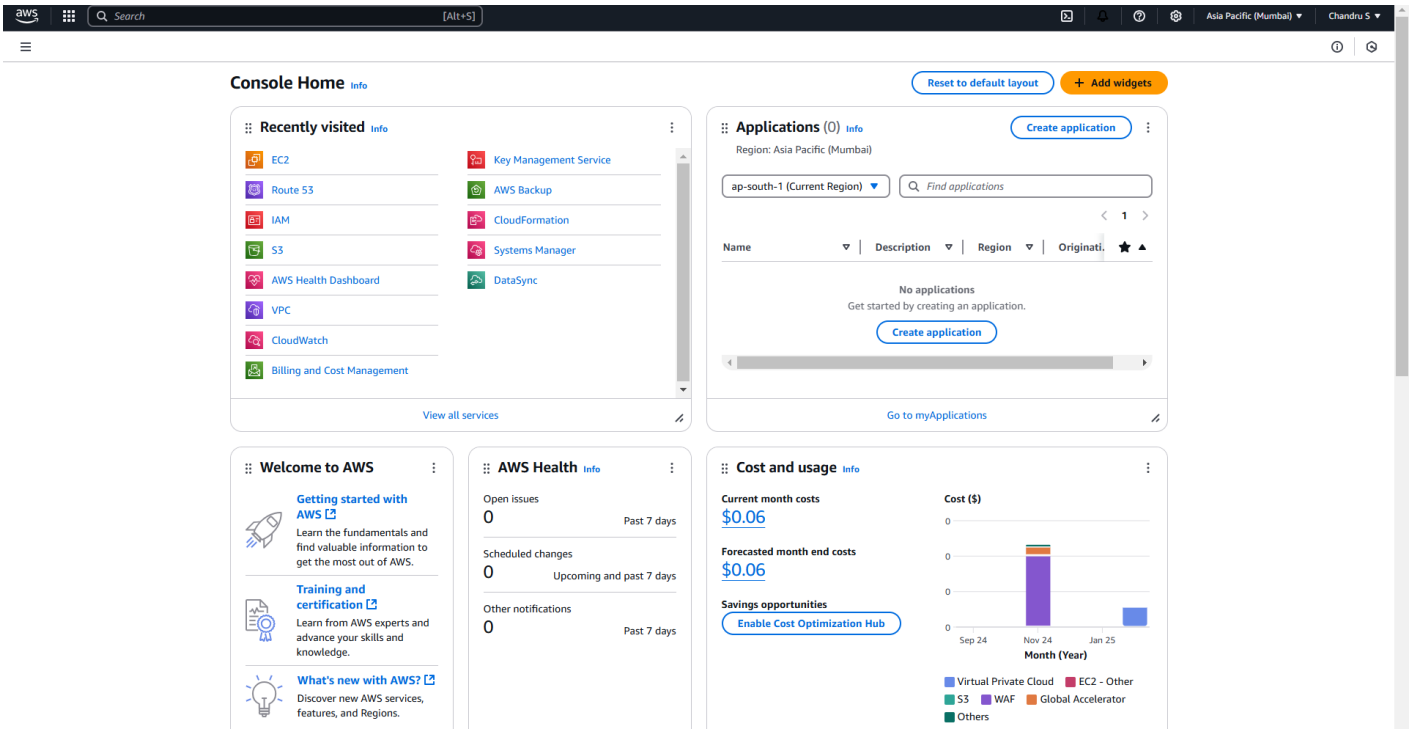
1. **Disaster Recovery:** Ensures that critical data can be restored quickly in case of unexpected failure.
2. **Cost Optimization:** Demonstrates terminating unused instances and restoring them only when required.
3. **Scalability and Flexibility:** Showcases AWS's ability to manage snapshots and volumes across regions and availability zones.
4. **Practical Knowledge:** Provides hands-on experience with EC2, EBS, and snapshot-based recovery processes.

