Project Report - Manual Exercises (Bac +2)

LAB 03

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CLOUD COMPUTING

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Paris, 19th March 2024.

LAB 03 – AWS S3 Bucket

Introduction:

The lab is structured into three main parts, each designed to progressively introduce users to more complex functionalities of S3, starting with the basics of bucket creation and object upload, advancing to hosting static websites, and finally, exploring version control of stored objects.

Part 1 focuses on the initial setup, guiding users through creating an S3 bucket and uploading different types of objects. This section provides step-by-step instructions on how to navigate the AWS Console, configure the bucket settings to ensure security and privacy, and successfully upload files.

Part 2 expands on the utility of S3 buckets by demonstrating how to use them for static website hosting. It introduces the concept of lifecycle rules to manage storage costs and ensure efficient data handling. This includes transitioning objects to more cost-effective storage classes after a certain period and setting up rules for automatic expiration.

Part 3 delves into enabling versioning for the S3 bucket, a crucial feature for maintaining data integrity and facilitating the recovery of previous versions of files. This section covers the re-upload of files to test and confirm the versioning feature is working as intended.

Throughout the lab, detailed guidelines and illustrations support the theoretical explanations, ensuring that users can follow along and apply the concepts in a practical, hands-on manner.

1. Create a bucket

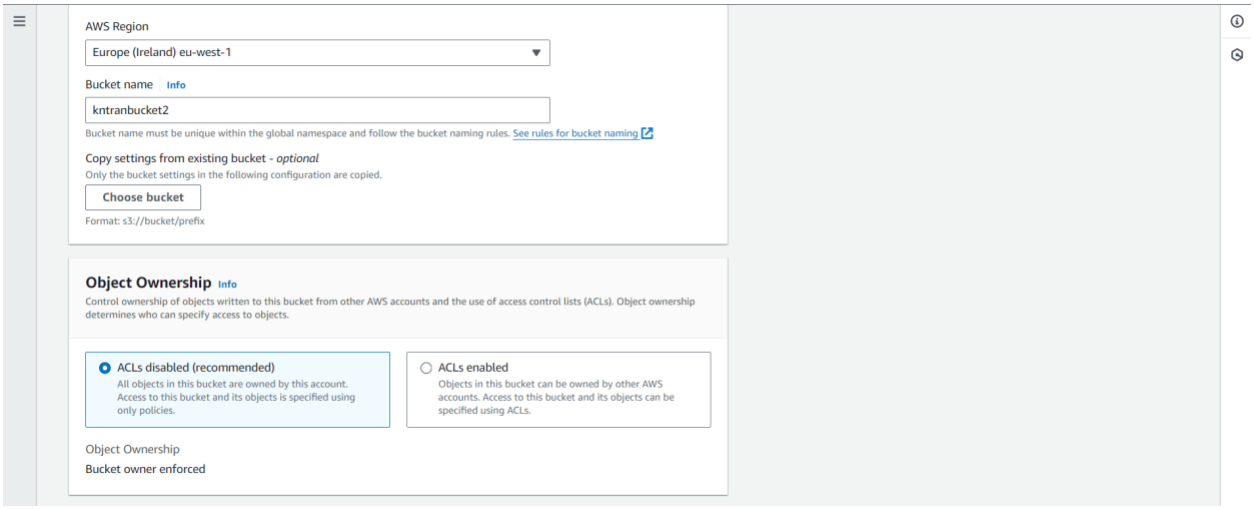

Figure 1.a. Setup bucket

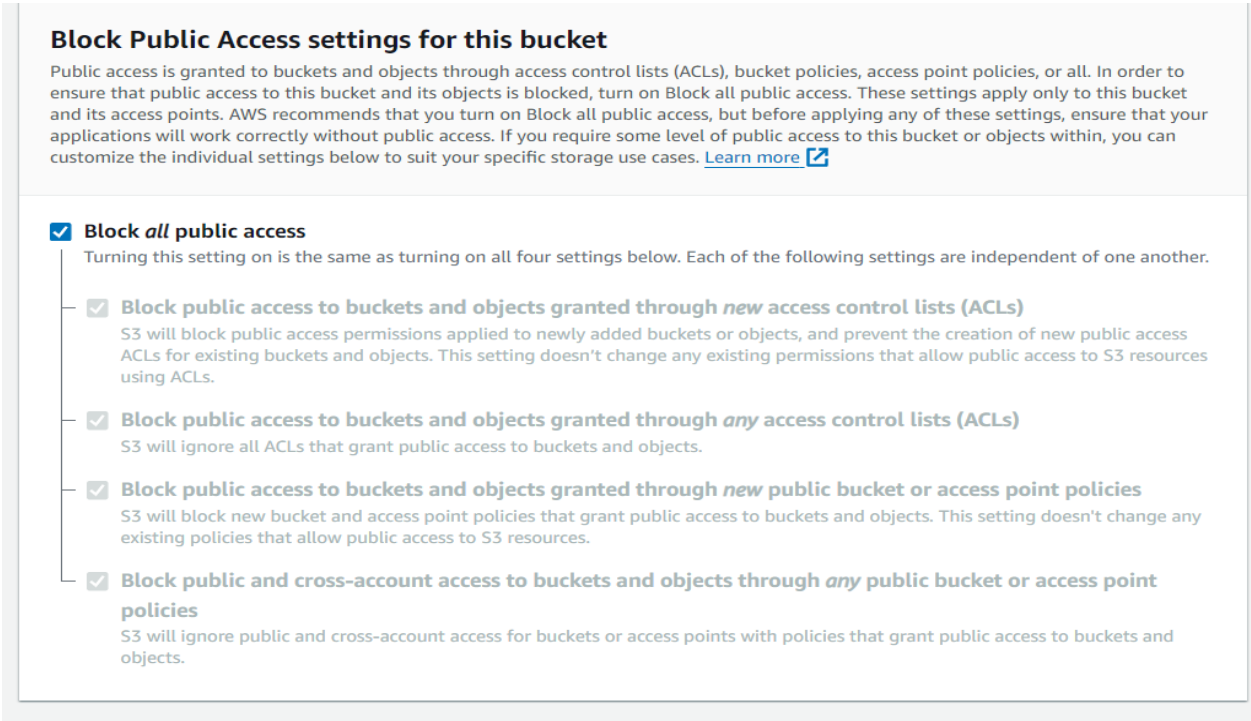

Figure 1.b. Setup bucket

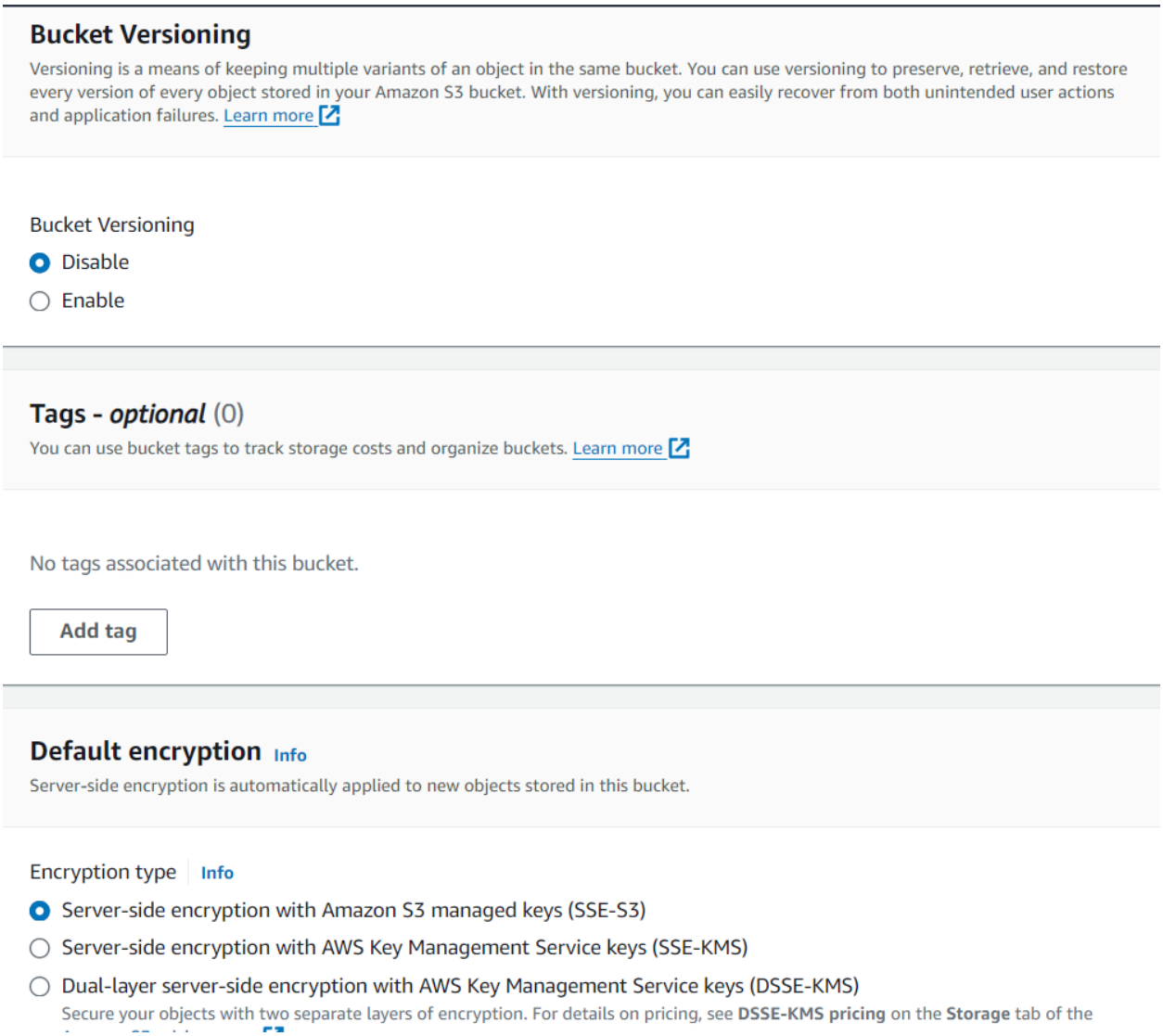

Figure 1.c. Setup bucket versioning

There are many reasons why creating a bucket is very crucial:

- Buckets provide a unique namespace on the internet for your data. The bucket name is unique globally across all AWS regions, ensuring that your data's storage location is distinct and accessible via a unique DNS address.
- With buckets, you can implement security features such as encryption, both at rest and in transit, to protect sensitive information.

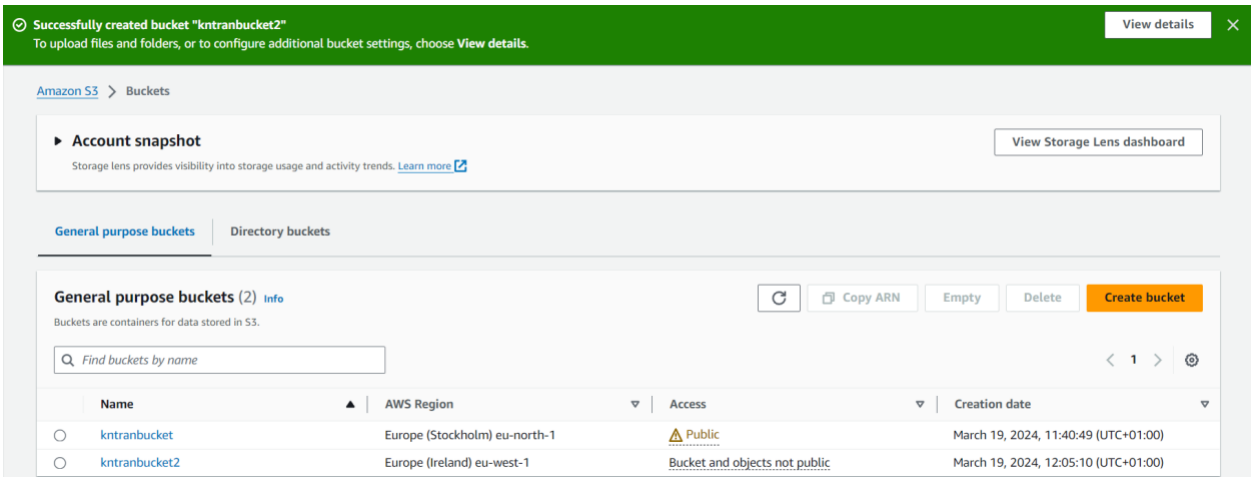

Figure 1.d. Finished setting up bucket

2. Upload files to S3

The advantages of uploading files to Amazon S3 (Simple Storage Service) span various aspects of data management, storage, security, and integration.

S3 offers comprehensive security features that help protect your data. This includes server-side encryption for data at rest, the option to use AWS Key Management Service (KMS) for managing encryption keys, and secure data transfer over SSL/TLS.

S3 provides a suite of management features to automate data transfers, set lifecycle policies for automatic archiving or deletion, and monitor and log access requests.

