What is EBS Root Volume Resize?

When your disk space becomes full, you can increase the size of your EBS volume without stopping the instance (in most cases).

Important:

- You can increase volume size.
- You cannot decrease volume size.
- After increasing in AWS, you must extend filesystem inside OS.

Step 1 – Increase Volume Size from AWS Console

Step-by-Step:

1. Login to AWS Console
2. Go to **EC2 Dashboard**
3. Click **Volumes** (under Elastic Block Store)
4. Select your volume
5. Click **Actions → Modify Volume**
6. Change the size (Example: 8 GB → 20 GB)
7. Click **Modify**

Status will show:

- `modifying`
- then `optimizing`
- then `completed`

Now AWS side is done.

But system still shows old size.
Now we must extend it inside the OS.

Step 2 – Check Disk Inside Linux

Connect to your EC2 instance:

```
ssh ec2-user@your-ip
```

Check disk:

```
lsblk
```

Example output:

```
xvda    8G
 └─xvda1 8G
```

Even if you increased to 20G, it may still show old partition size.

Step 3 – Extend Partition

If Root Volume (Usually /dev/xvda1 or /dev/nvme0n1p1)

Install growpart (if not installed):

Ubuntu:

```
sudo apt install cloud-guest-utils -y
```

Now extend partition:

For xvda:

```
sudo growpart /dev/xvda 1
```

For NVMe:

```
sudo growpart /dev/nvme0n1 1
```

Step 4 – Resize Filesystem

Now extend filesystem.

If File system is XFS (Amazon Linux default)

```
sudo xfs_growfs -d /
```

If File system is EXT4 (Ubuntu default)

```
sudo resize2fs /dev/nvme0n1p1
```

Check disk again:

```
df -h
```

Now you should see updated size.

What is a Snapshot in AWS?

In **Amazon Elastic Block Store (EBS)**, a **snapshot** is a **backup copy of an EBS volume**.

- It stores data in **Amazon Simple Storage Service (S3)** internally.
- It is **incremental** (only changed blocks are saved after first snapshot).
- Used for **backup, disaster recovery, and migration**.

Think of Snapshot = *Photo of your EBS volume at a specific time.*

How to Take Snapshot of an EBS Volume

Steps:

1. Login to **Amazon EC2**
2. Go to **Elastic Block Store → Volumes**
3. Select your Volume
4. Click **Actions → Create Snapshot**
5. Add description
6. Click **Create Snapshot**

Snapshot will appear in **Elastic Block Store → Snapshots**

1. Create New Volume from Snapshot (Same Region)

Steps:

1. Go to **Snapshots**
2. Select snapshot
3. Click **Actions → Create Volume**
4. Choose:
    - Volume type (gp3, gp2, etc.)
    - Size
    - Availability Zone (AZ)
5. Click **Create Volume**

IMPORTANT:

- You must create volume in the **same region**
- AZ can be different inside same region

Example:
If snapshot is in **Asia Pacific (Mumbai)**,
You can create volume in:

- ap-south-1a
- ap-south-1b
  (but not in another region directly)

2. Create Volume in Another Availability Zone (Same Region)

Suppose:

- Old volume in ap-south-1a
- EC2 instance in ap-south-1b

Process:

1. Create Snapshot
2. Create new volume from snapshot
3. Select AZ = ap-south-1b
4. Attach new volume to instance

Now volume works in new AZ.

3. How to Move Volume Across Region

You cannot directly move EBS volume to another region.

You must copy snapshot.

Steps:

1. Create Snapshot
2. Go to Snapshots

3. Select Snapshot
4. Click **Actions → Copy Snapshot**
5. Select Destination Region

Example:
From **Asia Pacific (Mumbai)**
To **US East (N. Virginia)**

6. Click Copy

After copy completes:
7. Go to new region
8. Create volume from copied snapshot

1 How to Take Backup Every Hour (Automatic Snapshot Rule)

In AWS, automatic backup of EBS is done using:

🔷 Amazon Data Lifecycle Manager (DLM)

It creates automatic snapshots based on schedule.

✅ Steps to Create Hourly Backup Rule

1. Go to **Amazon EC2**
2. Scroll → Click **Lifecycle Manager**
3. Click **Create lifecycle policy**
4. Choose:
   - Policy type → **EBS Snapshot policy**
   - Target resource → Volume
5. Add Tag
   Example:
   Key = Backup
   Value = Hourly
6. Schedule:
   - Frequency → **Custom**
   - Every → 1 hour
   - Retention → Example 24 snapshots (keep 24 hours)
7. Click **Create Policy**

🔥 Important:

Only volumes with matching **tag** will be backed up automatically.

What is Amazon Machine Image (AMI)

AMI is a template of:

- Operating System
- Applications
- EBS Snapshots

It is used to launch EC2 instances.

In AWS, when we create:

AMI (Amazon Machine Image)

Using **Create Image** option in EC2:

- AWS automatically creates:
  - Snapshot of Root Volume
  - Snapshot of attached EBS volumes

This collection is used to launch new EC2 instances.

This is called **Image Snapshot** (Snapshot created during AMI creation).

Copy AMI to Another Region

Example:
From **Asia Pacific (Mumbai)**
To **US East (N. Virginia)**

Steps:

1. Go to EC2 → AMIs
2. Select AMI
3. Click **Actions → Copy AMI**
4. Select Destination Region
5. Click Copy

After copy:

- AWS copies associated snapshots also.
- You can launch EC2 in new region.

What is Encryption of EBS Volume?

Encryption means:

- Data is converted into secure format
- Unauthorized users cannot read it

AWS uses:

AWS Key Management Service (KMS)

Encryption Protects:

- Data at rest (stored data)
- Snapshots
- AMI snapshots
- Data between EC2 and EBS

How to Create Encrypted Volume

While creating volume:

- Tick **Enable Encryption**
- Select KMS key

Important Rules:

Rule	Explanation
Encrypted volume → Snapshot is encrypted	Yes
Cannot remove encryption later	Must create new volume
Can copy snapshot and encrypt during copy	Yes

How to Delete AMI Created by You

When you create AMI, AWS creates:

- AMI record
- EBS Snapshots

Deleting AMI does NOT delete snapshot automatically.

Steps to Delete AMI

1. Go to EC2 → AMIs
2. Select your AMI
3. Click **Actions → Deregister**
4. Confirm

Then Delete Snapshot

1. Go to Snapshots
2. Find snapshot created by AMI
3. Click Delete

Important:

If you don’t delete snapshot:
Storage cost will continue.