

EXPERIMENT NO. 6

Aim :- To study and Implement storage as a service using own cloud.

Theory :-

Cloud Storage :-

Cloud storage allows you to save data and files in an off-site location that you access either through the public internet or a dedicated private network connection. Data that you transfer off-site for storage becomes responsibility of a third-party cloud provider. The provider hosts, secures, manages and maintains the servers and associated infrastructure and ensures you have access to the data whenever you require it.

Owncloud :-

Owncloud is a file server that enables secure storage, collaboration and sharing. It is convenient to store files in cloud, so they are available on any device and can be shared with a few clicks.

Features of Owncloud :-

- 1> Access your data
- 2> Sync your data

- 3> Share your data
- 4> Versioning
- 5> Encryption
- 6> Drag and Drop upload
- 7> Theming

Advantages of storage as a service :-

- 1> More affordable short-term costs.
- 2> Scalability
- 3> Security
- 4> Data Redundancy

Limitations :-

- 1> Greater cost over time
- 2> Data Transfer Speed
- 3> Dependency on Provider
- 4> Potential Downtime

Object Storage :-

It is a technology that stores and manages data in an unstructured format called objects. Modern organizations create and analyze large volumes of unstructured data across different types like photos, videos, email, audio files, etc.

File storage :-

Many applications need shared file access. This has been traditionally served by network-attached storage (NAS) services.

Block storage :-

Block storage is technology that controls data storage and storage devices. It takes any data, like a file or database entry, and divides it into blocks of equal sizes. Think of block storage as a more direct pipeline to the data.

Popular storage as a service vendors along with services:

1) Amazon Simple Storage Service (S3)

It is an object storage service offering industry leading scalability, data availability, security and performance.

2) Microsoft Azure Blob Storage:

It is Microsoft's object storage solution within the Azure cloud platform. It is designed for storage and managing large amounts of unstructured data.

3) Google Cloud Storage:

It is a managed service for storing large amounts of unstructured data.

4) IBM Cloud Object Storage:

It is an enterprise-grade object storage solution that provides scalable and secure data storage. It is designed to support large-scales.

s> Backblaze B2 Cloud Storage:

It offers cost-effective object storage solutions. It is known for simplicity and competitive pricing. Key features are affordability, data durability, scalable storage, and ease of use.

Conclusion :-

By performing above experiments we understood how to implement storage as a service using own cloud.

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Rishab Mandal
2103110
C23

Cloud Computing Experiment 6

Aim: To study and Implement Storage as a Service using Own Cloud.

Theory:

Introduction:

In Experiment 6, we delve into the implementation and study of Storage as a Service (SaaS) using OwnCloud. This experiment aims to explore the concept of cloud storage, understand OwnCloud and its features, discuss the advantages and limitations of SaaS, explain different types of storage, and provide an overview of popular SaaS vendors. Additionally, we will provide step-by-step installation instructions for OwnCloud and demonstrate its capabilities as a Storage as a Service solution.

1. Concept of Cloud Storage

Cloud storage refers to storing data on remote servers accessed over the internet instead of storing it locally on a physical disk or hard drive. It provides users with the ability to access their data from any location and device with internet connectivity. Cloud storage services typically offer scalability, reliability, and redundancy features, allowing users to store, manage, and retrieve data seamlessly.

2. OwnCloud and its Features

OwnCloud is an open-source cloud storage platform that allows users to store, sync, and share files securely. Its features include:

- File Synchronization: Sync files across devices and platforms.

- File Sharing: Share files and folders with individuals or groups, with customizable permissions.
- Security: OwnCloud offers encryption capabilities to ensure data security.
- Collaboration: Collaborate on documents in real-time with built-in editing features.
- Integration: Integration with other services such as calendars, contacts, and productivity tools.
- Scalability: OwnCloud can scale to meet the needs of both individuals and enterprises.

3. Advantages and Limitations of Storage as a Service

Advantages:

- Cost Savings: Eliminates the need for purchasing and maintaining physical storage infrastructure.
- Scalability: Easily scale storage resources up or down based on demand.
- Accessibility: Data can be accessed from anywhere with an internet connection.
- Redundancy and Disaster Recovery: Cloud storage providers often offer redundancy and backup options to ensure data availability and disaster recovery.
- Collaboration: Facilitates easy collaboration and sharing of files among users.

