

## **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.**

**Name: Sylashri Rajendran**  
**Department: IT**



## 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.
2. Creating an EBS snapshot of the instance's volume to back up its data.
3. Terminating the instance to simulate a failure or cost-saving scenario.
4. Restoring the instance using the snapshot by creating a new volume and attaching it to a new EC2 instance.

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

# Objective

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.

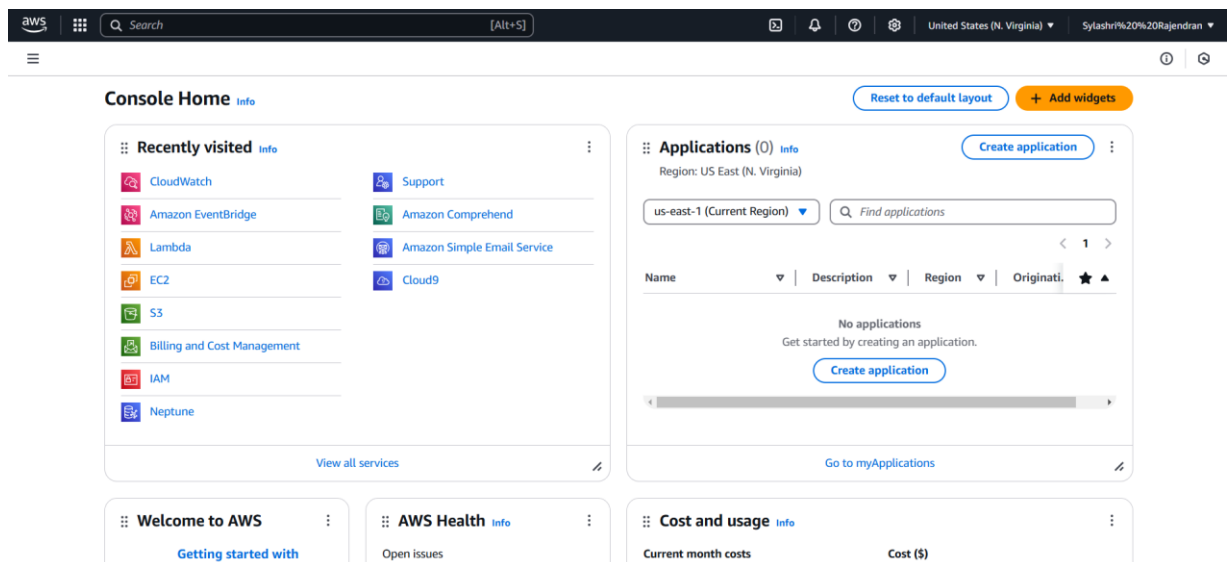
# Importance

- 1. Disaster Recovery:** Ensures that critical data can be restored quickly in case of an 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 in working with EC2, EBS, and snapshot-based recovery processes.

