



# S3 STATIC WEB HOSTING WITH CLOUDFRONT



Amazon S3

Presented by Aman Dandale

# INTRODUCTION

## What is Amazon S3?

- Amazon S3 is an object storage service that offers industry-leading scalability, data availability, security, and performance.
- Store and protect any amount of data for a range of use cases, such as data lakes, websites, cloud-native applications, backups, archive, machine learning, and analytics.
- Amazon S3 is designed for 99.99999999% (11 9's) of durability, and stores data for millions of customers all around the world.

## What is static web hosting?

- Static website hosting in Amazon S3 is a way to store and host a website without the need to maintain servers.
- It is a type of web hosting that delivers fixed web pages directly to the user's browser.

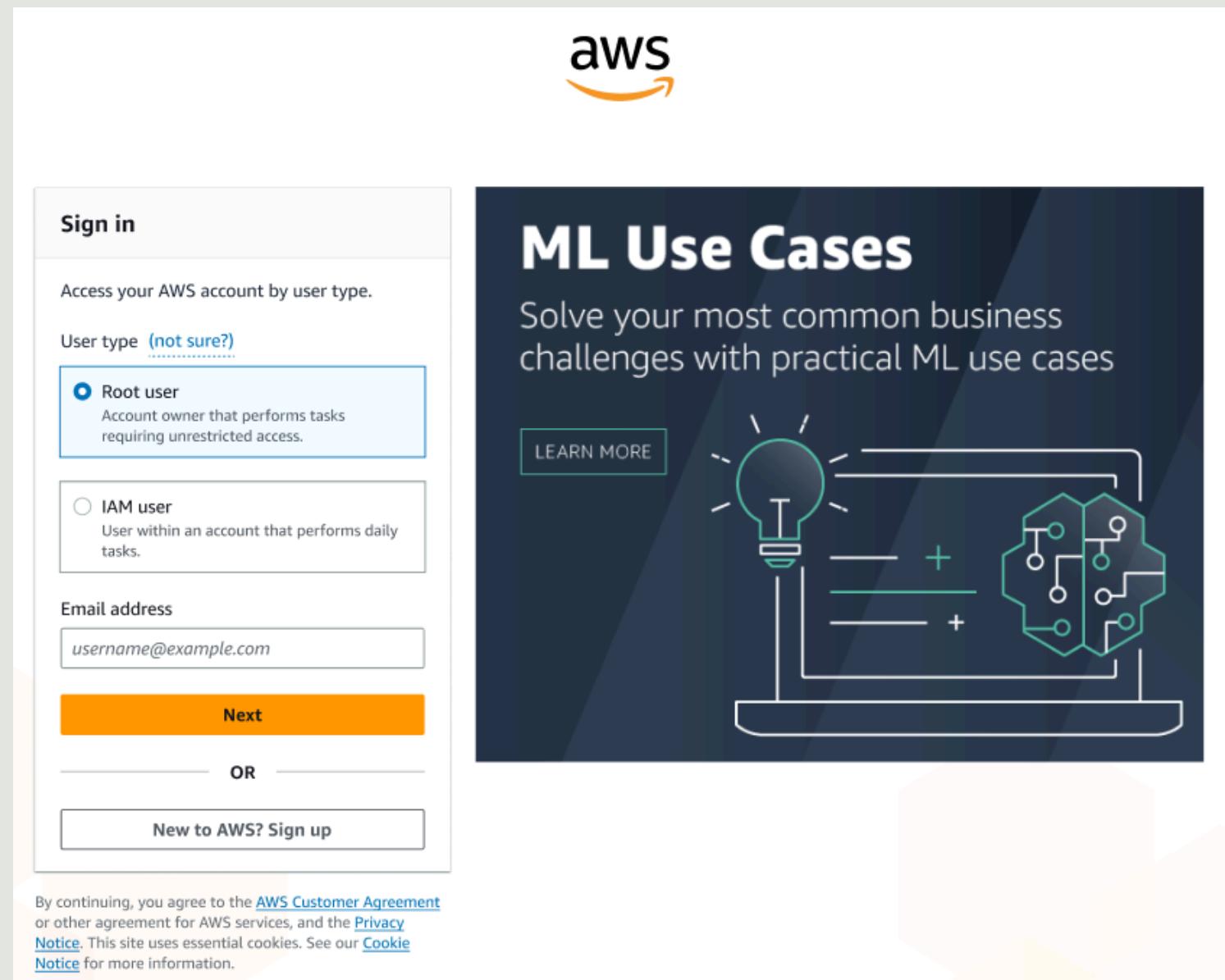
# OBJECTIVE

**S3 static web hosting** is a **cost-effective** and **scalable solution** to deploy static websites directly on Amazon S3. It eliminates the need for traditional web servers. Key objectives include:

- **Reduced Costs:** Lower storage and data transfer costs.
- **Enhanced Scalability:** Easily handles increased traffic without performance degradation.
- **High Availability and Durability:** Ensures website accessibility and data integrity.
- **Global Reach:** Delivers content to users worldwide with low latency.
- **Simplified Deployment:** Streamlined setup process.
- **Integration with AWS Services:** Seamlessly integrates with other AWS services for added functionality.

# Step 1: Sign In to AWS Console

- Open your web browser and navigate to the AWS Management Console.
- Enter your AWS account credentials (username and password) to log in.
- Search for S3 on AWS console

The image shows the AWS Management Console search results for the term "s3". The search bar at the top contains "s3". Below it, a sidebar lists "Services (8)", "Features (14)", "Resources New", "Blogs (1,147)", "Documentation (104,231)", "Knowledge Articles (30)", "Tutorials (9)", and "Events (16)". The main content area displays a list of services: "S3 ★ Scalable Storage in the Cloud" (highlighted with a red box), "S3 Glacier ★ Archive Storage in the Cloud", and "Athena ★ Query Data in S3 using SQL".

aws Services  X

Amazon WorkMail

Search results for 's3'

**Services**

S3 ★ Scalable Storage in the Cloud

S3 Glacier ★ Archive Storage in the Cloud

Athena ★ Query Data in S3 using SQL

Services (8)

Features (14)

Resources New

Blogs (1,147)

Documentation (104,231)