Limitations:

- Dependency on Internet: Access to data is reliant on internet connectivity.
- Security Concerns: Data security and privacy concerns may arise due to reliance on third-party cloud providers.
- Data Transfer Speed: Transfer speeds may be slower compared to local storage, especially for large files.
- Limited Control: Users may have limited control over data management and security policies compared to on-premises storage solutions.

4. Types of Storages

Object Storage:

Object storage is a data storage architecture that manages data as objects rather than as blocks or files. Each object typically includes the data itself, metadata, and a unique identifier. Object storage is highly scalable and suitable for storing large amounts of unstructured data such as documents, images, and multimedia files.

Block Level Storage:

Block-level storage involves dividing data into blocks, each with its address and identifier. It is typically used in Storage Area Networks (SANs) and provides high-performance storage suitable for databases and transactional applications.

5. Popular Storage-as-a-Service Vendors

Amazon S3 (Simple Storage Service):

Amazon S3 is a highly scalable, secure, and durable object storage service offered by Amazon Web Services (AWS). It provides a simple web services interface to store and retrieve any amount of data from anywhere on the web.

Google Cloud Storage:

Google Cloud Storage is an object storage service provided by Google Cloud Platform. It offers high availability, durability, and scalability, with various storage classes to optimize costs based on access frequency and latency requirements.

Microsoft Azure Blob Storage:

Azure Blob Storage is Microsoft's object storage solution within the Azure cloud platform. It provides scalable storage for unstructured data, including documents, images, and media files, with features such as encryption and access control.

Dropbox:

Dropbox is a popular file hosting service that offers cloud storage, file synchronization, and personal cloud features. It provides easy collaboration and sharing options for individuals and businesses.

Box:

Box is a cloud content management and file sharing service designed for businesses. It offers secure storage, collaboration, and workflow automation features, with integrations with various productivity tools and applications.

Installation and Demonstration of OwnCloud as Storage as a Service****Step 1: Installation of OwnCloud****

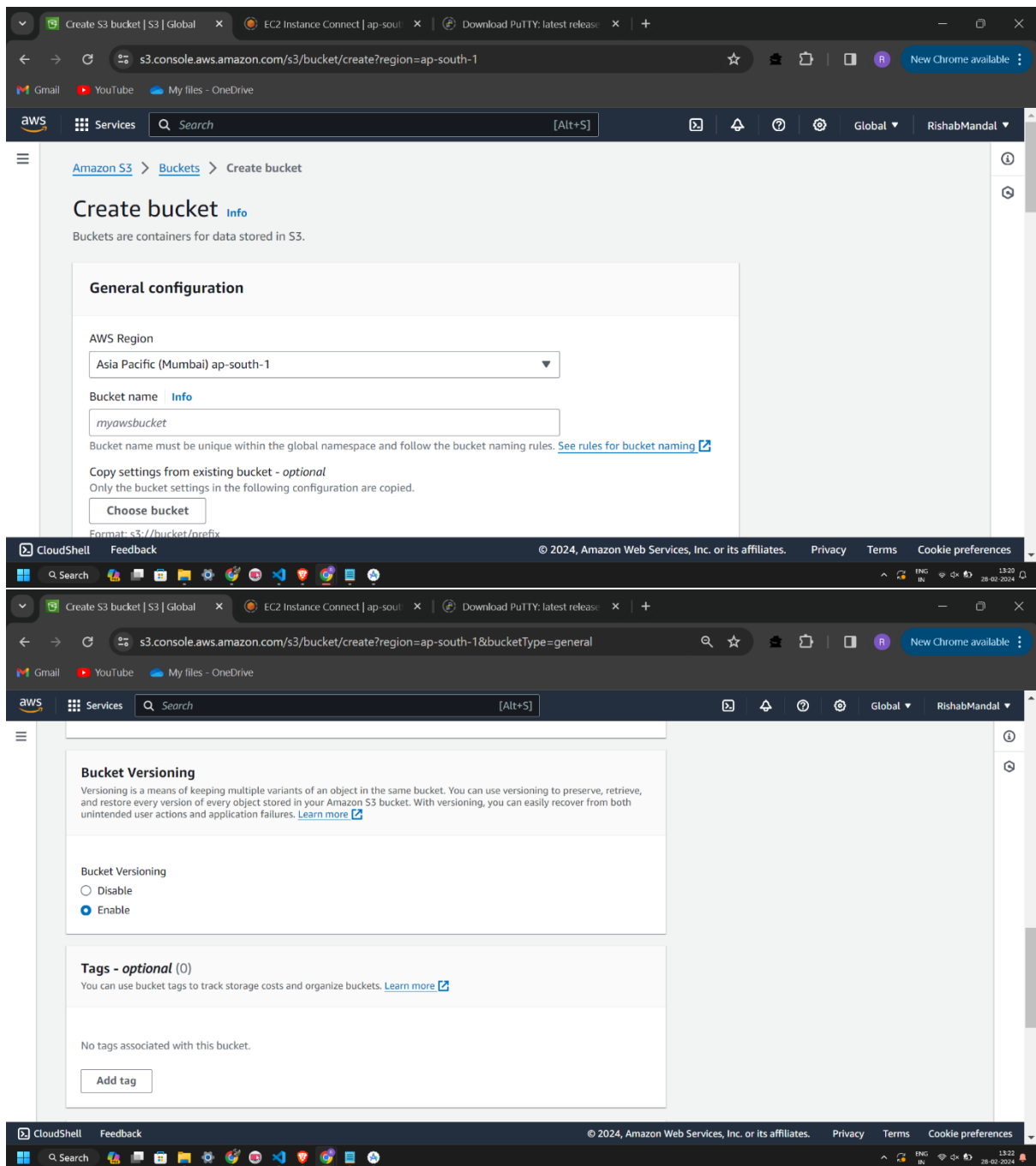
1. Download the OwnCloud package from the official website.
2. Install the required dependencies such as Apache, MySQL, and PHP.
3. Extract the OwnCloud package to the web server directory.
4. Configure the database settings and complete the installation via the web interface.
5. Set up user accounts and configure storage options.

