Cycle 08 AWS Homework

Core Task Replication

Task 1: Mirror the Demo Exactly

The objective is to replicate exactly what Karthick demonstrated in the session.

Steps:

1. **Domain Setup**
    - If you already own a domain (from GoDaddy, Namecheap, etc.), use it.
    - If not, purchase a cheap domain through AWS Route 53 (first-year cost can be very low) or use a free service like Freenom.
    - Example: `www.yourdomain.com`.
2. **Create S3 Bucket**
    - Go to the S3 service in AWS console.
    - Create a new bucket. **Important:** The bucket name must exactly match your domain name (e.g., `www.yourdomain.com`).
    - Choose the region you want to host in.
    - Keep Block Public Access disabled (only if required for static hosting).
3. **Enable Static Website Hosting**
    - Open the bucket → Properties → Static Website Hosting.
    - Enable hosting and specify `index.html` as the root file.
    - Upload a simple `index.html` file into the bucket.
4. **Route 53 – Create Public Hosted Zone**
    - Go to Route 53 → Hosted Zones → Create Hosted Zone.
    - Enter your domain name and select **Public Hosted Zone**.
5. **Update Nameservers at Domain Registrar**

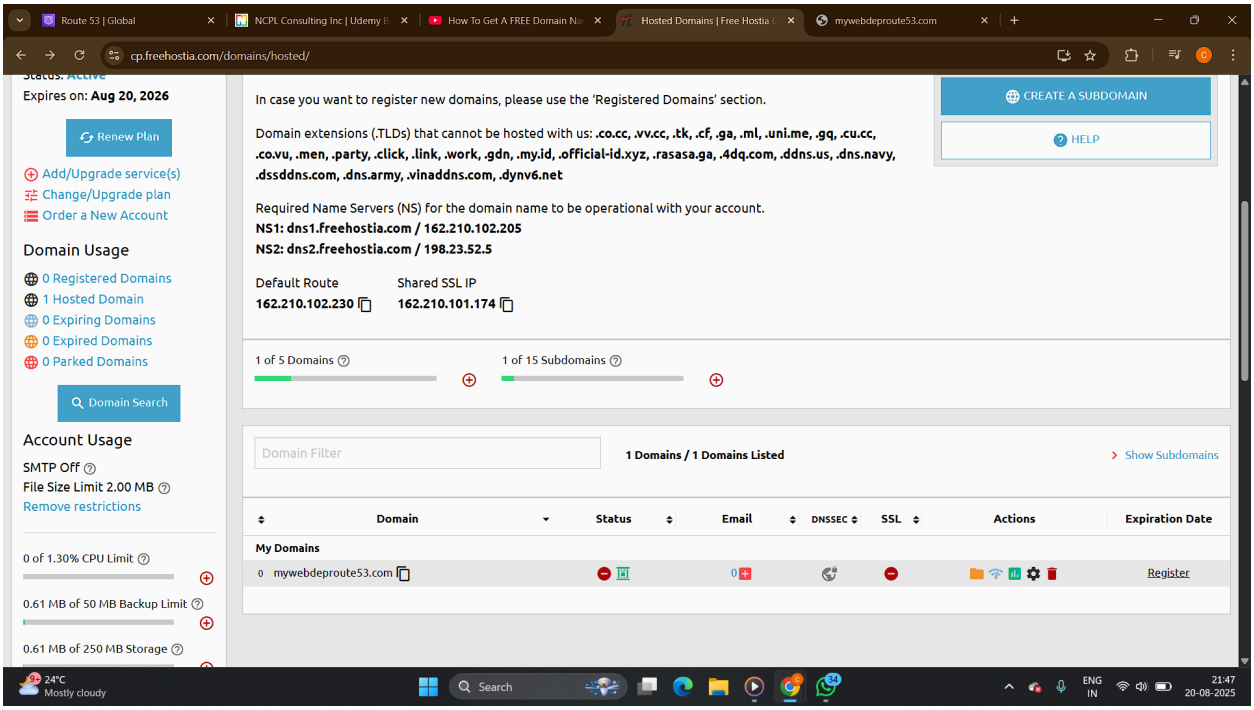
- The hosted zone will generate 4 Route 53 nameservers (NS records).
- Copy them and update the nameserver configuration in your domain registrar (GoDaddy, Freenom, etc.).
- This ensures DNS queries for your domain are handled by Route 53.

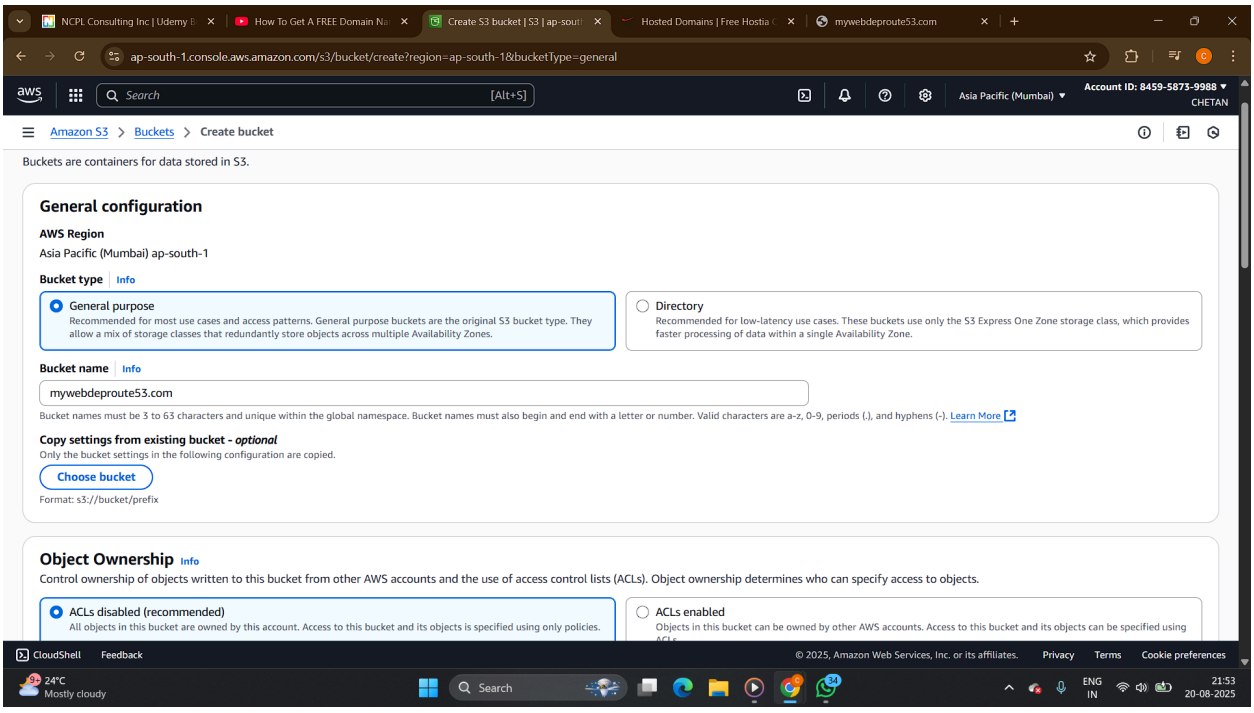
6. **Route 53 – Create A Record Alias to S3 Endpoint**
   - In the hosted zone, create an **A record (Alias)**.
   - Point it to your **S3 website endpoint** (e.g., `http://www.yourdomain.com.s3-website-us-east-1.amazonaws.com`).
   - Save changes.
   - Test your website via `http://www.yourdomain.com`.
7. **Request SSL Certificate (ACM)**
   - Go to AWS Certificate Manager (ACM).
   - Request a public certificate for your domain (`www.yourdomain.com`).
   - Select **DNS validation**.
8. **Validate Certificate**
   - ACM will generate a CNAME record for validation.
   - Copy it into your Route 53 hosted zone.
   - Wait until ACM shows the certificate as “Issued.”
9. **Create CloudFront Distribution**
   - Go to CloudFront → Create Distribution.
   - Set **Origin Domain Name** to your **S3 Website Endpoint** (not the bucket name).
   - Under **Viewer Protocol Policy**, choose **Redirect HTTP to HTTPS**.
   - Select the ACM certificate for your domain.
10. **Update Route 53 A Record to CloudFront**

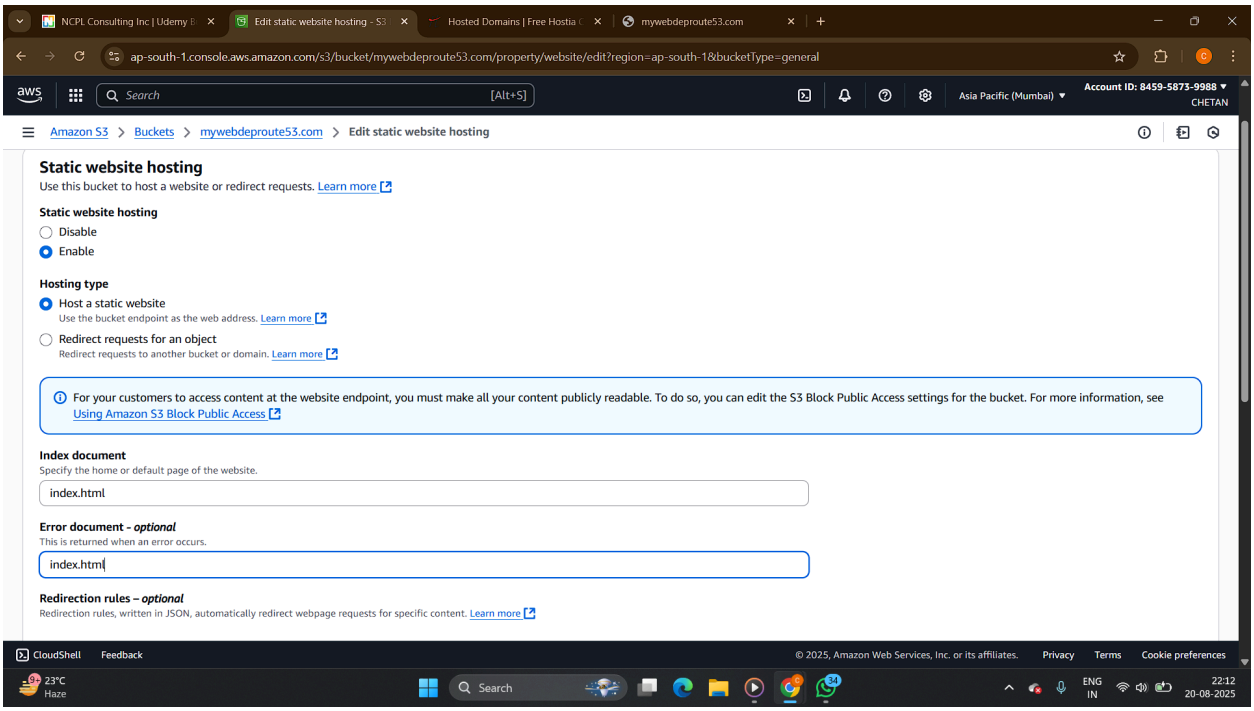
- In Route 53, update your A record alias to point to the CloudFront distribution domain name (e.g., `d12345.cloudfront.net`).

