

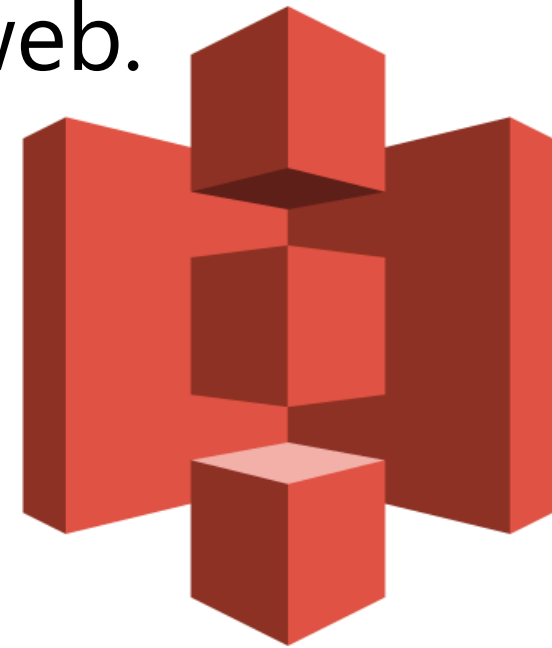


Introduction To Amazon Simple Storage Service (Amazon S3)

Amazon Web Services

Amazon Simple Storage Service (S3)

Amazon Simple Storage Service (Amazon S3) is object storage and you use a simple web interface to store and retrieve amount of data, at any time, from anywhere on the web.



Amazon Simple Storage Service (S3)

- Object Based Storage – Not Block Storage
- Unlimited Storage. Files can range from 0 Bytes to 5TB in size
- Files are stored in Buckets.
Buckets must be created before you can upload files.
- Bucket names can contain lowercase letters, numbers, hyphens and periods but must have a unique namespace i.e., they should be accessible across the Internet
 - Format – [https://S3-us-east-1.amazonaws.com/bucketname/key\(filename\)](https://S3-us-east-1.amazonaws.com/bucketname/key(filename))
- You can also access using the URL format
[https://bucketname.s3.amazonaws.com/Key\(Filename\)](https://bucketname.s3.amazonaws.com/Key(Filename))
- HTTP 200 Code if upload was successful



Important Note: It is recommended to use your domain name to use for your S3 buckets; this way you are more than likely to get the name you want and you can use them anywhere

Amazon Simple Storage Service (S3)

- Keys Value Store

- The combination of a bucket, key, and version ID uniquely identify each object
- Keys can be up to 1024 bytes of Unicode UTF-8 Characters
- Objects consist of Keys (filename of the object)
- Value – The data of the actual object in binary
- Version ID – Version of Object
- Metadata
- Sub resources - Access Control Lists

Amazon Simple Storage Service (S3)

Common Use Cases

- Storing Application Assets
- Static Web Site Hosting
- Backup & Disaster Recovery
- Store large amounts of Data for Analytics

