# Cloud Computing - Lab Assignment 2

- by Group 1


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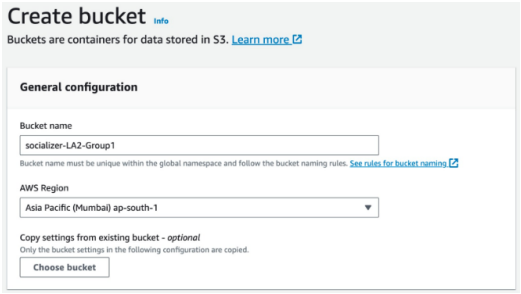
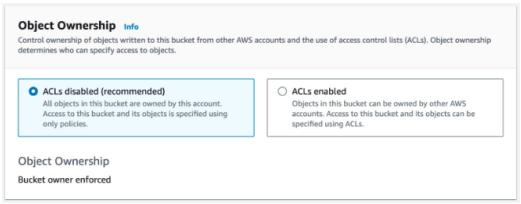
## Steps to host static website on AWS S3

1. give a name to the bucket which will also be a part of the url

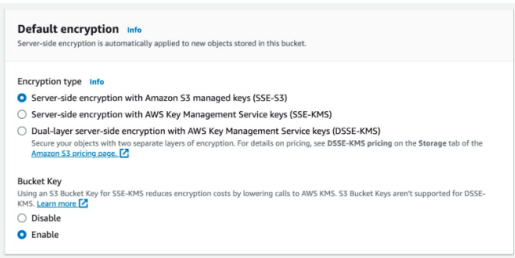


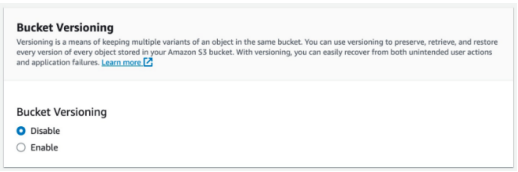

2. set up object ownership

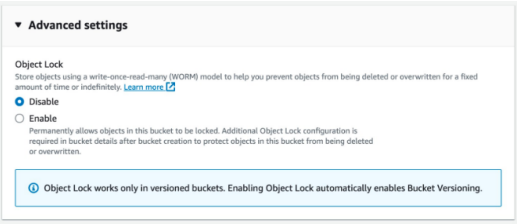



3. allow public access to the bucket as we need to host the static website publicly