1. **Test Website**

- Wait for DNS propagation and CloudFront distribution deployment.
- Verify your website is available at `https://www.yourdomain.com`.






NCPL Consulting Inc | Udemy
Edit static website hosting - S3
Hosted Domains | Free Hostia
mywebdeproute53.com
ap-south-1.console.aws.amazon.com/s3/bucket/mywebdeproute53.com/property/website/edit?region=ap-south-1&bucketType=general
Search [Alt+S]
Asia Pacific (Mumbai)
Account ID: 8459-5873-9988
CHETAN
Amazon S3 > Buckets > mywebdeproute53.com > Edit static website hosting
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
This is returned when an error occurs.
index.html
Redirection rules – optional
Redirection rules, written in JSON, automatically redirect webpage requests for specific content. Learn more
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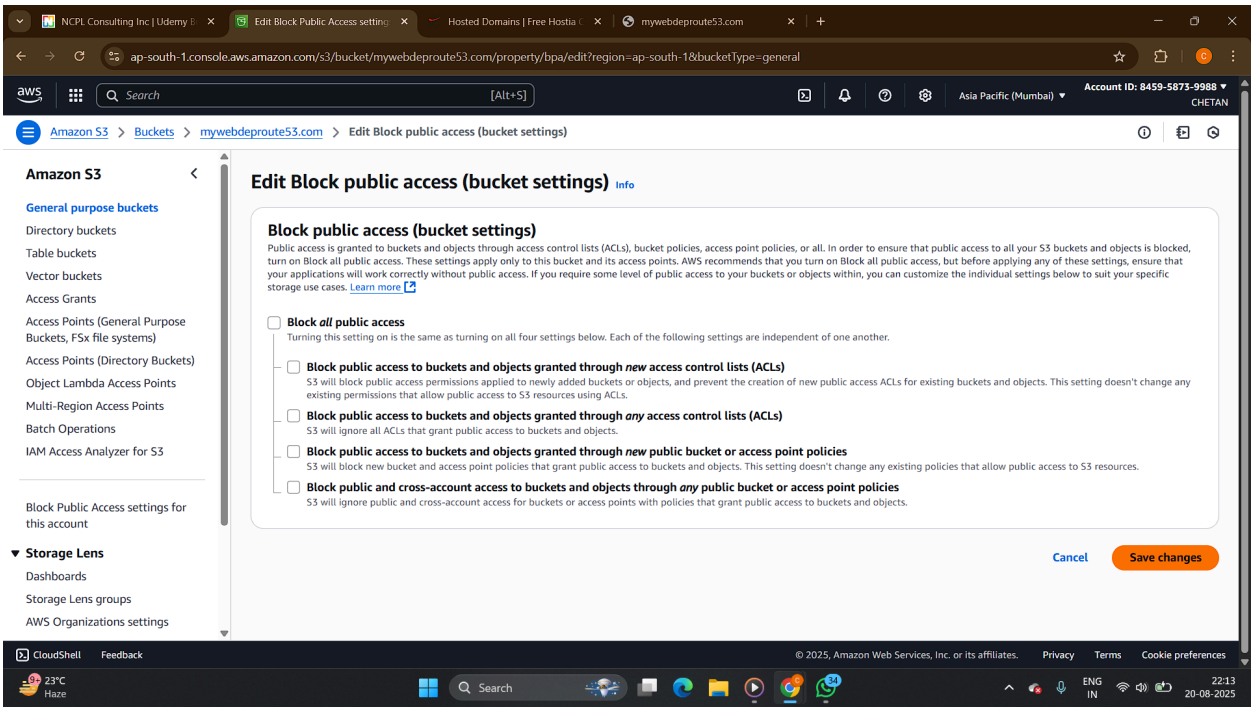
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Edit Block Public Access setting
Hosted Domains | Free Hostia
mywebdeproute53.com
ap-south-1.console.aws.amazon.com/s3/bucket/mywebdeproute53.com/property/bpa/edit?region=ap-south-1&bucketType=general
Search [Alt+S]
Asia Pacific (Mumbai)
Account ID: 8459-5873-9988
CHETAN
Amazon S3 > Buckets > mywebdeproute53.com > Edit Block public access (bucket settings)
Amazon S3
General purpose buckets
Directory buckets
Table buckets
Vector buckets
Access Grants
Access Points (General Purpose Buckets, FSx file systems)
Access Points (Directory Buckets)
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
Edit Block public access (bucket settings) Info
Block public access (bucket settings)
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
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.
Cancel
Save changes
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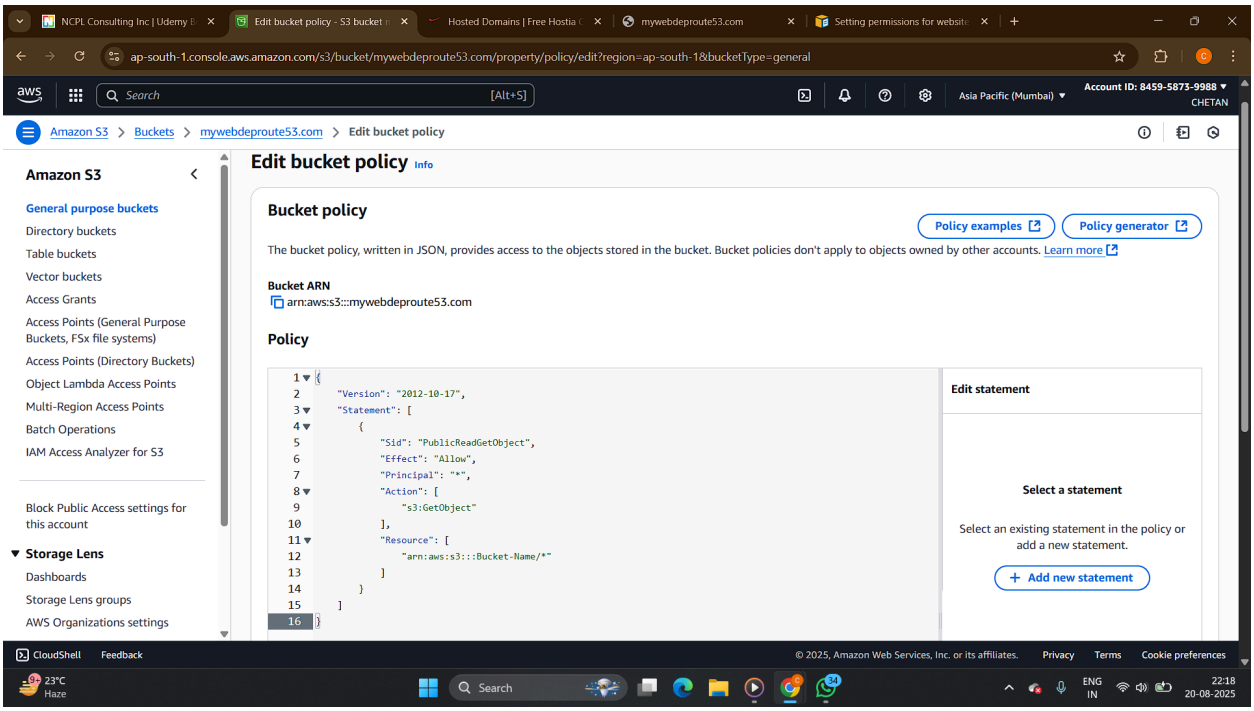
Edit bucket policy - S3 bucket
ap-south-1.console.aws.amazon.com/s3/bucket/mywebdeproute53.com/property/policy/edit?region=ap-south-1&bucketType=general
Search [Alt+S]
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Account ID: 8459-5873-9988
CHETAN
Amazon S3 > Buckets > mywebdeproute53.com > Edit bucket policy
Amazon S3
General purpose buckets
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AWS Organizations settings
Edit bucket policy Info
Bucket policy
Policy examples
Policy generator
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:::mywebdeproute53.com
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.
+ Add new statement
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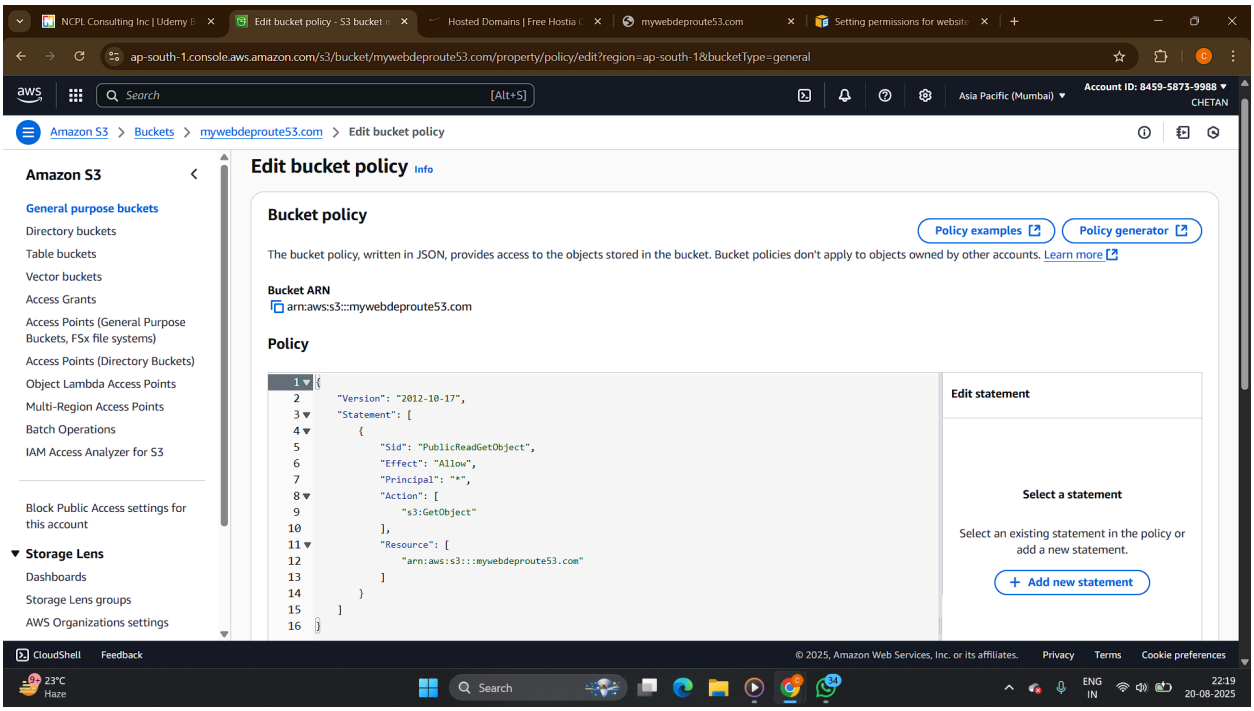
Edit bucket policy - S3 bucket
ap-south-1.console.aws.amazon.com/s3/bucket/mywebdeproute53.com/property/policy/edit?region=ap-south-1&bucketType=general
Search [Alt+S]
Asia Pacific (Mumbai)
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"Statement": [