Amazon S3 – Additional Features

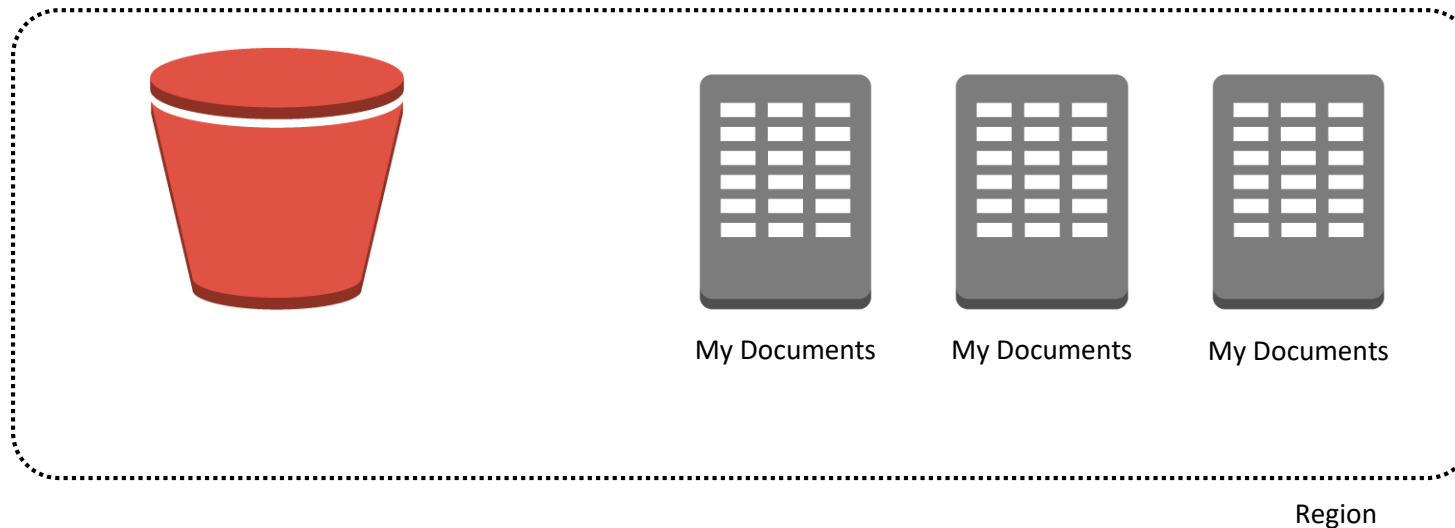
Permissions

- Access Control Lists - You can use ACLs to grant basic read/write permissions for objects to other AWS accounts
- Bucket Policy - Grant other AWS accounts or IAM users permissions for the bucket and the objects in it
- IAM Policy - Create IAM users, groups, and roles in your account and attach access policies to them granting them access Amazon S3 resources such as buckets.

Amazon Simple Storage Service (S3)

- Regions

- You have to specify where you wish to create the bucket.
 - This ensures you have storage buckets that is closest to your location or clients locations.
 - You can also meet regulatory and compliance requirements



S3 can handle the loss of up to concurrent datacentre facilities

Amazon Simple Storage Service (S3)

- Data Consistency Model for S3 – Key Exam Tip
 - Read after Write Consistency for Puts of new Objects
 - Eventual Consistency for overwrite Puts and Deletes



Amazon Simple Storage Service (S3)

Storage Classes

- S3 (Standard) – S3 – 99.99% availability and 99.9999999999% durability.
- S3 IA (Infrequently Access) – Data that is accessed less frequently but requires rapid access when needed. Lower fee than S3 but there is a charge for retrieval of data. For S3 IA is suitable for objects that have a minimum size of 128KB. Objects must reside in this class for a minimum of 30 Days.
- S3 One Zone-Infrequent Access (S3 One Zone-IA; Z-IA) - new storage class designed for customers who want a lower-cost option for infrequently accessed data, but do not require the multiple Availability Zone data resilience
- Reduced Redundancy —RRS storage class is designed for noncritical, reproducible data that can be stored with less redundancy than the STANDARD storage class.

Amazon Simple Storage Service (S3)

Storage Classes

- INTELLIGENT_TIERING storage class – This new class stores objects in two access tiers: one that is optimized for frequent access and another lower-cost tier that is optimized for infrequently accessed data.
 - You pay a small monthly fee for monitoring and automatic transition.
 - Amazon S3 monitors access patterns of the objects in the INTELLIGENT_TIERING storage class and moves objects that have not been accessed for 30 consecutive days to the infrequent access tier.
 - There are no retrieval fees when using the INTELLIGENT_TIERING storage class.
 - If an object in the infrequent access tier is accessed, it is automatically moved back to the frequent access tier.

Amazon Simple Storage Service (S3)

Amazon S3 Glacier

- The GLACIER storage class is suitable for archiving data where data access is infrequent. This storage class offers the same durability and resiliency as the STANDARD storage class. Cold archival storage offering the cheapest storage on AWS. Three models are Expedited, Standard or Bulk.
- Standard Retrieval takes between 3 to 5 hours
- Expedited Retrieval takes between 1 to 5 minutes for a subset of your archives
- Bulk Retrieval takes 5 to 12 hours for very large datasets

Amazon Simple Storage Service (S3)

Amazon S3 Glacier Deep Archive

- S3 Glacier Deep Archive is the lowest-cost storage class on offer and supports long-term retention for data that won't be regularly accessed. It is designed for customers who for example need to retain data sets for 7-10 years or longer to meet regulatory compliance requirements.
- Note that retrieval time is within 12 hours.

Amazon Simple Storage Service (S3)

	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%	N/A	N/A
Availability SLA	99.9%	99%	99%	99%	N/A	N/A
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

Amazon S3 – Additional Features

Lifecycle Management

You setup one or more rules to perform automatic tiering of objects to help better manage your costs associate with long term storage. Often you need to store data for several years that will be infrequently accessed but is required for compliance and regulatory legislation.

Two types of actions can be performed:

- Transition actions – In which you define when objects transition to another storage class
- Expiration actions – In which you specify when the objects expire which forces Amazon S3 to delete the object

You can apply Lifecycle management to the bucket and all objects contained in the bucket or only to objects specified by a prefix

Amazon S3 – Additional Features

Versioning

Versioning enables you to add a layer of protection by keeping multiple version of your objects. You can preserve every version of every object ever created . If you delete a file, you can restore the file to its original state. You have to turn on versioning at the bucket level and once enabled, it cannot be disabled. You can however, suspend versioning actions.