Step-by-Step Overview

Step 1:

Access AWS Management Console

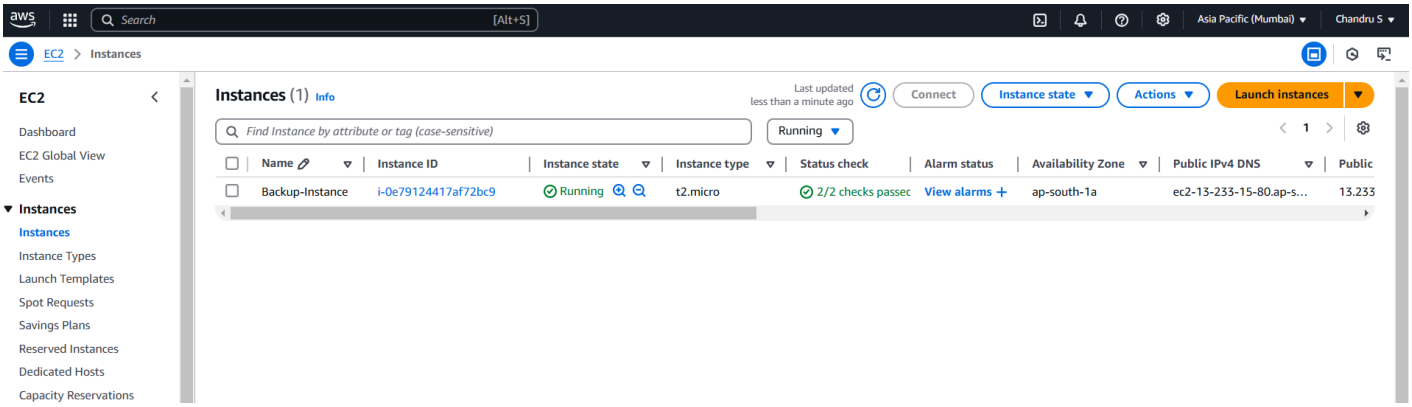
- Log in to the AWS Management Console with your credentials.



Step 2:

Launch an EC2 Instance (Backup Instance)

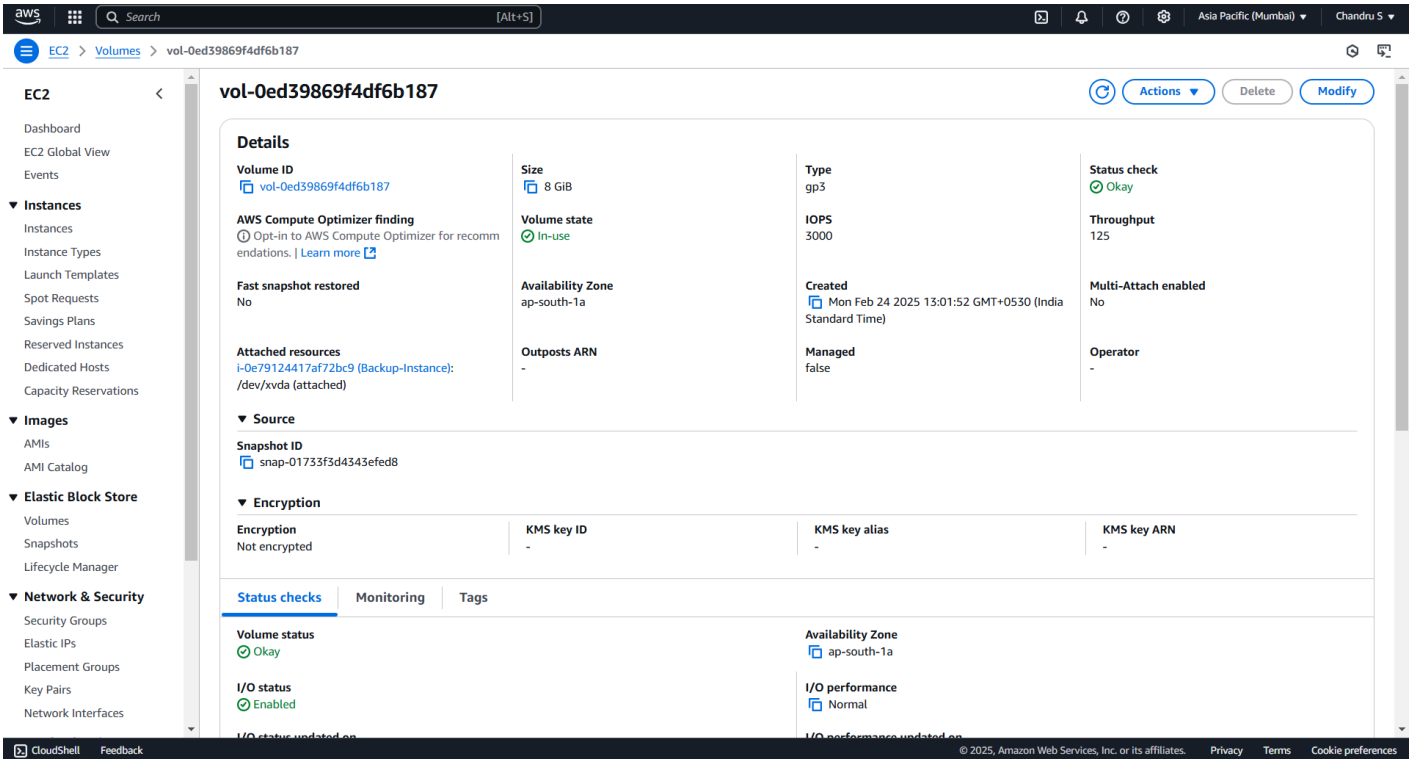
1. From the EC2 Dashboard, click **Launch Instance**.
2. Set the instance name (e.g., "Backup-Instance").
3. Select **Amazon Linux 2 AMI (Free Tier eligible)**.
4. Choose **t2.micro** instance type.
5. Configure the instance and ensure **Allow HTTP traffic** is enabled under Network settings.
6. Review and launch the instance.



