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CLASS: C24

ROLL NO: 2103124

EXPERIMENT NO. 06

AIM: To study and implement storage as a service using own cloud/AWS,glaciers.

Cloud Storage:

Cloud storage is a service model in which data is maintained, managed, and backed up remotely and made available to users over a network (typically the internet). The data is stored on multiple virtual servers, typically hosted by a third-party provider, ensuring redundancy and availability. Cloud storage eliminates the need for users to maintain their own physical storage infrastructure, reducing costs and complexity.

Cloud storage offers several key advantages, including scalability, accessibility, and cost-effectiveness. Users can easily scale their storage needs up or down based on demand, paying only for the storage they use. Data stored in the cloud can be accessed from anywhere with an internet connection, making it ideal for remote work and collaboration. Additionally, cloud storage providers typically offer high levels of data redundancy and availability, ensuring that data is protected against loss and downtime.

However, cloud storage also has some limitations, including security concerns, internet dependence, and data portability issues. Users must trust their cloud provider to protect their data against security breaches, and a stable internet connection is required to access data stored in the cloud. Moving large amounts of data in and out of the cloud can also be time-consuming, especially for organizations with significant data volumes.

OwnCloud and its Features:

OwnCloud is a self-hosted file sync and share server that allows users to store, sync, and share files across devices. It is similar to commercial cloud storage services like Dropbox or Google Drive but gives users more control over their data by allowing them to host it on their own servers or a third-party hosting provider.

OwnCloud offers a range of features, including file synchronization, file sharing, access control, and collaboration tools. Users can sync files across devices, ensuring they have access to the latest version wherever they are. They can also share files with other users or groups with configurable permissions, allowing for secure collaboration. OwnCloud also provides encryption for data in transit and at rest, ensuring that data is protected against unauthorized access.

Other features of OwnCloud include integration with third-party apps and services, allowing users to extend its functionality, and a web-based interface for easy access to files and folders. OwnCloud is open-source, meaning that users can customize and modify it to suit their needs, making it a flexible and versatile option for file storage and sharing.

Advantages and Limitations of Storage as a Service:

Advantages:

- Cost-Effectiveness: Pay only for the storage you use, reducing upfront costs.

- Scalability: Easily scale storage capacity up or down based on demand.

- Accessibility: Access data from anywhere with an internet connection.

- Redundancy: Data is often replicated across multiple data centers, ensuring high availability.

- Maintenance: Service providers handle maintenance and updates, reducing the burden on users.

Limitations:

- Security Concerns: Data stored in the cloud may be vulnerable to security breaches.

- internet Dependence: Requires a stable internet connection for access.

- Data Portability: Moving large amounts of data in and out of the cloud can be time-consuming.

- Vendor Lock-in: Users may be tied to a specific vendor's ecosystem, making it challenging to switch providers.

Types of Storage:

1. *Object Storage:* Stores data as objects, each containing data, metadata, and a unique identifier. Object storage is highly scalable

and is often used for storing unstructured data, such as photos, videos, and documents.

2. *Block Storage:* Stores data in fixed-sized blocks and is commonly used in storage area network (SAN) environments. Block storage is ideal for applications that require high-performance storage, such as databases and virtual machines.

3. *File Storage:* Stores data in a hierarchical structure and is commonly used in network-attached storage (NAS) environments. File storage is suitable for storing files and documents that need to be accessed by multiple users or applications.

Popular Storage-as-a-Service Vendors:

1. *Amazon S3 (Simple Storage Service):* Offers scalable object storage with high durability and availability. It is widely used for storing and retrieving any amount of data.

2. *Google Cloud Storage:* Provides scalable object storage with different storage classes, including standard, nearline, and coldline, offering different levels of accessibility and cost.

3. *Microsoft Azure Blob Storage:* Offers scalable object storage with features like data encryption, replication, and lifecycle management.

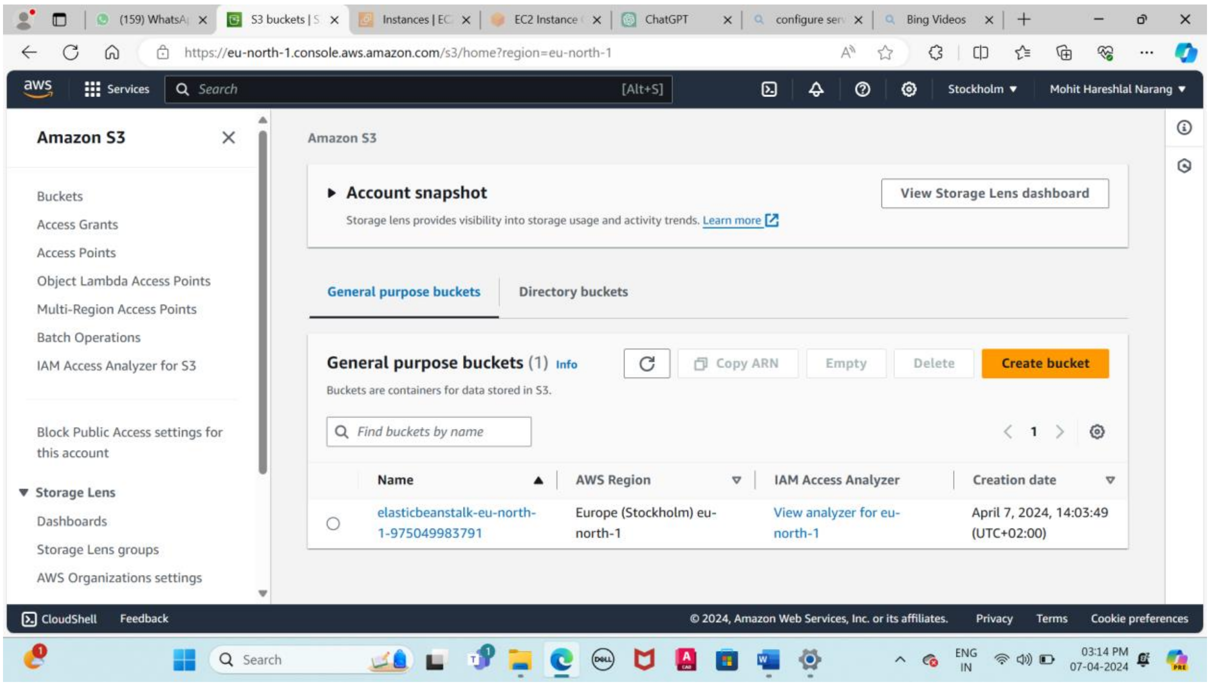
4. *IBM Cloud Object Storage:* Provides scalable object storage with features like encryption, versioning, and data retention policies.

5. *Backblaze B2 Cloud Storage:* Offers low-cost object storage with features like data encryption, versioning, and lifecycle management.

These vendors offer a range of storage services, including object storage, block storage, and file storage, catering to different storage needs and requirements.

Implementation:

Step-1: click on create bucket



https://eu-north-1.console.aws.amazon.com/s3/home?region=eu-north-1

Account snapshot

Storage lens provides visibility into storage usage and activity trends. Learn more

General purpose buckets (1) Info

Buckets are containers for data stored in S3.

	Name	AWS Region	IAM Access Analyzer	Creation date
○	elasticbeanstalk-eu-north-1-975049983791	Europe (Stockholm) eu-north-1	View analyzer for eu-north-1	April 7, 2024, 14:03:49 (UTC+02:00)

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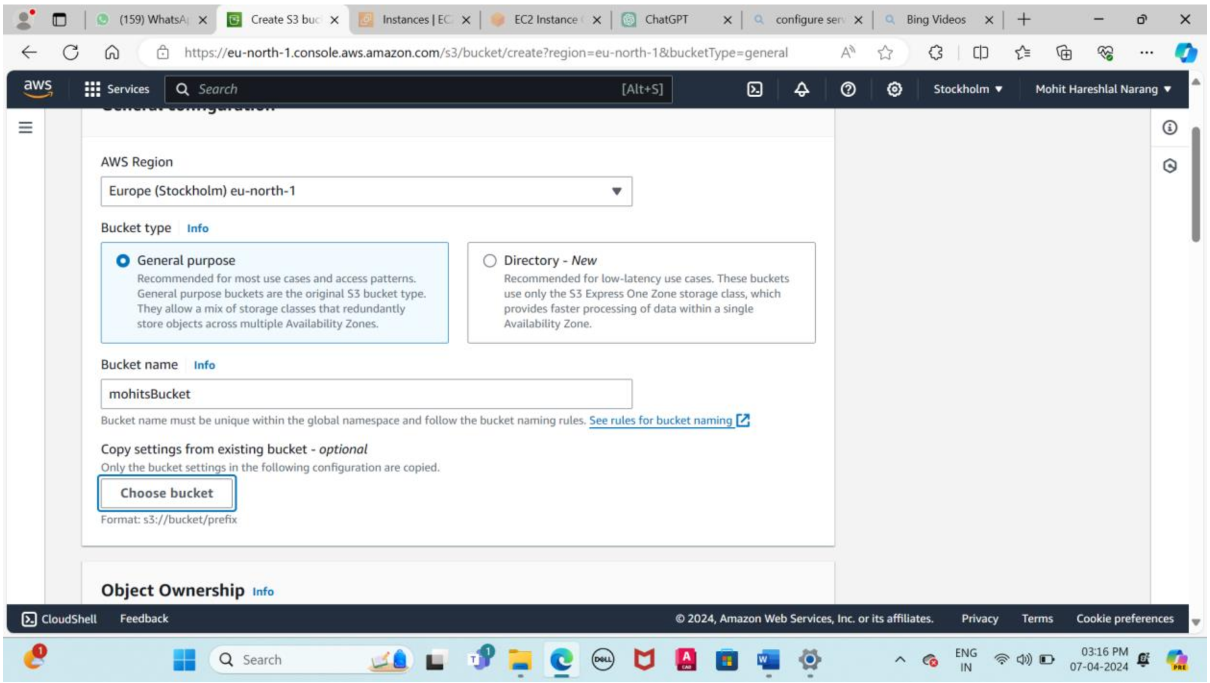
Step-2: Give Bucket name & select region for storage



AWS Region

Europe (Stockholm) eu-north-1

Bucket type Info

● General purpose
Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.

