AWS Project: Secure Multi-AZ Web Application with ALB, WAF, and SSL

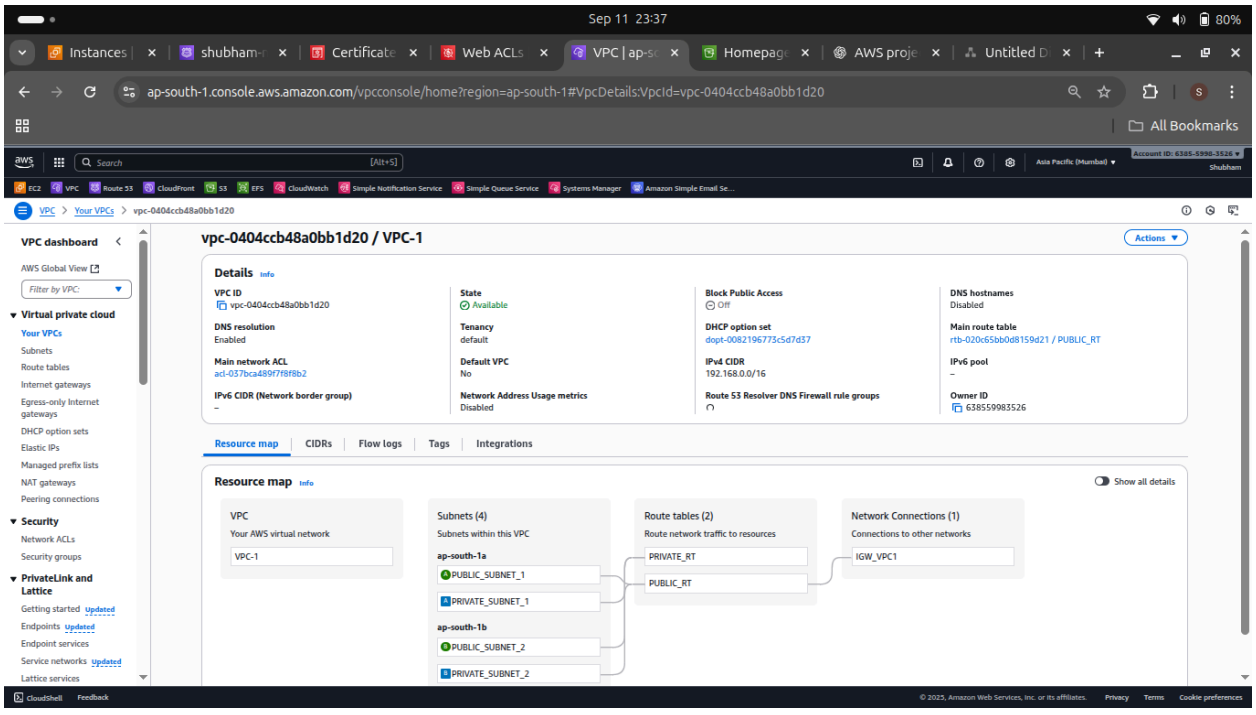
Designed and implemented a highly available, secure, and scalable web application architecture on AWS using VPC, subnets, NAT Gateway, Application Load Balancer (ALB), WAF, Route 53, and SSL certificates. The architecture ensures that only traffic from the ALB can access private EC2 instances, and security controls are applied using WAF rules.

