BATCH : B107 AWS-DevOps

LESSON : **AWS**

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SUBJECT : **AWS-S3-1**

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Simple Storage Service S3 - 1

What is Simple Storage Service(S3)?

S3 was launched on **March 14, 2006 (also known as "Pi Day").**
Amazon Simple Storage Service (Amazon S3) is an object-based storage service that offers industry-leading scalability, data availability, security, and performance. You pay for what you use.

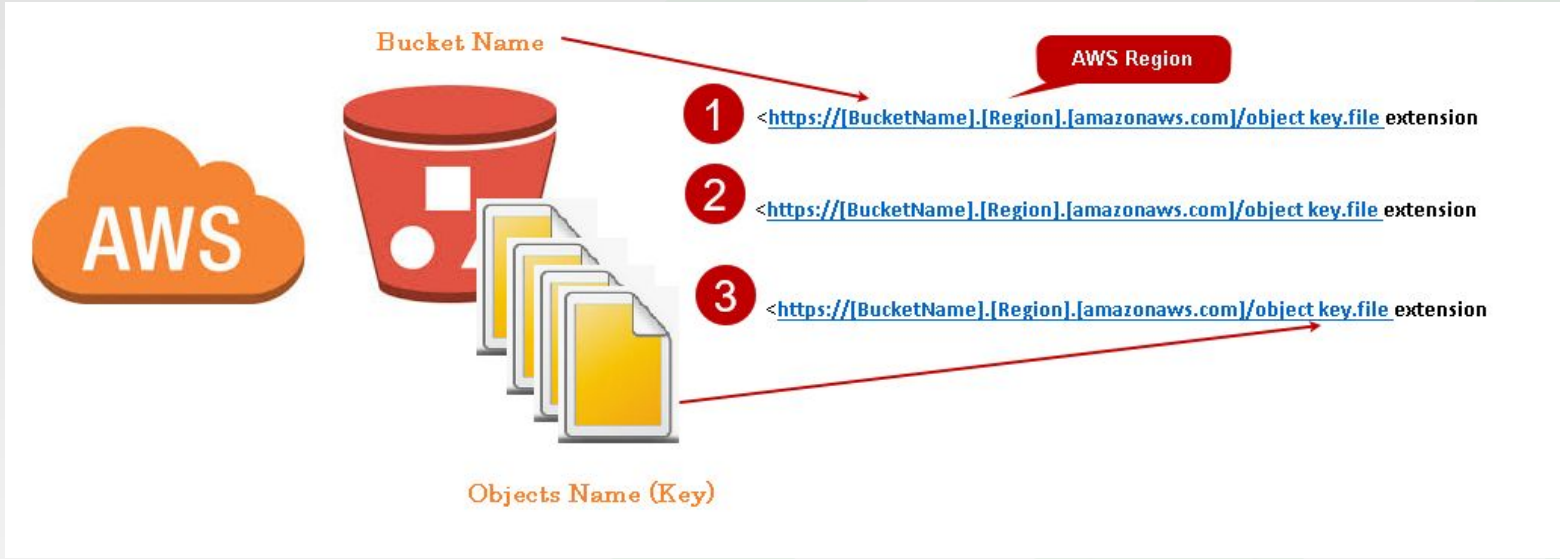
S3 is mainly used for

- Backup and archiving
- Content storage and distribution
- Big data analytics
- Static website hosting
- Disaster recovery

- Some of S3 Customers are Netflix, Dropbox, Siemens, GE Healthcare, Nasdaq
- S3 is one of the most favorite topics that is asked in AWS certification exams

