**📸 AWS Snapshots – Complete Explanation**

An **AWS Snapshot** is a **point-in-time backup** of an **Amazon EBS (Elastic Block Store) volume**. It captures the state of the volume, which can later be used to **restore** or **create new volumes**.

**📌 What is a Snapshot?**

* A **snapshot** is like taking a **photograph** of your disk (EBS volume) at a specific moment.
* It is **stored in Amazon S3** (but you **can’t access it directly** in S3).
* Used for **backup**, **disaster recovery**, **cloning**, or **migrating** EBS volumes.

**🧠 Key Features**

| **Feature** | **Details** |
| --- | --- |
| **Storage type** | Stored in **S3 (internally managed)** |
| **Type** | **Incremental** after the first snapshot |
| **Encryption** | Snapshots can be **encrypted** |
| **Cross-Region Copy** | Snapshots can be copied to other **regions** |
| **Automation** | Use **Amazon Data Lifecycle Manager (DLM)** to automate snapshot creation & retention |

**🔁 How Snapshots Work**

1. **First Snapshot** – Full backup of the volume
2. **Subsequent Snapshots** – **Incremental**, only changes since the last snapshot are stored (saves space and time).

**🎯 Incremental Example:**

* Snapshot 1: Full 100 GB backup
* Snapshot 2: Only 10 GB changed data is stored
* Snapshot 3: 5 GB more changes stored

👉 However, you can **restore the full volume** from any snapshot.

**🛠️ Snapshot Use Cases**

| **Use Case** | **Description** |
| --- | --- |
| **Backup** | Protect EBS volume data regularly |
| **Restore** | Quickly recreate a volume from snapshot |
| **Migration** | Move EBS volume across **AZs or Regions** |
| **Cloning** | Create multiple environments from one base snapshot |
| **🛡️ Amazon Data Lifecycle Manager (DLM) for Snapshots**  **Amazon DLM (Data Lifecycle Manager) is a tool that helps automate the creation, retention, and deletion of Amazon EBS snapshots and AMIs based on custom schedules and lifecycle policies.**  **🎯 Why Use DLM?**   * **❌ No more manual snapshot creation or cleanup** * **✅ Ensures regular backups of volumes** * **✅ Manages storage cost by deleting old snapshots**   **🧱 How It Works:**  **You create a lifecycle policy that defines:**   * **What volumes (or instances) to back up** * **How often to create snapshots (e.g., daily)** * **How long to retain snapshots before deletion**   **✅ Key Features:**   | **Feature** | **Description** | | --- | --- | | **Automated Snapshots** | **Create EBS snapshots on a schedule** | | **Retention Rules** | **Keep snapshots for X days or X number** | | **Target by Tags** | **Apply policy to resources with specific tags** | | **AMI Lifecycle** | **You can also manage AMIs (images) with DLM** | | **Cross-Region Copy** | **(Optional) Copy snapshots to another region** | | **Encryption Support** | **Supports encrypted volumes and snapshots** |   **🛠️ Step-by-Step: Create Snapshot Lifecycle Policy**   1. **Go to EC2 Console → Lifecycle Manager** 2. **Click “Create Lifecycle Policy”** 3. **Choose Policy Type: 🔘 EBS Snapshot Policy (for EBS volumes)** 4. **Target Resources:**    * **Use tags to identify volumes (e.g., Backup=true)** 5. **Schedule:**    * **Define frequency (hourly, daily, weekly)**    * **Set start time, time zone**    * **Set retention rule (e.g., keep last 7 snapshots)** 6. **(Optional) Enable:**    * **Fast snapshot restore**    * **Cross-region copy** 7. **Review and Create**   **📌 Example: Backup All Volumes with Tag Backup=Yes Daily**   | **Setting** | **Value** | | --- | --- | | **Policy Type** | **EBS Snapshot** | | **Target Resource Tag** | **Backup=Yes** | | **Frequency** | **Every 24 hours** | | **Retention** | **Keep 7 days** | | **Cross-Region Copy** | **Optional** | |  |

**Cross-Region Copy in AWS (Snapshots & S3)**

**Cross-region copy** is a feature in AWS that allows you to **copy your data (like snapshots or S3 objects) from one AWS region to another** for purposes such as **disaster recovery**, **data localization**, or **backup**.

**✅ Use Cases**

| **Use Case** | **Benefit** |
| --- | --- |
| **Disaster Recovery (DR)** | Keep a backup in another region |
| **Data Localization** | Comply with country-specific laws |
| **Faster Regional Access** | Improve latency for regional users |
| **Environment Cloning** | Set up identical environments across regions |

**🔁 1. Cross-Region Copy of Snapshots**

**📌 What:**

* Copies **EBS snapshots** to a **different AWS region**
* Can be **manual** or **automated** using **DLM (Data Lifecycle Manager)**

**🛠️ Manual Steps (Console):**

1. Go to **EC2 > Snapshots**
2. Select a snapshot → Click **Actions > Copy**
3. Choose:
   * **Destination Region**
   * **Description**
   * (Optional) **Encrypt**
4. Click **Copy Snapshot**

**Cross-Account Sharing of EBS Snapshots 1**

**📌 Steps:**

1. **Create snapshot** in Account A
2. Modify snapshot permissions:

bash

aws ec2 modify-snapshot-attribute \

--snapshot-id snap-0123456789abcdef0 \

--attribute createVolumePermission \

--operation-type add \

--user-ids 123456789012 # Account B

1. Now, **Account B** can use the snapshot to **create a volume or AMI**

🔒 If encrypted, the KMS key must also be shared.

**🧰 2. Sharing S3 Buckets (Access to Another Account)**

**📌 Options:**

* **Bucket policy** (preferred for one-way access)
* **IAM role with trust policy** (for secure, controlled access)

**✅ Example: Allow Account B to read Account A's bucket**

json

CopyEdit

{

"Version": "2012-10-17",

"Statement": [{

"Effect": "Allow",

"Principal": {"AWS": "arn:aws:iam::123456789012:root"},

"Action": ["s3:GetObject"],

"Resource": ["arn:aws:s3:::example-bucket/\*"]

}]

}

**🌐 3. Cross-Account Sharing of AMIs**

**Steps:**

1. From Account A:
   * Share AMI using modify-image-attribute
   * Also share the underlying **EBS snapshot**
2. From Account B:
   * Copy AMI to local region/account if needed
   * Launch instance from shared AMI