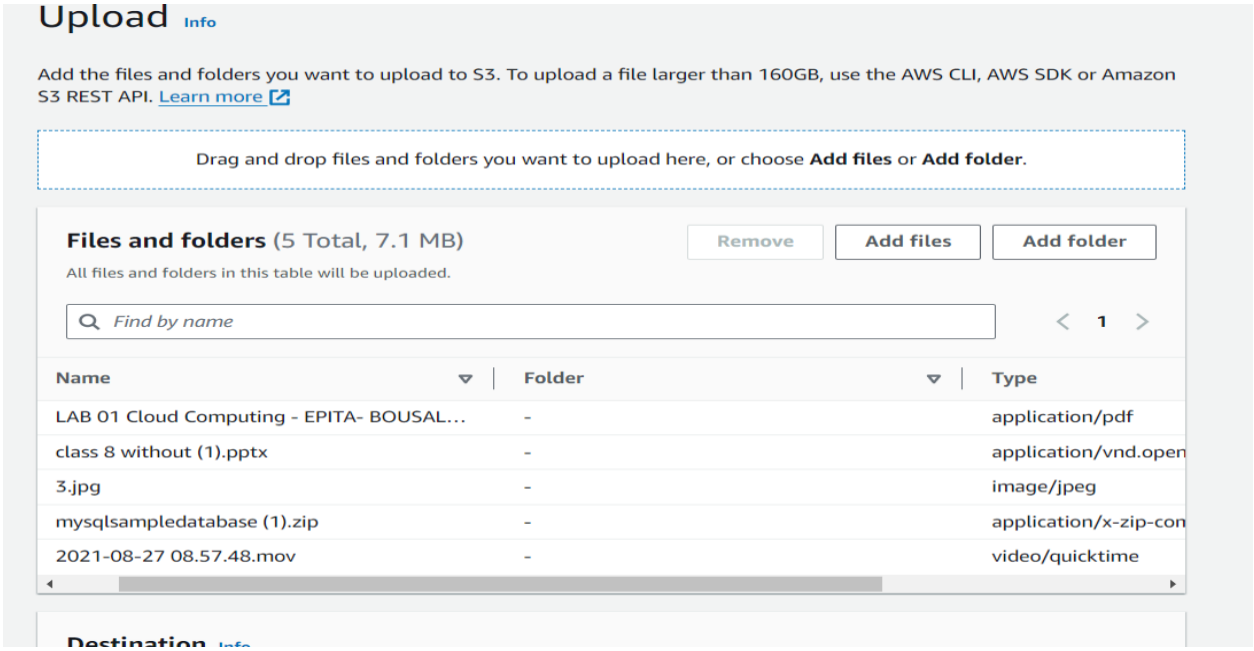

Figure 2.a. Uploading different files

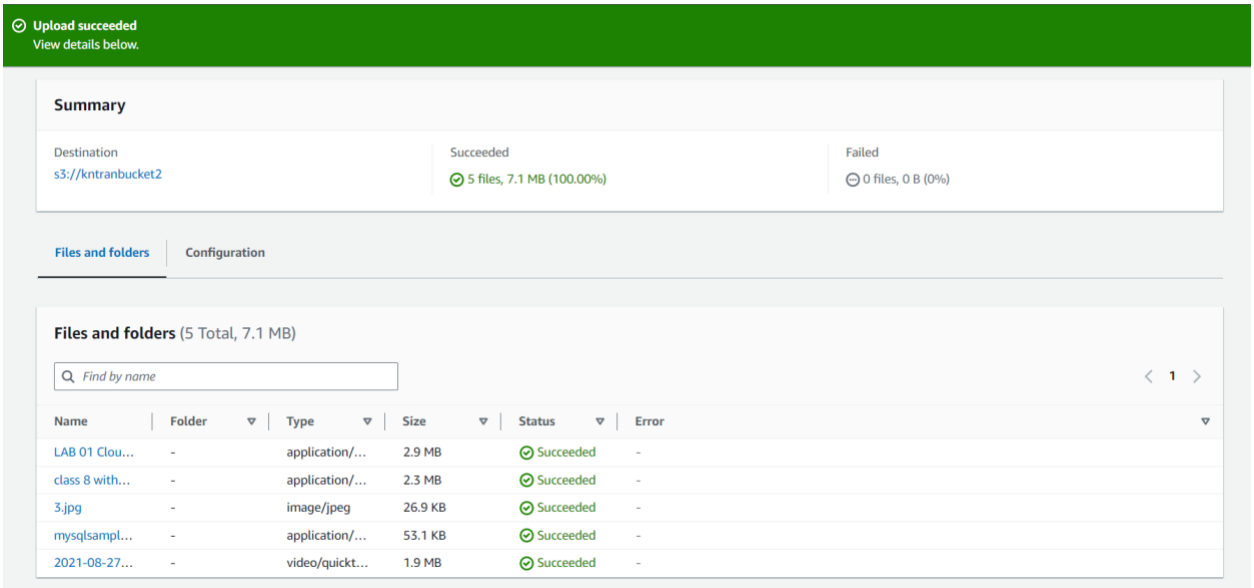

Figure 2.b. Successfully uploaded files

3. Static website hosting

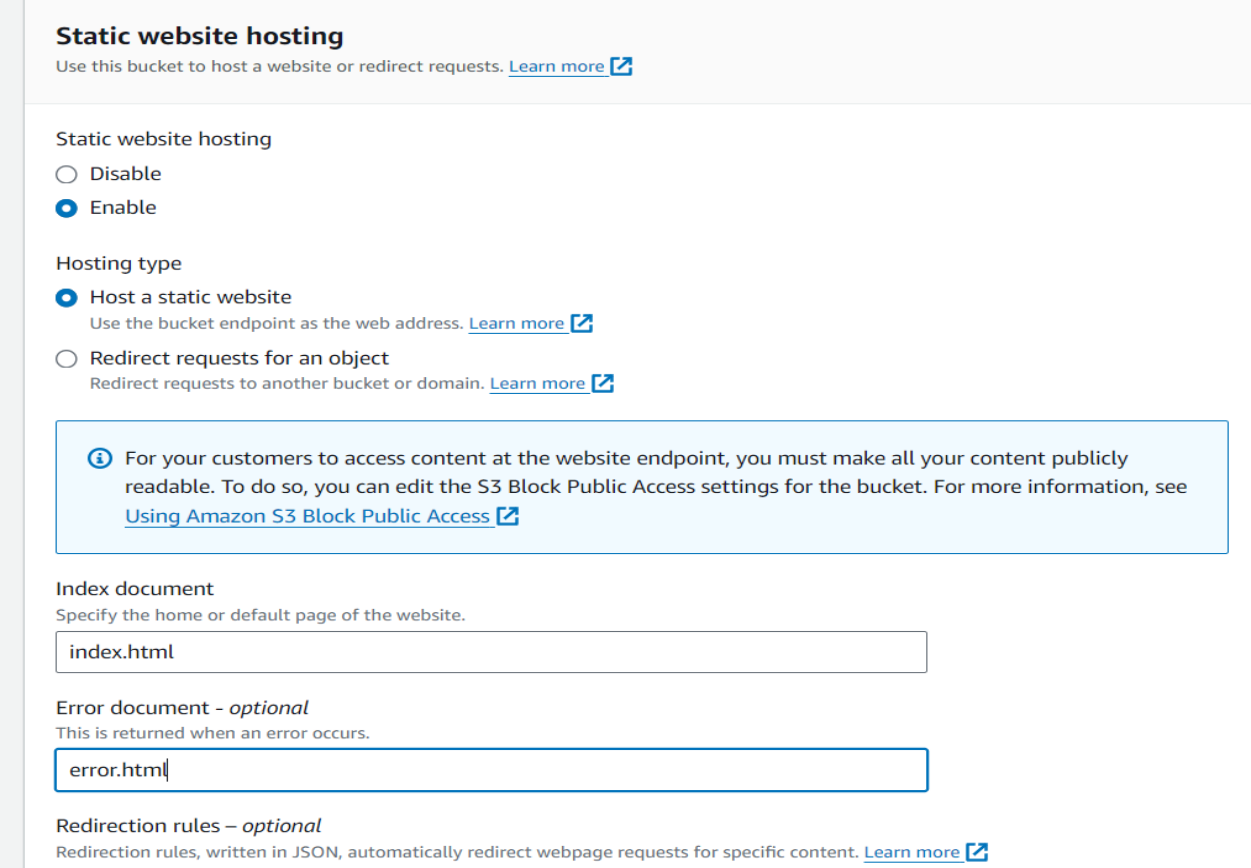

Figure 3.a. Enable web hosting and specify document

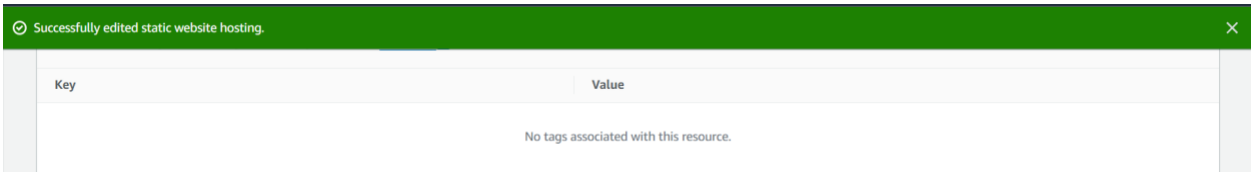

Figure 3.b. Successfully enabled web hosting

Benefits of hosting a static website on AWS:

- Amazon S3 automatically scales to handle high traffic loads, ensuring that your website remains available and performs well, even during peak times.