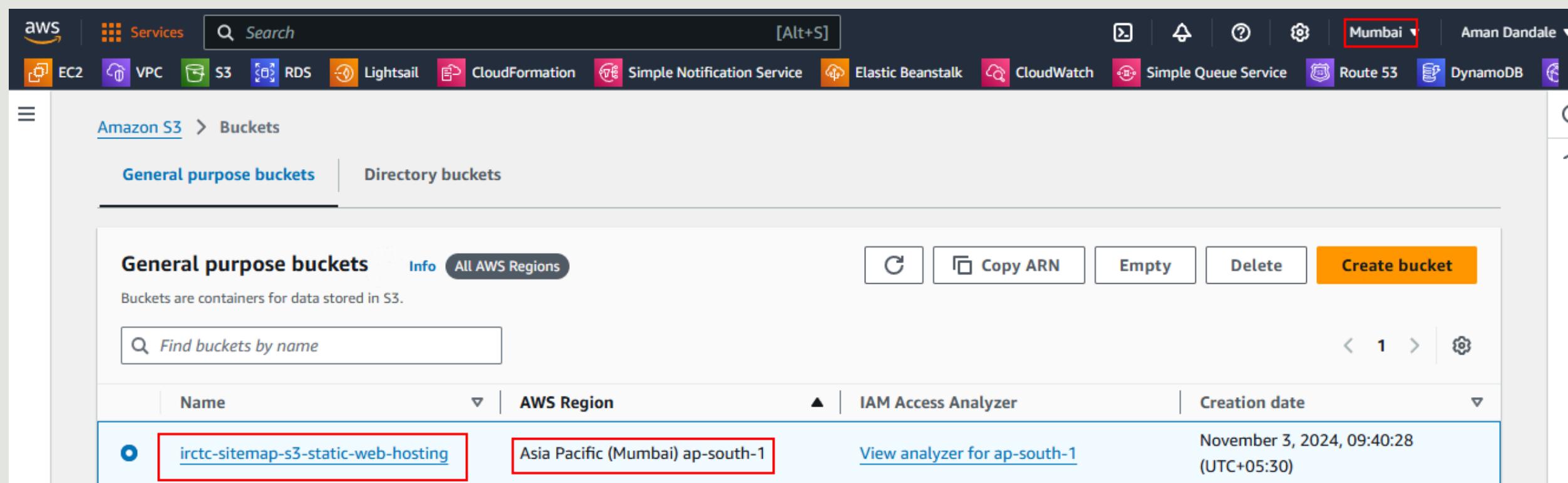
Knowledge Articles (30)

Tutorials (9)

Events (16)

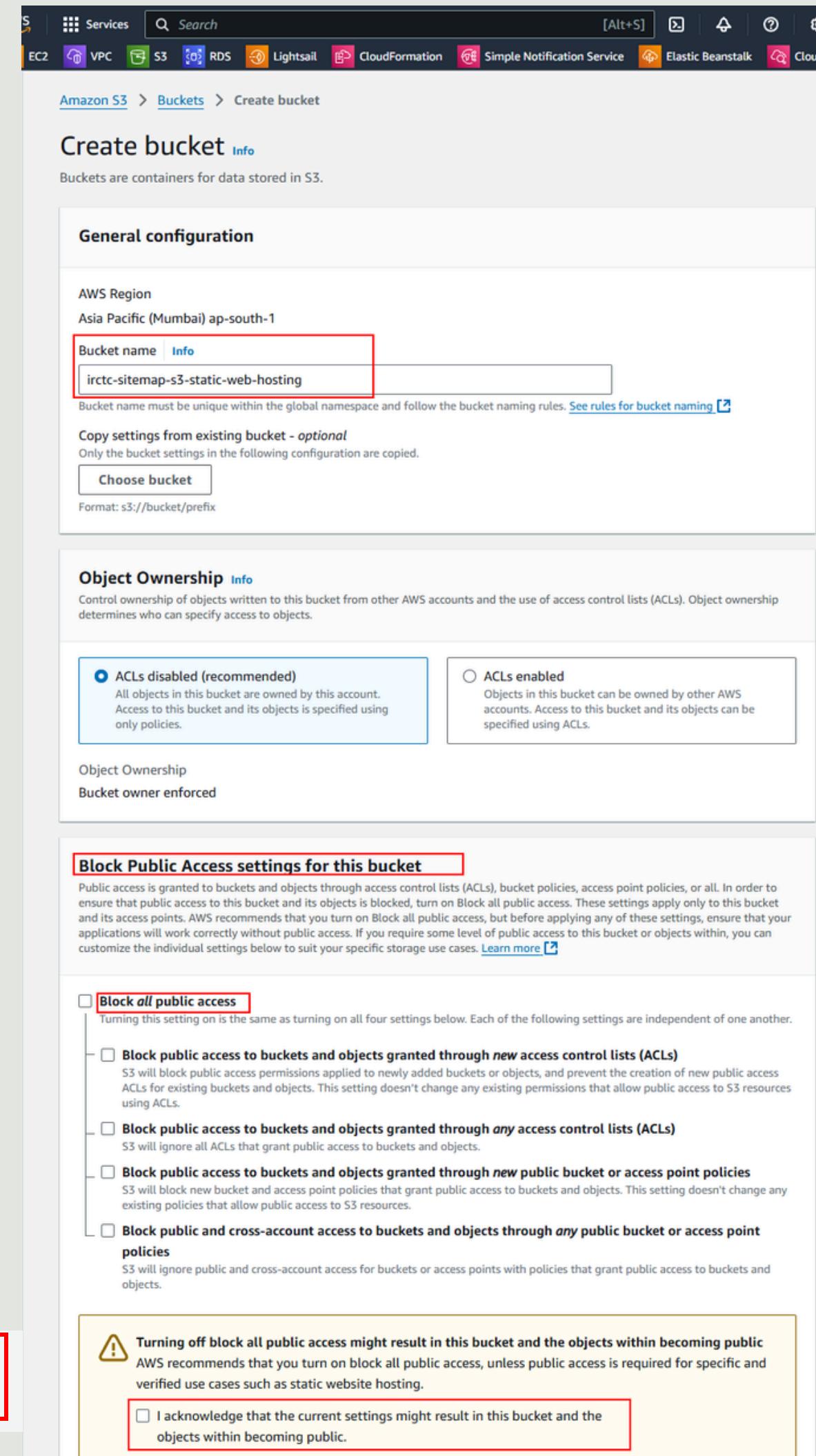
## Step 2: Create S3 Bucket

- Choose Create bucket.
- Enter the globally unique name for Bucket (irctc-sitemap-s3-static-web-hosting).
- Choose the Region where you want to create the bucket.
- Choose a Region that is geographically close to you to minimize latency and costs, or to address regulatory requirements.
- The Region that you choose determines your Amazon S3 website endpoint.



