**S3**

**What is S3…?**

* S3 stands for simple storage service.
* Amazon S3 is an object storage service that offers having performance, scalability, data availability, security.
* Customers of all sizes and industries can store the data in the form of object.
* In the S3 the data is stored in the bucket, in the bucket the data is stored as the objects. The size of the object is from 0 bytes to 5TB.
* We can store the unlimited objects in the bucket. Amazon S3 bucket is like the well with no depth.

**Topics in S3:**

* **Bucket:**
* A bucket is container which stores the objects. You can store any number of objects in buckets. But you have 100 buckets limit to every AWS account.
* The name of the bucket must be unique and we can select any location where we decide to create the bucket.
* Once the bucket is created, the name of the bucket and region of the bucket cannot be changed. You can enable the bucket versioning and storage management features.
* **Object:**
* Object are the entities which are stored in the Bucket. Objects consists of the object data and meta data. Meta data is set of name-Value pairs.
* Size of the object is from 0 bytes to 5TB.
* An object in the bucket is easily identified using the key, Version id (Which will be obtained by enabling the versioning).
* **Key:**
* Key is an unique identifier for an object in the bucket. Every object in the bucket has only one key.
* Key is the combination of “Bucket+key+Version”.
* **Versioning:**
* Versioning is to keep the multiple variants of objects to keep in same bucket with versioning you can preserver, restore, retrieve every version of the object stored in the bucket.
* When you enable the Versioning then version ID is also generated.

**N Bucket Policy:**

* Bucket policy is the resource based AWS IAM policy you can use it to grant permission to your bucket and object.
* Only the owner of the bucket can add the bucket policy. The policy size cannot be greater than 20 KB
* Bucket policy is written in the JSON format.
* **Storage Classes:**
* **Storage classes for frequently accessed data:**
* **S3 standard:**
* If you not specify any storage class the data will come under the S3 standard.
* **S3 Express one-zone:**
* It will is 50% less cost efficient than S3 standard. The data will be delivered most consistently, it has more latency in the milli seconds the data will be accessed.
* In these the data will stored in more than one device redundantly in a single available zone.
* **RRS(reduced redundancy storage class):**
* In these storage class the non-critical, reproducible data that can be stored with less redundancy than standard S3 storage class.
* **S3 intelligent tiering:**
* In these storage class the storing of data which causes cost was reduced by the determining the access pattern of the data which you have been accessing.
* The data is 99.9% available and 99.999999% durable.
* Types of storage classes:
* **Frequent access tier:** The data what you have uploaded will be comes under this pattern.
* **In Frequent access tier:** The data you have not accessed up to 30 days consecutively will be automatically comes under this tier.
* **Archive access:** The data you have not accessed up to 90 days consecutively will come under this tier. It has two types archive access and deep archive access:
* **Archive access:** data you have not accessed up to 90 days consecutively will come under this tier.
* **Deep archive access:** data you have not accessed up to 180 days consecutively will come under this tier.
* **Infrequently Accessed Data:**
* In these storage class the data is which is infrequently accessed and long lived. The durability and availability of data is high.
* The data accessing will done in the milliseconds. AWS charges more for the retrieval of data. Two types of infrequently accessed data:
* **S3 standard IA:** In these types the data is stored in the multiple separated availability zones. It has more availability and resilience.
* **S3 one zone-IA:** In these type the data is stored in one availability zone. It has less availability and resilience than S3 standard-IA.
* **Archiving objects:**
* These class is used for low cost archiving data. It offers same durability and resilience as S3 standard-IA and S3 standard.
* Types of archiving object storage class:
* **S3 Glacier instant retrieval:** It data is rarely accessed and require milliseconds retrieval. It offers cost saving compared to S3 standard-IA and with same latency and throughput performance same as S3 standard-IA.
* **S3 Glacier flexible retrieval:** In this data can be retrieved in minutes. It has minimum duration period is minimum 90 days and data can be retrieved in 1-5 minutes. If you delete, overwrite, and transition the object to storage class before 90 days minimum, you are charged up to 90 days.
* **S3 Glacier Deep archive:** In these data is rarely accessed. It has minimum duration period is 180 days and default retrieval time is 12 hours. If you delete, overwrite, and transition the object to storage class before 180 days minimum, you are charged up to 180 days.
* **S3 Cross Region Replication:**
* CRR meaning copying or replicating the data of one region into another region. Some uses of CRR:
* Improving latency and enhanced availability
* Disaster Recovery.
* To meet compliance requirements.
* Owner overridden
* **Bucket Policy:**
* Bucket policies are the resource based permission that will grant or deny the request in accessing the bucket or Objects in the bucket.
* The Bucket policies will be set only by the owner who owns the bucket. But those policies won’t apply to the owner.
* Bucket policies will written in the JSON based IAM policy. In bucket policy we can give the permission the IAM users to access the specific resource.
* **Access Control List:**
* ACL allows you to manage access to the buckets and objects. Each bucket and objects has ACL attached to its subresource.
* **Object Locking:**
* Object locking prevents the objects being deleted or overwritten for a fixed amount of time. It follows WORM( Write once read many) model.
* It provides two types of object retention period.
* **Retention period:** In the Retention period the objects in the bucket can’t be deleted or overwritten for a fixed period for fixed amount of time object remains locked. To delete the object we need to wait until for the fixed amount of time. In the new version the object locking will be enabled up to 60 days but in the newer version it maintain only for 15 days. To put retention period you need s3:putObjectRetention .it has two types:
* **Compliance mode:** A object is protected for the fixed amount of time and the overwritten or deletion of the object is not possible. The time stamp period is not shortened.
* **Governance mode:** A object is protected for the fixed amount of time and the overwritten or deletion of the object is not possible. The time stamp period is not shortened, unless you have the special permission. The permission is s3:ByPassGovernanceRetention and most explicitly include x-amz-bypass-governance-retention:true as request header to with any request that for requiring for bypass governance mode.
* **Legal Hold:** Like retention periods legal hold does not have any special permissions the objects in the buckets are locked until the legal hold effect is turned off. To place or remove the legal hold we need to have permission s3:PutObjectLegalHold.
* **Static web hosting:**
* AWS S3 can also used for the static web hosting which containing client side scripting. It will not support the dynamic web hosting to support it dynamic web hosting we need to use another resources.