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"Sid": "PublicReadGetObject",
"Effect": "Allow",
"Principal": "*",
"Action": [
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],
"Resource": [
"arn:aws:s3:::mywebdeproute53.com"
]
}
]
}
Edit statement
Select a statement
Select an existing statement in the policy or add a new statement.
+ Add new statement
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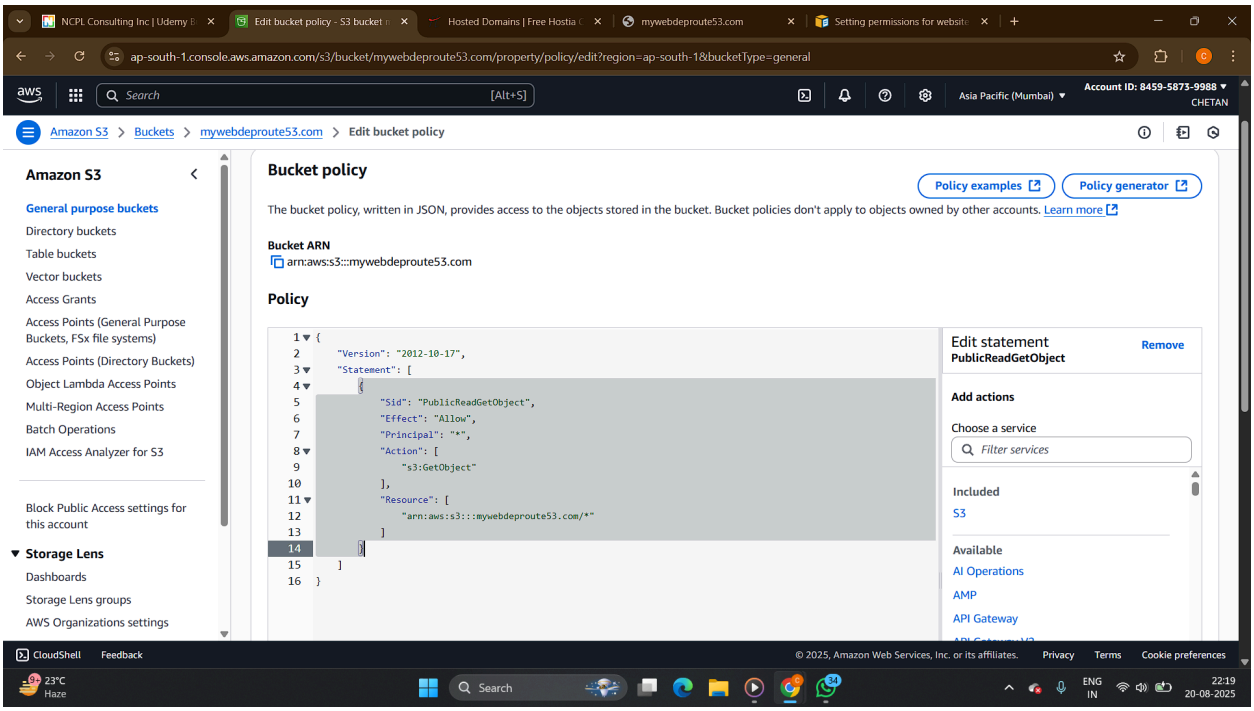
ap-south-1.console.aws.amazon.com/s3/bucket/mywebdeproute53.com/property/policy/edit?region=ap-south-1&bucketType=general
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"Effect": "Allow",
"Principal": "*",
"Action": [
"s3:GetObject"
],
"Resource": [
"arn:aws:s3:::mywebdeproute53.com/*"
]
}
]
}
Edit statement
PublicReadGetObject
Remove
Add actions
Choose a service
Filter services
Included
S3
Available
AI Operations
AMP
API Gateway
CloudShell
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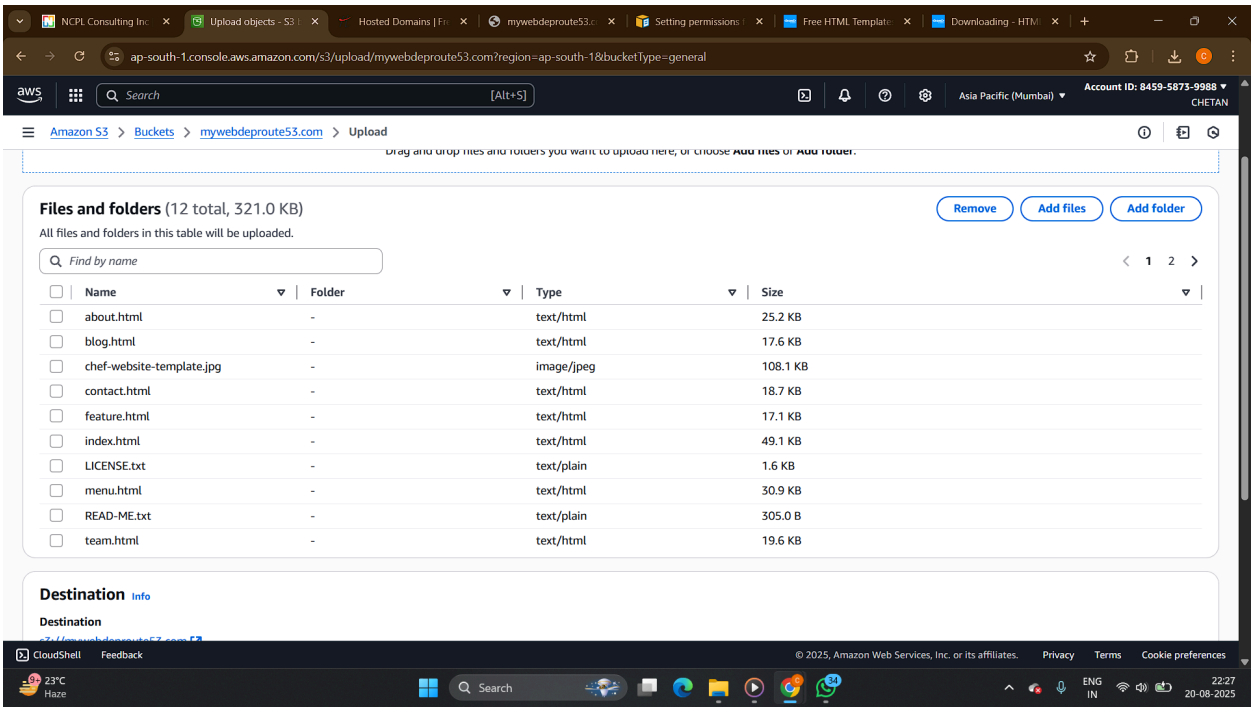
ap-south-1.console.aws.amazon.com/s3/upload/mywebdeproute53.com?region=ap-south-1&bucketType=general
Amazon S3 > Buckets > mywebdeproute53.com > Upload
Files and folders (12 total, 321.0 KB)
All files and folders in this table will be uploaded.
Remove
Add files
Add folder
Find by name
Name
Folder
Type
Size
about.html - text/html 25.2 KB
blog.html - text/html 17.6 KB
chef-website-template.jpg - image/jpeg 108.1 KB
contact.html - text/html 18.7 KB
feature.html - text/html 17.1 KB
index.html - text/html 49.1 KB
LICENSE.txt - text/plain 1.6 KB
menu.html - text/html 30.9 KB
READ-ME.txt - text/plain 305.0 B
team.html - text/html 19.6 KB
Destination Info
Destination
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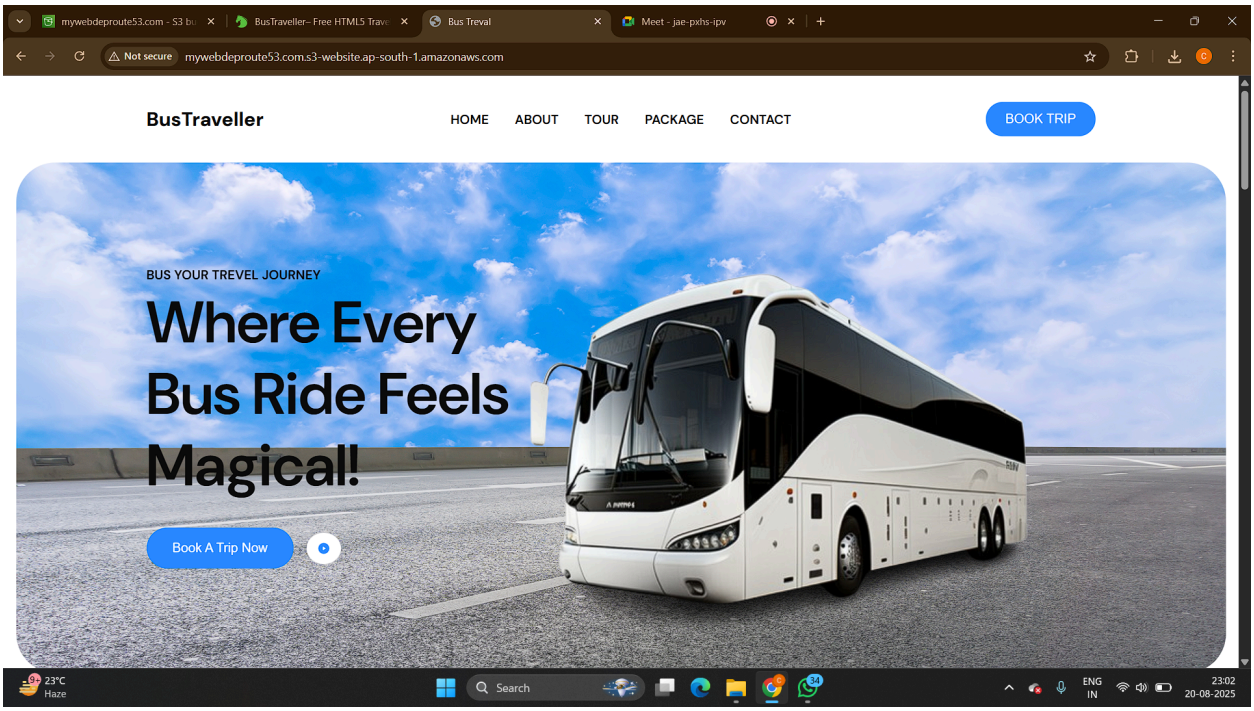
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HOME
ABOUT
TOUR
PACKAGE
CONTACT
BOOK TRIP
BUS YOUR TREVEL JOURNEY
Where Every Bus Ride Feels Magical!
Book A Trip Now
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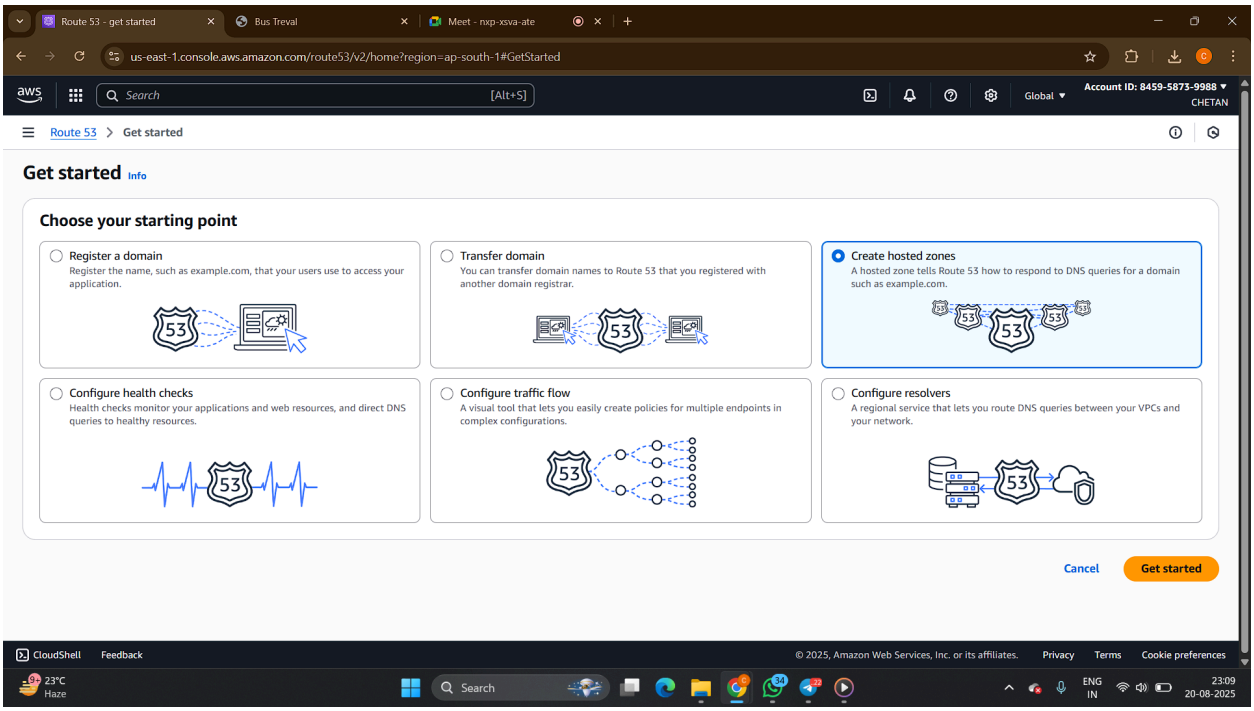
Route 53 - get started
Bus Treval
Meet - nxp-xsva-ate
us-east-1.console.aws.amazon.com/route53/v2/home?region=ap-south-1#GetStarted
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Global
Account ID: 8459-5873-9988
CHETAN
Route 53
Get started
Get started Info
Choose your starting point
Register a domain
Register the name, such as example.com, that your users use to access your application.
Transfer domain
You can transfer domain names to Route 53 that you registered with another domain registrar.
Create hosted zones
A hosted zone tells Route 53 how to respond to DNS queries for a domain such as example.com.
Configure health checks
Health checks monitor your applications and web resources, and direct DNS queries to healthy resources.
Configure traffic flow
A visual tool that lets you easily create policies for multiple endpoints in complex configurations.