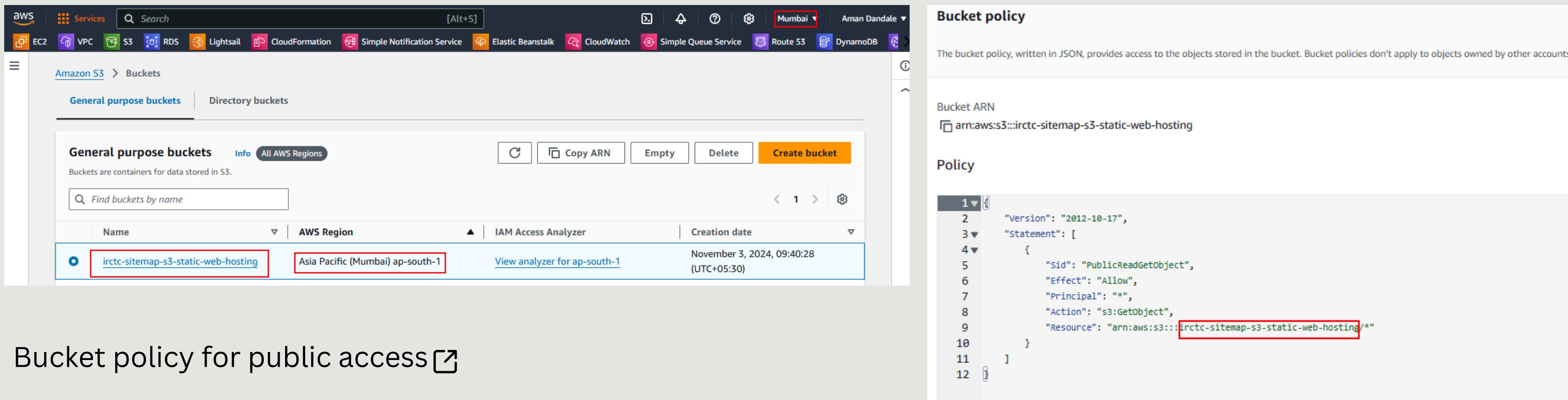
# Step 3: Edit Block Public Access settings

- By default, Amazon S3 blocks public access to your account and buckets. Clear Block all public access.
- Amazon S3 turns off the Block Public Access settings for your bucket. To create a public static website
- Enable Bucket Versioning (Versioning is a means of keeping multiple variants of an object in the same bucket.)
- Leave the default settings for the rest of the options and click “Create bucket.”



# Step 4: Add a bucket policy that makes your bucket content publicly available

- Once the bucket has been created, select it from the list of buckets.
- Go to the “Permission” tab and Under Bucket Policy, choose Edit.
- To grant public read access for your website, copy the following bucket policy, and paste it in the Bucket policy editor and save changes



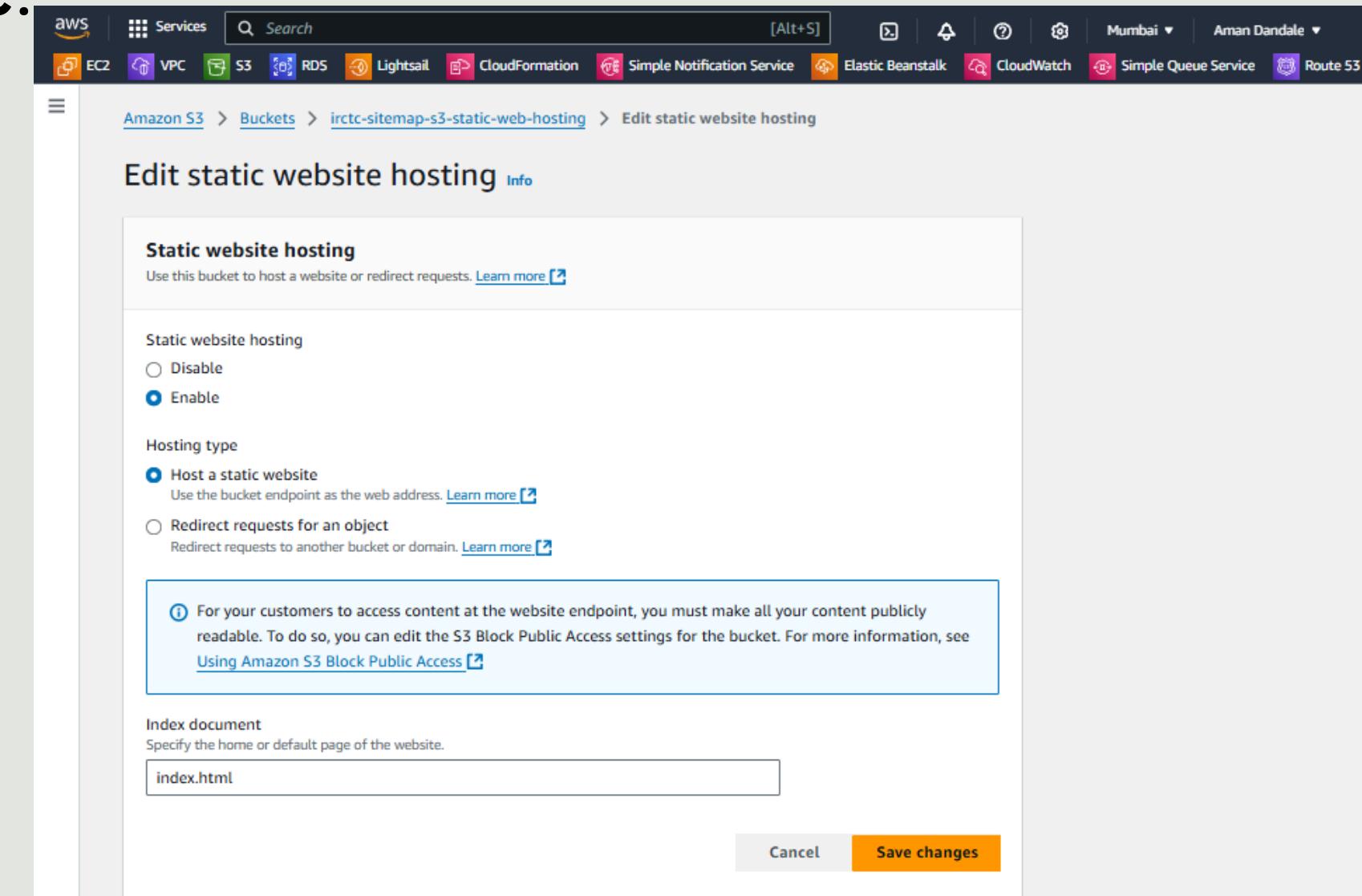
The screenshot shows the AWS Management Console interface for managing S3 buckets. On the left, the 'Amazon S3 > Buckets' page lists a single bucket named 'irctc-sitemap-s3-static-web-hosting'. This bucket is highlighted with a red box. To its right, the 'Bucket policy' editor is open. The editor displays a JSON policy document with a specific line highlighted by a red box. The policy grants public read access to all objects in the bucket.

```
1 "Version": "2012-10-17",
2 "Statement": [
3     {
4         "Sid": "PublicReadGetObject",
5         "Effect": "Allow",
6         "Principal": "*",
7         "Action": "s3:GetObject",
8         "Resource": "arn:aws:s3:::irctc-sitemap-s3-static-web-hosting/*"
9     }
10 ]
11 }
12 }
```

