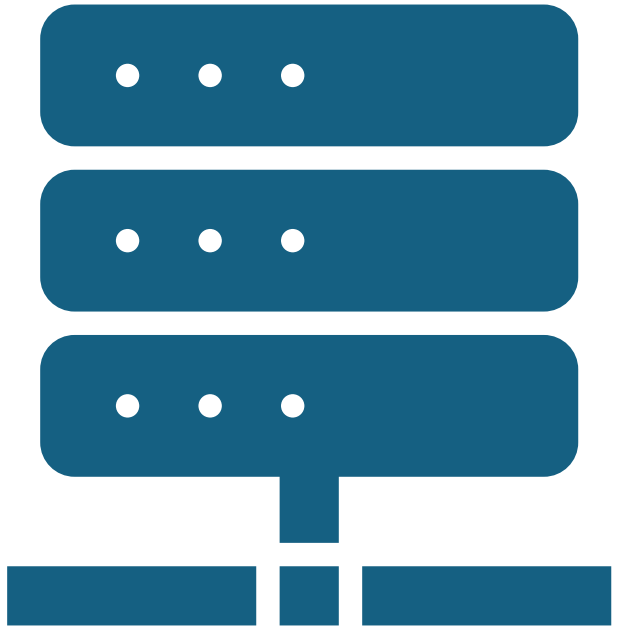
EBS Volume

What is an EBS Volume?



- **Definition:**
- Amazon EBS is like a network-attached hard drive for your EC2 instance.
- It allows data to persist (remain) even when the EC2 instance is stopped or terminated.
- Only one EC2 instance can attach to an EBS volume at a time (unless using EBS Multi-Attach, in specific cases).
- **Example**:
  Imagine your EC2 is a laptop and the EBS volume is a USB drive. When you plug it in, you can store or retrieve data. If you shut down the laptop (EC2), the data on the USB (EBS) stays.

Key Features of EBS

1. AZ-Bound Volume

•An EBS volume is **tied to one Availability Zone** (AZ).

•You cannot directly attach it to an EC2 instance in another AZ.

Example:
If the volume is in us-east-1a, you can only attach it to instances in that same zone.

2. Network-Based Storage

•EBS is **not on the physical host**, it connects over the network.

•May have slight **latency** compared to local instance storage.

3. Resize and IOPS

•You can **increase the size** and **IOPS (performance)** of a volume anytime.

Example:
If your database grows and your 100GB volume becomes full, you can increase it to 200GB without downtime.

- **Delete on Termination**
- **Definition:**
- Controls what happens to the EBS volume when the EC2 instance is **terminated**.

Volume Type	Default Behavior
Root Volume	Deleted
Additional EBS	Not Deleted

Use Case:
You want to **keep data even after instance termination** → Disable "Delete on Termination" for the volume.

Example:
If you terminate a Linux EC2 instance, the system disk will be deleted (default), but you can preserve your attached 100GB volume with project data.

EBS Snapshots

Definition:

•A snapshot is a backup of your EBS volume stored in Amazon S3 (but not visible directly in S3).

•You can create a new EBS volume from this snapshot anytime.

Snapshot Use Cases:

1.Backup before major software updates.

2.Cloning EC2 across AZs/Regions.

Example:
You create a snapshot of an EBS volume in us-east-1a, and later restore it to create a volume in us-east-1b.

EBS Snapshot Archive

- **Definition:**
- Long-term storage for snapshots that you don’t use regularly.
- **75% cheaper**, but **takes 24–72 hours to restore**.
- **Use Case:**
  Ideal for regulatory or compliance backups you don’t access often.
- **Recycle Bin for Snapshots**
- **Definition:**
- If someone deletes a snapshot accidentally, you can **recover it from the recycle bin**.
- You define rules to keep deleted snapshots for **1 day to 1 year**.
- **Example:**
  A student deletes a snapshot by mistake. If the retention policy is 7 days, they can recover it within a week.

Fast Snapshot Restore (FSR)

- **Definition:**
- Ensures **zero latency** when using a snapshot to launch a new volume.
- Normally, restored snapshots are slow on first access.
- **Use Case:**
  Critical applications that need fast start-up from snapshots.
- **Example:**
  For production workloads, enable FSR on critical snapshots to avoid delays when launching new EC2 instances from them.