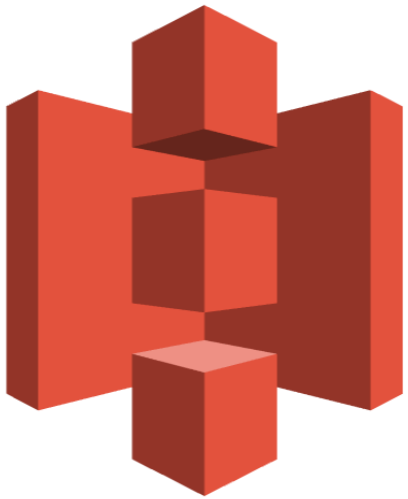


S3


Bucket

Bucket with Objects

# Topics to be covered—S3

1) S3 Introduction

2) Creating Bucket

3) Uploading different files and accessing it

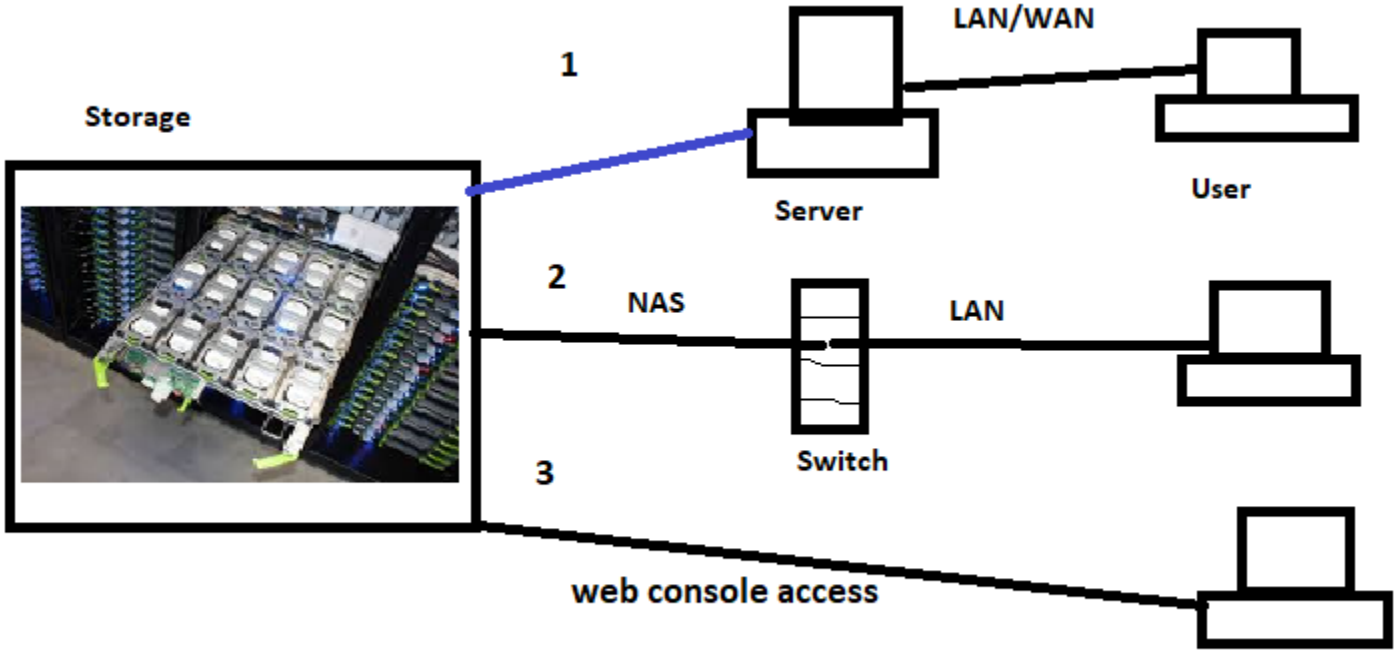
4) Cross region replication (CRR)