Bucket policy for public access ↗

## Step 5: Enable static website hosting

- After we create a bucket, we can enable static website hosting for our bucket.
- Choose **Properties**.
- Under **Static website hosting**, choose **Edit**.
- Choose Use this bucket to host a website.
- Provide **Index Document** as *index.html*
- Under **Static website hosting**, choose **Enable**.
- After this, save the changes.



AWS Services Search [Alt+S] Mumbai Aman Dandale

EC2 VPC S3 RDS Lightsail CloudFormation Simple Notification Service Elastic Beanstalk CloudWatch Simple Queue Service Route 53 DynamoDB CloudFront Lambda CloudTrail IAM

Amazon S3 > Buckets > irctc-sitemap-s3-static-web-hosting

## irctc-sitemap-s3-static-web-hosting Info

Objects Properties Permissions Metrics Management Access Points

### Bucket overview

AWS Region Asia Pacific (Mumbai) ap-south-1	Amazon Resource Name (ARN) <code>arn:aws:s3:::irctc-sitemap-s3-static-web-hosting</code>	Creation date November 3, 2024, 09:40:28 (UTC+05:30)
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### 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**  
Enabled

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 AWS CLI, AWS SDK, or the Amazon S3 REST API. [Learn more](#)

Disabled

### Static website hosting

Use this bucket to host a website or redirect requests. [Learn more](#)

**i We recommend using AWS Amplify Hosting for static website hosting**  
Deploy a fast, secure, and reliable website quickly with AWS Amplify Hosting. Learn more about [Amplify Hosting](#) or [View your existing Amplify apps](#)

**Create Amplify app**

**S3 static website hosting**  
Enabled

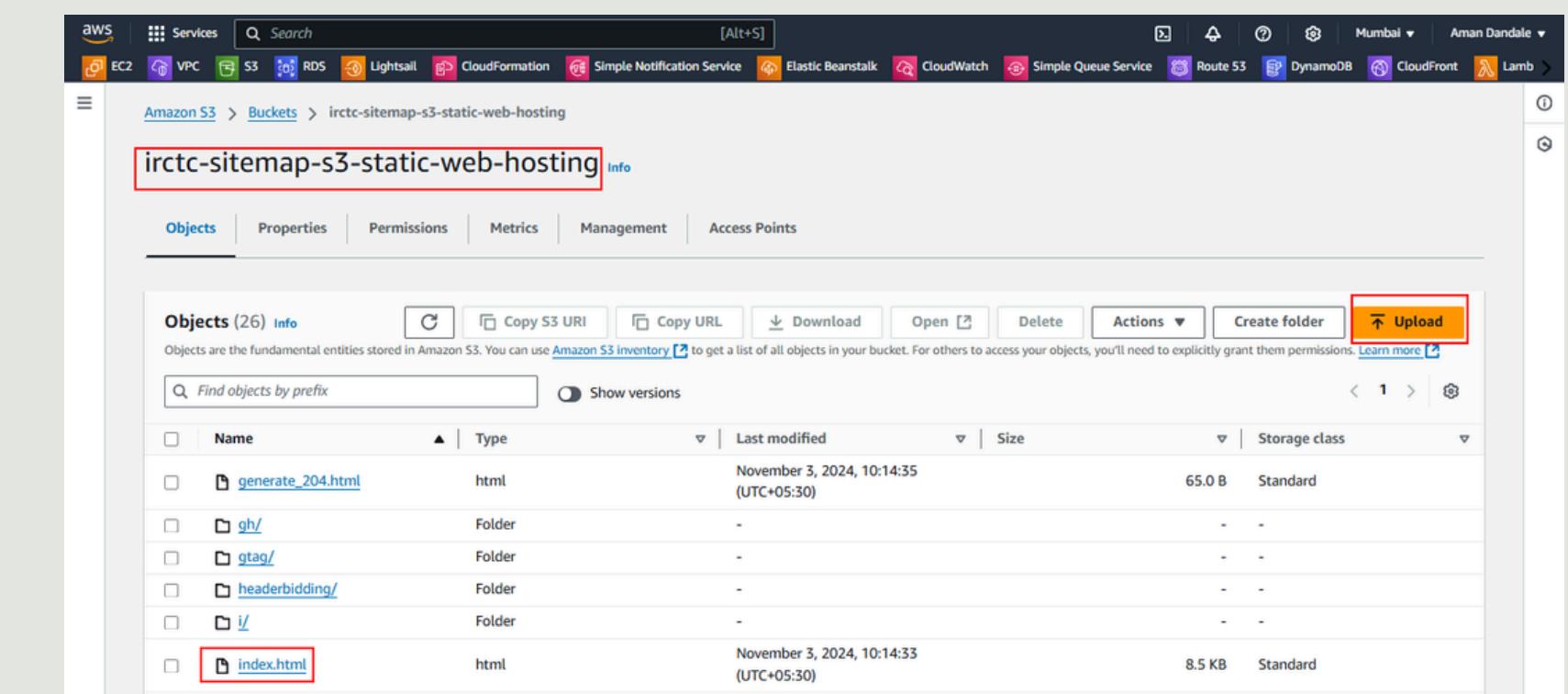
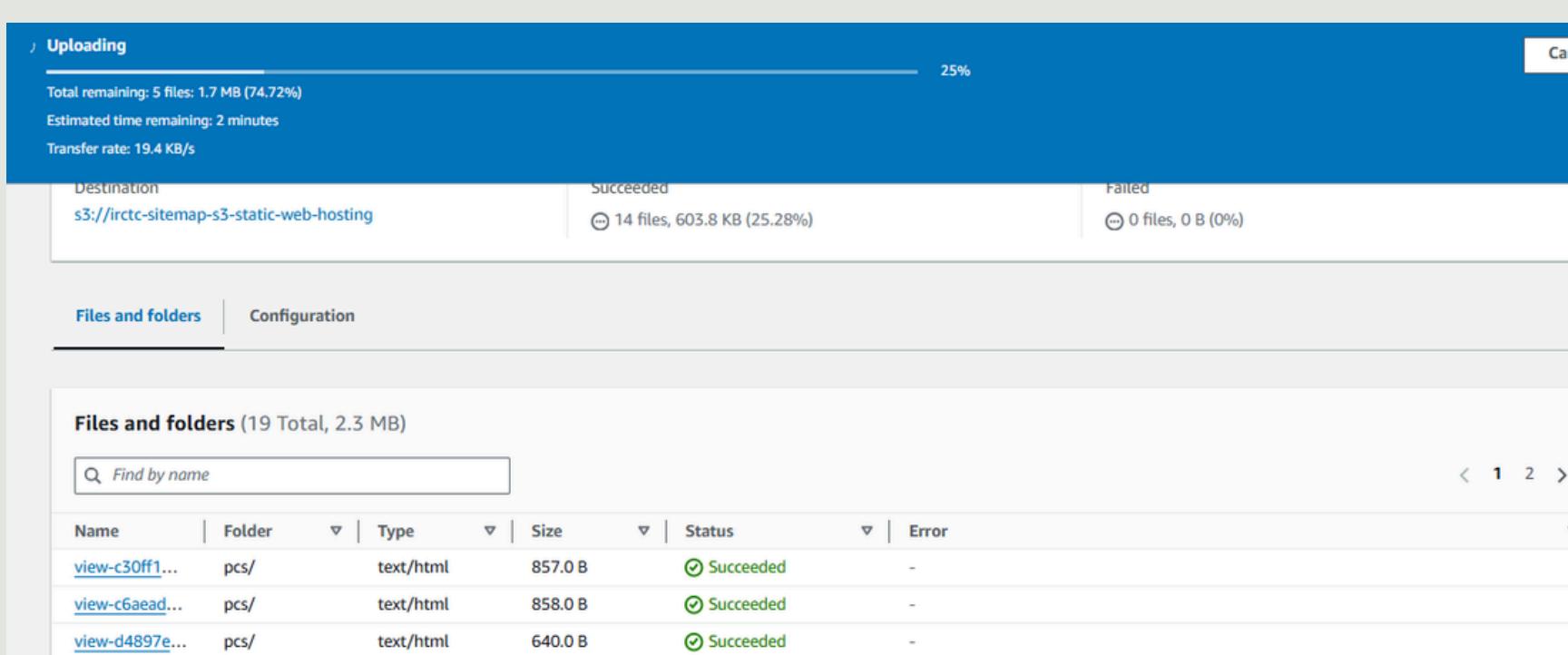
Hosting type  
Bucket hosting