****Step 2: Demonstration of Storage as a Service****

1. Upload files to OwnCloud from different devices.
2. Access the uploaded files from the OwnCloud web interface.
3. Share files with other users and set permissions.
4. Sync files across devices using the OwnCloud desktop or mobile client.
5. Collaborate on documents in real-time using built-in editing features.

****Screenshots:****

Amazon S3 Bucket:



Create S3 bucket | S3 | Global

s3.console.aws.amazon.com/s3/bucket/create?region=ap-south-1&bucketType=general

No tags associated with this bucket.

Add tag

Default encryption [info](#)
Server-side encryption is automatically applied to new objects stored in this bucket.

Encryption type [info](#)

- ☒ Server-side encryption with Amazon S3 managed keys (SSE-S3)
- ☐ Server-side encryption with AWS Key Management Service keys (SSE-KMS)
- ☐ Dual-layer server-side encryption with AWS Key Management Service keys (DSSE-KMS)
Secure your objects with two separate layers of encryption. For details on pricing, see [DSSE-KMS pricing](#) on the [Storage](#) tab of the [Amazon S3 pricing page](#).

Bucket Key
Using an S3 Bucket Key for SSE-KMS reduces encryption costs by lowering calls to AWS KMS. S3 Bucket Keys aren't supported for DSSE-KMS. [Learn more](#)

☒ Disable

☐ Enable

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S3 buckets | S3 | Global

s3.console.aws.amazon.com/s3/buckets?region=ap-south-1&bucketType=general

Successfully created bucket "rishabmandalbucket1"
To upload files and folders, or to configure additional bucket settings, choose [View details](#).

[Amazon S3](#) > Buckets

Account snapshot
Storage lens provides visibility into storage usage and activity trends. [Learn more](#)

[View Storage Lens dashboard](#)

General purpose buckets | Directory buckets

General purpose buckets (1) [info](#)