Configure resolvers
A regional service that lets you route DNS queries between your VPCs and your network.
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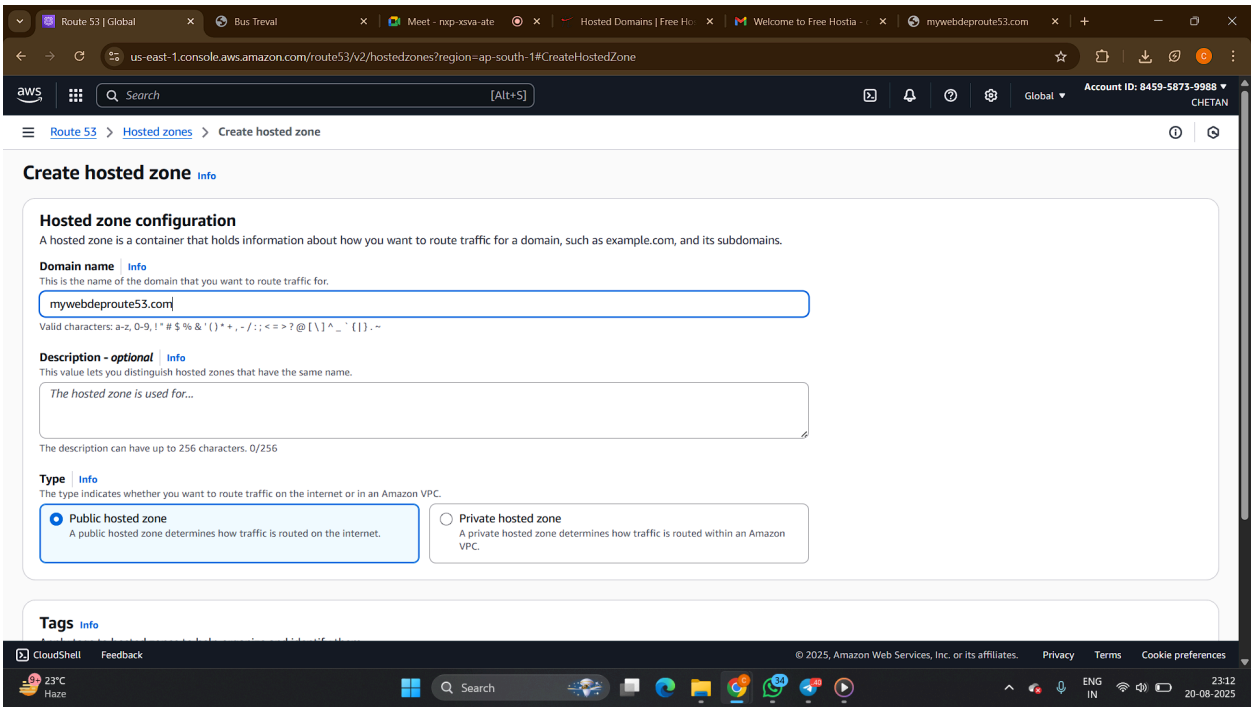
Route 53 | Global
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Meet - nxp-xsva-ate
Hosted Domains | Free Ho
Welcome to Free Hostia -
mywebdeproute53.com
us-east-1.console.aws.amazon.com/route53/v2/hostedzones?region=ap-south-1#CreateHostedZone
Search [Alt+S]
Global
Account ID: 8459-5873-9988
CHETAN
Route 53 > Hosted zones > Create hosted zone
Create hosted zone Info
Hosted zone configuration
A hosted zone is a container that holds information about how you want to route traffic for a domain, such as example.com, and its subdomains.
Domain name Info
This is the name of the domain that you want to route traffic for.
mywebdeproute53.com
Valid characters: a-z, 0-9, ! " # $ % & ' ( ) * + , - / : ; < = > ? @ [\ ] ^ _ ` { | } . ~
Description - optional Info
This value lets you distinguish hosted zones that have the same name.
The hosted zone is used for...
The description can have up to 256 characters. 0/256
Type Info
The type indicates whether you want to route traffic on the internet or in an Amazon VPC.
Public hosted zone
A public hosted zone determines how traffic is routed on the internet.
Private hosted zone
A private hosted zone determines how traffic is routed within an Amazon VPC.
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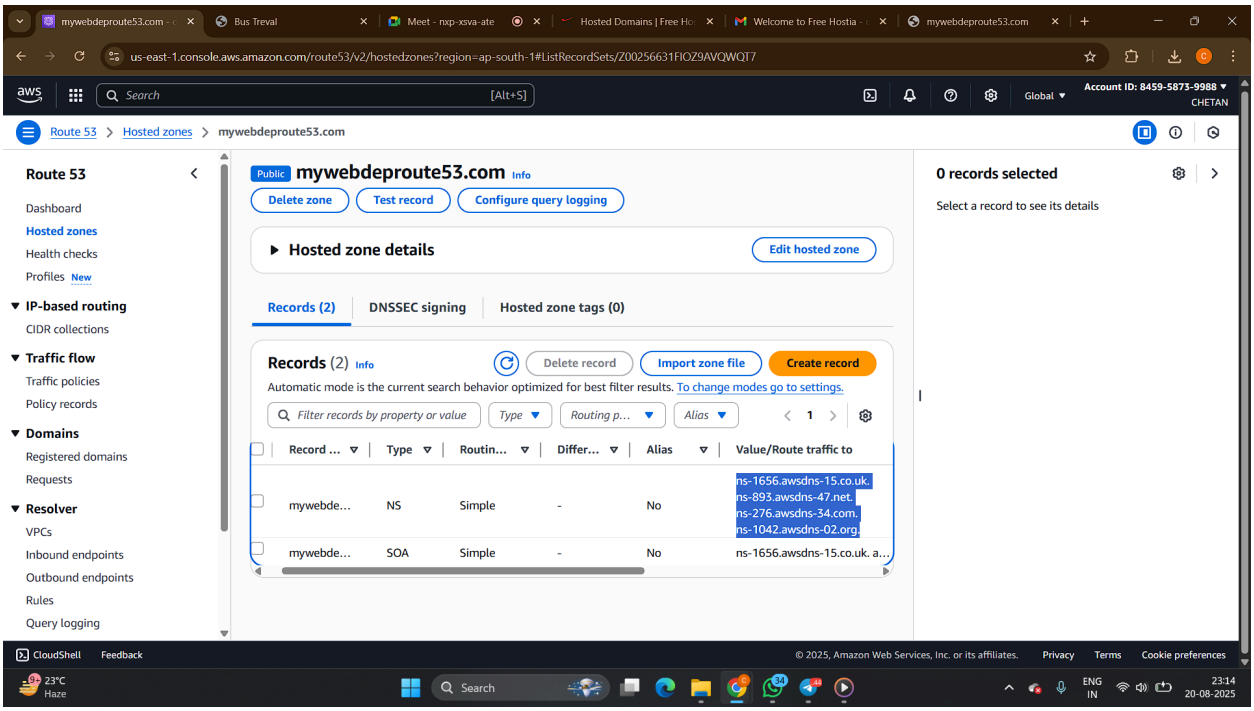
mywebdeproute53.com
Bus Treval
Meet - nxp-xsva-ate
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Welcome to Free Hostia -
mywebdeproute53.com
us-east-1.console.aws.amazon.com/route53/v2/hostedzones?region=ap-south-1#ListRecordSets/Z00256631FIOZ9AVQWQT7
Search [Alt+S]
Global
Account ID: 8459-5873-9988
CHETAN
Route 53 > Hosted zones > mywebdeproute53.com
Route 53
Dashboard
Hosted zones
Health checks
Profiles New
IP-based routing
CIDR collections
Traffic flow
Traffic policies
Policy records
Domains
Registered domains
Requests
Resolver
VPCs
Inbound endpoints
Outbound endpoints
Rules
Query logging
Public mywebdeproute53.com Info
Delete zone
Test record
Configure query logging
Hosted zone details
Edit hosted zone
Records (2)
DNSSEC signing
Hosted zone tags (0)
Records (2) Info
Delete record
Import zone file
Create record
Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings.
Filter records by property or value
Type
Routing p...
Alias
1
Record ...
Type
Routin...
Differ...
Alias
Value/Route traffic to
mywebde...
NS
Simple
-
No
ns-1656.awsdns-15.co.uk.
ns-893.awsdns-47.net.
ns-276.awsdns-34.com.
ns-1042.awsdns-02.org.
mywebde...
SOA
Simple
-
No
ns-1656.awsdns-15.co.uk. a...
0 records selected
Select a record to see its details
CloudShell
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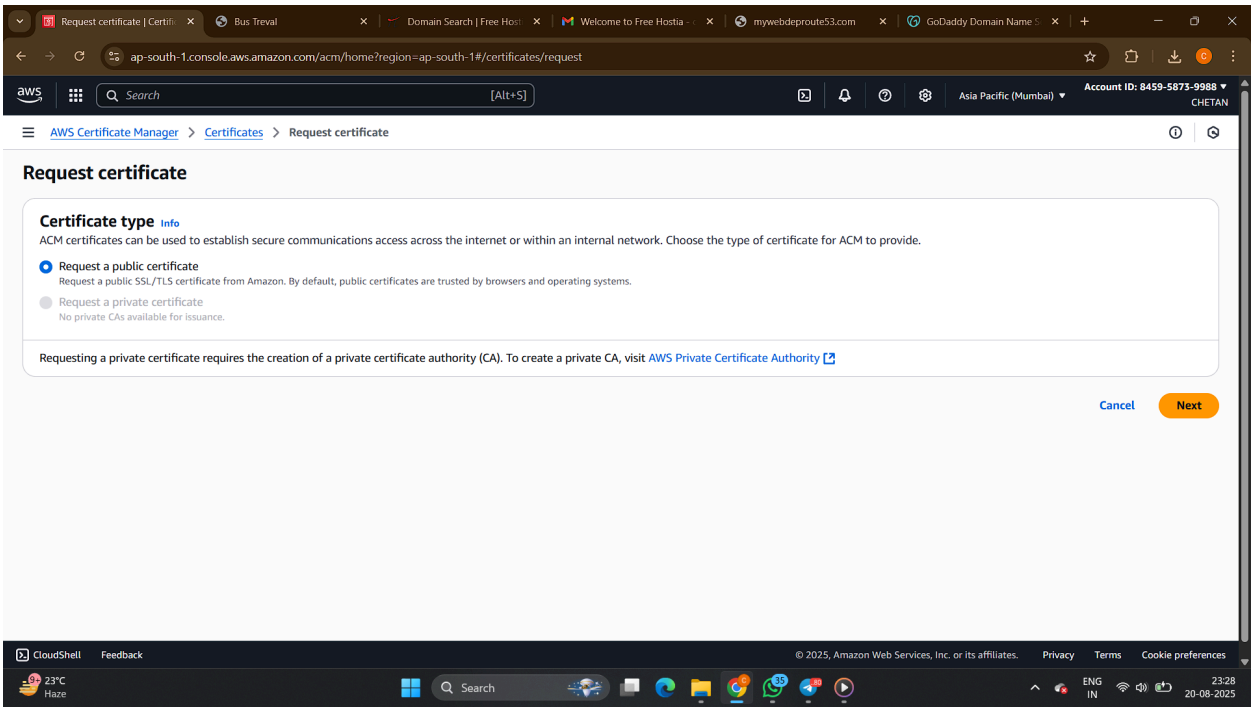
