# S3 - simple storage services

Backup- m working on laptop and my hard disk crash so purchase new hard disk and take backup of old file to new . faster as possible immediate restore, frequently use, data not that much huge., disk store price is more for backup becz speed is concern, for both access and transfer and request file its chargeable-in aws s3

Archival- disaster recovery,not for frequent use,data retrive slow time take process,data will be large in size,disk store price is less.- in aws s3 glacier

S3 used for - Storing blobs

As a backup device

Static website

Media and streaming (s3 + cloud front + transcoder)

Vpc based on region

Subnet based on Availability Zone

S3 based on Region is global (when upload data try to make a copy in every AZ)

S3 has 2 fold costs:

1.Storage Costs

2.Access Costs(create, upload, view charge but delete is free)

HOT - Access data more frequently

Access cost is less but storage cost is high

COLD - Access data less frequently

Access cost is high but storage cost is less

Bucket is root folder (bucket name is unique)

Object is files

5 type Storage Class

	Storage class	Designed for	Availability Zones	Min storage duration	Min billable object size	Monitoring and automation fees	Retrieval fees
0	Standard	Frequently accessed data					
•	Intelligent-Tiering	Long-lived data with changing or unknown access patterns	≥3	30 days	5.	Per-object fees apply	T.
•	Standard-IA	Long-lived, infrequently accessed data	≥3	30 days	128KB	#	Per-GB fees apply
•	One Zone-IA	Long-lived, infrequently accessed, non-critical data	≥1	30 days	128KB	¥	Per-GB fees apply
•	Glacier	Archive data with retrieval times ranging from minutes to hours	≥3	90 days	40KB	7	Per-GB fees apply
•	Glacier Deep Archive	Archive data that rarely, if ever, needs to be accessed with retrieval times in hours	≥3	180 days	40KB		Per-GB fees apply
	Reduced Redundancy	Frequently accessed, non-critical	≥3				

# $S3 = \underline{S}imple \underline{S}torage \underline{S}ervice$

### What is S3

#### Simplified Definition:

An online, bulk storage service that you can access from almost any device.

#### AWS Definition:

"Amazon S3 has a simple web services interface that you can use to store and retrieve any amount of data, at any time, from anywhere on the web. It gives any user access to the same highly scalable, reliable, fast, inexpensive data storage infrastructure that Amazon uses to run its own global network of web sites. The service aims to maximize benefits of scale and to pass those benefits on to users."

#### S3 Basics:

#### Components and Structure:

- Basics: (1) S3 = Simple Storage Service
- (2) It is AWS's primary storage service.
- (3) You can store any type of file in S3.

- Buckets: (1) Root level "Folders" you create in S3 are referred to as buckets.
- (2) Any "subfolder" you create in a bucket is referred to as a folder.

Objects: (1) Files stored in a bucket are referred to as objects.

Regions:
(1) When you create a bucket, you must select a specific region for it to exist. This means that any data you upload to the S3 bucket will be physically located in a data center in that

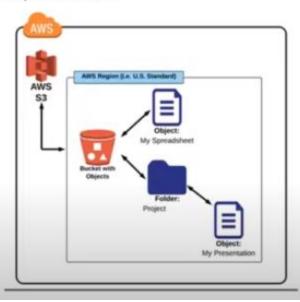
(2) Best practice is to select the region that is physically closest to you, to reduce transfer latency.

#### OR

(3) If you are serving files to a customer based in a certain area of the world, create the bucket in a region closest to your customers (to reduce latency for your customers).



#### Components & Structure.









#### Pricing/Cost Overview:

Free Tier use is available for S3.

#### How are you charged for using \$3?

#### (1) Storage Cost:

-Applies to data at rest in S3

-Charged per GB used

-Price per GB varies based on region and storage class

#### (2) Request Pricing - moving data in/out of S3:

-PUT

-COPY

-POST

-LIST

-GET

-Lifecycle Transitions Request

-Data Retrieval

-Data Archive

-Data Restore

NOTE: Before doing any major usage of S3, you should make sure to review AWS's current pricing model to make sure you understand how much you will be required to pay.