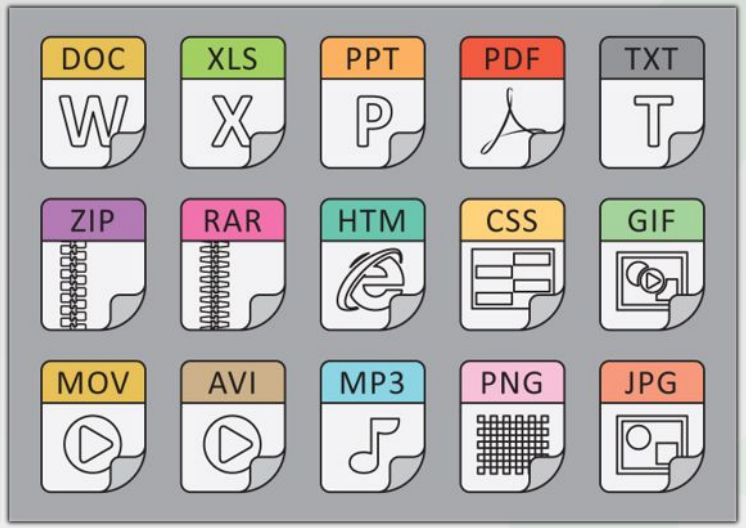
What is S3-Bucket?

- **Bucket is the container of objects. Each account can has 100 buckets.**
- **The file you store in a bucket is object. The file is replicated accross AZ's in that region.**
- Object **key** is the name of the file
- Object **value** is the body of the file
- **Prefix** is a logical folder



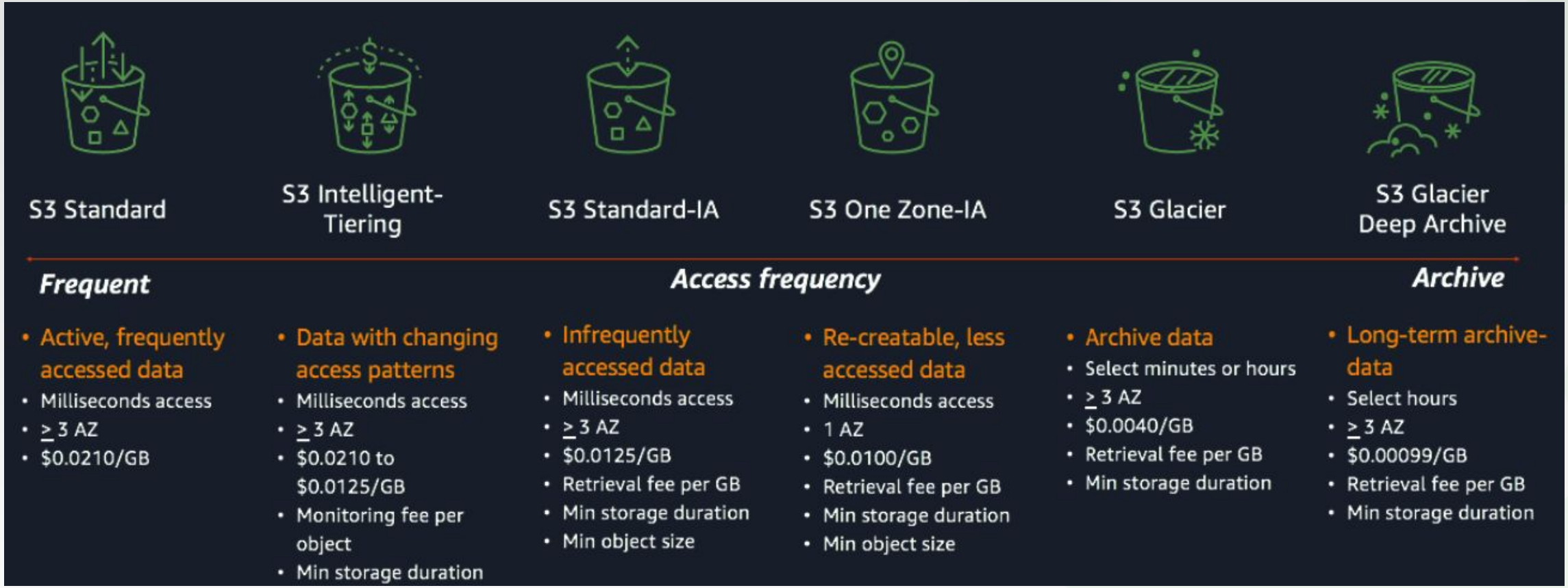
- **Operating system or databases can not be installed in S3 buckets**
- **You can not create a bucket inside a bucket**
- **There is no max bucket size or limit of objects you can put in a bucket**
- **A Bucket is regional**
- **A bucket must have a unique name**

What is Object in S3?



