

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.
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.

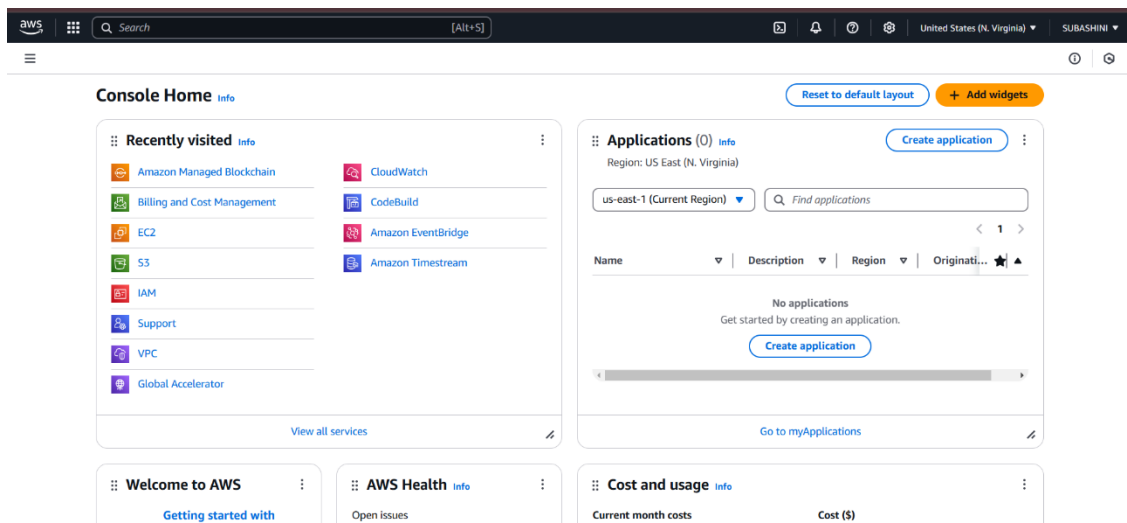
Importance

- 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

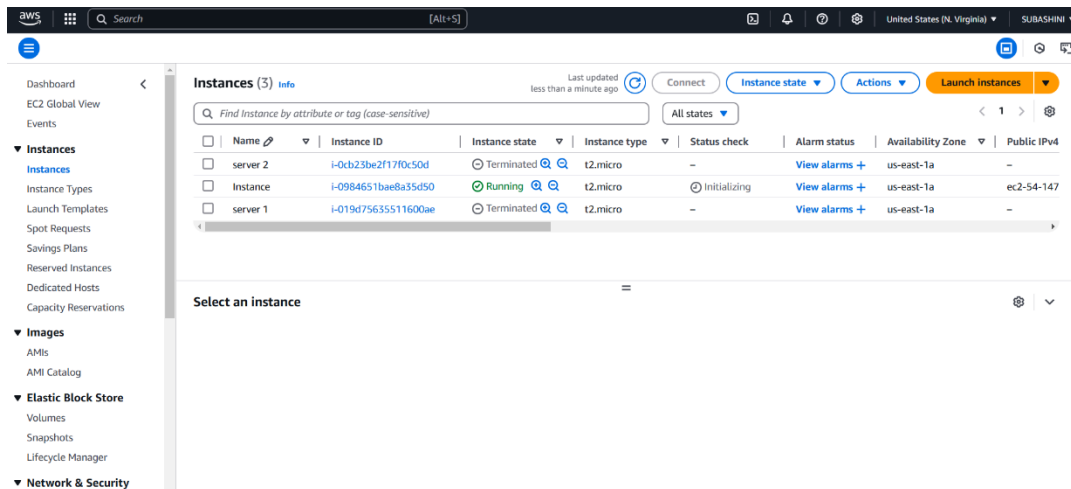
Step 1:

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



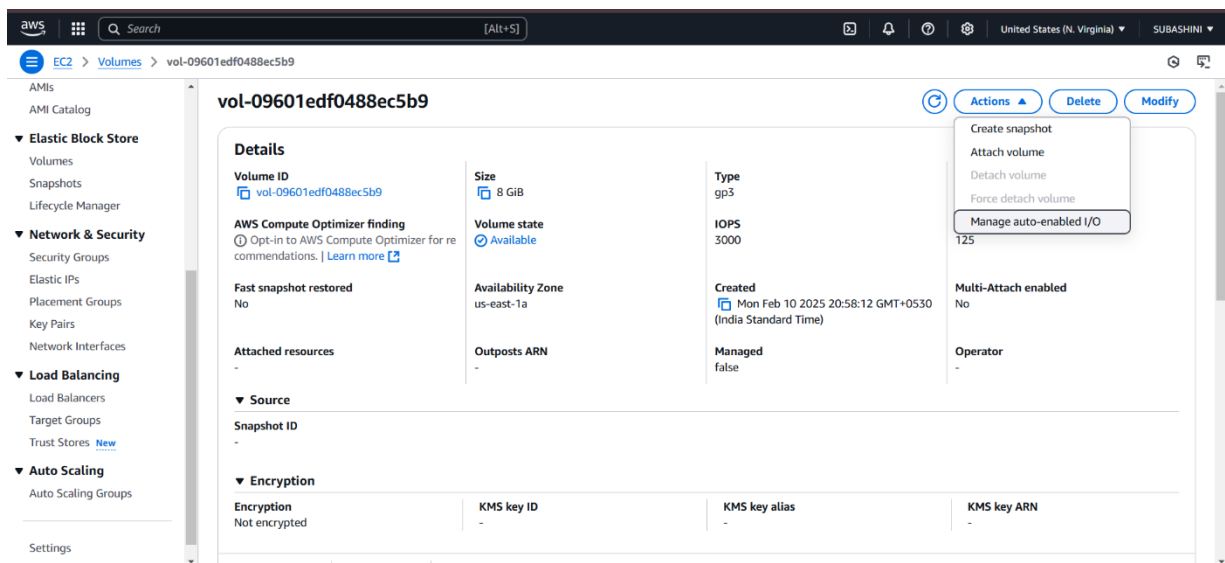
Step 2:

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.



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-09601edf0488ec5b9

Availability Zone
us-east-1a

Instance [Info](#)
i-0984651bae8a35d50
(Instance) (running)

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-g] for data volumes.

Notes: 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](#)

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.

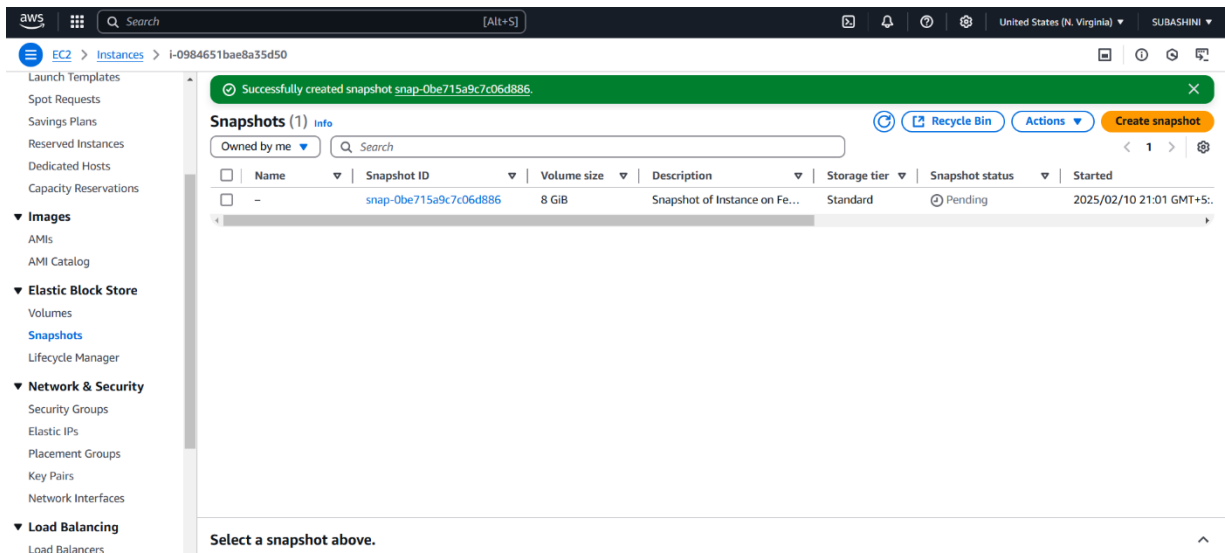
☐ **Instance**
Create multi-volume snapshots from an instance.