**Bucket website endpoint**  
When you configure your bucket as a static website, the website is available at the AWS Region-specific website endpoint of the bucket. [Learn more](#)

`http://irctc-sitemap-s3-static-web-hosting.s3-website.ap-south-1.amazonaws.com`

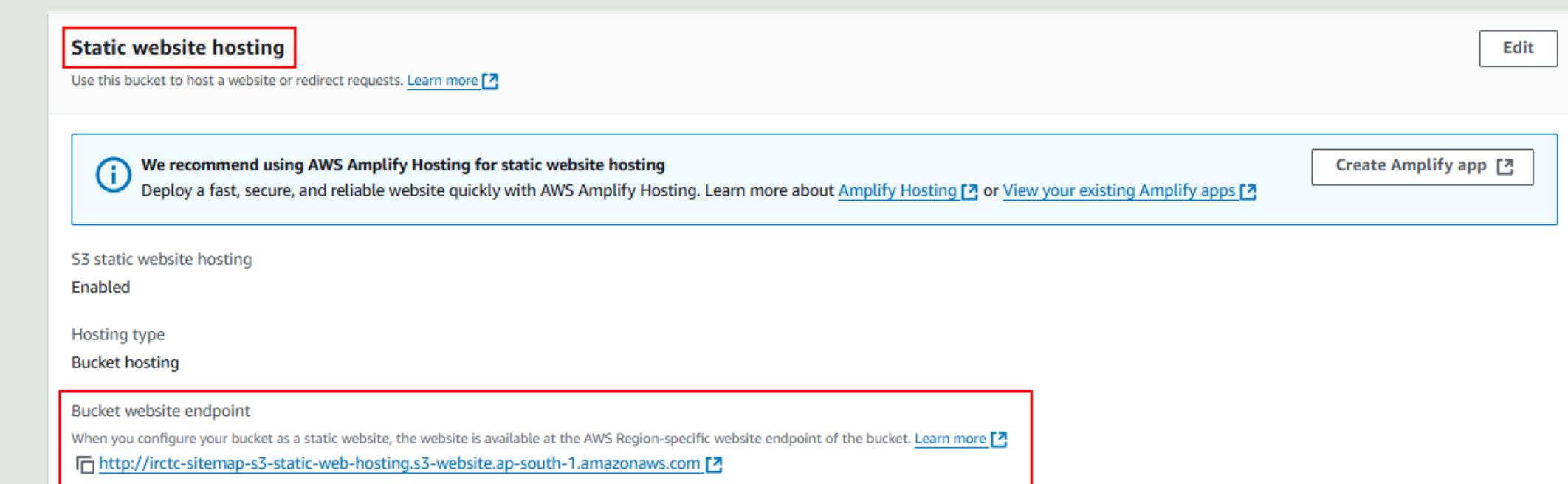
# Step 6: Configure an index document and upload website Files

- When we enable static website hosting for our bucket, We have to enter the name of the index document (for example, index.html).
- After we enable static website hosting for the bucket, we will upload an HTML file with this index document name to our bucket.
- To upload the index document to our bucket, do one of the following:
  - 1.Drag and drop the index file into the console bucket listing.
  - 2.Choose Upload, and follow the prompts to choose and upload the index file.
- In our case upload present IRCTC website sitemap content to our bucket.



## Step 7: Test the website endpoint

- Under Buckets, choose the name of your bucket.
- Choose Properties.
- At the bottom of the page, under Static website hosting, choose your Bucket website endpoint.
- Your index document opens in a separate browser window.
- After making bucket public, Our static website should be accessible at the endpoint provided in the “Static website hosting” section of our bucket’s properties.
- It will look like this: **http://irctc-sitemap-s3-static-web-hosting.s3-website.ap-south-1.amazonaws.com**



# Step 8: Access the S3 endpoint for the sitemap and original IRCTC website

The screenshot shows the IRCTC S3 endpoint website at [irctc-sitemap-s3-static-web-hosting.s3-website.ap-south-1.amazonaws.com/nget/train-search](https://irctc-sitemap-s3-static-web-hosting.s3-website.ap-south-1.amazonaws.com/nget/train-search). The page displays the IRCTC logo and navigation menu. The main content is a "BOOK TICKET" form with fields for "From" (03/11/2024), "To", "All Classes", and "GENERAL". Below the form is a large image of a modern Indian Railways train. A red box highlights the URL in the browser address bar.