Step 3:

Create an EBS Volume

1. In the EC2 Dashboard, under **Elastic Block Store**, select **Volumes**.
2. Click Create Volume.
3. Set the volume type to **General Purpose SSD** (gp3) and size to 8 GiB (within Free Tier limits).
4. Ensure the availability zone matches your EC2 instance (e.g., us-east-1b).
5. Click Create Volume and note the **Volume ID** for future reference.

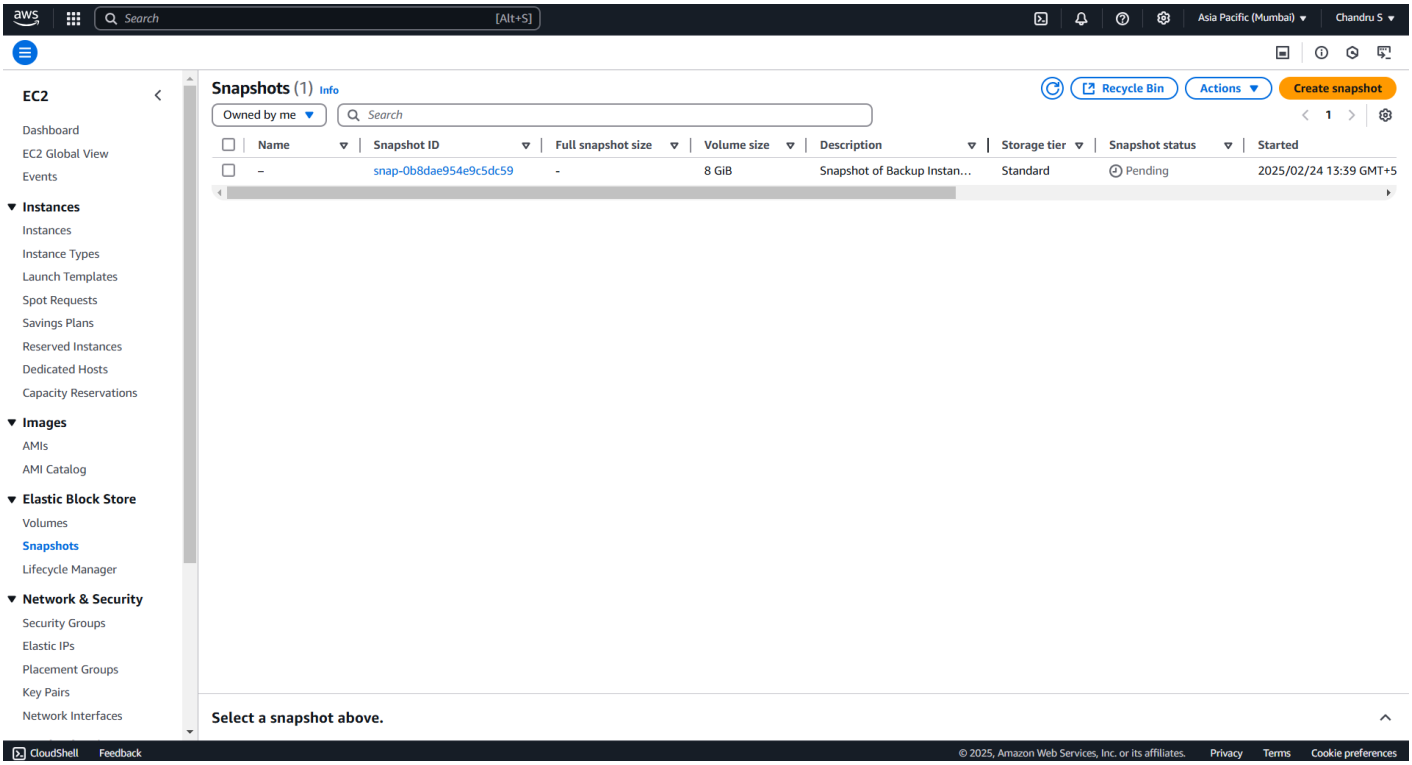