#### Request method

Get - select or see, download file

Post - enter user, password, passing parameter

Put - profile pic,updating content,upload file

List - see all the content

Delete - delete a request

Head - to check all the content available or not

# **Buckets & Folders:**

### Bucket, Folder and Object Propeties:

- (1) Bucket Level Properties:
  - -General Info
  - -Permissions
  - -Static Web Hosting
  - -Logging
  - -Events
  - -Versioning
  - -Lifecycle
  - -Cross-Region Replication
  - -Tags
  - -Requester Pays
  - -Transfer Acceleration
- (2) Folder Level Properties:
  - -General Info
  - -Details
- (3) Object Level Properties:
  - -General Info
  - -Details
  - -Permissions
- -MetaData

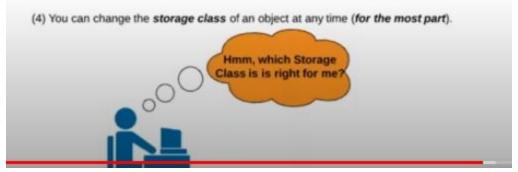
# S3 Storage Classes

### What is a storage class?

(1) A storage class represents the "classification" assigned to each Object in S3.

#### Availabile storage classes include:

- -Standard
- -Reduced Redundancy Storage (RRS)
- -Infrequent Access (S3-IA)
- -Glacier
- (2) Each storage class has varying attributes that dictate things like:
  - -Storage cost
  - -Object availibility
  - -Object durability
  - -Frequency of access (to the object)
- (3) Each object must be assigned a storage class ("standard" is the default class)



#### Standard:

- (1) Designed for general, all-purpose storage.
- (2) Is the default storage option.
- (3) 99.99999999% object durability ("eleven nines").
- (4) 99.99% object availability.
- (5) Is the most expensive storage class.

### Reduced Redundancy Storage (RRS):

- (1) Designed for non-critical, reproducible objects.
- (2) 99.99% object durability.
- (3) 99.99% object availability.
- (4) Is less expensive than the standard storage class.

### Infrequent Access (S3-IA):

- Designed for objects that you do not access frequently, but must be immediately available when accessed.
- (3) 99.999999999% object durability.
- (4) 99.90% object availability.
- (5) Is less expensive than the standard/RRS storage classes.

#### Glacier:

- (1) Designed for long-term archival storage.
- (2) May take several hours for objects stored in Glacier to be retrieved.
- (3) 99.99999999% object durability
- (4) Is the cheapest S3 storage class (very low cost)

# Object Durability

is the percent (%) over a one year time period that a file stored in S3 will **NOT** be lost.

For object durabilty of 99.99999999% (11 nines) that means there is a 0.00000001% chance of a file in S3 being lost in a year.

OR

If you have 10,000 files stored in S3 (@ 11 nines durabilty), then you can expect to lose one file 10 million years.

# **Object Availability**

Is the percent (%) over a one year time period that a file stored in S3 WILL be accessable.

For object availability of 99.99% - that means there is a 0.01% chance that you won't be able to access a file stored in S3 in a year.

OR

For every 10,000 hours, you can expect a total of one hour for which a file may not be available to access.

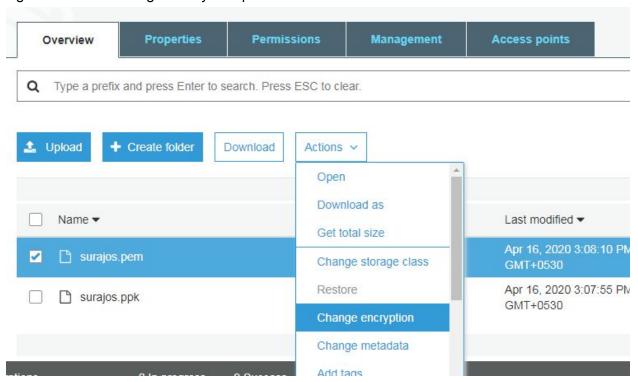
### Setting/changing storage class:

- (1) By default, all new objects uploaded to S3 are set to the Standard storage class
- (2) If you want new objects to have a differnet storage class, then you need to set the proper settings prior to or during the upload process. You can do this by either:
  - Selecting another storage class during the upload process ("set details").
  - -Using object lifecycle policies (covered in the next lesson).
- (3) For the following storage classes:
  - -Standard
  - -Reduced Redundancy Storage (RRS)
  - -Infrequent Access (S3-IA)

You can manually switch the objects storage class amoungts them (at any time) by changing the storage class in the objects "properties".

- (3) To move an object to the Glacier storage class:
  - -You need to use object lifecycles.
  - -The change to Glacier may take 1-2 days to take effect.

5 gb of standard storage is only free per month.



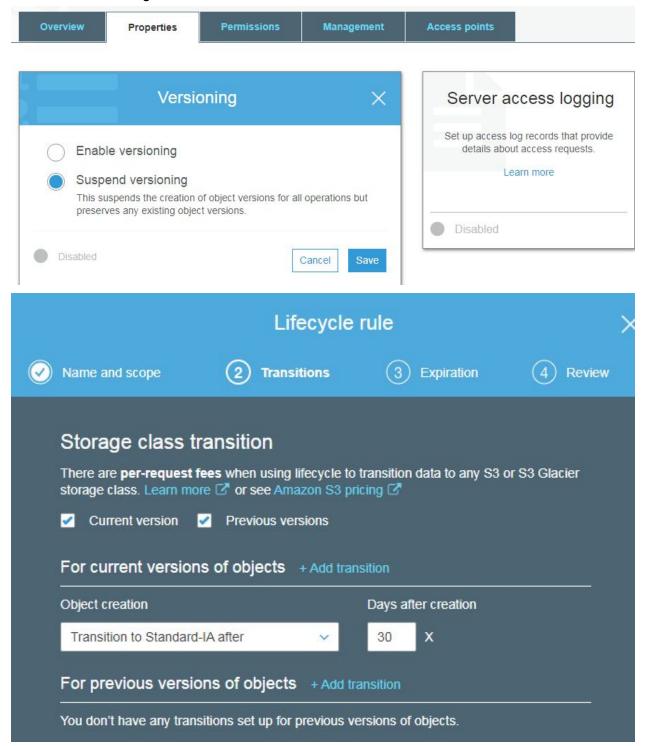
Versioning - maintain all the changes(by default its disable we can do enable)

Life cycle manage -

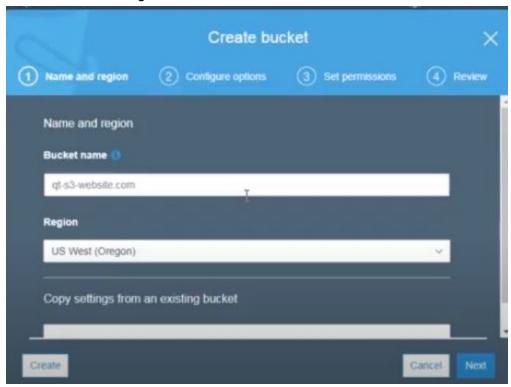
Storage class

Access permissions (public / private)

