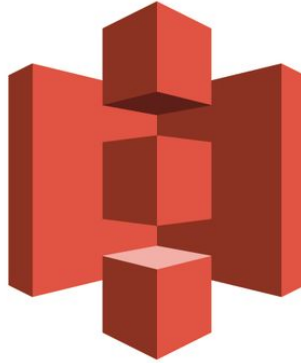


What is S3?



Amazon Simple Storage Service (Amazon S3) is an object storage service that offers industry-leading scalability, data availability, security, and performance. This means customers of all sizes and industries can use it to store and protect any amount of data for a range of use cases, such as websites, mobile applications, backup and restore, archive, enterprise applications, IoT devices, and big data analytics. Amazon S3 provides easy-to-use management features so you can organize your data and configure finely-tuned access controls to meet your specific business, organizational, and compliance requirements. Amazon S3 is designed for 99.999999999% (11 9's) of durability, and stores data for millions of applications for companies all around the world.

Amazon - Simple Storage Service(S3)

- S3 stores data as objects within **buckets**.
- An **object** consists of a file and optionally any metadata that describes that file.
- A **key** is the unique identifier for an object within a bucket.
- Storage capacity is **virtually unlimited**.
- S3 allows easy upload and download of files
- *AWS Console View for S3 Service is Global but Buckets are Region Specific.*



S3 Bucket



- For each S3 Bucket, we can:
 - Control access to it (create, delete, and list objects in the bucket)
 - View access logs for it and its objects
 - Choose the geographical region where to store the bucket and its contents
- **Bucket name must be a unique DNS-compliant name.**
 - The name must be unique across all existing bucket names in Amazon S3.
 - After you create the bucket you cannot change the name.
 - The bucket name is visible in the URL that points to the objects that is to put in your bucket.
 - You can't change its Region after creation.
 - By default, you can create up to 100 buckets in each of your AWS accounts.
- File size can be 0 Bytes to 5TB



S3 store

- S3 is object based Storage

Any object inside S3 consists -

1. **Key** - File name
2. **Value** - Actual data in bytes
3. **VersionID** - For versioning
4. **Metadata** - Data about data



Why S3?

- Built for 99.99% availability .
- Amazon guarantees 99.999999999% durability for s3 information.
- Tiered storage.
- Lifecycle management.
- Versioning.
- Encryption.
- Authorization using ACL and bucket policies.



Data consistency

- Read after write consistency for PUTS of new objects.
- Eventual consistency for overwrite PUTS and DELETES.
***Eventual consistency:** if you update an object and try to read it, the object may contain the old version. After some time passes, the latest version will be available.*
- Atomic updates-No partial or corrupted data.

Storage tiers

S3 (standard) -

99.99% availability, 99.999999999% durability, stored redundantly across multiple devices in multiple facilities and is designed to sustain loss of 2 facilities concurrently.

S3 IA (Infrequently accessed) -

For data that is accessed less frequently, but requires rapid access when needed. Lower fees than S3, but you are charged a retrieval fee.

Reduced Redundancy Storage -

Designed to provide 99.99% durability and 99.99% availability of objects over a given year.

Glacier -

Very cheap, but used for archival only. It takes 3-5 hours to restore from Glacier.



Storage tiers

	Standard	Standard - Infrequent Access	Reduced Redundancy Storage
Durability	99.999999999%	99.999999999%	99.99%
Availability	99.99%	99.9%	99.99%
Concurrent facility fault tolerance	2	2	1
SSL support	Yes	Yes	Yes
First byte latency	Milliseconds	Milliseconds	Milliseconds
Lifecycle Management Policies	Yes	Yes	Yes



Glacier

- Glacier is an extremely low cost storage service for data archival. Glacier stores data for as little as \$0.01 per GB per month.
- It is optimized for data that is infrequently accessed and for which retrieval time is 3-5 hours.

Storage tiers

	Standard	Standard - IA	Amazon Glacier
Designed for Durability	99.999999999%	99.999999999%	99.999999999%
Designed for Availability	99.99%	99.9%	N/A
Availability SLA	99.9%	99%	N/A
Minimum Object Size	N/A	128KB*	N/A
Minimum Storage Duration	N/A	30 days	90 days
Retrieval Fee	N/A	per GB retrieved	per GB retrieved**
First Byte Latency	milliseconds	milliseconds	select minutes or hours***
Storage Class	object level	object level	object level
Lifecycle Transitions	yes	yes	yes



Charges based on ?