Request certificate | Certifi
Bus Treval
Domain Search | Free Host
Welcome to Free Hostia - c
mywebdeproute53.com
GoDaddy Domain Name S
ap-south-1.console.aws.amazon.com/acm/home?region=ap-south-1#/certificates/request
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Asia Pacific (Mumbai)
Account ID: 8459-5873-9988
CHETAN
AWS Certificate Manager
Certificates
Request certificate
Request certificate
Certificate type Info
ACM certificates can be used to establish secure communications access across the internet or within an internal network. Choose the type of certificate for ACM to provide.
Request a public certificate
Request a public SSL/TLS certificate from Amazon. By default, public certificates are trusted by browsers and operating systems.
Request a private certificate
No private CAs available for issuance.
Requesting a private certificate requires the creation of a private certificate authority (CA). To create a private CA, visit AWS Private Certificate Authority
Cancel
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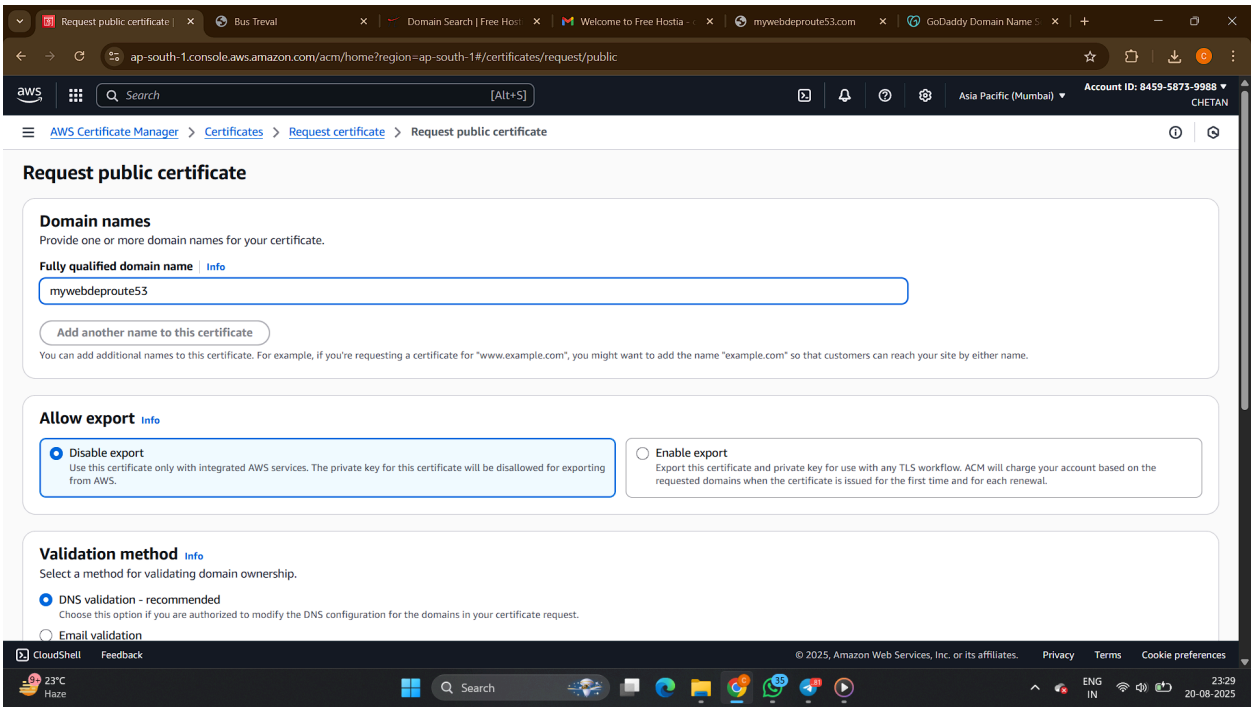
Request public certificate |
Bus Treval
Domain Search | Free Host
Welcome to Free Hostia - c
mywebdeproute53.com
GoDaddy Domain Name S
ap-south-1.console.aws.amazon.com/acm/home?region=ap-south-1#/certificates/request/public
Search
[Alt+S]
Asia Pacific (Mumbai)
Account ID: 8459-5873-9988
CHETAN
AWS Certificate Manager
Certificates
Request certificate
Request public certificate
Request public certificate
Domain names
Provide one or more domain names for your certificate.
Fully qualified domain name Info
mywebdeproute53
Add another name to this certificate
You can add additional names to this certificate. For example, if you're requesting a certificate for "www.example.com", you might want to add the name "example.com" so that customers can reach your site by either name.
Allow export Info
Disable export
Use this certificate only with integrated AWS services. The private key for this certificate will be disallowed for exporting from AWS.
Enable export
Export this certificate and private key for use with any TLS workflow. ACM will charge your account based on the requested domains when the certificate is issued for the first time and for each renewal.
Validation method Info
Select a method for validating domain ownership.
DNS validation - recommended
Choose this option if you are authorized to modify the DNS configuration for the domains in your certificate request.
Email validation
CloudShell
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23°C
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23:29
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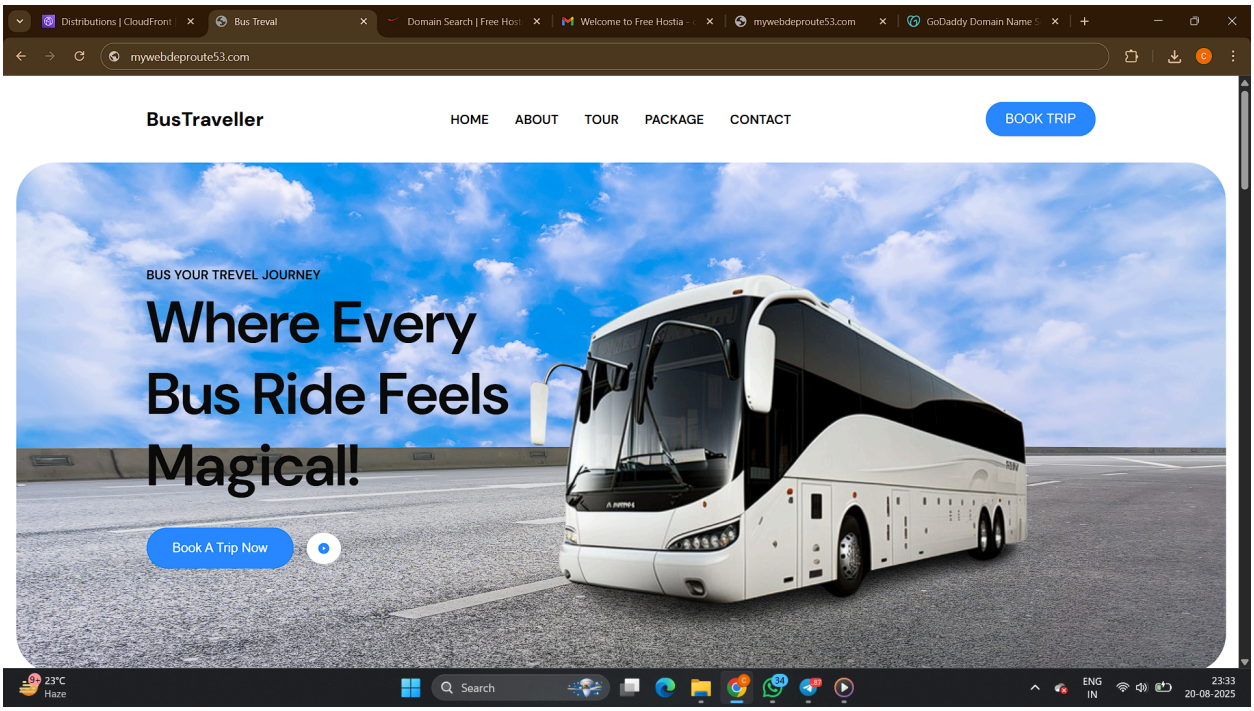
mywebdeproute53.com
BusTraveller
HOME
ABOUT
TOUR
PACKAGE
CONTACT
BOOK TRIP
BUS YOUR TREVEL JOURNEY
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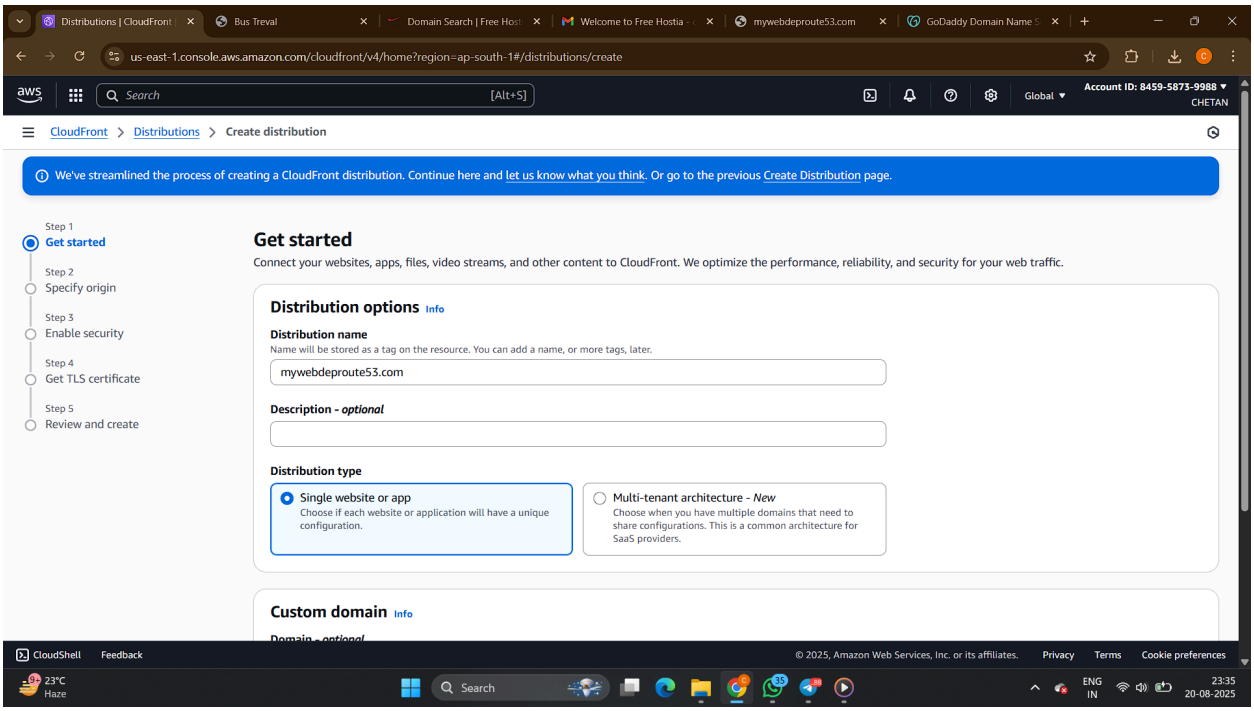
