



AWS S3





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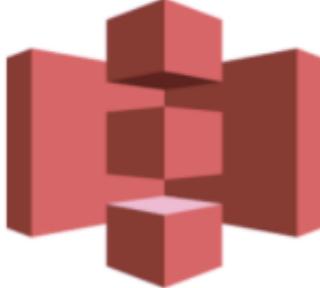
Introduction to S3



▶ Introduction to S3



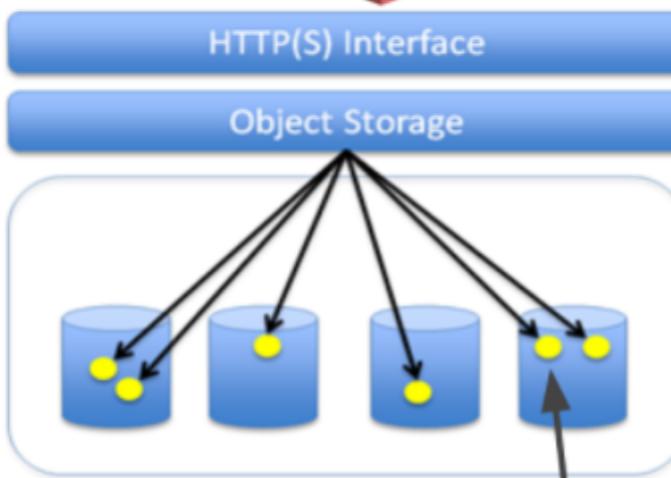
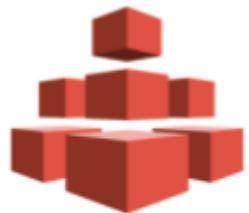
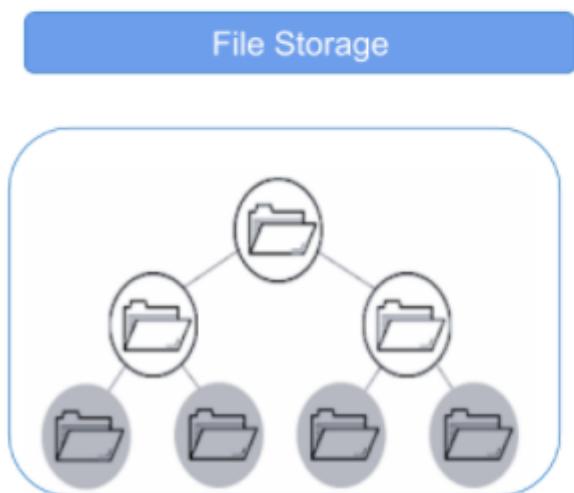
What is S3?



- S3 stands for Simple Storage Service.
- One of AWS's oldest services, Amazon S3 could be defined as AWS object-based file storage service.
- Amazon S3 offers industry-leading scalability, data availability, security, and performance.
- Bucket and object are the two key components of the S3.

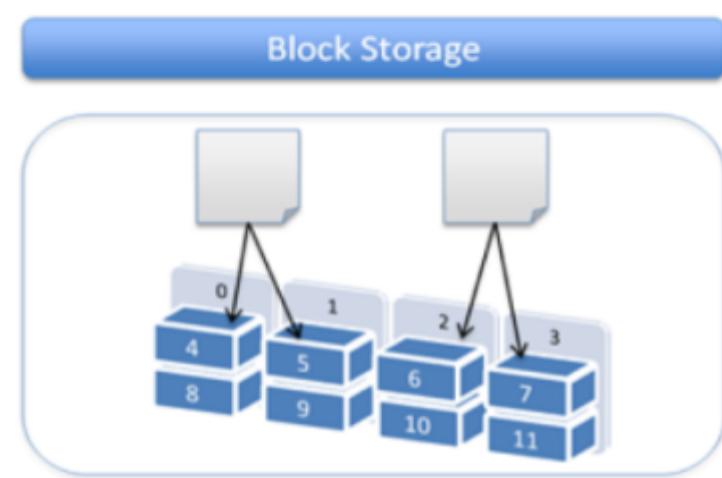
Introduction to S3

Storage Options



Object=
File+
Unique ID+
Metadata+

- 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.



▶ Introduction to S3

What is S3 Bucket?



- A bucket is a logical storage unit used to store objects in AWS.
- A bucket can also be considered as a container.
- To upload data to the Amazon S3, you need to create a bucket first. Then any number of objects can be added into that bucket.