- An object can be any kind of file; a text file, a photo, a video, etc. plus metadata that describes the file.
- The object size of the data can be up **to 5 TB**. Max 5 TB size is a limit for a single file. It is unlimited in terms of the number of files you can put in S3. You can put as many files as you want.
- The max. size of an object you can upload via AWS Management Console is **160 GB.** For uploading a file greater than 160 GB, the AWS CLI, AWS SDK, or Amazon S3 REST API should to be used.

What are S3 Storage Classes?

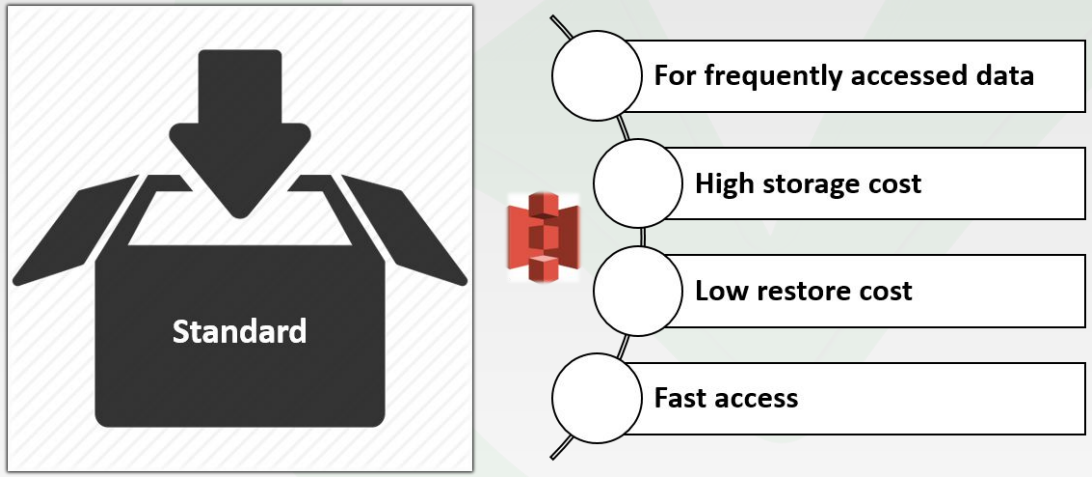


Amazon S3 offers a range of storage classes for the objects that you store.

S3 Storage Classes

Standard Storage

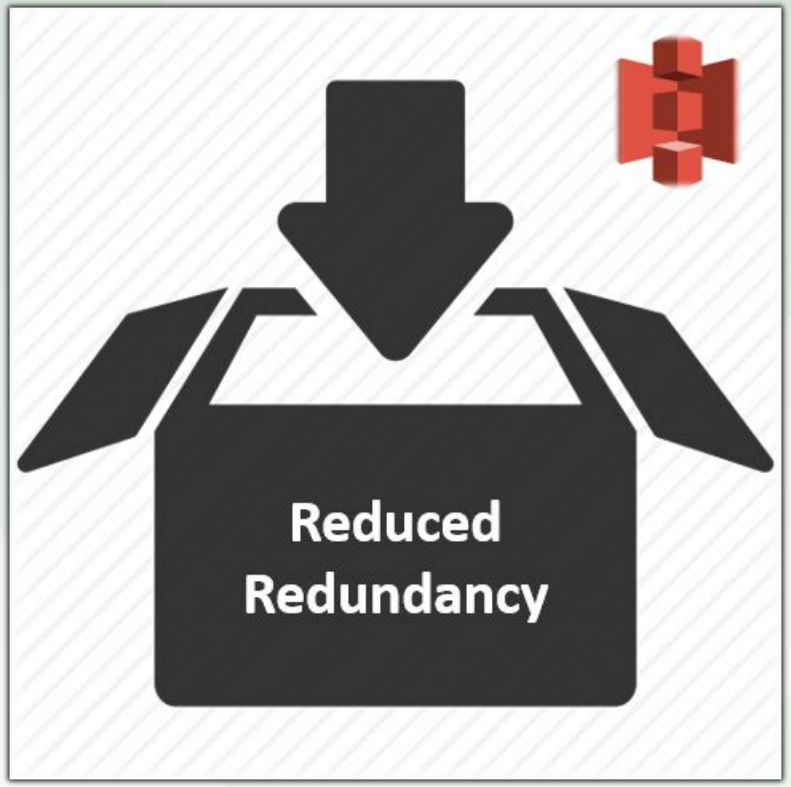
- High capacity and low latency.
- Durability/ Reliability at 99,999999999% level (Customers run the risk of losing only one of 100 billion objects per year).
- Availability at 99,99% level (For 10 thousand hours, the data will not be available only within one hour).