- Storage
- Requests
- Storage management pricing (tags)
- Data transfer pricing
- Transfer acceleration



What is transfer acceleration ?

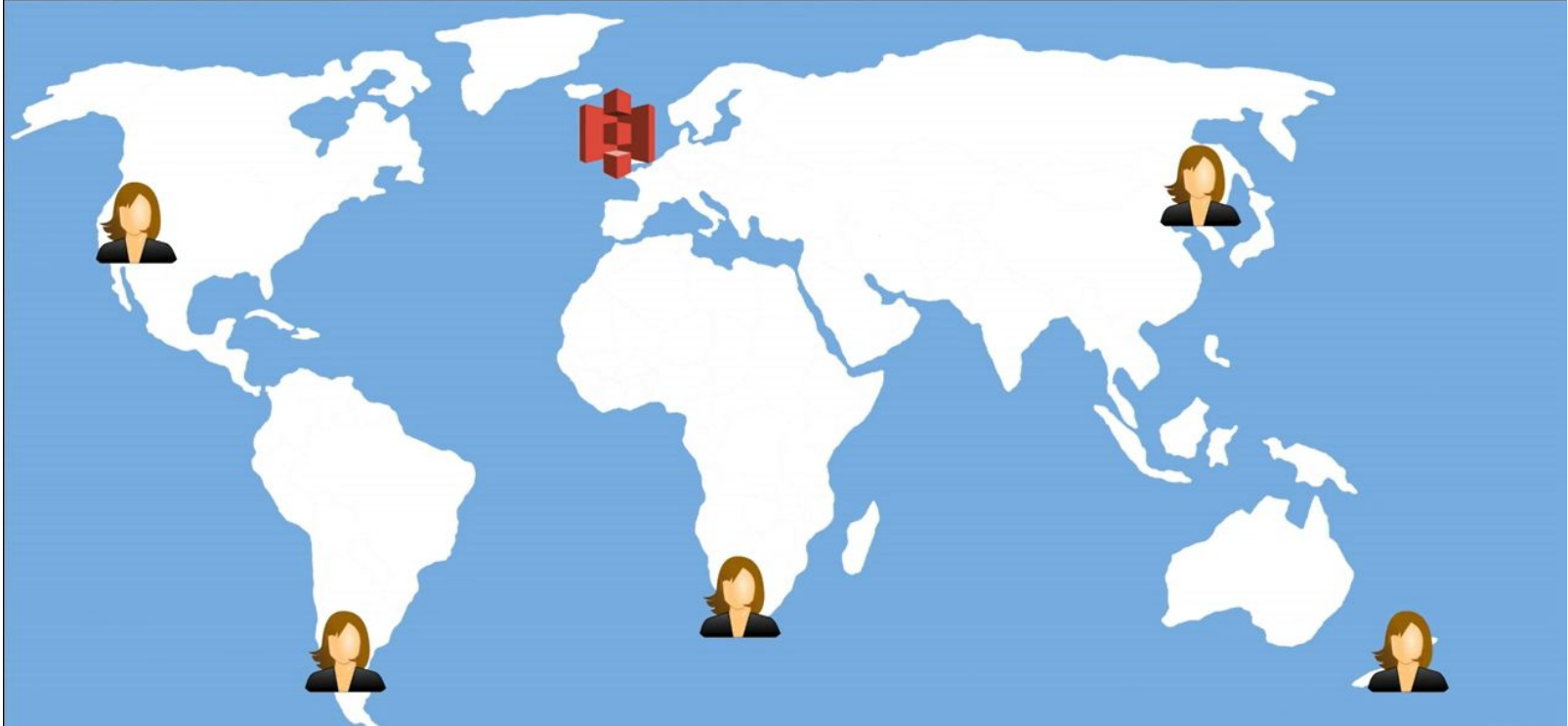
- Amazon S3 Transfer Acceleration enables fast, easy, and secure transfers of files over long distances between your client and an S3 bucket.
- Transfer Acceleration takes advantage of Amazon CloudFront's globally distributed edge locations.
- As the data arrives at an edge location, data is routed to Amazon S3 Bucket over an optimized network path.