# Step-by-Step Overview

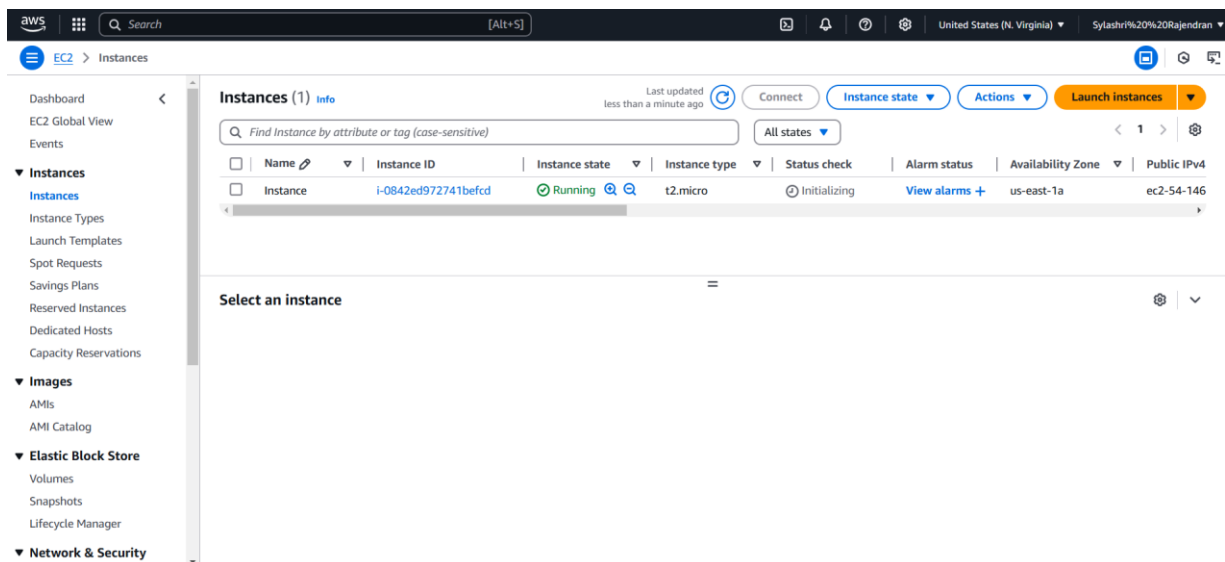
## Step 1:

1. Go to [AWS Management Console](#).
2. Enter your username and password to log in.



## Step 2:

Launch an Ec2 instance.(Instance)



## Step 3:

To create a new EBS volume in AWS, go to the EC2 Dashboard in the AWS Management Console by selecting **EC2** from the Services menu. In the left-hand menu, under **Elastic Block Store**, click on **Volumes**, then click the **Create Volume** button. Select **General Purpose SSD (gp3)** for the volume type, set the size (e.g., 8 GiB, within Free Tier limits), and choose the availability zone that matches your EC2 instance (e.g., us-east-1a). Leave the other options as default, then click **Create Volume**. Be sure to note the Volume ID for future reference.

The screenshot shows the AWS Management Console interface. The top navigation bar includes the AWS logo, a search bar, and the user's profile. The left sidebar shows the navigation menu with categories like Instances, Elastic Block Store, and Network & Security. The main content area displays the details for the volume 'vol-0a6a4abcd377ef343'. The details include Volume ID, Size (8 GiB), Type (gp3), IOPS (3000), Volume state (Available), Availability Zone (us-east-1a), Created date, and Attached resources. An 'Actions' dropdown menu is open, showing options like 'Create snapshot', 'Attach volume', 'Detach volume', 'Force detach volume', and 'Manage auto-enabled I/O'. Below the details, the 'Attach volume' dialog is shown. It includes fields for 'Volume ID' (vol-0a6a4abcd377ef343), 'Availability Zone' (us-east-1a), 'Instance' (i-0842ed972741befcd), and 'Device name' (/dev/sdb). A note at the bottom of the dialog states: 'Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvdp internally, even when the device name entered here (and shown in the details) is /dev/sdf through /dev/sdp.'

## Step 4:

To create a snapshot of your EBS volume, navigate to the EC2 Dashboard in the AWS Management Console and click on **Volumes** under the **Elastic Block Store** section. Locate the volume attached to your instance (it should match the instance name or ID), select it, then click **Actions** > **Create Snapshot**. Add a meaningful description (e.g., "Snapshot of Instance on Feb 10") and click **Create Snapshot**. To monitor its status, go to **Snapshots** under Elastic Block Store in the left menu and wait for the status to change to **Completed**.

**Create snapshot** [Info](#)

Create a point-in-time snapshot of an EBS volume and use it as a baseline for new volumes or for data backup. You can create snapshots from an individual volume, or you can create multi-volume snapshots from all of the volumes attached to an instance.

**Source**

**Resource type** [Info](#)

☒ **Volume**  
Create a snapshot from a specific volume.

☐ **Instance**  
Create multi-volume snapshots from an instance.

