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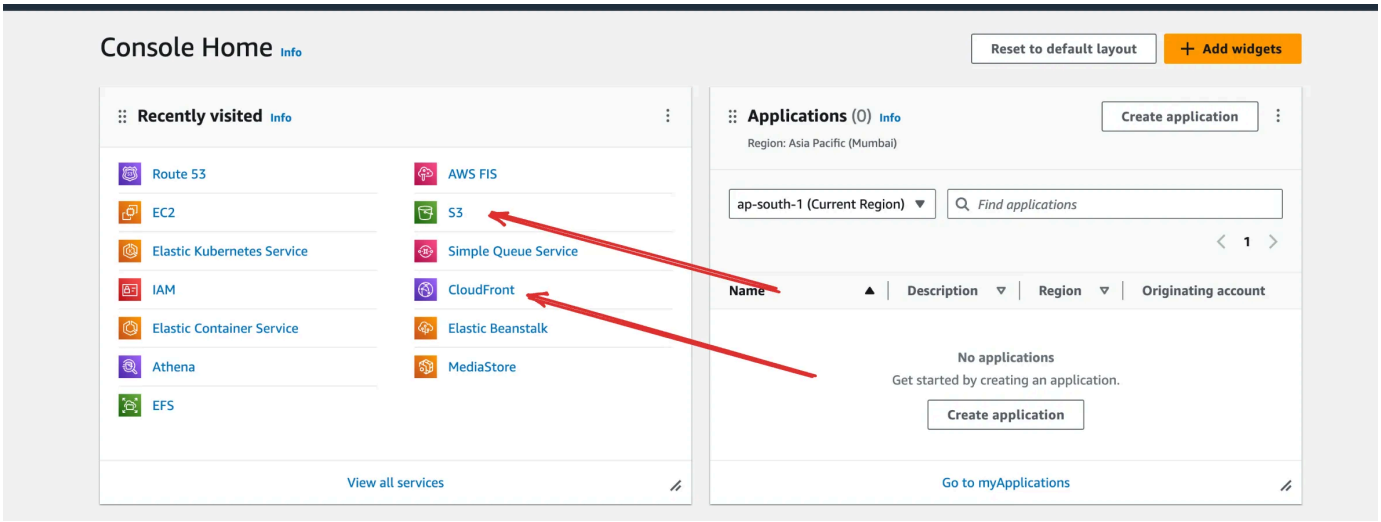
Frontend Deployments on AWS (1 / 9)

Step 1 - How to deploy Frontends to AWS

New things we will learn include
1. Object stores (S3)
2. CDNs (Cloudfront)

Step 1 - Signup and get an AWS account.

Step 2 - Make sure you can access S3 and cloudfront (this will automatically happen if you are the root user of that account)



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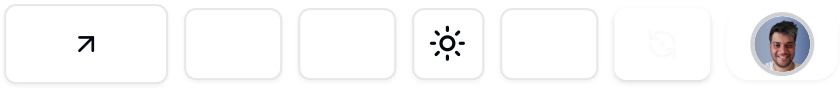

Frontend Deployments on AWS (2 / 9)

Step 2 - Build your React frontend

💡 This approach will not work for frameworks that use Server side rendering (like Next.js)
This will work for basic React apps, HTML/CSS/JS apps

Go to your react project

```
cd /link/to/your/react/project
```

Build your project

```
npm run build
```

Try serving the HTML/CSS/JS locally

```
npm i -g serve
serve
```

At this point you have basic HTML/CSS/JS code that you can deploy on the internet.

You might be tempted to host this on an EC2 instance, but that is not the right approach

The next slide explains why

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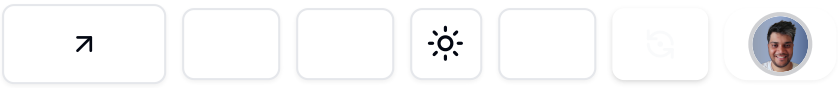


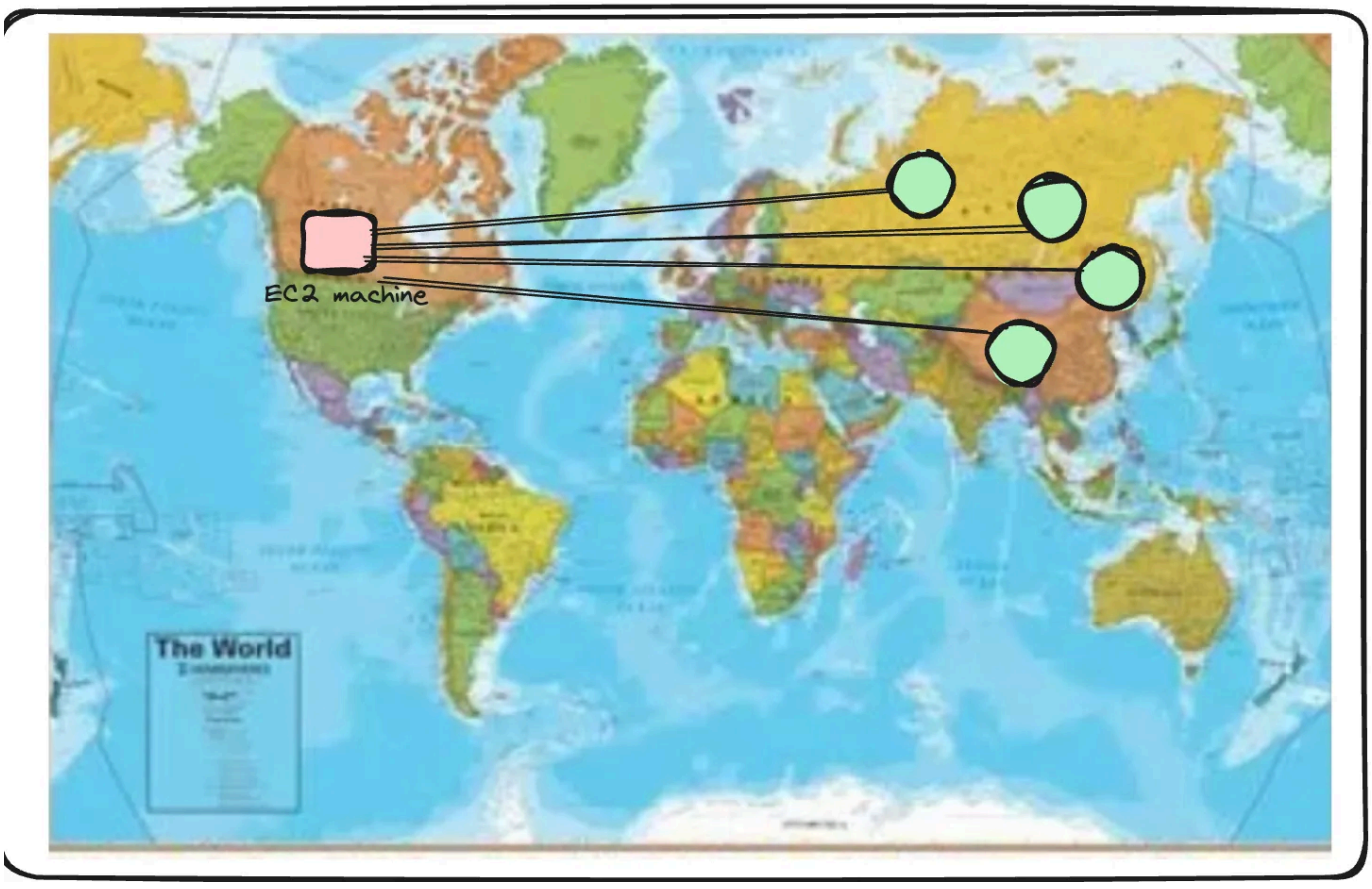
Frontend Deployments on AWS (3 / 9)

Step 3 - What are CDNs?