Step 4:

Create an EBS Snapshot

1. In the EC2 Dashboard, navigate to **Elastic Block Store > Volumes**.
2. Locate the volume attached to your instance, select it, and click **Actions > Create Snapshot**.

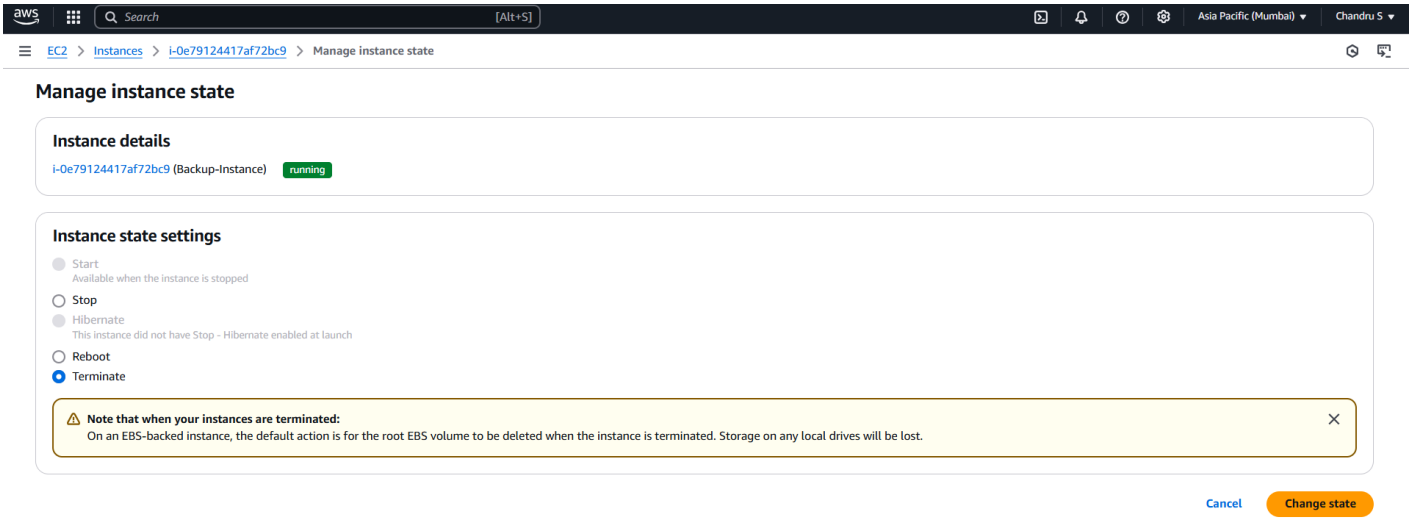
3. Add a description (e.g., "Snapshot of Backup Instance on Feb 7").
4. Click Create Snapshot.
5. Monitor the status under Snapshots until it changes to Completed.



