



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:

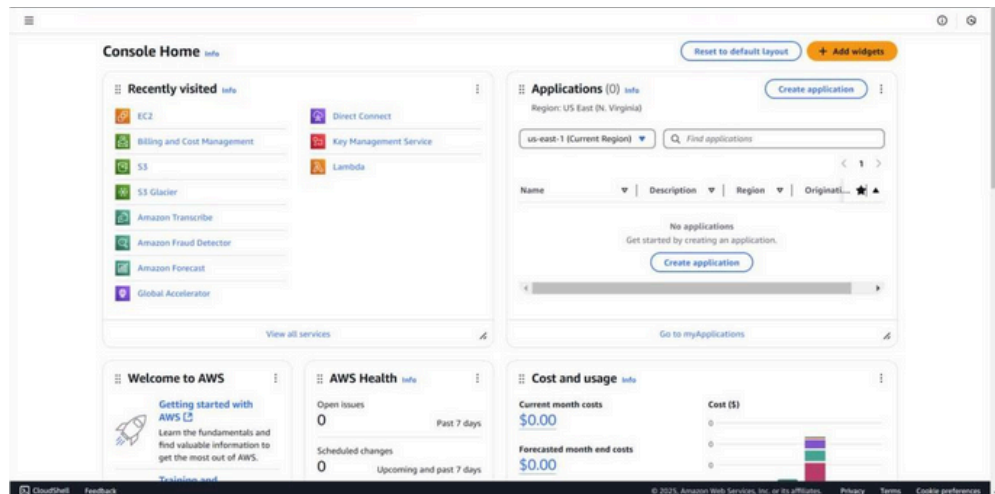
1. Demonstrate the process of creating and managing backups in AWS.
2. Explore the capabilities of EBS snapshots for disaster recovery.
3. Understand how to restore a terminated instance and verify data integrity.
4. Highlight cost-saving techniques using AWS Free Tier while ensuring operational readiness.

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.

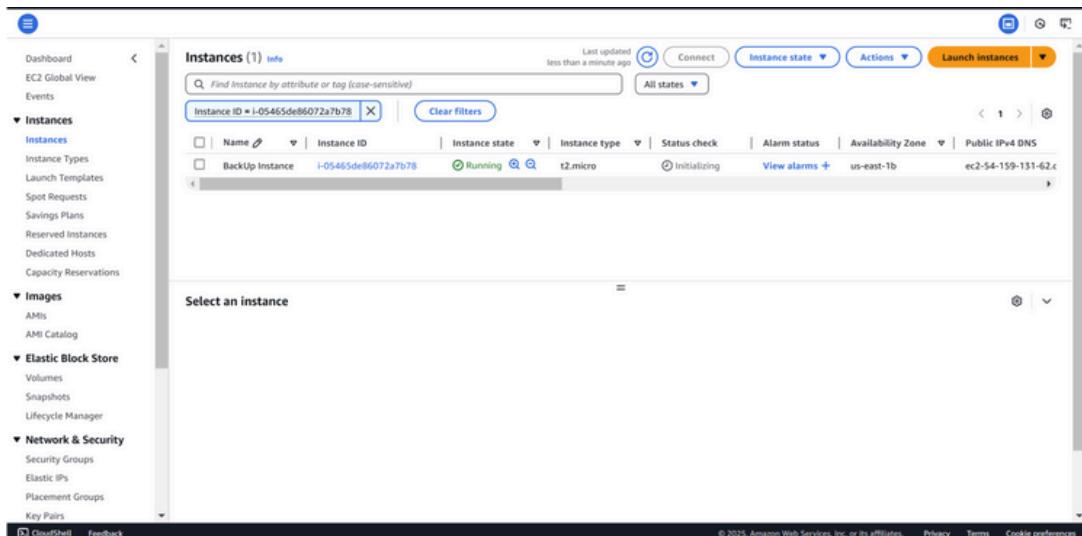
Step-by-Step Overview Step 1:

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



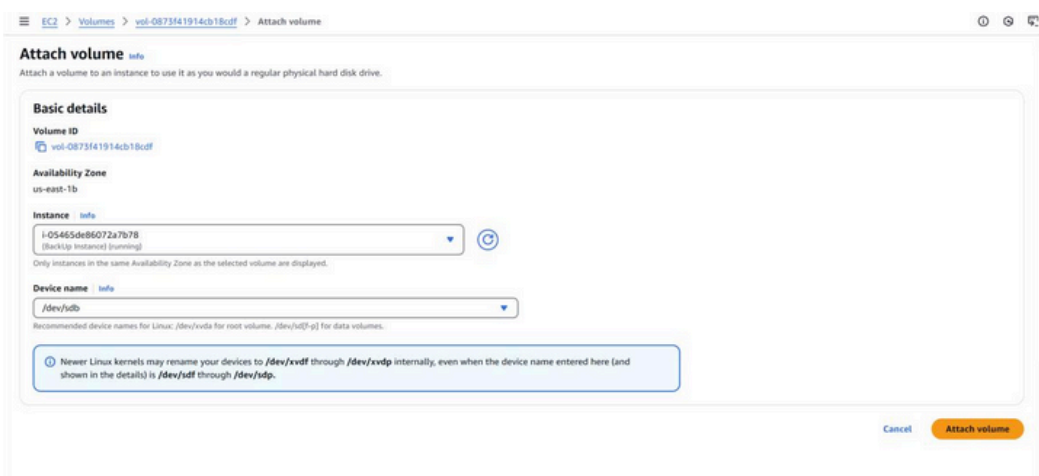
Step 2:

Launch an Ec2 instance.(Backup 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-1b). Leave the other options as default, then click Create Volume. Be sure to note the Volume ID for future reference.



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 Backup Instance on Feb 7") 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.

The screenshot shows the 'Create snapshot' form in the AWS Management Console. The breadcrumb trail at the top is 'EC2 > Volumes > vol-0673f41914cb18c0f > Create snapshot'. The form is titled 'Create snapshot' with a link to 'info'. Below the title is a sub-header: 'Create a point-in-time snapshot to back up the data on an Amazon EBS volume to Amazon S3.' The form is divided into three sections: 'Source volume', 'Snapshot details', and 'Tags'. The 'Source volume' section shows 'Volume ID' as 'vol-0673f41914cb18c0f' and 'Availability Zone' as 'us-east-1b'. The 'Snapshot details' section has a 'Description' field with the text 'Snapshot of Backup Instance on Feb 7' and a note '255 characters maximum'. Below the description is the 'Encryption' section, which is set to 'Not encrypted'. The 'Tags' section has a note 'No tags associated with the resource.' and an 'Add tag' button. At the bottom right of the form are 'Cancel' and 'Create snapshot' buttons.

EC2 > Volumes > vol-0673f41914cb18c0f > Create snapshot

Create snapshot [info](#)

Create a point-in-time snapshot to back up the data on an Amazon EBS volume to Amazon S3.

Source volume

Volume ID: vol-0673f41914cb18c0f Availability Zone: us-east-1b

Snapshot details

Description: Add a description for your snapshot
Snapshot of Backup Instance on Feb 7
255 characters maximum.

Encryption: [info](#)
Not encrypted

Tags [info](#)

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

No tags associated with the resource.

[Add tag](#)

You can add 50 more tags.

[Cancel](#) [Create snapshot](#)

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The screenshot shows the 'Snapshots' page in the AWS Management Console. The left-hand navigation menu is expanded, showing 'Elastic Block Store' > 'Snapshots'. The main content area is titled 'Snapshots (1)' with a link to 'info'. Below the title is a search bar and a table of snapshots. The table has columns: Name, Snapshot ID, Volume size, Description, Storage tier, Snapshot status, and Started. There is one snapshot listed with ID 'snap-0662b0255596f851', size '100 GiB', description 'Snapshot of Backup Instan...', storage tier 'Standard', status 'Completed', and started time '2025/02/07 22:32 GMT+5...'. Above the table are buttons for 'Recycle Bin', 'Actions', and 'Create snapshot'. Below the table is a message 'Select a snapshot above.'.

Snapshots (1) [info](#)

[Recycle Bin](#) [Actions](#) [Create snapshot](#)