○ Directory - *New*
Recommended for low-latency use cases. These buckets use only the S3 Express One Zone storage class, which provides faster processing of data within a single Availability Zone.

Bucket name Info

mohitsBucket

Bucket name must be unique within the global namespace and follow the bucket naming rules. See rules for bucket naming

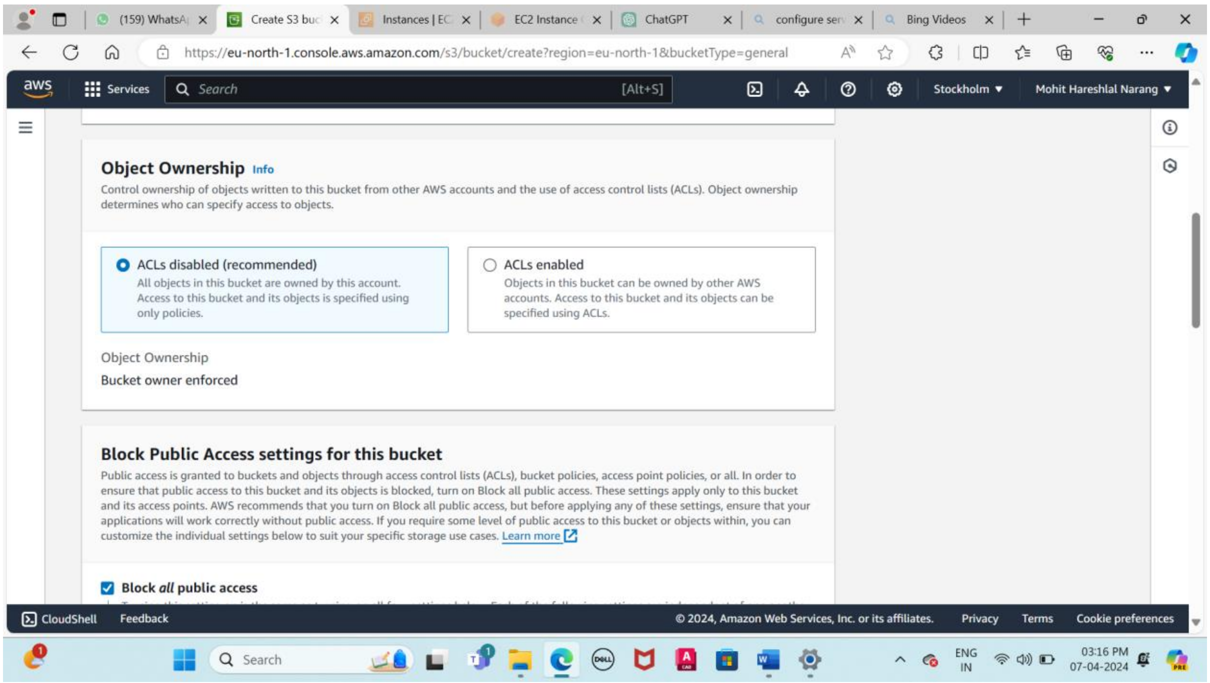
Copy settings from existing bucket - *optional*
Only the bucket settings in the following configuration are copied.

Choose bucket

Format: s3://bucket/prefix

Object Ownership Info

Step-3: Keep object ownership setting as ACLs Disabled as by-default



Object Ownership Info

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

● ACLs disabled (recommended)
All objects in this bucket are owned by this account. Access to this bucket and its objects is specified using only policies.

○ ACLs enabled
Objects in this bucket can be owned by other AWS accounts. Access to this bucket and its objects can be specified using ACLs.

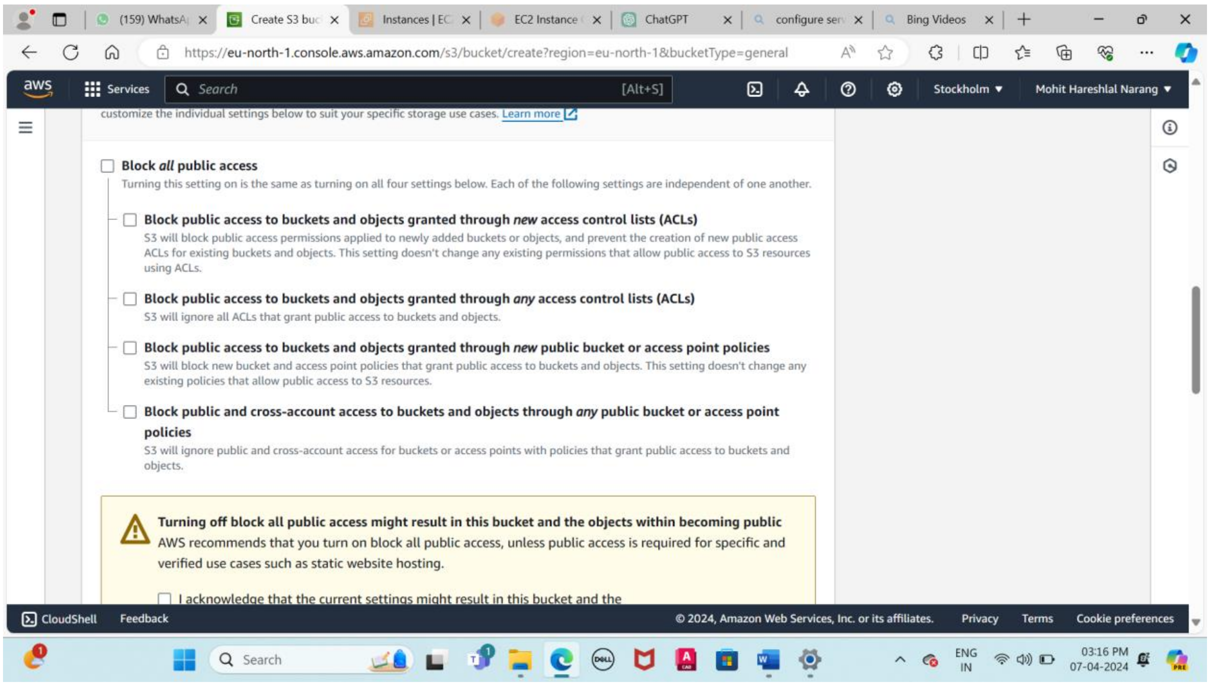
Object Ownership
Bucket owner enforced

Block Public Access settings for this bucket

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 this bucket and its 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 this bucket or objects within, you can customize the individual settings below to suit your specific storage use cases. Learn more

☑ Block *all* public access

Step-4: Disable block all public access checkbox



customize the individual settings below to suit your specific storage use cases. Learn more

□ **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.

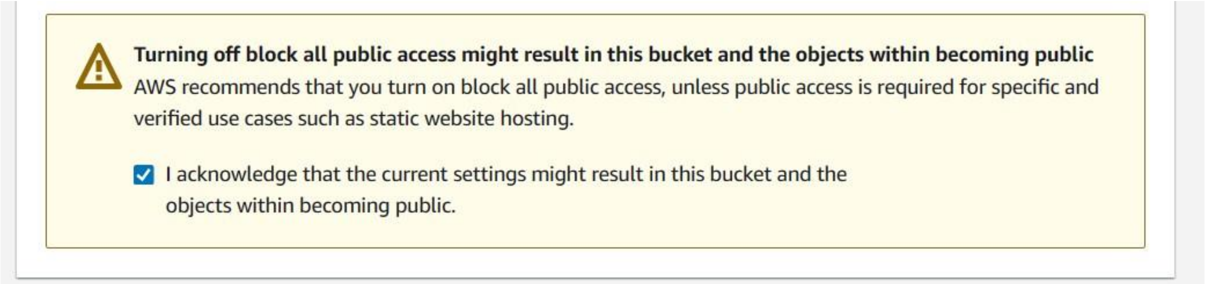
□ **Block public access to buckets and objects granted through *new* public bucket or access point policies**
S3 will block new bucket and access point policies that grant public access to buckets and objects. This setting doesn't change any existing policies that allow public access to S3 resources.

□ **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

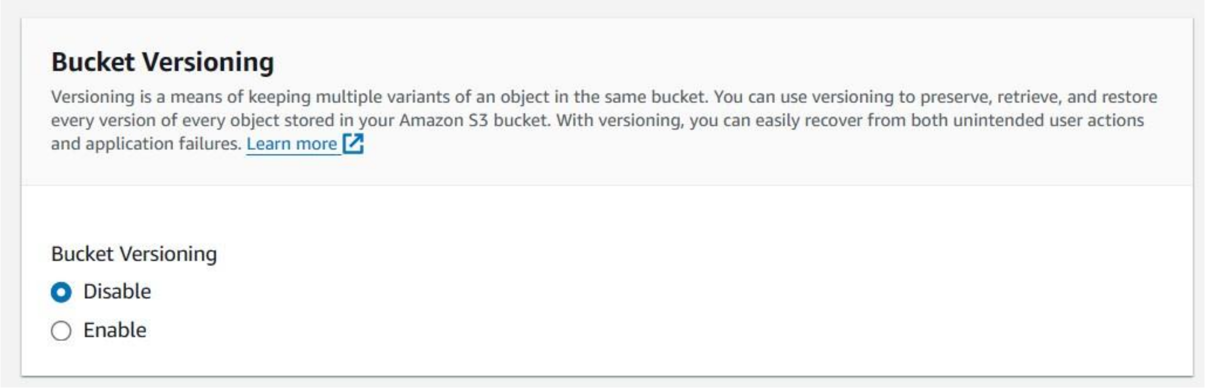
Step-5: Select the checkbox for Turning off block all public access might result in this bucket and the objects within becoming public



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.

