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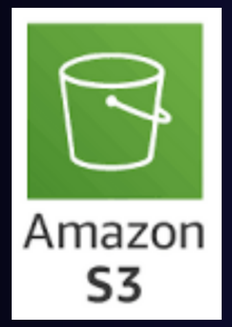


# AWS S3

## *Simple Storage Service*

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- S3 Versioning
- S3 Replication
- Data Encryption
- S3 Bucket Policies
- S3 Storage Classes
- Logging Monitoring
- Hosting Static website
- Snow Family
- Storage gateway (hybrid solution)

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**AWS S3 (Simple Storage Service)** is a cloud-based storage service that allows you to store, manage, and retrieve large amounts of data like files, images, videos, and backups securely and at scale.

It provides highly reliable, scalable object storage, making your data accessible from anywhere, anytime, via the internet.

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- Store data as objects
- Globally unique name

- Region specific
- Each object within a bucket is stored as a key-value pair
  - key is the object’s name (which can contain slashes /, mimicking directory structure)
  - value is the content of the object (the file/data itself).

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**Maximum Object Size:**

- **5 TB (Terabytes) is the maximum size for a single object in Amazon S3.**

**Multipart upload is recommended for objects larger than 5 GB (split the file into smaller parts and upload them separately).**

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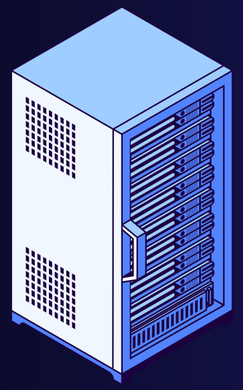
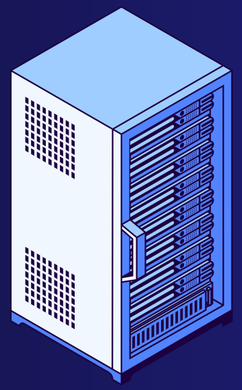
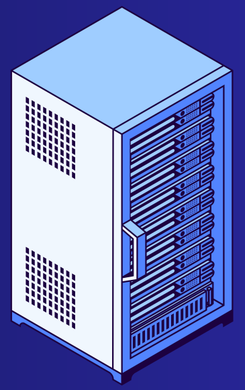
Amazon S3







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# Host Static Website

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S3 is used in many different scenarios. For example:

- **Web Hosting**: S3 can be used to host static websites by storing HTML, CSS, and JavaScript files.
- **Data Lake**: S3 is commonly used as a data lake, a central repository where you can store both structured and unstructured data for analytics.
- **Backups and Disaster Recovery**: Because of its durability and different storage classes, S3 is a popular choice for storing backups and long-term archives."

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# S3 Versioning

It allows you to keep multiple versions of an object in the same bucket, providing protection against accidental deletions or overwrites.

When versioning is enabled, S3 stores every version of an object, allowing you to recover older versions if needed, making it ideal for data safety and backup.

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# S3 Replication

It allows you to automatically copy objects from one S3 bucket to another, which can be

- within the same region (Same-Region Replication - SRR) or
- in different regions (Cross-Region Replication - CRR).

It's commonly used for compliance, redundancy, and to improve data access performance by maintaining copies closer to your users.

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# S3 Bucket Policies

JSON-based access control policies that you attach directly to an S3 bucket to manage permissions for accessing the bucket and its objects.

They allow you to define who can access the data and what actions they can perform, such as read, write, or delete, enabling fine-grained control over the security of your data stored in S3.

- Write or paste your JSON policy in the Bucket Policy editor.

- You can use **AWS's Policy Generator** to create a custom policy, or you can manually write the policy in JSON format.
  - **GetObject**: Used to retrieve or download files from an S3 bucket.
  - **PutObject**: Used to upload or add files into an S3 bucket.

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# S3 Storage Classes

| S3 Storage Class | Use Case | Features | Cost |
| --- | --- | --- | --- |
| **S3 Standard** | Frequently accessed data | High durability, high availability, low latency | Most expensive, designed for frequent access |
| **S3 Intelligent-Tiering** | Data with unknown or unpredictable access patterns | Moves data automatically between frequent and infrequent tiers | Slightly higher than Standard but cost-saving based on usage |
| **S3 Standard-IA** | Infrequently accessed but quickly retrievable | Lower cost for storage, higher cost for data retrieval | Lower than Standard, ideal for less frequent access |
| **S3 One Zone-IA** | Non-critical, infrequently accessed data | Stored in a single Availability Zone, lower resilience | Cheaper than Standard-IA, good for non-critical data |

| S3 Storage Class | Use Case | Features | Cost |
| --- | --- | --- | --- |
| **S3 Glacier** | Archival data, rarely accessed | Very low storage cost, retrieval time from minutes to hours | Ideal for long-term archives with low cost |
| **S3 Glacier Deep Archive** | Deep archival data, almost never accessed | Lowest cost, retrieval time up to 12 hours | Cheapest storage, ideal for compliance or long-term retention |
| **S3 Outposts** | Local storage using AWS Outposts | Provides S3 API locally, meets on-premises requirements | Dependent on Outposts infrastructure usage |

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# S3 Bucket Lifecycle

You can use lifecycle policies to control the movement of objects between different storage classes or delete them entirely, based on specific conditions like age or inactivity.