📂 **Tools & Services Used**

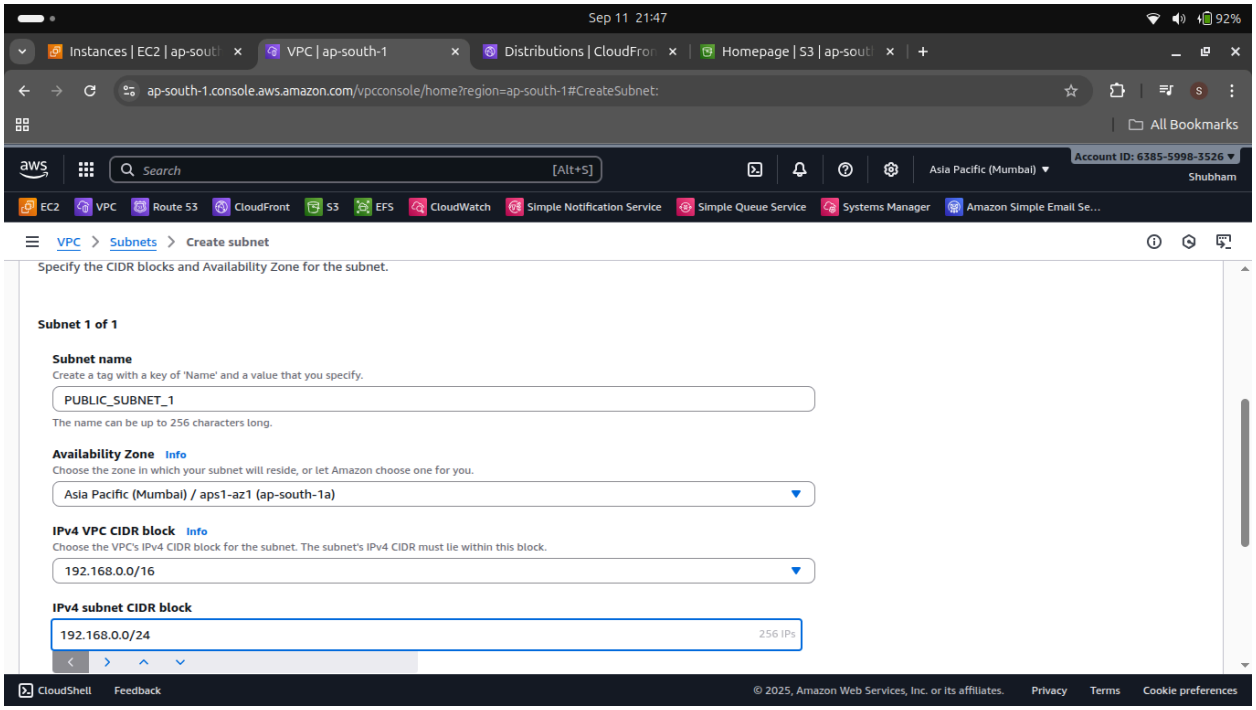
- **AWS VPC**
- **EC2 (Elastic Compute Cloud)**
- **NAT Gateway**
- **Application Load Balancer (ALB)**
- **Target Groups**
- **AWS WAF**
- **Route 53**

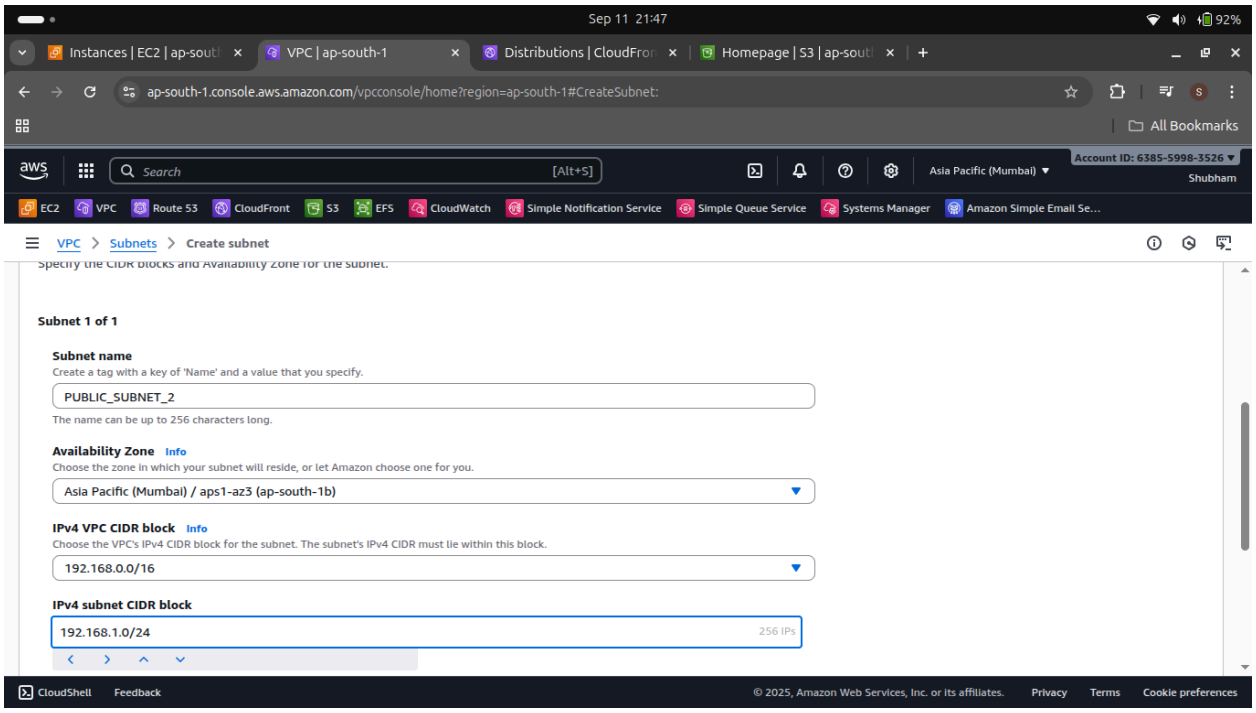
- **AWS Certificate Manager (ACM)**
- **CloudWatch Logs (optional monitoring)**
- **Linux instances for web server setup**

