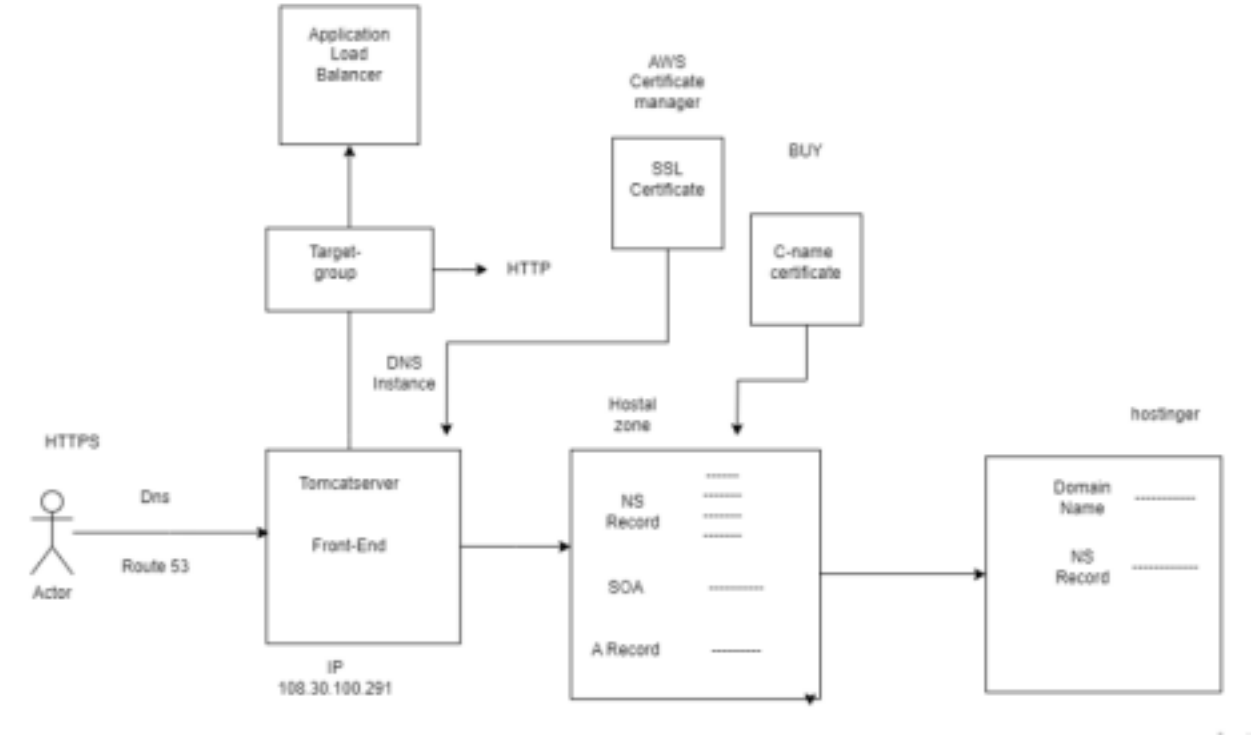
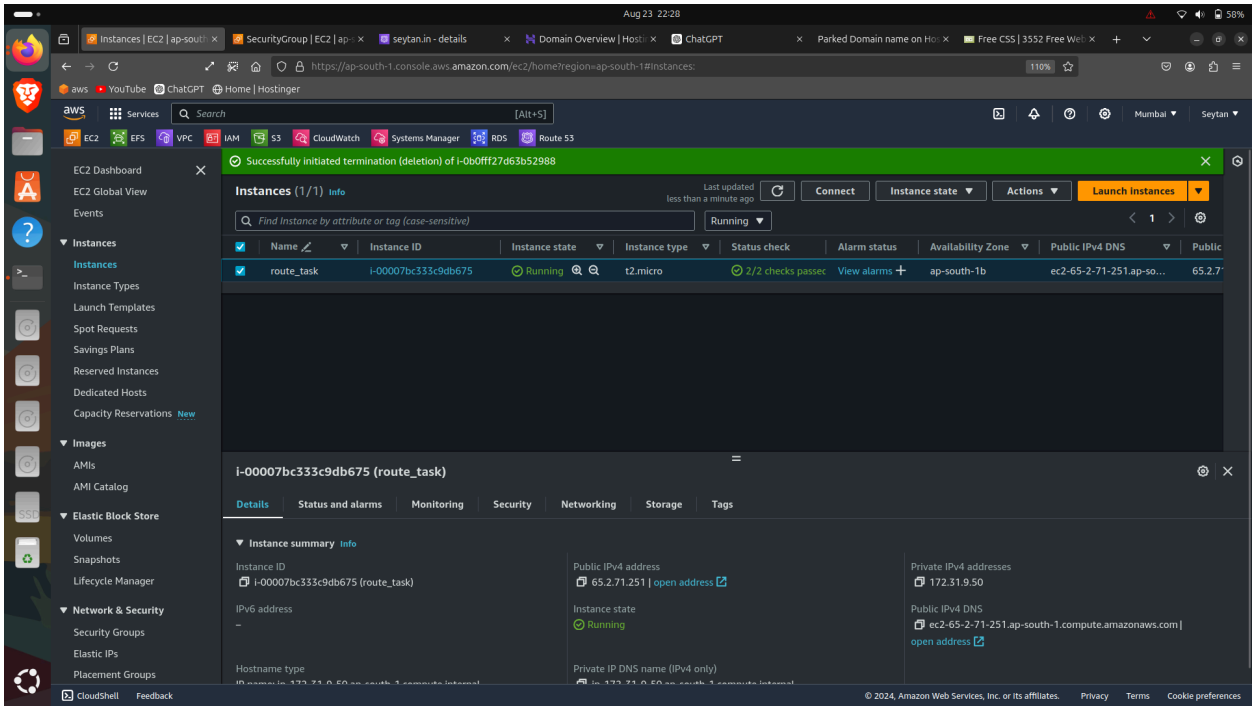
Task : Create Hosted Zone in Route53 ,bind ip with 3rd party Domain provider and make website ssl certified using ACM and Application Load Balancer in AWS.

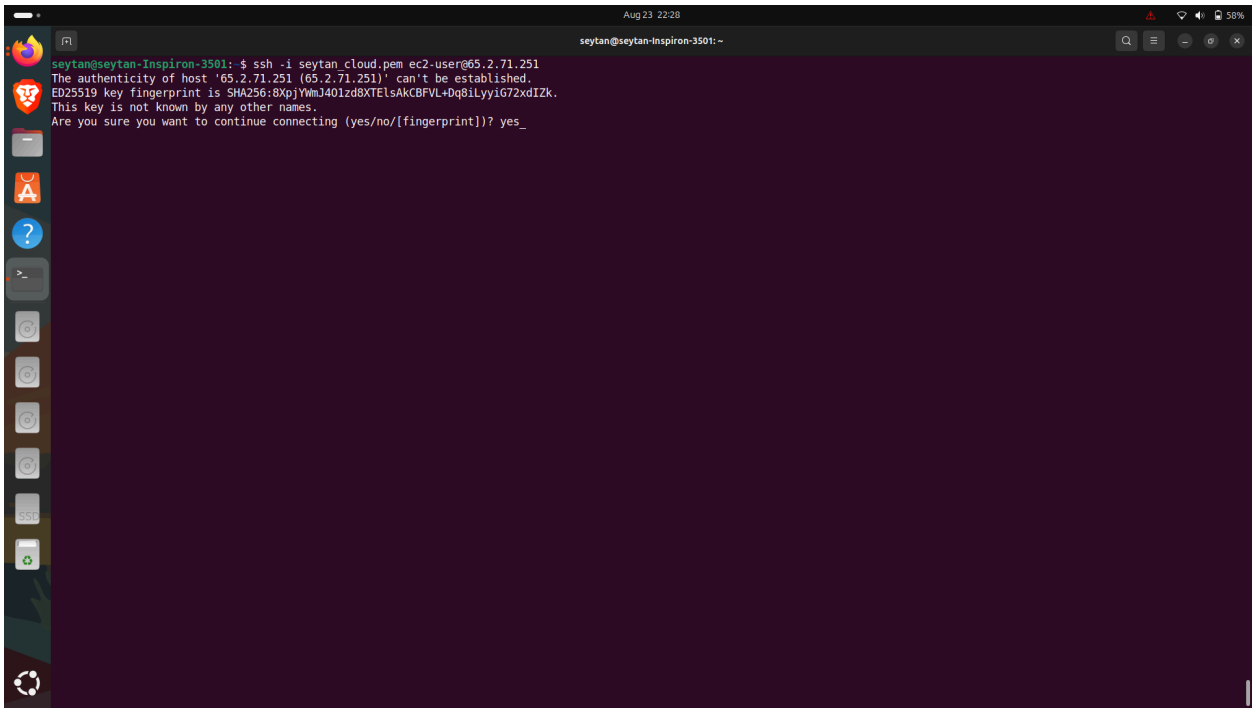
Diagramatic Representation:



Step 1: Create an EC2 instance and connect to it using -> Ssh -i private_rsa_key ec2-user@public_ip

What is an ec2 instance ? → An EC2 instance is a virtual server provided by Amazon Web Services (AWS) that allows users to run applications on the cloud with scalable computing resources. It can be configured with various operating systems, storage options, and network settings to meet specific needs.