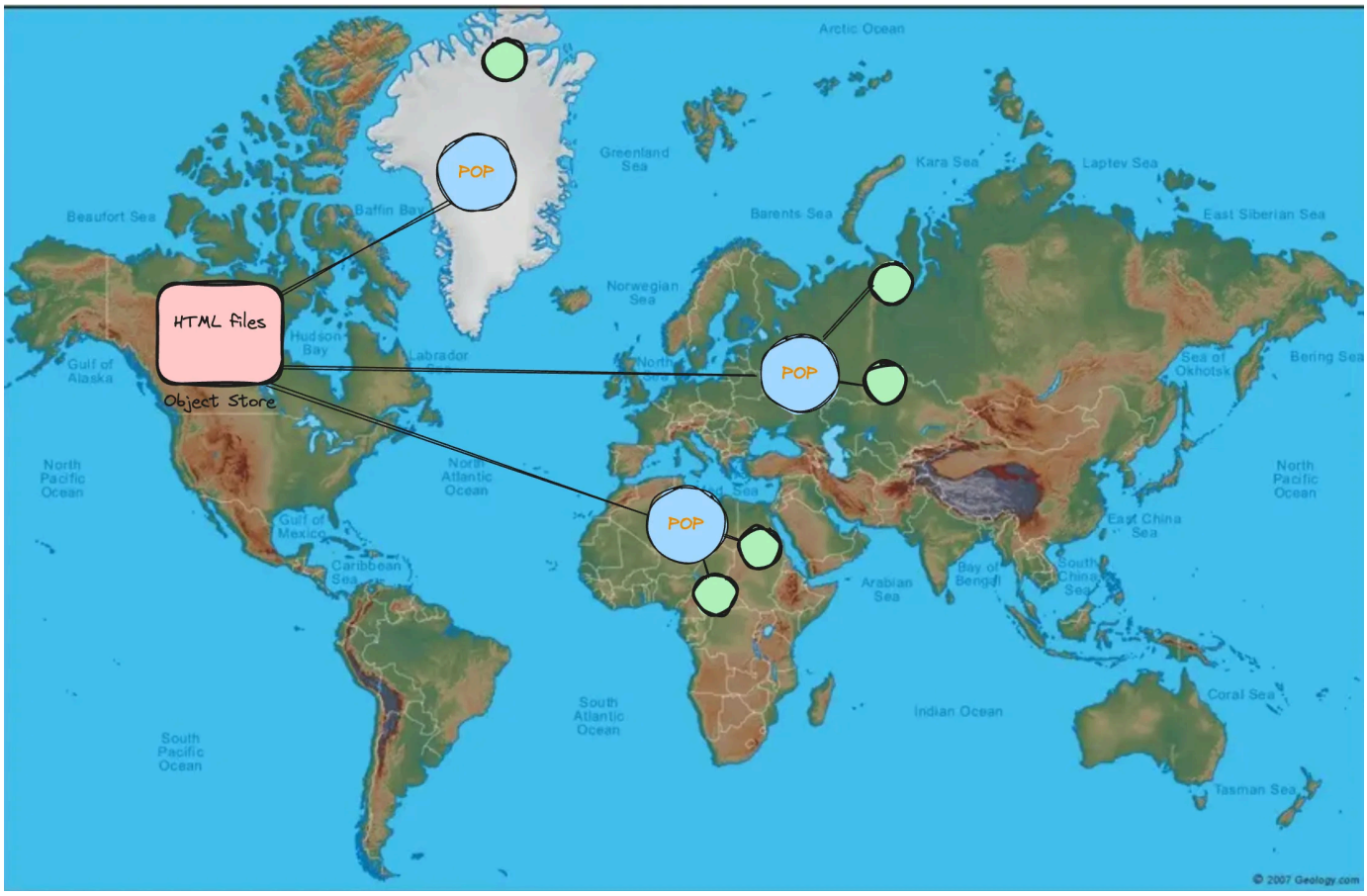
A CDN stands for Content Delivery Network .
As the name suggests, it's an optimal way for you to deliver content (mp4 files, jpgs and even HTML/CSS/JS files) to your users.

It is better than serving it from a VM/EC2 instances because of a few reasons -

1. EC2 machine apprach



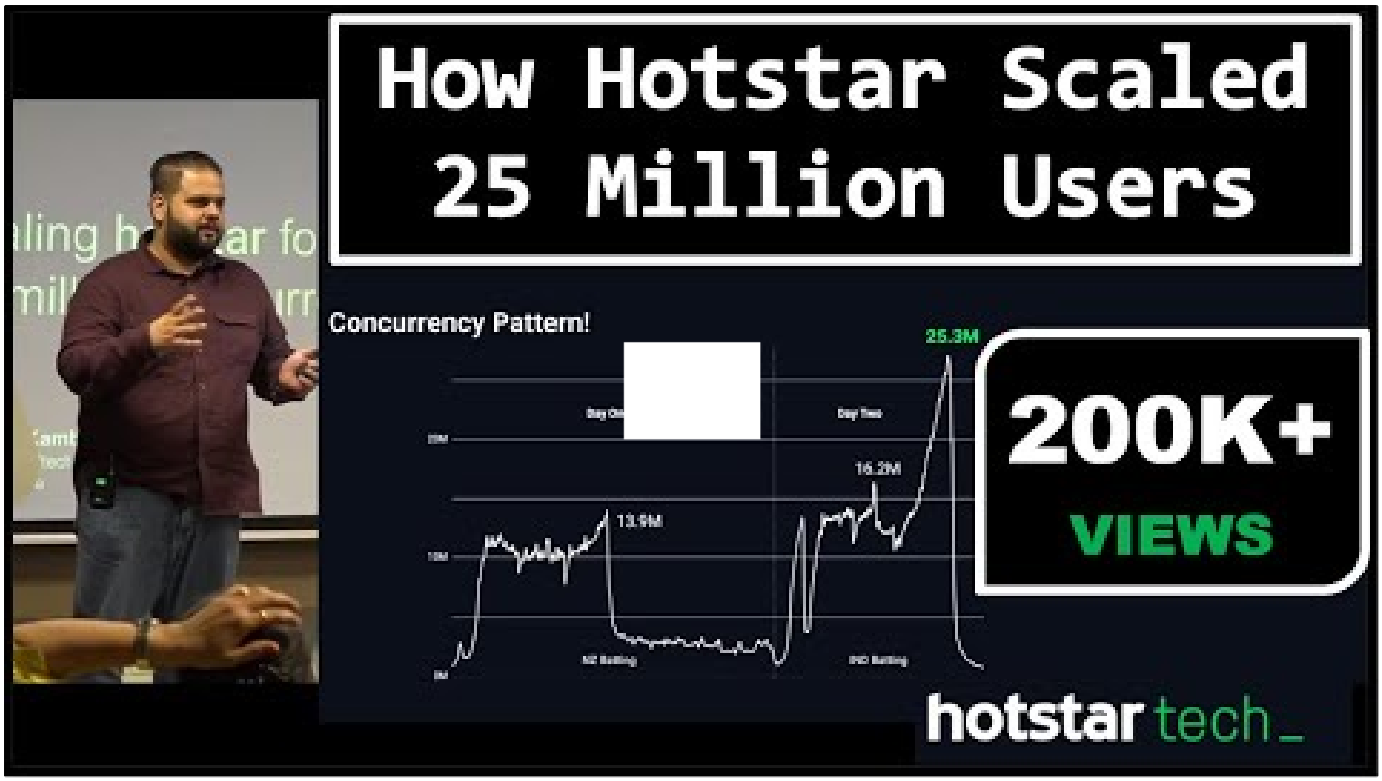
2. CDN approach



1. For frontends, mp4 files, images, Object stores + CDNs are a better approach.
2. You can't use the same for backends, since every request returns a different response. Caching doesn't make any sense there.

