Simple Storage as a Service(S3)

AWS

Topics to be covered

1. S3 brief introduction
2. Features of S3
    a. Storage classes
    b. Permissions(ACL & Bucket policies)
    c. Object Versioning
    d. Security (Encryption techniques)
    e. Lifecycle policies
3. Pricing
4. Static website hosting

S3 Introduction

- Block Storage
  - The data is stored in fixed sized chunks called blocks
    - AWS Service: Elastic Block Store
- File Storage
  - The data is stored as files like NTFS
    - AWS Service: Elastic File System
- Object Storage
  - Stored as objects
    - AWS Service: S3

S3 Introduction

- Cost effective storage solution(Object Storage)
- Pay for what you use
- Low latency and high availability**, scalability
- 11 9’s of durability(99.999999999%)
- AWS claims it has unmatched security and compliance auditing capabilities
- Querying capabilities with services like Athena, Redshift spectrum, S3 select

**Depends on the storage class selected

S3 Introduction

Use Cases

- Backup Storage
- Media Hosting (Video/Image store)
- Application assets (Read/Write data)
- Datalake (storing structured and unstructured data)
- Content Delivery (To download files etc..)

Features of S3

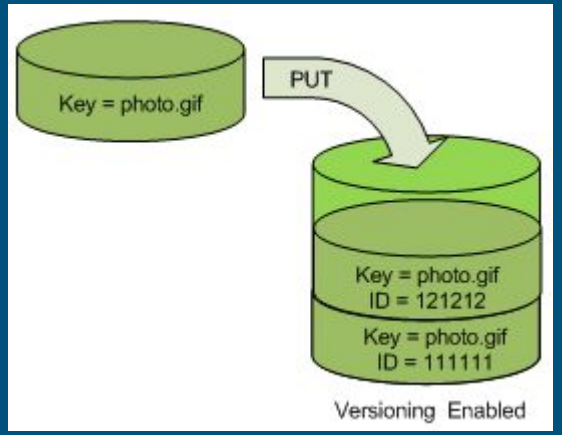
Storage classes

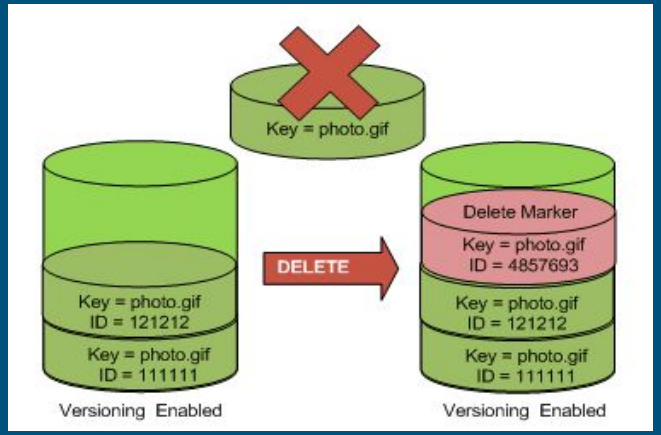
Features	S3 Standard	S3 Intelligent-Tiering	S3 Standard-IA	S3 One Zone-IA	S3 Glacier	S3 Glacier(Deep Archive)
Designed for durability	(11 9's)	(11 9's)	(11 9's)	(11 9's)	(11 9's)	(11 9's)
Designed for availability	99.99%	99.90%	99.90%	99.50%	99.99%	99.99%
Availability SLA	99.90%	99%	99%	99%	99.90%	99.90%
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	30 days	30 days	30 days	90 days	180 days
Retrieval fee	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
Use cases	Cloud apps, Dynamic websites, Content distribution, mobile/gaming apps, Big data analytics	Long lived data for access pattrens unknown	Long-term storage, Backups, disaster recovery files	Secondary backup/easily recreated data	Low cost design, Long term archive, provided with 3 retrieval options	Data store for 7-10 years long, alternative for magnetic tapes, retrieval time within hours

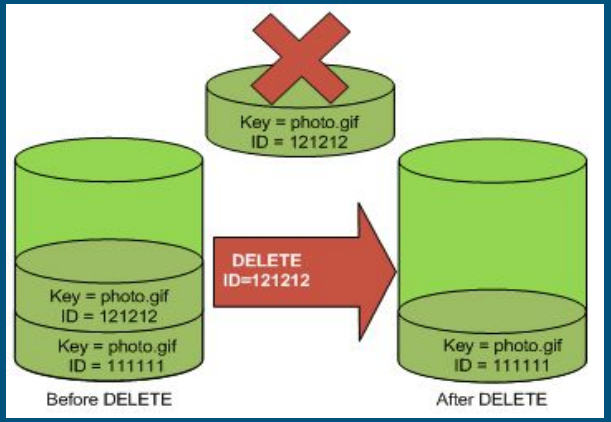
Permissions

1. IAM based policies -- Provided to Users, groups, Roles
2. Resource based Policies
    a. Bucket Policies
        i. Only applicable to buckets
        ii. Written in JSON
    b. Access Control Lists
        i. Applicable for both buckets and objects
        ii. Written in XML

Object versioning







Security/Encryption

1. On transit encryption
    a. Encrypts the data while transferring from application to S3
2. Encryption at rest
    a. To prevent data access when the data files are stolen/inappropriately accessed(AES 256)
    b. AWS - KMS

Lifecycle Policies

- Objects will get stored cost effectively through their lifestyle
- Actions
  - Transition actions -- transfer/archive from one storage class to another
  - Expiration actions -- delete objects after a particular time period
- Use-cases
  - Periodic access to files
  - Data retention for regulatory purposes
- Configuration
  - Console
  - CLI
  - REST API calls

Pricing

1. Storage classes
2. Storage used
3. Number of PUT/GET requests
4. Region

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