Amazon Web Services

Storage Classes

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STORAGE CLASSES

- Amazon S3 offers a range of storage classes designed for different use cases. When we upload our data into the bucket then we can select different classes as per our requirement.

- **Different Cases**

- S3 Standard
- S3 Intelligent-Tiering
- S3 Standard- Infrequent Access
- S3 One Zone- Infrequent Access
- S3 Glacier
- S3 Glacier Deep Archive

STORAGE CLASSES - S3 STANDARD

- S3 Standard offers high durability, availability, and performance object storage for frequently accessed data

- **Key Features:**

- It is default Storage Class, if none specified during upload
- Low latency and high throughput performance
- It designed for 99.99% availability and 99.999999999% durability
- If we store 10,000,000 objects which Amazon S3, we can on average expect to incur a loss of single object one every 10,000 Years

- **Use Cases**: S3 Standard is appropriate for a wide variety of use cases, including cloud applications, dynamic websites, content distribution, mobile and gaming applications, and big data analytics.

STORAGE CLASSES - S3 INTELLIGENT-TIERING

- S3 Intelligent-Tiering is the only cloud storage class that delivers automatic storage cost savings when data access patterns change, without performance impact or operational overhead. S3 Intelligent-Tiering works by storing objects
  in access tiers: two low latency access tiers optimized for frequent and infrequent access.

- **Key Features:**

- S3 Intelligent Tiering storage class is designed to optimize storage costs by automatically moving data to the most cost-effective storage access tier, without performance impact or operational overhead.
- Automatically optimizes storage costs for data with changing access patterns
- It provides low latency and high throughput performance.
- It designed for 99.99% availability and 99.999999999% durability
- No additional fees apply when objects are moved between access tiers
- S3 monitors access patterns of the objects and moves objects that have not been accessed for 30 consecutive days to the infrequent access tier.
- If the objects are accessed later, S3 Intelligent-Tiering moves the objects back to the Frequent Access tier.

STORAGE CLASSES - STANDARD- INFREQUENT ACCESS

- S3 Standard-IA is for data that is accessed less frequently, but requires rapid access when needed.

- **Key Features:**

- Standard IA storage class is used when data is accessed less frequently but requires rapid access when needed.
- It has a lower fee than S3, but you will be charged for a retrieval fee.
- Suitable for objects greater than 128 KB (smaller objects are charged for 128 KB only) kept for at least 30 days (charged for a minimum of 30 days)
- It designed for 99.99% availability and 99.999999999% durability

- **Use Cases**: As a Store for Disaster recovery, backup …

STORAGE CLASSES - ONE ZONE- INFREQUENT ACCESS

- S3 One Zone-IA is for data that is accessed less frequently, but requires rapid access when needed. Unlike other S3 Storage Classes which store data in a minimum of three
  Availability Zones (AZs), S3 One Zone-IA stores data in a single AZ and costs 20% less than S3 Standard-IA.

- **Key Features:**

- S3 one zone-infrequent access storage class is used when data is accessed less frequently but requires rapid access when needed.
- It is an optimal choice for the less frequently accessed data but does not require the availability of Standard or Standard IA storage class.
- It designed for 99.5% availability and 99.999999999% durability of objects in a single availability zone.
- Suitable for objects greater than 128 KB (smaller objects are charged for 128 KB only) kept for at least 30 days (charged for a minimum of 30 days)
- S3 Lifecycle management for automatic migration of objects to other S3 Storage Classes
- The data can be lost at the time of the destruction of an availability zone as it stores the data in a single availability zone.

- **Use Cases**: Storing Secondary backup copies of on premise data or storing data you

STORAGE CLASSES - S3 GLACIER

- S3 Glacier is a secure, durable, and low-cost storage class for data archiving.

- **Key Features:**

- S3 Glacier storage class is the cheapest storage class, but it can be used for archive only.
- We can store any amount of data at a lower cost than other storage classes.
- We can upload the objects directly to the S3 Glacier.
- Suitable for objects greater than 40 KB (smaller objects are charged for 40 KB only) kept for at least 90 days (charged for a minimum of 90 days)
- It is designed for 99.999% durability of objects across multiple availability zones
- Amazon S3 Glacier storage class provides three retrieval options:
- **Expedited** retrievals typically return data in 1-5 minutes, and are great for Active Archive use cases.
- **Standard** retrievals typically complete between 3-5 hours, and are best suited for less time-sensitive needs like backup data, media editing, or long-term analytics
- **Bulk** retrievals are the lowest-cost retrieval option, returning large amounts of data within 5-12 hours.