**Volume ID**  
The volume from which to create the snapshot.

vol-0a6a4abcd377ef343 [Refresh](#)

**Snapshot details**

**Description**  
Add a description for your snapshot.

Snapshot of Instance on Feb 10  
255 characters maximum

**Encryption** [Info](#)  
Not encrypted

**Successfully created snapshot snap-08ed4f323455f640f.**

**Snapshots (2)** [Info](#) [Refresh](#) [Recycle Bin](#) [Actions](#) [Create snapshot](#)

Owned by me

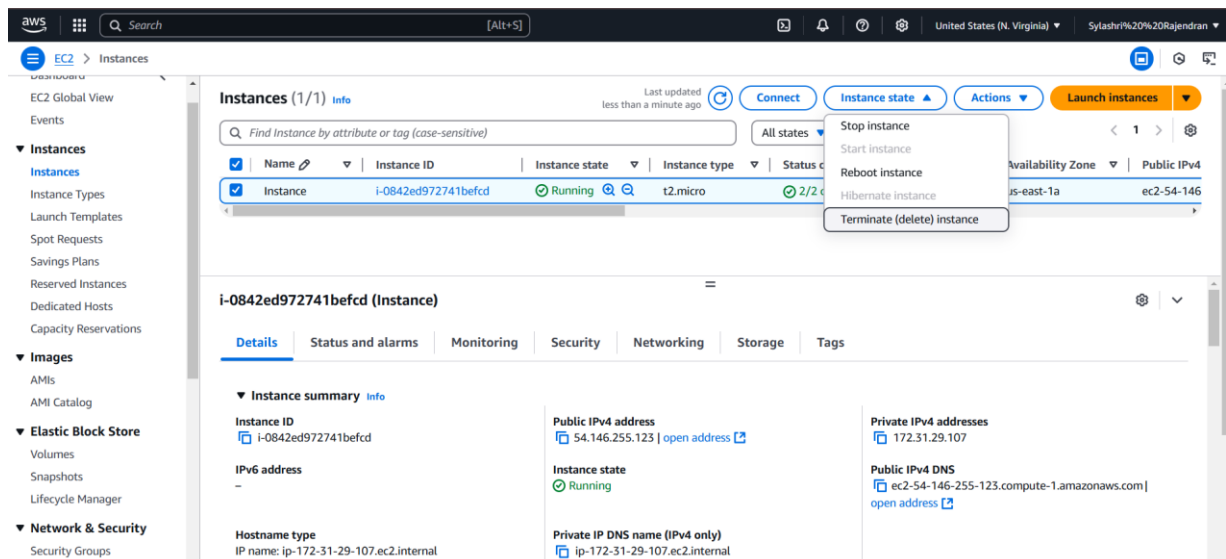
<input type="checkbox"/>	Name	Snapshot ID	Full snapshot size	Volume size	Description	Storage tier	Snapshot status
<input type="checkbox"/>	-	snap-08ed4f323455f640f	-	8 GiB	Snapshot of Instance on fe...	Standard	<span>Pending</span>
<input type="checkbox"/>	-	snap-05564011a801de7da	0 B	8 GiB	Snapshot of Instance on Fe...	Standard	<span>Completed</span>

Select a snapshot above.

## Step 5:

To terminate an EC2 instance, navigate to the EC2 Dashboard in the AWS Management Console and click on **Instances** under the **Instances** section. Locate the instance you want to terminate, then select it and click **Actions** > **Instance State** > **Terminate Instance**. Confirm the

termination by clicking **Terminate**, and refresh the page after a few moments to see the instance state change to **Terminated**.