Step 2: Now Install the httpd server in our ec2 instance

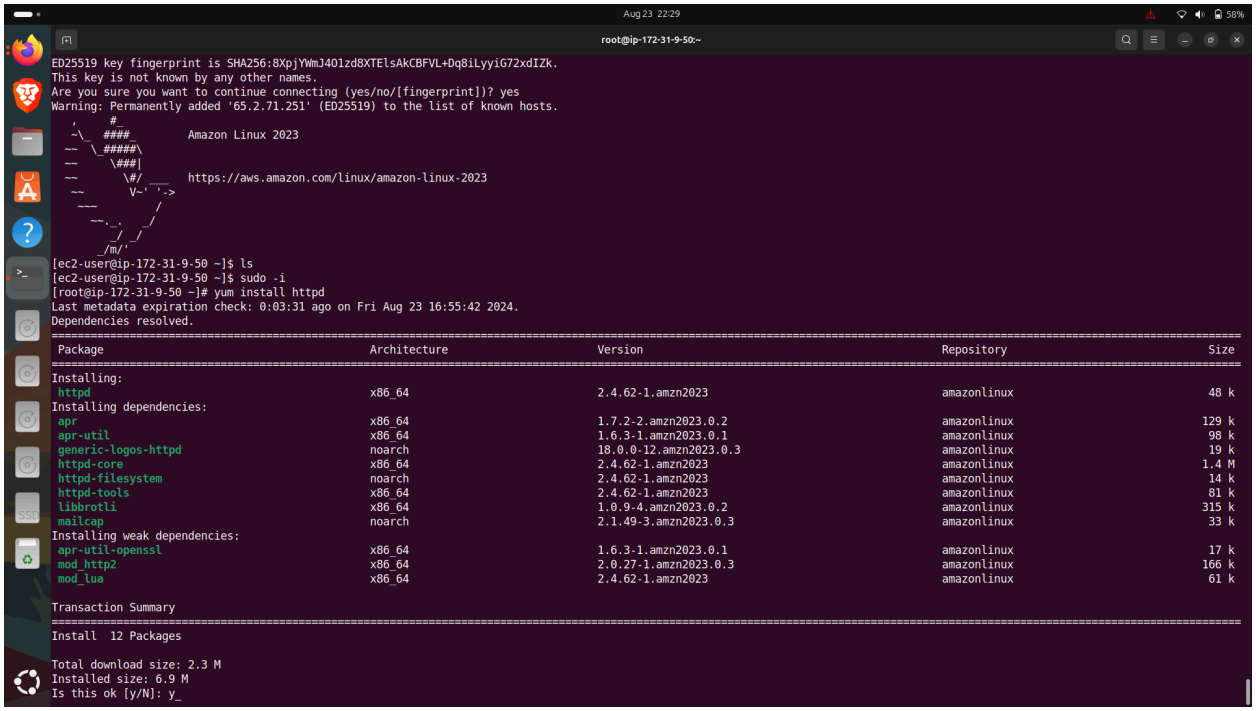
Sudo -i

Yum install httpd -y

What is httpd ?

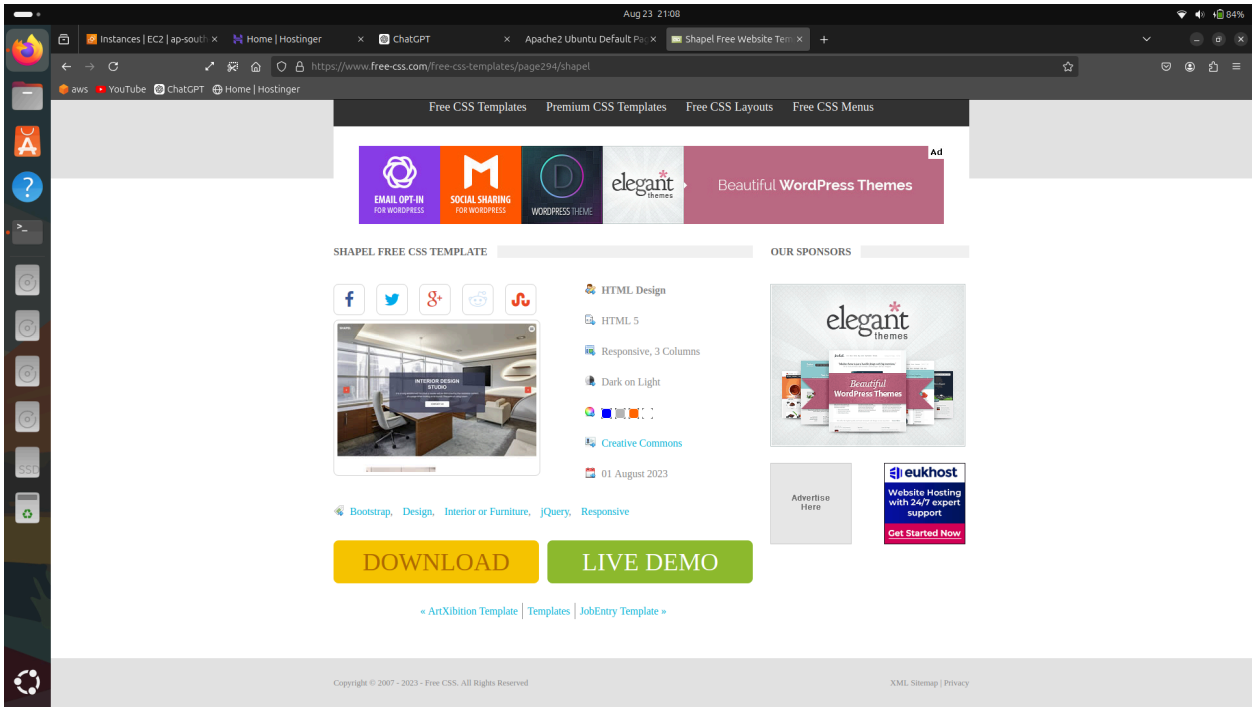
→`httpd` is the Apache HTTP Server, an open-source web server software used to serve web pages and applications over the internet. It handles requests from clients (like browsers) and delivers the requested content, often running on Linux-based systems.

Home directory of httpd is -> /var/www/html/



Step 3:Now install any free css template to host webpage

Sudo wget url_of_webpage_codes



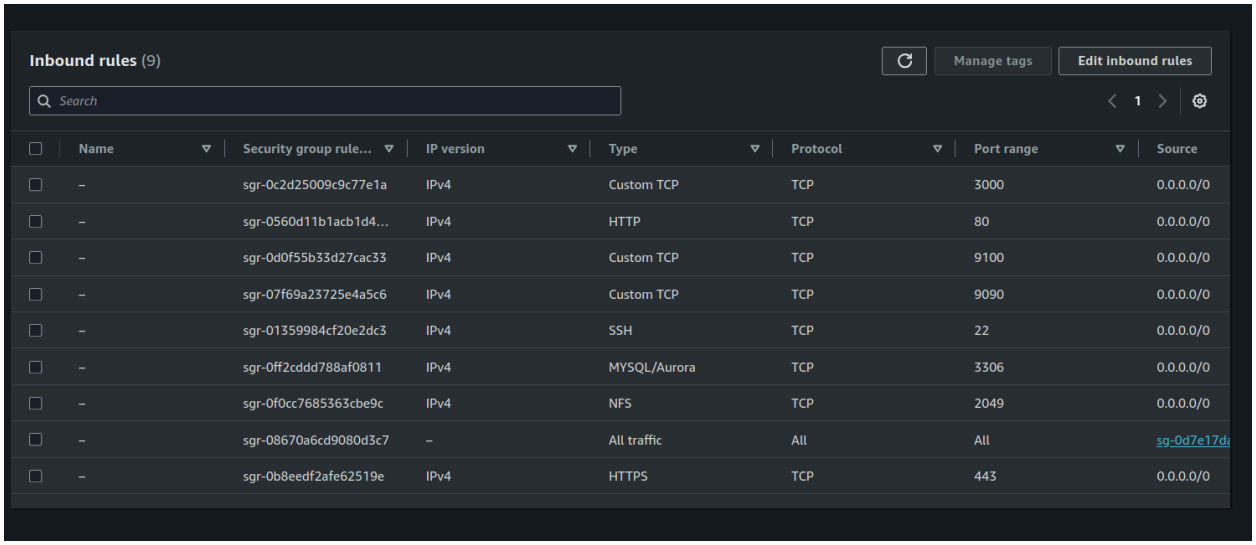
Extract this file and then copy the sub-files and sub-folder to the home directory of httpd

```
ubuntu@ip-172-31-33-39:/var/www/html$ sudo wget https://www.free-css.com/assets/files/free-css-templates/download/page294/shapel.zip
--2024-08-23 15:39:40--  https://www.free-css.com/assets/files/free-css-templates/download/page294/shapel.zip
Resolving www.free-css.com (www.free-css.com)... 217.160.0.242, 2001:8d8:100f:f000::28f
Connecting to www.free-css.com (www.free-css.com)|217.160.0.242|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1390016 (1.3M) [application/zip]
Saving to: ‘shapel.zip’

shapel.zip                          100%[=======================================================================================>]   1.33M  1.53MB/s    in 0.9s

2024-08-23 15:39:42 (1.53 MB/s) - ‘shapel.zip’ saved [1390016/1390016]
```

Step 4: Whitelist the port number 80 and 443 in security group of ec2 instance .