STORAGE CLASSES - S3 GLACIER DEEP ARCHIVE

- Glacier Deep Archive storage class provides the lowest-cost data archiving where data access is infrequent and retrieval time of hours is acceptable.

- **Key Features:**

- Suitable for objects greater than 40 KB (smaller objects are charged for 40 KB only) kept for at least 180 days (charged for a minimum of 180 days)
- Lowest cost storage class designed for long-term retention of data that will be retained for 7-10 years
- Retrieval time within 12 hours
- It is designed for 99.99999% durability of objects across multiple availability zones.
- Supports long-term retention and digital preservation for data that may be accessed once or twice a year

- **Use Cases**: Financial Services, Healthcare, and Public Sectors

STORAGE CLASSES - PERFORMANCE

	S3 Standard	S3 Intelligent-Tiering*	S3 Standard-IA	S3 One Zone-IA†	S3 Glacier	S3 Glacier Deep Archive
Designed for durability	99.999999999% (11 9's)	99.999999999% (11 9's)	99.999999999% (11 9's)	99.999999999% (11 9's)	99.999999999% (11 9's)	99.999999999% (11 9's)
Designed for availability	99.99%	99.9%	99.9%	99.5%	99.99%	99.99%
Availability SLA	99.9%	99%	99%	99%	99.9%	99.9%
Availability Zones	≥3	≥3	≥3	1	≥3	≥3
Minimum capacity charge per object	N/A	N/A	128KB	128KB	40KB	40KB
Minimum storage duration charge	N/A	N/A	30 days	30 days	90 days	180 days
Retrieval charge	N/A	N/A	per GB retrieved	per GB retrieved	per GB retrieved	per GB retrieved
First byte latency	milliseconds	milliseconds	milliseconds	milliseconds	select minutes or hours	select hours
Storage type	Object	Object	Object	Object	Object	Object
Lifecycle transitions	Yes	Yes	Yes	Yes	Yes	Yes

STORAGE CLASSES

- Create Bucket
- Select ACLs Enabled
- Enable all public Access
- Upload the Object
- Go to Properties
- Select the storage class as per requirement
- Give the public access

STORAGE CLASSES

- Click on upload
- Copy the object URL & Paste in the browser
- Change the Storage Class
- Go to properties tab
- Click on Edit for storage class
- We can select the storage class as per our client requirement.
- Click on save changes

Amazon Web Services

Replication

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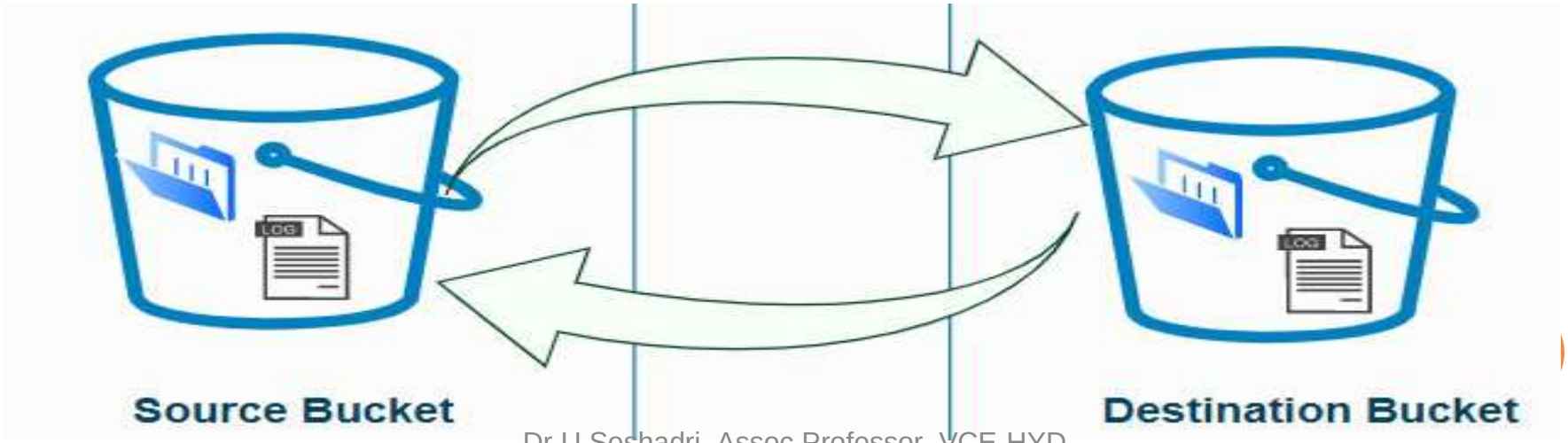
REPLICATION

