S3 Storage Classes and Lifecycle Policies

As mentioned before, S3 has a range of storage classes designed for different balances of cost, durability, availability and performance with prospective users being able to choose one based on their intended use cases. There are six major different storage classes, all of which are discussed below:

1. **S3 Standard**: For frequently accessed data. It offers high availability, low latency, and durability of 99.999999999% (11 nines). This storage class is best suited for general-purpose storage.

2. **S3 Standard-IA (Infrequent Access)**: For data that is accessed less frequently but needs fast retrieval when required. Lower storage cost but retrieval fees apply.

3. **S3 Intelligent-Tiering**: Automatically moves data between S3 Standard and S3 Infrequent Access as it sees fit using proprietary algorithms to determine which of the two tiers an object may be kept in. So objects that have a history of being more scarcely accessed would be automatically moved from S3 Standard to S3 Infrequent Access, without any extra retrieval charges. Most useful in cases where some files are accessed frequently while other files are rarely accessed in an unpredictable pattern.

4. **S3 One Zone-IA**: Similar to Standard-IA but data is stored in a single Availability Zone, making it cheaper albeit less available. This storage class is most suitable for non-critical, reproducible data.

5. **S3 Glacier**: For archival data where retrieval times of minutes to hours are acceptable. It's extremely cost-effective for long-term storage.

6. **S3 Glacier Deep Archive**: The lowest-cost storage class, designed for data that is accessed quite rarely and has the largest retrieval times of up to 12 hours.

Lifecycle Policies

With so many different storage classes available to us, there might be times when we would like to sort the objects into different buckets based on the time that has passed since the object's creation for the purposes of cost optimization, data retention, etc. Lifecycle policies provide us with this luxury.

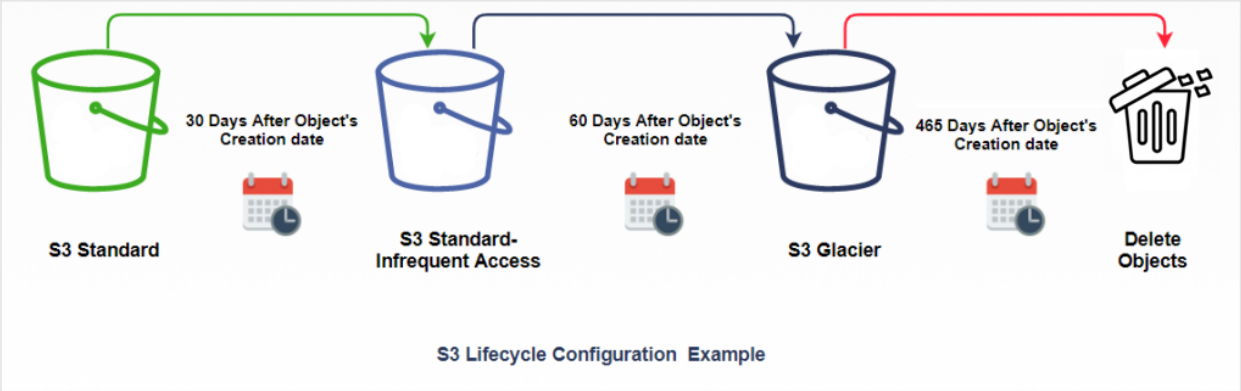
Lifecycle policies in AWS are a set of rules that allow us to manage resources (such as objects in S3 Buckets) and automate certain actions that are to be performed on the data, such as transitioning data to different storage classes or deleting them after a certain period of time.

Let us consider for example, that you are the administrator for a company that uses S3 to store all of its cash transaction logs. Said transaction logs are frequently accessed for the first month after their creation, and are sporadically accessed for the month after that. Though the transaction logs are rarely accessed after that, government regulations mandate transaction logs to be stored up till 465 days after the fact.

Now, in order to meet the restrictions laid out above, we can configure a lifecycle policy for the S3 Bucket where transaction logs are:

1. By default created and stored in S3 Standard
2. Moved from S3 Standard to S3 Infrequent Access 30 days after the object creation date

3. Moved from S3 Infrequent Access to S3 Glacier 60 days after the object creation date.
4. Retained in S3 Glacier until 465 days after the object creation date, after which it is promptly deleted.



Thus, through the use of S3 Lifecycle policies we were able to easily automate the process of managing our S3 object data based on the time that has passed since the object creation date in a hassle-free manner.