Experiment No.:6

Aim: To study and Implement Storage as a Service using own cloud/ AWS.

Software Required: AWS

Theory :-
What is Cloud Storage?
Cloud storage is a cloud computing model that stores data on the Internet through a cloud computing provider who manages and operates data storage as a service. It's delivered on demand with just-in-time capacity and costs, and eliminates buying and managing your own data storage infrastructure. This gives you agility, global scale and durability, with "anytime, anywhere" data access.

How Does Cloud Storage Work?
Cloud storage is purchased from a third party cloud vendor who owns and operates data storage capacity and delivers it over the Internet in a pay-as-you-go model. These cloud storage vendors manage capacity, security and durability to make data accessible to your applications all around the world.
Applications access cloud storage through traditional storage protocols or directly via an API. Many vendors offer complementary services designed to help collect, manage, secure and analyze data at massive scale.

Benefits of Cloud Storage
Storing data in the cloud lets IT departments transform three areas:
1. Total Cost of Ownership. With cloud storage, there is no hardware to purchase, storage to provision, or capital being used for "someday" scenarios. You can add or remove capacity on demand, quickly change performance and retention characteristics, and only pay for storage that you actually use. Less frequently accessed data can even be automatically moved to lower cost tiers in accordance with auditable rules, driving economies of scale.
2. Time to Deployment. When development teams are ready to execute, infrastructure should never slow them down. Cloud storage allows IT to quickly deliver the exact amount of storage needed, right when it's needed. This allows IT to focus on solving complex application problems instead of having to manage storage systems.

3. Information Management. Centralizing storage in the cloud creates a tremendous leverage point for new use cases. By using cloud storage lifecycle management policies, you can perform powerful information
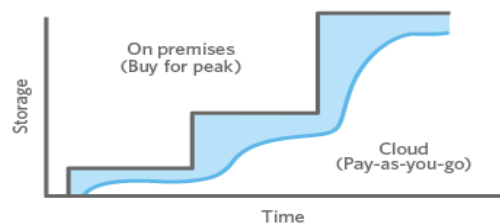
management tasks including automated tiering or locking down data in support of compliance requirements.

Cloud Storage Requirements

Ensuring your company's critical data is safe, secure, and available when needed is essential. There are several fundamental requirements when considering storing data in the cloud.

Durability. Data should be redundantly stored, ideally across multiple facilities and multiple devices in each facility. Natural disasters, human error, or mechanical faults should not result in data loss.

Availability. All data should be available when needed, but there is a difference between production data and archives. The ideal cloud storage will deliver the right balance of retrieval times and cost.

Security. All data is ideally encrypted, both at rest and in transit. Permissions and access controls should work just as well in the cloud as they do for on premises storage.

Types of Cloud Storage

There are three types of cloud data storage: object storage, file storage, and block storage. Each offers their own advantages and have their own use cases:

1. Object Storage - Applications developed in the cloud often take advantage of object storage's vast scalablity and metadata characteristics. Object storage solutions like Amazon Simple Storage Service (S3) are ideal for building modern applications from scratch that require scale and flexibility, and can also be used to import existing data stores for analytics, backup, or archive.

   File Storage - Some applications need to access shared files and require a file system. This type of storage is often supported with a Network Attached Storage (NAS) server. File storage solutions like Amazon Elastic File System (EFS) are ideal for use cases like large content repositories, development environments, media stores, or user home directories.

1. Block Storage - Other enterprise applications like databases or ERP systems often require dedicated, low latency storage for each host. This is analogous to direct-attached storage (DAS) or a Storage Area Network (SAN). Block-based cloud storage solutions like Amazon Elastic Block Store (EBS) are provisioned with each virtual server and offer the ultra low latency required for high performance workloads.