Introduction to S3

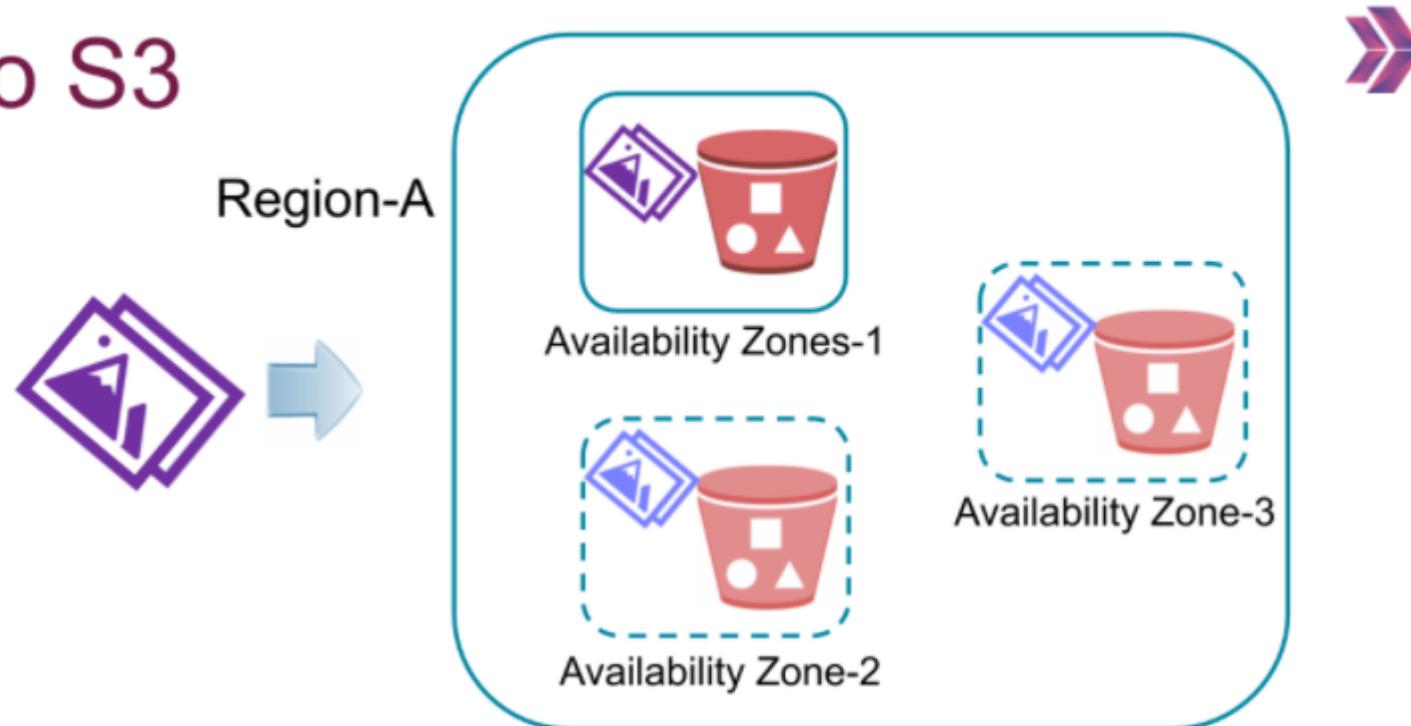
S3 Bucket



- Amazon S3 stores data in buckets as objects.
- The number of objects that can be stored in a bucket is not limited, but each AWS account can only have 100 buckets at once.
- Since S3 is a global service, bucket's name must be unique.

Introduction to S3

S3 Bucket



- S3 is a global service, but a **region must be selected** when creating a bucket.
- When you store anything in S3 Amazon S3 store your objects on multiple devices across a minimum of **3 Availability Zones (AZs)** in an Amazon S3 Region.

Introduction to S3



What is an Object in S3?



- Any kind of file such as a text file, photo, video, etc. stored in bucket is called an **Object**.
- An **unlimited number** of data objects can be added to a bucket.
- The max size of **a single file** in a bucket is **5 TB**.
- It means you can put millions of files into S3 bucket, each not exceeding 5 TB capacity

Introduction to S3

Object in S3-Upload



Up to 160 GB



Over 160 GB

- The max. size of an object you can upload via [AWS Management Console](#) is 160 GB.
- For uploading a file [greater than 160 GB](#), the AWS CLI, AWS SDK, or API is needed to be used.
- Objects can also be [moved to a created folder](#) in S3.