> 💡 You can use edge networks for backends (deploy your backend on various servers on the internet) but data can't be cached in there.

Great video on how Hotstar scales their infrastructure during cricket matches (they use CDNs heavily)


How Hotstar Scaled
25 Million Users
Concurrency Pattern!
25.3M
16.2M
13.9M
200K+
VIEWS
hotstar tech_

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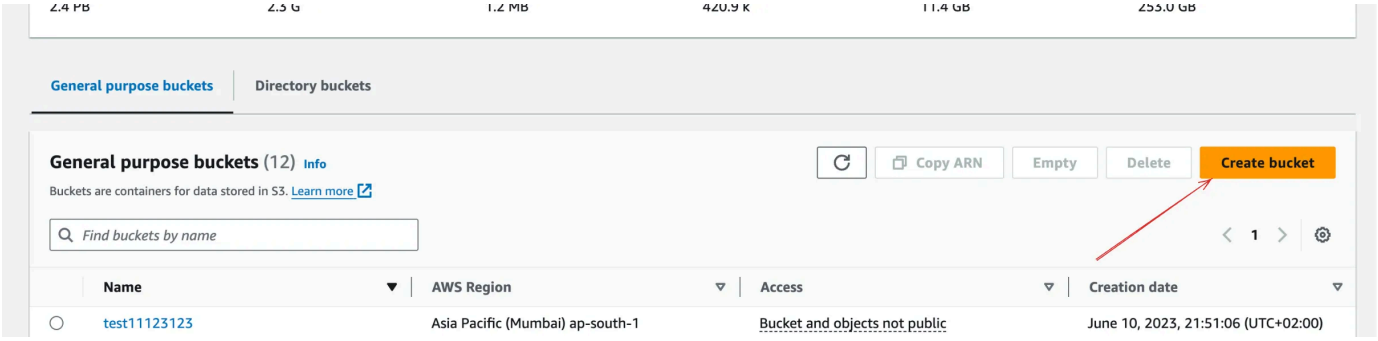
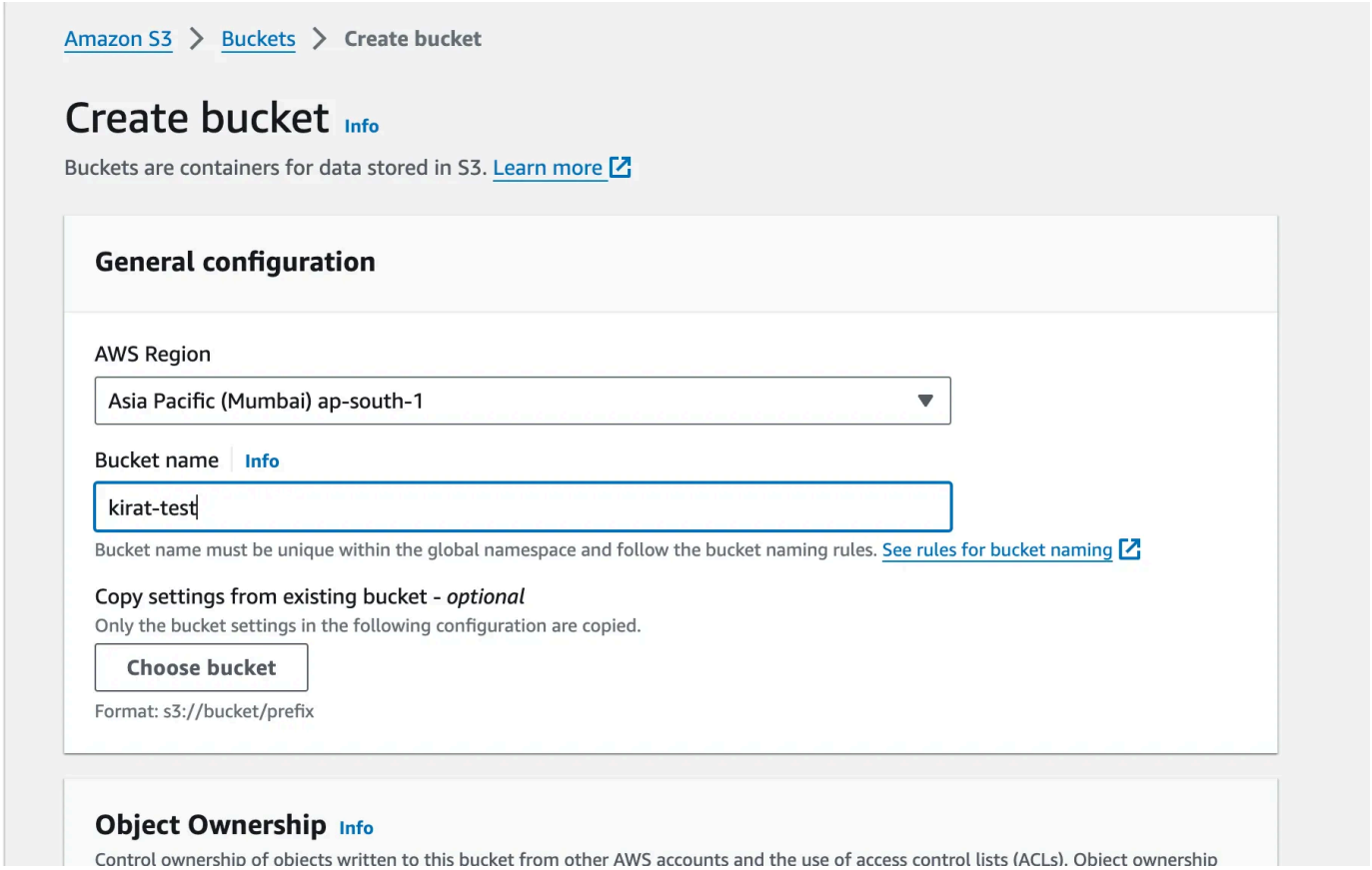
Frontend Deployments on AWS (4 / 9)

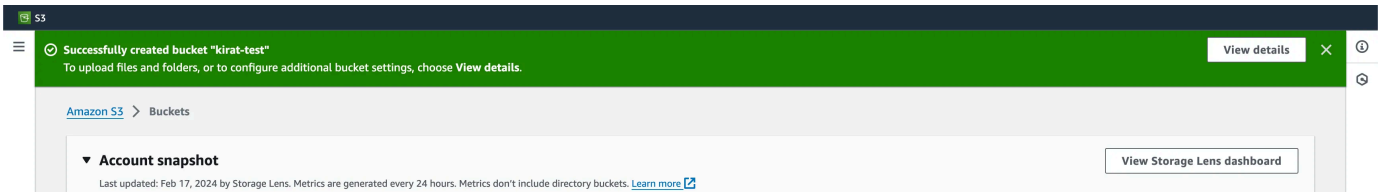
Step 4 - Creating an object store in AWS

In AWS, S3 is their object store offering.

You can create a bucket in there. A bucket represents a logical place where you store all the files of a certain project.