S3 Storage Classes

Reduced Redundancy Storage(RRS)

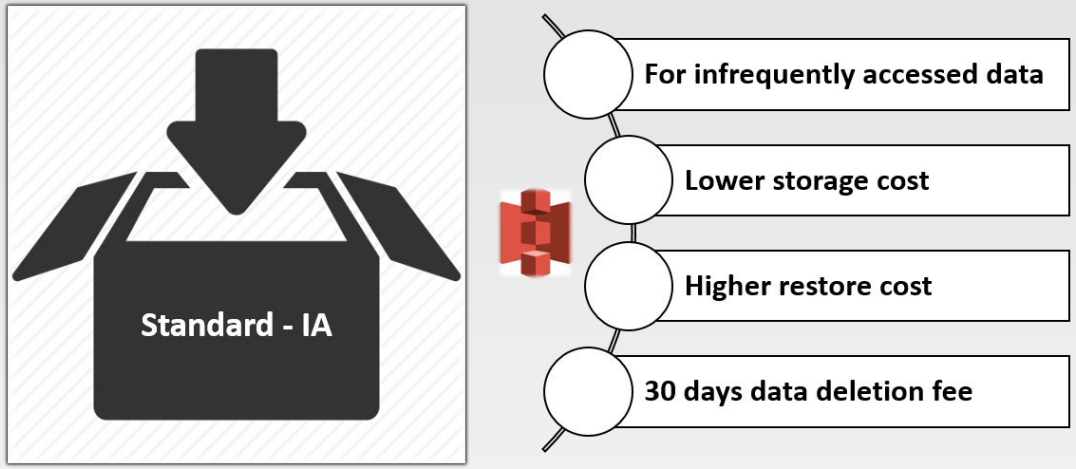
- The main difference between RRS and S3 Standard is reliability at 99,99%.
- This means that if you store 10,000 items, you run the risk of losing just one of them within a year.
- If an RRS object is lost, when requests are made to that object, Amazon S3 returns a 405 error. AWS recommends not to use this storage class because the Standard storage class is more cost-effective.



Redundant means having more than one of something in case the first instance fails. Having two disks on the same system that are regularly backed up makes them redundant, since if one fails the other can pick up the task.

S3 Storage Classes

Standard IA



- The main difference between Standard and Standard-IA is min storage duration and retrieval fees.
- Infrequently accessed data
- High capacity and low latency.
- Reliability at 99,999999999% level
- Availability at 99,99% level