Introduction to S3

S3 Object Pricing

Upload



Download



Storage



Request



Transferring in
the same Region



- Uploading an object in the bucket is free of charge.
- On the contrary with the uploading - downloading from Amazon S3 costs.
- Objects are charged as long as they are stored in the bucket.
(GB/month: \$0.023 per GB e.g.)
- AWS charges you for the requests as well. For example; While 3-rd party software like your web site accessing (GET, LIST, DELETE and so on.) a picture stored in S3. (\$0.005 per 1000 requests e.g.)



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Storage Classes

Storage Classes

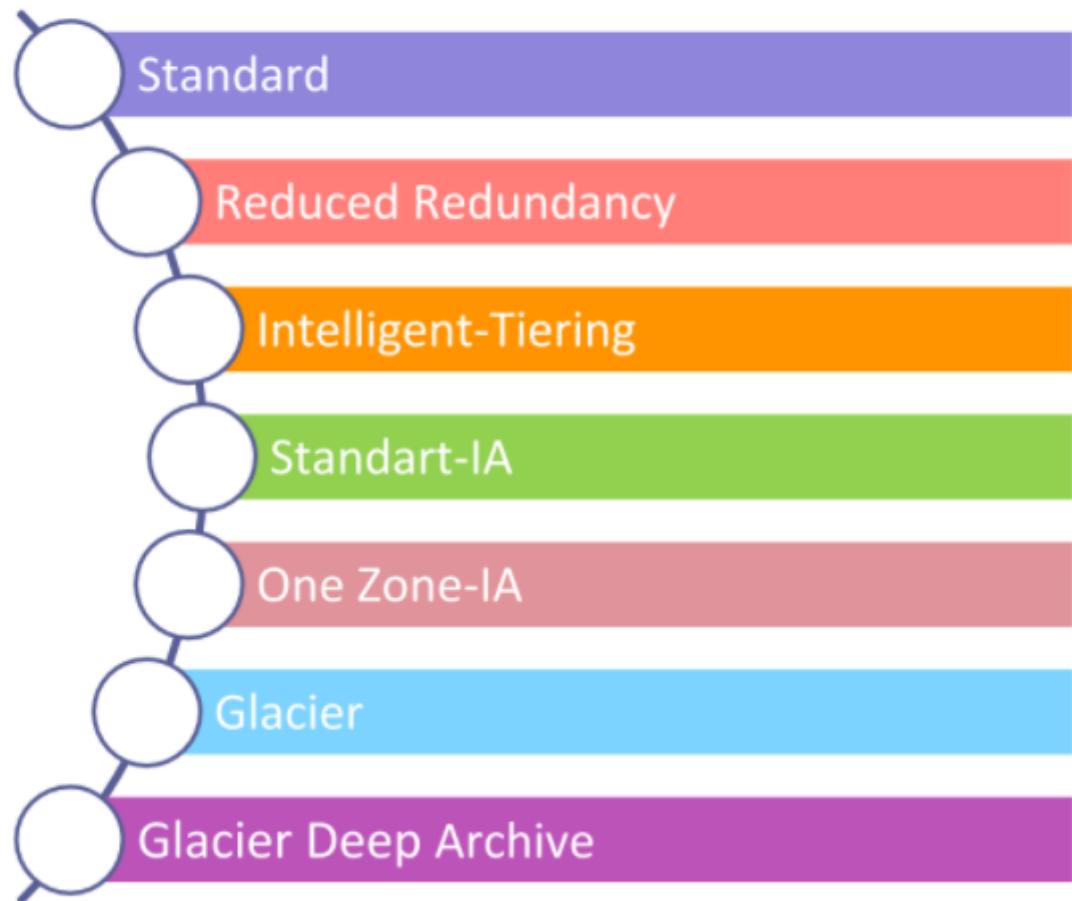
What is Storage Class?



- Amazon Storage class is a components used to determine the storage rules of object.
- You choose a class depending on your use case scenario and performance access requirements.
- There are currently 7 types of Storage Classes in AWS.

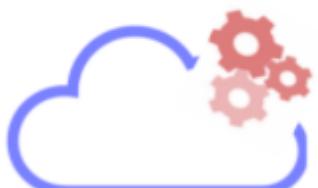
Storage Classes

Types of Storage Classes



► Storage Classes

Standard Class



Cloud Applications



Mobile Games



Website Hosting



- Standard is the **default** storage class unless you change
- This is the basic storage solution for **frequently accessed** data
- Provides high capacity and **low latency**.
- Reliability at **99,99999999%**
- Availability at **99,99%**
- Cloud applications and web-services, mobile games and website hosting are some example of use case

► Storage Classes

Reduced Redundancy (RRS)

Uncritical Data



- RRS class offering less redundancy is a modified version of Standard storage class
- It is designed for noncritical and reproducible data
- The main difference between RRS and Standard class is reliability
- While reliability of Standard storage class is at 99,99999999% level, reliability of RRS class is at 99,99 % level
- It provides cost saving compare to Standard class for the uncritical data.