STEP 1
Created VPC



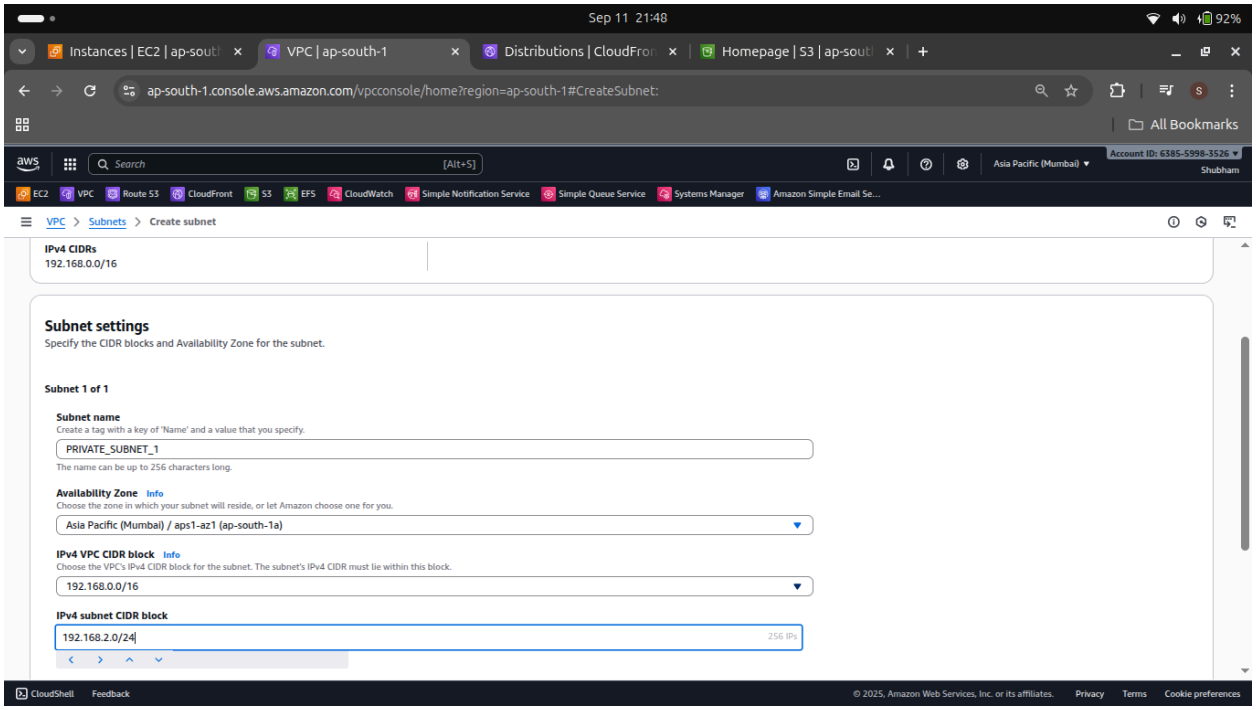
STEP 2
Created two public subnets

