**[Amazon Storage (S3)](https://play.fresco.me/course/430)**

Bucket Policy

A bucket policy is a resource-based AWS Identity and Access Management (IAM) policy. It is used to grant or restrict users to access the bucket having a policy, You need some basic knowledge on policies to create a policy and know how it works.

The policy applied to bucket is applied to all the objects in it.

A Bucket policy is defined using a valid JSON which can be written on own if you have a good knowledge on Policies or you could use the policy generator service for generation of JSON.

##### Amazon S3 Data consistency model

Amazon S3 follows **client centric consistency** model, this is emphasized on how data is seen by the clients after it is created or updated or deleted.

* S3 provides ***read-after-write*** consistency for PUTS of new objects into an S3 bucket i.e., A newly inserted data item will be immediately visible to clients. with a limitation that if you make a GET or HEAD request to an object before creating it, S3 provides ***eventual consistency*** i.e., If no new updates are made to a particular piece of data, eventually all reads to that item will return the last updated value.
* S3 offers **eventual consistency** for overwrite PUTS and DELETES in all regions.
* This **read-after-write consistency** allows you to build distributed systems with less latency
* Amazon S3 provide **eventual consistency in US standard region for all requests**.

##### Advantages of AWS S3

Amazon S3 is the leading cloud storage platform in the market for the following reasons:

* S3 storage's **durability**, **availability** and **scalability** are unmatched.
* **Security** is one major advantage of S3 supporting 3 different forms of encryption that can be applied at object level.
* Amazon has good **Content Distribution Network(CDN)**. With Amazon CloudFront, S3 can be configured to cache the data across any number of Amazon’s global data centres.
* S3 is very much useful in **hosting static websites**.
* Amazon S3 combined with Amazon's Quicksight UI forms a powerful **Big Data Tool**.
* One of the major benefits of Amazon S3 is the ability to implement **version controlled backups** of your data within S3 buckets.
* Competitive **pricing** is one major aspect giving edge to S3 as a cloud storage.
* AWS S3 can be accessed from your Amazon VPC using VPC endpoints. These are easy to configure and provide reliable connectivity to S3 without requiring an internet gateway instance.

##### AWS S3 Pricing

* A new customer can get a free usage tier for one year which includes
  + 5 GB of Amazon S3 storage in the Standard Storage class
  + 20,000 Get Requests
  + 2,000 Put Requests
  + 15 GB of data transfer out each month for one year.
* The Storage prices vary with region and it is different for different storage classes with Standard storage having high price and Glacier with lowest per gb price.
* Pricing also depends on the data stored or requests made, transfers into and out of bucket, and also for transfer acceleration, cross region replication.

You will see more on the storage classes in the upcoming topics.

To find the various pricing tiers, follow [*S3 Pricing*](https://aws.amazon.com/s3/pricing/).

##### S3 Storage Classes

#### S3 Standard:

Used for frequently accessed data offering high durability, availability and performance.

* S3 standard is used for various cases like cloud applications, dynamic websites, gaming, content distribution, Big data analytics and so on.
* In this type of storage, data is resilient in the event of one entire availability zone destruction.

#### S3 Standard - Infrequent Access:

This is used for infrequently accessed data but accessed rapidly when required.

* This also offers high durability, availability, and performance but **with a low per GB storage and retrieval fee** making **S3 Standard-IA** ideal for long-term storage, backups and as a data store for disaster recovery.

#### Amazon S3 One Zone-Infrequent Access:

Unlike S3 Standard-IA this **S3 One Zone-Infrequent Access stores data in a single availability zone**.

* This is 20% cheaper than the S3 Standard-IA.
* Best suited for secondary backup copy storages or for data that is cross region replicated.
* Data stored in this will be lost in the event of availability zone destruction.

#### S3 Glacier:

Amazon **Glacier is a data archiving service which is highly durable, extremely low cost, and secure**, for varying retrieval needs.

* Amazon Glacier provides three options for access to archives, from a few minutes to several hours.
* Data is resilient in the event of one entire Availability Zone destruction.

You can set the Storage class of an object during uploading it to the bucket and as well as later after uploading. To storage classes can be set using the management console,AWS CLI,and SDK's also using the Life Cycle Policies.

##### AWS CLI

All AWS services can be accessed and managed through both Management Console and AWS Command Line Interface(CLI).

* GUI provides more interactivity and user-friendly view.
* However, from performance of the tasks and automation of processes perspective, Amazon CLI is best suited
* Thus, AWS CLI acts a unified tool to manage all services by simple download and configuration of user keys.

##### S3 Buckets and Folders

In S3 there is **no concept of filesystem or hierarchy** all the objects uploaded are same in the space of a bucket.

The concept of Folders in S3 is more logical than physical, when you create a folder in s3 there will not exist a physical folder but a group of objects having same common first name or prefix. Its same in the case if you upload a folder.

For example, if you upload a folder called images that contains two files, sample1.jpg and sample2.jpg, Amazon S3 uploads the files and then assigns the corresponding key names, images/sample1.jpg and images/sample2.jpg.The key names include the folder name as a prefix.