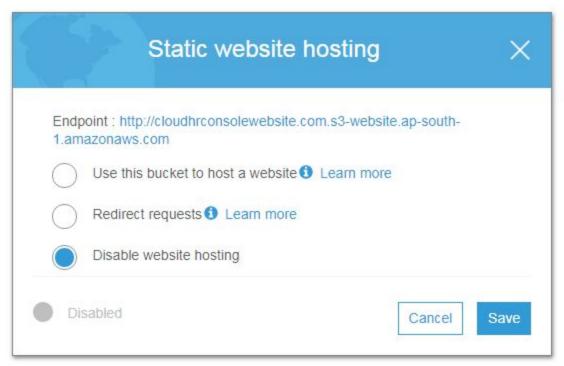
Static website hosting

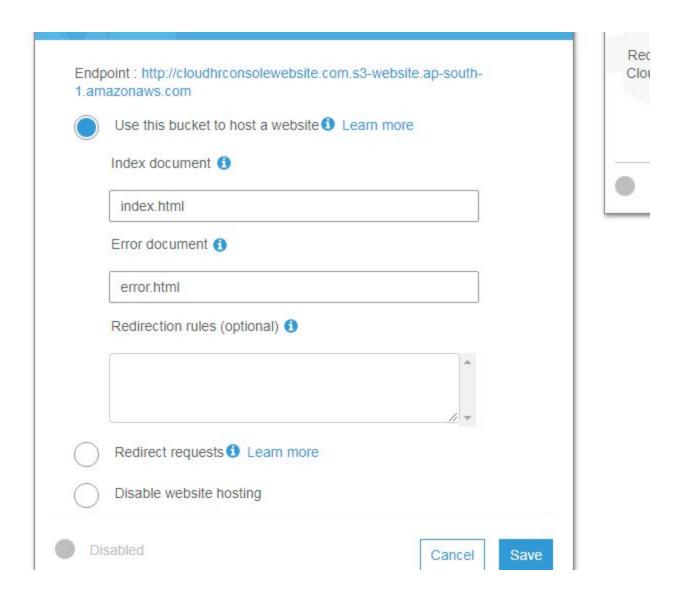


#### Static website hosting



Create bucket based on website name and upload index.html and error.html as object in this bucket and make it public access

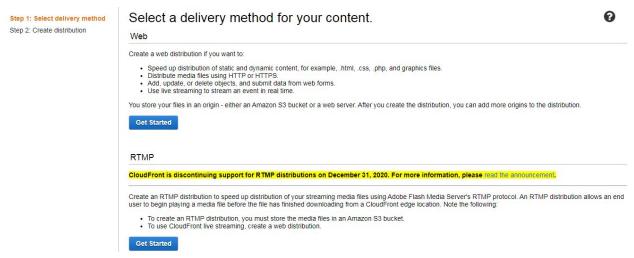




## **S3 Glacier**

it is an extremely low-cost storage service that provides secure, durable, and flexible storage for data backup and archival.

# **CloudFront**



Global content delivery network Select delivery method for your content and create distribution

#### Web

Create a web distribution if you want to:

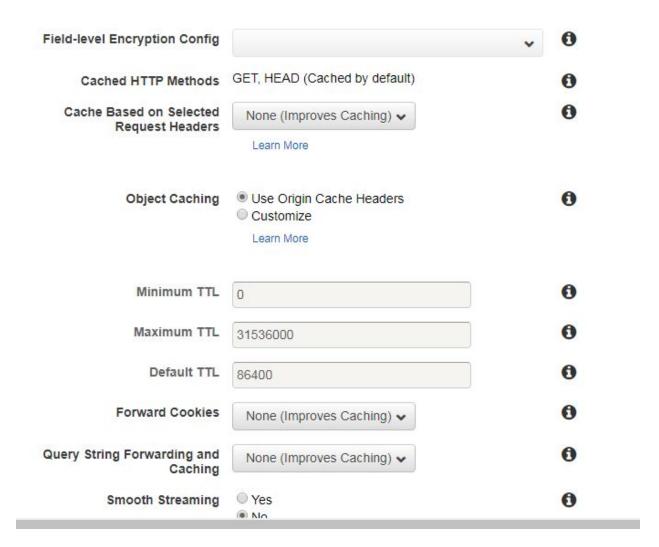
- Speed up distribution of static and dynamic content, for example, .html, .css, .php, and graphics files.
- Distribute media files using HTTP or HTTPS.
- Add, update, or delete objects, and submit data from web forms.
- Use live streaming to stream an event in real time.

