**EBS Volume and the EC2 instance.**

EBS volume stands for Elastic Book Store volume. It is a network drive that you can attach to your EC2 instance while it runs. They persist data even after your EC2 instance have been terminated.

They are bound to a specific availability zone. But can moved around with the help of a snapshot.

They can be detached from one instance to another.

Think of the EBS volume as a USB stick.

**EBS Snapshots.**

EBS snapshots can also be referred to as backups. They make snapshots of the EBS volume at a point in time.

It not necessary to detach the volume to do snapshots but it is recommended.

We can move an EBS volume between AZs by transforming the snapshots to a volume and set the AZ to the preferred location.

NB: AZ = Availability zone

**AMI Overview.**

AMI stands for Amazon Machine Image. This represents a customizable EC2 instance. The configuration include:

- Operating system

- CPU

- Monitoring

- User data

AMI are built for specific region, but can be transferred to other region.

**EC2 Instance Store Overview.**

Unlike the EBS which is a good network (although it works as a hard disk, it is virtual) drive, they are limited. EC2 Instance Store is a high performance hardware disks.

The Instance store has a better I/O throughput/performance.

It is ephemeral. If the EC2 instance is stopped a user will lose all information stored in the storage.

The EC2 Instance store is suitable for caching.

Make sure you back up your data before stopping the instance.

So any time you come across a high performance EC2 Instance, have it at the back of your mind that it is running on an Instance store.

For a long performance storage, always go with the Elastic Book Store.

**EBS Volume Types.**

They are 6 types:

- General purpose SSD:

- Cost Effective storage, low latency

- System boot volumes, Virtual Desktop, Dev and Test env.

- The general purpose volume consists of the GP3 and the GP2. GP3 have more benefits and less constraints that GP2.

- Provisioned IOPS SSD

- This is mostly used for critical jobs, databases workloads.

- This kind of volume ensures low latency.

- It is sub-divided into io1/io2

- the io2 has more benefits and less constraints.

- Hard Disk Drives HDD:

- They cannot be used as boot volumes.

- The throughput optimized HDD (stl) :

- Big Data, Log processing, Data warehousing

- Cold HDD (stc) :

- Used for data that is not frequently accessed.

**EBS Multi-Attach – io1/io2**

We can attach multiple EC2 instances of the same availability zone to one EBS volume ( io1/io2). Each instance have the ability to read and write permission to the volume.

**EFS- Elastic File System.**

Managed NFS (network file system) that can be mounted on many EC2. EFS unlike the EBS can be mounted in multi AZ. It is highly scalable and expensive.

Use cases:

- EFS is used in content management, code sharing, web serving

- Not compatible with window AMI.

- Uses security group to access EFS.

**EBS vs EFS.**

- EBS Volume:

- Can be attached to only one instance at a time.

- are locked to a specific availability zone.

- To migrate EBS Volume:

- take snapshots of the EBS Volume

- Restore snapshots in the AZ of your choice.

- EBS backup use IO and should be done when the application is down.

- If an EC2 instance shuts down the EBS volume attached will be terminated. But this behavior can be disabled

- EFS – Elastic File System

- Mounted on 100s of instance across AZ.

- EFS work only for linux instance.