Inbound rules (9)

Manage tags | Edit inbound rules

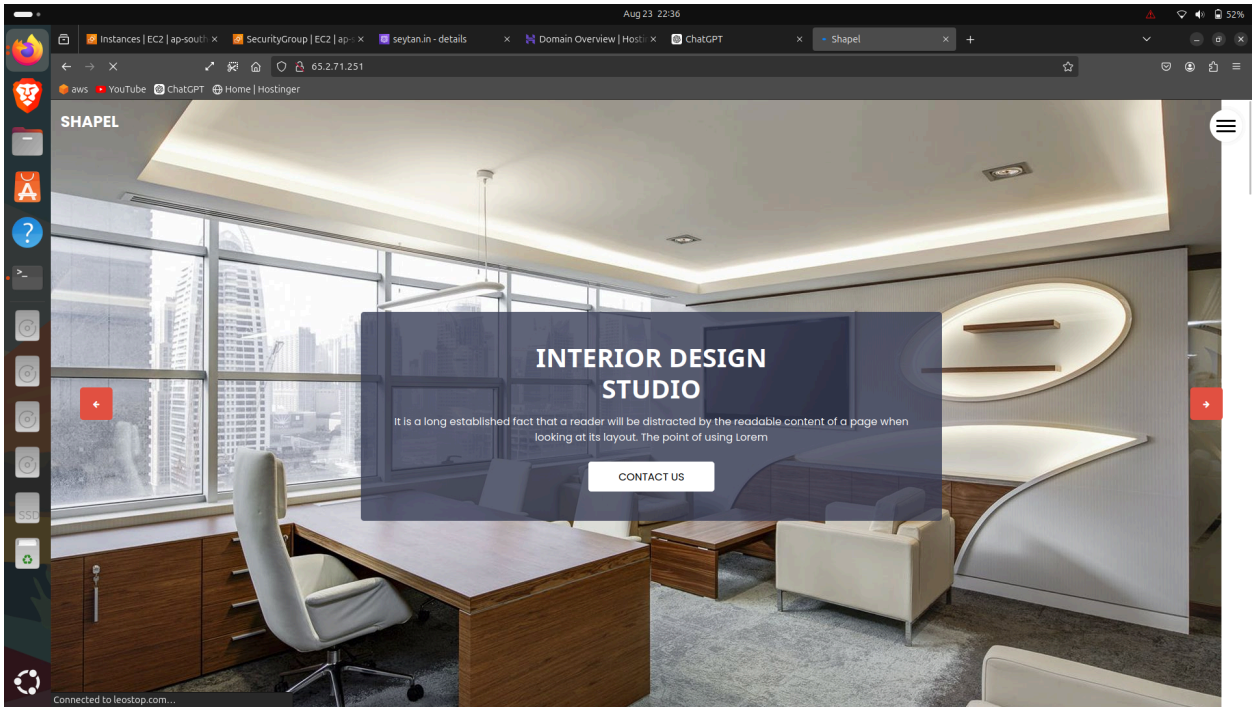
Search

1

Name	Security group rule...	IP version	Type	Protocol	Port range	Source
–	sgr-0c2d25009c9c77e1a	IPv4	Custom TCP	TCP	3000	0.0.0.0/0
–	sgr-0560d11b1acb1d4...	IPv4	HTTP	TCP	80	0.0.0.0/0
–	sgr-0d0f55b33d27cac33	IPv4	Custom TCP	TCP	9100	0.0.0.0/0
–	sgr-07f69a23725e4a5c6	IPv4	Custom TCP	TCP	9090	0.0.0.0/0
–	sgr-01359984cf20e2dc3	IPv4	SSH	TCP	22	0.0.0.0/0
–	sgr-0ff2cddd788af0811	IPv4	MYSQL/Aurora	TCP	3306	0.0.0.0/0
–	sgr-0f0cc7685363cbe9c	IPv4	NFS	TCP	2049	0.0.0.0/0
–	sgr-08670a6cd9080d3c7	–	All traffic	All	All	sg-0d7e17d
–	sgr-0b8eedf2afe62519e	IPv4	HTTPS	TCP	443	0.0.0.0/0

Now paste Public ip in the web browser to see your website working or not.

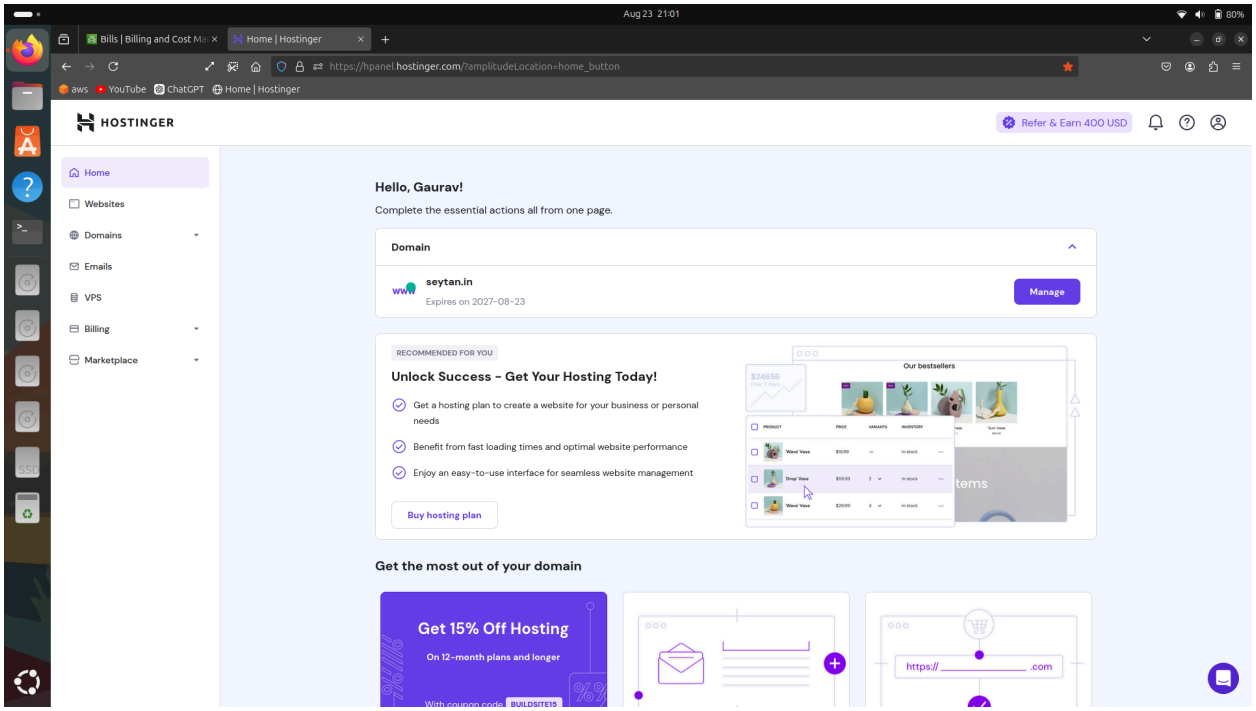
Output:



Step 5: Purchase a domain from 3rd party vendor.

Here we will use hostinger as a 3rd party domain provider and we will use seytan.in domain.

What is Domain ?
–> A domain is a human-readable address used to access websites on the internet, such as "example.com." It serves as a user-friendly way to identify and reach specific IP addresses, which are the underlying numerical addresses of servers hosting the website.

