

# S3

## What is S3?

S3 stands for **Simple Storage Service**.

- S3 is **object-based storage** allows you to upload files.
- Cannot be used to run an operating system or database.
- Files up to 5TB: Files can be from 0 bytes to 5TB.
- Unlimited Storage: The total volume of data & the number of objects you can store is unlimited.

## S3 Tips

- S3 is a universal namespace. So, bucket name should be unique.
- Web address created will be always in format below,  
<https://<bucket-name>.s3.<Region>.amazonaws.com/<key-name>>  
E.g., <https://cloudbuck.s3.us-east-1.amazonaws.com/dog.jpg>
- Successful CLI or API uploads will generate an HTTP 200 status code.

## S3 Object Tips

1. Key: The object name (e.g., dog.jpg)
2. Value: The data itself, which is made up of a sequence of bytes.
3. Version ID: allows you to store multiple versions of the same object.
4. Metadata: data about the data you are storing (e.g., content-type, last-modified etc.)

## Securing your Bucket with S3 Block Public Access

Object Access Control List (ACL) work on an individual object level whereas Bucket Policy work on entire bucket level.

Tips

1. Buckets are private by default: when you create an S3 bucket, it is private by default (including all objects within it). You have to allow public access on both the bucket and its objects in order to make the bucket public (i.e., both bucket policy and ACL)
2. Object ACLs: you can make individual objects public using Object ACLs.
3. Bucket Policies: you can make entire buckets public using bucket policies.
4. HTTP status code: when you upload an object to S3 & its successful, you will receive an HTTP 200 code.

## Hosting a static website using S3

- Bucket policies: Make entire buckets public using bucket policies.
- Static content: Use S3 to host static content only (not dynamic)
- Automatic Scaling: S3 scales automatically with demand.

## Versioning objects in S3

You can enable versioning in S3 so you can have multiple versions of an object within S3.

### Versioning Objects Tips

1. All versions: all versions of an object are stored in S3. This includes all writes and even if you delete an object.
2. Backup: Can be a great backup tool.
3. Cannot be disabled: Once enabled, versioning cannot be disabled – only suspended.
4. Lifecycle Rules: Can be integrated with lifecycle rules.
5. Supports MFA.

### S3 Storage Classes

Storage Class	Availability and Durability	AZ(s)	Use Case
S3 Standard	99.99% Availability 11 9's Durability	≥3	Suitable for most workloads (e.g., websites, content distribution, mobile and gaming applications, and big data analytics)
S3 Standard-Infrequent Access	99.9% Availability 11 9's Durability	≥3	Long-term, infrequently accessed critical data (e.g., backups, data store for disaster recovery files, etc.)
S3 One Zone-Infrequent Access	99.5% Availability 11 9's Durability	1	Long-term, infrequently accessed, non-critical data
S3 Intelligent-Tiering	99.9% Availability 11 9's Durability	≥3	Unknown or unpredictable access patterns
S3 Glacier Instant Retrieval	99.99% Availability 11 9's Durability	≥3	Provides <b>long-term data archiving</b> with instant retrieval time for your data.
S3 Glacier Flexible Retrieval	99.99% Availability 11 9's Durability	≥3	Ideal storage class for archive data that does not require immediate access but needs the flexibility to retrieve large sets of data at no cost, such as backup or disaster recovery use cases. Can be minutes or up to 12 hours.
S3 Glacier Deep Archive	99.99% Availability 11 9's Durability	≥3	Cheapest storage class and designed for customers that retain data sets for 7-10 years or longer to meet customer needs and regulatory compliance requirements. The standard retrieval time is 12 hours, and the bulk retrieval time is 48 hours.

### Lifecycle Management with S3

#### Lifecycle Management Tips

1. Automates moving objects between different storage tiers thereby maximizing cost effectiveness.
2. Can be used in conjunction with versioning.
3. Can be applied to current versions and previous versions.

### S3 Object Lock & Glacier Vault Lock

#### Object Lock Tips

1. Use S3 object Lock to store objects using a Write Once, Read Many (WORM) model.
2. Object Lock can be on individual objects or applied across the bucket as a whole.
3. Object Lock comes in two modes:

- a. Governance mode: Users cannot overwrite or delete an object version or alter its lock settings unless they have special permissions.
- b. Compliance mode: A protected object version cannot be overwritten or delete by any user, including root user in your AWS account.

### **S3 Glacier Vault Lock Tips**

- Allows you to easily deploy & enforce compliance controls for individual S3 Glacier Vaults with a vault lock policy.
- You can specify controls, such as WORM, in a vault lock policy & lock the policy from future edits. Once locked, the policy can no longer be changed.