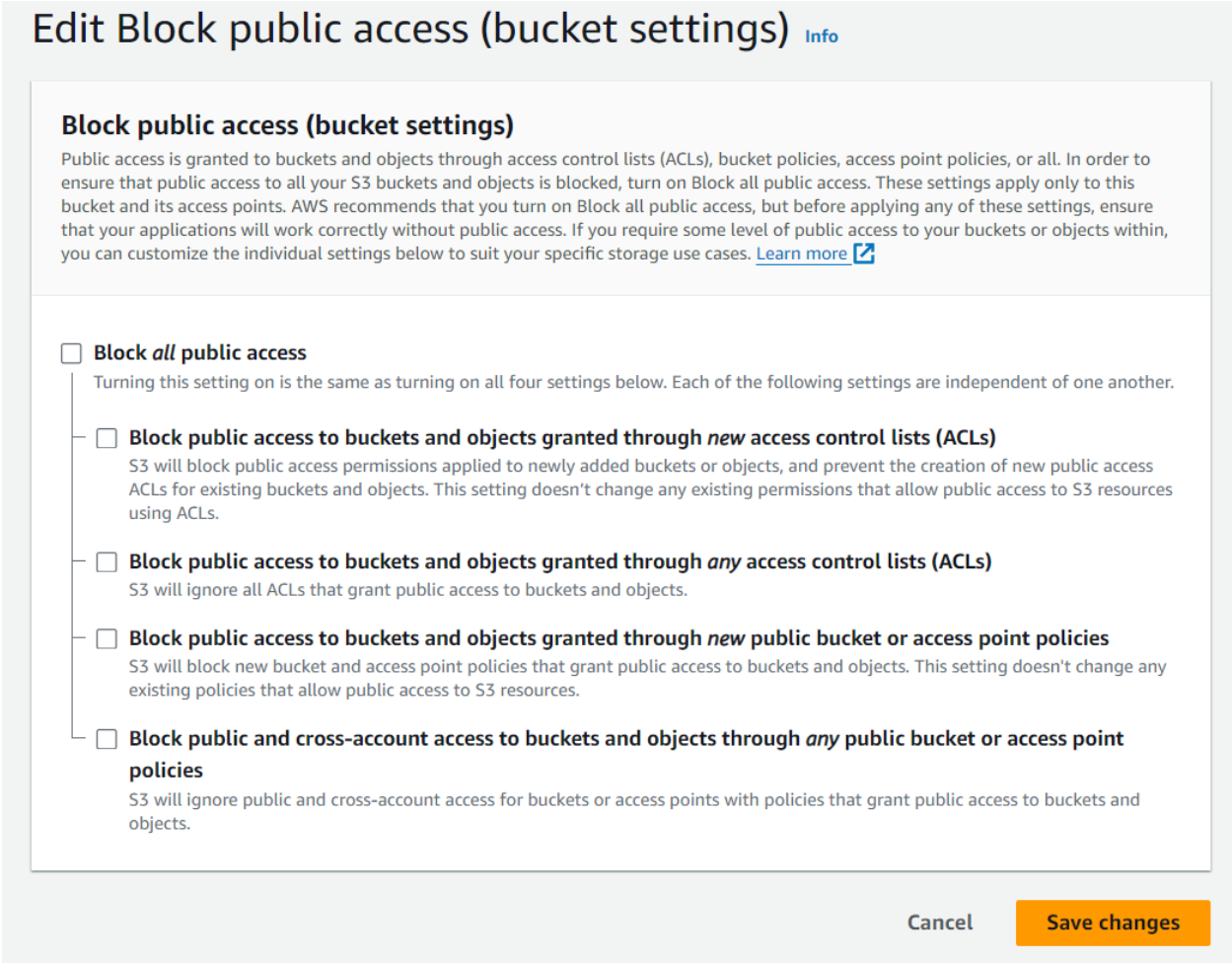

Figure 4.a. Make the bucket public

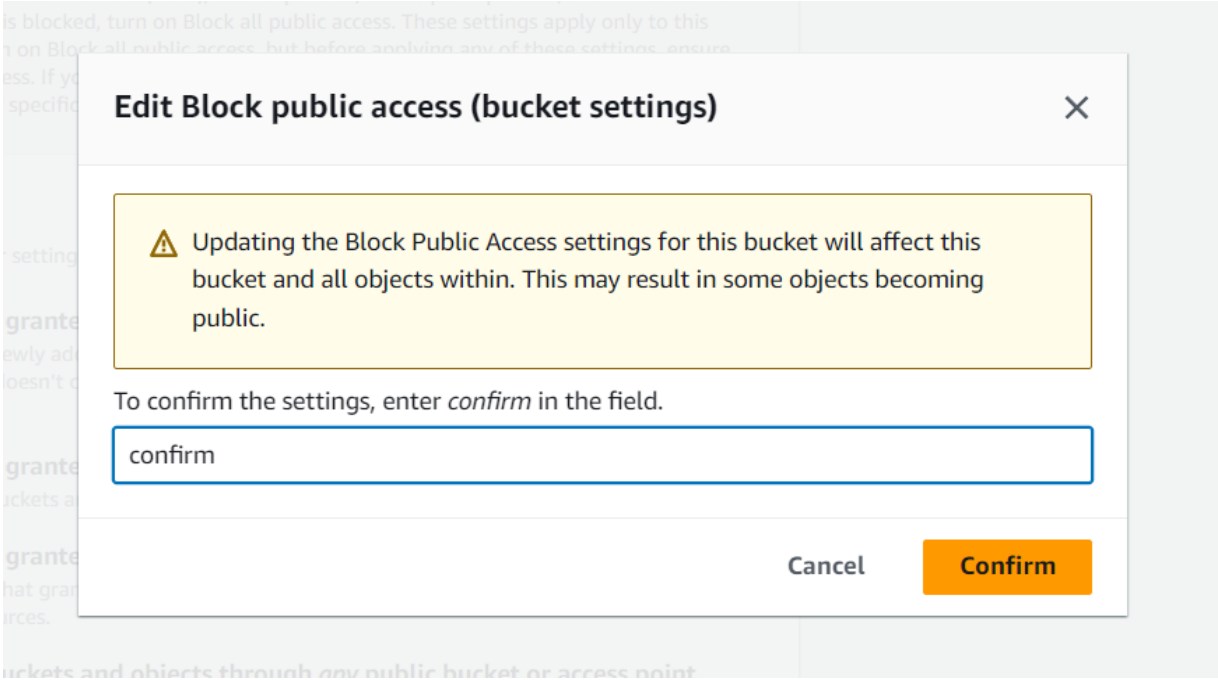

Figure 4.b. Confirm the settings

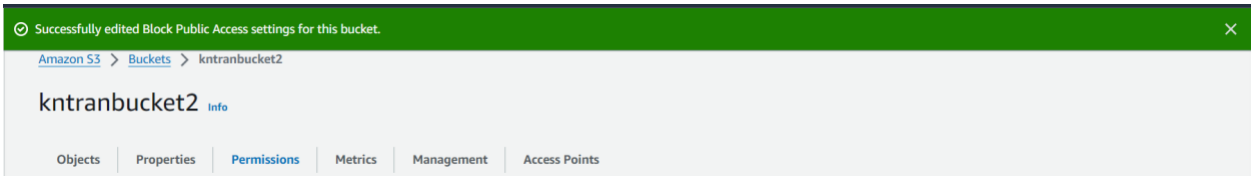

Figure 4.c. Successfully edited the public access

The be able to allow access to the website, we have to make the website go public.