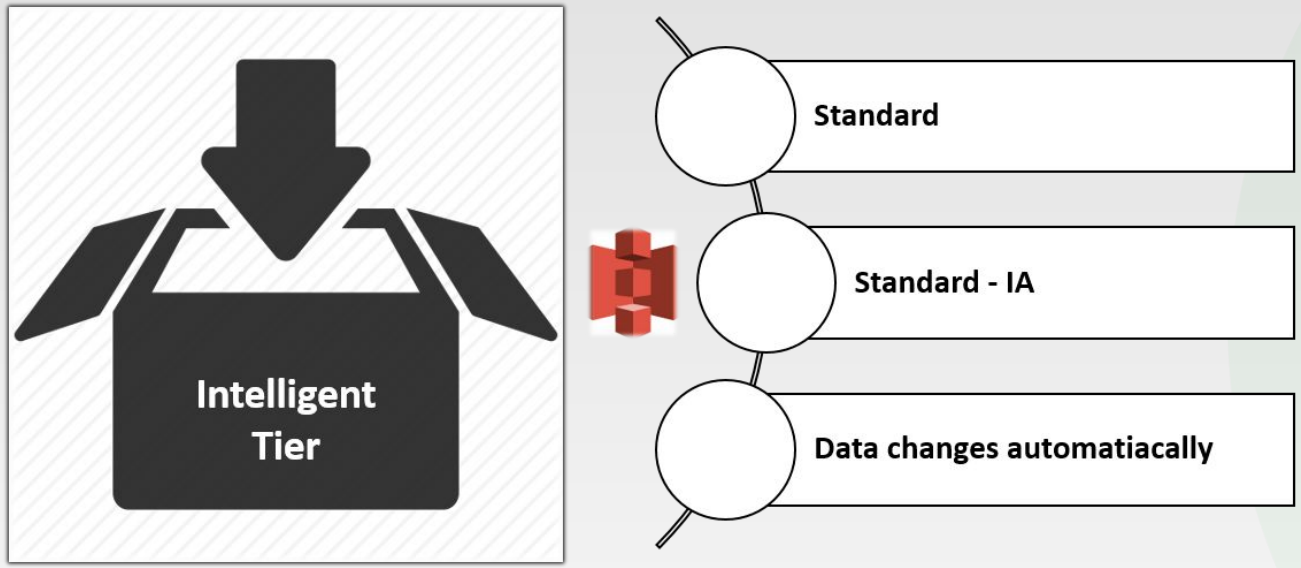
S3 Storage Classes

One Zone IA

- AWS introduced another Amazon S3 storage class in April 2018, One-Zone IA (Infrequent Access) which is 20 percent less expensive than Standard IA due to less availability.
- Instead of three available zones such as the other storage classes, One Zone IA only stores data in one zone.
- There is storage duration and retrieval fees.
- One-Zone IA can be considered as an affordable alternative storage class for files that are rarely used and can be afforded to lose.

S3 Storage Classes

Intelligent Tier



- The **Intelligent Tier** 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.

S3 Glacier Storage Classes

Archival data

Medical records, broadcast media, aerial images, consumer photos and videos

Upload directly or use S3 Lifecycle to transition data

Amazon S3 Glacier Instant Retrieval storage class

Milliseconds retrieval of data in a low-cost archive S3 storage class

Amazon S3 Glacier Flexible Retrieval storage class

Minutes to 12 hours retrieval of data in a lower cost archive S3 storage class

Amazon S3 Glacier Deep Archive storage class

12 – 48 hours retrieval of data in the lowest cost archive S3 storage class

Optimize your storage costs with low-cost storage options for long-term digital preservation for rarely accessed data

