Amazon Web Services (AWS) is well-known for its vast number of product offerings

Specifically in the storage arena, AWS provides three popular services — S3, Elastic Block Store (EBS), and Elastic File System (EFS) — which work quite differently and offer different levels of performance, cost, availability, and scalability. We'll discuss the use cases of these storage options, and compare their performance, cost, and accessibility to stored data.

AWS Storage Options: A Primer

- **Amazon S3** provides simple object storage, useful for hosting website images and videos, data analytics, and both mobile and web applications. Object storage manages data as objects, meaning all data types are stored in their native formats. There is no hierarchy of relations between files with object storage — data objects can be distributed across several machines. You can access the S3 service from anywhere on the internet.

- **AWS EBS** provides persistent block-level data storage. Block storage stores files in multiple volumes called blocks, which act as separate hard drives; block storage devices are more flexible and offer higher performance than regular file storage. You need to mount EBS onto an Amazon EC2 instance. Use cases include business continuity, software testing, and database management.

- **AWS EFS** is a shared, elastic file storage system that grows and shrinks as you add and remove files. It offers a traditional file storage paradigm, with data organized into directories and subdirectories. EFS is useful for SaaS applications and content management systems. You can mount EFS onto several EC2 instances at the same time.

The following diagram illustrates the difference between object storage and block storage.

HTTP(S) Interface

Object Storage
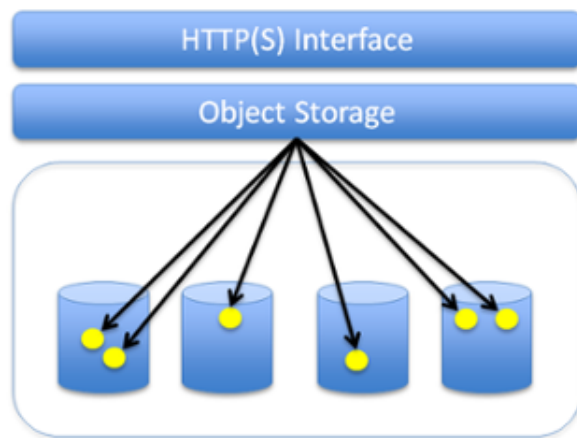
- Store virtually unlimited files.
- Maintain file revisions.
- HTTP(S) based interface.
- Files are distributed in different physical nodes.

Block Storage
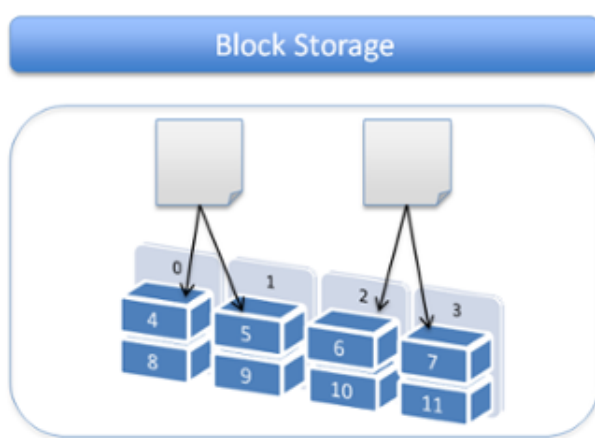
- File is split and stored in fixed sized blocks.
- Capacity can be increased by adding more nodes.
- Suitable for applications which require high IOPS, database, transactional data.

Image Source: [NetApp Cloud](#) (used with permission)

Head to Head

The table below compares Amazon S3, EBS, and EFS in terms of performance, cost, availability, accessibility, access control, and storage or file size limits enforced by each service.

	Performance	Cost	Availability and Accessibility	Access Control	Storage and File Size Limits
Amazon S3	- Supports 100 PUT/LIST/DELETE requests per second - Scalable to 300 requests per second	- First 50 TB/month: $0.0245 per GB - Next 450 TB/month: $0.0235 per GB - Over 500 TB/month: - $0.0225 per GB	- 99.99 percent available - Accessible via internet using APIs	- Access is based on IAM - Uses bucket policies and user policies	- No limit on quantity of objects - Individual objects up to 5TB
AWS EBS	- Provisioned IOPS delivers 4000 input/output operations per second	- Use-based cost structure that varies between regions	- 99.99 percent available - Accessible via single EC2 instance	- Security groups - Use-based authentication (IAM)	- Max storage size of 16 TB - No file size limit on disk
AWS EFS	- Up to 7000 file system operations per second	- $0.30, $0.33, or $0.36 per GB-month depending on region	- No publicly available SLA - Accessible from multiple Availability Zones in the same region	- IAM user-based authentication - Security groups	- No limits on size of the system - 52 TB maximum for individual files

Which AWS Cloud Storage Service Is Best?

As always, it depends.

- Amazon S3 is cheapest for data storage alone. However, there are various other pricing parameters in S3, including cost per number of requests made, S3 Analytics, and data transfer out of S3 per gigabyte. EFS has the simplest cost structure.

- Amazon S3 can be accessed from anywhere. AWS EBS is only available in a particular region, while you can share files between regions on multiple EFS instances.

- EBS and EFS are both faster than Amazon S3, with high IOPS and lower latency.

- EBS is scalable up or down with a single API call. Since EBS is cheaper than EFS, you can use it for database backups and other low-latency interactive applications that require consistent, predictable performance.

- EFS is best used for large quantities of data, such as large analytic workloads. Data at this scale cannot be stored on a single EC2 instance allowed in EBS—requiring users to break up data and distribute it between EBS instances. The EFS service allows concurrent access to thousands of EC2 instances, making it possible to process and analyze large amounts of data seamlessly.