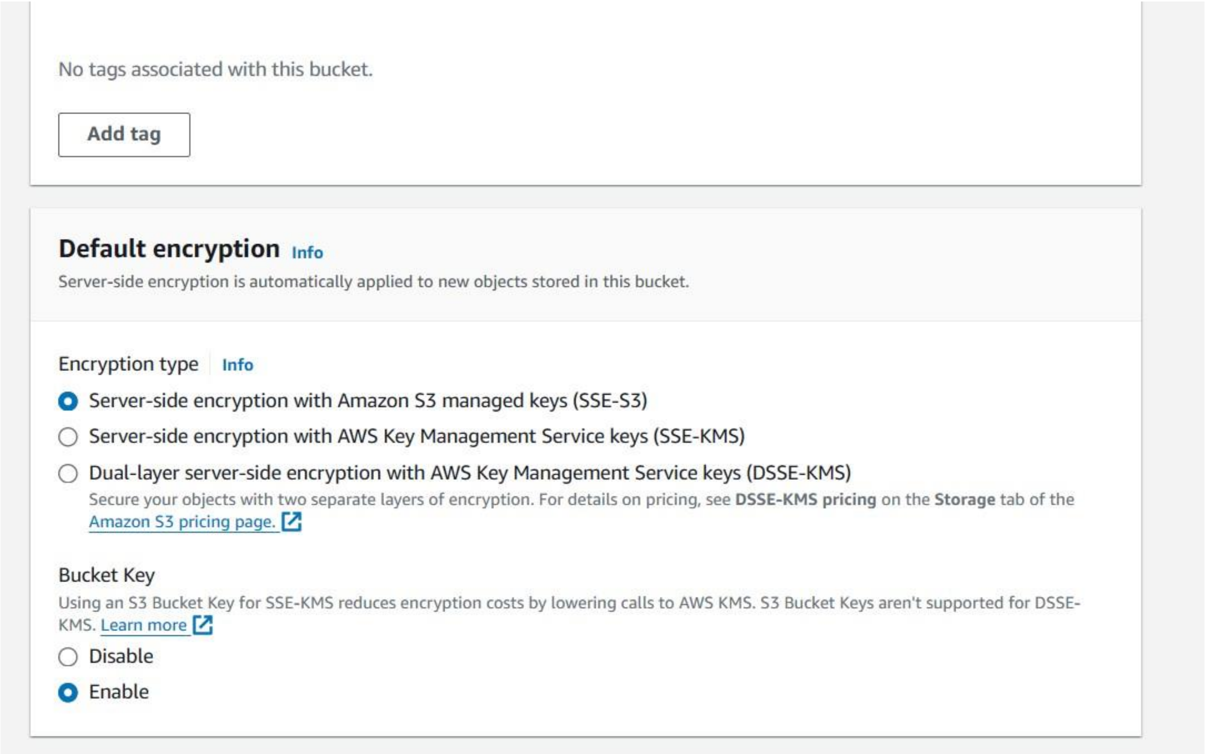
Step-6: Keep bucket versioning as disabled and add tags if required.



Bucket Versioning

Versioning is a means of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. Learn more

Bucket Versioning
● Disable
○ Enable



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.

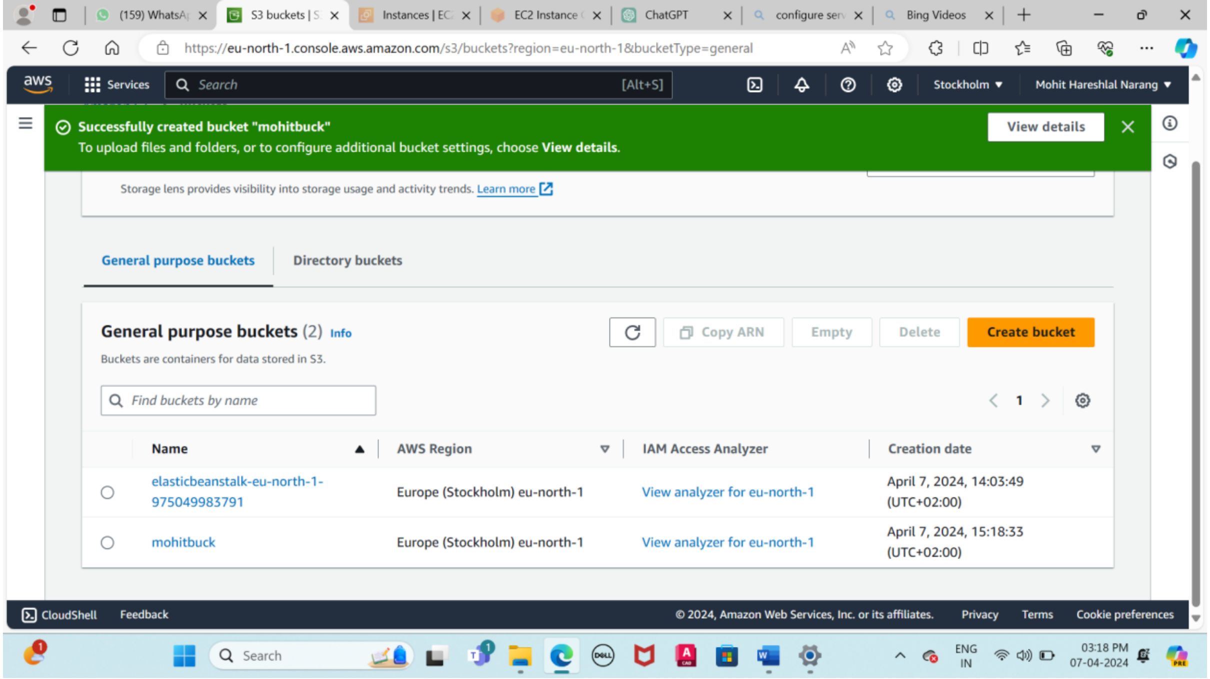
Bucket Key

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

Step-7: Keep default encryption disabled and click on create bucket button You can now see the successful creation of your bucket



Successfully created bucket "mohitbuck"
To upload files and folders, or to configure additional bucket settings, choose **View details**.

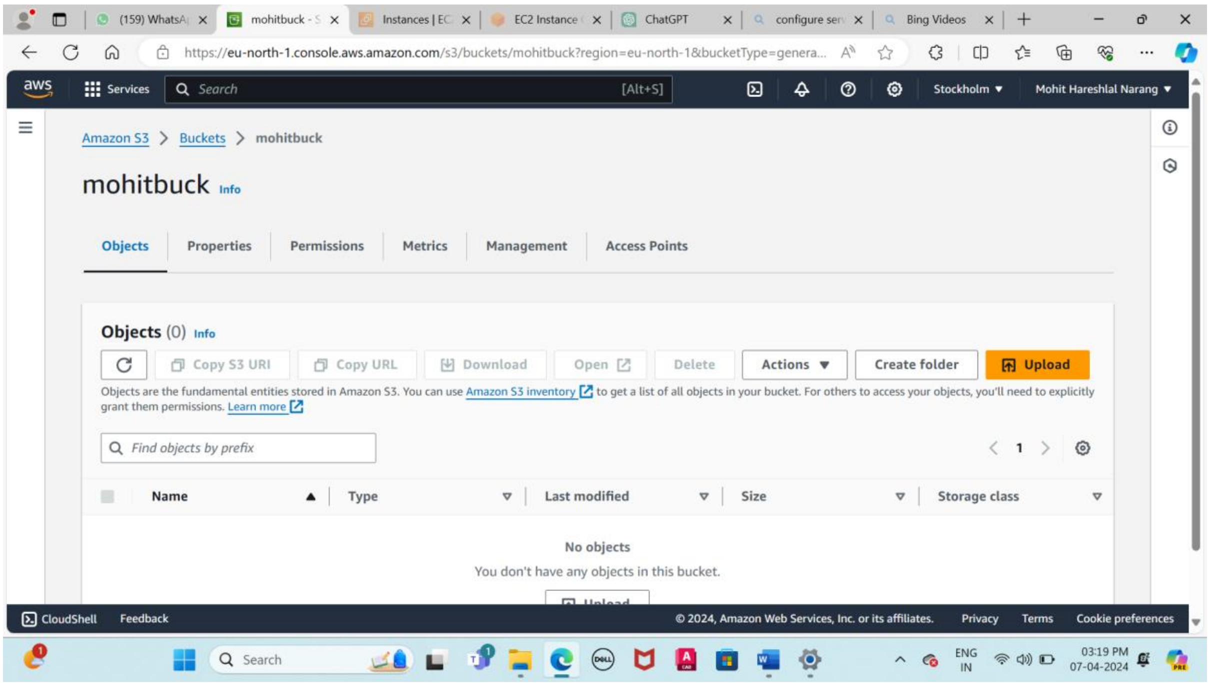
Storage lens provides visibility into storage usage and activity trends. Learn more

General purpose buckets (2) Info

Buckets are containers for data stored in S3.

	Name	AWS Region	IAM Access Analyzer	Creation date
○	elasticbeanstalk-eu-north-1-975049983791	Europe (Stockholm) eu-north-1	View analyzer for eu-north-1	April 7, 2024, 14:03:49 (UTC+02:00)
○	mohitbuck	Europe (Stockholm) eu-north-1	View analyzer for eu-north-1	April 7, 2024, 15:18:33 (UTC+02:00)

Step-8: now click on the bucket that you have created



Amazon S3 > Buckets > mohitbuck

mohitbuck Info

Objects (0) Info

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

Name ▲	Type	Last modified	Size	Storage class

No objects

You don't have any objects in this bucket.