Storage Classes

Standard IA (Infrequent Access)

Infrequently
Accessed Data



- As the name suggest, Standard IA (Infrequent Access) is a convenient for **infrequently accessed files**
- But in case of access, it provides you to reach the file **quickly**.
- In fact, it designed for the data which requires less frequent access, but with **longer storage time than Standard class**
- It is **cheaper than Standard class if you** access infrequently.
- So it is best practice to use Standard IA if you need to access data once a year

Storage Classes

One Zone IA (Infrequent Access)

Infrequently Accessed
& Noncritical Data

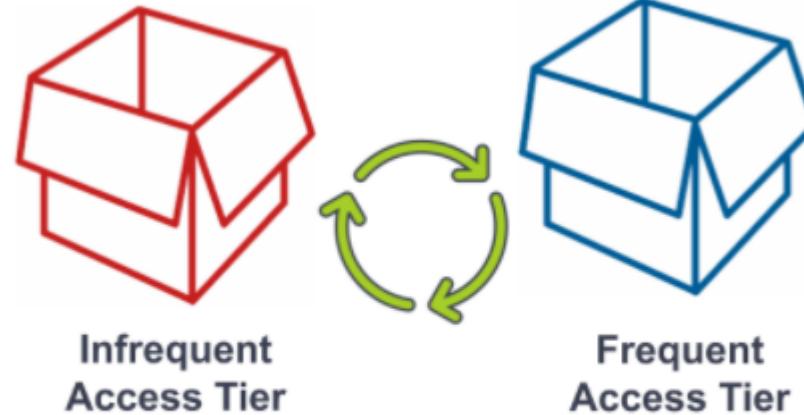


- One Zone IA class is a modified version of Standard IA.
- It is 20 percent cheaper than Standard IA due to less availability.
- Unlike others, One Zone IA stores data only in one availability zone, instead of three availability zones
- One-Zone IA can be preferred when you have infrequently accessed and noncritical files

Storage Classes

Intelligent Tier

Unpredictable
Access Patterns

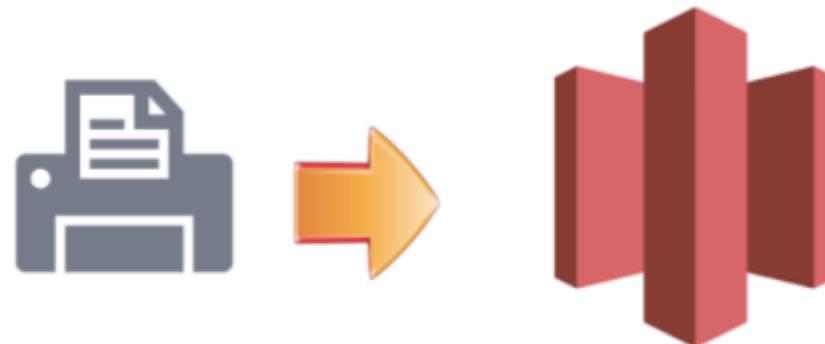


- It is designed to optimize storage costs by automatically moving data to the most cost-effective storage access tier.
- It stores objects in two access tiers: one tier that is optimized for frequent access and another lower-cost tier that is optimized for infrequently accessed data.
- It is ideal, if your access patterns are unknown or unpredictable.
- If an object in the infrequent access tier is accessed, it is automatically moved back to the frequent access tier. No additional tiering fees apply when objects are moved between access tiers within the S3 Intelligent-Tiering storage class.

Storage Classes

Amazon Glacier

Archives & Backup
Copies of Databases



- It is a perfect solution for long-term storage and data archiving that doesn't require instant access.
- In fact, Amazon Glacier is an independent service from S3
- Minimum storage duration period is 90 days and can be accessed at least in 1-5 minutes
- If you have deleted, overwritten, or transitioned to a different storage class an object before the 90-day minimum, you are charged for 90 days.

