**VOLUMES AND SNAPSHOTS**

An Amazon EBS volume is a durable, block-level storage device that you can attach to a single EC2 instance.

Amazon EBS provides persistent block-level storage volumes for use with Amazon EC2 instances. Each Amazon EBS volume is automatically replicated within its Availability Zone to protect you from component failure, offering high availability and durability.

Multiple Amazon EBS volumes can be attached to· a single Amazon EC2 instance, although a volume can only be attached to a single instance at a time.

Types of Amazon EBS Volumes:

Amazon EBS provides the following volume types:

General Purpose SSD (gp2)

Provisioned I OPS SSD (iol).

Throughput Optimized HDD (stl).

Cold HDD (scl), and

Magnetic (standard, a previous-generation type).

SSD-backed volumes optimized for transactional workloads involving frequent read/write operations with small I/0 size, where the dominant performance attribute is IOPS

HDD-backed volumes optimized for large streaming workloads where throughput (measured in MiB/s) is a better performance measure than IOPS.

**General Purpose SSD (gp2):**

General Purpose SSD (gp2) volumes offer cost-effective storage that is ideal for a broad range of workloads. These volumes deliver single-digit millisecond latencies and the ability to burst to 3,000 IOPS for extended periods of time. Between a minimum of 100 IOPS (at 33.33 GiB and below) and a maximum of 10,000 IOPS (at 3,334 GiB and above), baseline performance scales linearly at 3 !OPS per GiB of volume size. AWS designs gp2 volumes to deliver the provisioned performance 99% of the time. A gp2 volume can range in size from 1 GiB to 16 TiB.

**Provisioned IOPS SSD (iol):**

Provisioned IOPS SSD (iol) volumes are designed to meet the needs of 1/0intensive workloads, particularly database workloads, that are sensitive to storage performance and consistency.

An io 1 volume can range in size from 4 GiB to 16 TiB and you can provision 100 up to 32,000 IOPS per volume.

**Throughput Optimized HDD (stl):**

Throughput Optimized HDD. (stl) volumes provide low-cost magnetic storage that defines performance in terms of throughput rather than IOPS. This volume type is a good fit for large, sequential workloads such as Amazon EMR, ETL, data warehouses, and log processing.

* Not supported to use with root volume (Not Bootable)
* volume sizes ranging from 500GB to 16 TiB

**Cold HDD (scl) Volumes:**

Volumes provide low-cost magnetic storage that defines performance in terms of throughput rather than IOPS. With a lower throughput limit than stl, scl is a good fit ideal for large, sequential cold-data workloads. If you require infrequent access to your data and are looking to save costs, scl provides inexpensive block storage.

* Not supported to use with root volume (Not Bootable)
* volume sizes ranging from 0.5 to 16 TiB

**Magnetic volumes:**

Magnetic volumes are backed by magnetic drives and are suited for workloads where data is accessed infrequently, and scenarios where low-cost storage for small volume sizes is important. These volumes deliver approximately 100 IOPS on average, with burst capability of up to hundreds of IOPS, and they can range in size from I GiB to I TiB.

volume sizes ranging from 1 GiB to 1 TiB.

**INSTANCE STORE VOLUME:**

An instance store provides temporary block-level storage for your instance. This storage is located on disks that are physically attached to the host computer. Instance store is ideal for temporary storage of information that changes frequently, such as buffers, caches, scratch data, and other temporary content.

Instance Store Lifetime

* The underlying disk drive fails
* The instance terminates

Instance Store Volumes are called as Ephemeral Storage.

Instance store volumes cannot be stopped. If the underlying host fails, you will lose your data.

EBS backed instances can be stopped. You will not lose the data on this instance if it is stopped.

You cannot add extra volumes or storage.

You cannot take snapshot of volume.

By default, both ROOT volumes will be deleted on termination, however with EBS volumes, you can keep the root device volume by Unchecking the "Delete on Termination" option.

**Backup of EBS volumes:**

We can back up the data on our Amazon EBS volumes, regardless of volume type, by taking point-in-time snapshots.

Snapshots are incremental backups, which mean that only the blocks on the device that have changed since your most recent snapshot are saved.

Data for the snapshot is stored using Amazon S3 technology.

While snapshots are stored using Amazon S3 technology, they are stored in AWS-controlled storage and not in your account's Amazon S3buckets.

Snapshots are constrained to the region in which they are created, meaning you can use them to create new volumes only in the same region.

If you need to restore a snapshot in a different region, you can copy a snapshot to another region.

Snapshots can also be used to\_ increase the size of an Amazon EBS volume.

To increase the size of an Amazon EBS volume, take a snapshot of the volume, then create a new volume of the desired size from the snapshot. Replace the original volume with the new volume.