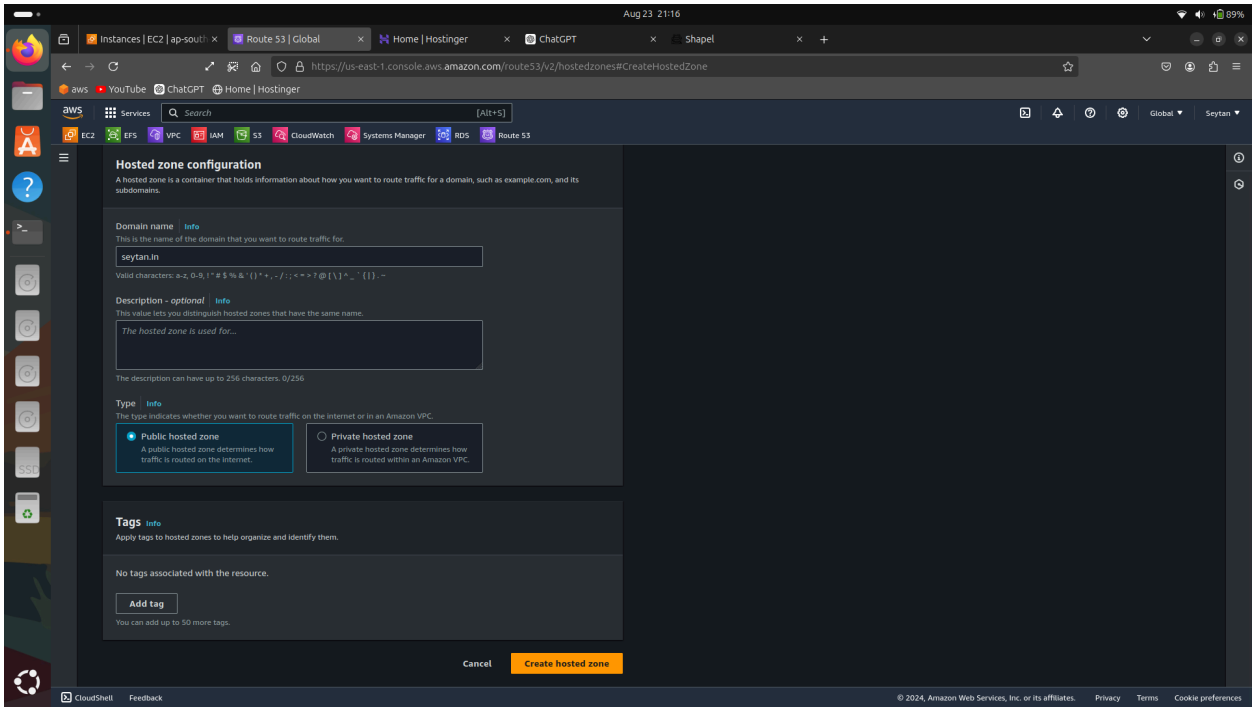


<u>Step 6:</u> Now Create Hosted Zone in Route53 to bind our domain with our public ip .

What is Route53 ?
→Amazon Route 53 is a scalable DNS (Domain Name System) web service by AWS that routes end-user requests to internet applications.

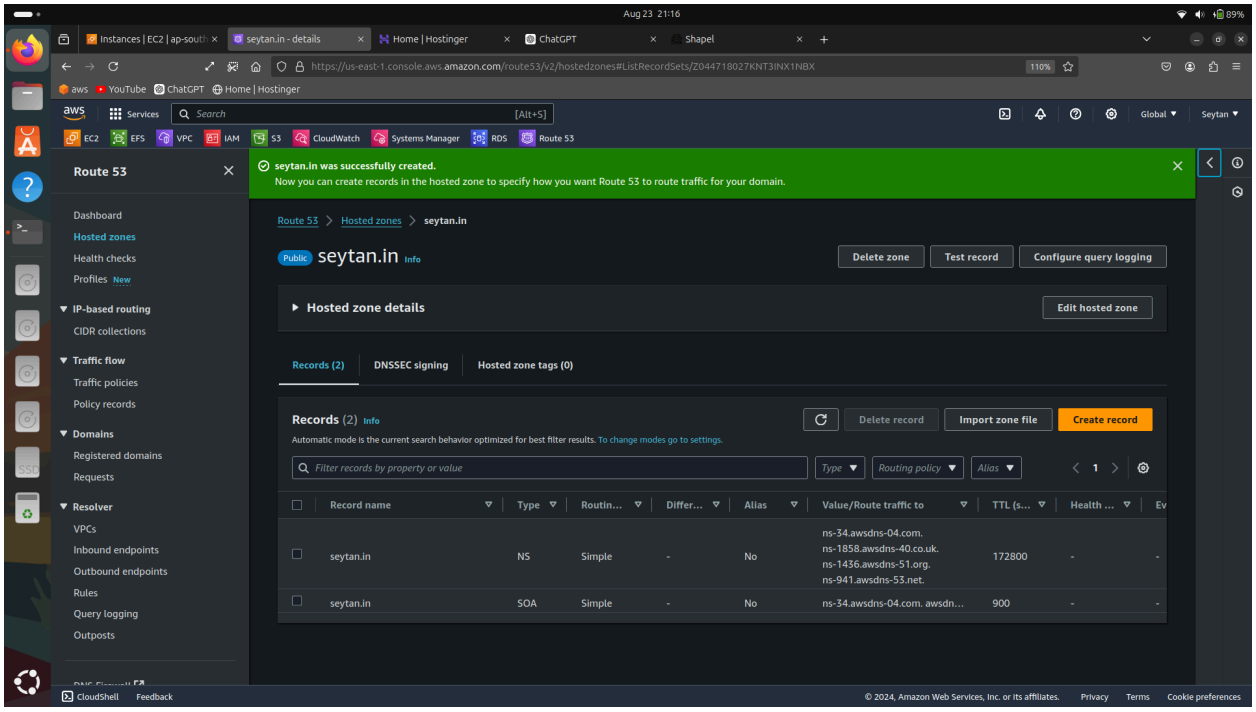
What is Hosted Zones in Route53 ?

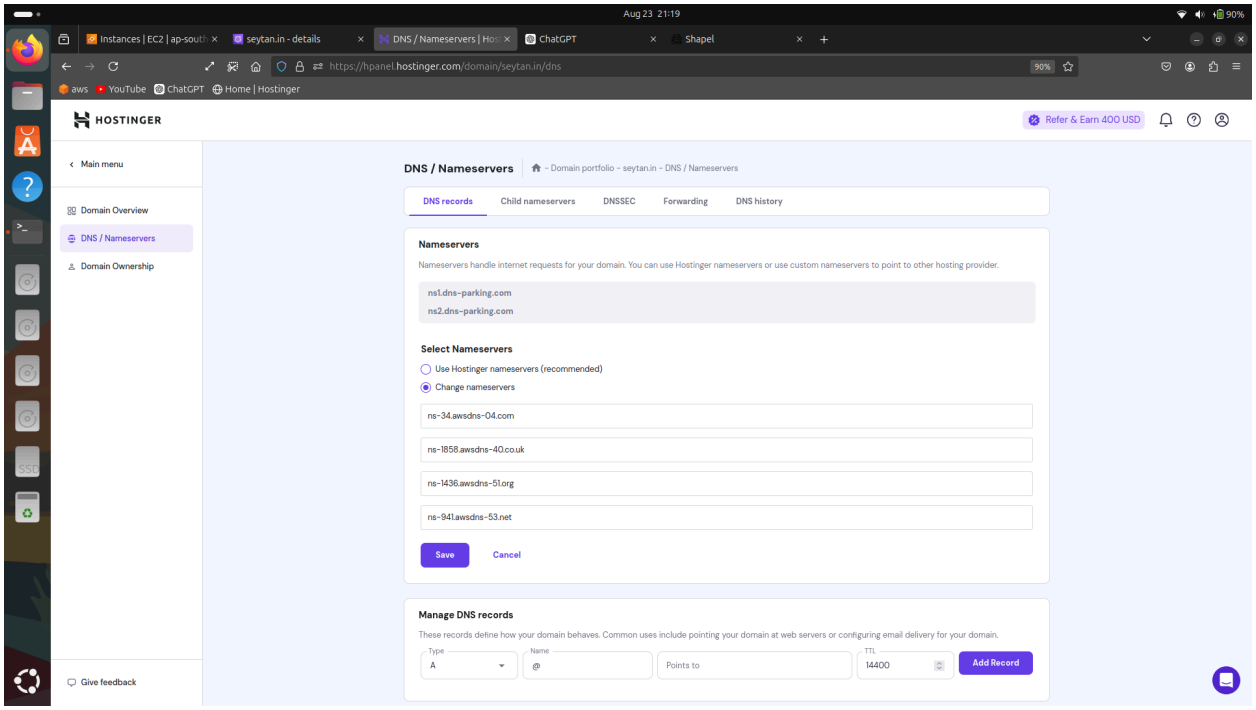
→A hosted zone in Route 53 is a container for records that define how traffic is routed for a specific domain or subdomain.