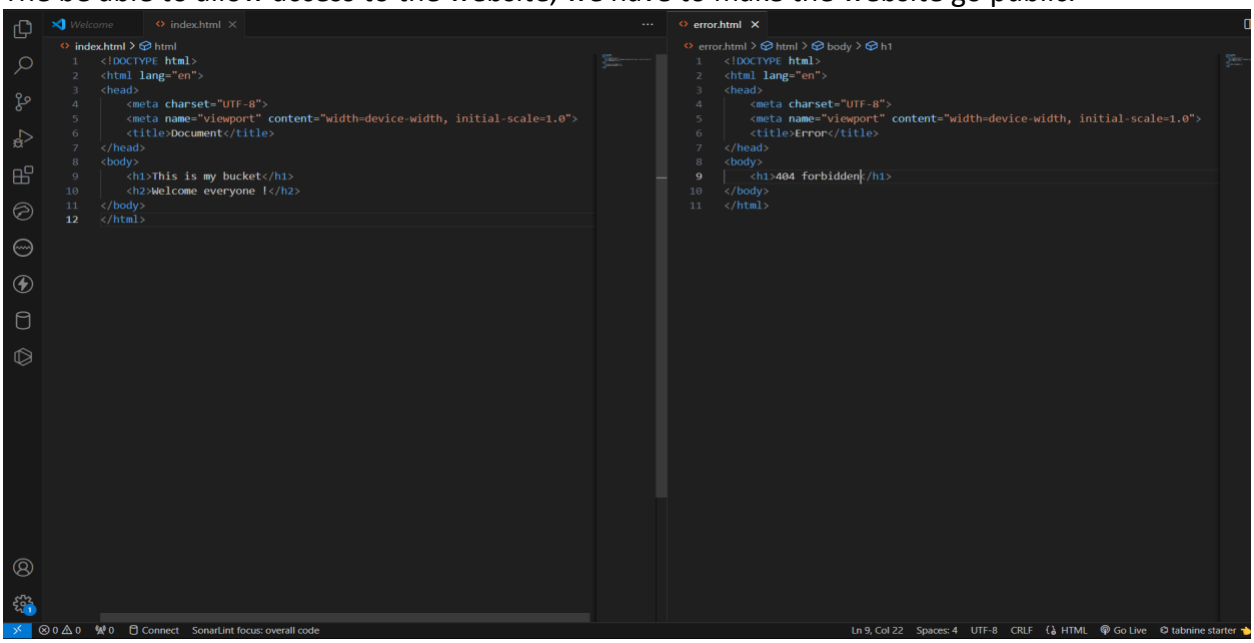

Figure 5.a. Create documents for the static website

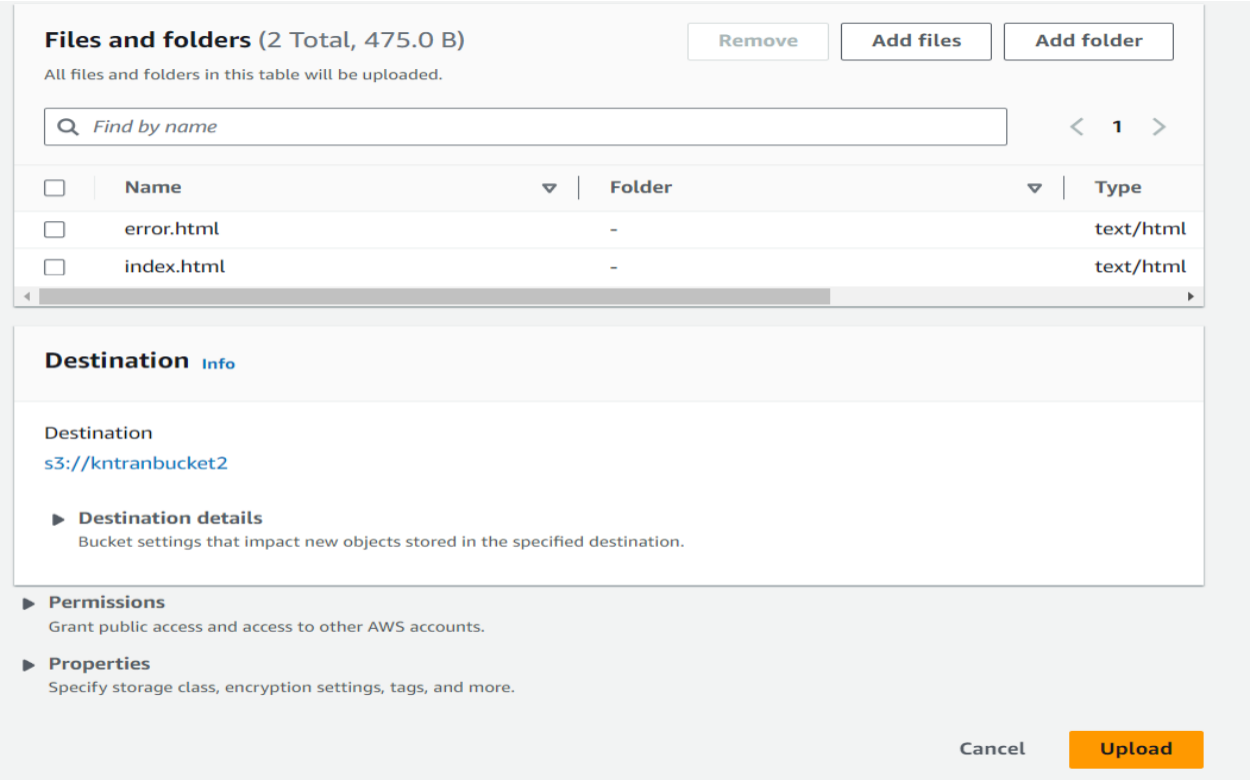

Figure 5.b. Upload the documents to the bucket

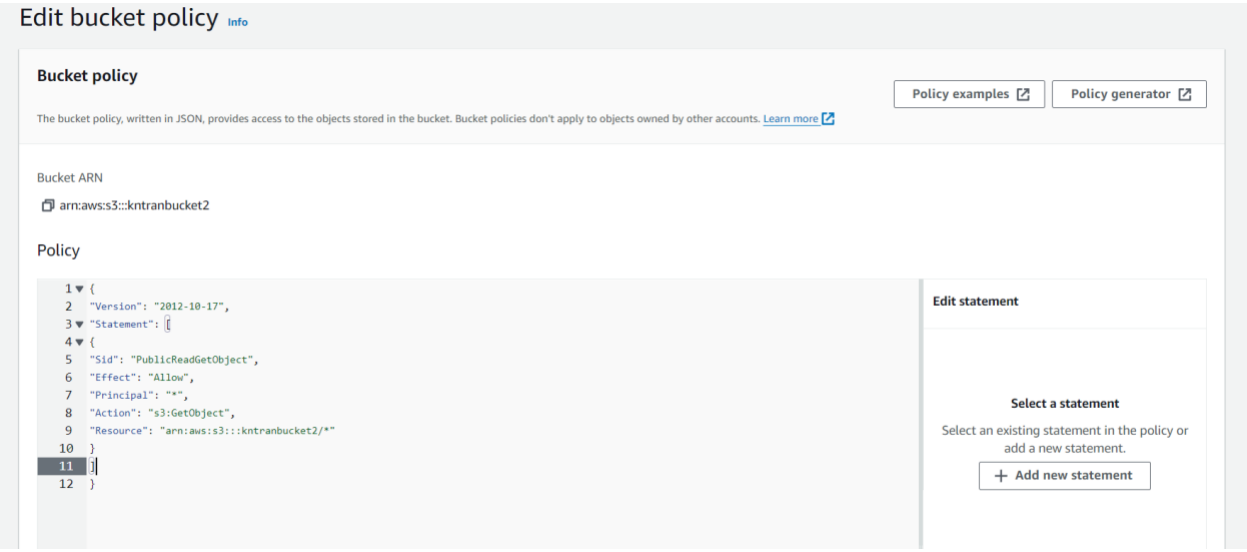

Figure 6.a. Modify bucket policy to allow access to the static website

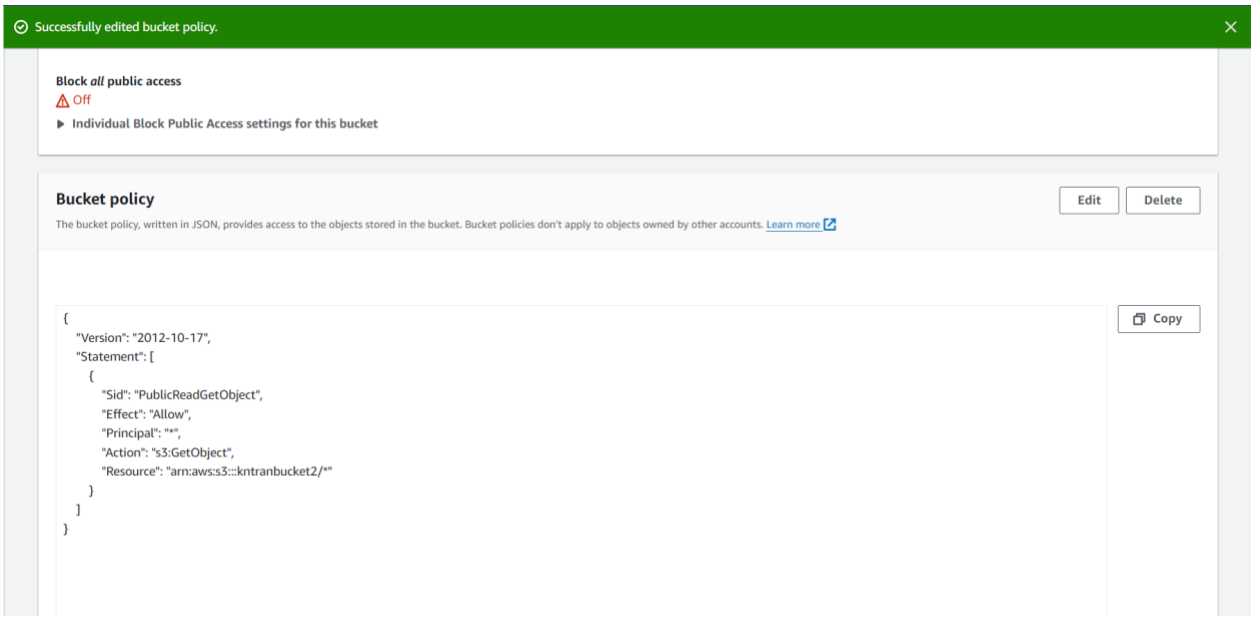

Figure 6.b. Successfully added the policies

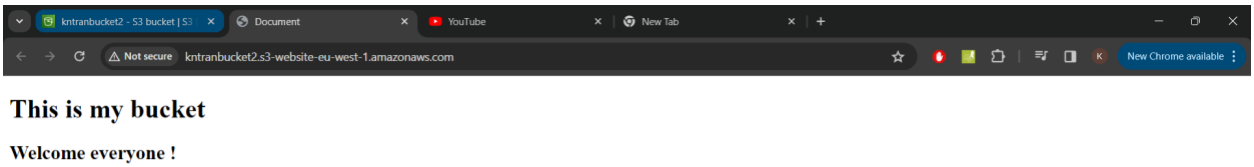

Figure 7. Website content

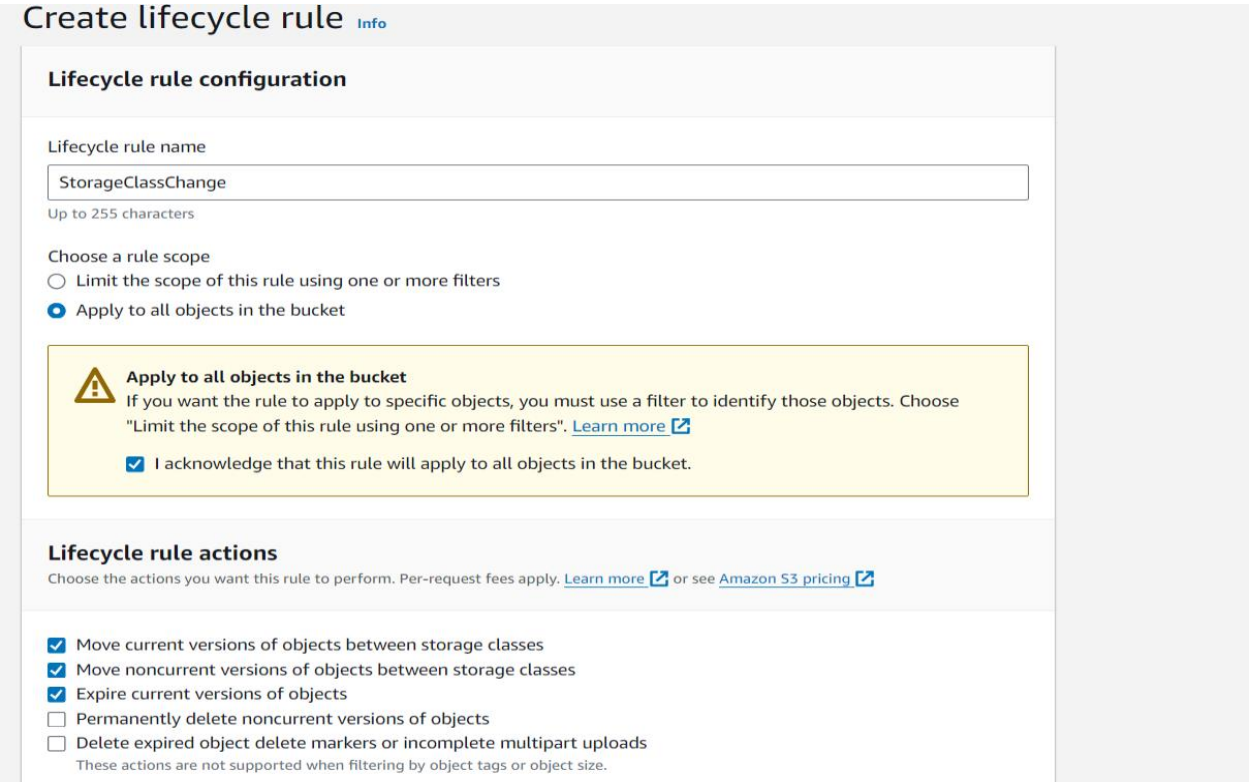

Figure 8.a. Create lifecycle rule

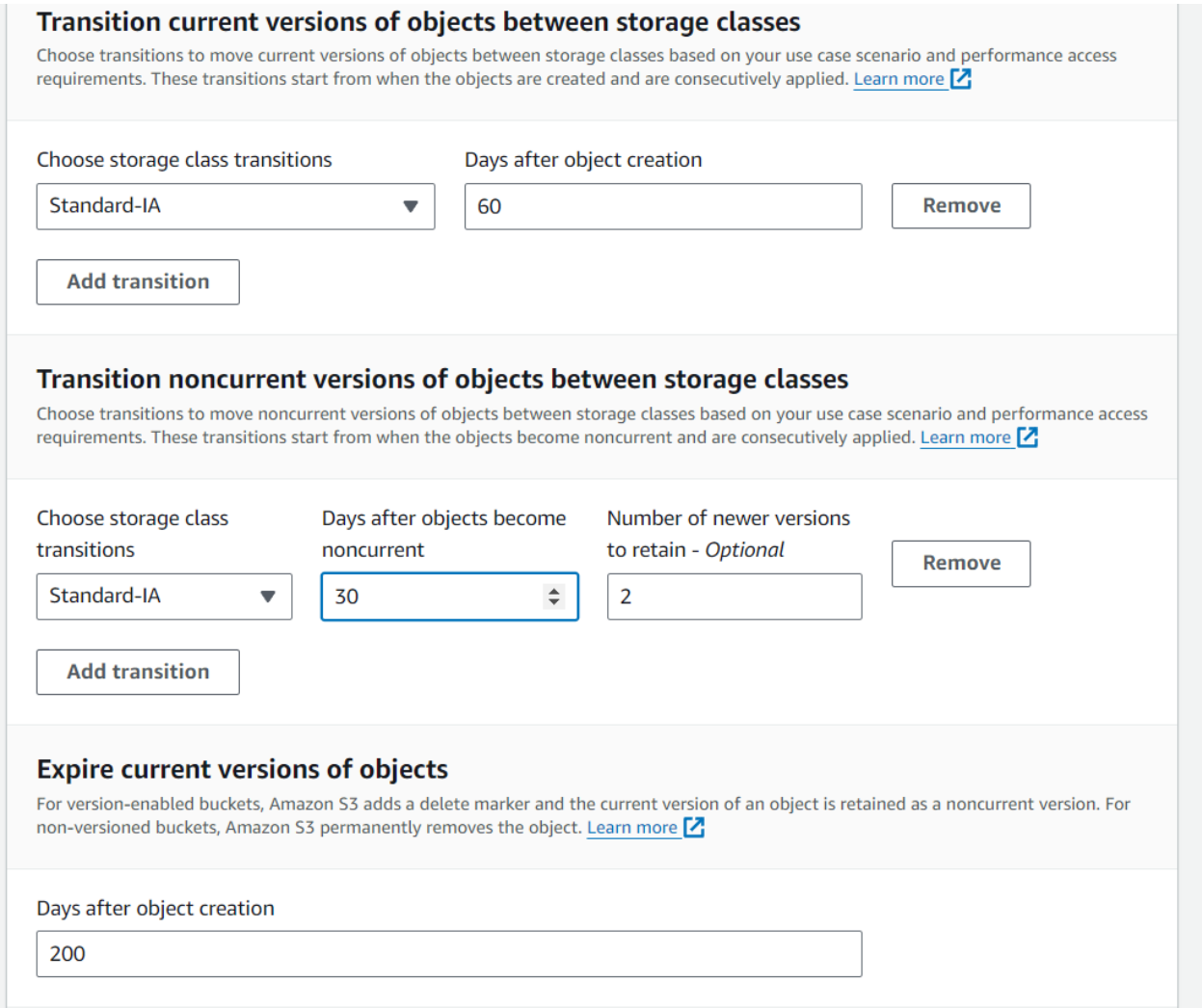

Figure 8.b. Create lifecycle rule

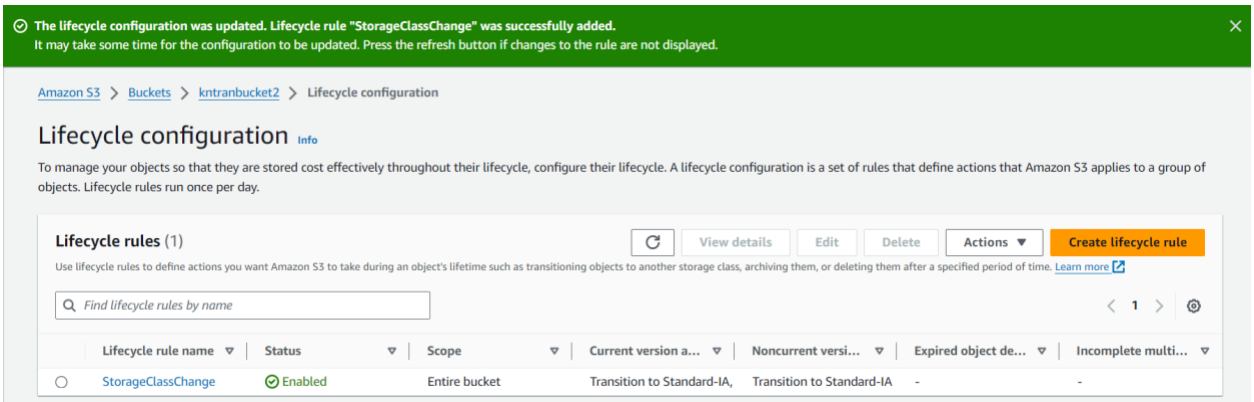

Figure 8.c. Successfully created lifecycle rule

Reasons why we have to create lifecycle rule:

- Lifecycle rules can automate the retention process, ensuring that data is kept for the required duration and then deleted or archived, thereby aiding in compliance with regulatory standards.
- By transitioning data to the most appropriate storage class, you can optimize performance for frequently accessed data and reduce costs for data that doesn't require immediate access.

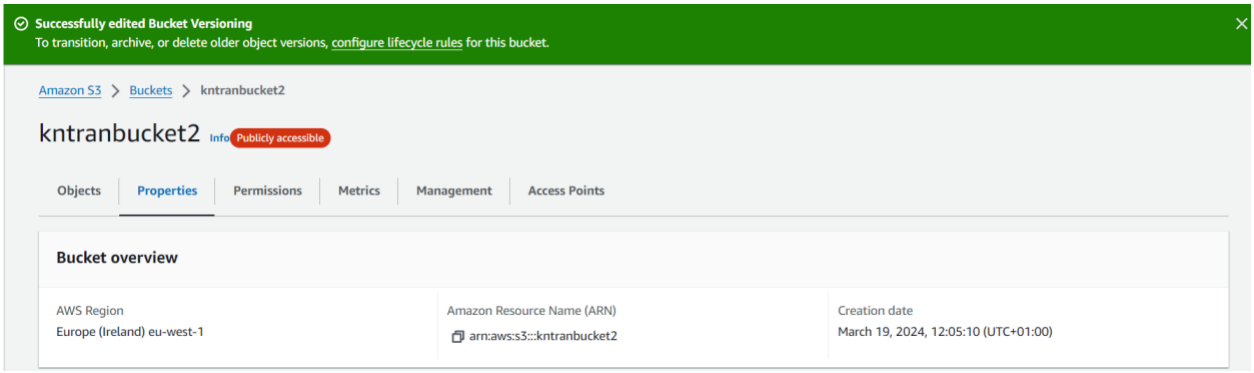

Figure 9.a. Successfully enabled bucket versioning

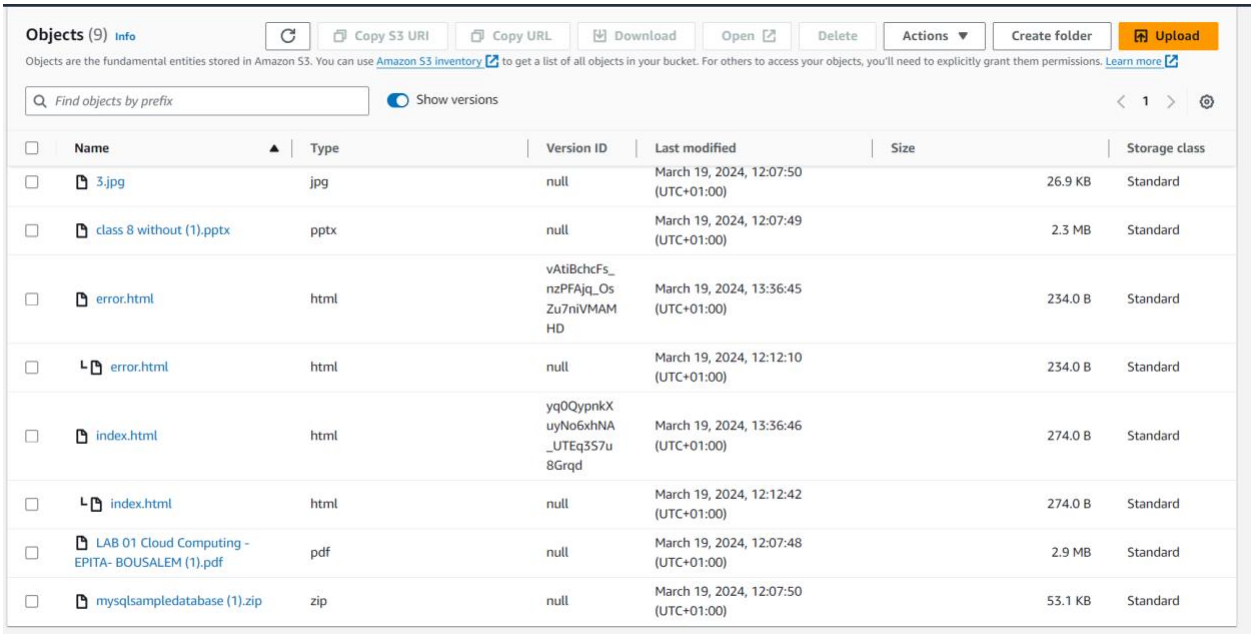

Figure 9.b. Version ID of newly uploaded files

Summary:

These tasks underscore several critical aspects of modern cloud computing practices, data management, and organizational agility, reflecting broader implications:

1. Secure and Scalable Storage Solution: The creation and management of AWS S3 buckets address the growing need for scalable and secure cloud storage solutions. As organizations generate and rely on vast amounts of data, having a reliable way to store, manage, and share this data securely becomes paramount. AWS S3 offers a durable infrastructure for storing data of any volume, accessible from anywhere, which is crucial for businesses operating in today's digital landscape.
2. Enhanced Data Accessibility and Sharing: By learning how to upload objects and configure buckets for public sharing when needed, we can ensure that the organization can efficiently distribute content. This capability is vital for sharing resources with stakeholders, distributing media files, or hosting static content for web applications, enhancing the company's ability to communicate and operate online.
3. Cost Management and Efficiency: The section on static website hosting and lifecycle policies introduces essential practices for managing storage costs and ensuring data is stored efficiently. Transitioning objects to less expensive storage classes and setting expiration rules help in reducing costs associated with data storage.
4. Data Integrity and Recovery: Implementing version control by enabling bucket versioning is critical for protecting the integrity of data. This feature allows for the recovery of previous versions of files, safeguarding against accidental deletions or modifications.

In summary, the lab's focus on AWS S3 bucket creation, object management, static website hosting, and version control transcends technical training. It embodies key principles of secure, efficient, and innovative data management in the cloud era.