Amazon S3 > Buckets > Create bucket
Create bucket Info
Buckets are containers for data stored in S3. Learn more
General configuration
AWS Region
Asia Pacific (Mumbai) ap-south-1
Bucket name Info
kirat-test
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
Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership


S3
Successfully created bucket "kirat-test"
To upload files and folders, or to configure additional bucket settings, choose View details.
View details
Amazon S3 > Buckets
Account snapshot
View Storage Lens dashboard
Last updated: Feb 17, 2024 by Storage Lens. Metrics are generated every 24 hours. Metrics don't include directory buckets. Learn more

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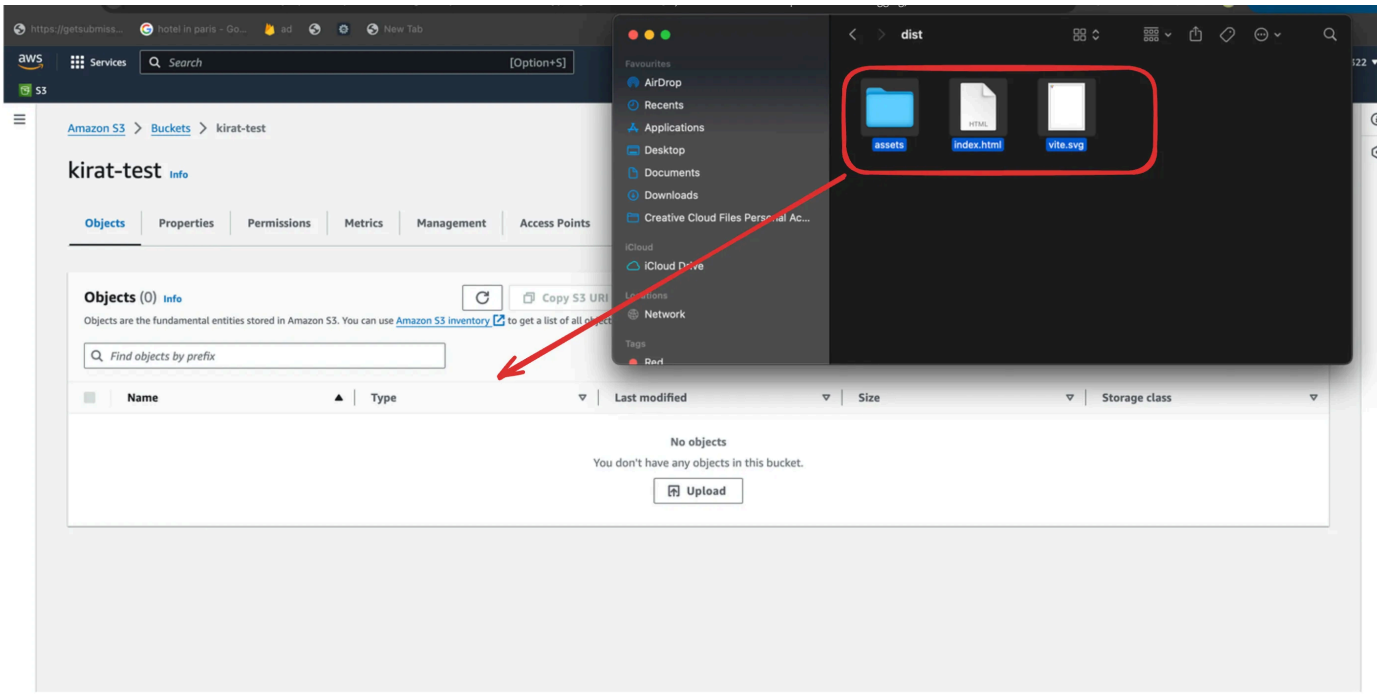
Frontend Deployments on AWS (5 / 9)

Step 5 - Upload the file bundle to S3

Upload all the files in the `dist` folder of your react project to S3



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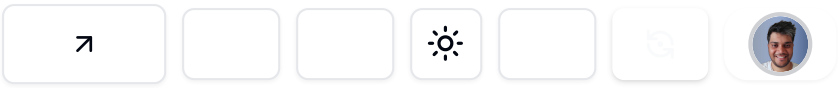
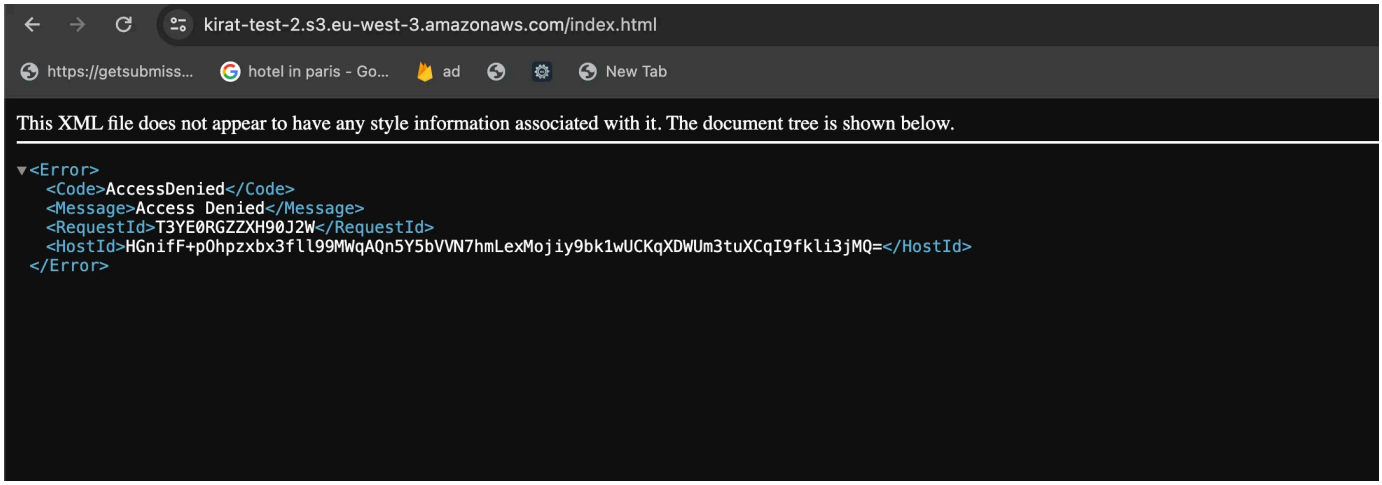


Frontend Deployments on AWS (6 / 9)

Step 6 - Try accessing the website



You might be tempted to open your S3 bucket at this point, but don't

Your S3 bucket should be blocked by default, and you should allow cloudfront (CDN) to access it.

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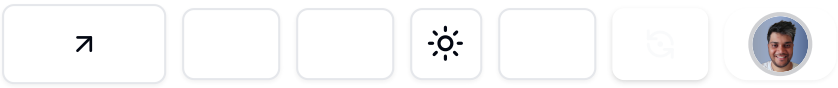
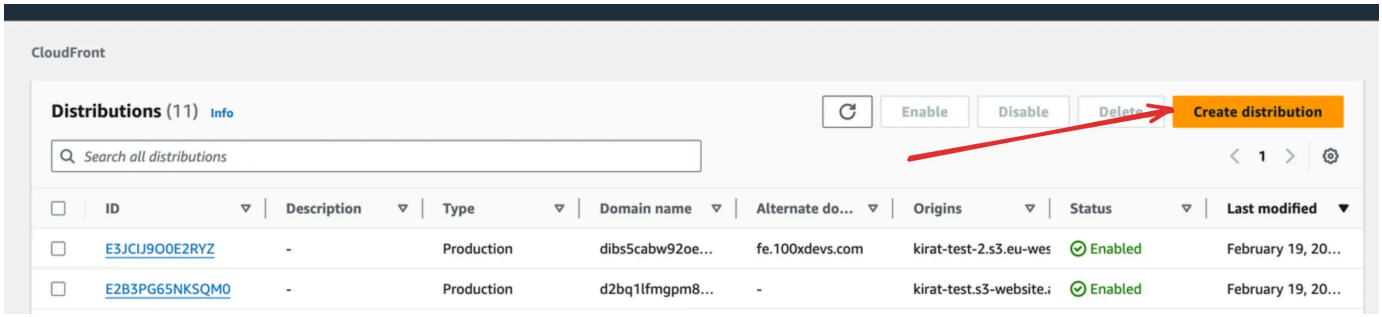


Frontend Deployments on AWS (7 / 9)