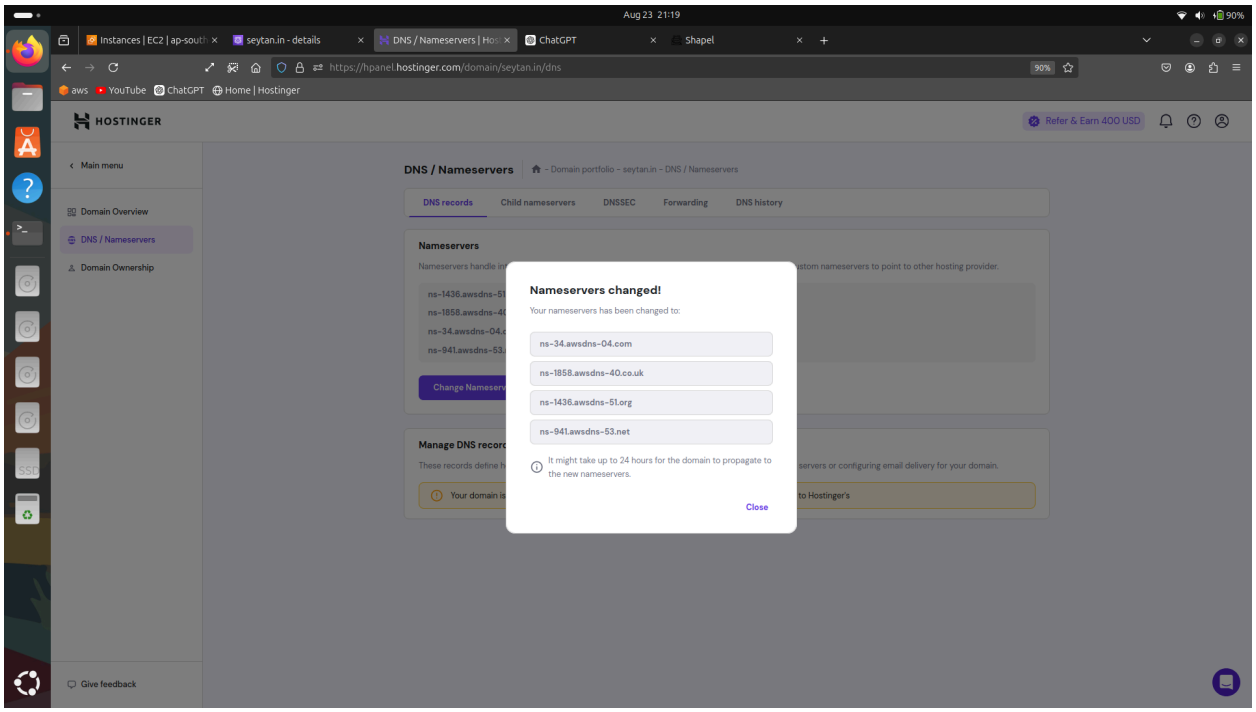


Step 7:After Creating Hosted Zone it will give us 2 records NS and SOA.

The NS Records are to copied to our hostinger nameservers.







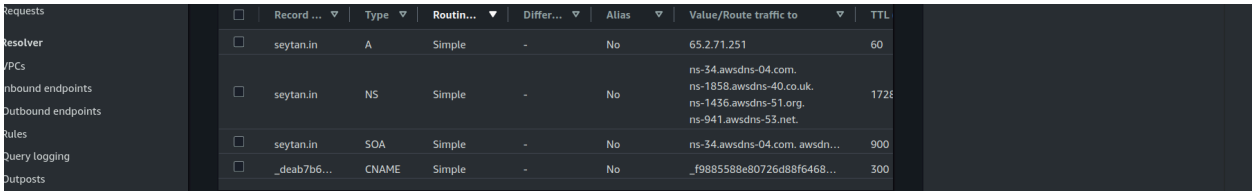
What is ns record and soa record ?

→1) An NS (Name Server) record specifies the authoritative name servers for a domain, directing queries to the correct servers for DNS resolution.

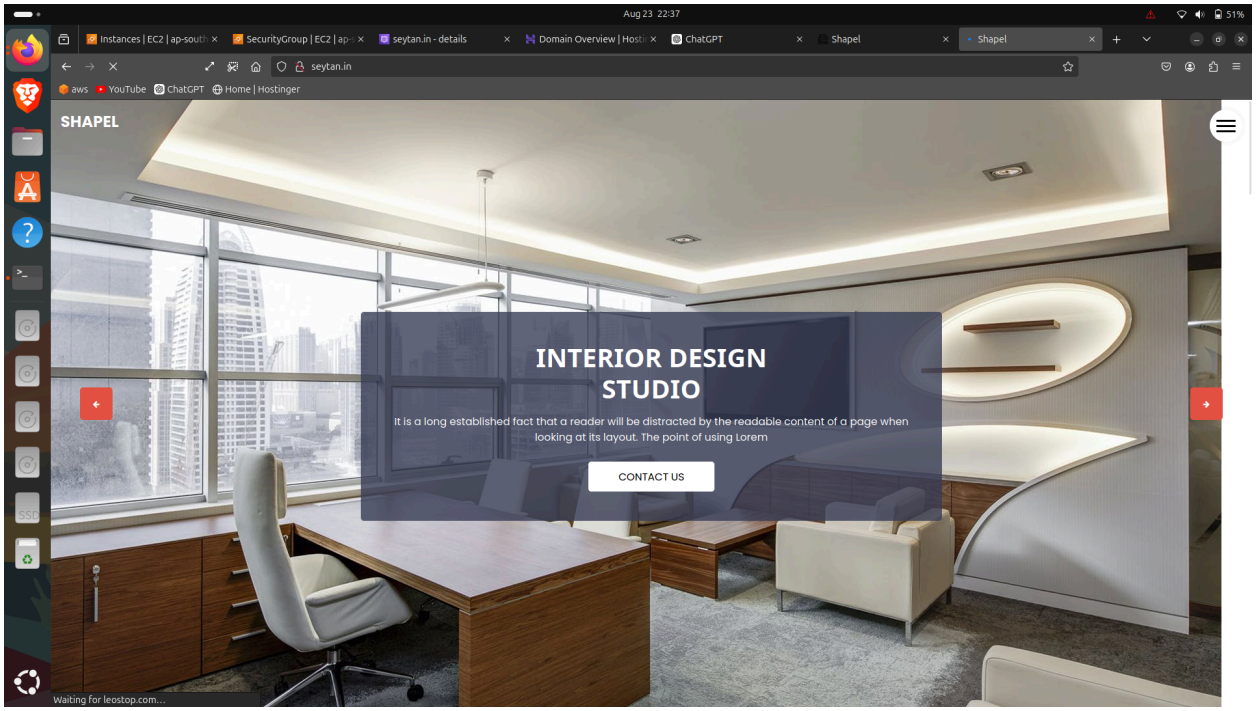
2) An SOA (Start of Authority) record provides essential information about a DNS zone, including the primary name server, the email of the domain administrator, and the domain's serial number and refresh times.

<u>Step 8</u>: Now Create A-record and enter our public ip to bind with the domain.
After this you can enter the domain name seytan.in to see your domain is working or not .

What is A record ? →An A record, or Address record, maps a domain name to its corresponding IPv4 address, allowing browsers to locate the server hosting the website



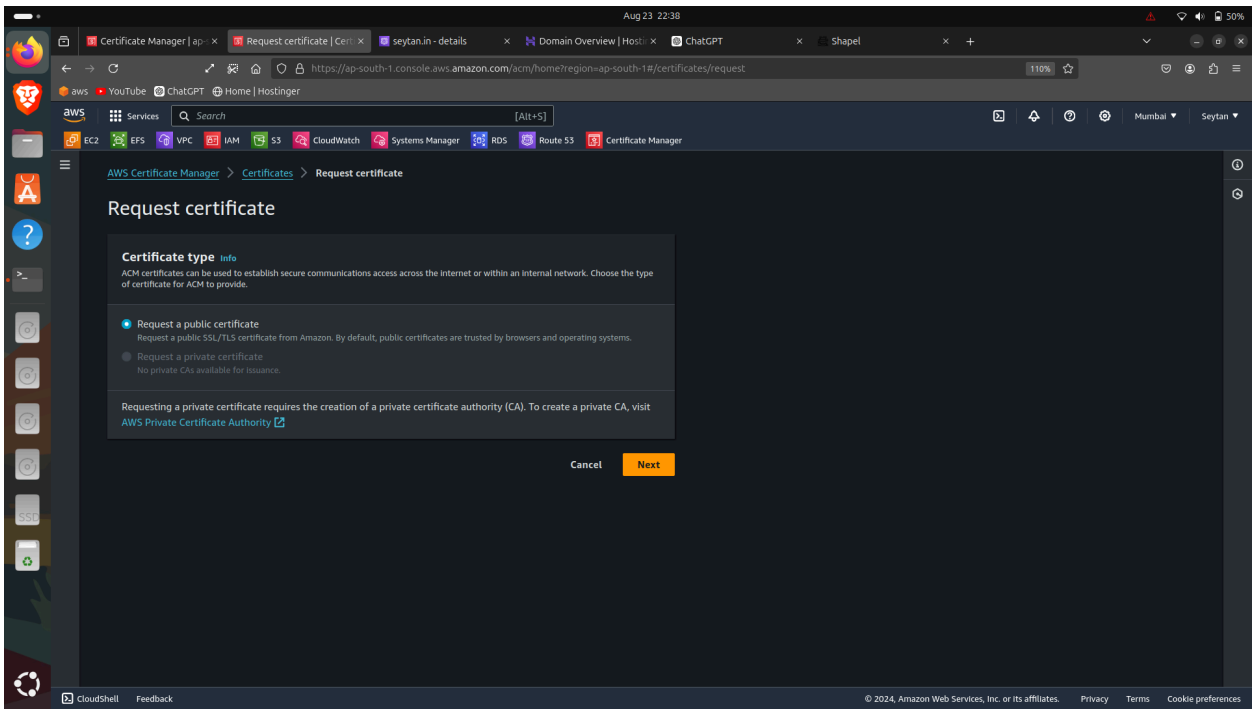
<u>Output:</u>

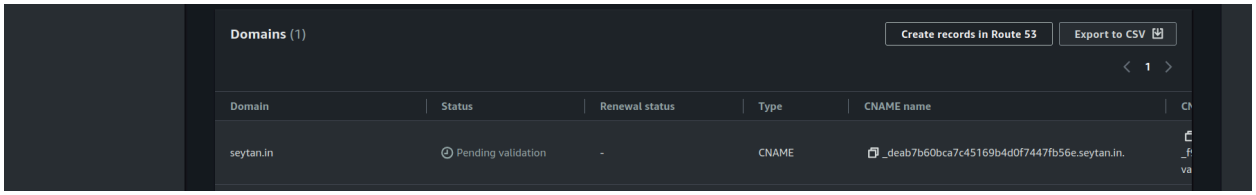


<u>Step</u> 9: Now our domain is working property but the connection is not secured as we have not attached any ssl certificate with our domain.