us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=ap-south-1#/distributions/create
CloudFront > Distributions > Create distribution
We've streamlined the process of creating a CloudFront distribution. Continue here and let us know what you think. Or go to the previous Create Distribution page.
Step 1 Get started
Step 2 Specify origin
Step 3 Enable security
Step 4 Get TLS certificate
Step 5 Review and create
Get started
Connect your websites, apps, files, video streams, and other content to CloudFront. We optimize the performance, reliability, and security for your web traffic.
Distribution options Info
Distribution name
Name will be stored as a tag on the resource. You can add a name, or more tags, later.
mywebdeproute53.com
Description - optional
Distribution type
Single website or app
Choose if each website or application will have a unique configuration.
Multi-tenant architecture - New
Choose when you have multiple domains that need to share configurations. This is a common architecture for SaaS providers.
Custom domain Info
CloudShell
Feedback
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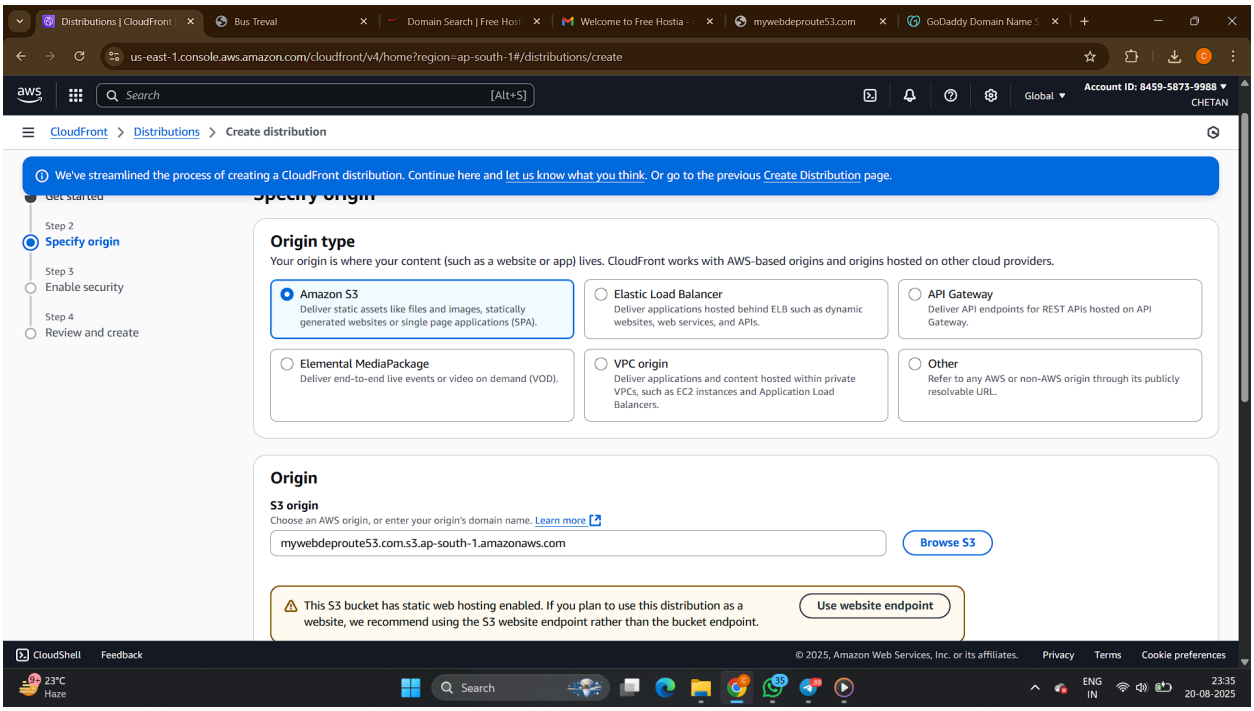
Distributions | CloudFront
Bus Treval
Domain Search | Free Host
Welcome to Free Hostia -
mywebdeproute53.com
GoDaddy Domain Name
us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=ap-south-1#/distributions/create
Search [Alt+S]
Global
Account ID: 8459-5873-9988
CHETAN
CloudFront > Distributions > Create distribution
We've streamlined the process of creating a CloudFront distribution. Continue here and let us know what you think. Or go to the previous Create Distribution page.
Step 2
Specify origin
Step 3
Enable security
Step 4
Review and create
Origin type
Your origin is where your content (such as a website or app) lives. CloudFront works with AWS-based origins and origins hosted on other cloud providers.
Amazon S3
Deliver static assets like files and images, statically generated websites or single page applications (SPA).
Elastic Load Balancer
Deliver applications hosted behind ELB such as dynamic websites, web services, and APIs.
API Gateway
Deliver API endpoints for REST APIs hosted on API Gateway.
Elemental MediaPackage
Deliver end-to-end live events or video on demand (VOD).
VPC origin
Deliver applications and content hosted within private VPCs, such as EC2 instances and Application Load Balancers.
Other
Refer to any AWS or non-AWS origin through its publicly resolvable URL.
Origin
S3 origin
Choose an AWS origin, or enter your origin's domain name. Learn more
mywebdeproute53.com.s3.ap-south-1.amazonaws.com
Browse S3
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.
Use website endpoint
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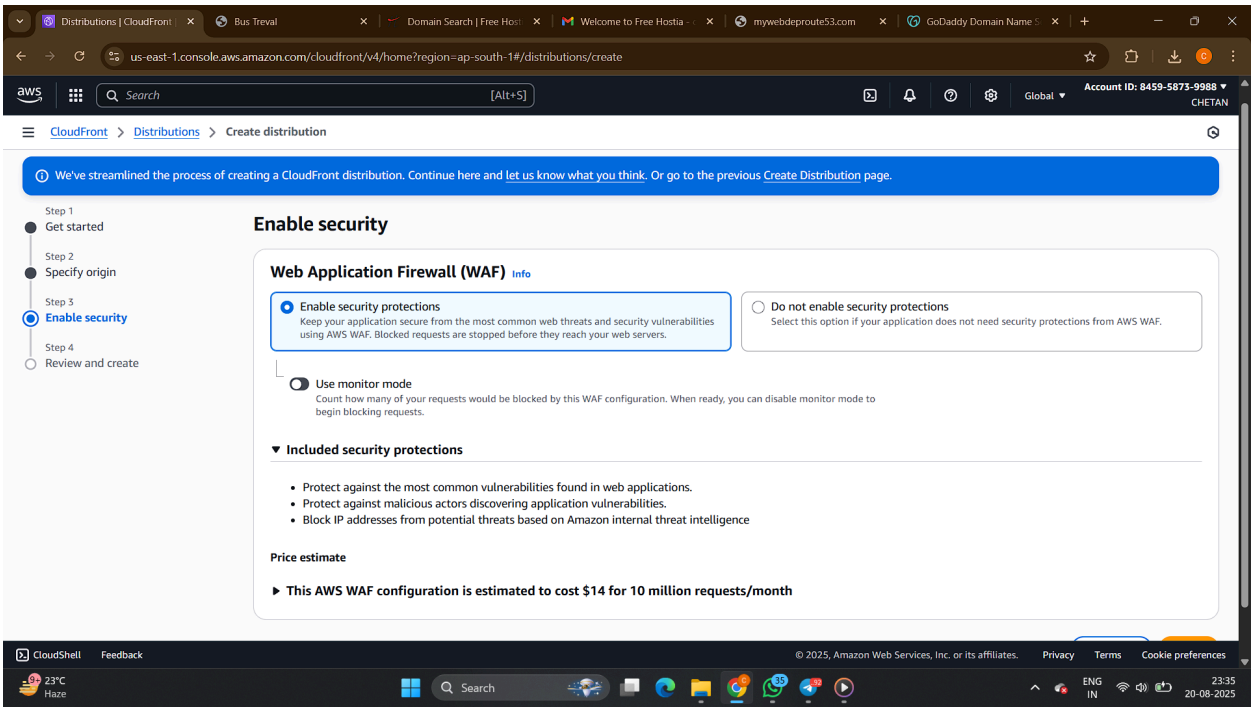
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Step 1