Volume ID
The volume from which to create the snapshot.
vol-09601edf0488ec5b9
us-east-1a

Snapshot details

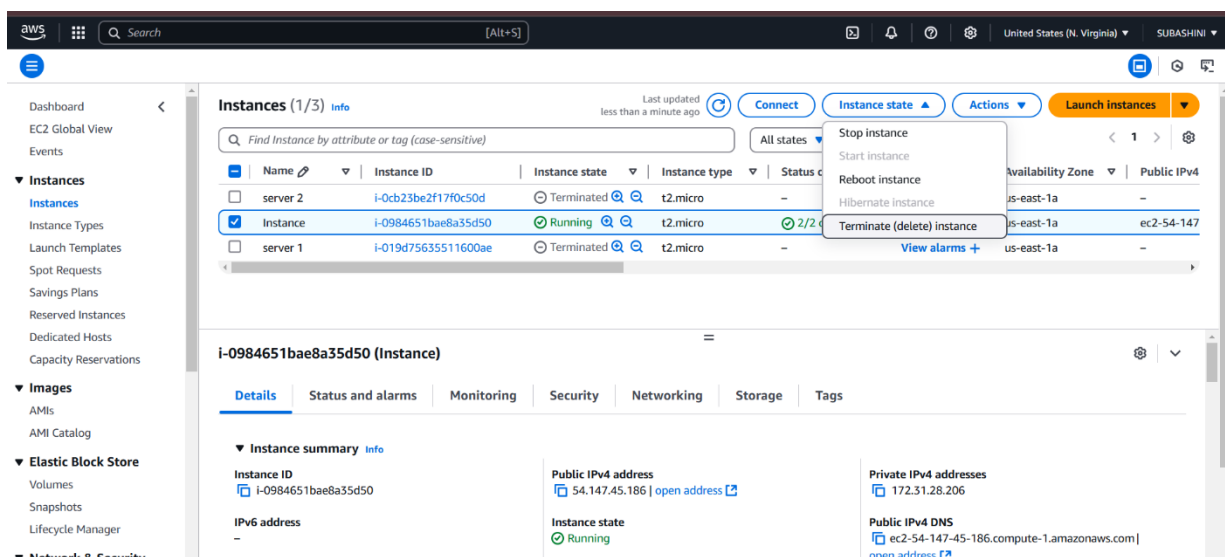
Description
Add a description for your snapshot.
Snapshot of Instance on Feb 10
255 characters maximum