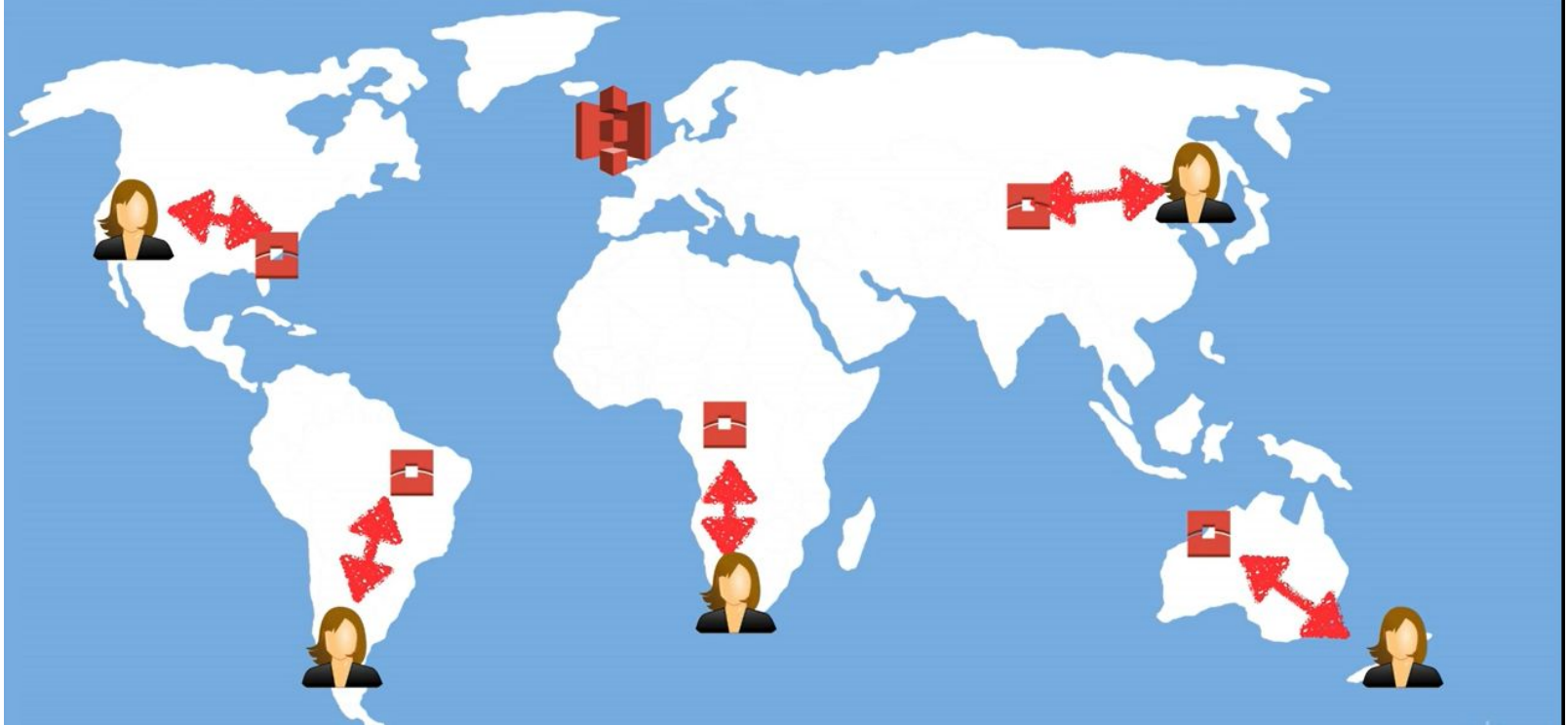
Why Use Amazon S3 Transfer Acceleration?

- Customers want to upload to a centralized bucket from all over the world.
- Transfer gigabytes to terabytes of data on a regular basis across continents.
- You are unable to utilize all of your available bandwidth over the Internet when uploading to Amazon S3.