Storage Classes



Amazon Glacier Deep Archive

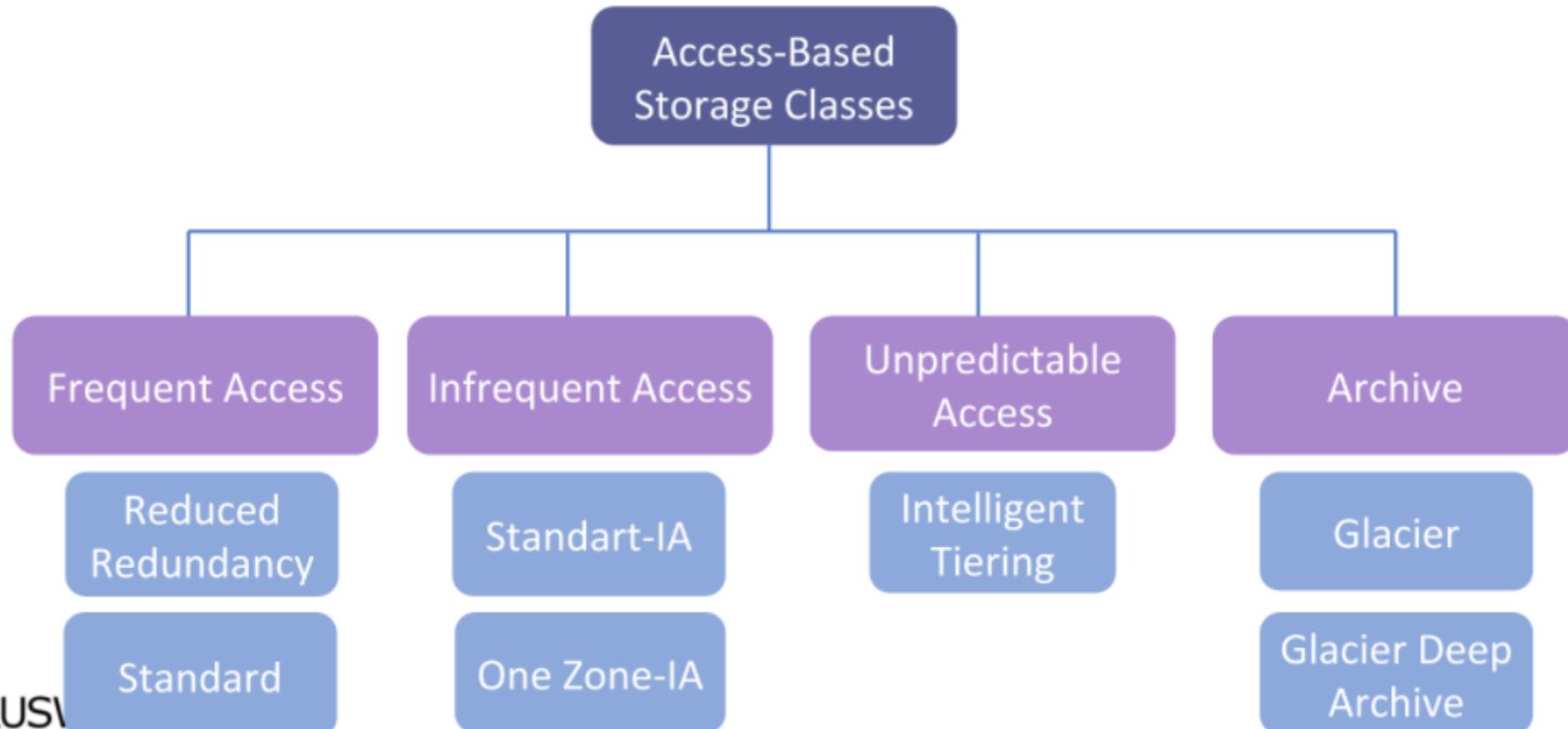
Infrequently Accessed
& Noncritical Data



- It is used for archiving data that rarely need to be accessed.
- It is the lowest cost storage option in AWS.
- The fastest retrieval time is up to 12 hours.
- You can reduce retrieval costs by using bulk retrieval, which returns data within 48 hours.
- Minimum storage duration period is 180 days and a default retrieval time of 12 hours. If you interact with the object in 180 you'll be charged for 180 days.

Storage Classes

Summary of Storage Classes





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Versioning

Versioning

What is Versioning?



- Versioning is a way to keep multiple versions (deleted and changed versions) of an object in a bucket.
- Each time an object in a bucket changed deleted a new version of the object would be created and act as a new current version.
- By using versioning, all unwanted user behavior and program errors can be quickly recovered.