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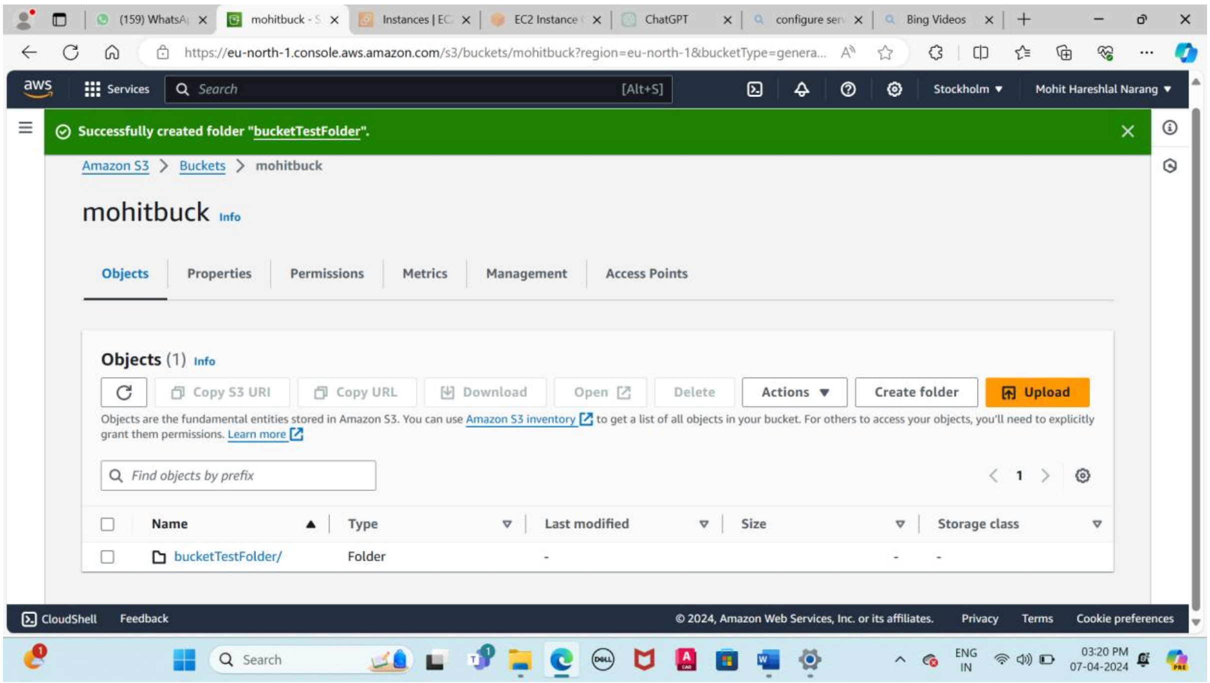
Step-9: You can either create a folder here or upload an existing file in the bucket



Successfully created folder "bucketTestFolder".

Amazon S3 > Buckets > mohitbuck

mohitbuck Info

Objects (1) Info

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

□	Name ▲	Type	Last modified	Size	Storage class
□	bucketTestFolder/	Folder	-	-	-

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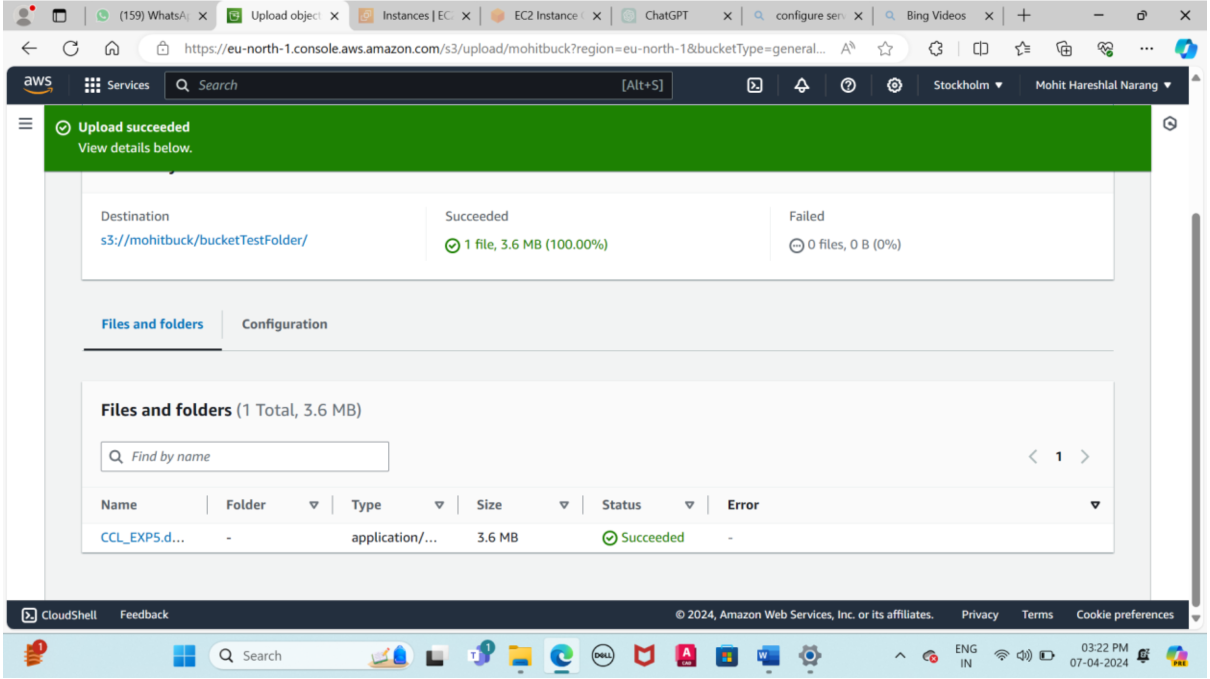


Upload succeeded
View details below.

Destination	Succeeded	Failed
s3://mohitbuck/bucketTestFolder/	1 file, 3.6 MB (100.00%)	0 files, 0 B (0%)

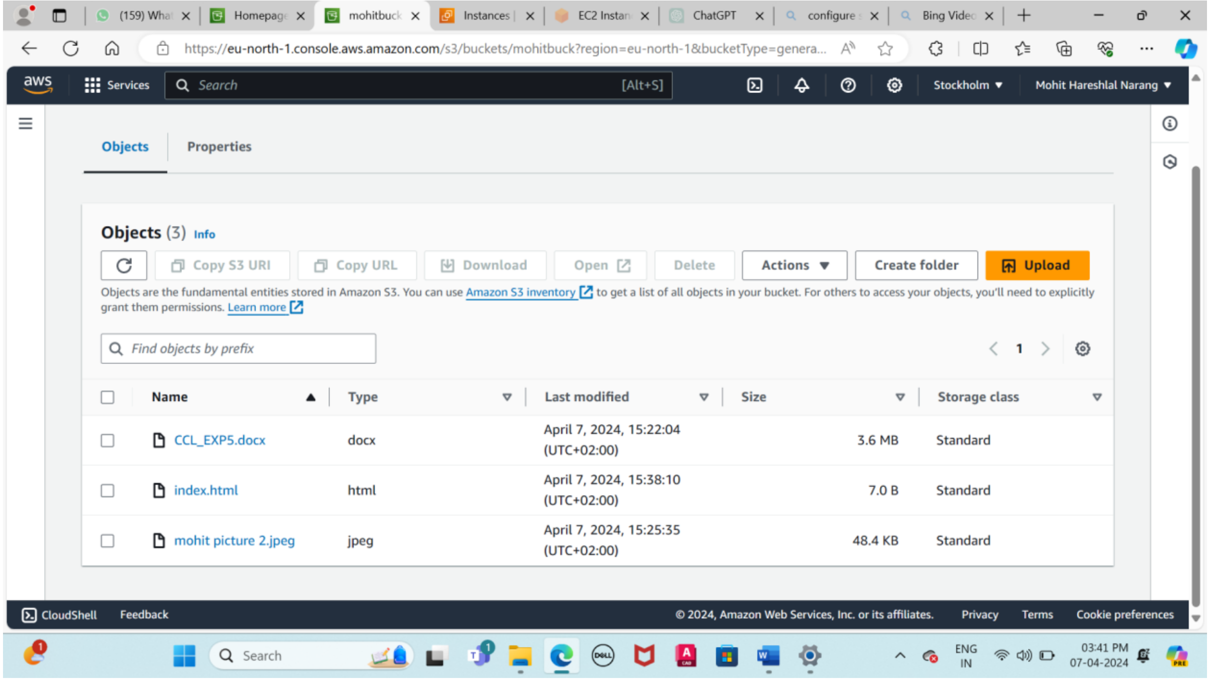
Files and folders | Configuration

Files and folders (1 Total, 3.6 MB)

Find by name

Name	Folder	Type	Size	Status	Error
CCL_EXP5.d...	-	application/...	3.6 MB	Succeeded	-

Step-10: now click on upload button and click on add files button browse your local machine and select which file you need to upload on S3 next click on upload button at bottom right end Now you can check the upload status screen Now click on close button The screen will appear as below

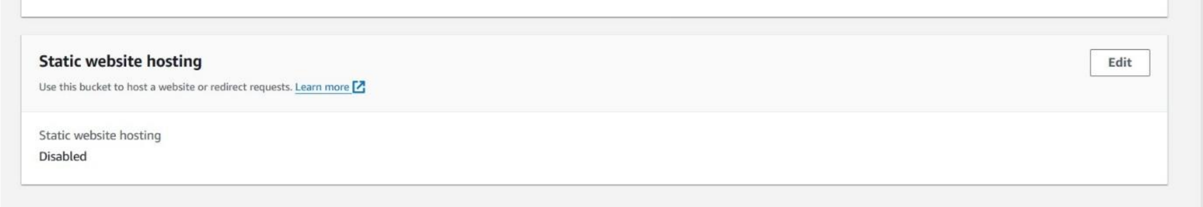


Objects (3) Info

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

	Name	Type	Last modified	Size	Storage class
□	CCL_EXP5.docx	docx	April 7, 2024, 15:22:04 (UTC+02:00)	3.6 MB	Standard
□	index.html	html	April 7, 2024, 15:38:10 (UTC+02:00)	7.0 B	Standard
□	mohit picture 2.jpeg	jpeg	April 7, 2024, 15:25:35 (UTC+02:00)	48.4 KB	Standard

Step-11: Select properties and scroll down to Static website hosting option which is disabled now click on Edit option on right side