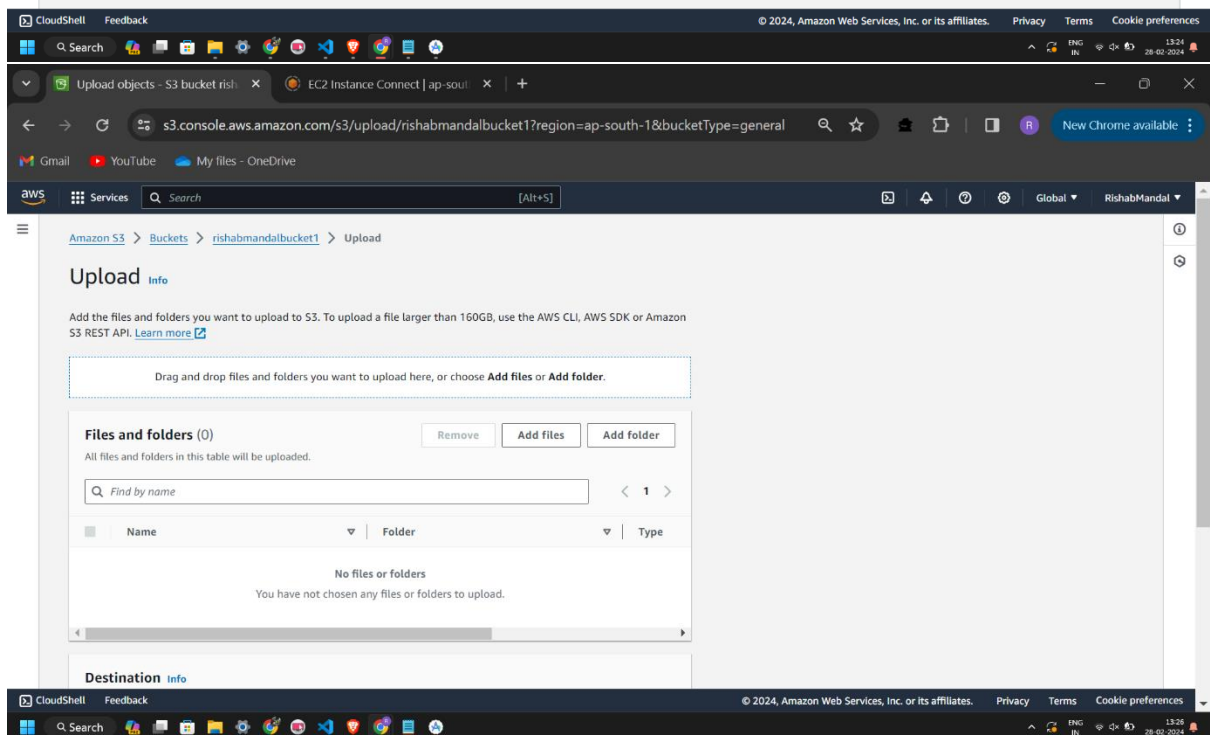
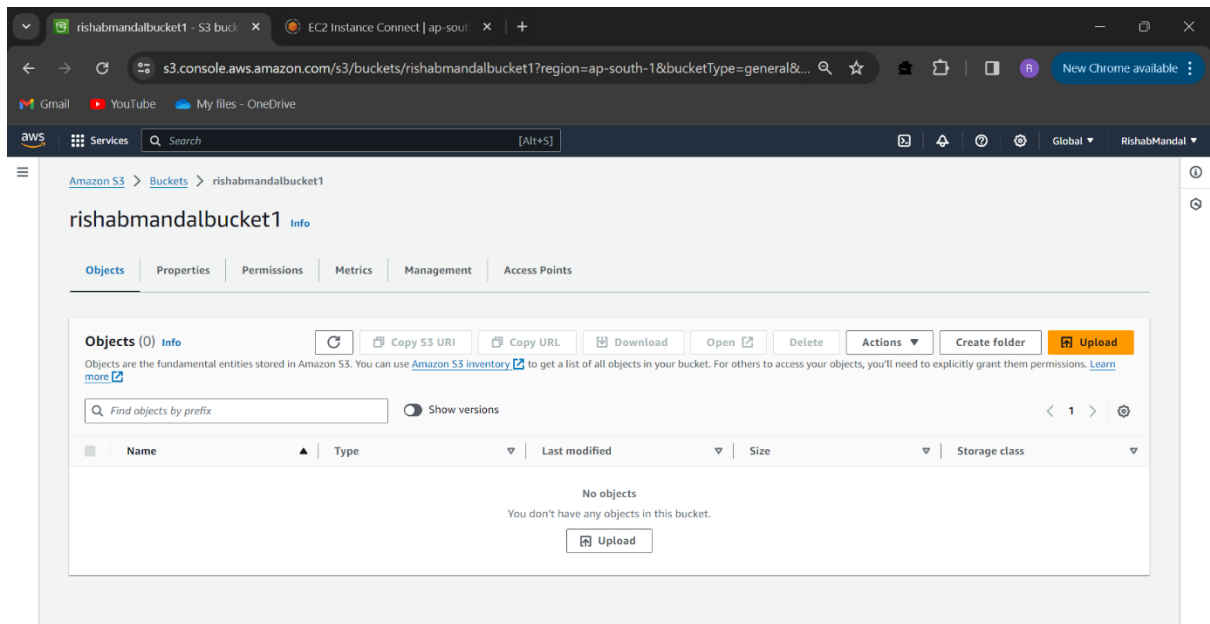
Buckets are containers for data stored in S3.