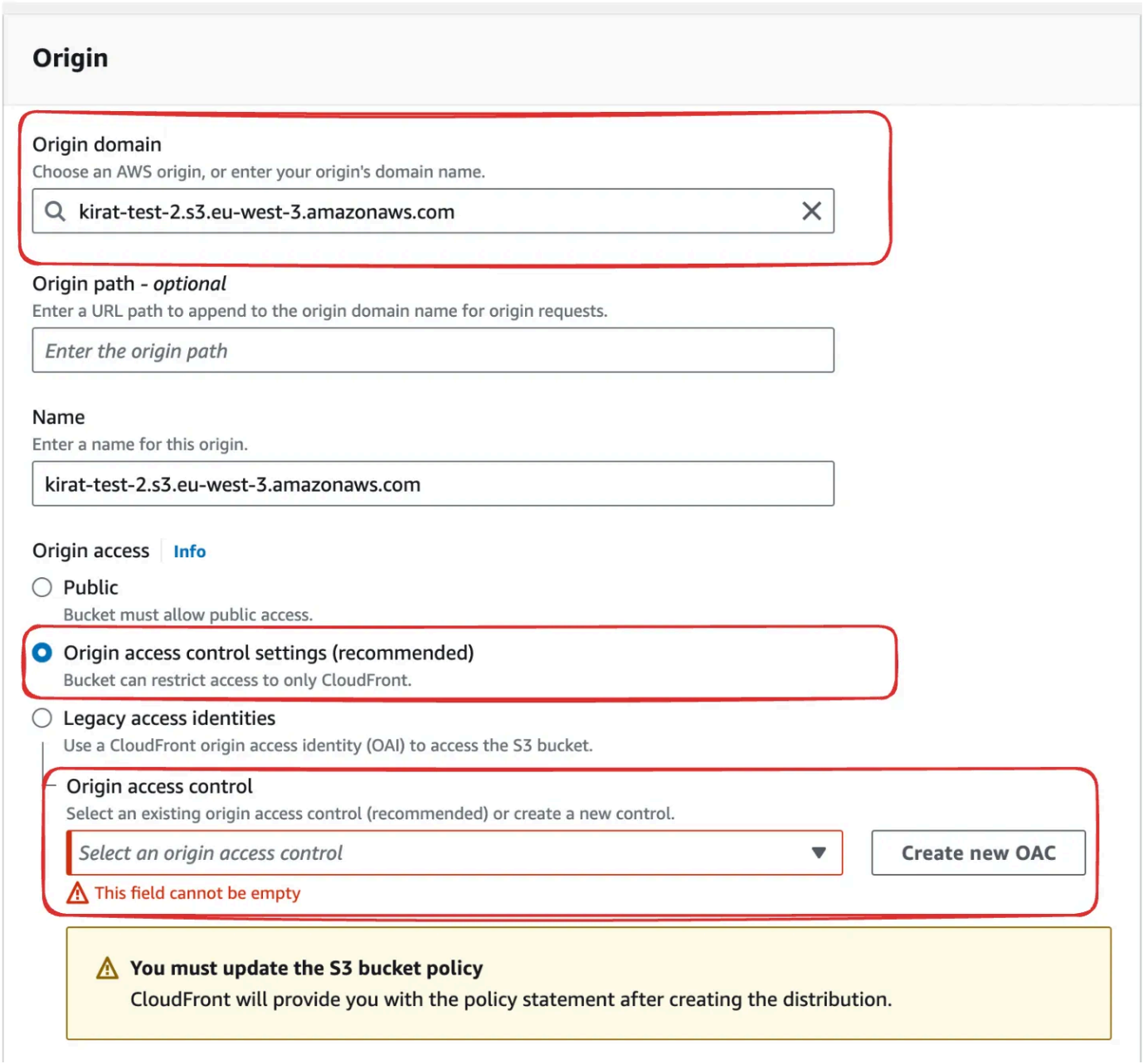
Step 7 - Connecting Cloudfront

Step 1 - Create cloudfront distribution

Go to cloudfront and create a new distribution. A distribution here means you're creating a place from where content can be distributed.

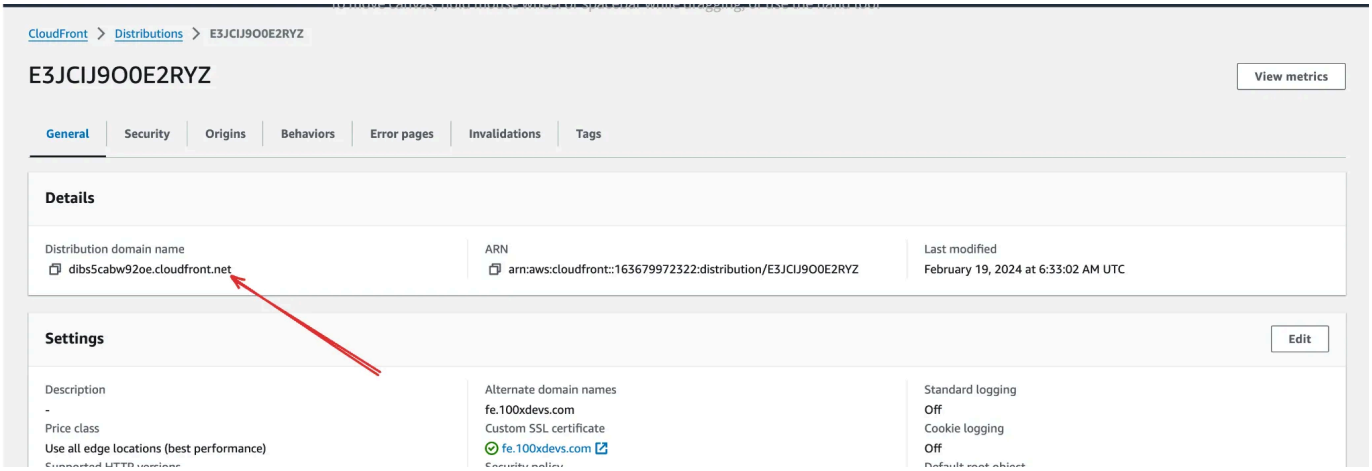


Step 2 - Select your S3 bucket as the source



Origin Access Control (OAC) is a feature in Cloudfront, which allows you to restrict direct access to the content stored in your origin, such as an Amazon S3 bucket or a web server, ensuring that users can only access the content through the CDN distribution and not by directly accessing the origin URL.

By the end of this, you should have a working cloudfront URL.


CloudFront > Distributions > E3JCIJ9O0E2RYZ
E3JCIJ9O0E2RYZ
View metrics
General
Security
Origins
Behaviors
Error pages
Invalidations
Tags
Details
Distribution domain name
dibs5cabw92oe.cloudfront.net
ARN
arn:aws:cloudfront::163679972322:distribution/E3JCIJ9O0E2RYZ
Last modified
February 19, 2024 at 6:33:02 AM UTC
Settings
Edit
Description
-
Price class
Use all edge locations (best performance)
Alternate domain names
fe.100xdevs.com
Custom SSL certificate
fe.100xdevs.com
Standard logging
Off
Cookie logging
Off

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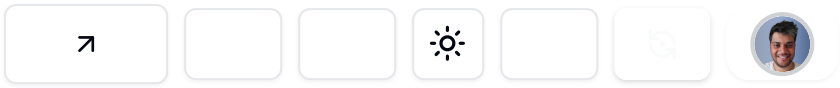