This screenshot shows the same S3 endpoint website as above, but with additional content below the book ticket form. It features a banner for "Vigilance Awareness Week- 2024" with the theme "Culture of Integrity for Nation's Prosperity" from 28th October to 3rd November 2024. Below the banner, there is a message: "Have you not found the right one? Find a service suitable for you here." followed by icons for various services: FLIGHTS, HOTELS, RAIL DRISHTI, E-CATERING, BUS, HOLIDAY PACKAGES, TOURIST TRAIN, HILL RAILWAYS, CHARTER TRAIN, and GALLERY. At the bottom, the IRCTC Customer Care No : 14646 is listed, along with a note about not asking for personal banking information. A red box highlights the URL in the browser address bar.



The screenshot shows the Original IRCTC Website at [irctco.in/nget/train-search](https://irctco.in/nget/train-search). The layout is identical to the S3 endpoint version, featuring the IRCTC logo, navigation menu, and a "BOOK TICKET" form. A red box highlights the URL in the browser address bar.

This screenshot shows the Original IRCTC Website at [irctco.in/nget/train-search](https://irctco.in/nget/train-search), similar to the S3 endpoint version. It includes the "Vigilance Awareness Week- 2024" banner, the "Have you not found the right one?" message, and the list of services. At the bottom, the IRCTC Customer Care No : 14646 is listed, along with a note about not asking for personal banking information. A red box highlights the URL in the browser address bar.



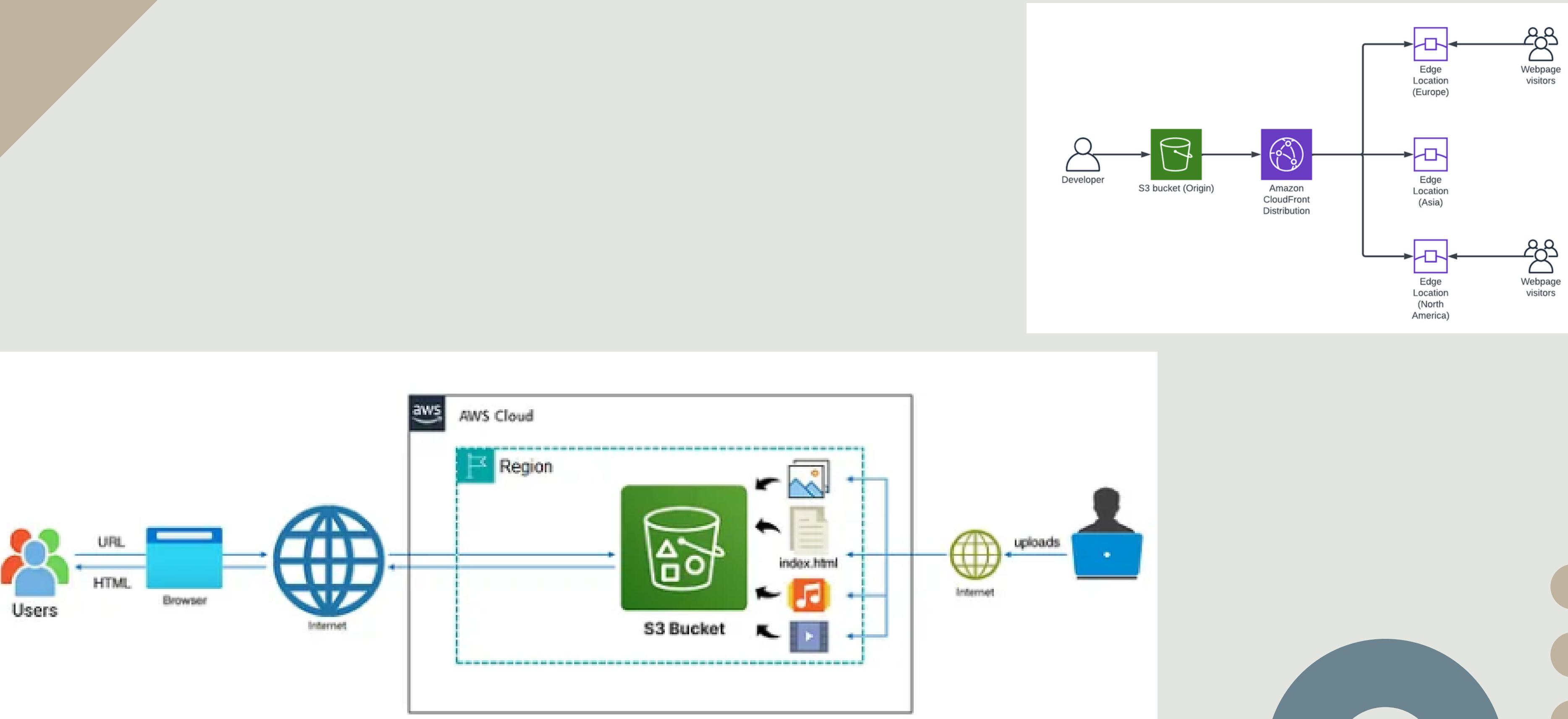
# LIMITATIONS

- **Limited Server-Side Processing:** Not suitable for complex dynamic applications.
- **Security:** Requires careful configuration to prevent unauthorized access.
- **Performance Optimization:** May require additional configuration for optimal performance.
- **Custom Error Pages:** Limited customization options compared to traditional web servers.
- **Scalability for Dynamic Content:** Less flexible for scaling dynamic content compared to traditional web servers.