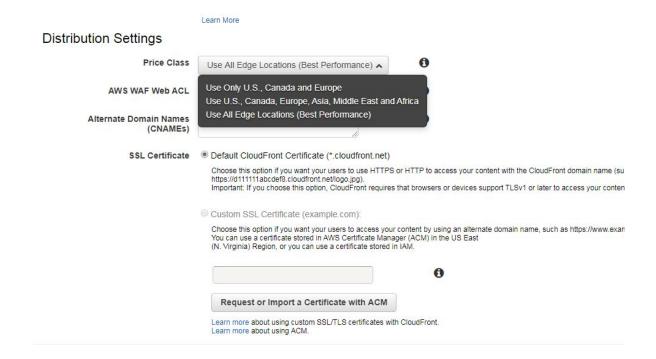
You store your files in an origin - either an Amazon S3 bucket or a web server. After you create the distribution, you can add more origins to the distribution

# **Create Distribution**

# Origin Settings

Origin Domain Name	cloudhrconsolewebsite.com.s3.amazona	0
Origin Path	J*	0
Origin ID	S3-cloudhrconsolewebsite.com/*	0
Restrict Bucket Access	○ Yes ● No	0
Origin Custom Headers	Header Name	Value
Default Cache Behavior S	PRODUCTION OF THE PRODUCTION O	
Path Pattern	Default (*)	0
Viewer Protocol Policy	HTTP and HTTPS     Redirect HTTP to HTTPS     HTTPS Only	0
Allowed HTTP Methods	● GET, HEAD	0





### RTMP (streaming video like live youtube video or fb vedio)

# CloudFront is discontinuing support for RTMP distributions on December 31, 2020. For more information,

Create an RTMP distribution to speed up distribution of your streaming media files using Adobe Flash Media Server's RTMP protocol. An RTMP distribution allows an end user to begin playing a media file before the file has finished downloading from a CloudFront edge location. Note the following:

- To create an RTMP distribution, you must store the media files in an Amazon S3 bucket.
- To use CloudFront live streaming, create a web distribution.

Note: if you use cloudfront it's more faster than s3 as per performance to get data.because it's closer to your proxy.(s3+cloudfront is fast storage)
Its charge based on request and its chargeable.

# **Backup Strategies in aws**

https://www.qualitythought.in/wp-content/uploads/2017/03/BackUp-Strategies.pdf

2 kind backup offline and online

Disaster recovery -

Onsite storage backup - storage area network SAN OR NAS network attached storage only for backup, Basically All of backup taken to nas and nas archive to the cloud.

Magnetic Tape backup

Offsite backup -stored in other location or outside office,

#### Onsite-Offsite Backups

Both options can be used to counteract some of their disadvantages.

For example: By having data offsite in addition to onsite, we can protect against disastrous events. The data is replicated in multiple locations, so if a fire or other event occurred, we could still recover the data from the other geographically separated location.

Having data onsite can also speed up recovery times and transfer times, since we wouldn't have to transfer massive amounts of data through the open Internet or through dedicated connections in order to recover data in the event of an issue.

#### Security of data

KMS (create private key with owner and public key with aws)- data at rest Encrypt data and send it to aws s3 and when you need to download it and decrypt but it's time consuming.

https:// - its helps to secure data

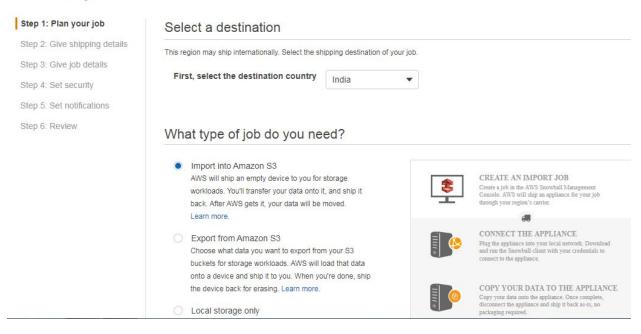
# **Snowball**

Large scale data transport (temporary storage)

AWS Snowball is a service used to transfer data into the cloud at faster-than-Internet speeds or harness the power of the AWS Cloud locally using AWS-owned appliances.