<u>So now we will Request a ssl Certificate from ACM Service in aws .</u>

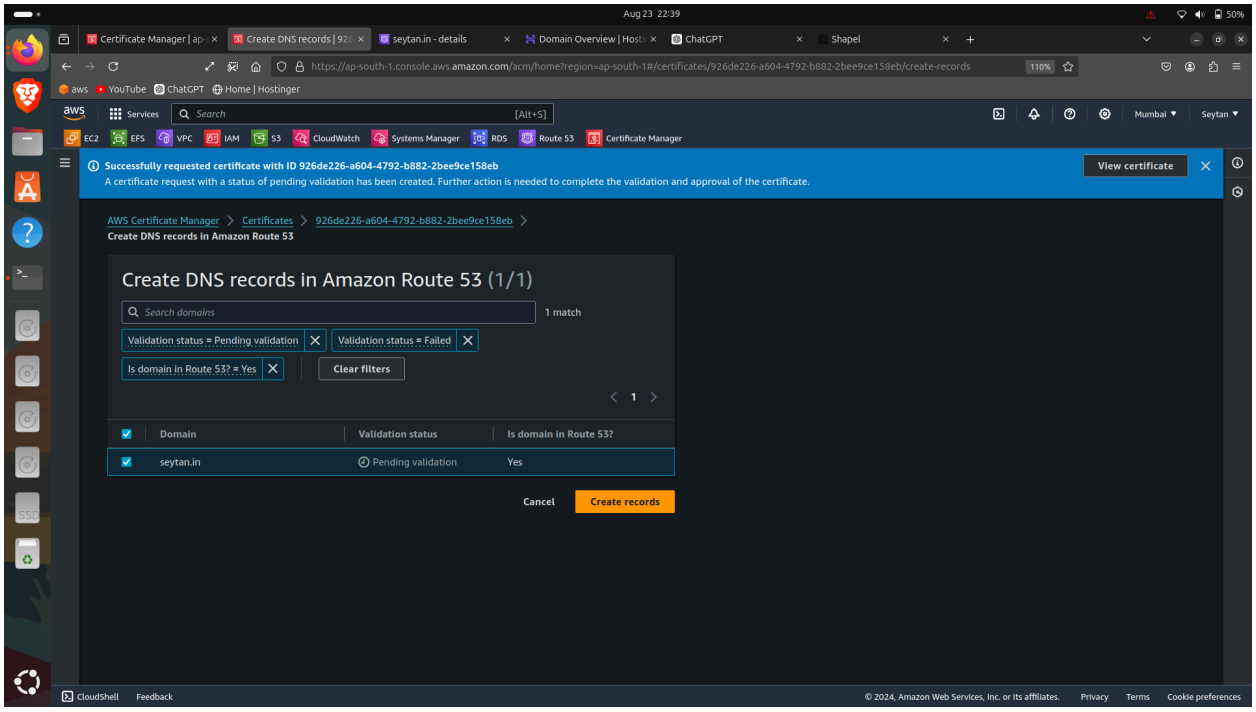
What is ACM →ACM (AWS Certificate Manager) is a service by AWS that allows you to easily provision, manage, and deploy SSL/TLS certificates for use with AWS services and your websites to secure network communications.





Step 10 : After Creating Certificate create CName record in Our hosted zone .

What is CName record ? →
When using ACM (AWS Certificate Manager), a CNAME record is often required to verify domain ownership. AWS provides a unique CNAME that you must add to your DNS records, which allows ACM to confirm that you control the domain before issuing an SSL/TLS certificate.



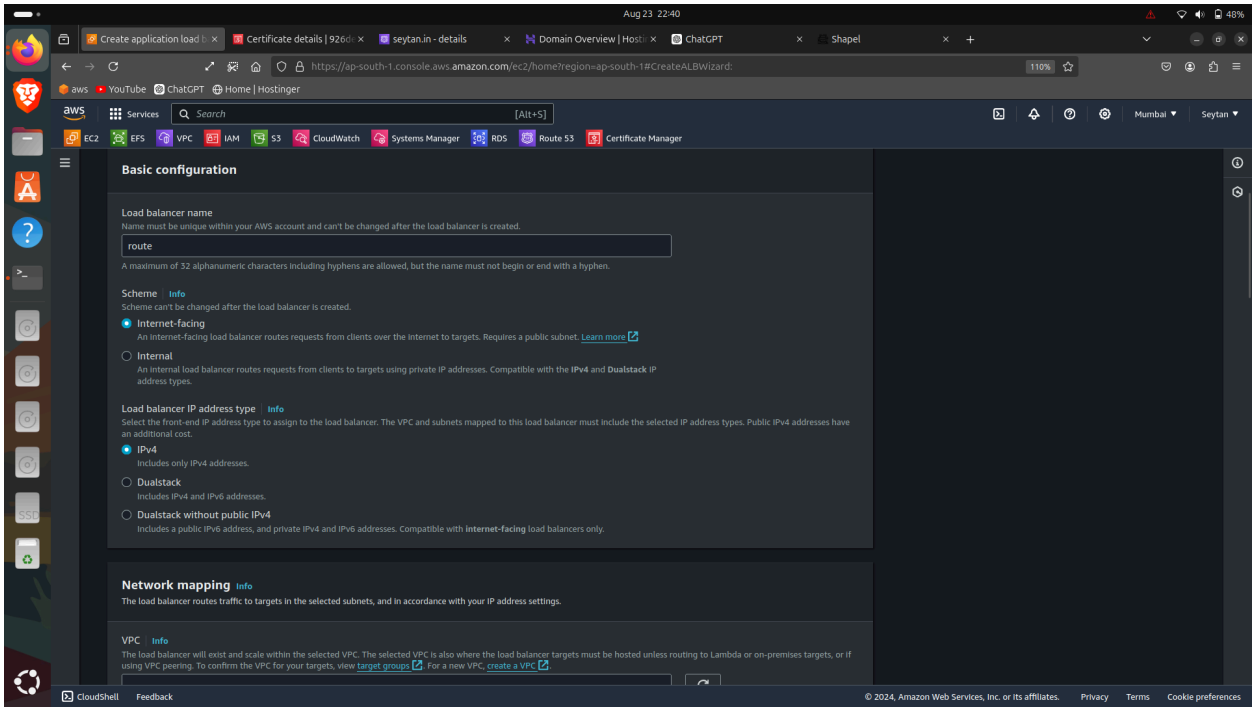
<u>Step 11</u>: Now We need to create a <u>Application Load balancer and Target Group</u> for using the ACM Certificate so we can redirect from http to https.

What is Application Load balancer ?