5) Versioning

6) Bucket Policy

7) Bucket ACL

8) AWS Free tier limit

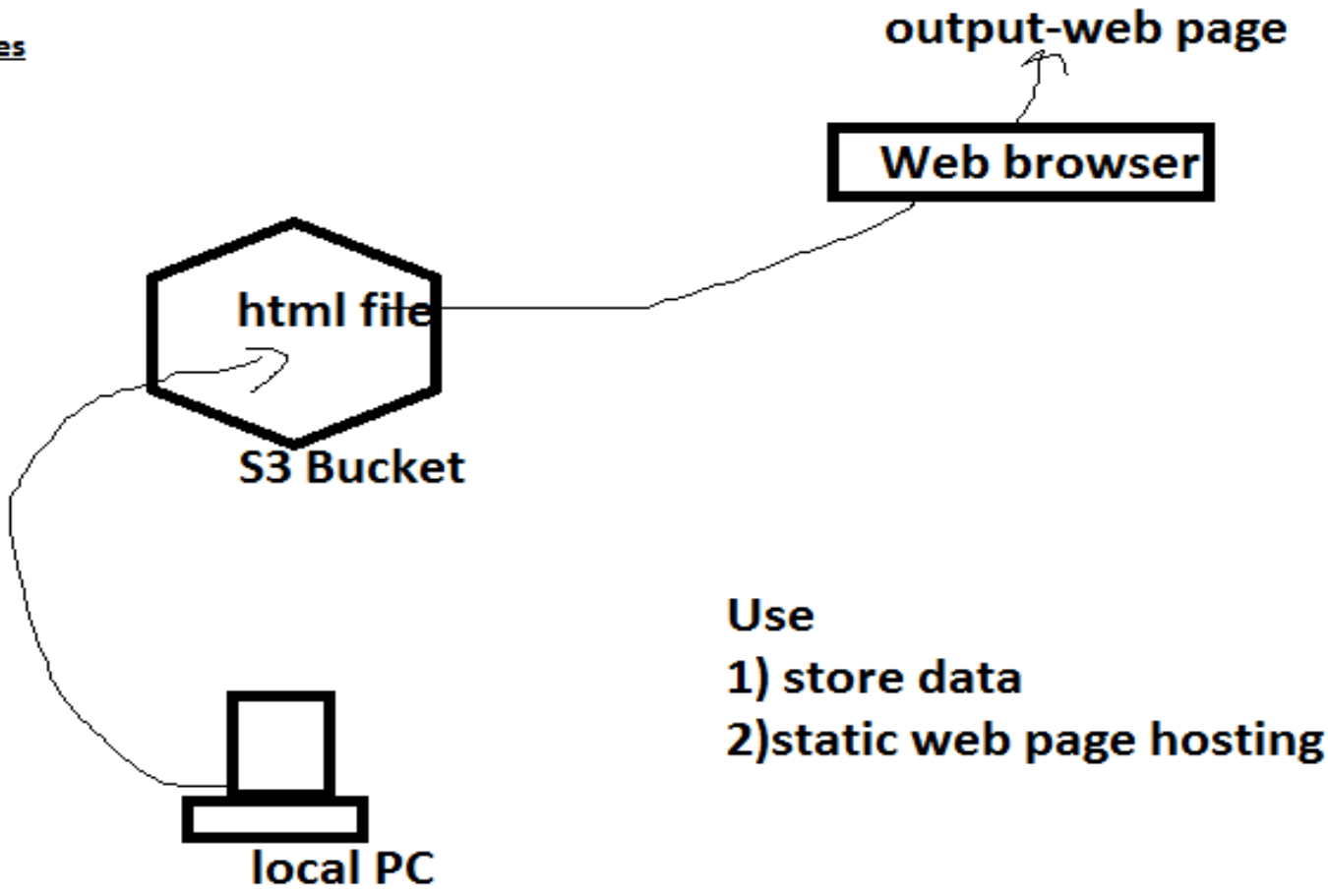

Storage
1
LAN/WAN
Server
User
2
NAS
LAN
Switch
3
web console access

# What is Amazon S3

- Amazon Simple Storage Service is storage for the Internet.
- It is designed to make web-scale computing easier for developers.
- 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 developer 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 developers.