## There are two main types of actions that you can define in a lifecycle policy:

- **Transition Actions**: This action is used to move objects to a different storage class. You can move objects to cheaper storage classes as they age and are less frequently accessed.

  For instance:
  - Move objects from S3 Standard to S3 Standard-IA (Infrequent Access) after 30 days.
  - Move objects from S3 Standard-IA to S3 Glacier after 90 days.
  - Move objects to S3 Glacier Deep Archive for long-term retention after a specific period.

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There are two main types of actions that you can define in a lifecycle policy:

- **Expiration Actions**: This action is used to delete objects after a specified period. You can set rules to permanently delete objects when they are no longer needed, such as:
  - Delete objects after 365 days.
  - Delete old versions of objects (when versioning is enabled) after a certain period.

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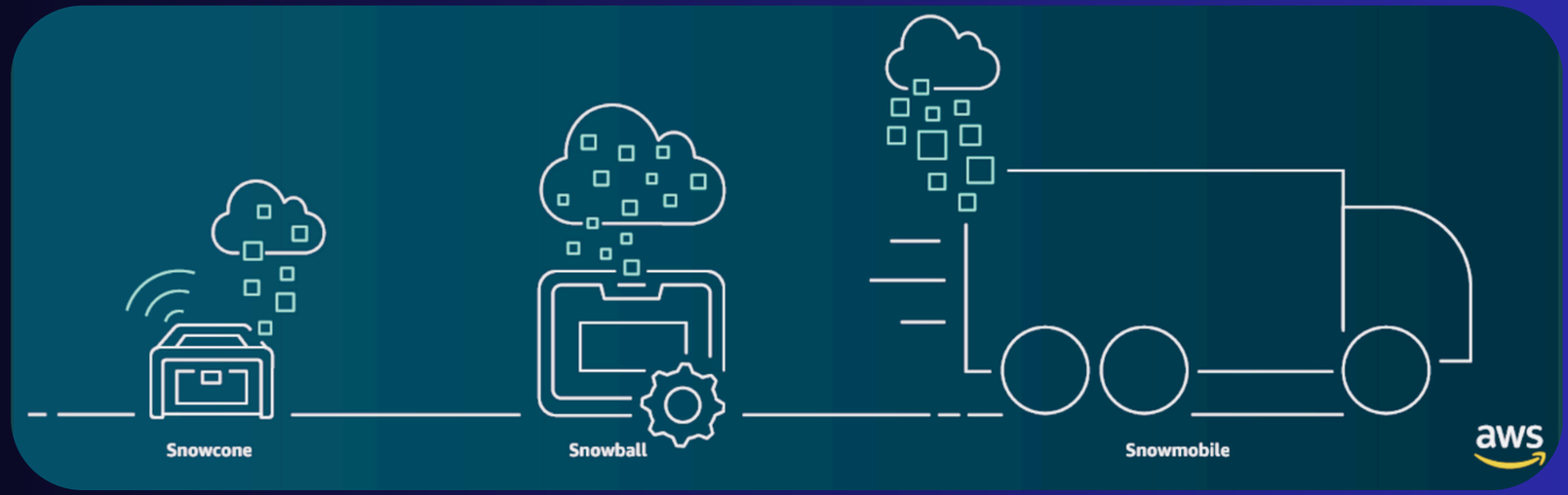
# S3 Snow Family

The S3 Snow Family is a group of physical devices offered by AWS to help move large amounts of data to the cloud when using the internet isn’t practical.

These devices are used when there's too much data to upload over a regular connection or when dealing with remote areas without good internet.



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The Snow Family includes:

- **AWS Snowcone**: A small, portable device for a few terabytes of data.
- **AWS Snowball**: A larger device for moving petabytes of data and can also be used for edge computing.
- **AWS Snowmobile**: A massive truck-sized container used for exabyte-scale data transfers, typically used by big companies moving entire data centers.

These devices help you transfer data quickly, securely, and cost-effectively to AWS, especially when internet speed or reliability is an issue.