Encryption [Info](#)
Not encrypted



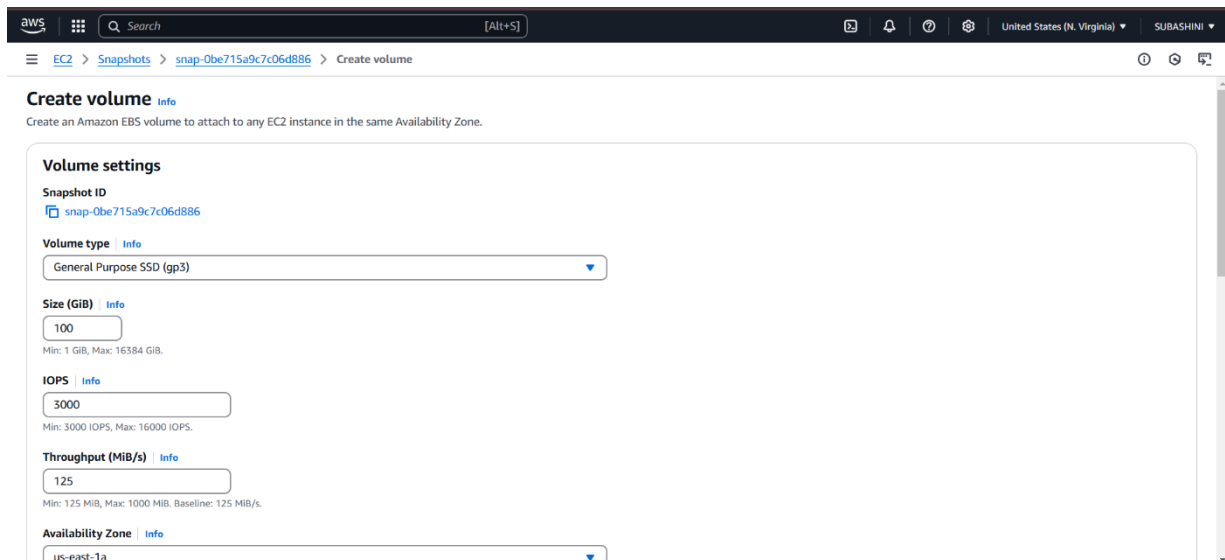
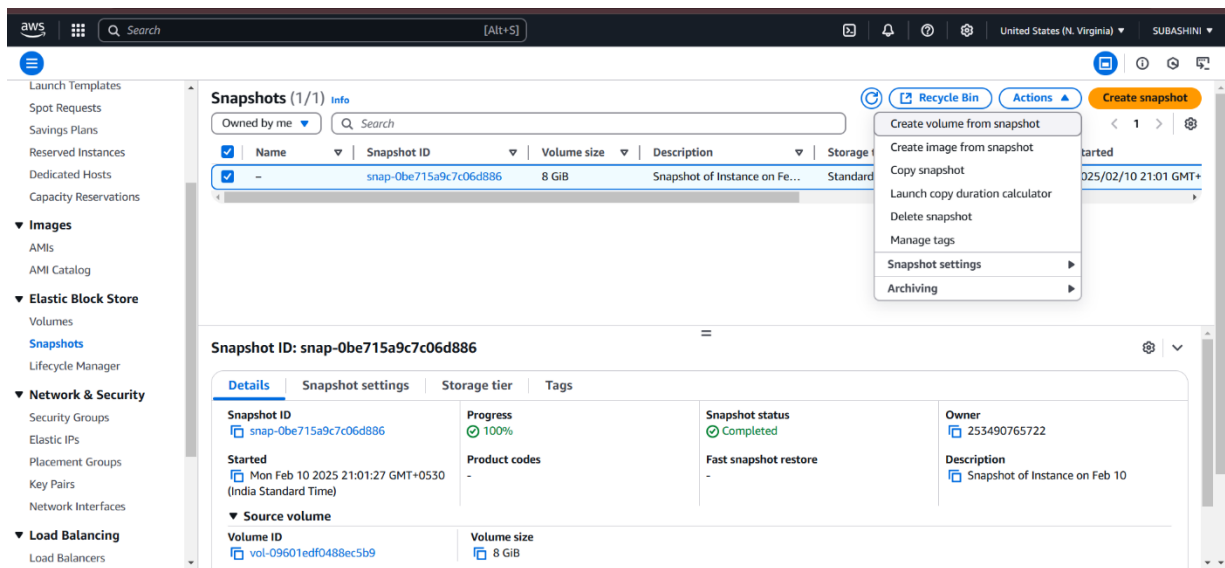
Step 5:

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**.