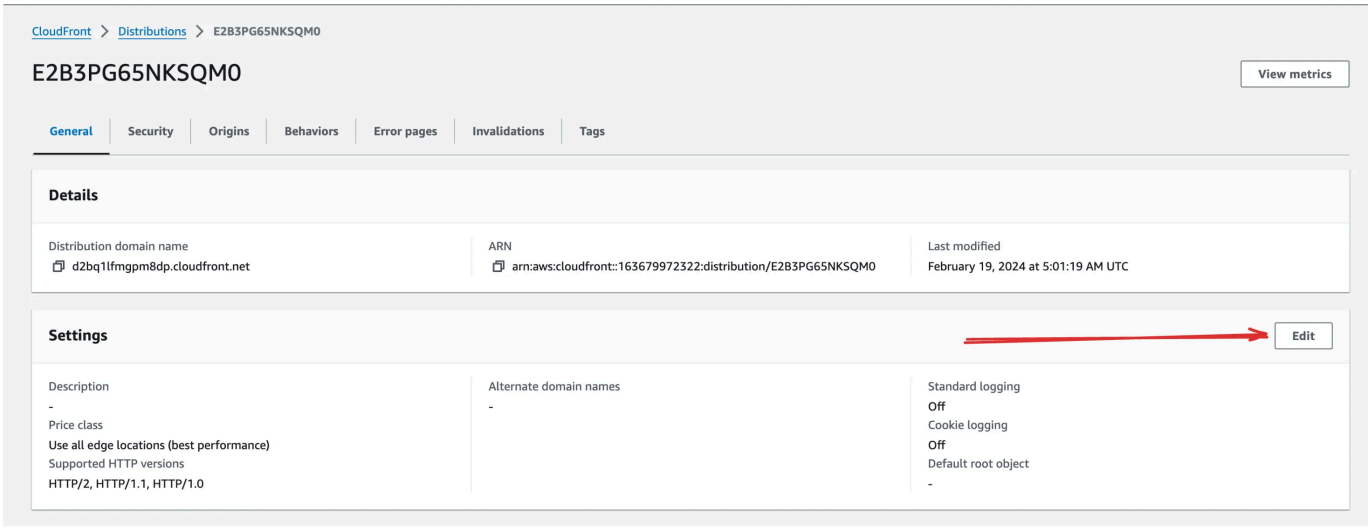
Frontend Deployments on AWS (8 / 9)

Step 8 - Connect your own domain to it

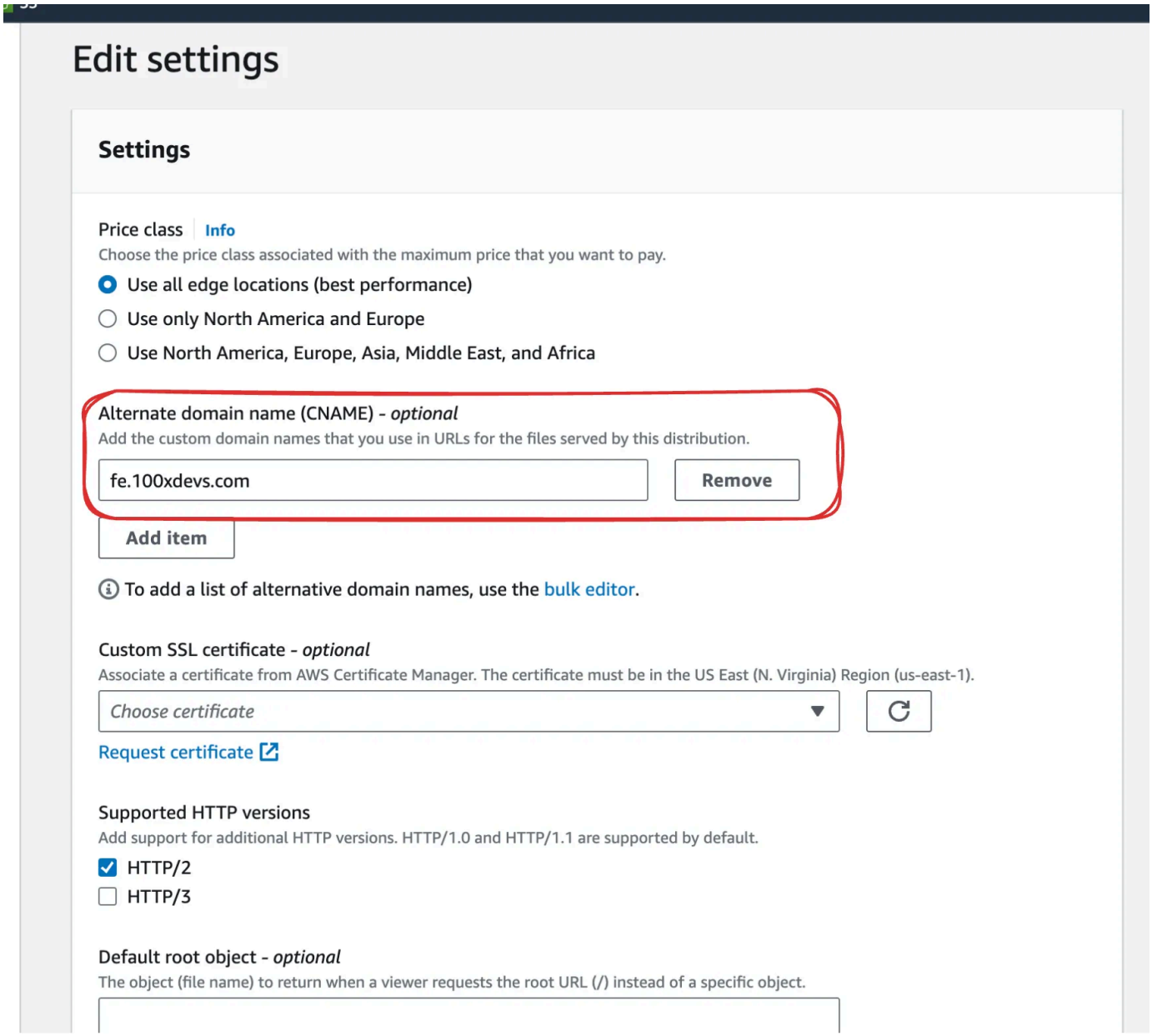
Websites aren't fun if you have to go to a URL that looks like this - https://dibs5cabw92oe.cloudfront.net