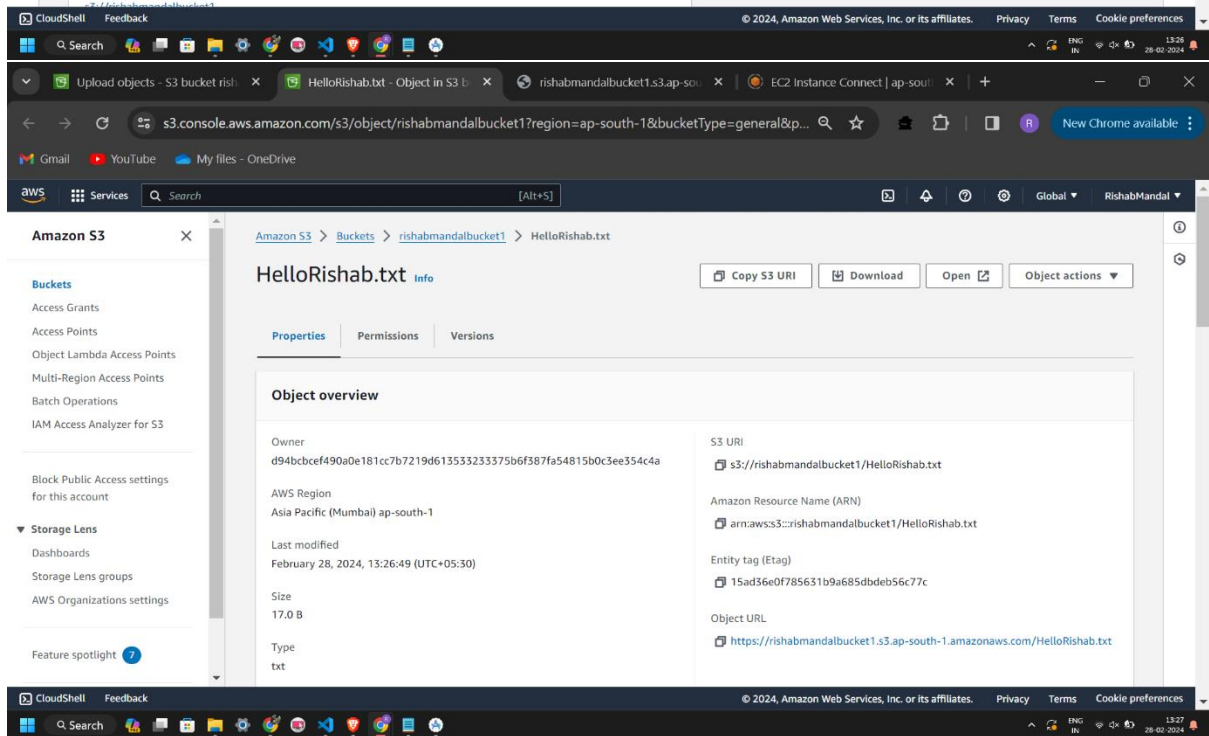
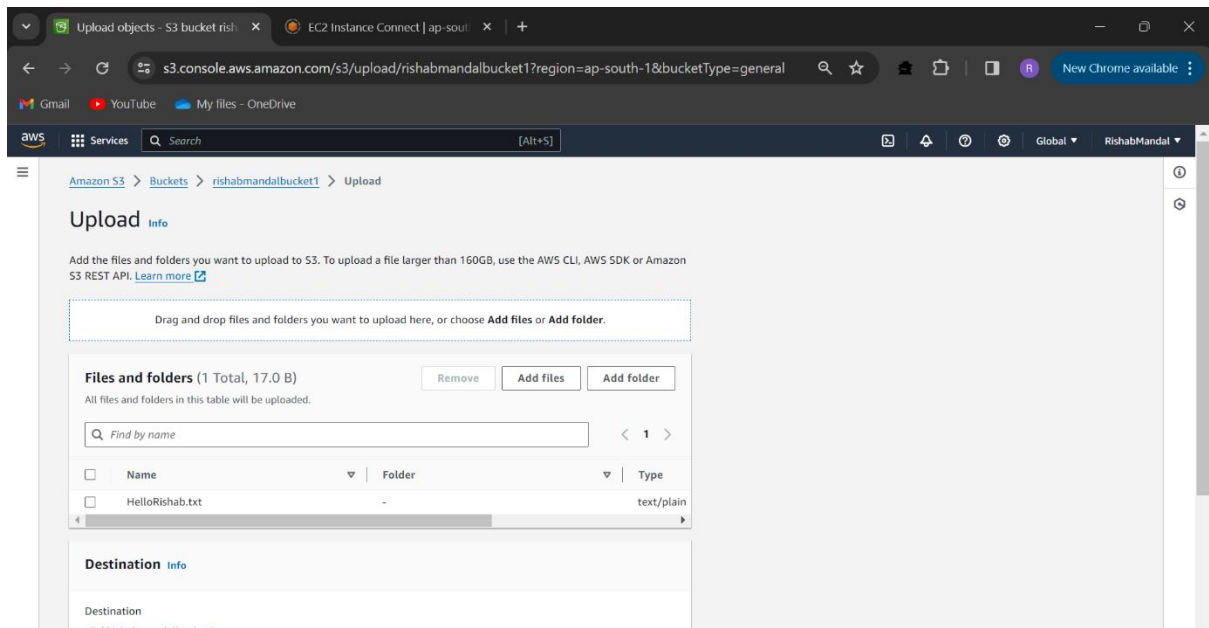
[Refresh](#) [Copy ARN](#) [Empty](#) [Delete](#) [Create bucket](#)