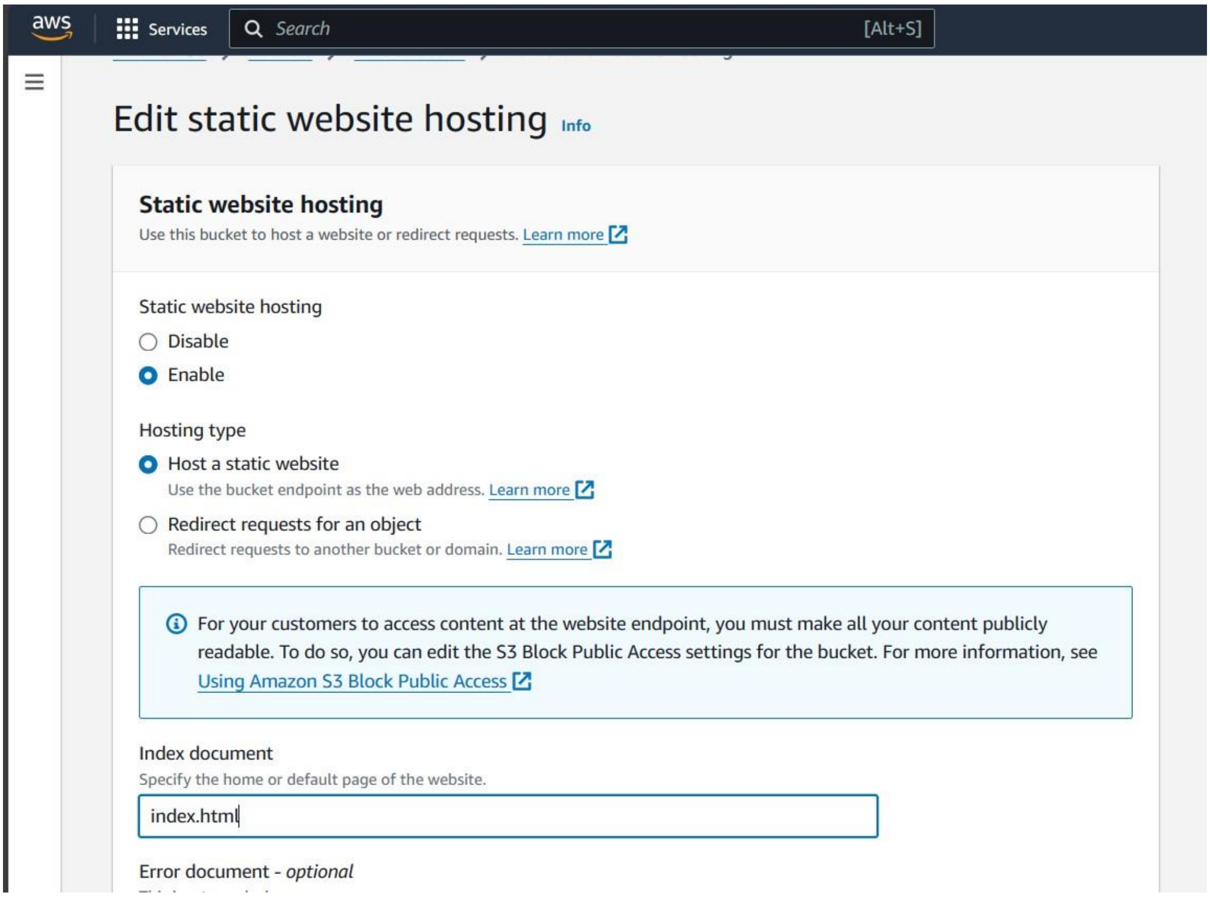


Static website hosting

Use this bucket to host a website or redirect requests. Learn more

Static website hosting
Disabled

Step-12: Enable the radio button and specify the file name in Index document which you have added in S3 Scroll down and save the changes at bottom right Following screen will appear



Edit static website hosting Info

Static website hosting

Use this bucket to host a website or redirect requests. Learn more

Static website hosting

○ Disable

● Enable

Hosting type

● Host a static website

Use the bucket endpoint as the web address. Learn more

○ Redirect requests for an object

Redirect requests to another bucket or domain. Learn more

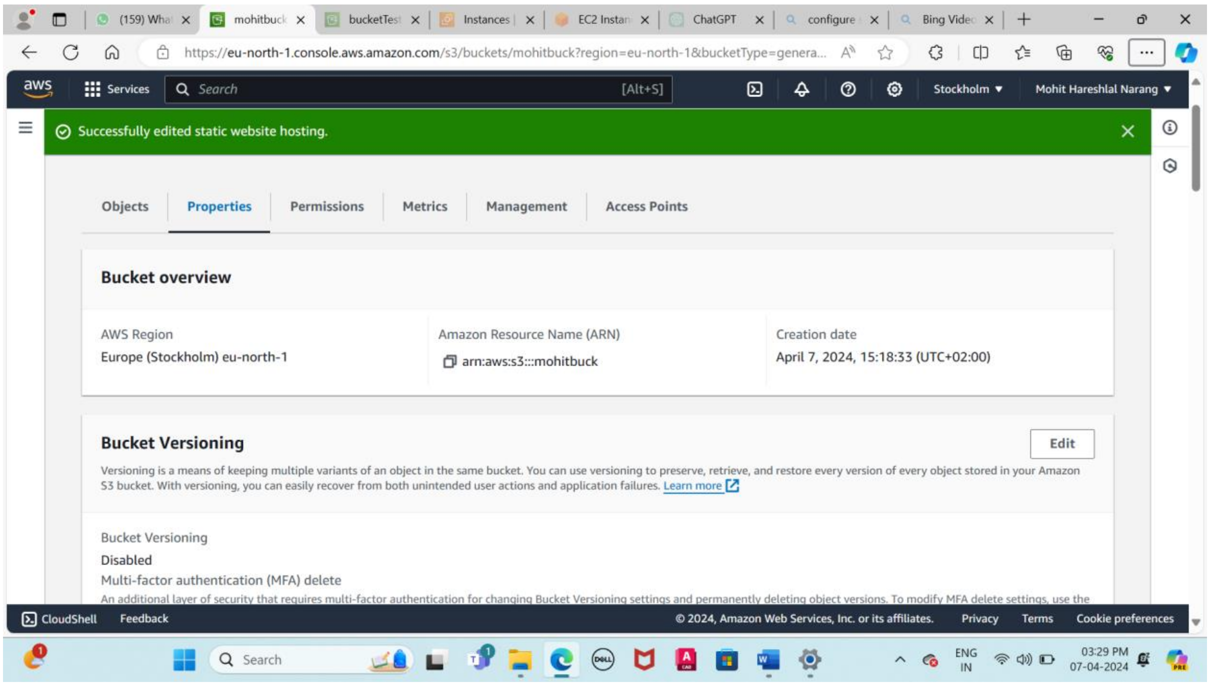
For your customers to access content at the website endpoint, you must make all your content publicly readable. To do so, you can edit the S3 Block Public Access settings for the bucket. For more information, see Using Amazon S3 Block Public Access

Index document

Specify the home or default page of the website.

index.html

Error document - *optional*



Successfully edited static website hosting.

Objects | Properties | Permissions | Metrics | Management | Access Points

Bucket overview

AWS Region	Amazon Resource Name (ARN)	Creation date
Europe (Stockholm) eu-north-1	arn:aws:s3:::mohitbuck	April 7, 2024, 15:18:33 (UTC+02:00)

Bucket Versioning Edit

Versioning is a means of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. Learn more

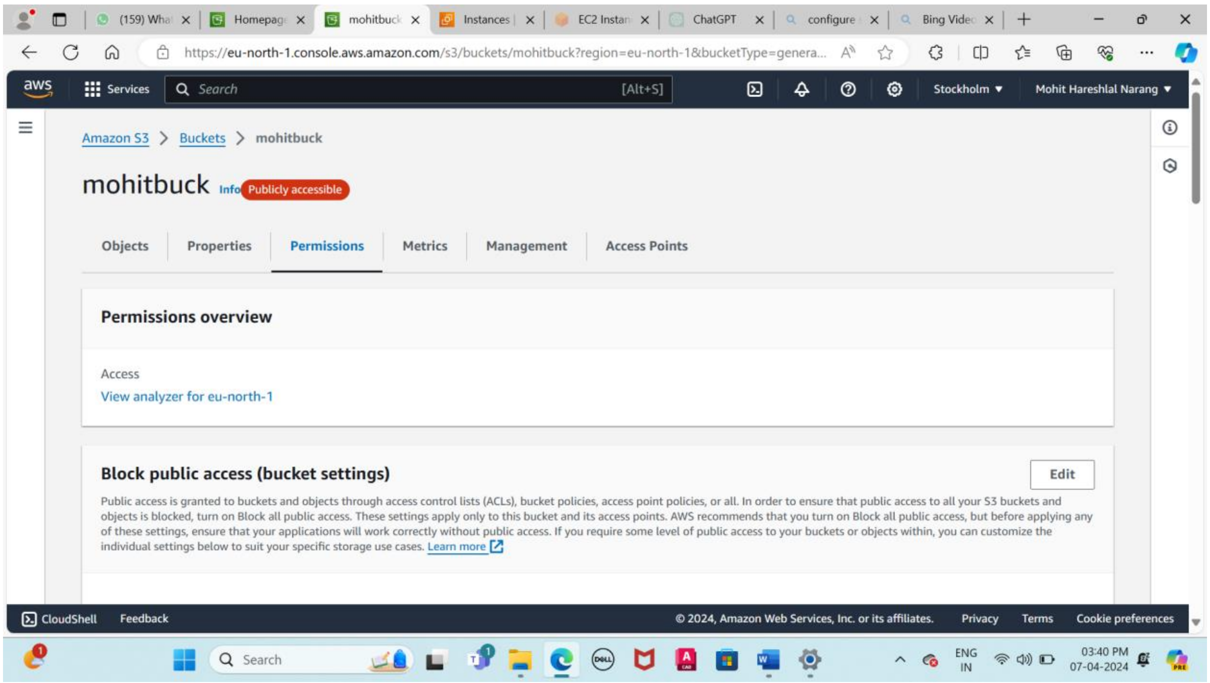
Bucket Versioning

Disabled

Multi-factor authentication (MFA) delete

An additional layer of security that requires multi-factor authentication for changing Bucket Versioning settings and permanently deleting object versions. To modify MFA delete settings, use the