Get started
Step 2
Specify origin
Step 3
Enable security
Step 4
Review and create
Enable security
Web Application Firewall (WAF) Info
Enable security protections
Keep your application secure from the most common web threats and security vulnerabilities using AWS WAF. Blocked requests are stopped before they reach your web servers.
Do not enable security protections
Select this option if your application does not need security protections from AWS WAF.
Use monitor mode
Count how many of your requests would be blocked by this WAF configuration. When ready, you can disable monitor mode to begin blocking requests.
Included security protections
Protect against the most common vulnerabilities found in web applications.
Protect against malicious actors discovering application vulnerabilities.
Block IP addresses from potential threats based on Amazon internal threat intelligence
Price estimate
This AWS WAF configuration is estimated to cost $14 for 10 million requests/month
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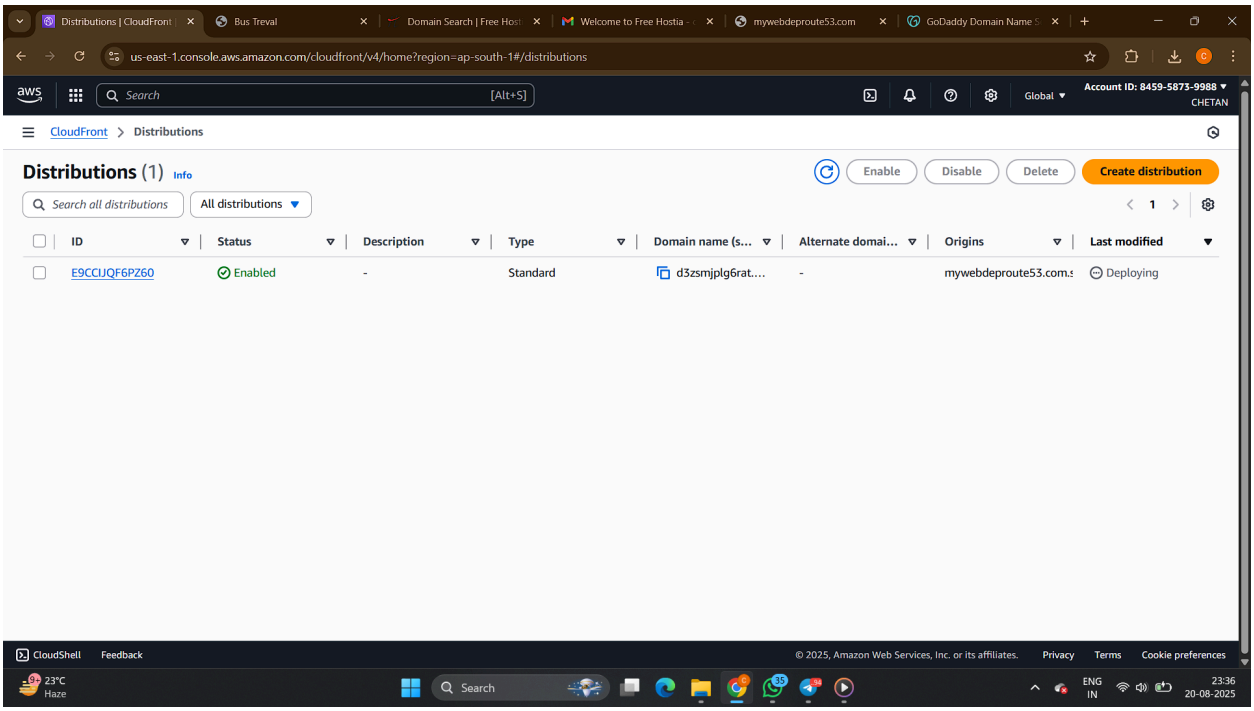
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us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=ap-south-1#/distributions
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Account ID: 8459-5873-9988
CHETAN
CloudFront > Distributions
Distributions (1) Info
Enable
Disable
Delete
Create distribution
Search all distributions
All distributions
ID
Status
Description
Type
Domain name (s...
Alternate domai...
Origins
Last modified
E9CCIJQF6PZ60
Enabled
-
Standard
d3zsmjplg6rat....
-
mywebdeproute53.com.s
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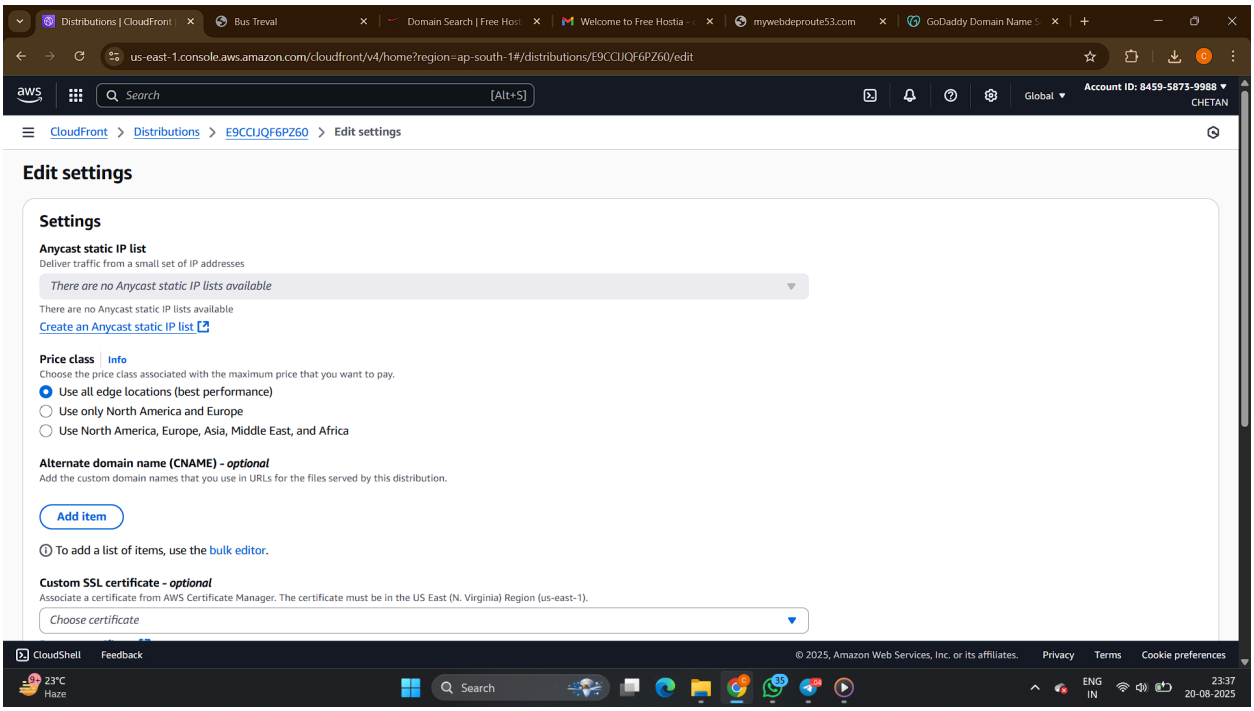
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us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=ap-south-1#/distributions/E9CCIJQF6PZ60/edit
Search [Alt+S]
Global
Account ID: 8459-5873-9988
CHETAN
CloudFront > Distributions > E9CCIJQF6PZ60 > Edit settings
Edit settings
Settings
Anycast static IP list
Deliver traffic from a small set of IP addresses
There are no Anycast static IP lists available
There are no Anycast static IP lists available
Create an Anycast static IP list
Price class Info
Choose the price class associated with the maximum price that you want to pay.
Use all edge locations (best performance)
Use only North America and Europe
Use North America, Europe, Asia, Middle East, and Africa
Alternate domain name (CNAME) - optional
Add the custom domain names that you use in URLs for the files served by this distribution.
Add item
To add a list of items, use the bulk editor.
Custom SSL certificate - optional
Associate a certificate from AWS Certificate Manager. The certificate must be in the US East (N. Virginia) Region (us-east-1).
Choose certificate
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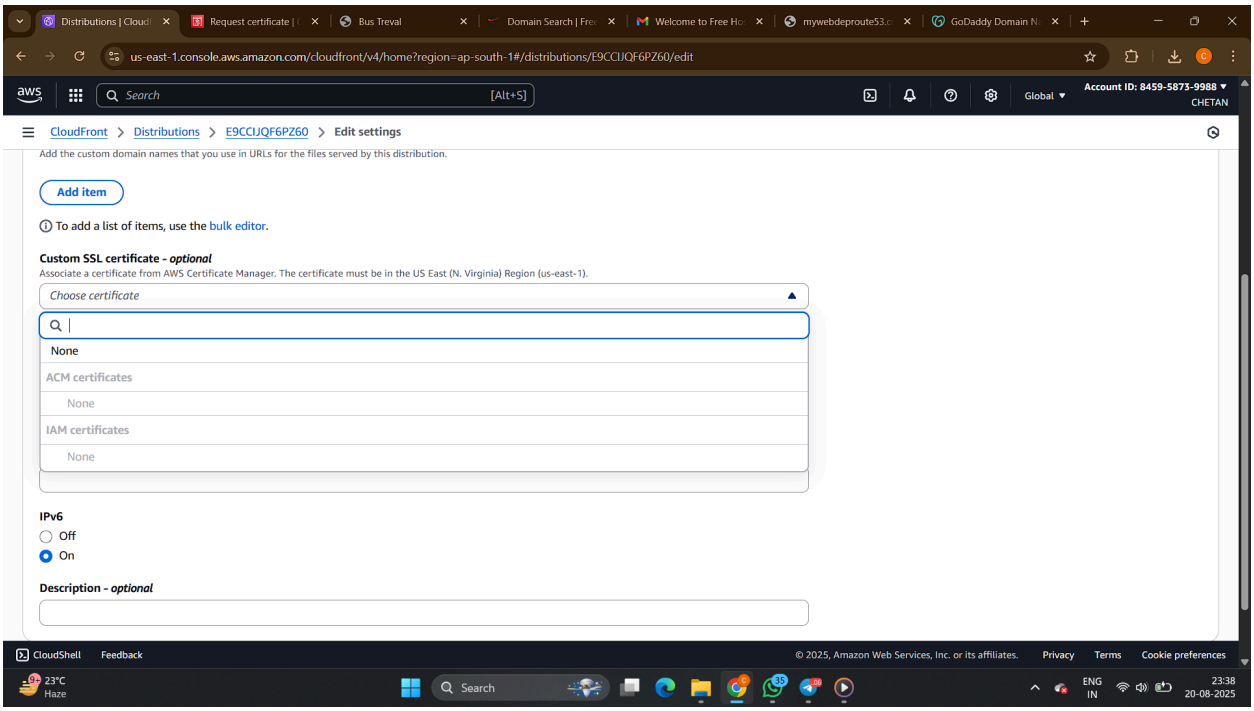