Create Job-Plan your job-give shipping details-give job details-set security-set notifications -review

### Create a job



# **EFS- Elastic file system**

(mount multiple space share) like network drive in AZ

Copy the file content of one region to another region we use efs or file share.

Configure network access

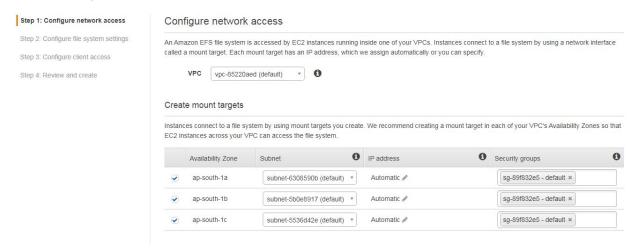
Configure file system settings

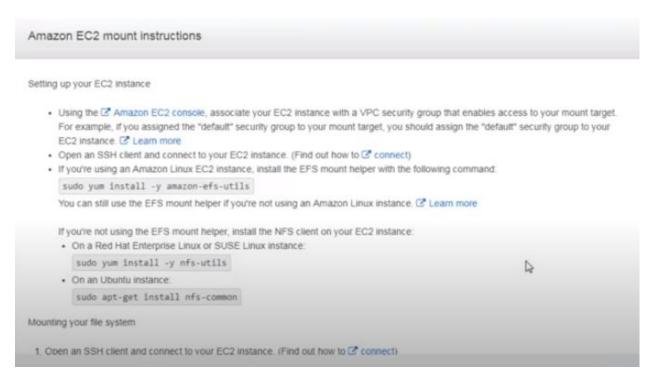
Configure client access

Review and create

We can use for aws data sync and aws backup

Create file system





#### https://docs.aws.amazon.com/efs/latest/ug/wt1-test.html

```
package(s) needed for security, out of 12 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-1-51 ~]$ sudo su -
[root@ip-172-31-1-51 ~]# aws s3 ls
2017-04-28 14:03:55 rgvproject
2017-06-07 02:11:01 valaxyinfotech
2017-04-24 03:06:23 valaxywebsites
[root@ip-172-31-1-51 ~] # aws s3 mb valaxyinfotech01
<S3Uri>
Error: Invalid argument type
[root@ip-172-31-1-51 ~]# aws s3 mb s3://valaxyinfotech01
make_bucket: valaxyinfotech01
[root@ip-172-31-1-51 ~] # aws s3 rb valaxyinfotech01
Error: Invalid argument type
[root@ip-172-31-1-51 ~] # aws s3 rb s3://valaxyinfotech01
emove_bucket: valaxyinfotech01
```