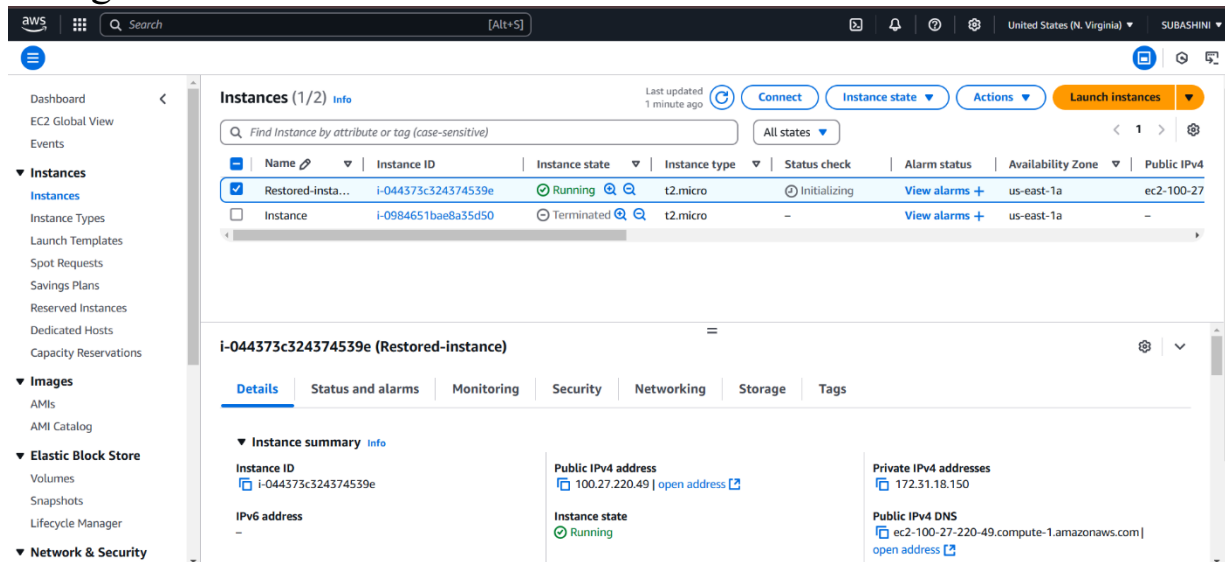
Step 6:

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.



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)

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Dashboard

EC2 Global View

Events

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Lifecycle Manager

Network & Security

Instances (1/2) Info

Last updated 1 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-044373c324374539e (Restored-instance)

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

i-044373c324374539e (R

Details

Status and al

Instance summary Info

Instance ID

i-044373c324374539e

IPv6 address

Instance state

Running

Public IPv4 DNS

ec2-100-27-220-49.compute-1.amazonaws.com

open address

Launch Templates

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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

vol-09601edf0488ec5b9

gp3

8 GiB

3000

125

vol-042f2d40dfed6cd97

gp3

100 GiB

3000

125

vol-01816b0dd9e235a9c

gp3

8 GiB

3000

125

Volume ID: vol-042f2d40dfed6cd97

Details

Status checks

Monitoring

Tags

Volume ID

vol-042f2d40dfed6cd97

Size

100 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

Mon Feb 10 2025 21:05:25 GMT+0530 (India Standard Time)

Multi-Attach enabled

No

aws

Search

[Alt+S]

United States (N. Virginia)

SUBASHINI

EC2

Volumes

vol-042f2d40dfed6cd97

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-042f2d40dfed6cd97

Availability Zone

us-east-1a

Instance Info

i-044373c324374539e (Restored-instance) (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.