Amazon Simple Storage Service (S3) is a storage for the internet. It is designed for large-capacity, low-cost storage provision across multiple geographical regions. Amazon S3 provides developers and IT teams with Secured, durable and highly scalable object storage.

S3 is Secure because:
AWS provides encryption to the data that we store. It can happen in two ways:
Client Side Encryption
Server Side Encryption

Multiple copies are maintained to enable re-generation of data in case of data corruption, versioning - where each edit is archived for a potential retrieval.

S3 is Durable because:
It regularly verifies the integrity of data stored using checksums e.g. if S3 detects there is any corruption in data, it is immediately repaired with the help of replicated data.

Even while storing or retrieving data, it checks incoming network traffic for any corrupted data packets.

S3 is Highly Scalable, since it automatically scales our storage according to our requirement and we only pay for the storage we use.

The next question which comes to our mind is - What kind and how much of data one can store in AWS S3?

We can store virtually any kind of data in any format in S3 and when we talk about capacity, the volume and the number of objects that we can store in S3 are unlimited.

An object is the fundamental entity in S3. It consists of data, key and metadata.

When we talk about data, it can be of two types-
- Data which is to be accessed frequently.
- Data which is accessed not that frequently.

Therefore, Amazon came up with 3 storage classes to provide its customers the best experience and at an affordable cost. Let us understand the 3 storage classes with a "health-care" use case:

1. Amazon S3 Standard for frequent data access: This is suitable for performance sensitive use cases where the latency should be kept low. E.g. in a hospital, frequently accessed data will be the data of admitted patients, which should be retrieved quickly.

2. Amazon S3 Standard for infrequent data access
This is suitable for use cases where the data is long lived and less frequently accessed, i.e. for data archival but still expects high performance. E.g. in the same hospital, people who have been discharged, their records/data will not be needed on a daily basis, but if they return with any complication, their discharge summary should be retrieved quickly.

3. Amazon Glacier: - Suitable for use cases where the data is to be archived and high performance is not required. It has a lower cost than the other two services. e.g. in the hospital, the patients' test reports, prescriptions, MRI, X Ray, Scan docs etc. that are older than a year will not be needed in the daily run and even if it is required, lower latency is not needed.

Specification Snapshot: - Storage Classes

Characteristics	Standard	Standard - Infrequent Access	Glacier
Durability	99.99%	99.99%	99.99%
Availability	99.99%	99.90%	N/A
Minimum Object Size	No limit	128KB	No limit
Minimum Storage Duration	No minimum duration	30 Days	90 Days
First Byte Latency	milliseconds	milliseconds	4 hours
Retrieval Fee	No Fee	per GB retrieved	per GB retrieved

How is data organized in S3?
Data in S3 is organized in the form of buckets.
A Bucket is a logical unit of storage in S3.
A Bucket contains objects which in turn contain the data and metadata.

Before adding any data in S3, the user has to create a bucket which will be used to store objects.

Where is our data stored?
We can self-choose where or in which region our data should be stored. Making a decision for the region is important and therefore it should be planned well.

These are the 4 parameters to choose the optimal region –
- Pricing
- User/Customer Location
- Latency
- Service Availability

Let us understand this through an example:
Suppose there is a company which has to launch these storage instances to host a website for the customers in the US and India.

To provide the best experience, the company has to choose a region, which best fits its requirements.

Regions	• Mumbai/N Virginia
Instance Type (Reserved Instance)	• e.g. amazon ec2- m4.4xlarge 16(vCPU), 64 GB RAM
Pricing(1 Year)	• Mumbai - $691/monthly - $0.9 hourly • N Virginia - $480/monthly - $0.6 hourly
Latency	• From USA to India - Low • From India to USA - High

Now looking at the above parameters, we can clearly identify that N Virginia will be the best region for this company because of the low latency and low price. Irrespective of our location, we can select any region which might suit our requirements, since we can access our S3 buckets from anywhere.

Talking about regions, let us see the possibility of having a backup in some other availability region or we may want to move our data to some other region. This feature has now been added to the AWS S3 system and is pretty easy to use.

Cross-region Replication:

As the name suggests, Cross-region Replication enables user to either replicate or transfer data to some other location without any problem.

How is the data transferred?