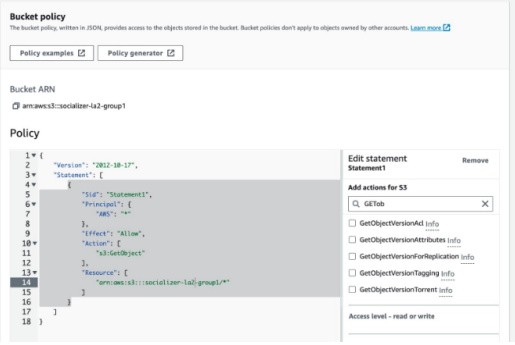

4. choose other versioning and encryption options as required



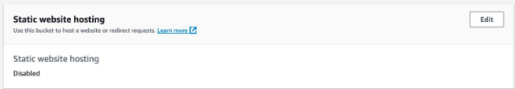



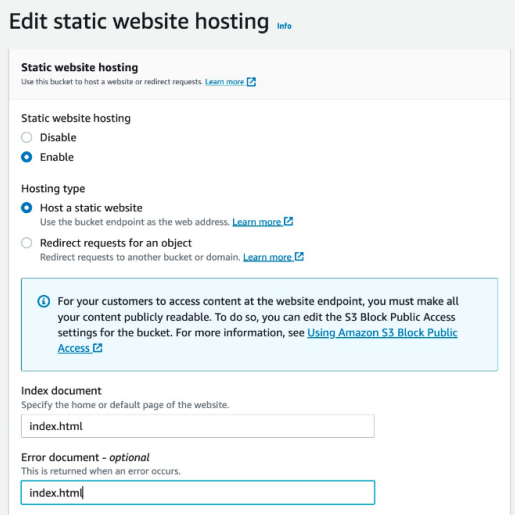



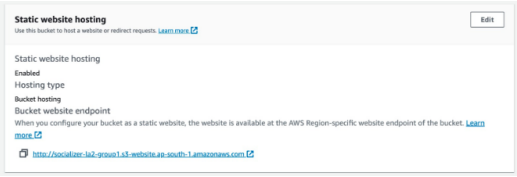

5. add bucket policy to allow access to objects stored in the bucket



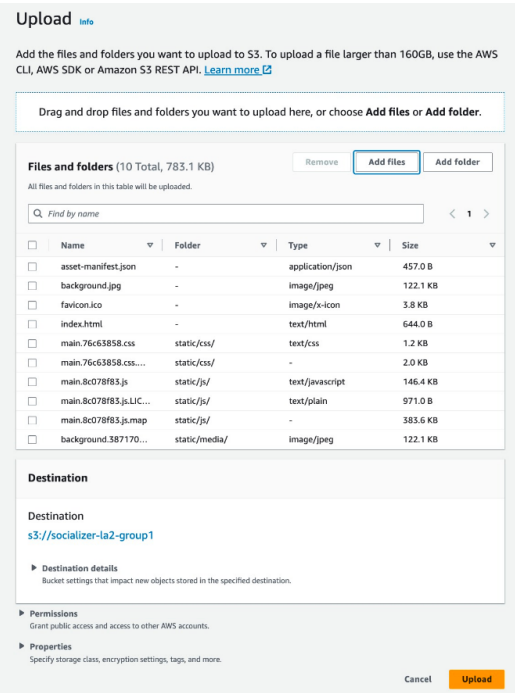

6. allow static website hosting under properties and specify index document and error document




7. upload the build files of the static website



## Options to choose when creating an S3 bucket

**REGION**

Choose a region that is close to your target audience to minimize latency. For example, if your target audience is in India, you would choose a region in India, in our case Mumbai.

**BUCKET NAME**

Bucket names must be unique across all of AWS. Choose a bucket name that is descriptive of your website and easy to remember.

**STORAGE CLASS**

S3 offers a variety of storage classes, each with its own pricing and performance characteristics. The following table provides a brief overview of the different storage classes:

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| | Storage class | Pricing | Performance |
|---|---|---|---|
| 1 | Standard | Most expensive | Highest performance |
| 2 | Infrequent Access (IA) | Less expensive than Standard | Lower performance than Standard |
| 3 | Reduced Redundancy Storage (RRS) | Least expensive | Lowest performance |
| 4 | Glacier | Very inexpensive | Very low performance |

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Choose a storage class that is appropriate for your needs and budget. For example, if you are hosting a static website that is frequently accessed, you would choose the Standard storage class. If you are hosting a static website that is not frequently accessed, you could choose the IA or RRS storage class.

**VERSIONING**

Object versioning allows you to recover previous versions of objects that have been accidentally deleted or overwritten. It is recommended to enable object versioning for all S3 buckets.

**PERMISSIONS**

By default, S3 buckets are private. This means that only users with explicit permission can access the bucket and its contents. You can make your bucket public or private, depending on your needs. For example, if you are hosting a static website, you would likely want to make your bucket public so that anyone can access your website.

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## Hosting a website on S3

To host a website on S3, you need to enable static website hosting for your bucket. Once you have enabled static website hosting, you need to upload your website files to your bucket. You can then set the index document for your website and the permissions for your bucket.
The following are some recommendations for when to choose which options when creating an S3 bucket and hosting a website:

- **Region**: Choose a region that is close to your target audience to minimize latency.
- **Bucket name**: Choose a bucket name that is descriptive of your website and easy to remember.
- **Storage class**: Choose a storage class that is appropriate for your needs and budget. For example, if you are hosting a static website that is frequently accessed, you would choose the Standard storage class. If you are hosting a static website that is not frequently accessed, you could choose the IA or RRS storage class.
- **Versioning**: It is recommended to enable object versioning for all S3 buckets.
- **Permissions**: If you are hosting a static website, you would likely want to make your bucket public so that anyone can access your website.

**Additional considerations**
In addition to the options mentioned above, there are a few other things to consider when creating an S3 bucket and hosting a website:

- **Website endpoint**: By default, S3 website endpoints do not support HTTPS. If you want to use HTTPS for your website, you can use Amazon CloudFront to distribute your website content.
- **Custom domain name**: S3 does not support custom domain names by default. You need to use a service like Amazon Route 53 to map a custom domain name to your S3 bucket.
- **Caching**: You can use caching to improve the performance of your website. Amazon CloudFront offers a variety of caching options. You can also use a third-party caching solution, such as CloudFlare.
- **Monitoring**: It is important to monitor your website for performance and availability. You can use Amazon CloudWatch to monitor your website and receive alerts if there are any problems.