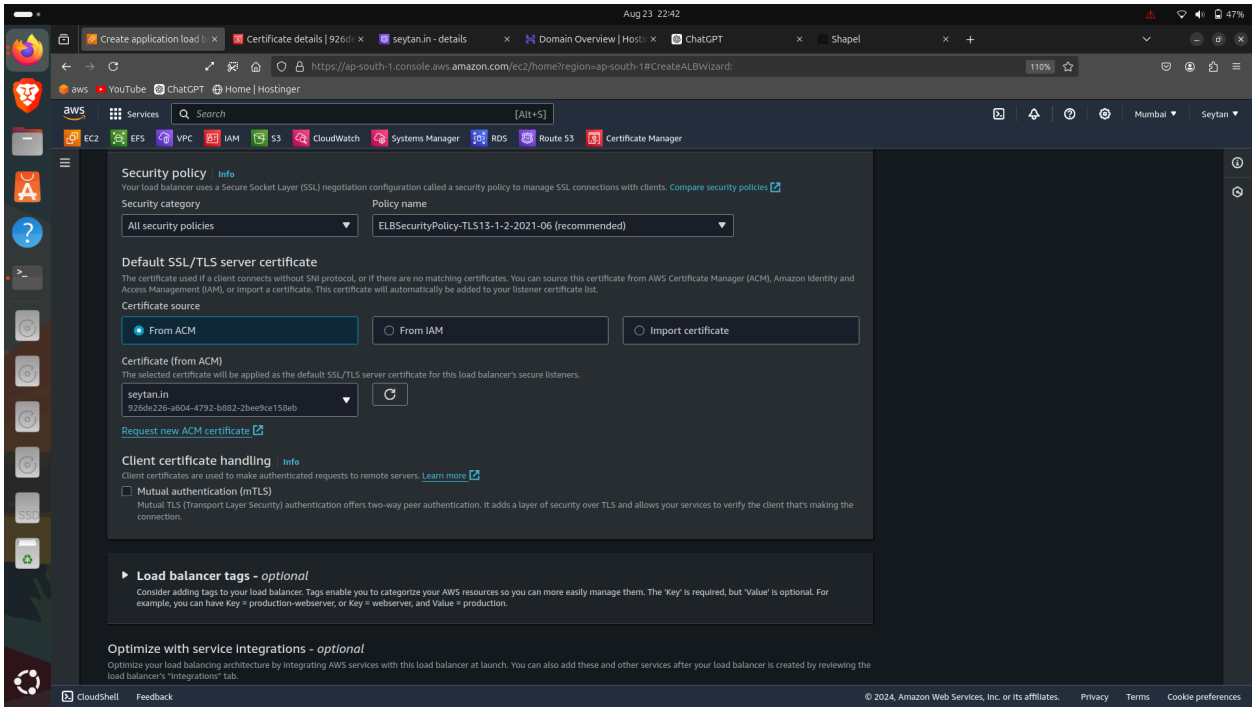
→ An Application Load Balancer (ALB) is an AWS service that distributes incoming application traffic across multiple targets, such as EC2 instances, based on request content, improving availability and scalability. It operates at the application layer (Layer 7) of the OSI model and supports advanced routing features like path-based and host-based routing.

What is Target Group ?

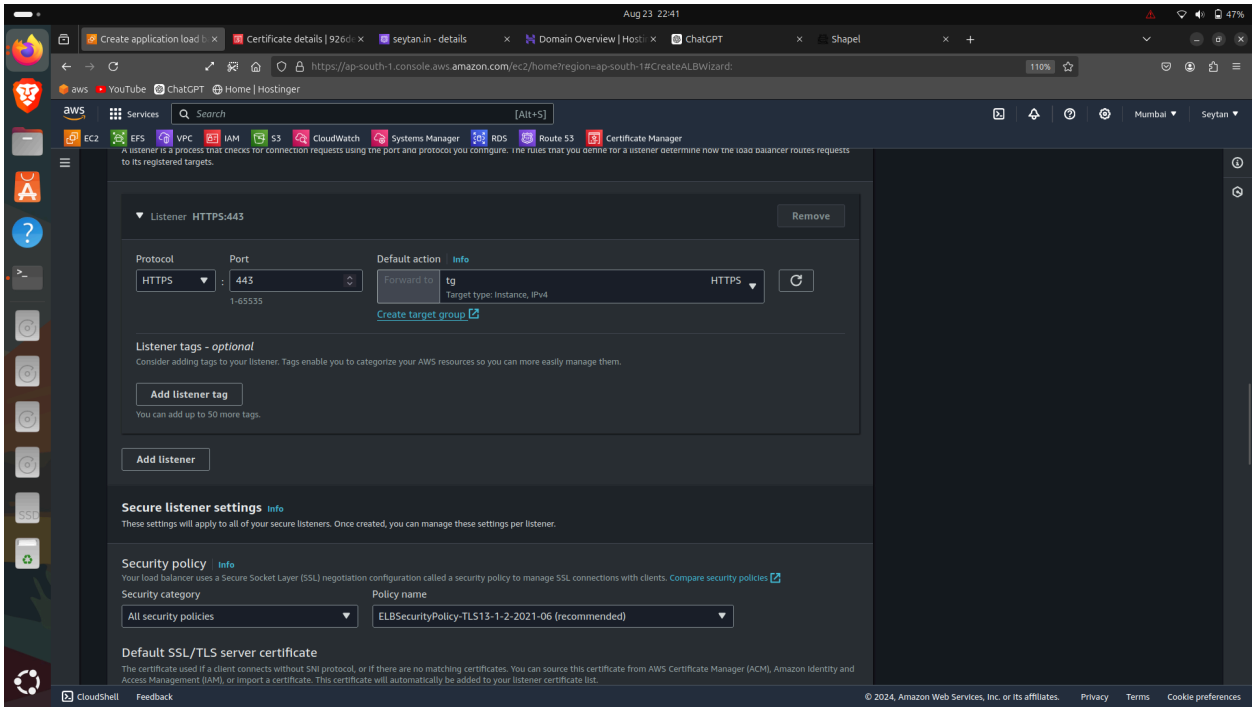
→ A target group in AWS is a set of resources, such as EC2 instances or IP addresses, that the Application Load Balancer routes traffic to based on the configured rules. It allows you to manage and monitor the health of these resources and balance the load among them.



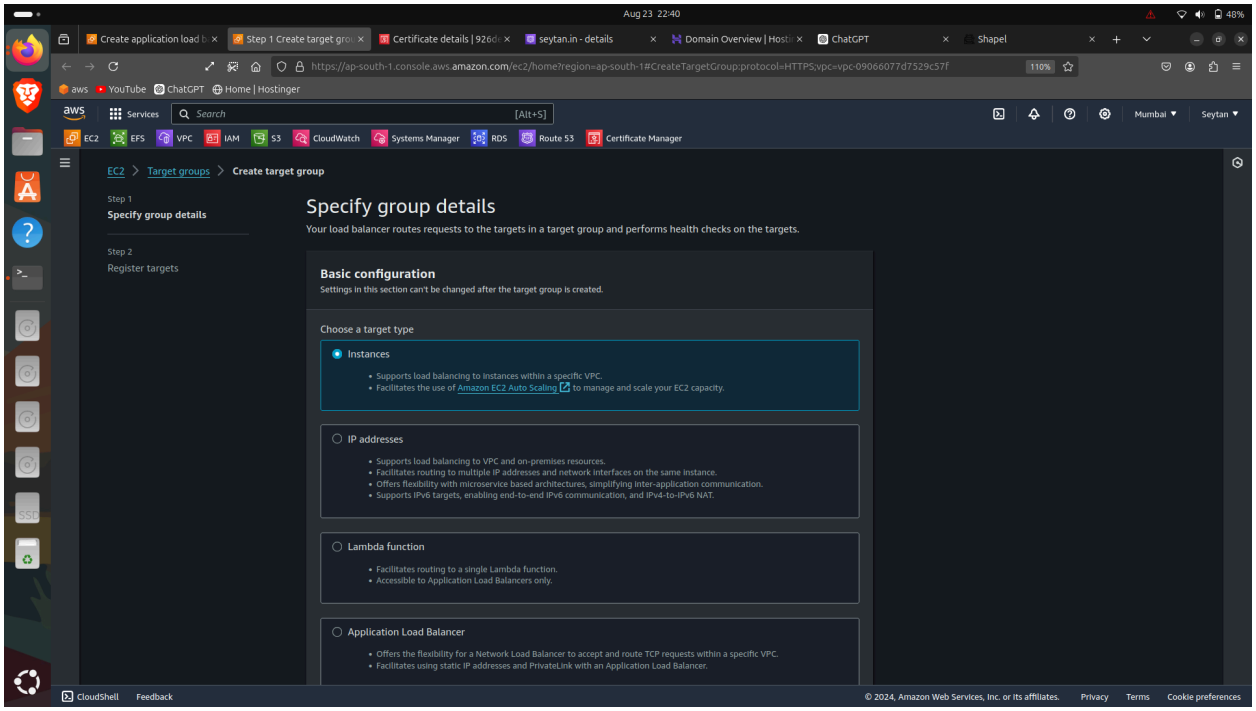
Assign ACM Certificate to our Load balancer