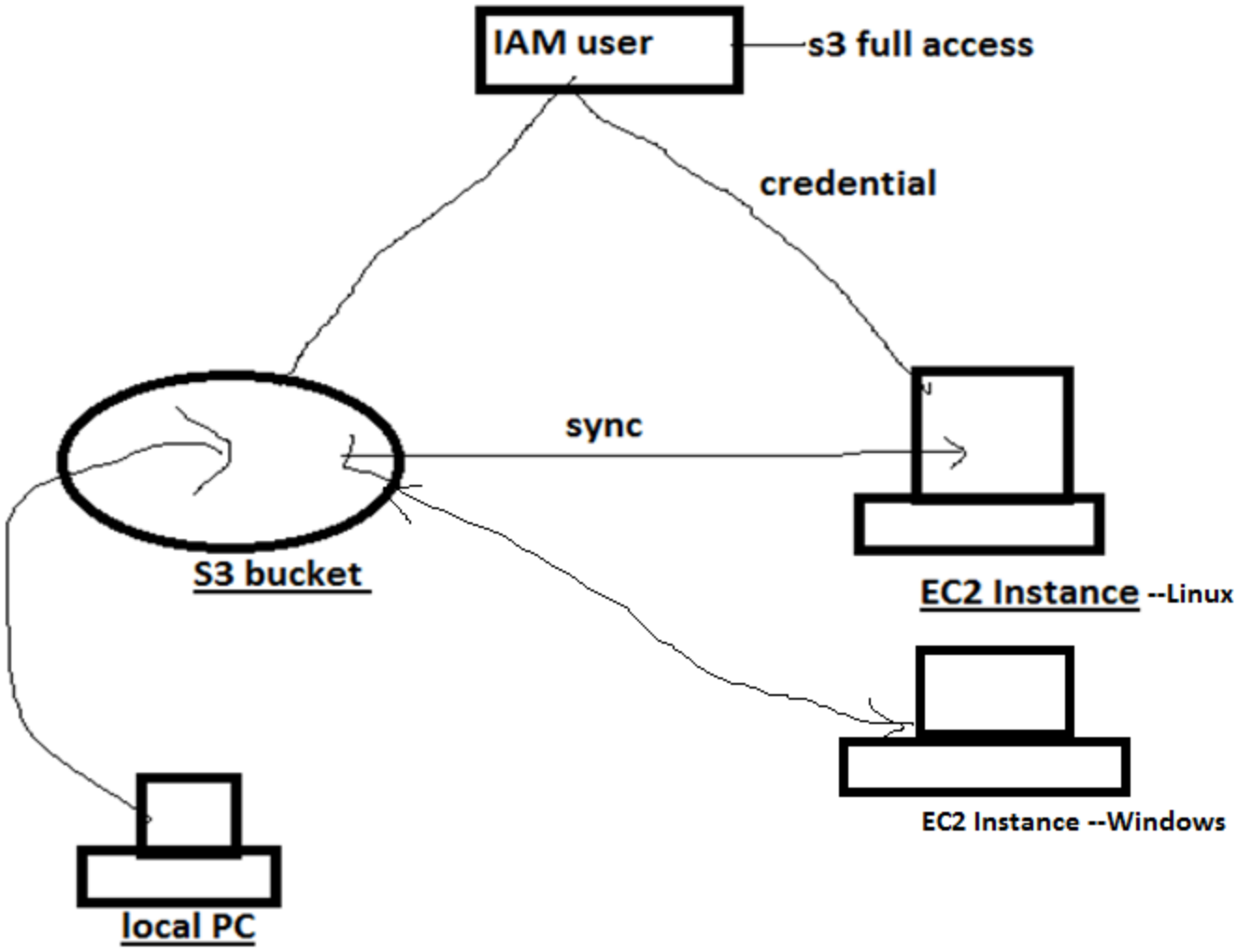
# S3 --Simple Storage Service

**Suitable files**
.html files
.pdf files
.mp4 files

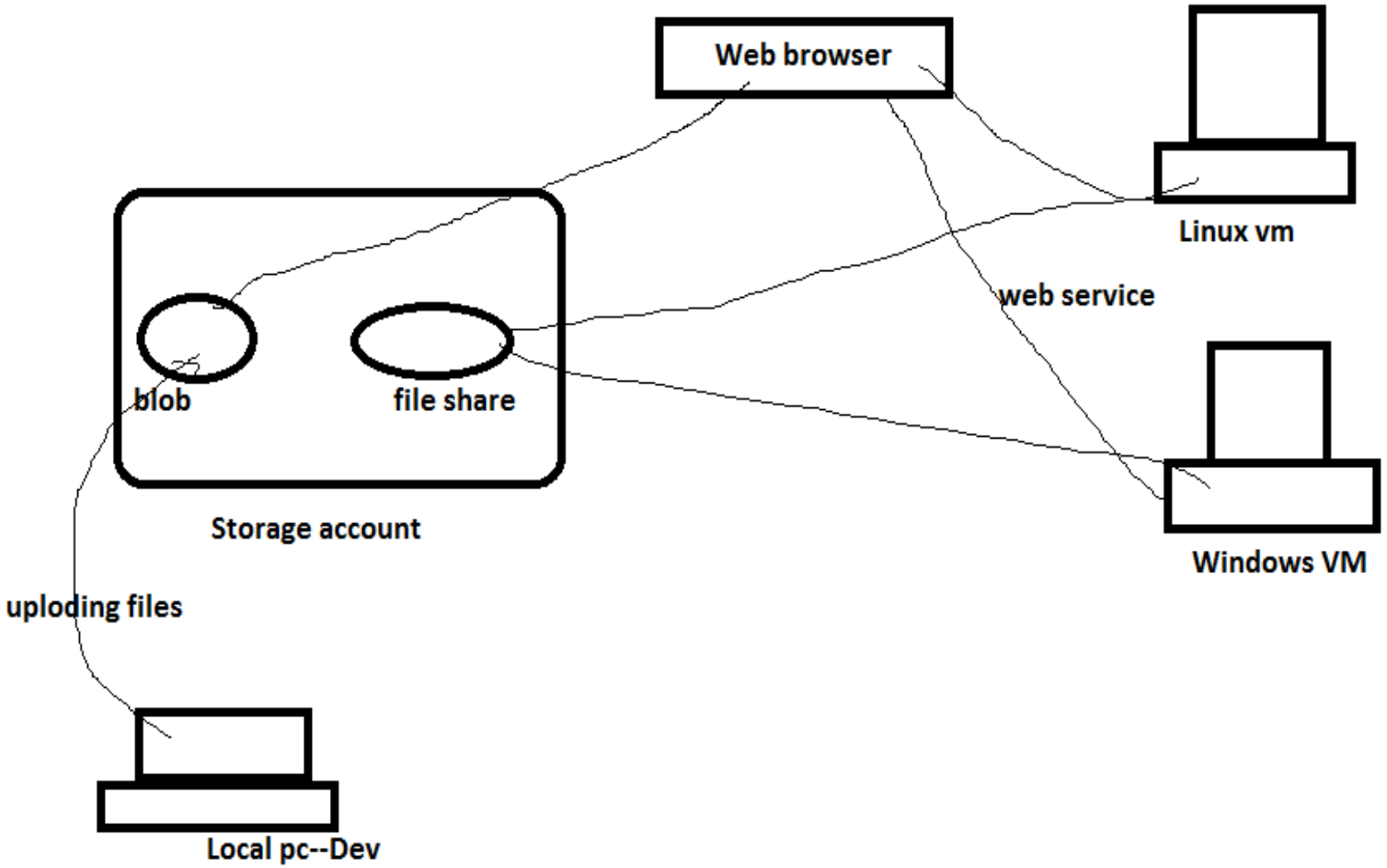



Use
1) store data
2)static web page hosting

# Sync S3 bucket with EC2 instance



# Blob and file share in Azure



# What is Amazon S3—In short

1) To host static website
2) Use as storage

Most suitable files to upload for static website

1) .pdf
2) .mp4
3) .html

# AWS Free Tier

As part of the AWS Free Tier, you can get started with Amazon S3 for free. Upon sign-up, new AWS customers receive

- ✓ 5GB of Amazon S3 storage in the S3 Standard storage class;
- ✓ 20,000 GET Requests;
- ✓ 2,000 PUT, COPY, POST, or LIST Requests;
- ✓ and 15GB of Data Transfer Out each month for one year.

# How Amazon S3 works

- Amazon S3 is an object storage service, which differs from block and file cloud storage. Each object is stored as a file with its metadata included and is given an ID number. Applications use this ID number to access an object. Unlike file and block cloud storage, a developer can access an object via a REST API.

- The S3 cloud storage service gives a subscriber access to the same systems that Amazon uses to run its own websites. S3 enables customers to upload, store and download practically any file or object that is up to five terabytes (TB) in size, with the largest single upload capped at five gigabytes (GB).

# Block and Object Storage

- **What is Block Storage?**
- Block storage devices provide fixed-sized raw storage capacity. Each storage volume can be treated as an independent disk drive and controlled by an external server operating system. This block device can be mounted by the guest operating system as if it were a physical disk. The most common examples of Block Storage are SAN, iSCSI, and local disks.
- Block storage is the most commonly used storage type for most applications. It can be either locally or network-attached and are typically formatted with a file system like FAT32, NTFS, EXT3, and EXT4.
- **Use cases**
- Ideal for databases, since a DB requires consistent I/O performance and low-latency connectivity.
- Use block storage for RAID Volumes, where you combine multiple disks organized through stripping or mirroring.
- Any application which requires service side processing, like Java, PHP, and .Net will require block storage.
- Running mission-critical applications like Oracle, SAP, Microsoft Exchange, and Microsoft SharePoint.

# Block and Object Storage

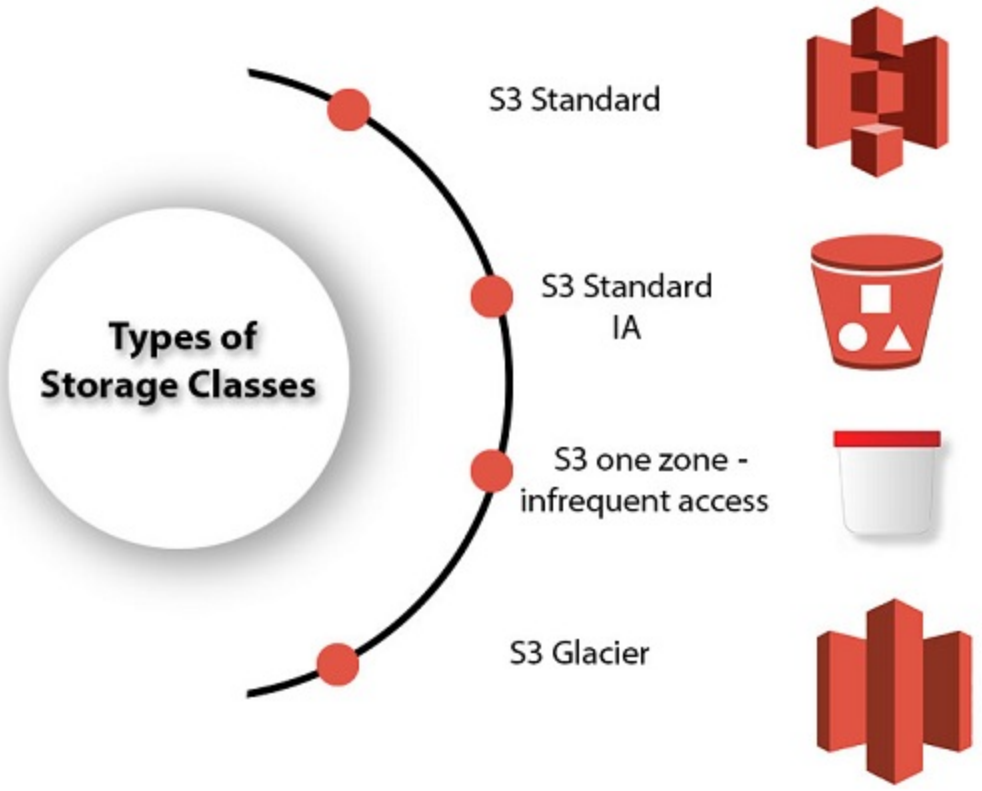
- **What is Object Storage**
- Block storage volumes can only be accessed when they're attached to an operating system. But data kept on object storage devices, which consist of the object data and metadata, can be accessed directly through APIs or http/https. You can store any kind of data, photos, videos, and log files. The object store guarantees that the data will not be lost. Object storage data can be replicated across different data centers and offer simple web services interfaces for access.
- A simple use case would see application developers who deal with large amounts of user-generated media, using object storage to store unlimited media files. As data stores scale to hundreds of terabytes and then into the petabyte range and beyond, object storage becomes even more attractive.
- **Use Cases**
- Storage of unstructured data like music, image, and video files.
- Storage for backup files, database dumps, and log files.
- Large data sets. Whether you're storing pharmaceutical or financial data, or multimedia files such as photos and videos, storage can be used as your big data object store.
- Archive files in place of local tape drives. Media assets such as video footage can be stored in object storage and archived to AWS glacier.