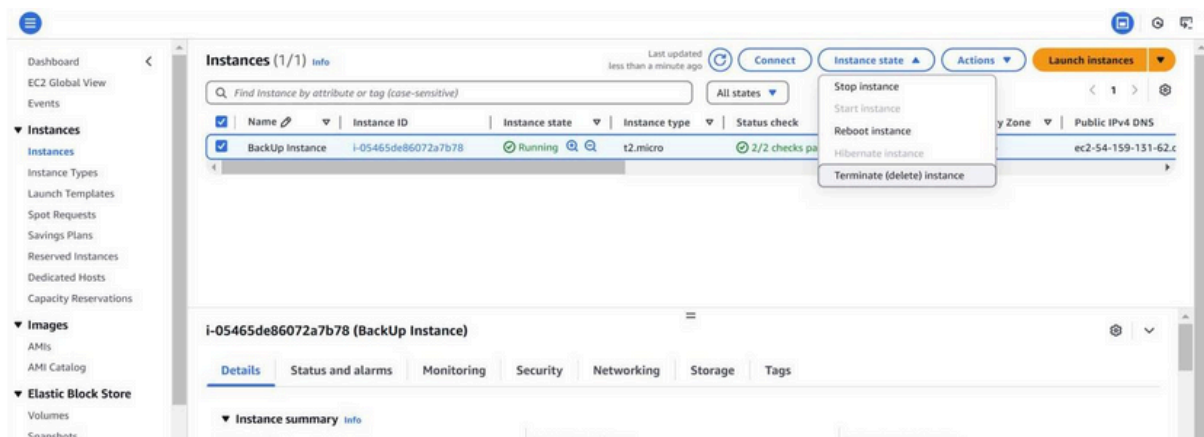
<input type="checkbox"/>	Name	Snapshot ID	Volume size	Description	Storage tier	Snapshot status	Started	
<input type="checkbox"/>	-	snap-0662b0255596f851	100 GiB	Snapshot of Backup Instan...	Standard	Completed	2025/02/07 22:32 GMT+5...	Pro

Select a snapshot above.

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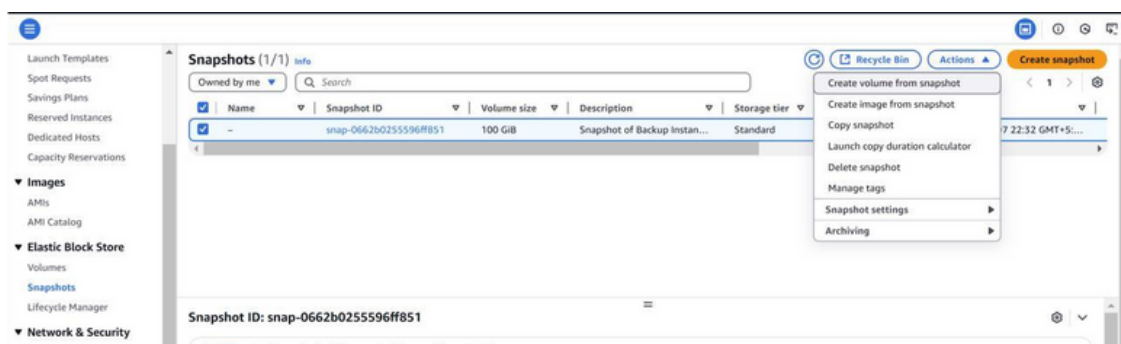
Step 5:

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.