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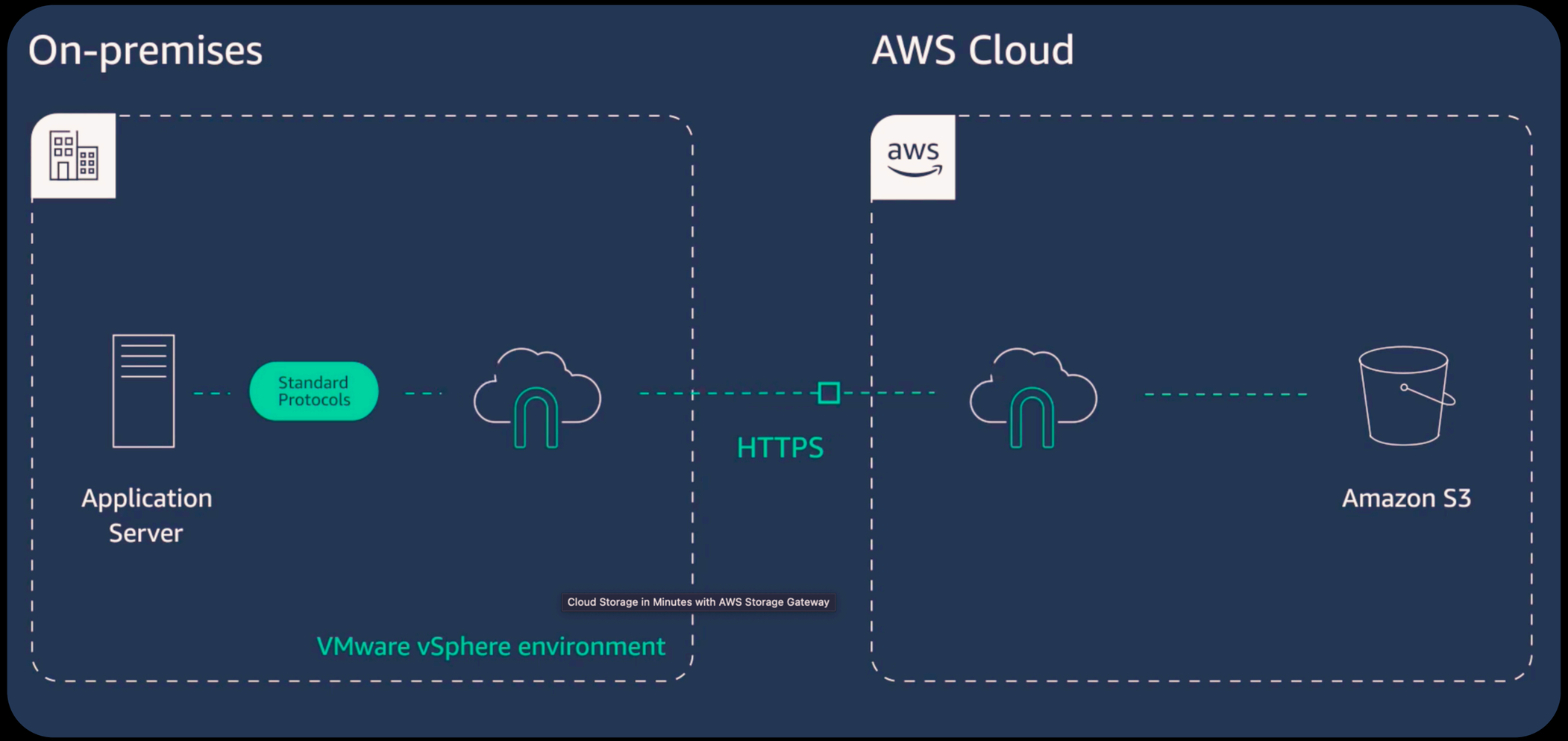
# Amazon S3 Storage Gateway

It is a hybrid cloud storage service that connects on-premises environments to cloud storage in Amazon S3. It helps extend your local storage to the cloud by acting as a bridge.


On-premises
AWS Cloud
aws
Standard Protocols
HTTPS
Application Server
Amazon S3
Cloud Storage in Minutes with AWS Storage Gateway
VMware vSphere environment

Gateway type

- (•) **Amazon S3 File Gateway**
  Store and access objects in Amazon S3 from NFS or SMB file data with local caching.

- ( ) **Amazon FSx File Gateway**
  Access fully managed file shares in Amazon FSx for Windows File Server using SMB.


- ( ) **Tape Gateway**
  Store virtual tapes in Amazon S3 using iSCSI-VTL, and store archived tapes in Amazon S3 Glacier Flexible Retrieval or Amazon S3 Glacier Deep Archive.

- ( ) **Volume Gateway**
  Store and access iSCSI block storage volumes in Amazon S3.