# AWS Storage Classes

- S3 storage classes are used to assist the concurrent loss of data in one or two facilities.
- S3 storage classes maintain the integrity of the data using checksums.
- S3 provides lifecycle management for the automatic migration of objects for cost savings.

**S3 contains four types of storage classes:**

- S3 Standard
- S3 Standard IA
- S3 one zone-infrequent access
- S3 Glacier



## S3 Standard

- Standard storage class stores the data redundantly across multiple devices in multiple facilities.
- It is designed to sustain the loss of 2 facilities concurrently.
- Standard is a default storage class if none of the storage class is specified during upload.
- It provides low latency and high throughput performance.
- It designed for 99.99% availability and 99.999999999% durability

## S3 Standard IA

- IA stands for infrequently accessed.
- Standard IA storage class is used when data is accessed less frequently but requires rapid access when needed.
- It has a lower fee than S3, but you will be charged for a retrieval fee.
- It is designed to sustain the loss of 2 facilities concurrently.
- It is mainly used for larger objects greater than 128 KB kept for atleast 30 days.
- It provides low latency and high throughput performance.
- It designed for 99.99% availability and 99.999999999% durability

# S3 one zone-infrequent access

- S3 one zone-infrequent access storage class is used when data is accessed less frequently but requires rapid access when needed.
- It stores the data in a single availability zone while other storage classes store the data in a minimum of three availability zones. Due to this reason, its cost is 20% less than Standard IA storage class.
- It is an optimal choice for the less frequently accessed data but does not require the availability of Standard or Standard IA storage class.
- It is a good choice for storing the backup data.
- It is cost-effective storage which is replicated from other AWS region using S3 Cross Region replication.
- It has the same durability, high performance, and low latency, with a low storage price and low retrieval fee.
- It designed for 99.5% availability and 99.999999999% durability of objects in a single availability zone.
- It provides lifecycle management for the automatic migration of objects to other S3 storage classes.
- The data can be lost at the time of the destruction of an availability zone as it stores the data in a single availability zone.

## S3 Glacier

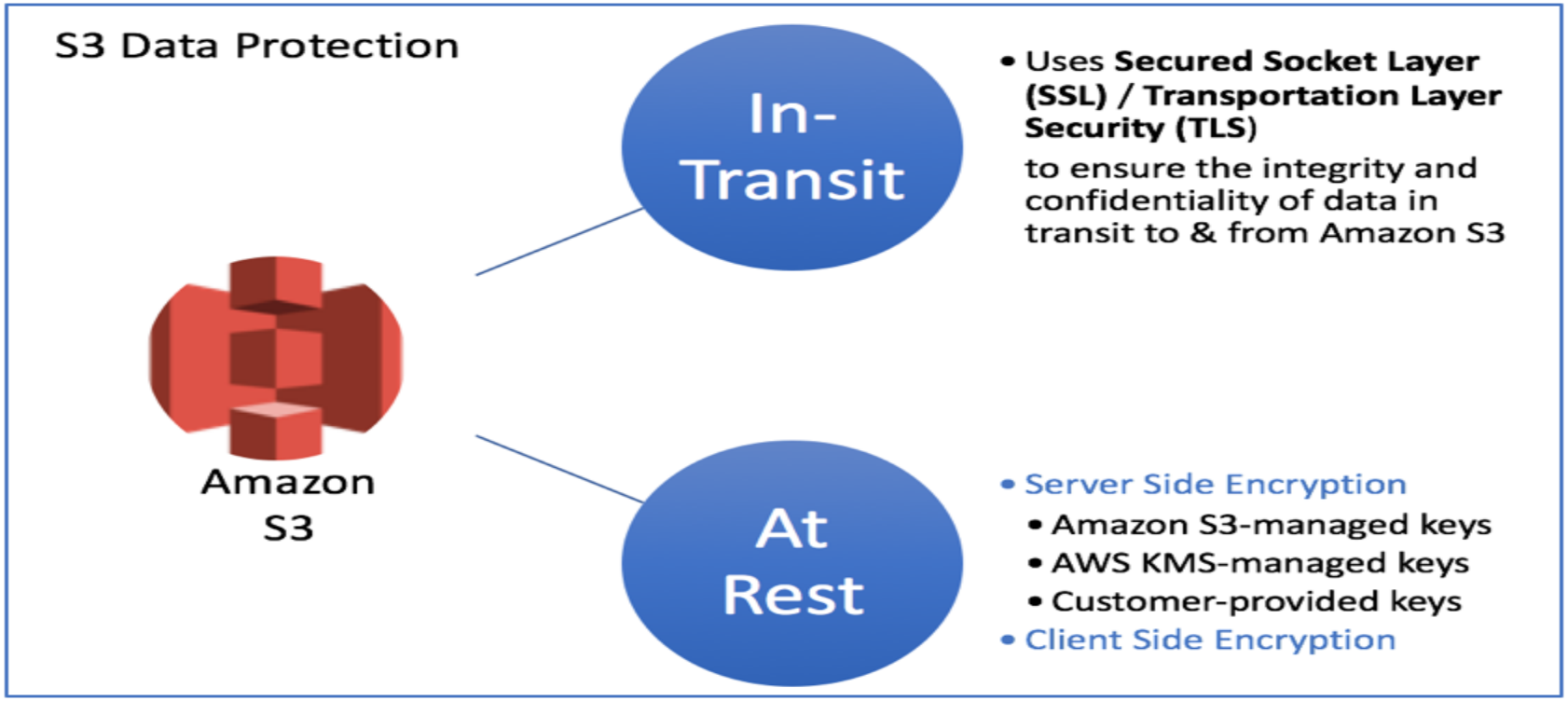
- S3 Glacier storage class is the cheapest storage class, but it can be used for archive only.
- You can store any amount of data at a lower cost than other storage classes.
- S3 Glacier provides three types of models:
  - **Expedited:** In this model, data is stored for a few minutes, and it has a very higher fee.
  - **Standard:** The retrieval time of the standard model is 3 to 5 hours.
  - **Bulk:** The retrieval time of the bulk model is 5 to 12 hours.
- You can upload the objects directly to the S3 Glacier.
- It is designed for 99.999999999% durability of objects across multiple availability zones.