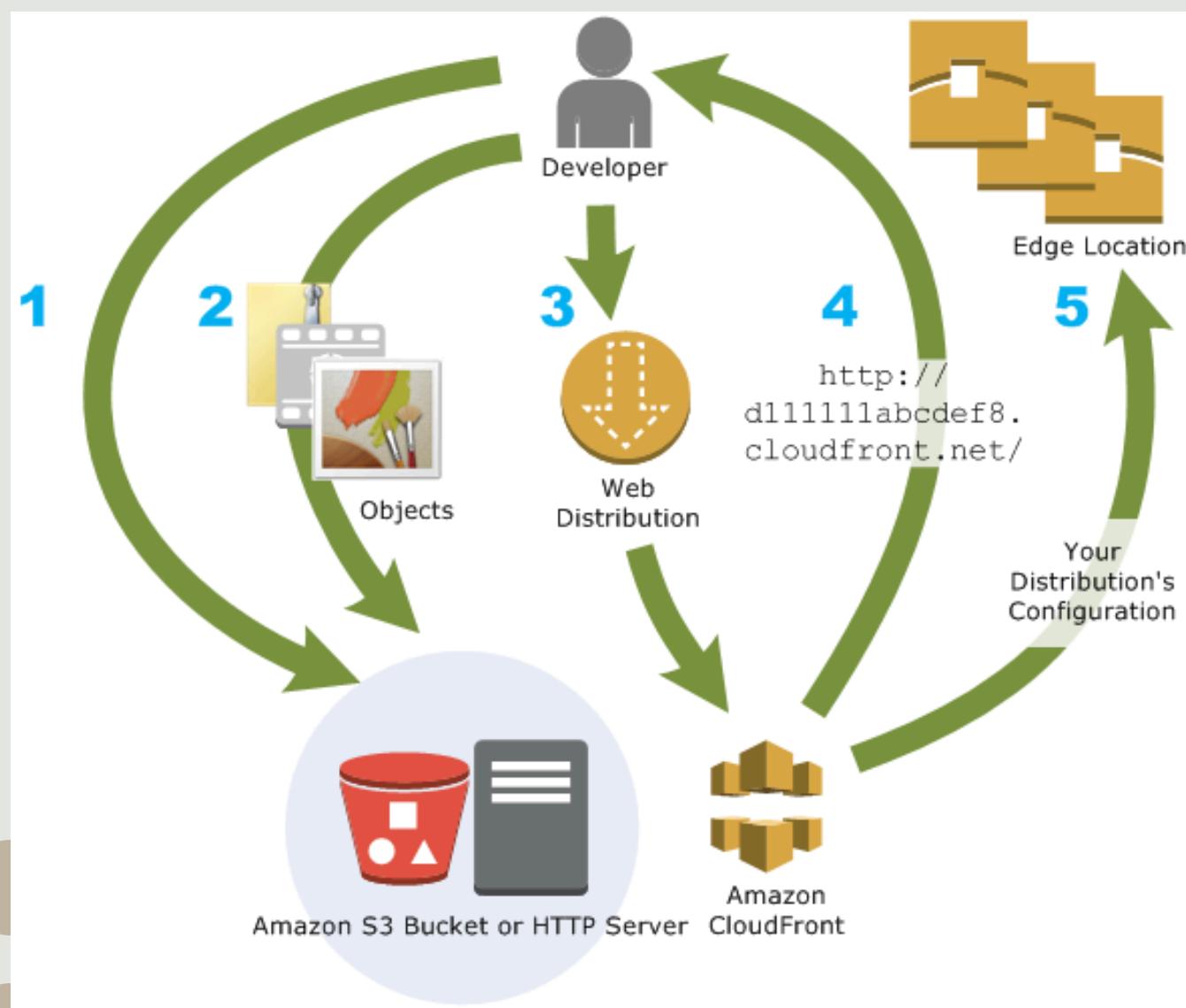
# CONCLUSION

- S3 static web hosting is a powerful and cost-effective solution for deploying static websites.
- It leverages the scalability, durability, and global reach of AWS S3 to deliver high-performance websites.
- While it's ideal for static content, it's important to understand its limitations, especially when dealing with complex dynamic applications. By carefully considering your website's requirements and leveraging S3's capabilities,
- You can create robust and scalable web solutions.

# ARCHITECTURE



# CLOUDFRONT (CDN)



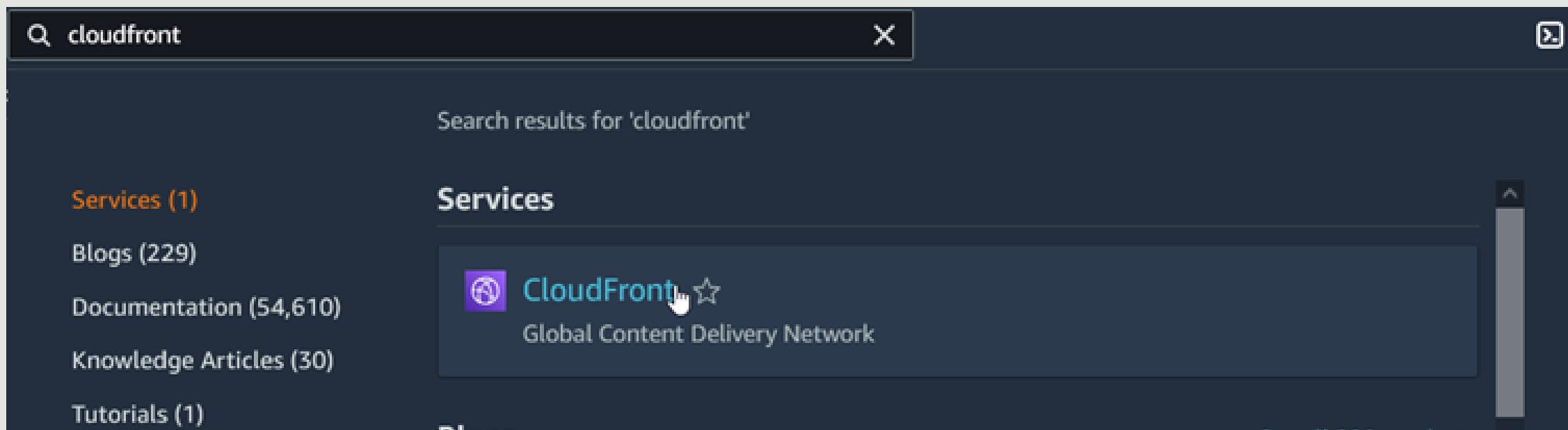
## What is ClouFront?

- Amazon CloudFront is a web service that speeds up distribution of your static and dynamic web content, such as .html, .css, .js, and image files, to your users.
- It leverages AWS's global cloud infrastructure with a large number of edge locations worldwide.
- Offers consistent performance across regions due to its integration with AWS's network.

## Step 9: Create a CloudFront distribution

First, we need to create a CloudFront distribution. This makes our website available from data centers around the world.

- Search for Cloudfront on AWS console
- In the navigation pane, choose Distributions, then choose Create distribution.
- Specify settings for the distribution.
- Origin domain : Choose an AWS origin, or enter your origin's domain name (irctc-sitemap-s3-static-web-hosting.s3.ap-south-1.amazonaws.com)
- Origin access : Public (Bucket must allow public access.)
- Leave the default settings for the rest of the options and click “Create Distribution.