## Step 6:

To create a new volume from the snapshot, go to the EC2 Dashboard and click on **Snapshots** under the **Elastic Block Store** section in the left menu. Select the snapshot you created earlier, then click **Actions** at the top and choose **Create Volume**. In the configuration settings, leave the **Size** as is (it will match the snapshot size) and select the same **Availability Zone** where you want to restore your instance (e.g., us-east-1a). Finally, click **Create Volume** to complete the process.



aws

Search

[Alt+S]

United States (N. Virginia)

Sylashr%20Rajendran

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

Images

AMIs

AMI Catalog

Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

Network & Security

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

Snapshots (1/2)

Owned by me

Search

	Name	Snapshot ID	Full snapshot size	Volume size	Description
<input checked="" type="checkbox"/>	-	snap-08ed4f323455f640f	0 B	8 GiB	Snapshot of Ins
<input type="checkbox"/>	-	snap-05564011a801de7da	0 B	8 GiB	Snapshot of Ins

Recycle Bin

Actions

Create snapshot

Create volume from snapshot

Create image from snapshot

Copy snapshot

Launch copy duration calculator

Delete snapshot

Manage tags

Snapshot settings

Archiving

Snapshot ID: snap-08ed4f323455f640f

Details

Snapshot settings

Storage tier

Tags

<div>Snapshot ID</div> <div>snap-08ed4f323455f640f</div>	<div>Full snapshot size</div> <div>0 B</div>	<div>Progress</div> <div>100%</div>	<div>Snapshot status</div> <div>Completed</div>
<div>Owner</div> <div>842676011451</div>	<div>Started</div> <div>Fri Feb 14 2025 19:32:38 GMT+0530 (India Standard Time)</div>	<div>Product codes</div> <div>-</div>	<div>Fast snapshot restore</div> <div>-</div>
<div>Description</div> <div>Snapshot of Instance on feb 10</div>			

Source volume

aws

Search

[Alt+S]

United States (N. Virginia)

Sylashr%20Rajendran

EC2

Snapshots

snap-08ed4f323455f640f

Create volume

Volume settings

Snapshot ID

snap-08ed4f323455f640f

Volume type

General Purpose SSD (gp3)

Size (GiB)

8

Min: 1 GiB, Max: 16384 GiB.

IOPS

3000

Min: 3000 IOPS, Max: 16000 IOPS.

Throughput (MiB/s)

125

Min: 125 MiB, Max: 1000 MiB. Baseline: 125 MiB/s.