Ideal for archiving rarely-accessed data—no matter how quickly you need it

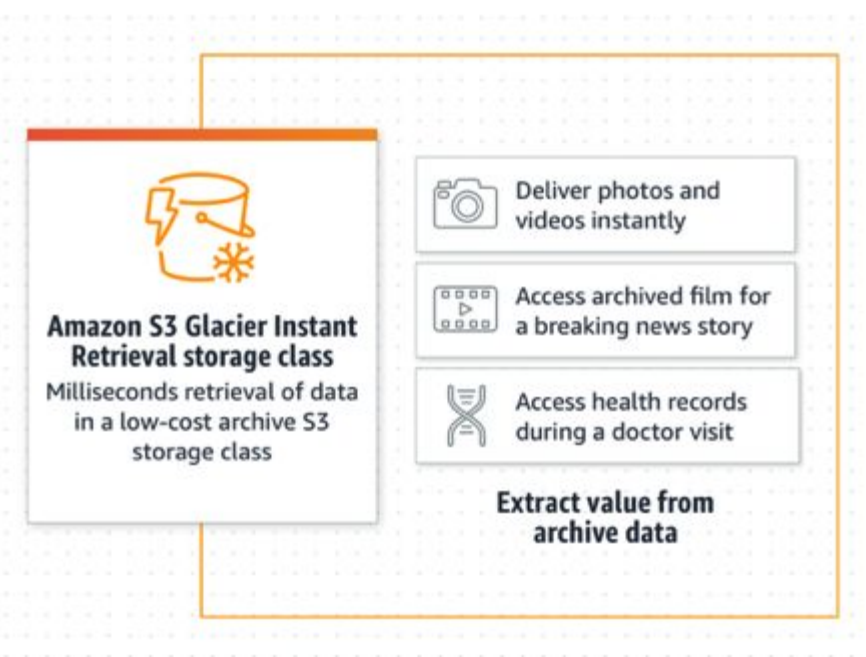
Cost-effective, highly durable, and secure for long-term retention, compliance, and digital preservation

Provides unlimited scale, the highest security standards, and data durability of 11 9s

Increase the value of your digital assets, unlock agility, and save money

S3 Storage Classes

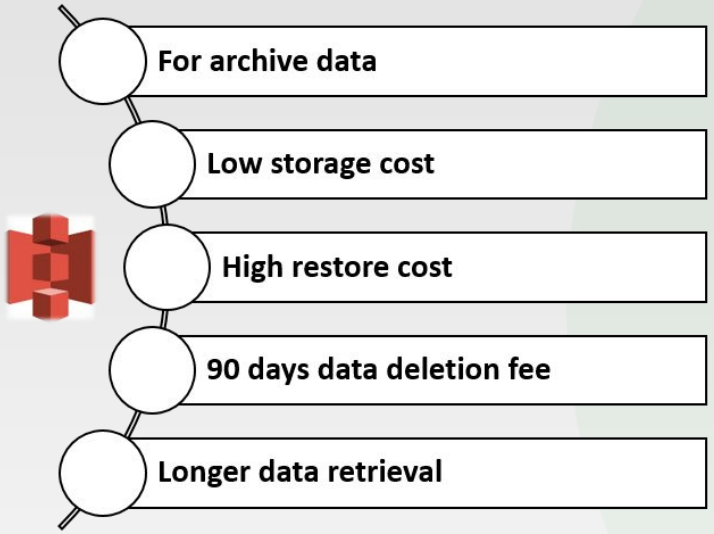
S3 Glacier Instant Retrieval



- S3 Glacier classes are for archiving
- Amazon S3 Glacier Instant Retrieval is a perfect solution for long-term storage and provides milliseconds access time.
- Multi AZ

S3 Storage Classes

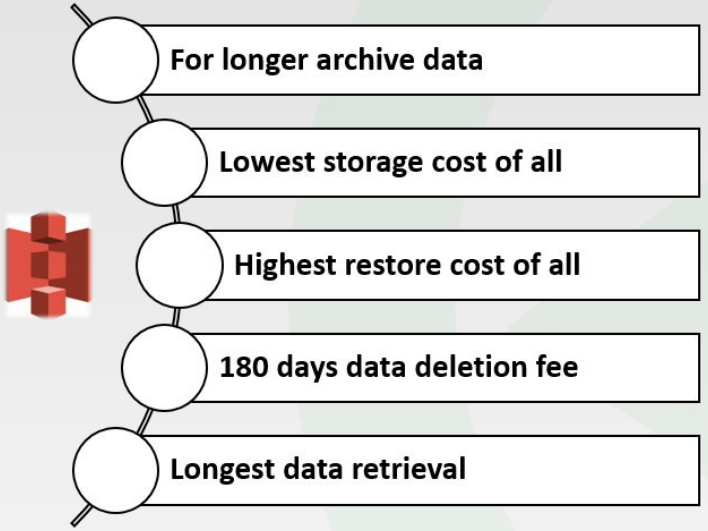
S3 Glacier Flexible Retrieval



- S3 Glacier Flexible Retrieval is a perfect solution for long-term storage and data archiving that doesn't require instant access.
- Multi AZ
- Retrieval time goes from minutes to 12 hours.