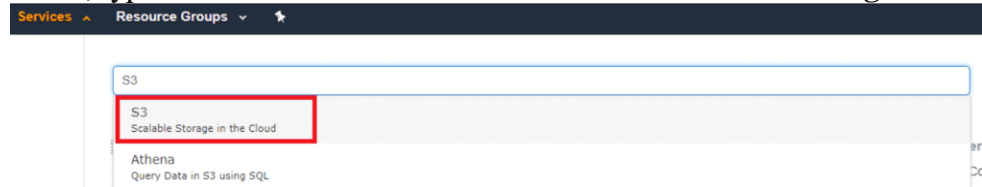**Steps to use Cloud Storage :**

Steps for Creating an S3 Bucket

1. Sign in to AWS. The *AWS Management Console* will open.

   Hint: Clicking on the AWS logo in the upper-left corner will open the Management Console from any AWS window.
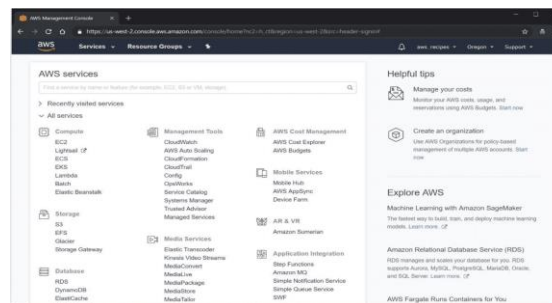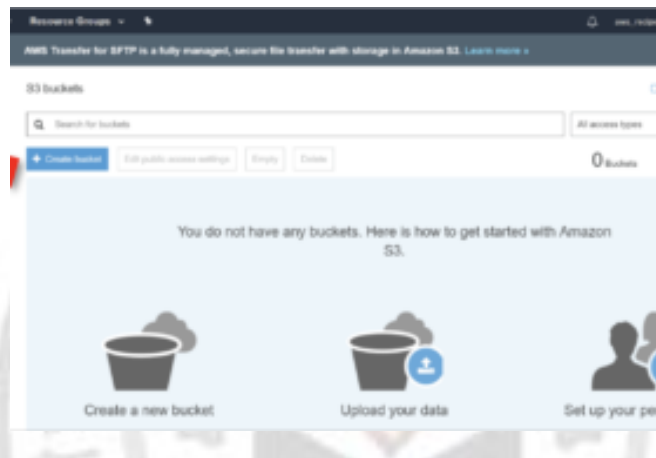

AWS Management Console

2.Under *Find Services*, type "S3" in the search box and click on **S3 Scalable Storage in the Cloud**.

Search for "s3"

3.In the S3 console, click on **Create bucket**.

Create bucket

4.In the *Create bucket* pop-up, enter a **Bucket name** (**1**).
- The bucket name has to be unique among all AWS bucket names.
- Once created, the name cannot be changed.
- Choose a name that's descriptive of what the contents will be, particularly if you will be using more than one bucket.

5.For *Region* (**2**), select **US East (N. Virginia)** for this recipe.
- Remember, there are no costs for data that are transferred between AWS services within the same region. So, for example, if your bucket will be used to store data to be processed by an EC2 Instance, make sure both are located in the same region.
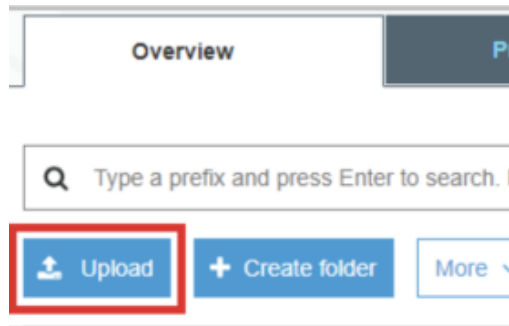

The Create bucket pop-up window

6.Click **Create** (**3**).

- Your new bucket is displayed in the *S3 buckets console*.
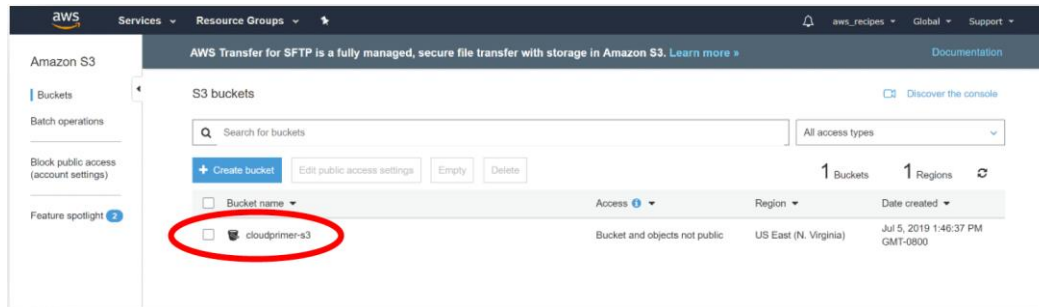
Adding a File to a Bucket