Connect your own custom domain by following the given steps -

1. Select edit on the root page

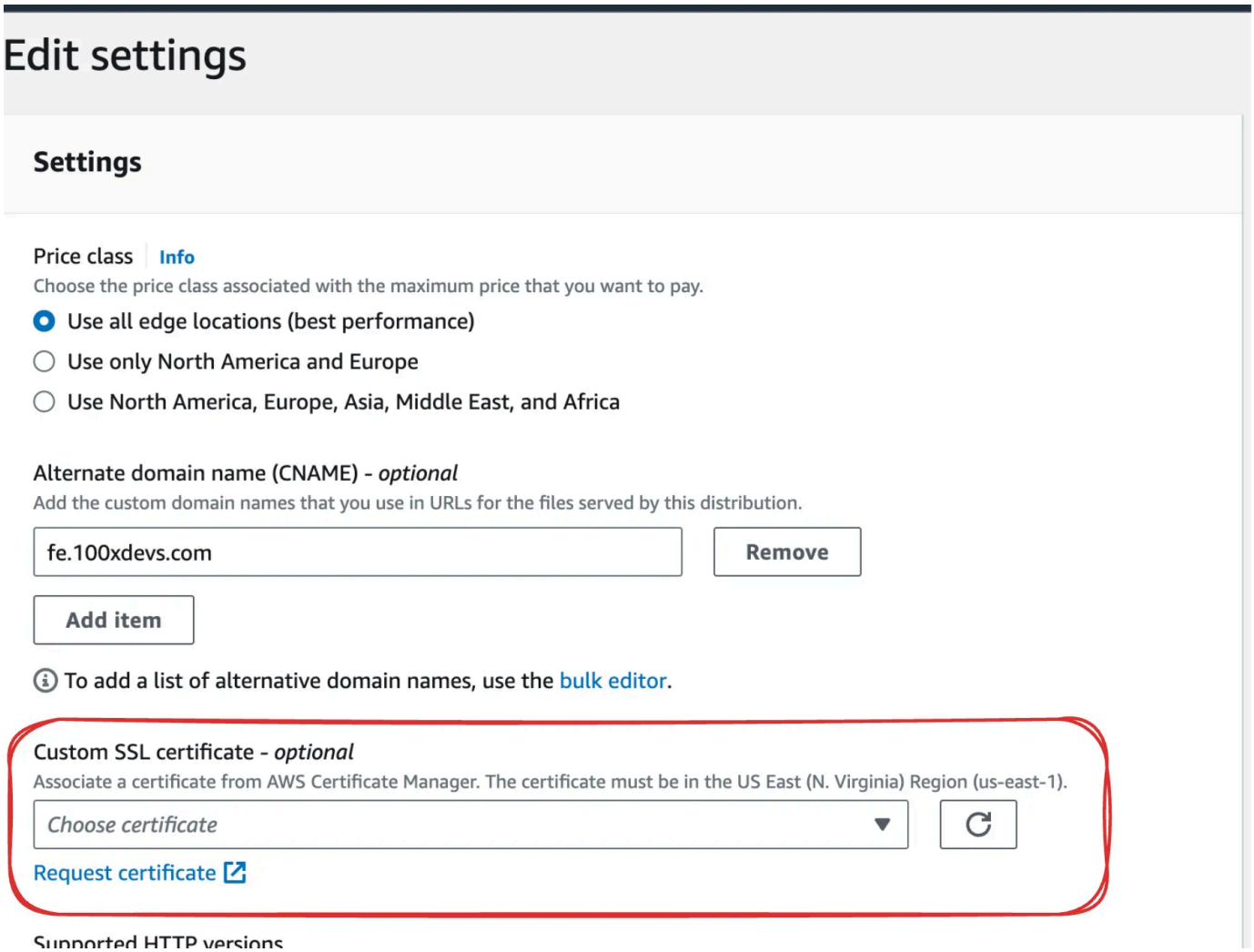


2. Attach a domain name to the distribution

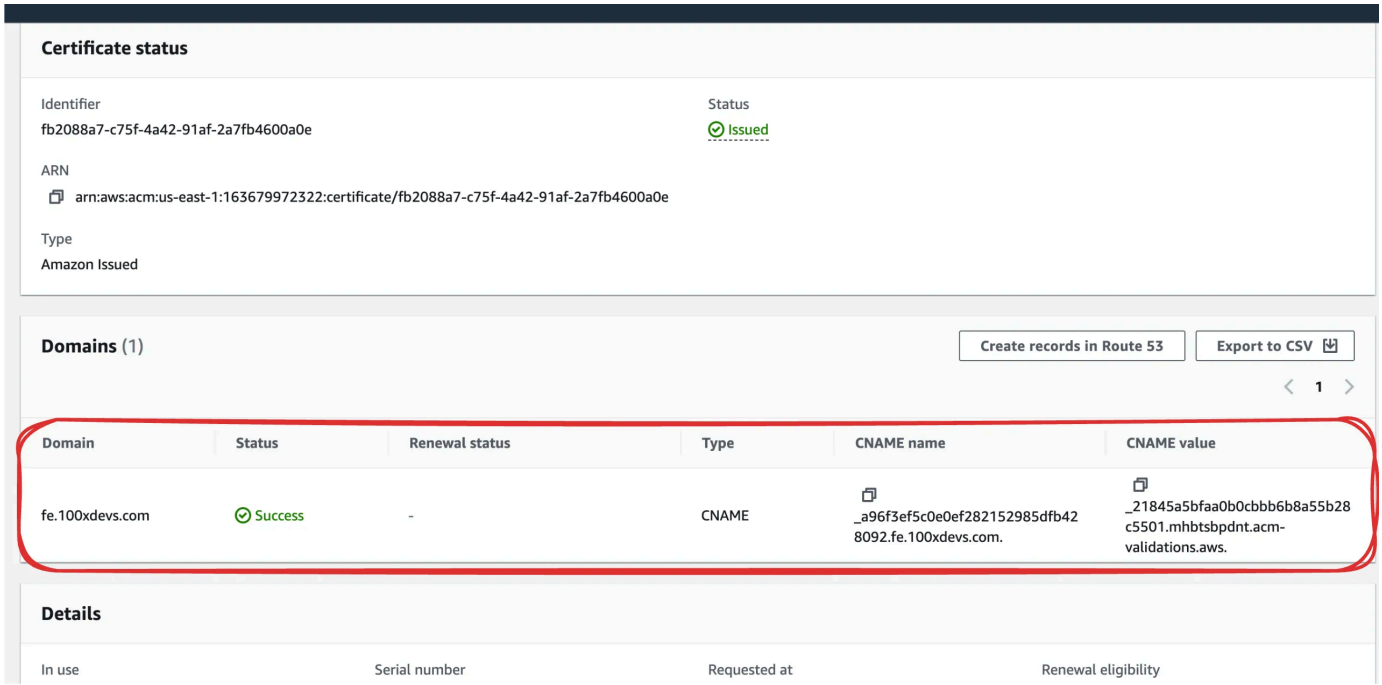


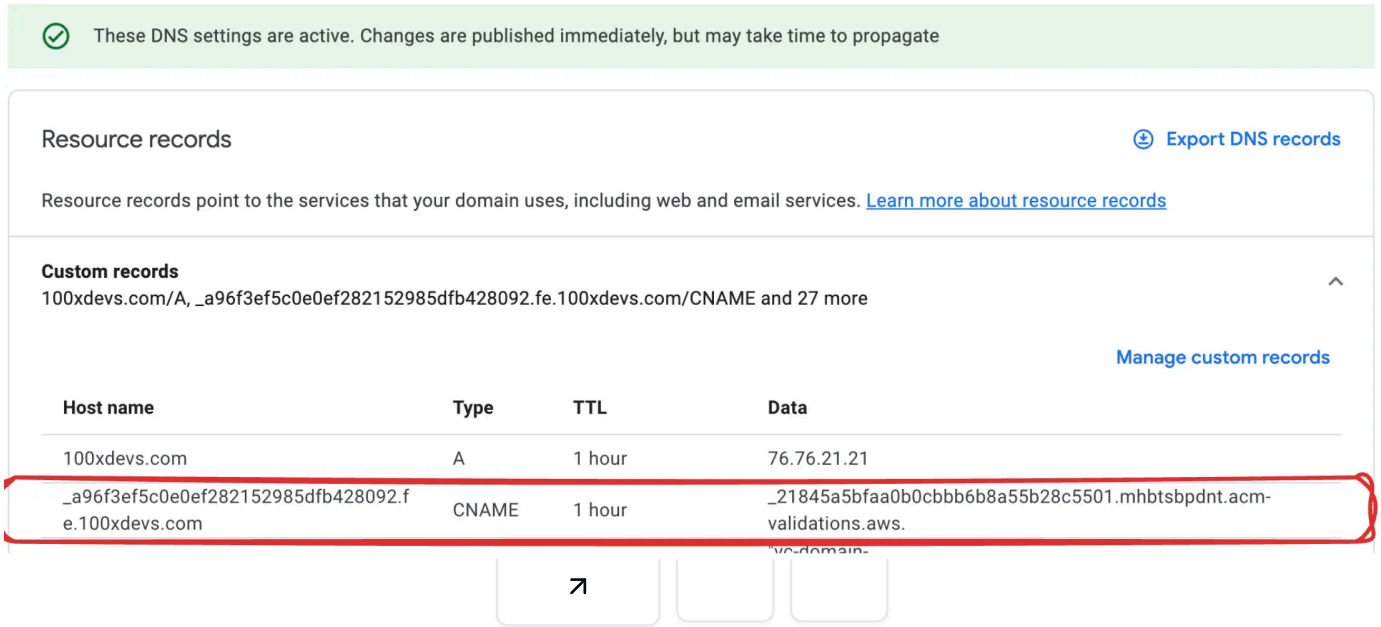
3. Create a certificate

Since we want our website to be hosted on HTTPS, we should request a certificate for our domain