S3 Storage Classes

S3 Glacier Deep Archive



- Amazon Glacier Deep Archive is the lowest cost storage option in AWS. Storage costs for DEEP ARCHIVE is less expensive than using the Glacier storage class.
- Multi AZ
- Data retrieval is from 12 to 48 hours.

S3 Storage Classes

Storage Classes Comparison

	S3 Standard	S3 Intelligent-Tiering	S3 Standard-IA	S3 One Zone-IA	S3 Glacier Instant Retrieval	S3 Glacier Flexible Retrieval	S3 Glacier Deep Archive
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)	99.999999999% (11 9's)
Availability	99.99% (4 9's)	99.99% (4 9's)	99.99% (4 9's)	99.99% (4 9's)	99.99% (4 9's)	99.99% (4 9's)	99.99% (4 9's)
AZ's	>=3	>=3	>=3	1	>=3	>=3	>=3
Min capacity charge per object	NA	NA	128 KB	128 KB	128 KB	40 KB	40 KB
Min storage duration charge	NA	NA	30 days	30 days	90 days	90 days	180 days
Retrieval charge	NA	NA	per GB	per GB	per GB	per GB	per GB
First byte latency	milliseconds	milliseconds	milliseconds	milliseconds	milliseconds	minutes or hours	hours

AWS Simple Monthly Calculator resides on S3. Give it a try.

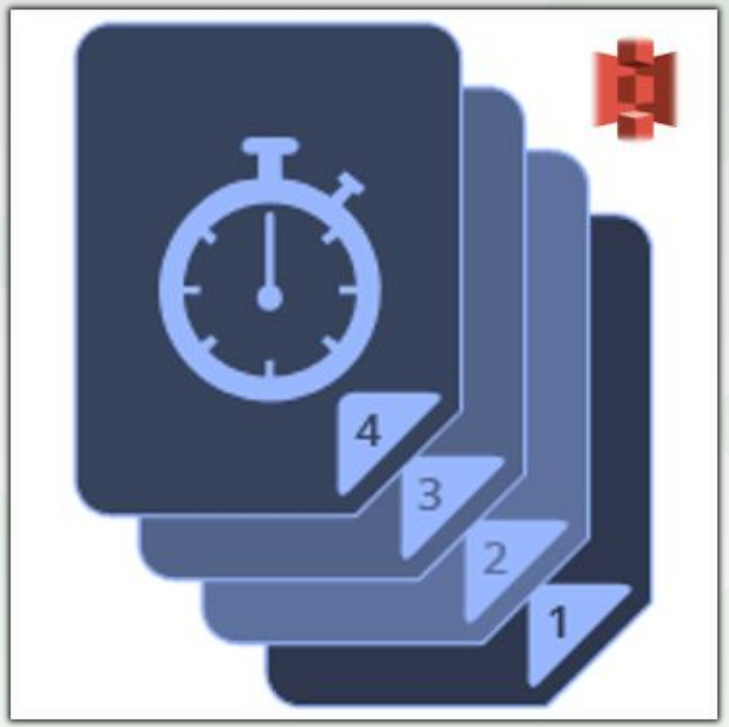
S3 Versioning?

- Versioning is a way to keep multiple versions of an object in a bucket.

- It is used to manage, delete, and restore any version of any object saved in an S3 bucket.

- Each time an object in a bucket changed, a new version of the object would be created and act as a new current version.