1. In the *S3 buckets console*, click on the bucket name to open the bucket.
   o   The bucket contents window shows that the bucket is empty.
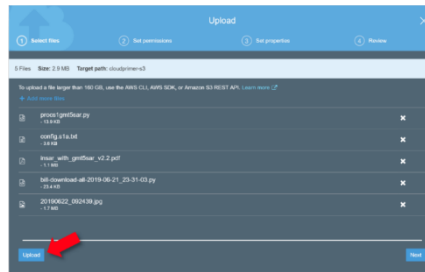2. Click on **Upload**.

The Upload button

3.   In the *Upload* pop-up window, you have the option to drag and drop files into the bucket, or to click on **Add files** and navigate to the location of the files on your computer.
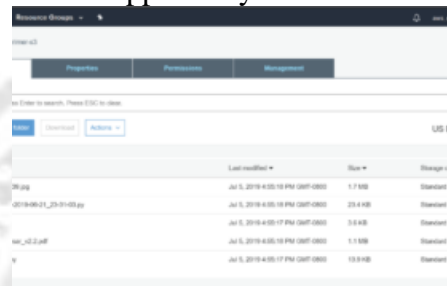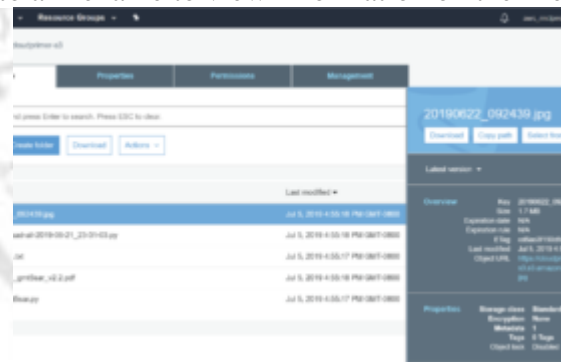

The Upload pop-up window

4.   When you have selected the files to add to your bucket, click on **Upload**.

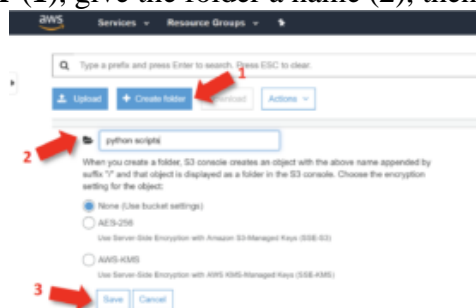5.   When the upload is complete, the files appear in your bucket.

6.   Select the checkbox next to a filename to view information on the file.


Working with Files in a Bucket
1. Files can be organized in a bucket by creating a folder and copying and pasting files into the folder.
  - Click on **Create folder** (**1**), give the folder a name (**2**), then click **Save** (**3**).


Create, name, and save a folder

- Check the box in front of the file(s) you want to move to the new folder (**1**).
- Click on Actions (**2**) to open the dropdown menu, then click **Copy** (**3**).
- Click on the folder name to open the folder (**4**).
- Click on **Actions**, then click **Paste**.
- Use the browser back arrow to return to the main level of the bucket (or use the breadcrumbs at the top of the bucket window to move one level up).
- Select the file(s) you moved, click on **Actions**, then click **Delete**.
- Confirm that you want to delete the files in the *Delete objects* pop-up window. Click **Delete**.
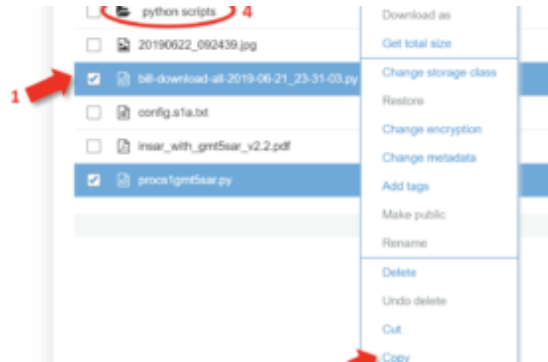
Move a folder
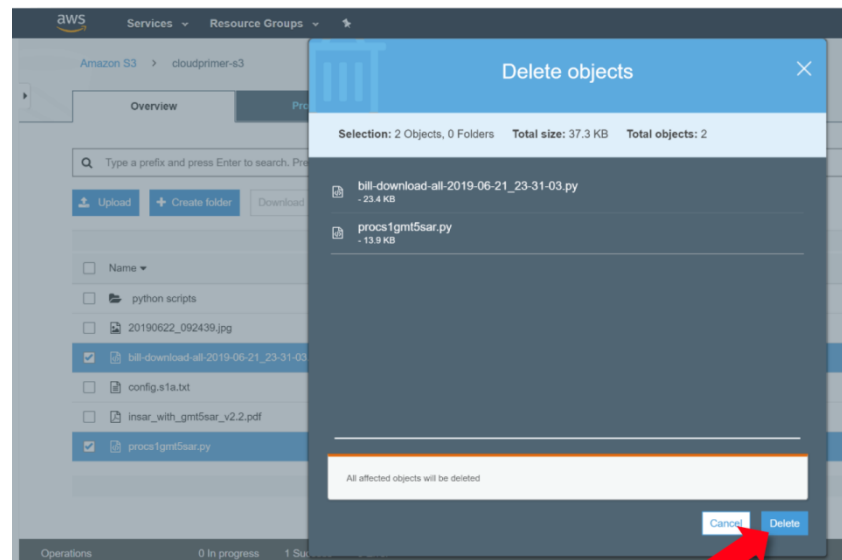
Delete objects