Step 5:

Terminate the EC2 Instance

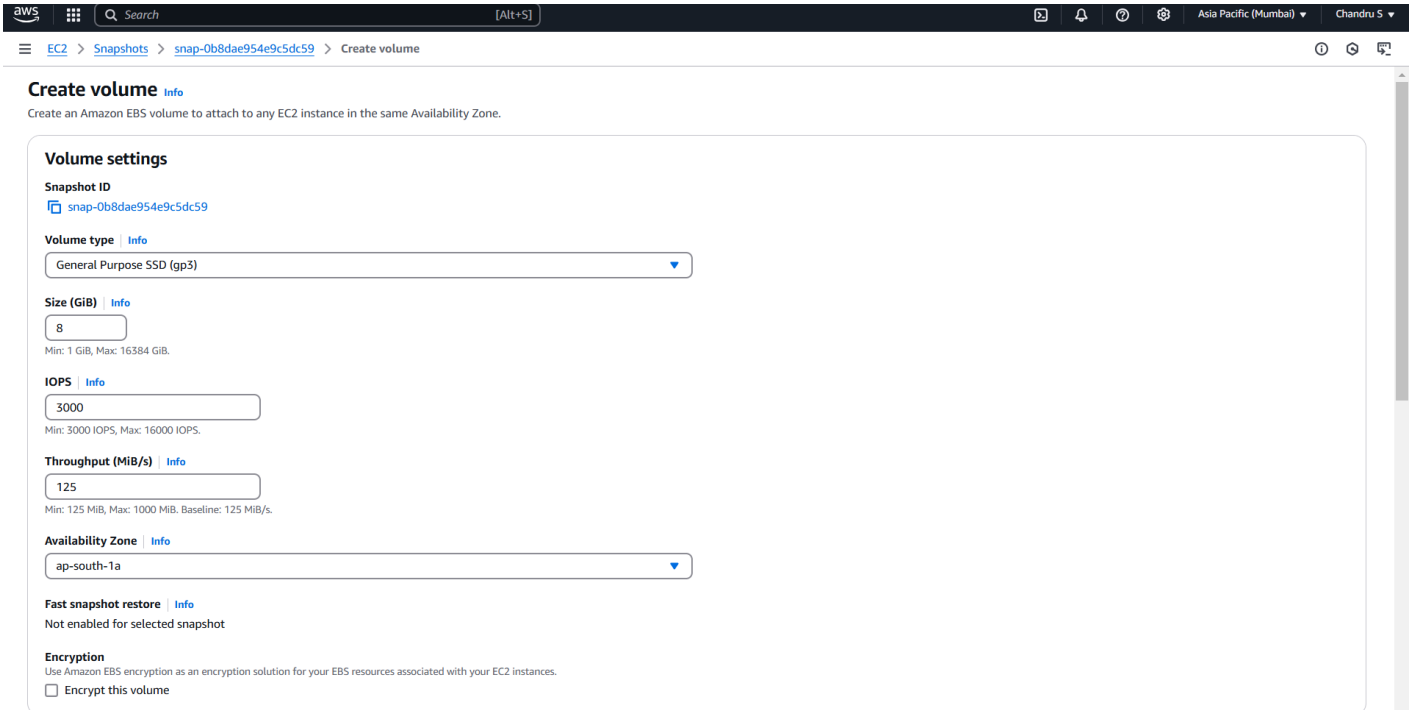
1. In the EC2 Dashboard, navigate to **Instances**.
2. Select the instance you wish to terminate.
3. Click **Actions > Instance State > Terminate Instance**.
4. Confirm the termination and wait for the state to change to Terminated.



Step 6:

Create a New Volume from Snapshot

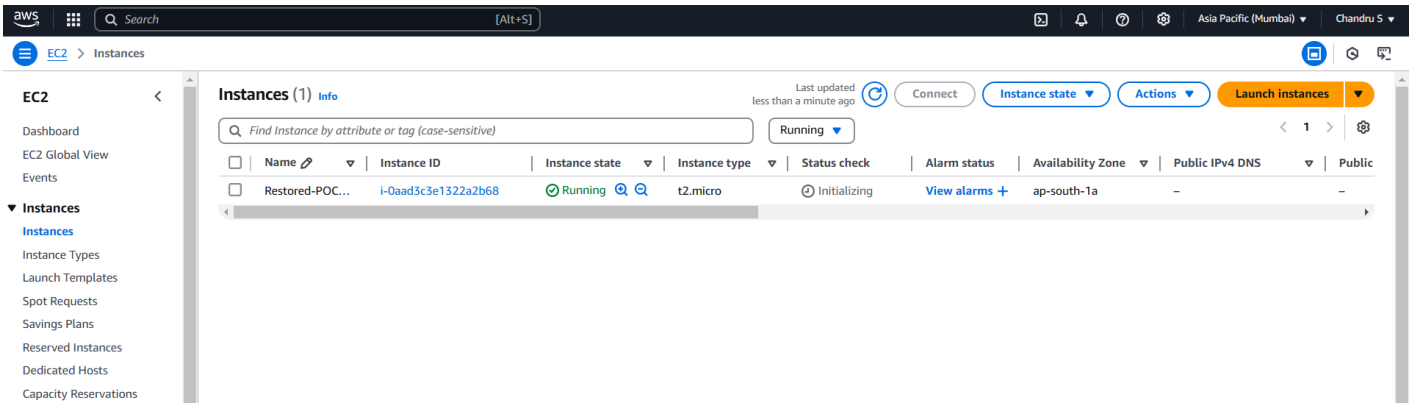
1. In the EC2 Dashboard, go to **Snapshots** under **Elastic Block Store**.
2. Select the snapshot created earlier.
3. Click **Actions > Create Volume**.
4. Keep the size as-is and select the matching availability zone (e.g., **us-east-1a**).
5. Click **Create Volume**.



Step 7:

Launch a New EC2 Instance

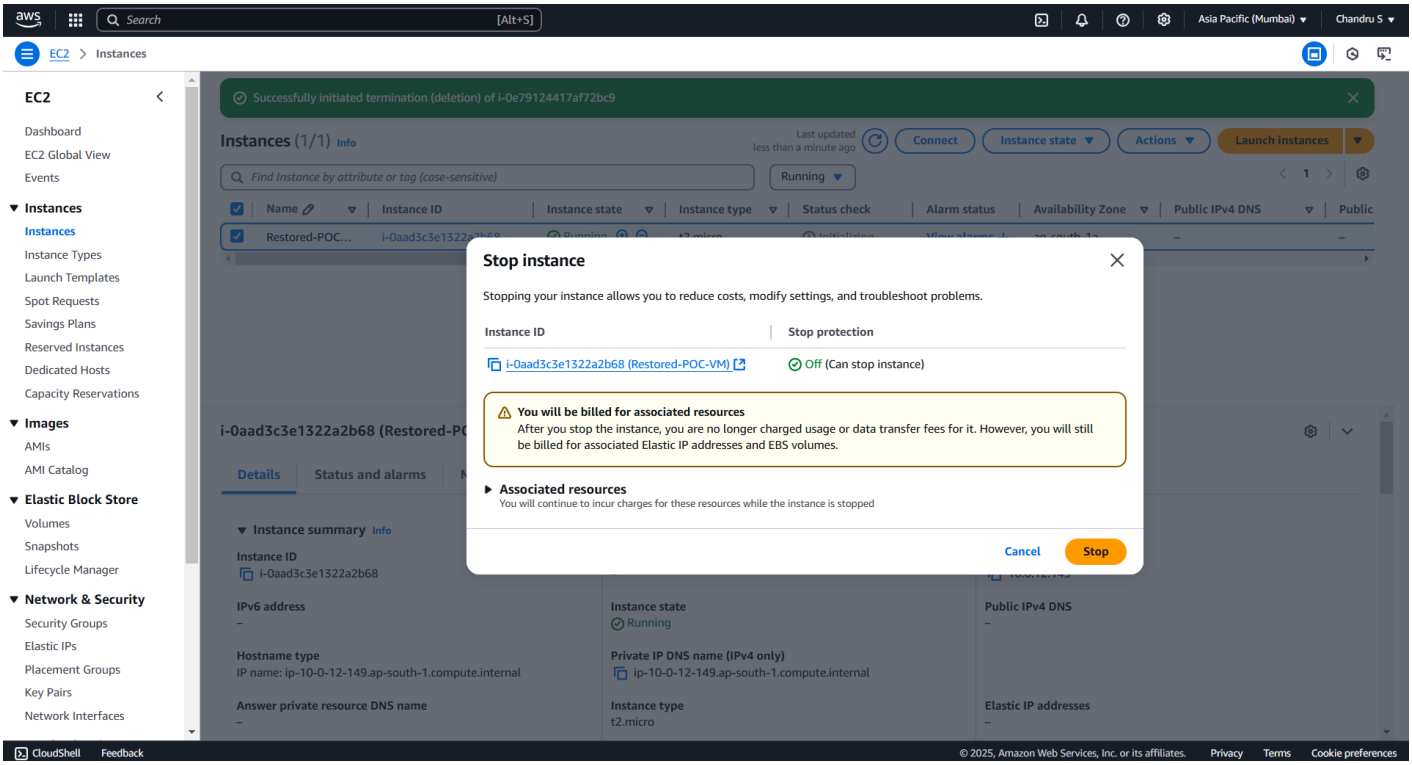
1. In the EC2 Dashboard, click **Launch Instance**.
2. Name the instance (e.g., "Restored-POC-VM").
3. Select **Amazon Linux 2023 Free Tier eligible** as the AMI.
4. Choose **t2.micro** instance type (Free Tier eligible).
5. Skip the storage section for now and launch the instance.