Objects in buckets can be in three states

- Un-versioned state
- Versioning-enabled
- Versioning –suspended

Amazon S3 – Additional Features

S3 Transfer Acceleration

Amazon S3 Transfer Acceleration enables fast, easy, and secure transfers of files over long distances between your client and an S3 bucket. This is achieved by using Amazon CloudFront's globally distributed edge locations. As the data arrives at an edge location, data is routed to Amazon S3 over AWS high bandwidth links.

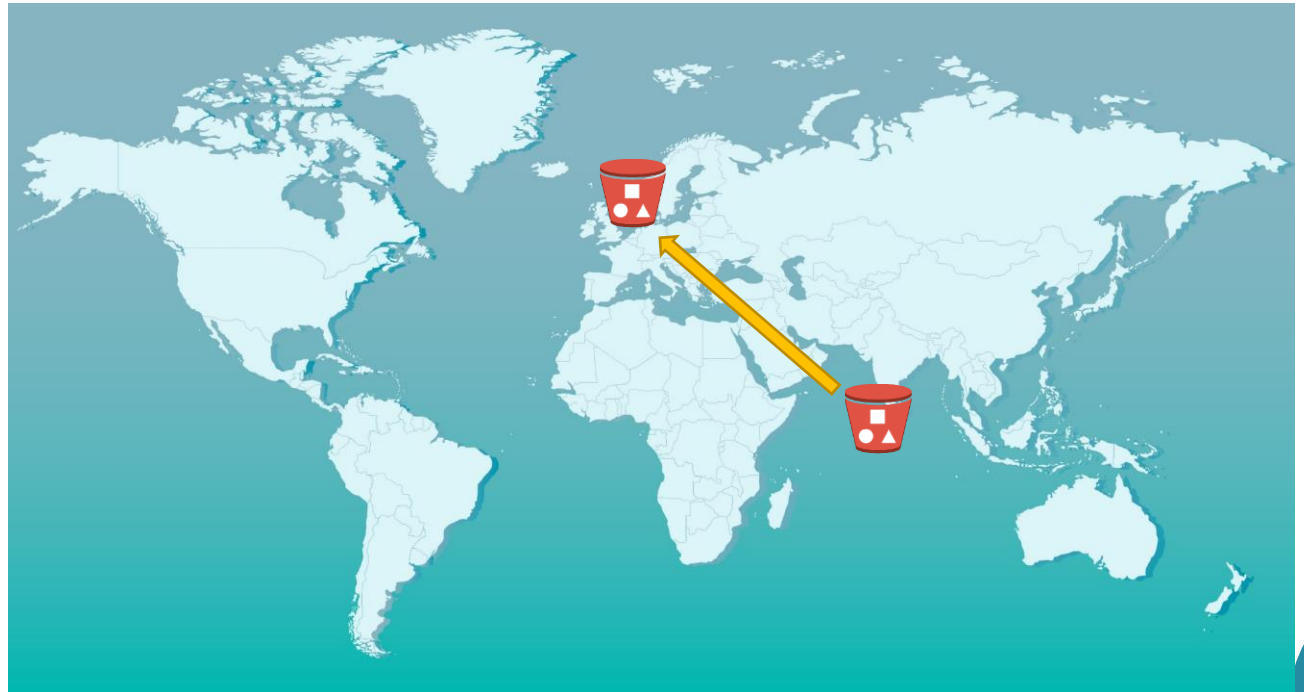


Amazon S3 – Advanced Concepts

Cross-Region Replication

Using Cross-Region Replication you can replicate objects in a bucket in one AWS region with a target bucket in another region asynchronously. All metadata and ACLs will also get replicated. When you setup Cross-Regional Replication, any changes to objects will trigger the replication.

- You can use this service to ensure that you place objects locally to consumers by replicating data to a their local region.
- You can also use this feature in use cases where you are required to store a backup of data at a certain distance from the original source



Amazon S3 – Additional Features

Notifications

You can send out Event Notifications to actions that are performed on your bucket such as uploading a new object or deleting an object. You can make this very granular so that for example you are notified each time someone uploads a file of a specific type, with specific prefixes or delimiters or any other similar attribute.

In addition, you can use Event Notification to setup up triggers that perform specific actions on your objects; for example transcoding media files when they are uploaded

Amazon S3 – Additional Features

Encryption

You can use encryption to ensure that all sensitive data on Amazon S3 is safe and secure. Encryption can be applied to S3 resources both in flight and at rest.



Amazon S3 Exam Tips

- Amazon S3 is Object Storage
- File size range from 0 Bytes to 5TB
- Files are stored in Buckets
- Bucket names are unique –
 - Format – [https://s3-us-east-1.amazonaws.com/bucketname/key\(filename\)](https://s3-us-east-1.amazonaws.com/bucketname/key(filename))
- HTTP 200 Code if upload was successful
- Data Consistency Model
- Storage Classes

Next Video

Create an S3 Bucket