Simple Storage Service

→ S3 is a storage for the internet. It has a simple webservices interface for simple storing & Retrieving of any amount of data, anytime from anywhere on the internet.

→ S3 is Object Based storage.

→ You cannot install O.S on S3

→ S3 has a distributed data-store architecture where Objects are Redundantly stored in multiple locations. (min. 3 location in same Region).

→ Data is stored in Bucket.

→ A Bucket is a flat container of objects.

→ Max. Capacity of a Bucket is 5 TB.

→ You can create folders in your Bucket (available through consol)

→ You cannot create Nested Buckets.

→ Bucket ownership is Non-transferrable.

→ S3 Bucket is Regim Specific.

→ You can have upto 100 Buckets per account. (may expand on Request)

S3 Buckets - Naming Rules :→

→ S3 Bucket names (keys) are globally unique across all aws Region.

→ Bucket Names cannot be change after they are created.

→ If a bucket is deleted, its name becomes available again to you or other acount use.

→ Bucket names must be atleast 3 and no more than 63 characters long.

→ Bucket names are part of the URL used to access buckets.

→ Bucket name must be a series of one or more labels. (xyz.bucket).

→ Bucket names can contain lowercase, numbers & hyphen Cannot use uppercase letter.

→ Bucket name should not be an Ip address (10.10.20.20).

→ Each labels must start and end with lowercase letter or a number.

→ By default buckets & its objects are private By default, only owner can access the bucket.

S3 Buckets - Subresources

Sub-resources for S3 buckets includes :

Lifecycle → To decide on object's Lifecycle management.

Website → To hold configurations related to static website hosted in S3 buckets.

Versioning → keep objects versions as it changes. (get updated).

Access Control List (ACL) → Bucket policies.

URL

The name is simply two parts :→

Bucket Region's endpoint / bucketname.

example. for S3 bucket named mybucket in Europe west Region.

https://s3-eu-west1.amazonaws.com/mybucket-

S3 Objects

→ An object size stored in an S3 Bucket can be 0byte to 5 TB.

→ Each object ~~each~~ is stored and Retrieved by a Unique Key (ID or name).

→ An Object in AWS S3 is uniquely identified and addressed through

- → service endpoint
- → Bucket name.
- → Object key (name)
- → Optional Object version.

→ Object stored in a S3-bucket in a Region will never leave that Region unless you specifically move then to another region or CRR.

→ A Bucket owner can grant cross-account permission to another AWS account (or users in another account) to upload Objects.

→ you can grant S3 bucket/object permission to —

- → Individual users
- → AWS Account
- → make the Resource public
- → or to all authenticate users.

S3 Bucket Versioning

→ Bucket Versioning is a S3 Bucket sub-Resource used to protect against accidental object/data deletion or Overwrites.

→ Versioning can also be used for data Retention and archive.

→ Once you enable Versioning on a Bucket, it cannot be disabled, however it can be suspended.

→ When enabled, Bucket versioning will protect existing and new objects and maintains their versions as they are updated.

→ Updating Objects refers to PUT, POST, COPY, DELETE action on objects.

→ When versioning is enabled and you try to delete an object, a delete marker is placed on the object.

→ you can still view the object and the delete marker

→ If you Reconsider deleting the objects, you can delete the "Delete marker" and the object will be available again.

→ you will be charged for all S3 storage cost for all objects versions stored.

→ You can use versioning with s3 Lifecycle policies to delete older versions, or you can move them to a cheaper s3 storage (or Glacier)

Bucket versioning state :→

→ Enabled
→ suspended
→ un-versioned.

→ versioning applied to all objects in a bucket & not partially applied.

→ Object Existing before enabling versioning will have a version ID or "NULL"

→ If you have a bucket that is already versioned, then you suspend versioning existing Objects and their versions remain as it is.

→ However they will not be updated/versioned further with future updates while the bucket versioning is suspended.

→ New objects (uploaded after suspension) they will have a version ID "null"

→ If the same key (name) is used to store another objects, it will override the existing one.

→ An object deletion in a suspended versioning buckets, will only delete the objects with ID. "null"

S3 Bucket versioning - MFA Delete.

→ Multifactor authentication delete is a versioning capacity that adds another level of security in case your account is compromised.

→ This adds another ~~level~~ layer of security for the following:

- changing your Bucket's versioning state.
- changing your Bucket's versioning state.
- ~~perma~~ permanently deleting an object version.