Versioning

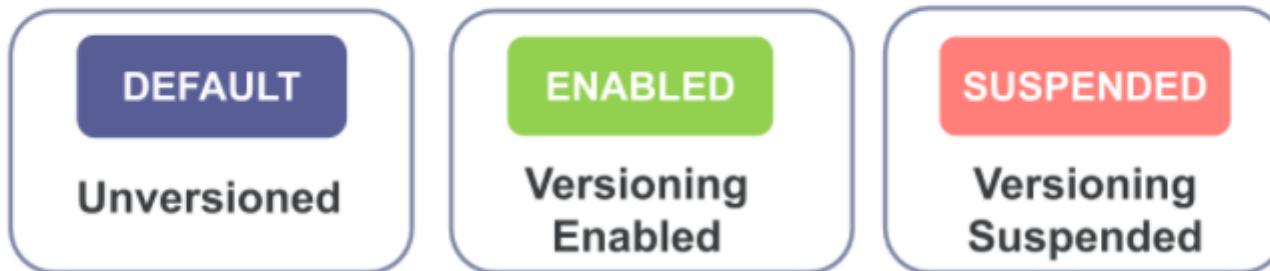
What is Versioning?



- Versioning is **bucket-based** component. Versioning can only be applied to buckets, not objects.
- But, if you enable versioning for the bucket, it **interact all objects** in the bucket.

Versioning

States of Versioning



- There are three states of versioning; Unversioned(the default), Versioning Enabled and Versioning Suspended.
- The first time you enable a bucket for versioning, objects in it are thereafter always versioned and given a unique version ID.
- Once you enable versioning on a bucket, it can never return to an unversioned state.
- You can, however, suspend versioning on that bucket.

Versioning

Enabling Versioning

Amazon S3 > awsdevopsteam.com

awsdevopsteam.com

Overview Properties Permissions Management Access points

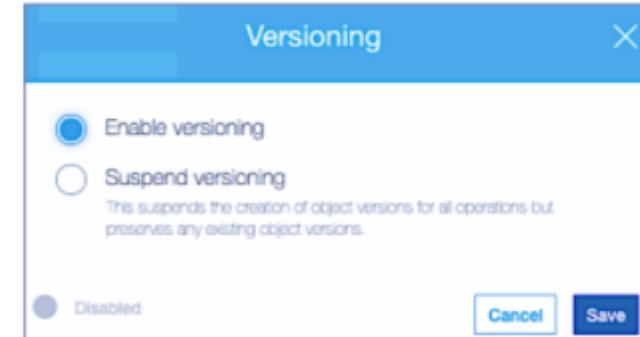
Versioning
Keep multiple versions of an object in the same bucket.
Learn more
Disabled

Server access logging
Set up access log records that provide details about access requests.
Learn more
Disabled

Static website hosting
Host a static website, which does not require server-side technologies.
Learn more
Disabled

Object-level logging
Record object-level API activity using the CloudTrail data events feature (additional cost).
Learn more
Disabled

Default encryption
Automatically encrypt objects when stored in Amazon S3
Learn more
Disabled



Enabling Versioning Path

S3>Bucket>**Properties**>Versioning



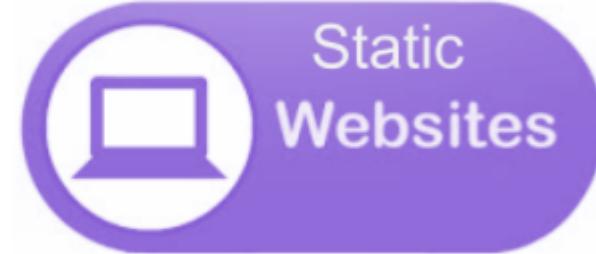
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S3 Static Website Hosting

S3 Static Website Hosting



What is Static Website Hosting?



- Static Website Hosting is an exhibiting website that contains simple web components.
- Static websites contain only static resources such as HTML, CSS, images, etc.
- So, it doesn't need server, database or any application code.
- For example, aws.amazon.com and clarusway.com are dynamic website. If they were a static website, you couldn't run any applications on these websites.
- A static website provides exactly the same content on each request.