- Amazon Simple Storage Service (S3) Replication is an elastic, fully managed, low cost feature that replicates objects between buckets. With Amazon S3 Replication, we can configure Amazon S3 to automatically replicate S3 objects across different AWS Regions by using Amazon S3 Cross-Region Replication (CRR) or between buckets in the same AWS Region by using Amazon S3 Same-Region Replication (SRR).



REPLICATION – SAME REGION

- Same-Region Replication (SRR) is used to copy objects across Amazon S3 buckets in the same AWS Region.
- Create two bucket in the same region
- Select ACLs Enabled
- Give Public Access
- Enable Versioning
- Go to Properties of the Bucket
- Click on Edit for Bucket Versioning
- Select Enable & Click on Save changes

REPLICATION – SAME REGION

- Enable replication
- Click on first bucket
- Go to Management tab
- Go to replication rule
- Click on create replication rule
- Enter the name of the rule
- Select Status as Enabled

REPLICATION – SAME REGION

- Select this rule applies to all objects in the bucket in Source bucket
- Select the Destination bucket
- Select create new role
- Click on Save
- Select No, do not replicate existing objects
- Click on submit
- Upload the objects in the first bucket
- Give the permission to public
- Check the Second bucket

REPLICATION – CROSS REGION

- S3 Cross-Region Replication (CRR) is used to copy objects across Amazon S3 buckets different AWS Regions.
- Create first bucket in Mumbai region
- Unblock all public access
- Enable Bucket versioning
- Create the second bucket with another region
- Unblock all public access
- Enable Bucket versioning

REPLICATION – CROSS REGION

- Upload one object in Mumbai region bucket
- Give public access
- Enable the replication in the Mumbai region bucket
- Go to the management tab.
- Go to replication rule
- Click on create replication rule
- Enter the name of the rule

Replication – Cross Region

- Select this rule applies to all objects in the bucket in Source bucket
- Select the Destination bucket
- Select create new role
- Click on Save
- Select No, do not replicate existing objects
- Click on submit
- Upload the objects in the first bucket
- Give the permission to public
- Check the Second bucket

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Transfer Acceleration

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TRANSFER ACCELERATION

- Amazon S3 Transfer Acceleration can speed up content transfers to and from Amazon S3 by as much as 50-500% for long-distance transfer of larger objects. When we enable transfer acceleration, takes advantage of Amazon Cloudfront & data will be transferred to edge location and then from edge location data will be transferred to bucket.

- **For Example**: If our end user is in the India & Bucket is in the USA region it is very far distance & if end user is trying to upload the heavy object & there is network fluctuation again end user need to start again. For this we can use this feature.

TRANSFER

- There is total of 218+ edge locations and 12 regional edge caches
- Edge Location is works as Cloudfront destination and Regional Edge Caches is working is alternative of origin (source of data) to reduce the burden of origin. Now Cloudfront will try to fetch data from Region Edge Caches before going to origin. Transfer Acceleration takes advantage of the globally distributed edge locations in Amazon Cloudfront.
- **Global Edge Network Map: Click Here**

TRANSFER ACCELERATION

- Create S3 Bucket
- Select ACLs Enabled
- Unblock all public access
- Open bucket
- Go to Properties tab
- Go to transfer acceleration
- Click on edit

TRANSFER ACCELERATION

- Select enable

- To use the transfer acceleration AWS will charge us extra amount.

- Click on save changes