Types of Storage Services

Elastic Block Store (EBS) - Block
Data is split into evenly split blocks
Directly accessed by the Operation System
Supports only a single write volume

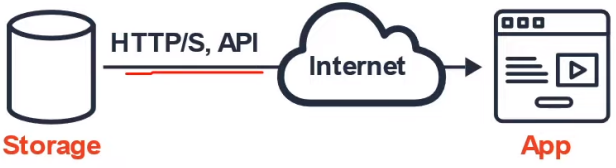
When you need a virtual hard drive attached to a VM

AWS Elastic File Storage (EFS) - File
File is stored with data and metadata
Multiple connections via a network share
Supports multiple reads, writing locks the file.

When you need a file-share where multiple users or VMs need to access the same drive

Amazon Simple Storage Service (S3) - Object
Object is stored with data, metadata and Unique ID
Scales with limited no file limit or storage limit
Supports multiple reads and writes (no locks)

When you just want to upload files, and not have to worry about underlying infrastructure. Not intended for high IOPs



Introduction to S3

What is Object Storage (Object-based Storage)?

data storage architecture that manages data as objects, **as opposed** to other storage architectures:

- **file systems** which manages data as a files and fire hierarchy, and
- **block storage** which manages data as blocks within sectors and tracks.

S3 provides you with **unlimited storage**.

You don't need to think about the underlying infrastructure

The S3 Console provides an interface for you to upload and access your data

S3 Object

Objects contain your data. They are like files.

Object may consist of:

- **Key** this is the name of the object
- **Value** the data itself made up of a sequence of bytes
- **Version ID** when versioning enabled, the version of object
- **Metadata** additional information attached to the object

S3 Bucket

Buckets hold objects. Buckets can also have folders which in turn hold objects

S3 is a universal namespace so bucket names must be unique (think like having a domain name)

You can store an individual object from **0 Bytes** to **5 Terabytes** in size

S3 Storage Classes

AWS offers a range of S3 storage classes that *trade* **Retrieval Time, Accessibility and Durability** for **Cheaper Storage**

S3 Standard (default)
Fast! 99.99% Availability, 11 9's Durability. Replicated across at least three AZs

S3 Intelligent Tiering
Uses ML to analyze object usage and determine the appropriate storage class.
Data is moved to the most cost-effective access tier, without any performance impact or added overhead.

S3 Standard-IA (Infrequent Access)
Still Fast! Cheaper if you access files less than once a month.
Additional retrieval fee is applied. **50% less** than Standard (reduced availability)

S3 One-Zone-IA
Still Fast! Objects only exist in one AZ. Availability (is 99.5%). but cheaper than Standard IA by 20% less
(Reduce durability) Data could get destroyed. A retrieval fee is applied.

S3 Glacier
For long-term cold storage. Retrieval of data can take minutes to hours but the off is very cheap storage

S3 Glacier Deep Archive
The lowest cost storage class. Data retrieval time is 12 hours.

Cheaper

S3 Outposts has its own storage class.

AWS Snow Family

AWS Snow Family are **storage and compute devices used to physically move data in or out the cloud** when moving data over the internet or private connection it to slow, difficult or costly.

Snowcone

Comes in two sizes:

- 8 TB of Storage (HHD)
- 14 TB of Storage (SSD)

Snowball Edge

Comes generally in two type:

- Storage Optimized
  - 80 TB
- Compute Optimized
  - 39.5 TB

Snowmobile

100 PB of storage

Data is delivered to Amazon S3

Storage Services

Cheat sheets, Practice Exams and Flash cards 👉 www.exampro.co/clf-c01

Simple Storage Service (S3) is a **serverless object storage service**. You can upload very large files and an unlimited amount of files. You pay for what you store. You don't worry about the underlying file-system, or upgrading the disk size.

S3 Glacier is a **cold storage service**. It design as a low cost storage solution for **archiving and long-term backup.** It uses previous generation HDD drives to get that low cost. Its highly secure and durable.

Elastic Block Store (EBS) is a **persistent block storage service.** It is a virtual hard drive in the cloud you attach to EC2 instances. You can choose different kinds of hard drives: **SSD, IOPS SSD, Throughput HHD, Cold HHD**

Elastic File Storage (EFS) is a **cloud-native NFS file system service**. File storage you can mount to multiple EC2 instances at the same time. **When you need to share files between multiple servers**

Storage Gateway is a **hybrid cloud storage** service that extends your on-premise storage to cloud

File Gateway extends your local storage to AWS S3

Volume Gateway caches your local drives to S3 so you have a countious backup of local files in the cloud

Tape Gateway stores files onto virtual tapes for backing up your files on very cost effective long term storage.

Storage Services

Cheat sheets, Practice Exams and Flash cards 👉 www.exampro.co/clf-c01

AWS Snow Family are **storage devices used to physically migrate large amounts of data** to the cloud.

- ~~**Snowball** and~~ **Snowball Edge** are briefcase size data storage devices. **50-80 Terabytes**
- **Snowmobile** is a cargo container filled with racks of storage and compute that is transported via semi-trailer tractor truck to transfer up to **100PB** of data per trailer.
- **Snowcone** is a very small version of Snowball that can transfer **8TB** of data.

AWS Backup a fully **managed backup service** that makes it easy to centralize and automate the backup of data across multiple AWS services eg. EC2, EBS, RDS, DynamoDB, EFS, Storage Gateway. You create backup plans.

CloudEndure Disaster Recovery continuously replicates your machines into a low-cost staging area in your target AWS account and preferred Region enabling fast and reliable recovery in case of IT data center failures.

Amazon FSx is a **feature rich and highly-performant file system.** That can be used for Windows (SMB) or Linux (Lustre)

Amazon FSx for Window File Server uses the SMB protocol and allows you to mount FSx to Windows servers

Amazon FSx for Lustre uses Linux's Lustre file system and allows you to mount FSx to Linux servers