S3 Static Website Hosting

Static Website Hosting - Steps





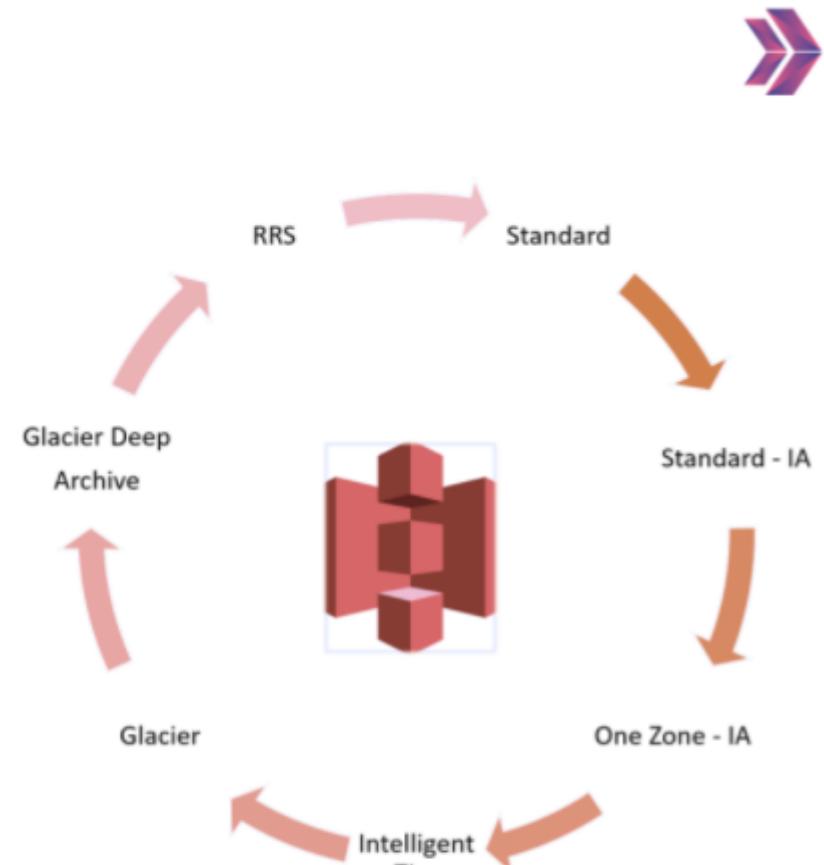
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Lifecycle Management

Lifecycle Management

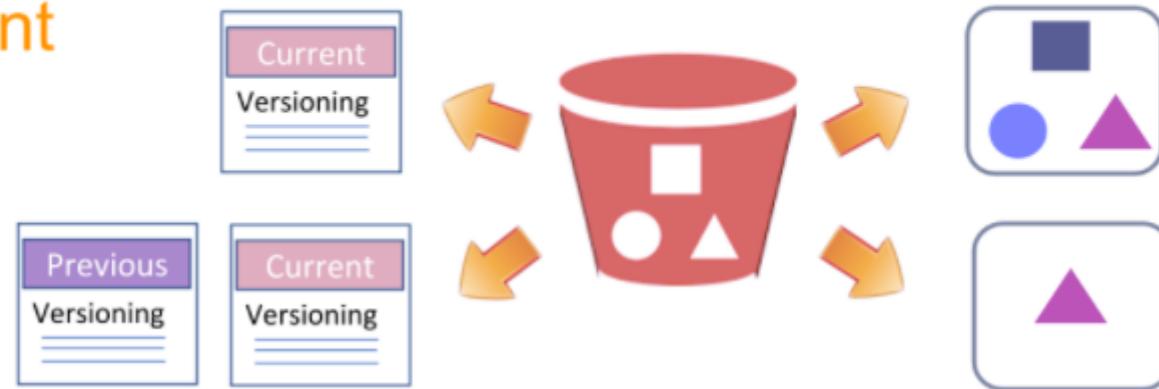
What is Lifecycle Management?

- Lifecycle management is to determine how an object will be subject to a **storage policy** during the time it is stored in S3.
- So, it is used to ;
 - Transition objects to another storage class,
 - Archive objects,
 - Delete objects after a specified period of time.



Lifecycle Management

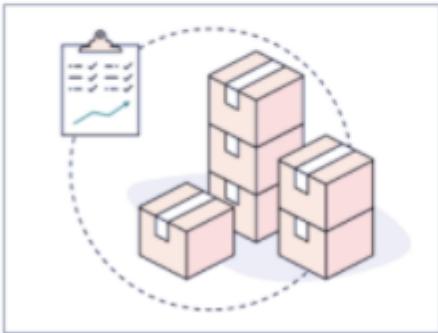
Lifecycle Management



- A lifecycle policy is **bucket-base component**. If you apply lifecycle policy to bucket it interacts **all objects**
- But, by using a prefix (that is, objects with names that begin with a common string), you can also apply lifecycle policy to **subset of objects** in the bucket
- You can also define lifecycle policy for both **current and previous** versions of objects which are stored in **versioning-enabled bucket**.