	Name	AWS Region	Access	Creation date
<input type="radio"/>	rishabmandalbucket1	Asia Pacific (Mumbai) ap-south-1	Bucket and objects not public	February 28, 2024, 13:24:07 (UTC+05:30)

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Create S3 bucket

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Homepage | S3

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EC2 Instance Cor

Rishab Mandal

s3.console.aws.amazon.com/s3/bucket/create?region=ap-south-1&bucketType=general

GmailYouTubeMy files - OneDrive

ServicesSearch[Alt+S]

GlobalRishabMandal

Block all public access

Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent of one another.

Block public access to buckets and objects granted through new access control lists (ACLs)

S3 will block public access permissions applied to newly added buckets or objects, and prevent the creation of new public access ACLs for existing buckets and objects. This setting doesn't change any existing permissions that allow public access to S3 resources using ACLs.

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.

Turning off block all public access might result in this bucket and the objects within becoming public

AWS recommends that you turn on block all public access, unless public access is required for specific and verified use cases such as static website hosting.

☒ I acknowledge that the current settings might result in this bucket and the objects within becoming public.

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Search

risshabmandalbucket12

risshabmandalbucket1

Homepage | S3 | Global

risshabmandalbucket1.s

EC2 Instance Connect

s3.console.aws.amazon.com/s3/buckets/risshabmandalbucket123?region=ap-south-1&bucketType=genera...

GmailYouTubeMy files - OneDrive

ServicesSearch[Alt+S]

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Amazon S3

Buckets

Access Grants

Access Points

Object Lambda Access Points

Multi-Region Access Points

Batch Operations

IAM Access Analyzer for S3

Block Public Access settings for this account

Storage Lens

Dashboards

Storage Lens groups

AWS Organizations settings

Feature spotlight

Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In order to ensure that public access to all your S3 buckets and objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that you turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to your buckets or objects within, you can customize the individual settings below to suit your specific storage use cases. [Learn more](#)

Block all public access

Off

Individual Block Public Access settings for this bucket

Bucket policy

The bucket policy, written in JSON, provides access to the objects stored in the bucket. Bucket policies don't apply to objects owned by other accounts. [Learn more](#)

No policy to display.

