S3:

What Is S3?

Object Storage
S3 provides secure, durable, highly scalable object storage.

Scalable
S3 allows you to store and retrieve any amount of data from anywhere on the web at a very low cost.

Simple
Amazon S3 is easy to use, with a simple web service interface.

S3 IS OBJECT-BASED STORAGE

Manages data as objects rather than in file systems or data blocks.

✓ **Upload any file type** you can think of to **S3**.

✓ **Examples** include photos, videos, code, documents, and text files.

✓ **Cannot** be used to run an operating system or database.

S3 Basics

Unlimited Storage
The total volume of data and the number of objects you can store is unlimited.

Objects up to 5 TB in Size
S3 objects can range in size from a minimum of 0 bytes to a maximum of 5 terabytes.

S3 Buckets
Store files in buckets (similar to folders).

Working with S3 Buckets

1 **Universal Namespace**
All AWS accounts share the S3 namespace.
Each S3 bucket name is globally unique.

2 **Example S3 URLs**
https://bucket-name.s3.Region.amazonaws.com/key-name
https://acloudguru.s3.us-east-1.amazonaws.com/Ralphie.jpg

3 **Uploading Files**
When you upload a file to an S3 bucket, you will receive an
HTTP 200 code if the upload was successful.
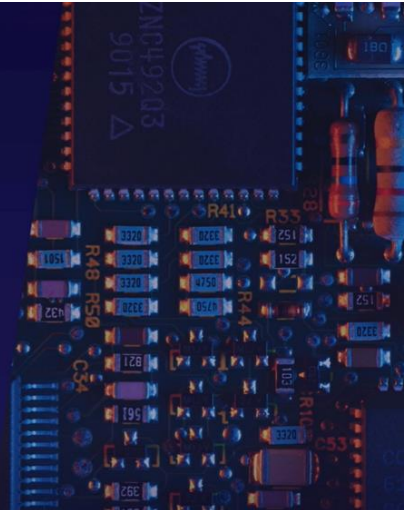
Key
The name of the object
(e.g., `Ralphie.jpg`)

Version ID
Important for storing multiple
versions of the same object

Value
The data itself, which is made
up of a sequence of bytes

Metadata
Data about the data you are
storing (e.g., `content-type`,
`last-modified`, etc.)

S3 is a safe place to store your files.

The data is spread across multiple devices and
facilities to **ensure availability** and **durability**.

Highly Available and Highly Durable

✓ **Built for Availability**
Built for 99.95% – 99.99% **service
availability**, depending on the S3 tier.

✓ **Designed for Durability**
Designed for 99.999999999% (9 decimal
places) durability for **data stored** in S3.

S3 Standard

1 **High Availability and Durability**
Data is stored redundantly across multiple devices in multiple facilities (>=3 AZs):
- **99.99% availability**
- **99.999999999% durability (11 9's)**

2 **Designed for Frequent Access**
Perfect for frequently accessed data.

3 **Suitable for Most Workloads**
- The default storage class.
- Use cases include websites, content distribution, mobile and gaming applications, and big data analytics.

Tiered Storage

S3 offers a range of storage classes designed for different use cases.

Lifecycle Management

Define rules to automatically transition objects to a cheaper storage tier or delete objects that are no longer required after a set period of time.

Versioning

With versioning, all versions of an object are stored and can be retrieved, including deleted objects.

Securing Your Data

1 **Server-Side Encryption**
You can set default encryption on a bucket to encrypt all new objects when they are stored in the bucket.
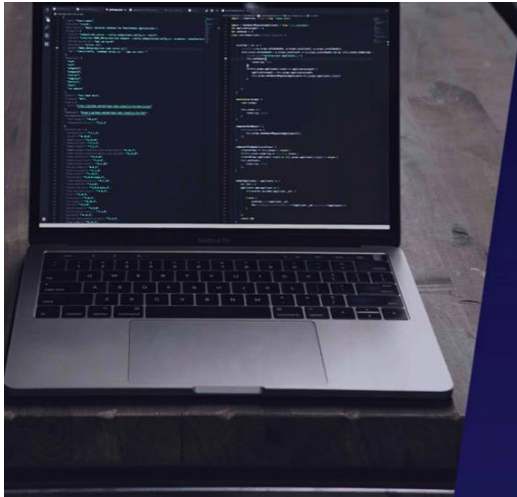
2 **Access Control Lists (ACLs)**
Define which AWS accounts or groups are granted access and the type of access. You can attach S3 ACLs to individual objects within a bucket.

3 **Bucket Policies**
S3 bucket policies specify what actions are allowed or denied (e.g., allow user Alice to PUT but not DELETE objects in the bucket).

Strong Read-After-Write Consistency

- **After a successful write** of a new object (PUT) or an overwrite of an existing object, any subsequent read request immediately receives the latest version of the object.

- **Strong consistency** for list operations, so after a write, you can immediately perform a listing of the objects in a bucket with all changes reflected.

What to Know for the Exam

Object Based
Object-based storage allows you to upload files.

Not OS or DB Storage
Not suitable to install an operating system or run a database on.

Files up to 5 TB
Files can be from 0 bytes to 5 TB.

Unlimited Storage
The total volume of data and the number of objects you can store is unlimited.

IMPORTANT EXAM TIP

Files Stored in Buckets

S3 is a **universal namespace**.

https://bucket-name.s3.Region.amazonaws.com/key-name
https://acloudguru.s3.us-east-1.amazonaws.com/Ralphie.jpeg

✓ Successful CLI or API uploads will generate an **HTTP 200 status code**.

4 S3 Object Tips

✓ **Key**
The object name (e.g., `Ralphie.jpg`)

✓ **Value**
The data itself, which is made up of a sequence of bytes

✓ **Version ID**
Allows you to store multiple versions of the same object

✓ **Metadata**
Data about the data you are storing (e.g., `content-type`, `last-modified`, etc.)