→ MFA delete requires:—

- your security credentials.
- The code displayed on an approved physical or s/w Based authentication device.

S3 Multipart upload

→ Is used to upload an objects in part.

→ parts are uploaded independently and in parallel, in any order.

→ It is recommended for objects sizes of 100MB or larger.

→ you must use it for object larger than 5GB.

→ This is done through s3 multipart upload API.

Copying S3 objects

→ The Copy Operation creates a copy of an object that is already stored in Amazon S3.

→ you can create a copy of your objects up to 5GB in size in single atomic operation.

→ However to copy an object greater than 5GB, you must use the multipart upload API.

→ Incur charges, if copy to another Region.

Use the copy Operation to —

→ Generate additional copies of the subjects.

→ Renaming object (copy to new name).

→ changing the copy's storage class or encrypt it at rest.

→ move object across AWS location/Region.

→ change object metadata.

Storage Classes of Amazon S3

1. Amazon S3 - standard
2. Amazon S3 standard Infrequent Access (standard IA)
   ↳ cost less but you pay to access it more frequently.
3. Amazon Glacier. (Long term storage)
4. Amazon S3 Glacier Deep Archive (cheapest).
5. Amazon S3 one-zone - IA
6. Amazon S3 Intelligent Tiering.

Amazon S3 standard

→ S3 standard offers high durability availability and performance object storage for frequently accessed data.

→ Durability is 99.999999999 %.

→ Designed for 99.99 % availability over a given year.

→ support SSL for data in-transit and encryption of data at rest.

→ The storage cost for the object is fairly high, but there is very less charge for accessing the objects.

→ Largest object that can be uploaded in a single PUT is 5GB.

Amazon S3-IA

→ S3-IA is for data that is accessed less frequently but Requires Rapid access when needed.

→ The storage cost is much cheaper than S3-stand almost half the price. But you are charged more heavily for accessing your objects.

→ Durability is 99.999999999 %.

→ Availability is 99 % in year.

→ Resilient against event that impact an entire AZ.

→ support SSL for data ~~at rest~~ in transit & encryption of data at rest.

→ Data that is deleted from S3-IA within 30 days will be charged for a full 30 days.

→ Backed with the Amazon S3 service level agreement availability.

Amazon S3 Intelligent tiering

→ The S3 Intelligent tiering storage class is designed to optimize cost by automatically moving data to the most cost effective access-tier.

→ It works by storing objects in two access tiers.

→ If an objects in the infrequent access tier is accessed, it is automatically moved back to the frequent access tier.

→ There are no Retrieval fees when using the S3 Intelligent tiering storage class and no additional tiering fee when objects are moved between access tiers.

→ Same low latency and high performance of s3-standard.

→ objects less than 128KB cannot move to IA.

→ Durability is 99.999999999%

→ ~~Duration~~ Availability is 99.9%.

Amazon One-zone IA

→ S3-one zone-IA is for data that is accessed less frequently, but Requires rapid access when Needed

→ Data store in single AZ.

→ Ideal for those, who want lower cost option of IA-data.

→ It is good choice for storing Secondary backup copies of on-premise data or easily Re-creatable data.

→ you can use s3 lifecycle policies.

→ Durability is 99.999999999%.

→ Availability 99.5%.

→ Because s3 one zone-IA stores data in a single AZ, data stored in this storage class will be lost in the event of AZ destruction

Amazon S3 Glacier

→ S3 glacier is a secure, durable, low cost storage class for data archiving.

→ To keep cost low yet suitable for varying needs, S3 glacier provides three Retrieval options that range from a few minutes or use Lifecycle policies.

→ Durability is 99.999999999%.

→ Data is Resilient in the event of one entire AZ destruction.

→ Support SSL for data in transit & encryption data at rest.

→ You can Retrieve 10 GB of your Amazon S3 glacier data per month for free with free tier account.

Amazon S3 Glacier Deep Archive

→ S3 glacier Deep arichive is Amazon S3 cheapest storage.

→ Design to Retain data for long period. eg:- 10 years

→ All objects stored in S3-glacier Deep Archive are Replicated & stored across atleast at three geographically - dispersed AZ.

→ Durability is 99.999999999%

→ Ideal alternative to magnetic tape libraries.

→ Retrieval time within 12 hours.

→ storage cost is upto 75% less than for the existing S3-glacier storage class.

→ Availability is 99.9%