Besides traditional transfer practices that is over the internet, AWS has 2 more ways to provide data transfer securely and at a faster rate:

- Transfer Acceleration
- Snowball

Transfer Acceleration enables fast, easy and secure transfers over long distances by exploiting Amazon's **CloudFront** edge technology.

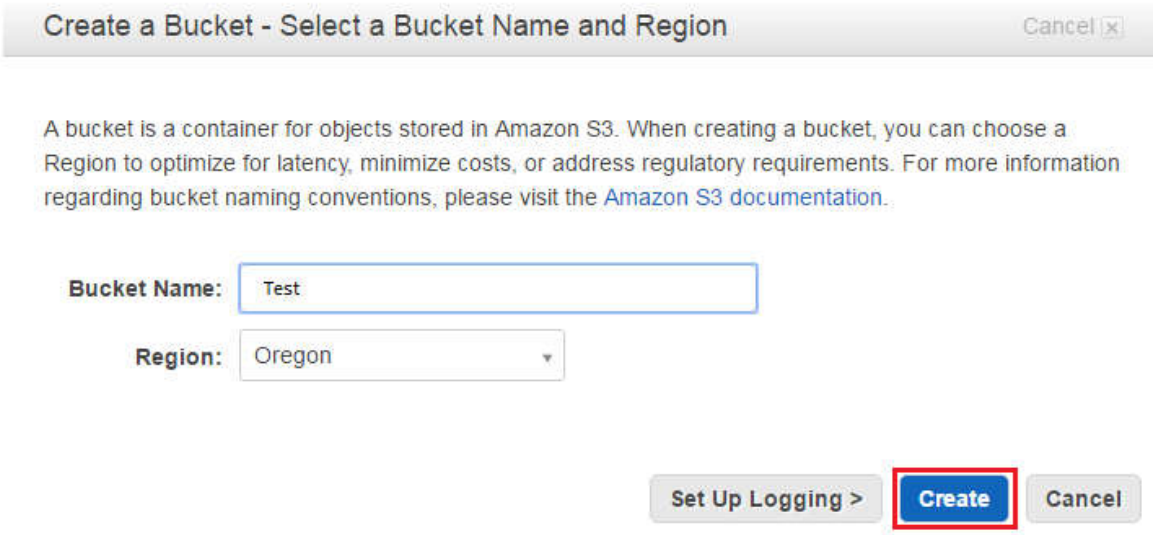
CloudFront is a caching service by AWS, in which the data from client site gets transferred to the nearest edge location and from there the data is routed to our AWS S3 bucket over an optimized network path.

The **Snowball** is a way of transferring your data physically. In this Amazon sends an equipment to our premises, on which you can load the data. It has a kindle attached to it which has your shipping address when it is shipped from Amazon. When data transfer is complete on the Snowball, Snowball changes the shipping address back to the AWS headquarters where the Snowball has to be sent.

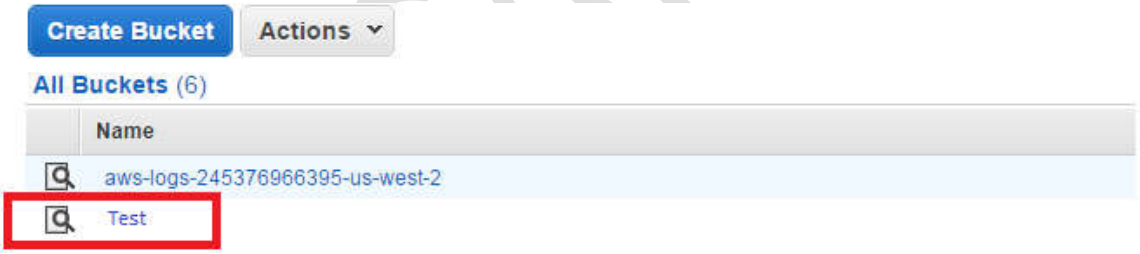
Step 1: Create a bucket

To create a bucket, navigate to S3 in the AWS Management Console and hit Create Bucket. Enter a name and a region.

In case we plan on using our own domain/sub-domain, it is recommended to use that for our bucket name.



Step 2: Verify the Created Bucket



Note: After creating bucket we can perform multiple operations like storing information. We can even we can host Static website.