





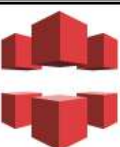
	Amazon Simple Storage Service (Amazon S3)	A service that provides scalable and highly durable object storage in the cloud.
	Amazon Glacier	A service that provides low-cost highly durable archive storage in the cloud.
	Amazon Elastic File System (Amazon EFS)	A service that provides scalable network file storage for Amazon EC2 instances.
	Amazon Elastic Block Store (Amazon EBS)	A service that provides block storage volumes for Amazon EC2 instances.
	Amazon EC2 Instance Storage	Temporary block storage volumes for Amazon EC2 instances.
	AWS Storage Gateway	An on-premises storage appliance that integrates with cloud storage.
	AWS Snowball	A service that transports large amounts of data to and from the cloud.
	Amazon CloudFront	A service that provides a global content delivery network (CDN).

# AWS STORAGE

AWS offers a comprehensive range of cloud storage services designed to support both application and archival compliance requirements. These services include:

## Snowball:

A physical data transport solution that helps you transfer large amounts of data into and out of the AWS cloud using secure appliances.

## Elastic File System (EFS):

A scalable file storage service that provides shared file storage for use with Amazon EC2 instances. It supports the Network File System (NFS) protocol.

## Glacier:

A low-cost storage service designed for data archiving and long-term backup. It is ideal for data that is infrequently accessed.

## Simple Storage Service (S3):

A highly scalable object storage service that offers durable and reliable storage for a wide range of data, including backups, analytics, and content distribution.

## Elastic Block Storage (EBS):

A block storage service that provides persistent storage volumes for use with Amazon EC2 instances. It is suitable for databases and other applications that require low-latency access to data.

AWS's cloud storage services cater to various needs, allowing you to select from object storage (S3), file storage (EFS), and block storage (EBS). These services, along with cloud data migration options, provide a solid foundation for designing your cloud IT

environment. Whether you need to store, backup, or archive data, AWS's storage services offer the flexibility and scalability to meet your requirements.

## **Block vs. Object Storage**

### **Block Storage:**

Block storage is well-suited for applications such as transactional databases, workloads with random read/write operations, and structured database storage.

In block storage, data is divided into evenly sized blocks or chunks. For instance, a file can be split into equal-sized blocks before being stored.

Each data block stored in block storage does not contain metadata like creation date, modification date, content type, etc.

Block storage only maintains the addresses (indices) where data blocks are stored, without concern for the actual content of the block itself.

It uses protocols like HTTP/HTTPS for communication.

Amazon EBS (Elastic Block Storage) is an example of block storage.

### **Object Storage:**

Object storage stores files as whole objects without dividing them into smaller blocks.

In object storage, an object includes both the file/data itself and its associated metadata.

This metadata includes attributes like creation date, content type, and a globally unique ID.

The globally unique ID serves as a unique identifier for the object and allows retrieval regardless of the physical storage location.

Object storage solutions do not provide the ability to mount as a drive or filesystem.

Examples of object storage solutions include Dropbox, Amazon S3, and Facebook's storage systems.

In summary, block storage is suitable for scenarios that require controlled data access and manipulation at the block level, making it ideal for databases. On the other hand, object storage focuses on storing entire objects along with their metadata, making it suitable for large-scale storage needs and unstructured data types.

## **Amazon Simple Storage Service (S3):**

Amazon S3 is an internet-based storage service with a straightforward web services interface designed for easy storing and retrieving of data, regardless of the data volume. S3 operates with region-specific buckets, offering access from any location on the internet.

### **Key Features:**

#### **S3 Bucket Ownership:**

Ownership of an S3 bucket is non-transferrable, ensuring security and control over data access.

**Object-Based Storage:** S3 is an object-based storage service, which means you store discrete units of data, called objects, rather than installing an operating system or traditional file system.

**No Operating System Installation:** It's important to note that you cannot install an operating system on S3; it's not designed for that purpose.

#### **Data Architecture:**

##### **Distributed Data Store:**

S3 employs a distributed data store architecture, ensuring that objects are redundantly stored in multiple locations (at least 3) within the same region.

##### **Data Storage:**

Data is organized within buckets, each functioning as a flat container of objects.

##### **Bucket Capacity:**

Each bucket has a maximum capacity of 5TB.

##### **Folder Organization:**

You can create folders within your bucket to organize your objects, making it easier to manage data.

Additional Information:

Nested Buckets:

You cannot create nested buckets for further organization within your S3 storage space.

Bucket Limit:

Each AWS account can have up to 100 buckets, but this limit may be expanded upon request.

In summary, Amazon S3 is a highly scalable storage solution that provides an easy and flexible way to store, manage, and retrieve data over the internet. It offers bucket-based organization and object storage, making it ideal for various data storage needs.

### **S3 Bucket Versioning:**

S3 Bucket Versioning is a sub-resource for Amazon S3 buckets that serves as a safeguard against inadvertent deletion or overwriting of objects/data.

Key Points:

Purpose of Versioning:

Bucket Versioning not only protects against accidental deletion or overwrites but can also serve purposes like data retention and archiving.

Enabling and Disabling:

After enabling Versioning on a bucket, it cannot be outright disabled; however, it can be temporarily suspended when needed.

Protection and Maintenance:

With Versioning enabled, both existing and new objects within the bucket are safeguarded. Their versions are maintained as updates occur. Updates encompass actions like PUT, POST, COPY, and DELETE on objects.

#### Deletion Behavior:

When Versioning is enabled and you attempt to delete an object, a delete marker is added to the object.

#### Visibility and Reversal:

Despite the delete marker, you can still view the object. If you reconsider deleting the object, you can remove the delete marker. The object then becomes available once more.

#### Storage Costs:

Keep in mind that storage costs apply to all versions of objects stored, including active objects and those associated with delete markers.

Bucket Versioning in Amazon S3 enhances object management by providing a safety net for your data and allowing better control over its retention and access.

### **S3 Multipart Upload:**

Amazon S3 Multipart Upload is employed to upload a single object in multiple parts. These parts are uploaded independently and can be done in parallel, in any sequence. Multipart Upload is particularly recommended for objects larger than 100MB in size. It is even a requirement for objects larger than 5GB.

This functionality is carried out through the Amazon S3 Multipart Upload API, allowing for more efficient and reliable uploading of large objects to S3.

### **Amazon S3 Storage Classes:**

Amazon S3 offers a range of storage classes designed to cater to different data storage needs based on cost, durability, availability, and performance. These storage classes include:

#### Amazon S3 Standard:

This is the default storage class, offering high durability, availability, and low latency access. It's suitable for frequently accessed data and can be used for various use cases, including big data analytics, mobile and gaming applications, and content distribution.

#### Amazon S3 Intelligent-Tiering:

This storage class uses machine learning to automatically move objects between two access tiers – frequent and infrequent – based on changing access patterns. This helps optimize costs while maintaining performance.

Amazon S3 One Zone-IA (Infrequent Access): This class stores data in a single availability zone and is suitable for infrequently accessed data that can be recreated if lost. It offers lower costs compared to the standard storage class.

#### Amazon S3 Glacier:

Glacier is designed for long-term archival of data that is accessed infrequently. It offers significantly lower storage costs but with longer retrieval times, making it suitable for data archiving, compliance, and regulatory requirements.

#### Amazon S3 Glacier Deep Archive:

This storage class offers the lowest storage costs and is optimized for long-term retention and archiving of data that is rarely accessed. It provides the most economical option for storing data for compliance, legal, or business needs.