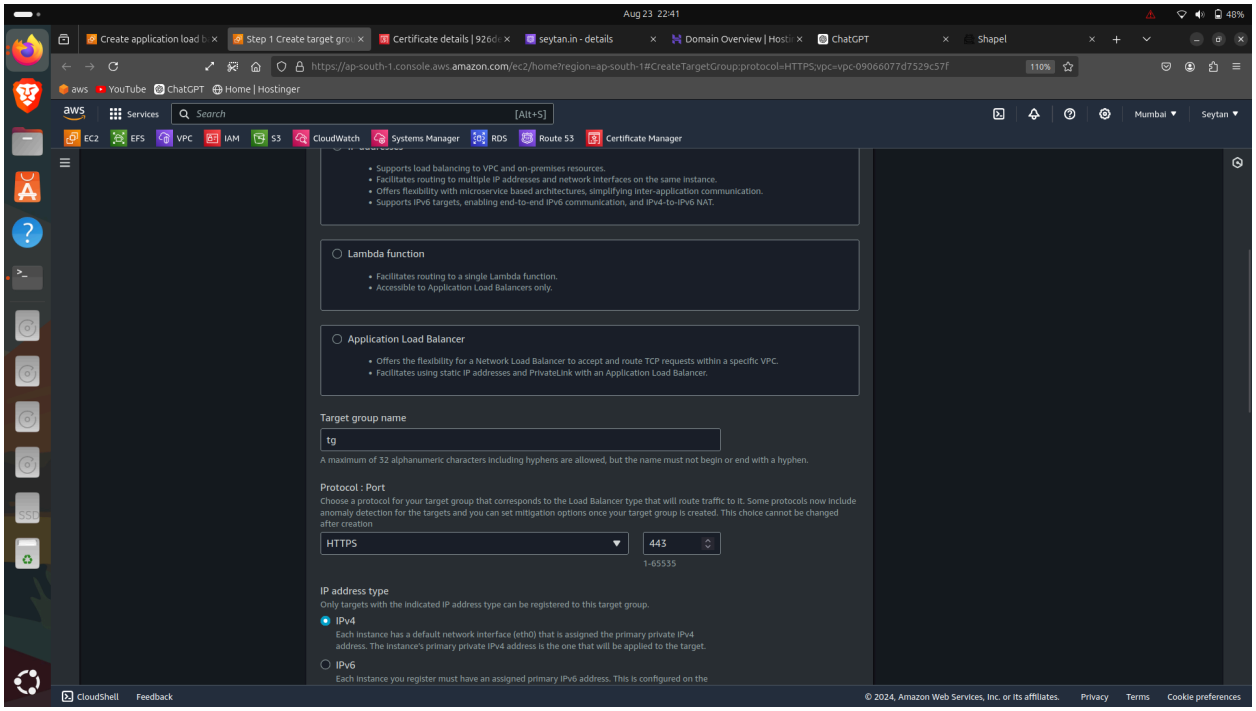


Make Load Balancer To Listen on Https



Step 12 : Create target group for load balancer with port 80 and protocol http .



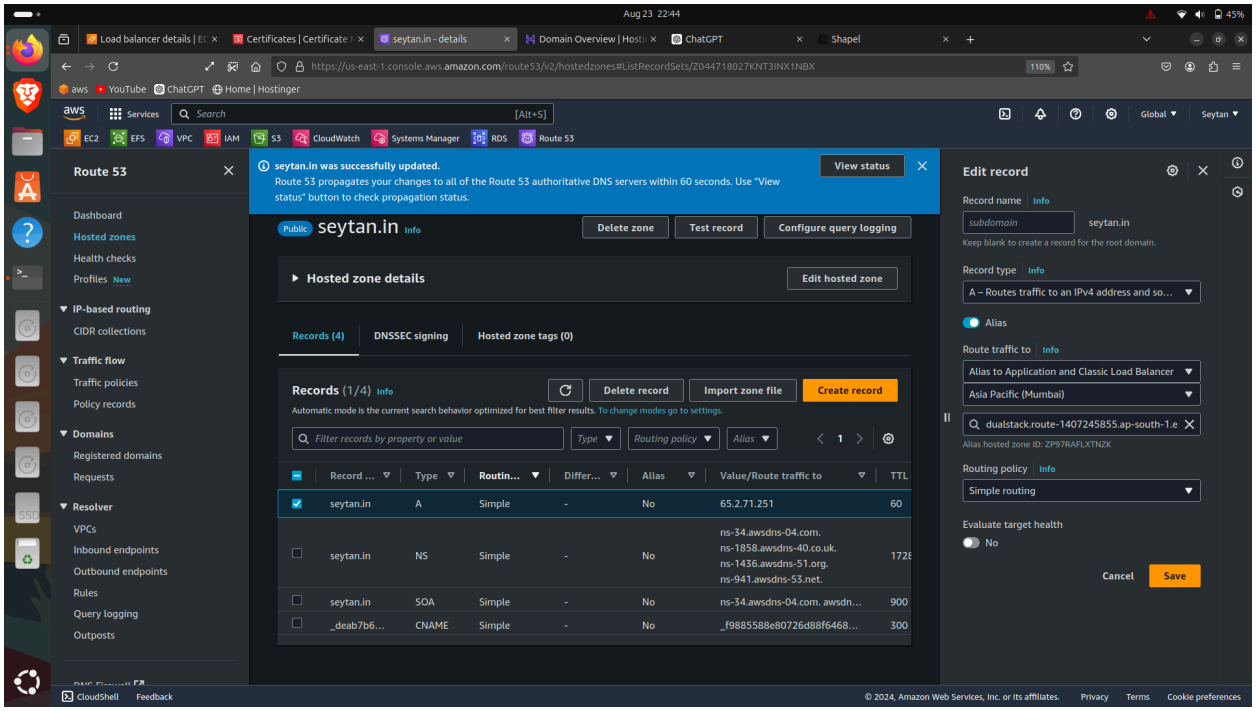


<u>Step 13:</u> Now We have to Edit the A Record to point the domain to the load balancer dns instead ot public ip.

Here we use Routing Policies→
Routing policies in Route 53 define how DNS queries are handled. They determine which IP address or resource is returned based on factors like health, latency, or geography.

There are 8 types of routing policy

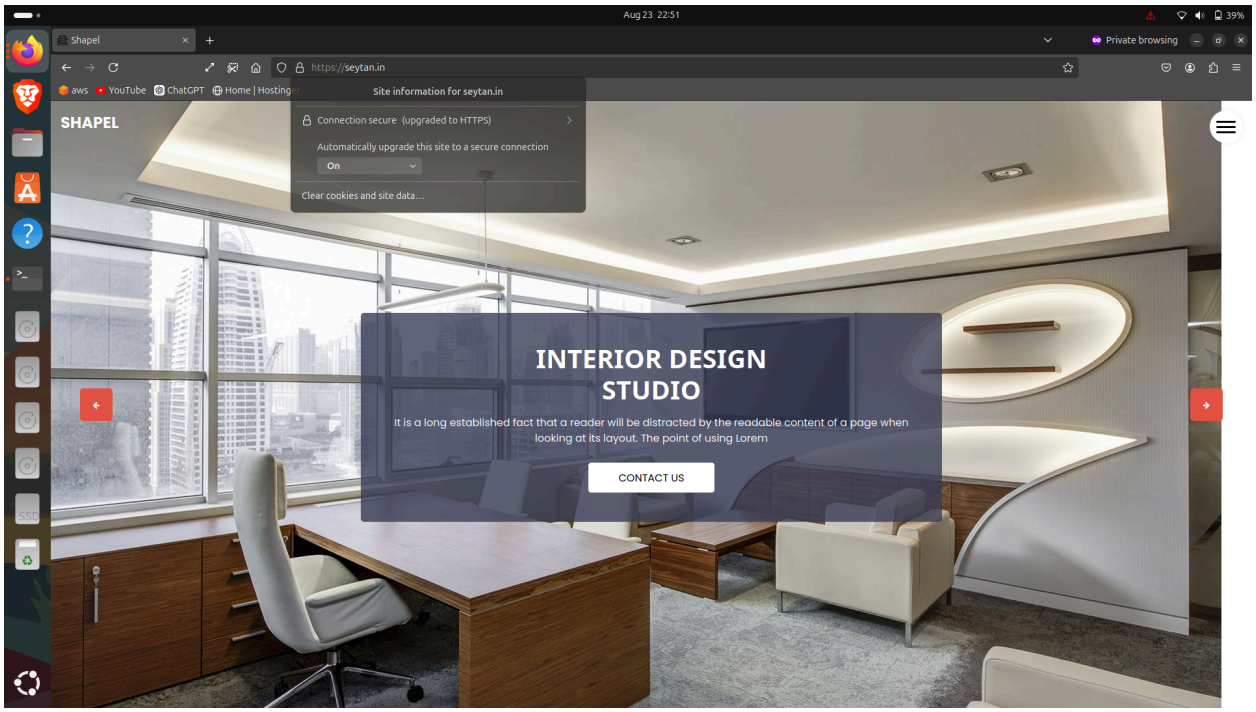
1. **Simple routing policy** □ Use for a single resource that performs a given function for your domain.
2. **Failover routing policy** □ Use when you want to configure active-passive failover. ·
3. **Geolocation routing policy** □Use when you want to route traffic based on the location of your users.
4. **Geoproximity routing policy** □Use when you want to route traffic based on the location of your resources and, optionally, shift traffic from resources in one location to resources in another location.
5. **Latency routing policy** □ Use when you have resources in multiple AWS Regions and you want to route traffic to the Region that provides the best latency .
6. **IP-based routing policy** □Use when you want to route traffic based on the location of your users, and have the IP addresses that the traffic originates from.
7. **Multivalue answer routing policy** □Use when you want Route 53 to respond to DNS queries with up to eight healthy records selected at random.
8. **Weighted routing policy** □Use to route traffic to multiple resources in proportions that you specify .



Step 14: Now hit the seytan.in domain in any browser .

Here , we can see Our domain is now showing connection secure as we have attached the SSL Certificate to it .

Output :



Conclusion: By following these steps, you will have configured your domain to be managed by Route 53, secured your website with an SSL/TLS certificate, and set up an ALB to handle and route HTTPS traffic efficiently, ensuring secure and reliable access to your web application.