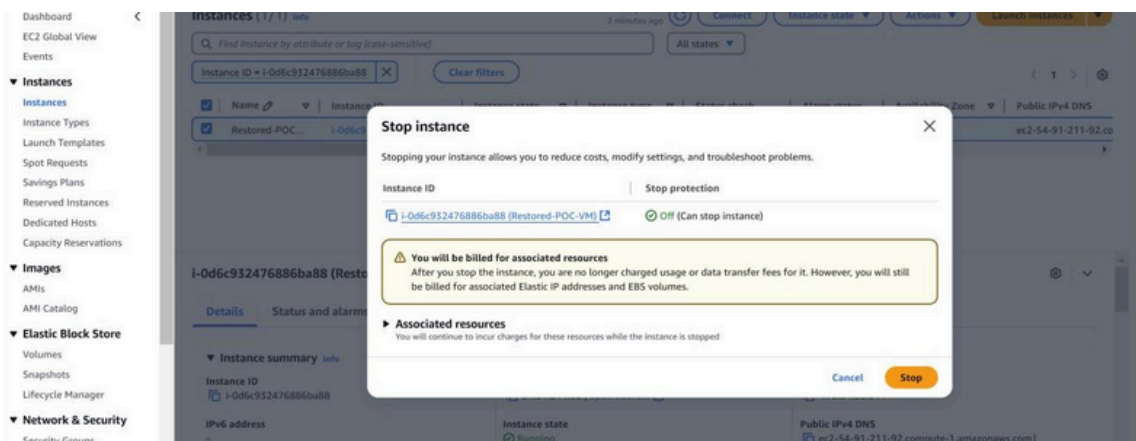


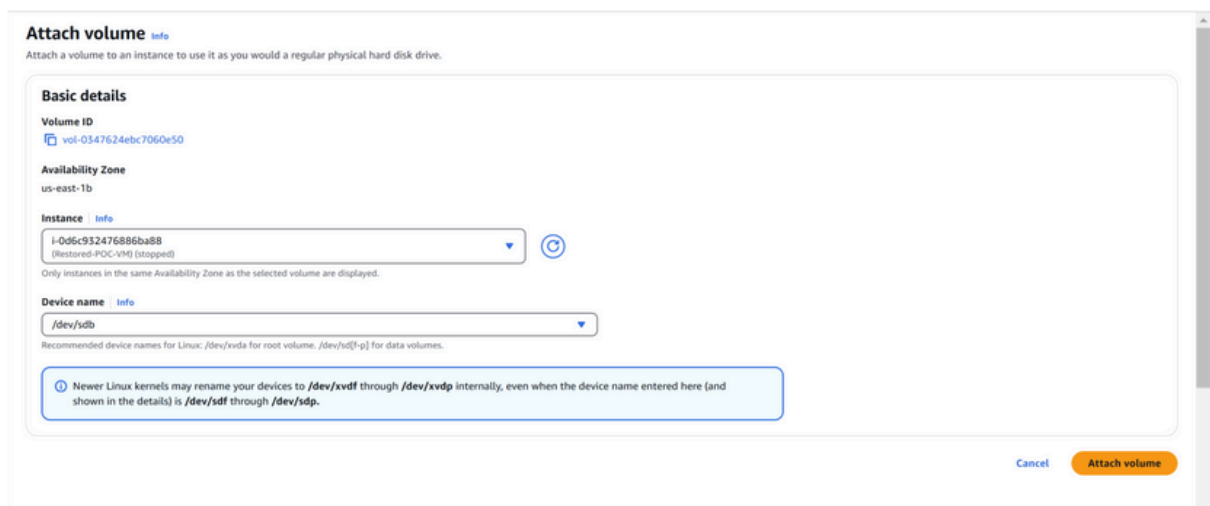
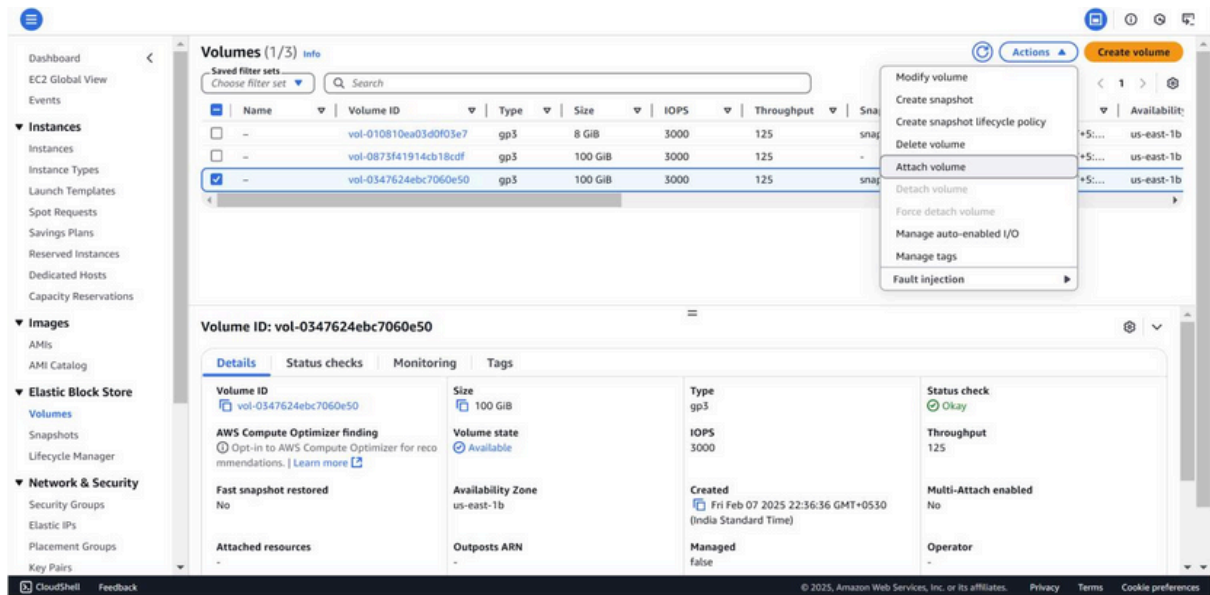
Step 7:

To launch a new instance, go to the EC2 Dashboard and click Launch Instances. Set the name of the new instance (e.g., Restored-POCVM) 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.





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.