Step-13: Click on Permissions Tab


https://eu-north-1.console.aws.amazon.com/s3/buckets/mohitbuck?region=eu-north-1&bucketType=genera...
aws
Services
Search
[Alt+S]
Stockholm ▾
Mohit Hareshlal Narang ▾
CloudShell
Feedback
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Privacy
Terms
Cookie preferences

Amazon S3 > Buckets > mohitbuck

mohitbuck Info Publicly accessible

Objects | Properties | Permissions | Metrics | Management | Access Points

Permissions overview

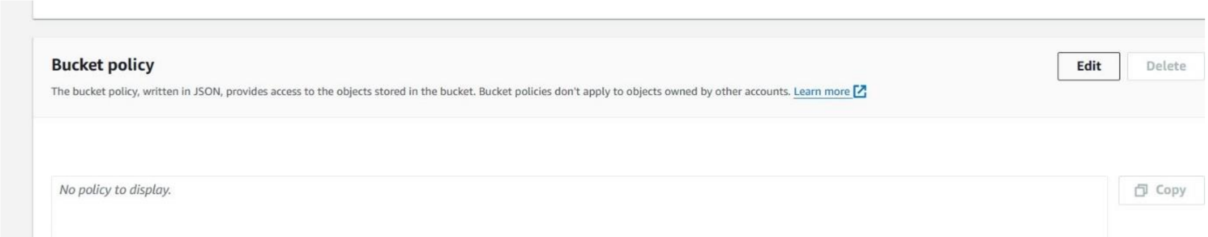
Access

View analyzer for eu-north-1

Block public access (bucket settings) Edit

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

Step-14: In bucket policy click on Edit option



Bucket policy Edit Delete

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

Step 15- after clicking on edit button paste the following code in bucket policy

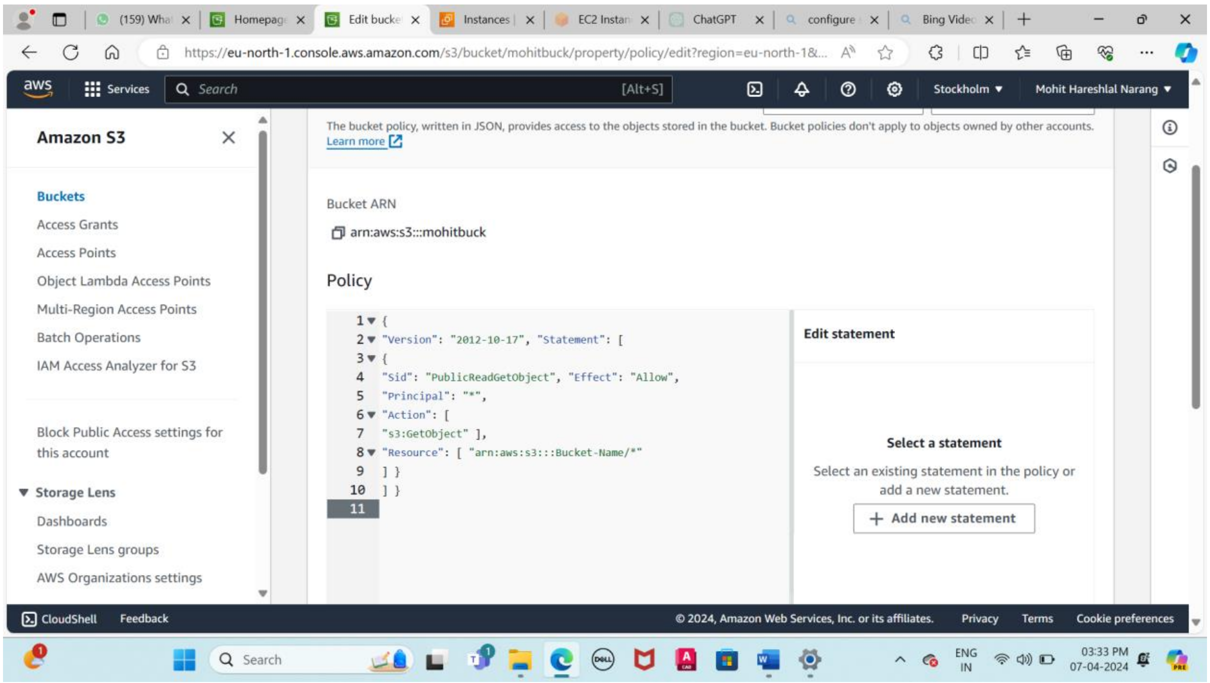
```
{
"Version": "2012-10-17", "Statement": [
{
"Sid": "PublicReadGetObject", "Effect": "Allow",
"Principal": "*",
"Action": [
```

"s3:GetObject"],

"Resource": ["arn:aws:s3:::Bucket-Name/*"

] }

] }



(159) What
Homepage
Edit bucket
Instances
EC2 Instan
ChatGPT
configure
Bing Video
https://eu-north-1.console.aws.amazon.com/s3/bucket/mohitbuck/property/policy/edit?region=eu-north-1&...
aws
Services
Search
[Alt+S]
Stockholm
Mohit Hareshlal Narang
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
CloudShell
Feedback
© 2024, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Search
ENG IN
03:33 PM
07-04-2024

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

Bucket ARN

arn:aws:s3:::mohitbuck

Policy

```
{
"Version": "2012-10-17", "Statement": [
{
"Sid": "PublicReadGetObject", "Effect": "Allow",
"Principal": "*",
"Action": [
"s3:GetObject" ],
"Resource": [ "arn:aws:s3:::Bucket-Name/*"
] }
] }
```

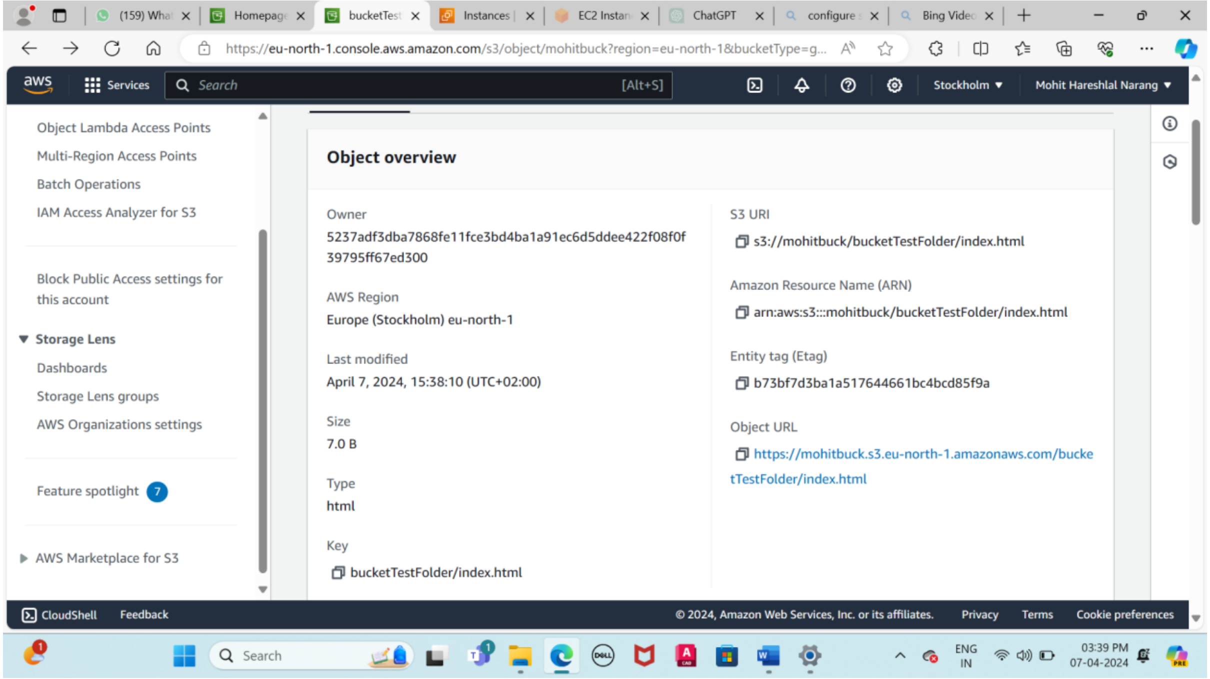
Edit statement

Select a statement

Select an existing statement in the policy or add a new statement.

Note-Make sure that you add your bucket name in the code above Scroll down and click on Save Changes button

Step-16: open your html file and click on Object URL


aws
Services
Search
[Alt+S]
Stockholm
Mohit Hareshlal Narang
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 7
AWS Marketplace for S3
CloudShell
Feedback
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Privacy
Terms
Cookie preferences

https://eu-north-1.console.aws.amazon.com/s3/object/mohitbuck?region=eu-north-1&bucketType=g...