Lifecycle Management

Advantage of Lifecycle Management



- It provides you to **arrange your S3 inventory**,
- You can **save money** by transition the objects to the cost-effective storage class,
- You can **get rid of redundant objects**,
- It provides **archiving** objects.

Lifecycle Management

Enabling Lifecycle Management

The screenshot shows the Amazon S3 console with a bucket named "new-otto-deneme". The "Management" tab is selected in the top navigation bar. Under the "Lifecycle" tab, there is a button labeled "+ Add lifecycle rule". Below this, there are three icons: a computer monitor with a gear, two stacked cylinders with a gear, and a bucket with a gear, each with associated text: "Use lifecycle rules to manage your objects", "Automate transition to tiered storage", and "Expire your objects". A large blue arrow points from the S3 interface to a "Lifecycle rule" configuration dialog on the right.

Amazon S3 > new-otto-deneme

new-otto-deneme

Overview Properties Permissions Management Access points

Lifecycle Replication Analytics Metrics Inventory

+ Add lifecycle rule Edit Delete Actions

There is no lifecycle rule applied to this bucket.
Here is how to get started.

Use lifecycle rules to manage your objects

Automate transition to tiered storage

Expire your objects

Lifecycle rule

1 Name and scope 2 Transitions 3 Expiration 4 Review

Enter a rule name
e.g Rule for archiving old objects

Choose a rule scope

Limit the scope to specific prefixes or tags

Apply to all objects in the bucket

Cancel Next

Lifecycle Management Path
S3>Bucket> **Management** > Lifecycle>Add a Lifecycle Rule



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Bucket Replication



Bucket Replication

What is Bucket Replication?



- Replication is to **copy** the objects in the buckets to **another bucket** in **different region** or in the **same region**.
- There are **2 types** of replication in S3:
 - **Cross-Region Replication (CRR)** is used to copy objects in different AWS Regions
 - **Same-Region Replication (SRR)** is used to copy objects in the same AWS Region

Bucket Replication

Replication Features



- AWS can keep object's metadata while replicating (Original creation time, version IDs., etc.)
- You can store replicated object in different storage class.
- Regardless of who owns the source object, you can change replicated object's ownership.
- Thanks to the S3 Replication Time Control (S3 RTC), you can replicate 99.99 percent of new objects within 15 minutes.

Bucket Replication



Why Replication?

- Although Amazon S3 stores your data across in 3 different Availability Zones by default, compliance requirements might dictate that you store data at even greater distances.
- You might be required to store multiple copies of your data in separate AWS accounts within a certain Region.
- If your customers are in two geographic locations, you can minimize latency by creating the replicated object close to the customer.
- If you store logs in multiple buckets you can aggregate logs into a single bucket.

Bucket Replication

How S3 Replication Works?



- 1- Select the Source Bucket,
- 2- Determine your replication policy,
- 3- Select your data set by object tag, prefix or entire bucket,
- 4- Select the Destination Bucket in the same region or in different region.

Bucket Replication

Creating Bucket Replication

Overview Properties Permissions Management Access points

Lifecycle Replication Analytics Metrics Inventory

+ Add rule Edit priorities Edit Delete Actions

You haven't created any replication rules for this bucket.

Cross-Region Replication
Cross-Region replication enables automatic and asynchronous copying of objects across buckets in different AWS Regions. Buckets configured for object replication can be owned by the same AWS account or by different accounts.
[Learn more](#)

Same-Region Replication
Same-Region replication enables automatic and asynchronous copying of objects across buckets in the same AWS Region. Buckets configured for object replication can be owned by the same AWS account or by different accounts.
[Learn more](#)

Get started

Replication rule

① Set source ② Set destination ③ Configure rule options ④ Review

Set source

Entire bucket new-otto-dename
 Prefix or tags

Replication criteria

Replicate objects encrypted with AWS KMS

Note: Your replication rule will be created using the new schema. Replication now has a new schema that supports replication based on prefixes, one or more object tags or a combination of the two. As part of the new schema, you can set overlapping rules with priorities. The new schema does not support delete marker replication, which would prevent any delete actions from replicating. [Learn more](#)

Cancel **Next**

Bucket Replication Path

S3>Bucket> **Management** > Bucket Replication >Add a Rule



THANKS!

Any questions?

You can find me at:

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- ▶ osvaldo@clarusway.com