To check the S3 Transfer Acceleration Speed :

<https://s3-accelerate-speedtest.s3-accelerate.amazonaws.com/en/accelerate-speed-comparsion.html>

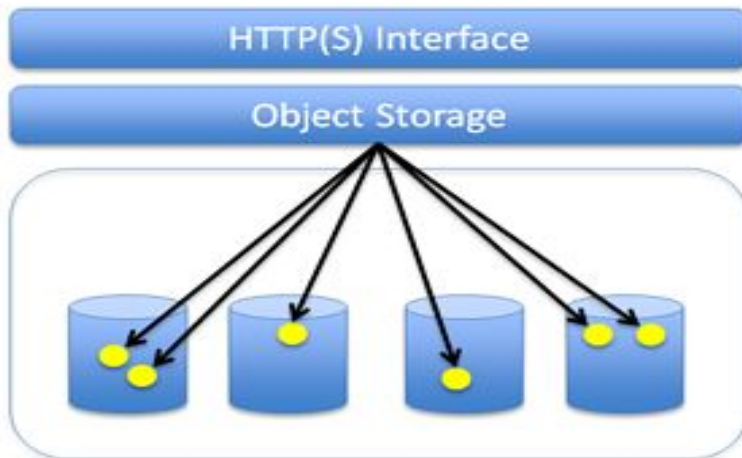




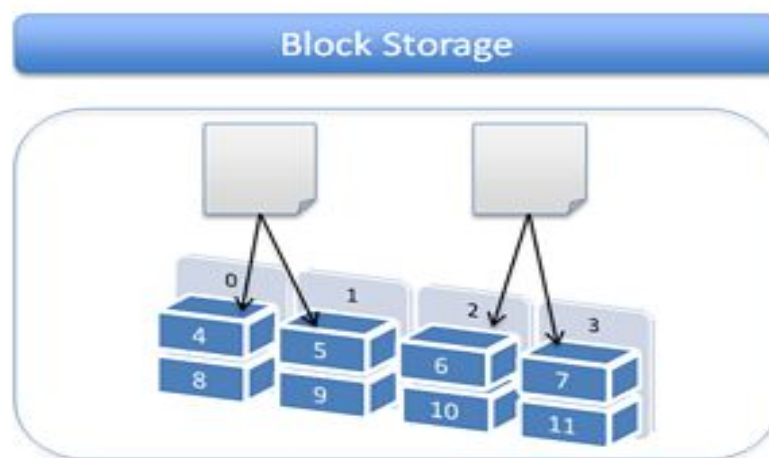
S3 and EBS

	Performance	Availability and Accessibility	Access Control	Storage and File Size Limits	Cost
Amazon S3	<ul style="list-style-type: none"> - Supports 3500 PUT / LIST / DELETE requests per second - Scalable to 5500 GET requests per second 	<ul style="list-style-type: none"> - Usually 99.9% available - If lower, returns 10-100% of cost as service credits - Accessible via Internet using APIs 	<ul style="list-style-type: none"> - Access is based on IAM - Uses bucket policies and user policies - Public access via Block Public Access 	<ul style="list-style-type: none"> - No limit on quantity of objects - Individual objects up to 5TB 	<ul style="list-style-type: none"> - Free tier: 5GB - First 50 TB/month: \$0.023 per GB - Next 450 TB/month: \$0.022 per GB - Over 500 TB/month: \$0.021 per GB
AWS EBS	<ul style="list-style-type: none"> - HDD volumes: 250-500 IOPS/volume depending on volume type - SSD volumes: 16-64K IOPS/volume 	<ul style="list-style-type: none"> - 99.99% available - Accessible via single EC2 instance 	<ul style="list-style-type: none"> - Security groups - User-based authentication (IAM) 	<ul style="list-style-type: none"> - Max storage size of 16TB - No file size limit on disk 	<ul style="list-style-type: none"> - Free tier: 30GB - General Purpose: \$0.045 per GB/month - Provisioned SSD: \$0.125 per GB/month, \$0.065 per IOPS/month

S3 and EBS



- Store virtually unlimited files.
- Maintain file revisions.
- HTTP(S) based interface.
- Files are distributed in different physical nodes.



- File is split and stored in fixed sized blocks.
- Capacity can be increased by adding more nodes.
- Suitable for applications which require high IOPS, database, transactional data.



Questions?

