

# Overview

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// FS -> File System.
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Cloud storage refers to services that allow you to store data in the cloud.

## Storage types

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### File based

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- Data is organized under names with folders at directories and subdirectories.
- Complicated for large amount of files.

### Services

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- [Amazon EFS](#): A scalable, elastic and cloud native Network FS.
- [Amazon FSx for Windows File Server](#): A fully managed file storage for Windows server.

### Block based

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- Files are split into chunks of data of equal size, and stored in raw storage volumes.
- Typically used by server based OS, which can use them as individual hard drives.
- Ideal for databases, email servers and RAID systems (blocks are stored on multiple disk shown as a single disk to a FS).
- Also used by VMs.

### Services

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- [Amazon EBS](#): Easy to use, high performance block storage. Also used by EC2 instances.

### Object based

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- Files are stored in objects.

- Each object has an identifier, and are stored in a flat memory model.

## Services

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- [Amazon S3](#): Store and retrieve any amount of data from anywhere in the world.

## Backup

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- [AWS Backup](#): Centrally manage and automate backups across AWS services.

## Data Transfer

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- [AWS Storage Gateway](#): Provides on-premises access to unlimited cloud storage.
- [AWS DataSync](#): Easily transfer data to and from AWS up to 10x faster than normal.
- [AWS Transfer Family](#): Transfer files to Amazon S3 via FTP protocols (SFTP, FTP, and FTPS).

## S3 and S3 Glacier

// Amazon Simple Storage Service.

## Industry Leading Durability

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- [11 9's](#) in durability (99.9999999999%)
- Server copies data for redundancy.

## Storage Classes

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// Varies on security and performance requirements.

- [S3 standard](#)
- [S3 standard - infrequent](#)
- [S3 One Zone - infrequent](#)

// Infrequent is for data that needs to be stored but not read frequently.

- [S3 Glacier](#)
- [S3 Glacier Deep Archive](#)

// Glacier is for long-term data storage.

- [S3 Intelligent Tiering](#)

// Intelligently save cost by automatically figuring out ideal storage class.

## S3 Glacier

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- Data archival and long-term backup
- Cheapest for storage, if time is not critical for retrieval.
- Query-in-place functionality.
- Three retrieval options:
  - [Standard](#) (low cost) (within few hours) - ideal for restoring backups.
  - [Bulk retrieval](#) (Cost effective for large amounts).
  - [Expedited](#) (Urgent retrieval)

## EFS

// Elastic File System

- A fully managed service.
- NFS: Network File System.
- Multiple servers can access the FS.
- Highly available and durable.
- Built-in protection from Availability Zone outages and other failures.
- Has two different storage classes
  - [Standard](#)
  - [Infrequent access](#)
- EFS lifecycle management has an aging off policy where data will be moved to infrequent access automatically after certain number of days (7, 14, 30, 60 or 90), saving money.
- Automatically grows or shrinks.
- Encryption enabled by default.

# Storage gateway

- Provides access to virtually unlimited cloud storage on premises.

## File Gateway

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Two interfaces to S3.

- Samba (SMB)
- NFS interface

Systems can write to file gateway and the file gateway stores the data automatically to s3.

## Tape Gateway

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Presents a virtual tape library on local network, for people migrating from tape to cloud.

## Volume Gateway

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Presents an [iSCSI block storage](#) volume to on-premises applications. It stores and manages on-premises data in Amazon S3, and operates in either [Stored mode](#) or [Cached mode](#).

### Cached mode

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- Primary data is stored in s3.
- Frequent data is stored locally for low latency access.

### Stored mode

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- All data is stored locally and in S3.