Availability Zone

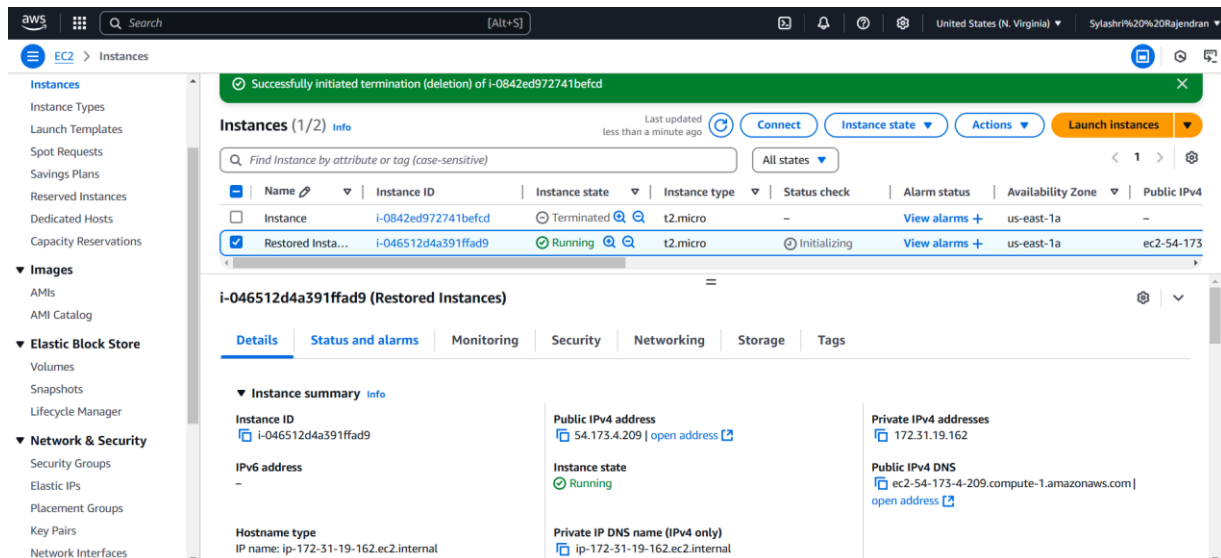
us-east-1a

Fast snapshot restore

Not enabled for selected snapshot

## Step 7:

To launch a new instance, go to the EC2 Dashboard and click **Launch Instances**. Set the name of the new instance (e.g., **Restored-instance**) and choose the same AMI (e.g., **Amazon Linux 2023 Free Tier eligible**) as the original instance. Select **t2.micro** for the instance type (Free Tier eligible). Configure the instance as needed, but skip the storage section for now.



## Step 8:

To attach the volume to the instance, first, stop the instance temporarily after it is launched by selecting the new instance, then click **Actions > Instance State > Stop Instance**. Next, go to **Volumes** in the left menu and select the new volume created from the snapshot. Click **Actions > Attach Volume**, and in the pop-up window, choose the new instance to attach the volume.

aws

Search

[Alt+S]

United States (N. Virginia)

Sylashri%20%20Rajendran

EC2

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

Images

AMIs

AMI Catalog

Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

Network & Security

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

Instances [1/2] info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch instances

Find instance by attribute or tag (case-sensitive)

All states

Stop instance

Stopping your instance allows you to reduce costs, modify settings, and troubleshoot problems.

Instance ID

Stop protection

i-046512d4a391ffad9 (Restored Instances)

Off (Can stop instance)

You will be billed for associated resources

After you stop the instance, you are no longer charged usage or data transfer fees for it. However, you will still be billed for associated Elastic IP addresses and EBS volumes.

Associated resources

You will continue to incur charges for these resources while the instance is stopped

Cancel

Stop

aws

Search

[Alt+S]

United States (N. Virginia)

Sylashri%20%20Rajendran

EC2

Volumes

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

Images

AMIs

AMI Catalog

Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

Network & Security

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

Volumes (1/3) info

Saved filter sets

Choose filter set

Search

Modify volume

Create snapshot

Create snapshot lifecycle policy

Delete volume

Attach volume

Detach volume

Force detach volume

Manage auto-enabled I/O

Manage tags

Fault injection

Volume ID: vol-0a6a4abcd377ef343

Details

Status checks

Monitoring

Tags

Volume ID

vol-0a6a4abcd377ef343

Size

8 GiB

Type

gp3

Status check

Okay

AWS Compute Optimizer finding

Opt-in to AWS Compute Optimizer for recommendations. | Learn more

Volume state

Available

Throughput

125

Fast snapshot restored

No

Availability Zone

us-east-1a

Created

Fri Feb 14 2025 19:18:47 GMT+0530 (India Standard Time)

Multi-Attach enabled

No

aws

Search

[Alt+S]

United States (N. Virginia)

Sylashri%20%20Rajendran

EC2

Volumes

vol-0a6a4abcd377ef343

Attach volume

Attach volume info

Attach a volume to an instance to use it as you would a regular physical hard disk drive.

Basic details

Volume ID

vol-0a6a4abcd377ef343

Availability Zone

us-east-1a

Instance

Info

i-046512d4a391ffad9 (Restored Instances) (stopped)

Only instances in the same Availability Zone as the selected volume are displayed.

Device name

Info

/dev/sdb

Recommended device names for Linux: /dev/xvda for root volume, /dev/sd[f-p] for data volumes.

Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvdp internally, even when the device name entered here (and shown in the details) is /dev/sdf through /dev/sdp.

Cancel

Attach volume

## Verify the Restoration

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

POC is **completed** successfully:

1. **Created a Snapshot** of your 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 of **Back Up and Restore a Cloud Instance** in AWS, you will:

1. **Create and manage snapshots** of EC2 instances, enabling easy backup of instance data without manual intervention.
2. **Terminate instances** while ensuring that 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 the instance is restored.

**5. Gain practical knowledge** of AWS services like EC2, EBS snapshots, and how to use them for backup and recovery, which is vital for disaster recovery and business continuity in the cloud.