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## Analysing AWS S3 for hosting static websites

**PERFORMANCE**

S3 is a highly performant object storage service. It can deliver millions of requests per second with low latency. This makes it a good choice for hosting static websites, which typically have high traffic volumes.

- How to choose the right options for performance:
    - Choose a region that is close to your target audience to minimize latency.
    - Use the Standard storage class for static websites that are frequently accessed.
    - Use a content delivery network (CDN) like Amazon CloudFront to distribute your website content to users around the world.

**SCALABILITY**

S3 is designed to be scalable to virtually any size. It can store and deliver petabytes of data with ease. This makes it a good choice for hosting static websites of all sizes, from small personal blogs to large enterprise websites.

- How to choose the right options for scalability:
    - **Size of website**: Use the Standard storage class for static websites that are likely to grow in size over time.
    - **Market reach**: Use a CDN like Amazon CloudFront to distribute your website content to users around the world.

**THROUGHPUT**

S3 has a very high throughput. It can deliver terabytes of data per second. This is more than enough to handle the traffic demands of most static websites.

- How to choose the right options for throughput:
    - Use the Standard storage class for static websites that have high traffic volumes.
    - Use a CDN like Amazon CloudFront to distribute your website content to users around the world.

**EFFICIENCY**

S3 is an efficient object storage service. It uses a variety of techniques to reduce storage costs, such as data compression and deduplication. This makes it a cost-effective choice for hosting static websites.

- How to choose the right options for efficiency:
    - Use the Standard storage class for static websites that are frequently accessed.
    - Use a CDN like Amazon CloudFront to distribute your website content to users around the world.

**RESOURCE UTILIZATION**

S3 is a fully managed service. AWS takes care of all of the infrastructure and maintenance, so you don't have to worry about managing any resources yourself. This frees up your time and resources to focus on other things.

- How to choose the right options for resource utilization:
    - Simply choose the Standard storage class and use a CDN like Amazon CloudFront. AWS will take care of the rest.

**FAULT TOLERANCE**

S3 is a highly fault-tolerant service. It replicates your data across multiple availability zones to protect it from data loss. This makes it a reliable choice for hosting static websites.

- How to choose the right options for fault tolerance:
    - Simply choose the Standard storage class and use a CDN like Amazon CloudFront. AWS will take care of the rest.

Here are some additional things you can do to ensure fault tolerance for your static website hosted on S3:

- Use a CDN like Amazon CloudFront. CloudFront is a global content delivery network (CDN) that can help to improve the performance and reliability of your website. CloudFront delivers your website content from edge locations around the world, which can reduce latency and improve availability for your users. CloudFront also replicates your website content across multiple edge locations, which helps to protect your website from outages.
- Use a domain name service (DNS) such as AWS Route53 provider that supports failover. A DNS failover service can help to ensure that your website is still accessible to users even if one of your S3 buckets or CloudFront edge locations is unavailable.
- Use a monitoring service to monitor your website for outages. A monitoring service can alert you if your website is unavailable, so that you can take corrective action quickly.

**COST-EFFECTIVENESS**

S3 is a very cost-effective object storage service. It offers a variety of pricing options to fit your budget. You can also use AWS's free tier to get started with S3 for free.

- How to choose the right options for cost-effectiveness:
    - Choose the storage class that is appropriate for your needs and budget. For example, if you are hosting a static

website that is not frequently accessed, you could choose the IA or RRS storage class.

- Use a CDN like Amazon CloudFront to distribute your website content to users around the world. This can help to reduce your bandwidth costs.

**SECURITY**

S3 is very secure but it only provides http endpoints. CloudFront can also be used to increase security for your website. CloudFront can encrypt your website content using HTTPS, which helps to protect it from eavesdropping and tampering. You can restrict the S3 HTTP URL to CloudFront. To do this, you need to create an Origin Access Control (OAC) for your S3 bucket. An OAC is a permission that allows CloudFront to access your S3 bucket.

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## Conclusion

S3 is a great choice for hosting static websites. It is performant, scalable, efficient, and cost-effective. It is also easy to use and manage. By following the recommendations above, you can choose the right options for your needs and create a highly available and performant website.