Object overview

Owner
5237adf3dba7868fe11fce3bd4ba1a91ec6d5ddee422f08f0f39795ff67ed300

AWS Region
Europe (Stockholm) eu-north-1

Last modified
April 7, 2024, 15:38:10 (UTC+02:00)

Size
7.0 B

Type
html

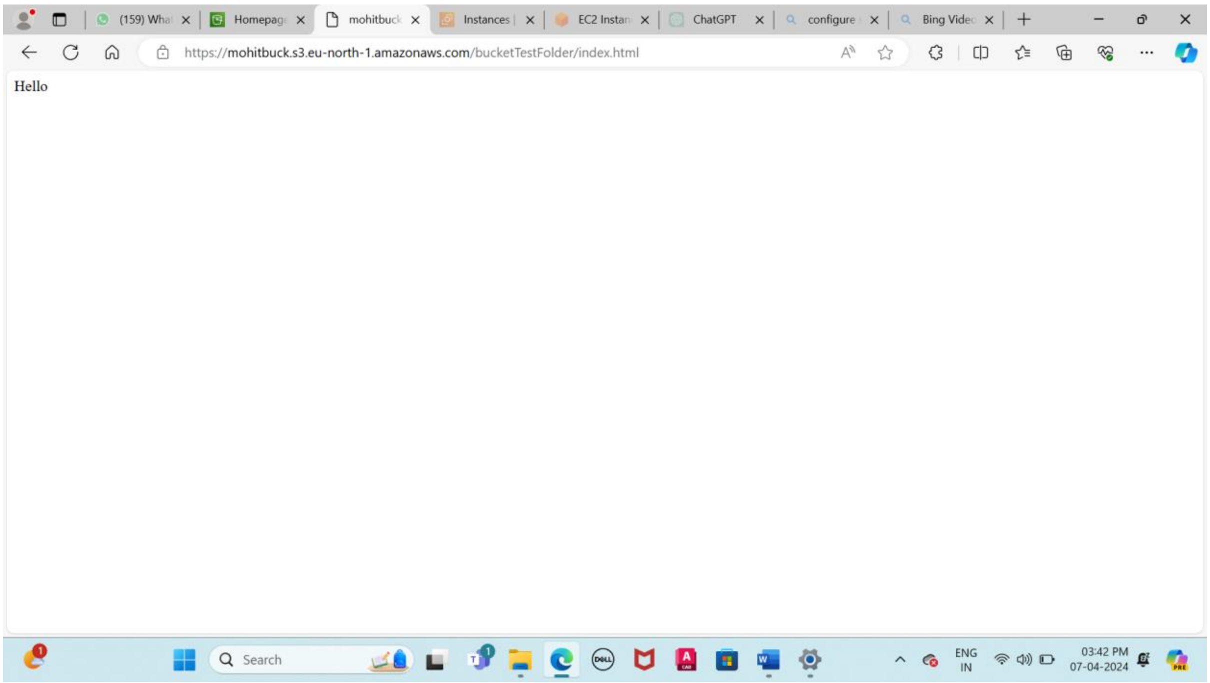
Key
bucketTestFolder/index.html

S3 URI
s3://mohitbuck/bucketTestFolder/index.html

Amazon Resource Name (ARN)
arn:aws:s3:::mohitbuck/bucketTestFolder/index.html

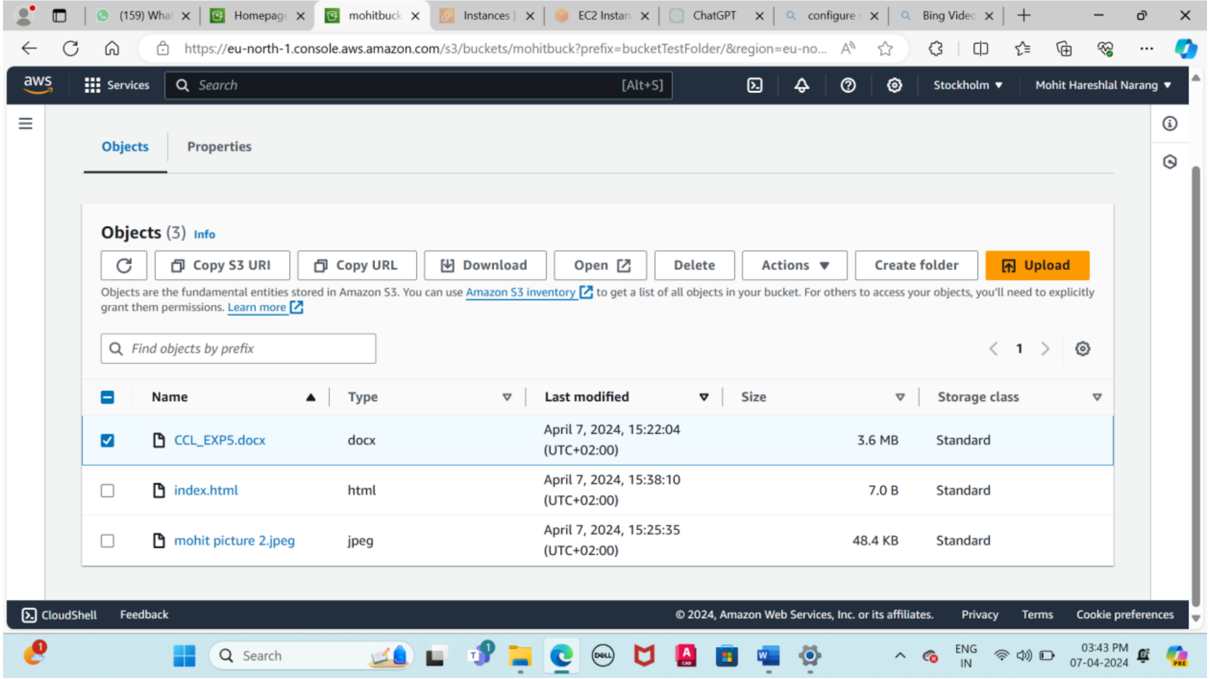
Entity tag (Etag)
b73bf7d3ba1a517644661bc4bcd85f9a

Object URL
https://mohitbuck.s3.eu-north-1.amazonaws.com/bucketTestFolder/index.html


https://mohitbuck.s3.eu-north-1.amazonaws.com/bucketTestFolder/index.html

Hello

Step-17: Now for delete files click on checkbox of your file and then click on Delete Button Write permanently delete and click on delete object button Now click on close button



https://eu-north-1.console.aws.amazon.com/s3/buckets/mohitbuck?prefix=bucketTestFolder/&region=eu-no...

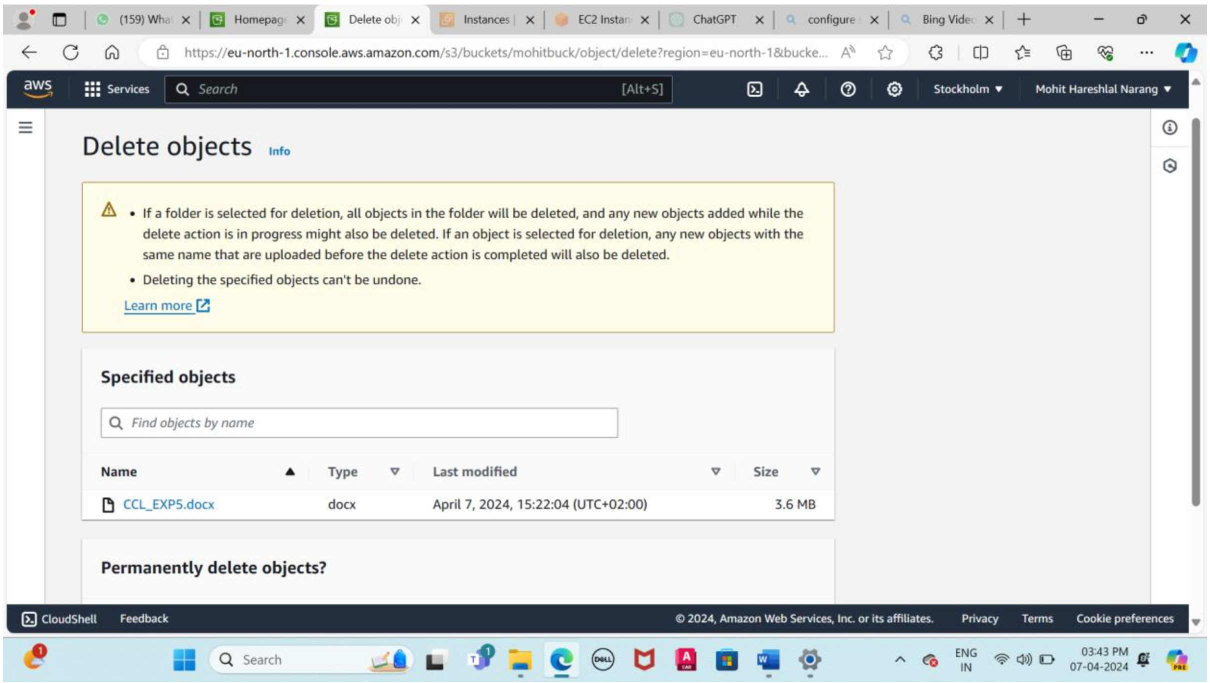
Objects (3) Info

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

Find objects by prefix

	Name	Type	Last modified	Size	Storage class
☑	CCL_EXP5.docx	docx	April 7, 2024, 15:22:04 (UTC+02:00)	3.6 MB	Standard
□	index.html	html	April 7, 2024, 15:38:10 (UTC+02:00)	7.0 B	Standard
□	mohit picture 2.jpeg	jpeg	April 7, 2024, 15:25:35 (UTC+02:00)	48.4 KB	Standard

03:43 PM 07-04-2024



https://eu-north-1.console.aws.amazon.com/s3/buckets/mohitbuck/object/delete?region=eu-north-1&bucke...

Delete objects Info

- If a folder is selected for deletion, all objects in the folder will be deleted, and any new objects added while the delete action is in progress might also be deleted. If an object is selected for deletion, any new objects with the same name that are uploaded before the delete action is completed will also be deleted.
- Deleting the specified objects can't be undone.

