
Understanding AMI Backups and EBS Snapshots in AWS

When working with AWS, ensuring data protection and system recovery is crucial. Two essential backup mechanisms provided by AWS are Amazon Machine Images (AMIs) and EBS Snapshots. In this blog, we will explore what AMI backups and snapshots are, their differences, and step-by-step guides on how to create and manage them.

What is an AMI (Amazon Machine Image)?

An Amazon Machine Image (AMI) is a pre-configured template containing the operating system, application server, and application data necessary to launch an EC2 instance.

Key Components of an AMI

- **Root Volume Snapshot** – Stores the OS and system files.
- **Block Device Mapping** – Defines the attached storage volumes.
- **Launch Permissions** – Controls who can use the AMI.
- **Instance Metadata** – Stores instance configuration details.

Why Use an AMI Backup?

- **Disaster Recovery:** Restore an instance quickly after failure.
- **Scaling & Deployment:** Launch multiple instances with the same configuration.
- **Migration:** Move an instance to another region with ease.
- **Testing & Development:** Create a duplicate environment for safe testing.

Creating an AMI Backup of an EC2 Instance

Using AWS Console

1. Navigate to **EC2 Dashboard** → Click on **Instances**.
2. Select the instance you want to back up.
3. Click **Actions** → **Image and templates** → **Create Image**.
4. Enter **Image Name & Description** (e.g., My-EC2-Backup-2025-03-24).
5. Choose **No Reboot** (optional, for live backups).
6. Click **Create Image** → AWS starts creating the AMI.
7. Monitor the process under **EC2 Dashboard** → **AMIs**.

Copying an AMI to Another AWS Region

If you need to replicate an EC2 instance in another region, you can copy the AMI.

Steps to Copy an AMI

1. Go to **EC2 Dashboard** → **AMIs**.
2. Select the AMI you want to copy.
3. Click **Actions** → **Copy AMI**.
4. Choose the destination AWS region.
5. Set a new **AMI name** and select encryption options.
6. Click **Copy AMI** and monitor progress under **AMIs** in the target region.

What is an EBS Snapshot?

An EBS Snapshot is a point-in-time backup of an EBS volume attached to an EC2 instance. It helps in restoring data, migrating volumes, and creating AMIs.

Key Features of EBS Snapshots

- **Incremental Backups** – Only changes from the last snapshot are saved.
- **Stored in Amazon S3** – Though not directly visible, AWS manages it.
- **Can Be Used to Create a New Volume** – Enables easy recovery.
- **Supports Encryption** – Ensures secure storage.

When to Use EBS Snapshots?

- **For Data Backup** – Ensures you have a copy of important files.
- **Before Making Major Changes** – Take a snapshot before system updates.
- **For Volume Migration** – Move data across regions or accounts.

Creating an EBS Snapshot

Using AWS Console

1. Go to **EC2 Dashboard** → **Elastic Block Store (EBS)** → **Volumes**.
2. Select the volume you want to back up.
3. Click **Actions** → **Create Snapshot**.
4. Enter **Snapshot Name & Description**.
5. Click **Create Snapshot** and monitor under **Snapshots**.

Restoring from a Snapshot

1. Go to **EC2 Dashboard** → **Snapshots**.
2. Select the snapshot and click **Actions** → **Create Volume**.
3. Choose the new volume type, size, and availability zone.
4. Click **Create Volume**.
5. Attach the new volume to an EC2 instance.

AMI vs Snapshot in AWS

Both AMI (Amazon Machine Image) and Snapshot are used for backups in AWS, but they serve different purposes.

Amazon Machine Image (AMI)

- AMI is a complete image of an EC2 instance that includes:
 - The Operating System (OS) (Ubuntu, Amazon Linux, Windows, etc.)
 - Installed applications and configurations
 - EBS Snapshots of attached volumes

Purpose:

- Used to launch new EC2 instances with the same configuration.
- Helps in cloning, scaling, and disaster recovery of EC2 instances.

Example:

You have an EC2 instance running a web server (Nginx, MySQL, PHP). Instead of setting up each new server manually, you create an AMI and launch identical instances from it.

Snapshot (EBS Snapshot)

- A Snapshot is a backup of an EBS (Elastic Block Store) volume.
- It does not include OS or configurations.
- Stores only disk data (like files, databases).
- Incremental backup – stores only changed data from the last snapshot.

Purpose:

- Used for data backup and restoration of storage volumes.
- You can create a new EBS volume from a snapshot and attach it to any EC2 instance.

Example:

Before updating a database, you take a snapshot of the EBS volume. If something goes wrong, you can restore the database from the snapshot.

Key Differences Between AMI & Snapshot

Feature	AMI	Snapshot
What does it stores?	Entire instance (OS, apps, settings, EBS volumes)	Only EBS volume (disk data)
Includes OS?	Yes	No
Includes Data?	Yes, if data is on the root volume	Yes
Purpose	Launch new EC2 instances	Restore EBS volume data
Use Case	System recovery, scaling, cloning	Data backup, restore

How AMI and Snapshot are Related

- When you create an AMI, AWS automatically takes a snapshot of the root volume.
- If you delete an AMI, its snapshot remains in AWS, unless deleted manually.
- Snapshots can be used to create new AMIs if needed.

When to Use What?

- **Use AMI** if you want to launch EC2 instances with a pre-configured setup.
- **Use Snapshot** if you need to back up or restore data from an EBS volume.

Conclusion

In this article, we explore two key AWS backup mechanisms: Amazon Machine Images (AMIs) and EBS Snapshots. AMIs are complete templates of an EC2 instance, including the operating system, applications, and configurations, ideal for launching new instances. EBS Snapshots capture point-in-time data of EBS volumes for data backup and restoration. We discuss their features, purposes, and differences, along with step-by-step guides on creating and managing them in AWS.