# Your choice of Amazon S3 storage classes


| S3 Standard | S3 INT | S3 S-IA | S3 Z-IA | S3 Glacier |
|---|---|---|---|---|
| *Frequent* ← | | *Access Frequency* | | → *Infreque* |
| • Active, frequently accessed data<br>• Milliseconds access<br>• ≥ 3 AZ<br>• $0.0210/GB | • Data with changing access pattern<br>• Milliseconds access<br>• ≥ 3 AZ<br>• $0.0210 to $0.0125/GB<br>• Monitoring fee per Obj.<br>• Min storage duration | • Infrequently accessed data<br>• Milliseconds access<br>• ≥ 3 AZ<br>• $0.0125/GB<br>• Retrieval fee per GB<br>• Min storage duration<br>• Min object size | • Re-creatable less accessed data<br>• Milliseconds access<br>• 1 AZ<br>• $0.0100/GB<br>• Retrieval fee per GB<br>• Min storage duration<br>• Min object size | • Archive data<br>• Select minutes or hours<br>• ≥ 3 AZ<br>• $0.0040/GB<br>• Retrieval fee per GB<br>• Min storage duration<br>• Min object size |

# Protecting your data

User data is stored on redundant servers in multiple data centers. S3 uses a simple web-based interface -- the Amazon S3 console -- and encryption for user authentication.



# Lab-Creating bucket –uploading files

1) Services –S3 –create bucket –given bucket name and select region –uncheck block all public --I acknowledge option --select (check) –Bucket versioning -Enable –---create

2) Open the created bucket –upload –Add files –select any file from local system-select storage class --Standard—upload ---then--exit

3) Open uploaded file—make public –scroll down –copy the URL and paste in new tab

aws Services Resource Groups shamnadamazon Global Support

Amazon Glacier now offers expedited retrievals, typically in 1-5 minutes. Learn More » Documentation

Amazon S3 Discover the new console Quick tips

Search for buckets

+ Create bucket Delete bucket Empty bucket

0 Buckets 0 Public 0 Regions

You do not have any buckets. Here is how to get started with Amazon S3.

## Create a new bucket

Buckets are globally unique containers for everything that you store in Amazon S3.

Learn more

## Upload your data

After you create a bucket, you can upload your objects (for example, your photo or video files).

Learn more

## Set up your permissions

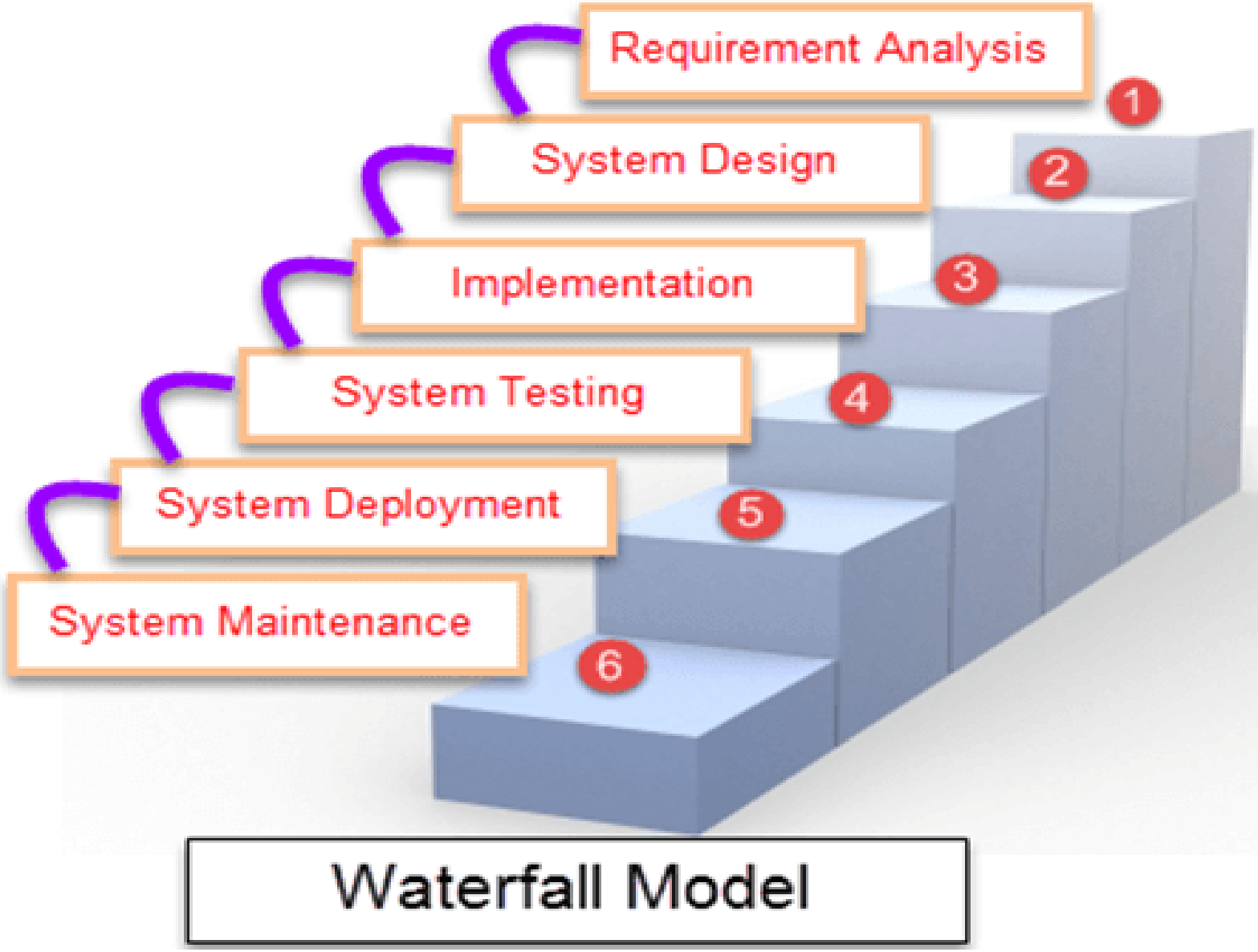
By default, the permissions on an object are private, but you can set up access control policies to grant permissions to others.