Deleting a bucket

Note: Deleting a bucket deletes the bucket as well as its contents. If you want to keep the bucket for future use and preserve the name, you can delete the content files individually. Or you can empty the bucket, which deletes the contents without deleting the bucket.

To delete files from a bucket

1. Use the steps outlined at the end of <u>Working with Files in a Bucket</u>.
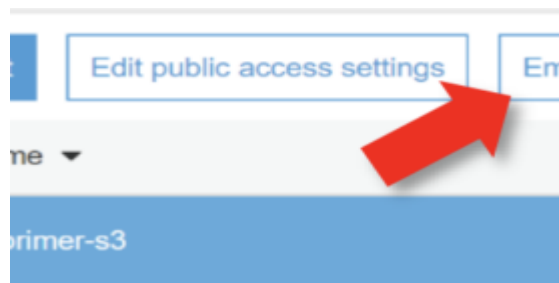
To empty a bucket

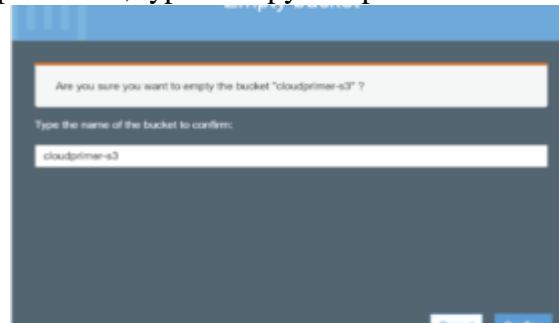1. In the *S3 buckets* list, check the box in front of the bucket name.
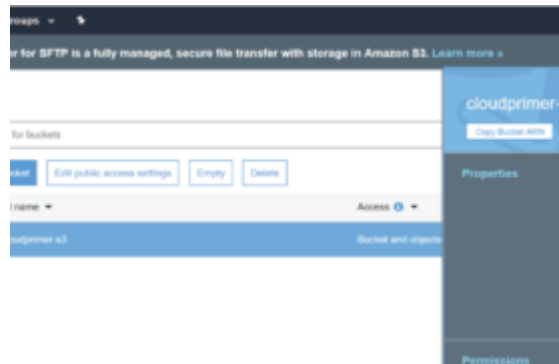
Check the box

2.   Click on **Empty**.

The Empty button

3.   In the *Empty bucket* pop-up window, type or copy and paste the bucket name, then click on **Confirm**.

The Empty bucket pop-up window

To delete a bucket
1.   In the *S3 buckets* list, check the box in front of the bucket name.
2.   Click on **Delete**.

The Delete button

3.	In the *Delete bucket* pop-up window, type or copy and paste the bucket name, then click on **Confirm**.

The Delete bucket pop-up window

Conclusion :-

Sign and Remark:

R1 (3 Marks)	R2 (2 Marks)	R3 (5 Marks)	R4 (5 Mark)	Total (15 Marks)	Signature