Concept Reinforcement

Task 2.1: Understand DNS Propagation

- DNS changes (like updating nameservers or modifying records) take time to propagate globally.
- Use tools like DNS Checker to see the current status.
- Expect delays from a few minutes to 24-48 hours.

Task 2.2: Break and Fix Permissions

1. **Access S3 Endpoint Directly**
    - Before applying restrictions, try accessing the website directly via the S3 endpoint. It should load fine.
2. **Restrict S3 Access to CloudFront Only**
    - Create a **CloudFront Origin Access Identity (OAI)** or use a **CloudFront Origin Access Control (OAC)**.

- Update your S3 bucket policy to allow only the CloudFront distribution to access it.
- This ensures users cannot bypass CloudFront and directly hit the S3 endpoint.

Example Policy Snippet:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::cloudfront:user/CloudFront Origin Access Identity YOUR-OAI-ID"
      },
      "Action": "s3:GetObject",
      "Resource": "arn:aws:s3:::www.yourdomain.com/*"
    }
  ]
}
```

3. **Test Again**
   - Now the direct S3 URL should be blocked.
   - But `https://www.yourdomain.com` (via CloudFront) should still work.

Task 2.3: Test CDN Performance

1. Upload a large image or file to your S3 bucket and link it in your website.
2. Run tests using Pingdom or GTmetrix.
3. Run tests from multiple regions.
4. Observe that CloudFront serves content from the nearest **edge location**, reducing latency and improving performance.

Advanced Exploration

Task 3.1: Blue/Green Style Deployment with Route 53

1. Create two S3 buckets:
   - `blue-website.yourdomain.com` (upload blue-themed page).
   - `green-website.yourdomain.com` (upload green-themed page).
2. Enable static hosting for both buckets.
3. In Route 53, create a subdomain record: `test.yourdomain.com`.
4. Add two records with **Weighted Routing Policy**:
   - One points to `blue-website` (weight 90).
   - One points to `green-website` (weight 10).
5. Access `http://test.yourdomain.com`.
   - Most requests (90%) will go to blue version.
   - Some requests (10%) will go to green version.
   - This simulates a canary release or blue/green deployment.

Task 3.2: Automate with AWS CLI

- Write a **Bash script** using AWS CLI to automate:
  1. Create S3 bucket.
  2. Configure static website hosting.
  3. Sync local website files (`aws s3 sync ./website s3://www.yourdomain.com`).
  4. Create Route 53 records (`aws route53 change-resource-record-sets`).
  5. Optionally create CloudFront distribution and link with Route 53.