Learn more

Get started

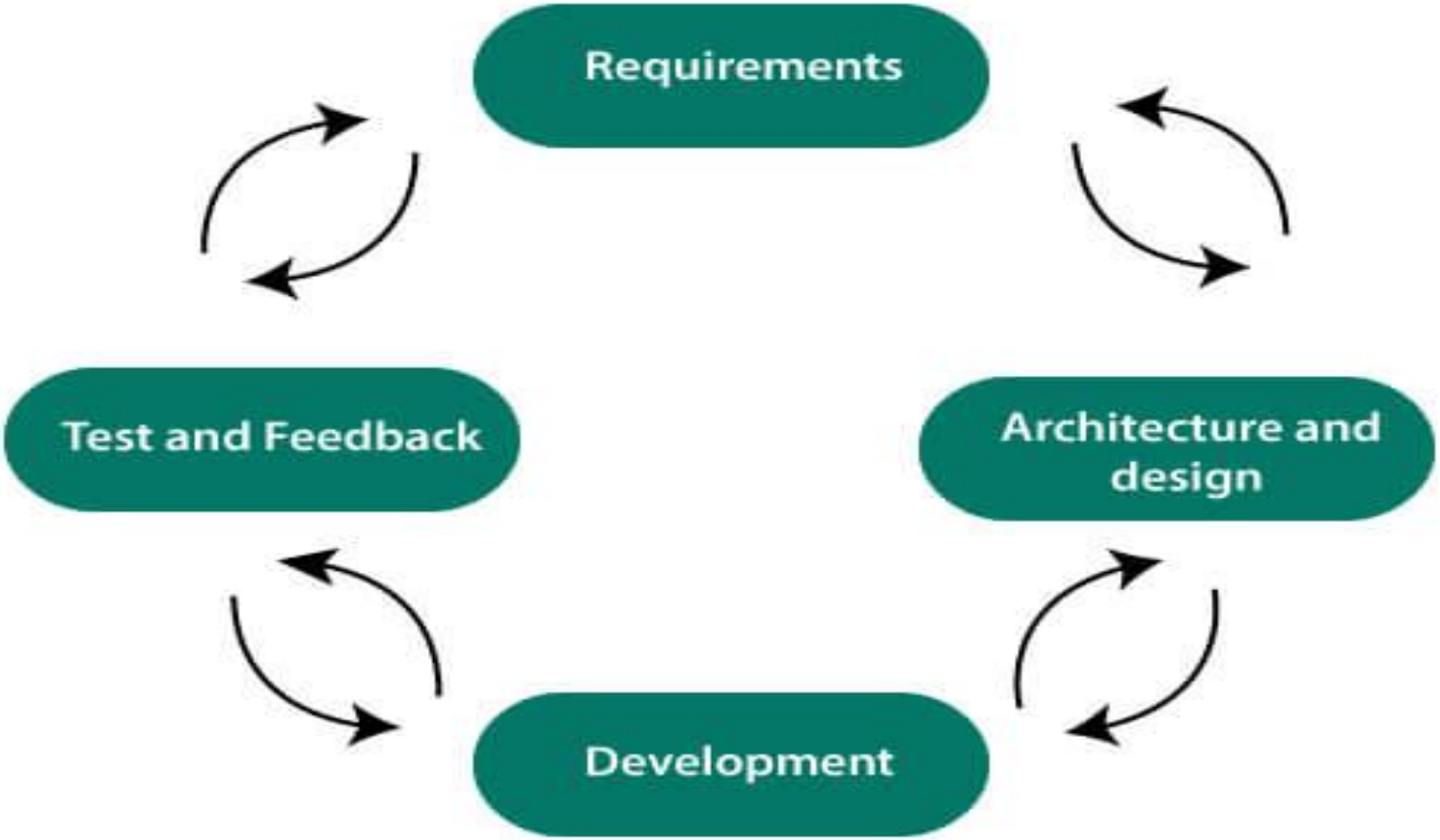
# SDLC


Maintenance
Requirement Analysis
Deployment
Defining
SDLC
(Software Development life Cycle)
Testing
Designing
Coding