#### Access S3 buckets from EC2 instances with IAM role

https://www.youtube.com/watch?v=NHAuCWIHevk

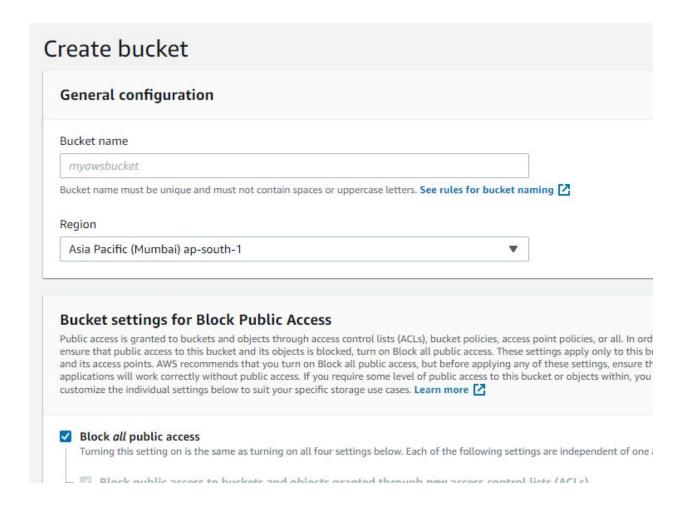
#### Install AWSCLI in Linux instance

Lunch redhat ec2 instance and connect

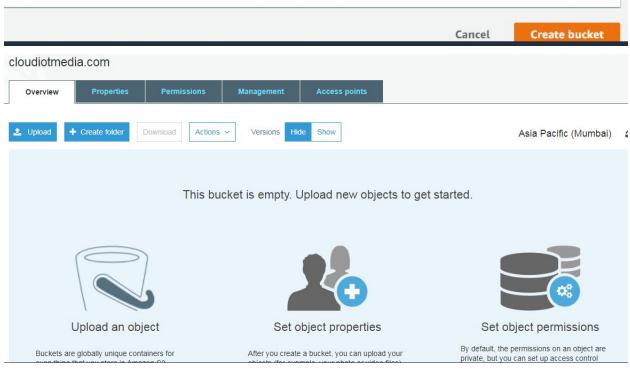
### How to install AWSCLI in Linux instance

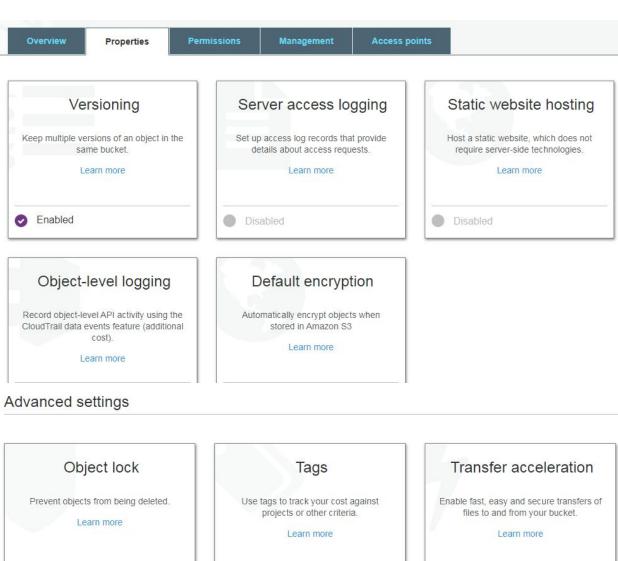


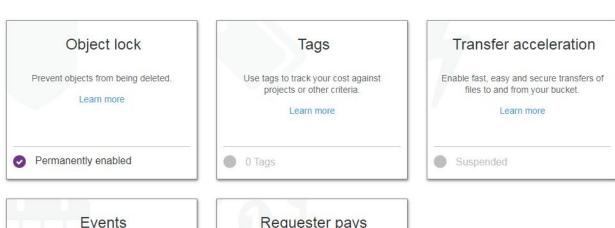
https://www.youtube.com/watch?v=Dx1WSKcJTgE



 Block public access to buckets and objects granted through any access control lists (ACLs) S3 will ignore all ACLs that grant public access to buckets and objects. Block public access to buckets and objects granted through new public bucket or access point policies S3 will block new bucket and access point policies that grant public access to buckets and objects. This setting doesn't change any existing policies that allow public access to S3 resources. Block public and cross-account access to buckets and objects through any public bucket or access point policies S3 will ignore public and cross-account access for buckets or access points with policies that grant public access to buckets and objects. Advanced settings Object Lock Store objects using a write-once-read-many (WORM) model to help you prevent objects from being deleted or overwritten for a fixed amount of time or indefinitely. Learn more Disable Enable Permanently allows objects in this bucket to be locked. Additional configuration is required after bucket creation to protect objects in this bucket from being deleted or overwritten. Enabling Object Lock automatically enables Bucket Versioning. **Create bucket** Cancel









#### Block public access (bucket settings)

Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In orde objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to individual settings below to suit your specific storage use cases. Learn more