Copy

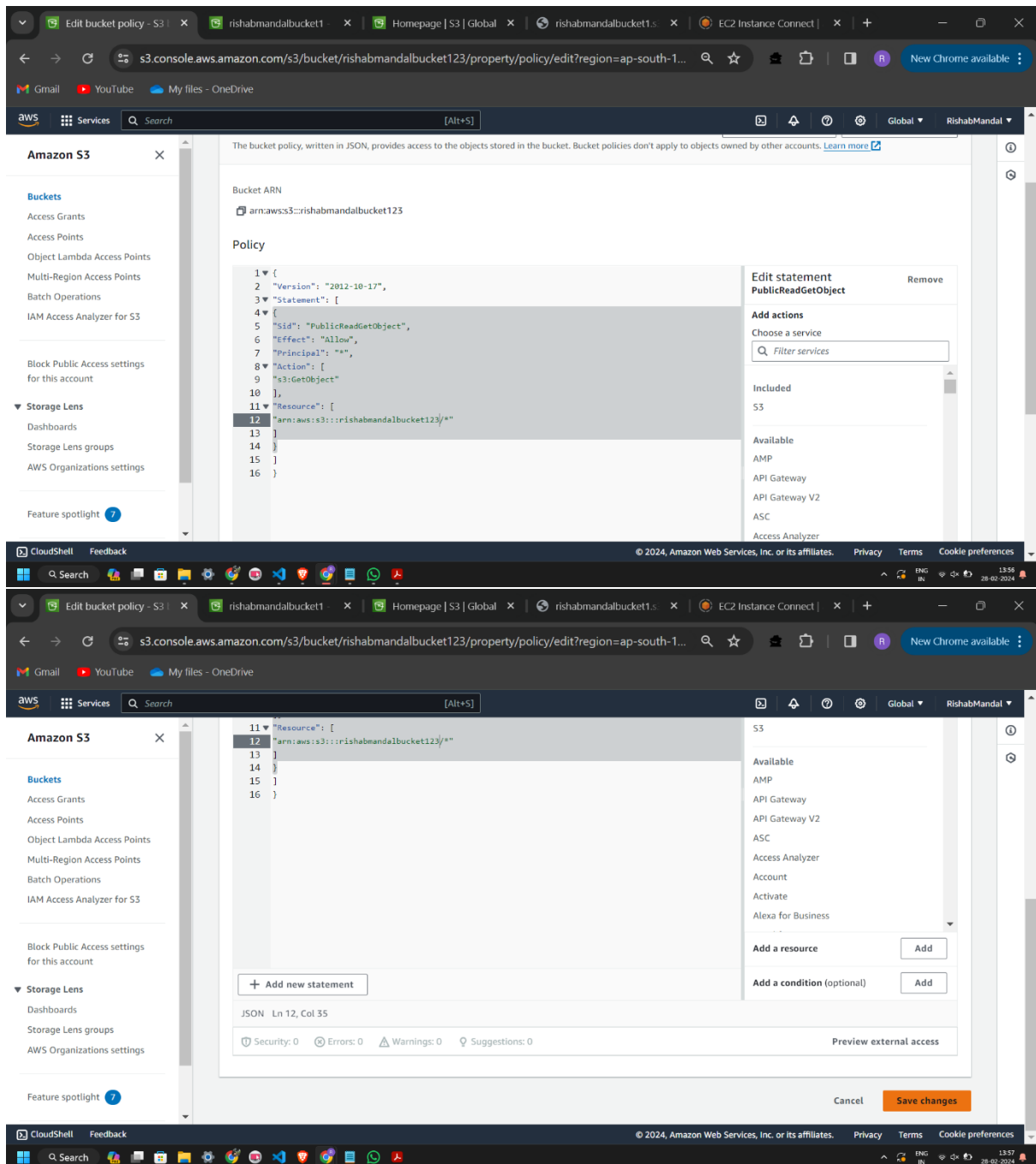
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Conclusion:

In conclusion, Storage as a Service using OwnCloud offers a flexible and scalable solution for storing, syncing, and sharing data securely. By understanding the concept of cloud storage, exploring OwnCloud's features, discussing the advantages and limitations of SaaS, and reviewing popular storage-as-a-service vendors, users can make informed decisions when implementing cloud storage solutions.