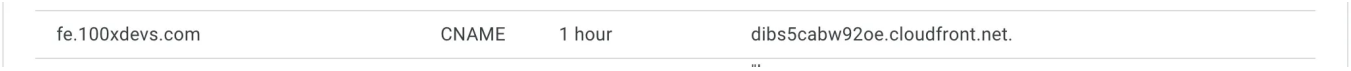


Step 4 - Follow steps to create the certificate in the certificate manager





Step 5 - Add a CNAME record for the website to point to your cloudfront URL



That's it, you have a fully running react project hosted on HTTPS on a custom domain

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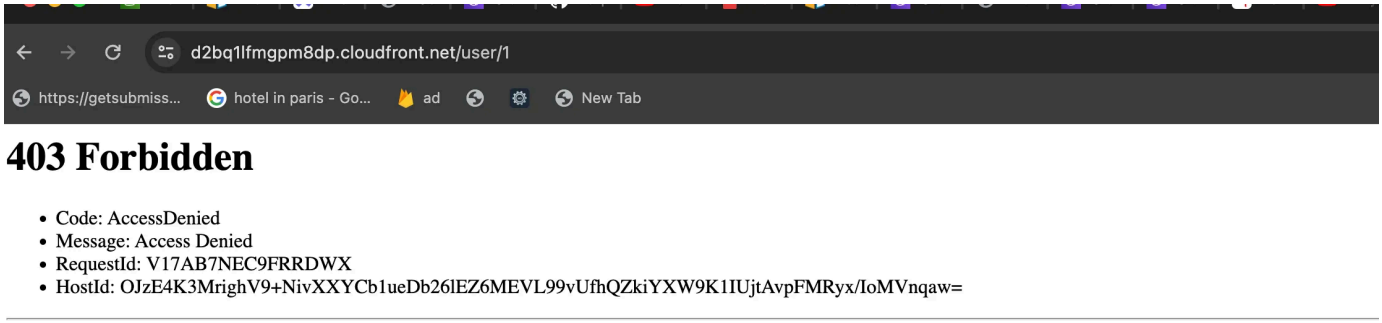
Frontend Deployments on AWS (9 / 9)

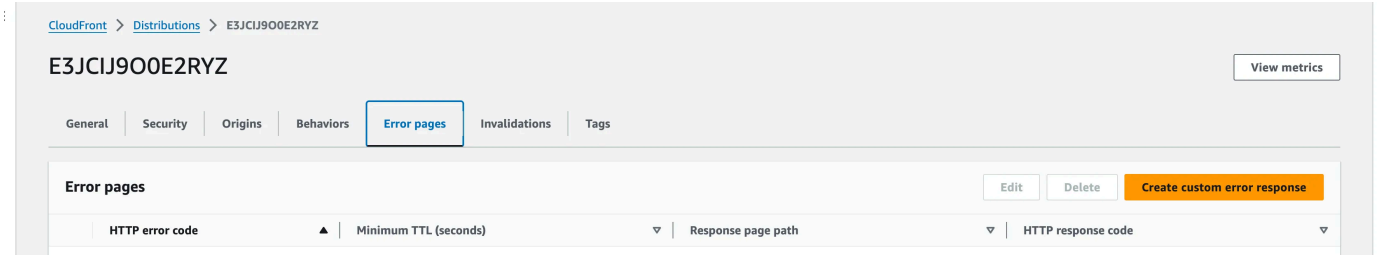
Step 9 - Error pages

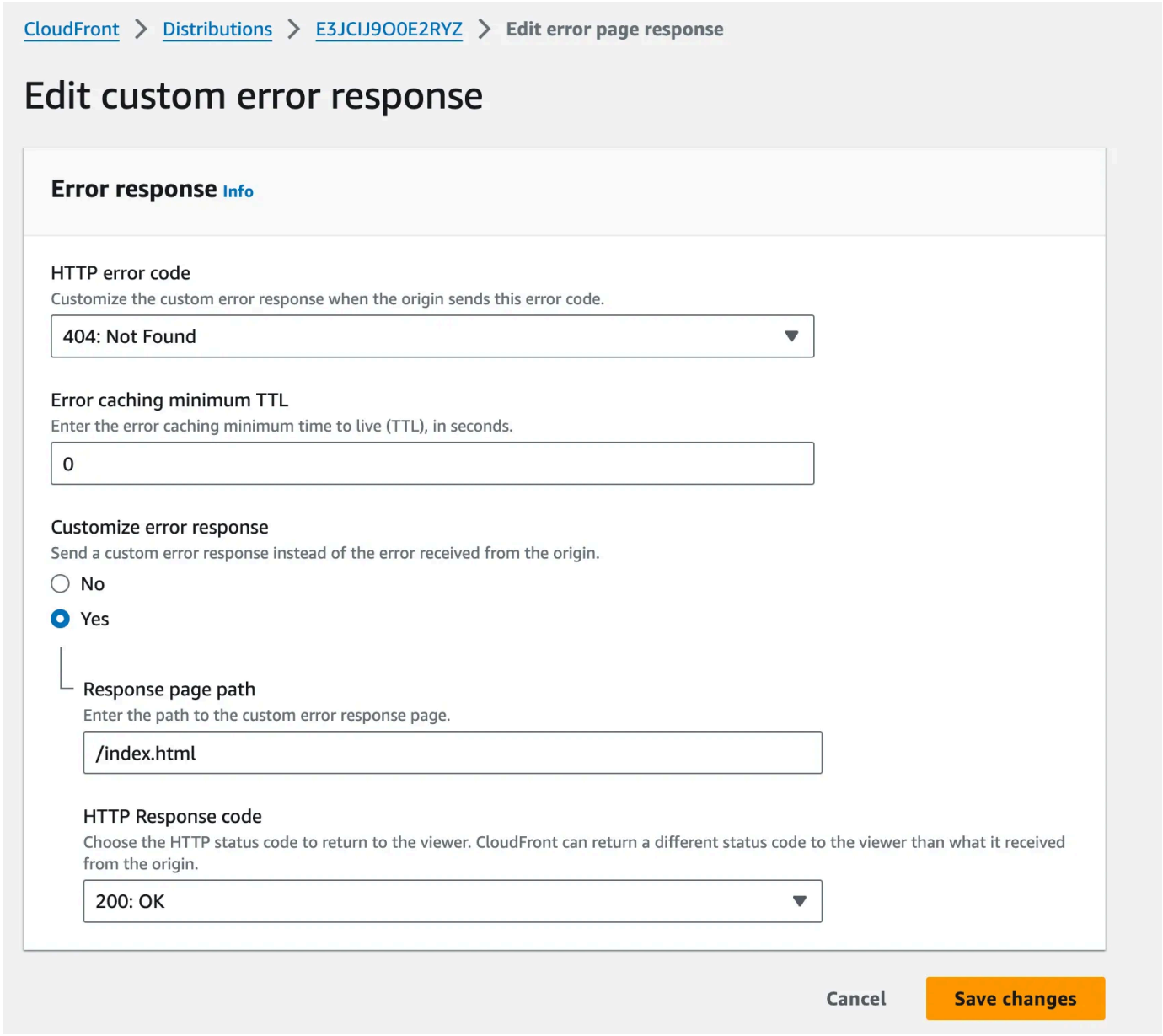
You will notice a problem, whenever you try to access a route on your page that isn't the index route (/user/1) , you reach an error page



This is because cloudfront is looking for a file `/user/1` in your S3, which doesn't exist.

To make sure that all requests reach `index.html` , add an `error page` that points to `index.html`





You might have to invalidate cache to see this in action.