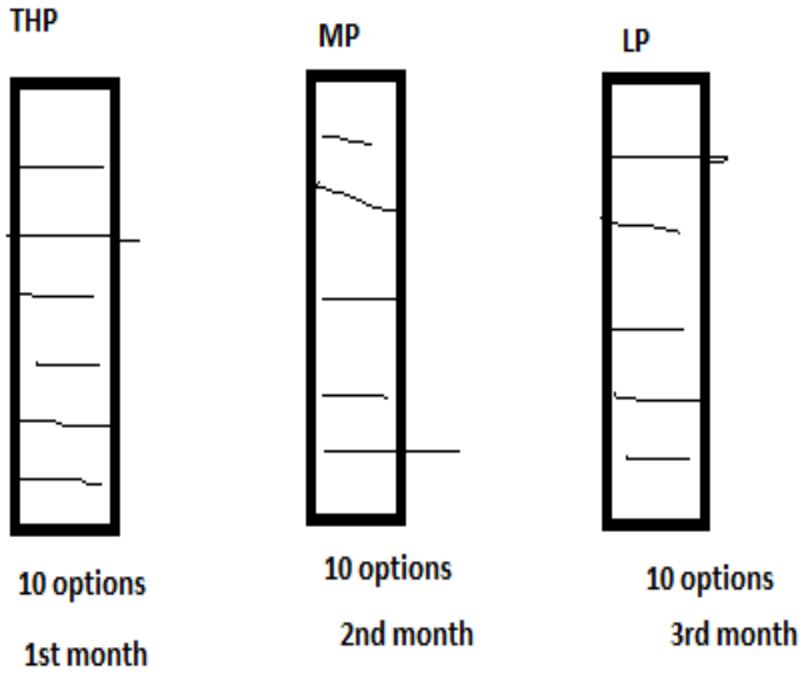

Waterfall Model

# SDLC Agile model



Full Project-- 30 options

Agile Process

# S3 bucket file versioning

1)AWS S3 bucket keeps record of all version of file

2) Create one html file –upload it –and open it

3) Do modification in same file and upload again –open it

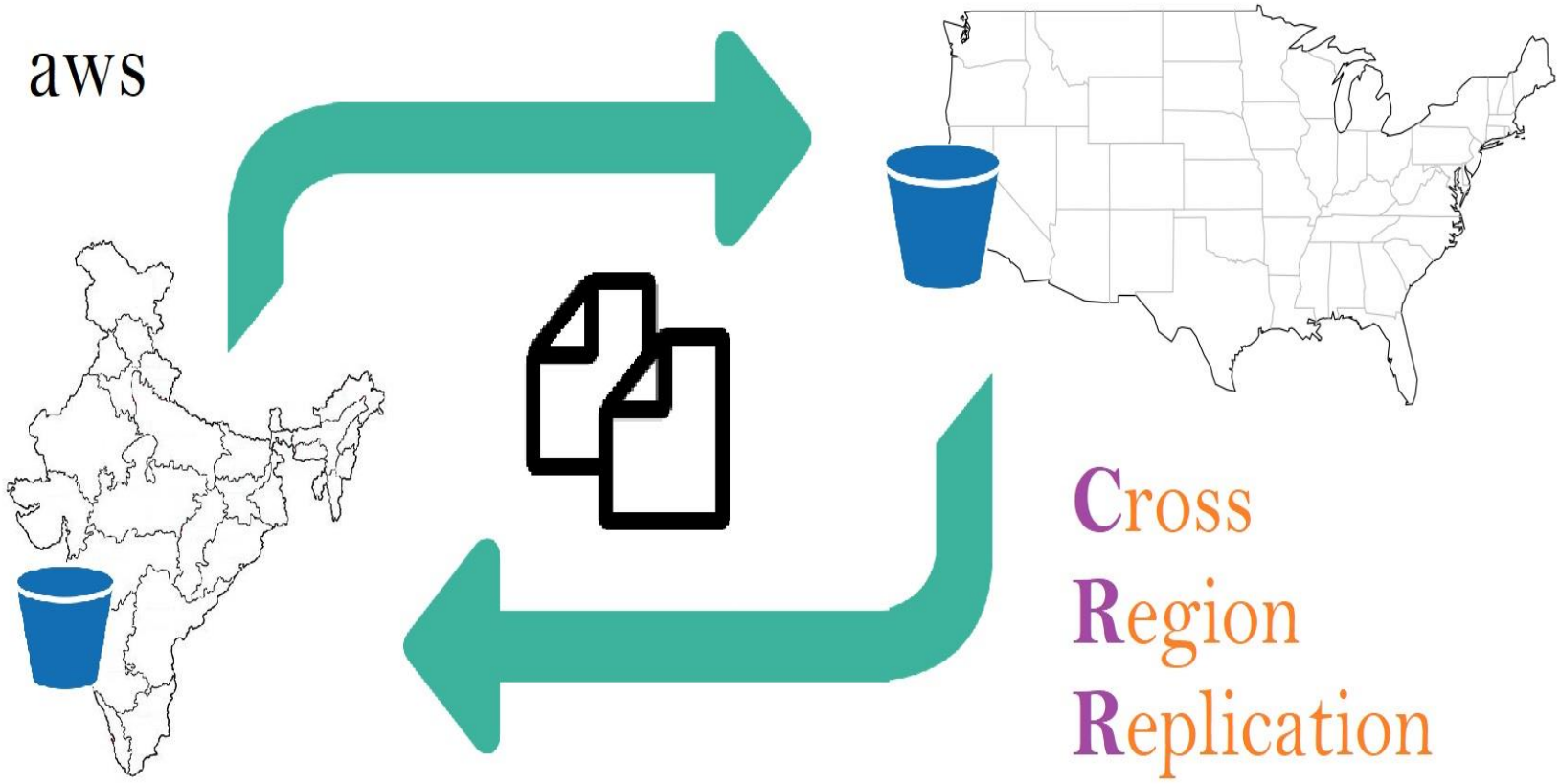
4) Do modification in same file and upload again –open it

5) Open bucket –file –check all version will be there— delete anyone in case getting error

# Cross Region Replication(CRR)

**S3 CRR** is configured to a source **S3 bucket** and replicates objects into a destination **bucket** in another **AWS** Region. **Amazon S3 CRR** automatically replicates data between **buckets** across different **AWS** Regions.