Learn more

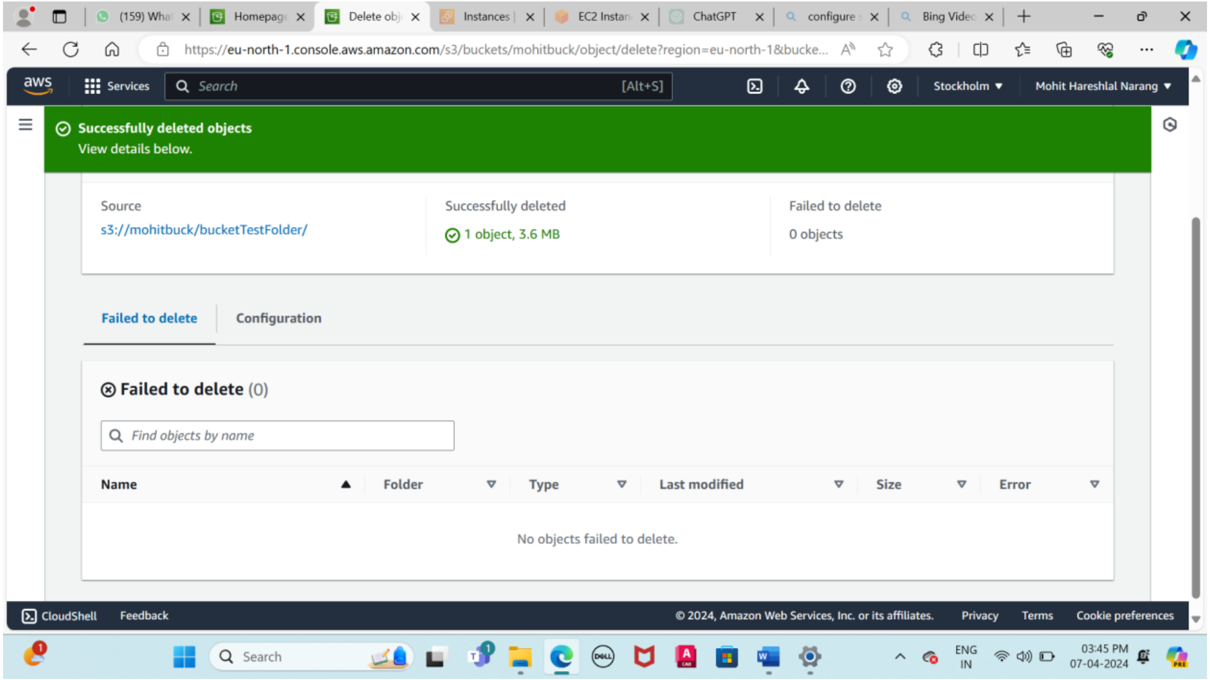
Specified objects

Find objects by name

Name	Type	Last modified	Size
CCL_EXP5.docx	docx	April 7, 2024, 15:22:04 (UTC+02:00)	3.6 MB

Permanently delete objects?

03:43 PM 07-04-2024


https://eu-north-1.console.aws.amazon.com/s3/buckets/mohitbuck/object/delete?region=eu-north-1&bucke...
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Successfully deleted objects
View details below.

Source	Successfully deleted	Failed to delete
s3://mohitbuck/bucketTestFolder/	1 object, 3.6 MB	0 objects

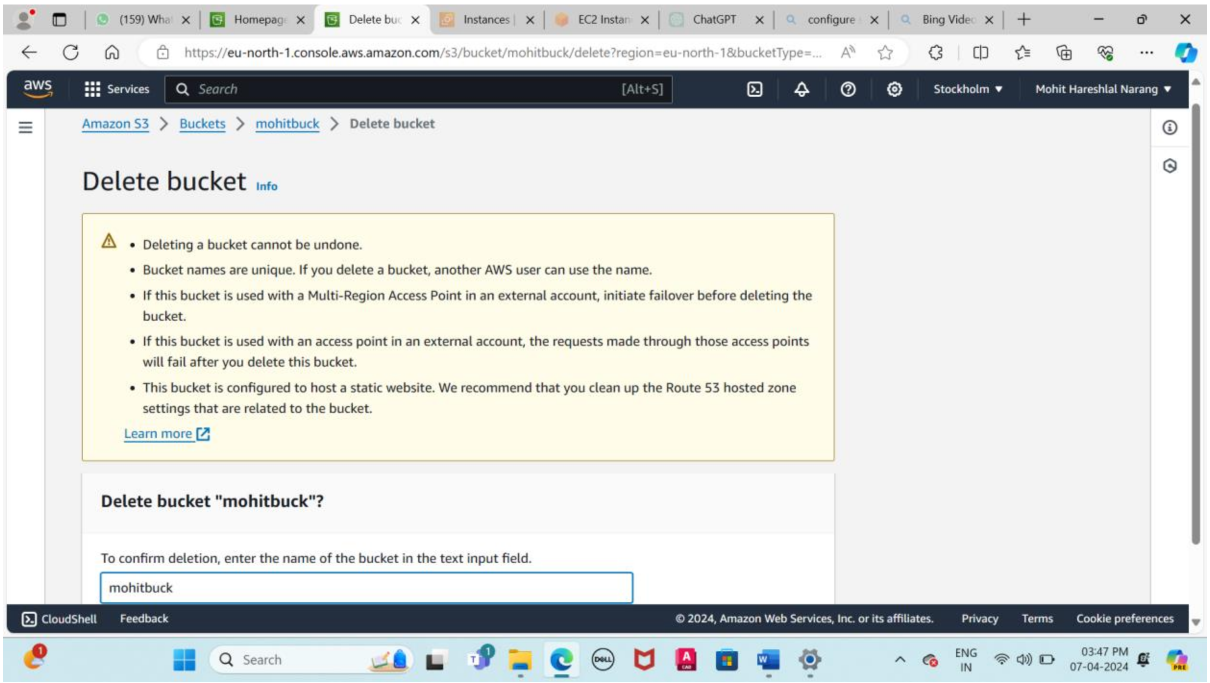
Failed to delete | Configuration

Failed to delete (0)

Find objects by name

Name	Folder	Type	Last modified	Size	Error
No objects failed to delete.					

Step-18: now come to Amazon S3 tab and select your bucket and then click on delete button Write down your bucket name in delete bucket tab and click on delete button at bottom right You can see that the bucket is deleted


https://eu-north-1.console.aws.amazon.com/s3/bucket/mohitbuck/delete?region=eu-north-1&bucketType=...
Services
Search
[Alt+S]
Stockholm ▾
Mohit Hareshlal Narang ▾
Amazon S3 > Buckets > mohitbuck > Delete bucket
CloudShell
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Delete bucket Info

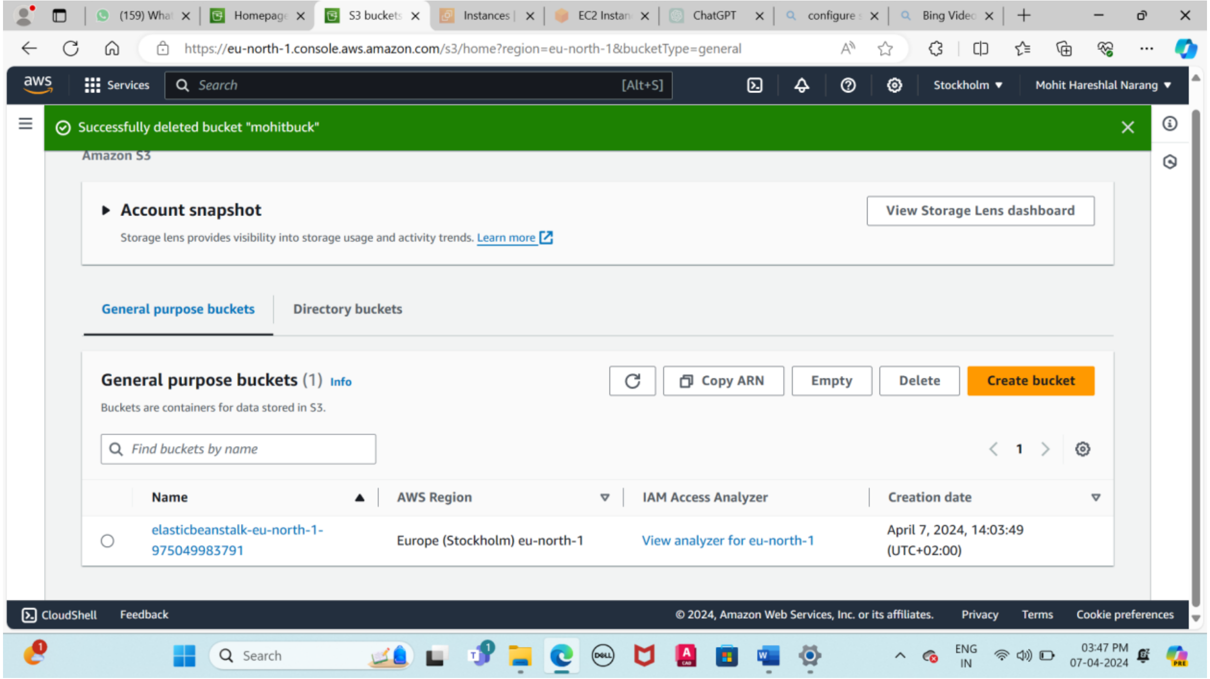
- Deleting a bucket cannot be undone.
- Bucket names are unique. If you delete a bucket, another AWS user can use the name.
- If this bucket is used with a Multi-Region Access Point in an external account, initiate failover before deleting the bucket.
- If this bucket is used with an access point in an external account, the requests made through those access points will fail after you delete this bucket.
- This bucket is configured to host a static website. We recommend that you clean up the Route 53 hosted zone settings that are related to the bucket.

Learn more

Delete bucket "mohitbuck"?

To confirm deletion, enter the name of the bucket in the text input field.

mohitbuck



https://eu-north-1.console.aws.amazon.com/s3/home?region=eu-north-1&bucketType=general

Successfully deleted bucket "mohitbuck"

Amazon S3

Account snapshot

Storage lens provides visibility into storage usage and activity trends. Learn more

General purpose buckets | Directory buckets

General purpose buckets (1) Info

Buckets are containers for data stored in S3.

Name	AWS Region	IAM Access Analyzer	Creation date
○ elasticbeanstalk-eu-north-1-975049983791	Europe (Stockholm) eu-north-1	View analyzer for eu-north-1	April 7, 2024, 14:03:49 (UTC+02:00)

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Conclusion:

Thus we have successfully implemented the aws services by uploading files to the cloud and creating a static web page and configuring it into our cloud database.