# Step 9: Create a CloudFront distribution

The screenshot shows the AWS CloudFront 'Create distribution' wizard with three main steps:

- Step 1: Create distribution**
  - Origin**: Set origin domain to `irctc-sitemap-s3-static-web-hosting.s3.ap-south-1.amazonaws.com`, selected via a red box. A note says "This S3 bucket has static web hosting enabled. If you plan to use this distribution as a website, we recommend using the S3 website endpoint rather than the bucket endpoint." A red box highlights the "Use website endpoint" button.
  - Origin path - optional**: Enter the origin path.
  - Name**: Enter the name for this origin, set to `irctc-sitemap-s3-static-web-hosting.s3.ap-south-1.amazonaws.com`.
  - Origin access**: Set to **Public**.
  - Additional settings**: Includes sections for **Enable Origin Shield** (No selected), **Default cache behavior** (Path pattern: Default (\*)), and **Viewer** (Protocol: HTTP and HTTPS).
- Step 2: Default cache behavior**
  - Default cache behavior**: Path pattern: Default (\*). Compress objects automatically: Yes.
  - Viewer**: Protocol policy: HTTP and HTTPS.
  - Cache key and origin requests**: Cache policy: CachingOptimized (Recommended for S3). Origin request policy: Select origin policy.
  - Function associations - optional**: Function type: Viewer request, Response: No association.
  - Web Application Firewall (WAF)**: Options: Enable security protections (selected).
- Step 3: Web Application Firewall (WAF)**
  - Web Application Firewall (WAF)**: Price estimate: \$14 for 10 million requests/month.
  - Settings**: Price class: Use all edge locations (best performance) (selected).
  - Alternate domain name (CNAME) - optional**: Add item.
  - Custom SSL certificate - optional**: Choose certificate.
  - Supported HTTP versions**: HTTP/2 (selected).
  - Default root object - optional**: Object: /
  - Standard logging**: Off (selected).
  - IPv6**: Off (selected).
  - Description - optional**: Description field.

**Create distribution** button is highlighted with a red box at the bottom right.

## Step 10: Access the CloudFront Domain Name

- Once the cloudfont distribution has been created. It will generate publicly accessible domain name for us.
- We can access our website or S3 bucket content with this domain publicly.
- Domain will look like after SSL/TLS: <https://d16nouxfb4fdz.cloudfront.net>

The screenshot shows the AWS CloudFront Distributions page. At the top, there's a navigation bar with various AWS services like EC2, VPC, S3, RDS, etc. Below it, the CloudFront service is selected. The main area displays a table of distributions. One distribution is listed:

ID	Description	Type	Domain name	Origins	Status
E1H38J24B34ROK	-	Production	d16nouxfb4fdz.cloudfront.net	irctc-sitemap-s3-static-web-hosting.s3-we	Enabled

Red boxes highlight the 'ID' (E1H38J24B34ROK), 'Domain name' (d16nouxfb4fdz.cloudfront.net), and 'Origins' (irctc-sitemap-s3-static-web-hosting.s3-we) columns.

# Step 10: Access the S3 endpoint for the sitemap, CloudFront Domain and original IRCTC website

The screenshot shows the official IRCTC website at [irctc-sitemap-s3-static-web-hosting.s3-website.ap-south-1.amazonaws.com/nget/train-search](http://irctc-sitemap-s3-static-web-hosting.s3-website.ap-south-1.amazonaws.com/nget/train-search). The page displays the 'BOOK TICKET' form with fields for 'From' (03/11/2024), 'To', 'Classes' (All Classes), and 'GENERAL'. Below the form is a large image of a white and blue high-speed train. A red box highlights the URL in the address bar.

**BOOK TICKET**  
From: 03/11/2024  
To:  
Classes: All Classes  
GENERAL  
Person With Disability Concession Train with Available Berth Railway Pass Concession  
Flexible With Date  
Search Easy Booking on AskDISHA  
Customers can use enhanced interface for their IRCTC related queries! <https://equery.irctc.co.in>  
Vigilance Awareness Week- 2024 ("सत्यनिष्ठा की संरक्षित से राह की रामदि, Culture of Integrity for Nation's Prosperity"). Click here to take the pledge.  
"सत्यनिष्ठा की संरक्षित से राह की रामदि"  
"Culture of Integrity for Nation's Prosperity"  
28th October to 3rd November 2024  
IRCTC  
Have you not found the right one?  
Find a service suitable for you here.  
FLIGHTS HOTELS RAIL DRISHTI E-CATERING BUS  
HOLIDAY PACKAGES TOURIST TRAIN HILL RAILWAYS CHARTER TRAIN GALLERY  
IRCTC Customer Care No : **14646**  
IRCTC Never ask for your Personal banking information such as Debit / Credit Card Number / OTP / PIN /CVV PAN or Date of Birth or Ask to install any app for customer complaint

The screenshot shows the official IRCTC website at [irctc.co.in/nget/train-search](http://irctc.co.in/nget/train-search). The layout is identical to the first screenshot, featuring the 'BOOK TICKET' form and a high-speed train image. A red box highlights the URL in the address bar.

**BOOK TICKET**  
From: 03/11/2024  
To:  
Classes: All Classes  
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The screenshot shows the website at [d2mjvn2iil6qcw.cloudfront.net/nget/train-search](http://d2mjvn2iil6qcw.cloudfront.net/nget/train-search), which is a CloudFront distribution of the IRCTC site. The layout is identical to the previous screenshots. A red box highlights the URL in the address bar.

**BOOK TICKET**  
From: 04/11/2024  
To:  
Classes: All Classes  
GENERAL  
Person With Disability Concession Train with Available Berth Railway Pass Concession  
Flexible With Date  
Search Easy Booking on AskDISHA  
Customers can use enhanced interface for their IRCTC related queries! <https://equery.irctc.co.in>  
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# ADVANTAGES OF CLOUDFRONT

Amazon CloudFront is a Content Delivery Network (CDN) that offers:

- **Faster content delivery:** By caching content closer to users, reducing latency.
- **Enhanced security:** Protects content with features like DDoS protection and SSL/TLS encryption.
- **Scalability:** Automatically adjusts to handle increased traffic.
- **Cost-effective:** Pay-as-you-go pricing and optimized cost structure.
- **Ease of use:** User-friendly interface and seamless integration with other AWS services.

# REFERENCE

Documentation of Configuring a static website on Amazon S3 

IRCTC sitemap files 

Tutorial Video

# Thank You

For your attention