# Cross Region Replication(CRR)



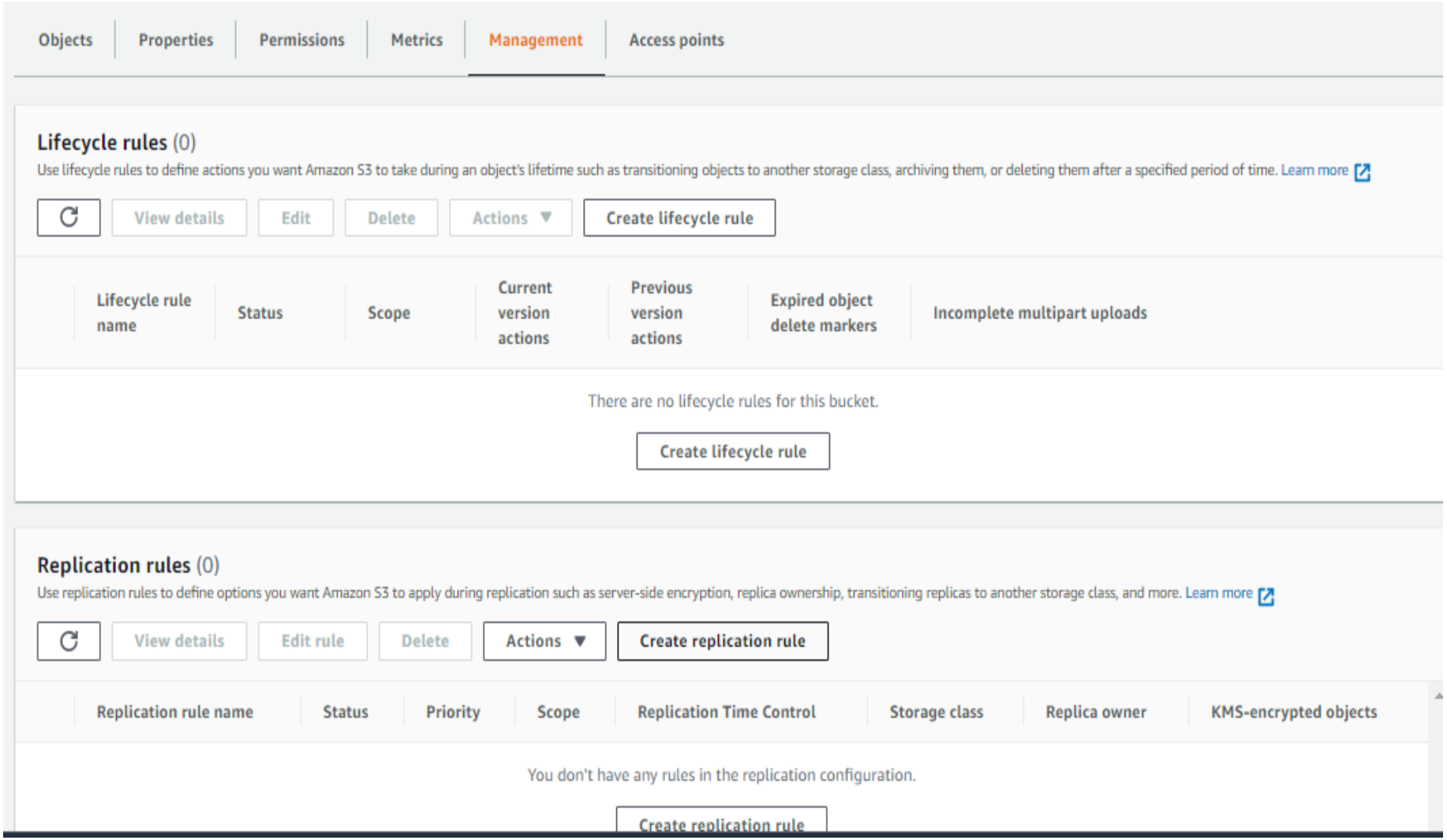
# Cross Region Replication(CRR)

1) Create main bucket in mumbai – “mumbaibucket1”

2) Create  backup bucket in singapore – “mumbaibucket1-bkp”

3) Open mumbai bucket –Management –Create Replication Rule –Replication Rule name type-”mumbai-singapore-crr-rule1” – IAM Role –create a new role – Rule scope –This rule apply to all object – Choose a bucket in this account – Browse and select singapore bucket –Save

4) Now upload some files in mumbai bucket and  check the replication in Singapore bucket


Objects
Properties
Permissions
Metrics
Management
Access points
Lifecycle rules (0)
Use lifecycle rules to define actions you want Amazon S3 to take during an object's lifetime such as transitioning objects to another storage class, archiving them, or deleting them after a specified period of time. Learn more
View details
Edit
Delete
Actions
Create lifecycle rule
Lifecycle rule name
Status
Scope
Current version actions
Previous version actions
Expired object delete markers
Incomplete multipart uploads
There are no lifecycle rules for this bucket.
Create lifecycle rule
Replication rules (0)
Use replication rules to define options you want Amazon S3 to apply during replication such as server-side encryption, replica ownership, transitioning replicas to another storage class, and more. Learn more
View details
Edit rule
Delete
Actions
Create replication rule
Replication rule name
Status
Priority
Scope
Replication Time Control
Storage class
Replica owner
KMS-encrypted objects
You don't have any rules in the replication configuration.
Create replication rule

# Create replication rule

## Replication rule configuration

Replication rule name

Mumbai-singapore-crr-rule1

Up to 255 characters.

IAM role

Create new role

View

Status

Choose whether the rule will be enabled or disabled when created.

- (•) Enabled
- ( ) Disabled

Priority

The priority value resolves conflicts that occur when an object is eligible for replication under multiple rules. The rule is added to the configuration at the highest available priority and the priority can be changed on the replication rules table.

0

Choose a rule scope

- ○ Limit the scope of this rule using one or more filters
- ◉ This rule applies to *all* objects in the bucket

## Destination

Destination

You can replicate objects across buckets in different AWS Regions (Cross-Region Replication) or you can replicate objects across buckets in the same AWS Region (Same-Region Replication). You can also specify a different bucket for each rule in the configuration. **Learn more** or see **Amazon S3 pricing**

- ◉ Choose a bucket in this account
- ○ Choose a bucket in another account

Bucket name

Choose the bucket that will receive replicated objects.

deepakbatch205-bk | Browse S3

Destination Region

Asia Pacific (Singapore) ap-southeast-1

# S3 Bucket Policy

A bucket policy is a resource-based AWS Identity and Access Management (IAM) policy. You add a bucket policy to a bucket to grant other AWS accounts or IAM users access permissions for the bucket and the objects in it. Object permissions apply only to the objects that the bucket owner creates.

**Policy Language Overview**

- **Resources** – Buckets, objects, access points, and jobs are the Amazon S3 resources for which you can allow or deny permissions. In a policy, you use the Amazon Resource Name (ARN) to identify the resource. For more information, see Amazon S3 Resources.
- **Actions** – For each resource, Amazon S3 supports a set of operations. You identify resource operations that you will allow (or deny) by using action keywords.

# S3 Bucket Policy

- **Effect** – What the effect will be when the user requests the specific action—this can be either *allow* or *deny*.
- If you do not explicitly grant access to (allow) a resource, access is implicitly denied. You can also explicitly deny access to a resource. You might do this to make sure that a user can't access the resource, even if a different policy grants access. For more information, see IAM JSON Policy Elements: Effect.
- **Principal** – The account or user who is allowed access to the actions and resources in the statement. In a bucket policy, the principal is the user, account, service, or other entity that is the recipient of this permission. For more information, see Principals.
- **Condition** – Conditions for when a policy is in effect. You can use AWS-wide keys and Amazon S3-specific keys to specify conditions in an Amazon S3 access policy.

# Limiting Access to Specific IP Addresses

```
{
  "Version": "2012-10-17",
  "Id": "S3PolicyId1",
  "Statement": [
    {
      "Sid": "IPAllow",
      "Effect": "Deny",
      "Principal": "*",
      "Action": "s3:*",
      "Resource": [
              "arn:aws:s3:::awsexamplebucket1",
        "arn:aws:s3:::awsexamplebucket1/*"
      ],
      "Condition": {
              "NotIpAddress": {"aws:SourceIp": "54.240.143.0/24"}
      }
    }
  ]
```