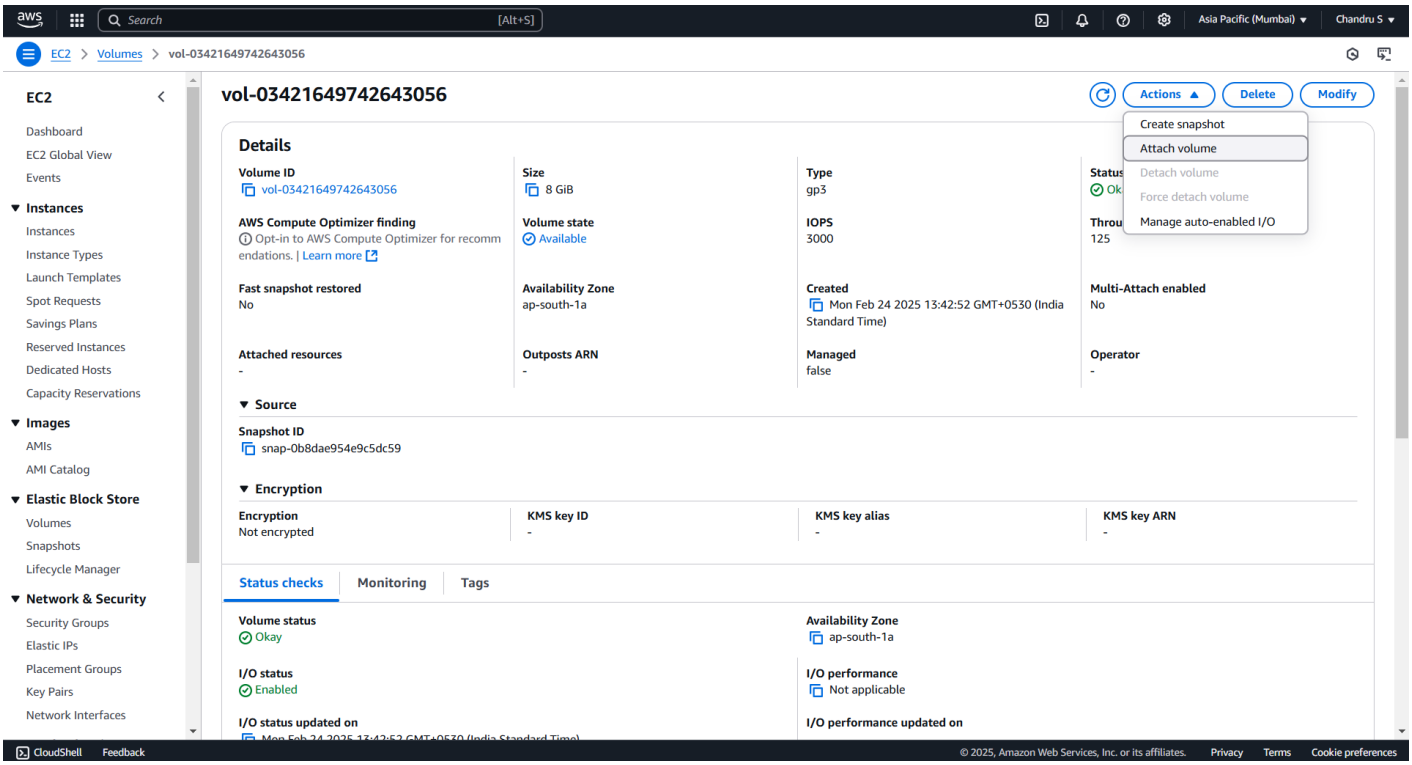
Step 8:

Attach the Volume to the Instance

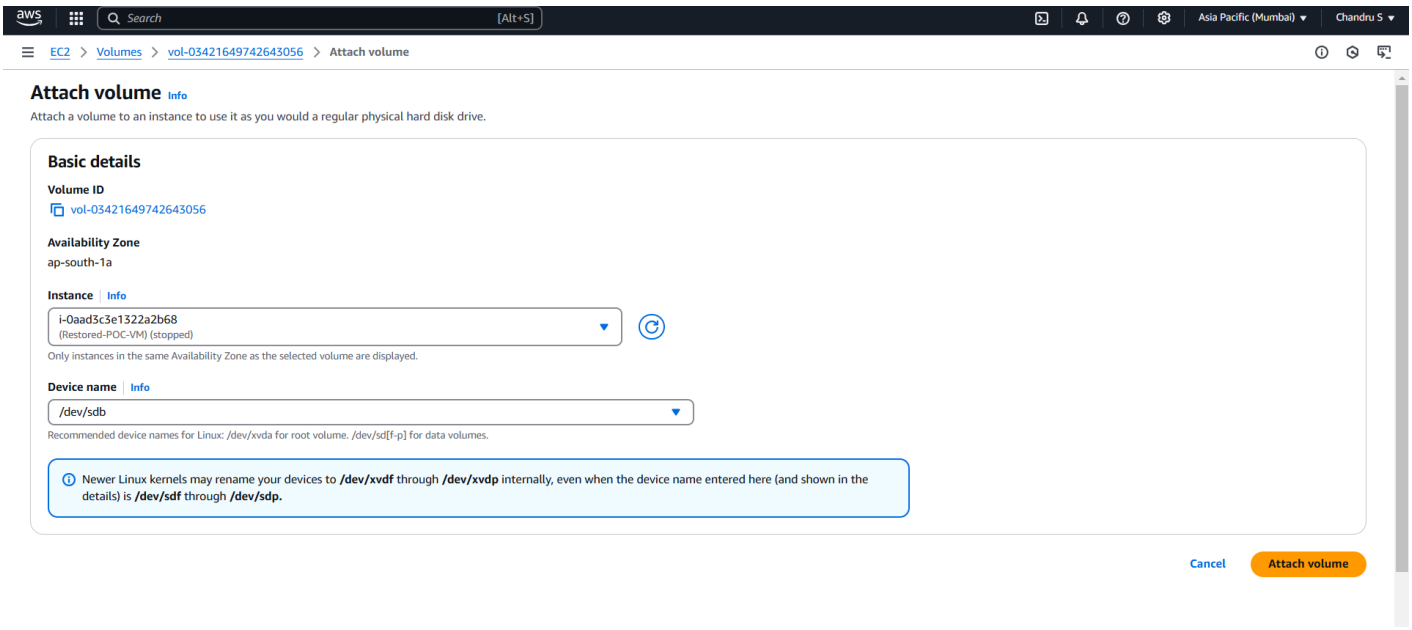
1. After launching the instance, stop it by selecting **Actions > Instance State > Stop Instance**.



2. In the **Volumes** section, select the new volume created from the snapshot.
3. Click **Actions > Attach Volume**.



4. In the pop-up window, choose the new instance to attach the volume.



Verify the Restoration

1. Connect to the instance using SSH.
2. Check if the files, data, and configurations match the original setup.

POC Completion Steps:

1. Created a snapshot of the instance.
2. Terminated the instance to avoid extra charges.
3. Restored the instance using the snapshot by creating a volume and attaching it to a new VM.

Outcome

By completing this POC for backing up and restoring a cloud instance in AWS, you will:

1. Create and manage snapshots of EC2 instances, enabling easy backup without manual intervention.
2. Terminate instances while ensuring important data remains intact through the backup snapshot.
3. Restore an instance from a snapshot by creating a new EBS volume and attaching it to a fresh EC2 instance.
4. Verify the restoration process, ensuring data integrity and proper functionality after recovery.
5. Gain practical knowledge of AWS services like EC2 and EBS snapshots, vital for disaster recovery and business continuity in the cloud.