- By using versioning, all unwanted user behavior and program errors can be quickly recovered

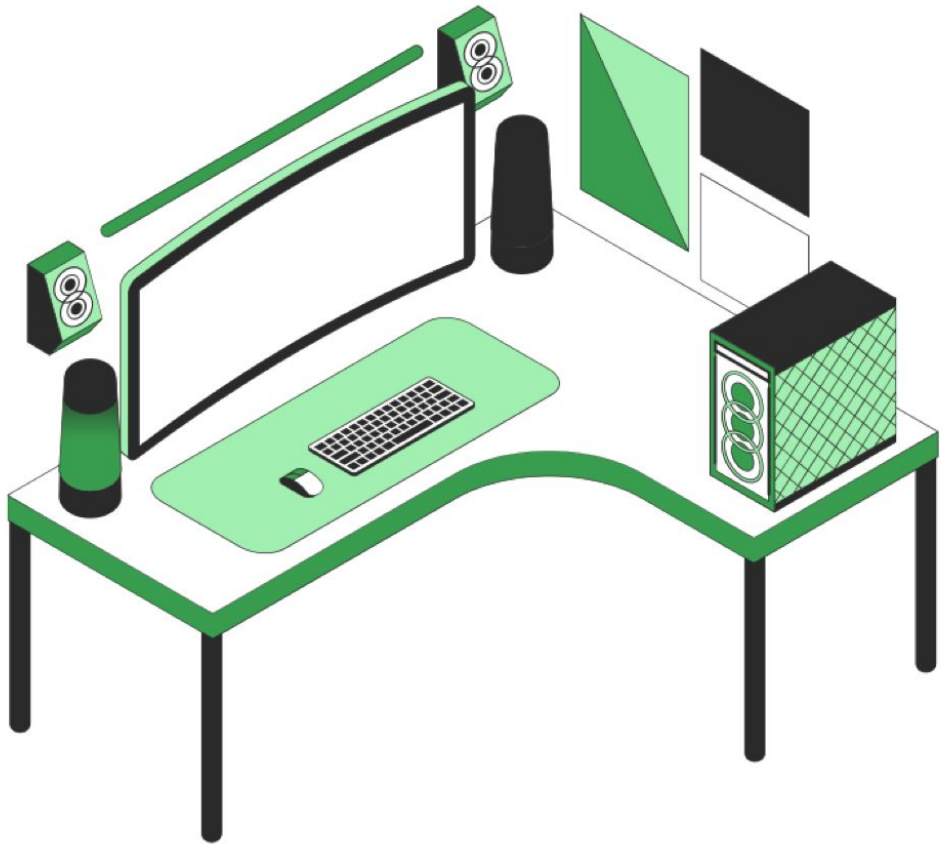


Once you enable versioning on a bucket, it can never return to an unversioned state. You can, however, suspend versioning on that bucket.

S3 Pricing

	Standard	Intelligent-Tiering	Standard-IA	One Zone-IA	Glacier Instant Retrieval	Glacier Flexible Retrieval	Glacier Deep Archive
Storage Cost (per GB per month)	$0.023	$0.0025 - $0.023	%0.0125	$0.01	$0.004	$0.0036	$0.00099
Retrieval Cost (per 1000 request)	**GET:** $0.0004 **POST:** $0.005	**GET:** $0.0004 **POST:** $0.005	**GET:** $0.001 **POST:** $0.01	**GET:** $0.001 **POST:** $0.01	**GET:** $0.01 **POST:** $0.02	**GET:** $0.0004 **POST:** $0.03 **Expedited:** $10 **Standard:** $0.05 **Bulk:** free	**GET:** $0.0004 **POST:** $0.05 **Standard:** $0.10 **Bulk:** $0.025
Retrieval Time	Instantaneous					**Expedited** (1 – 5 mins) **Standard** (3 – 5 hours) Bulk (5 – 12 hours)	**Standard** (12 hours) **Bulk** (48 hours)
Monitoring Cost (pet 1000 objects)		$0.0025					

https://aws.amazon.com/s3/pricing/



Do you have any questions?

Send it to us! We hope you learned something new.