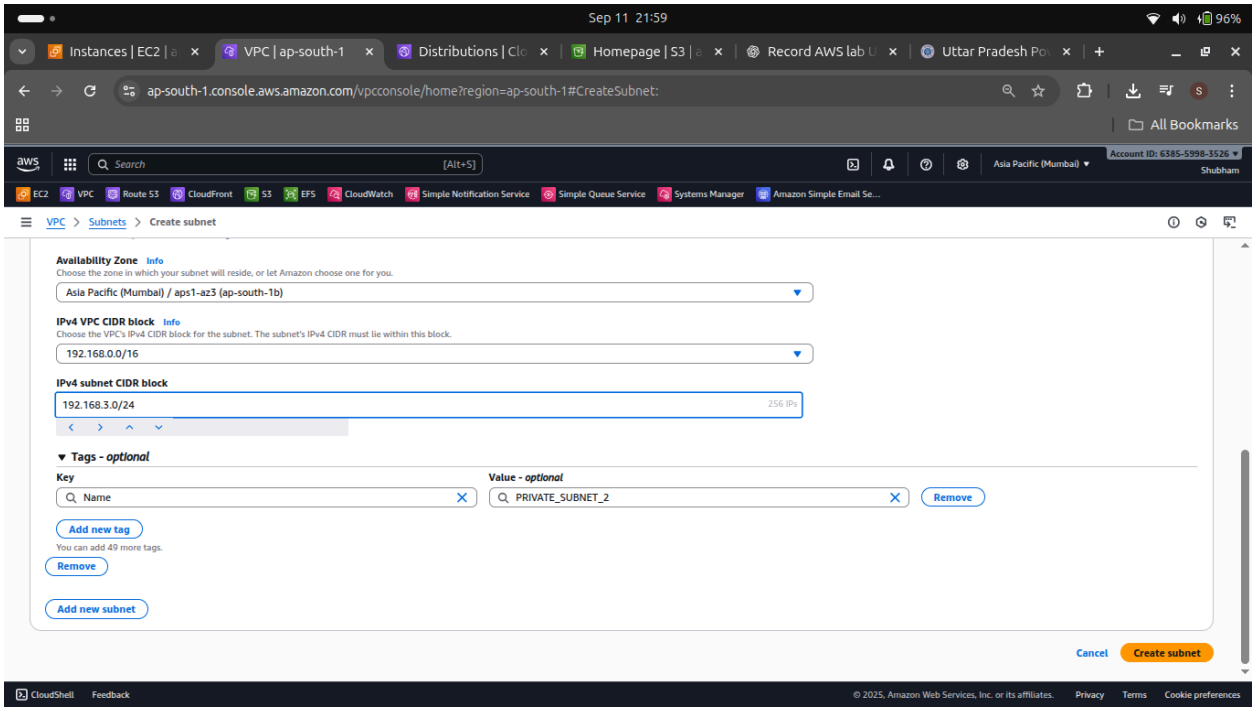




STEP 3

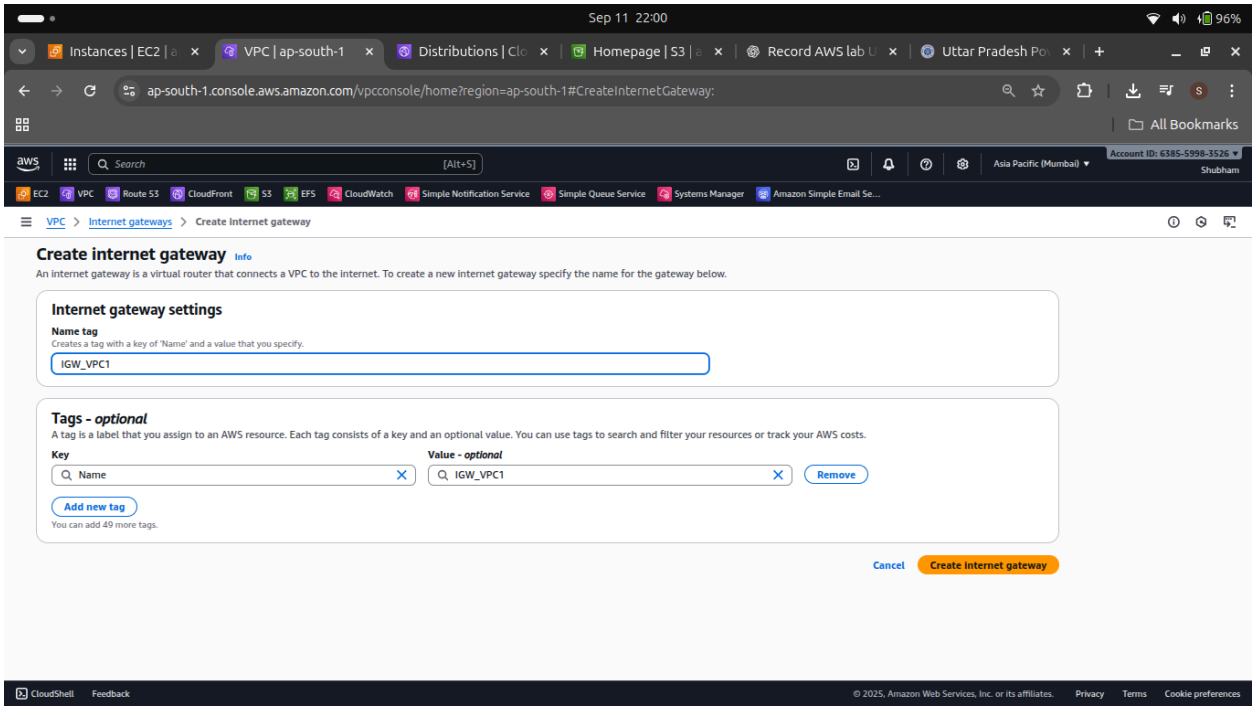
Created two private subnets





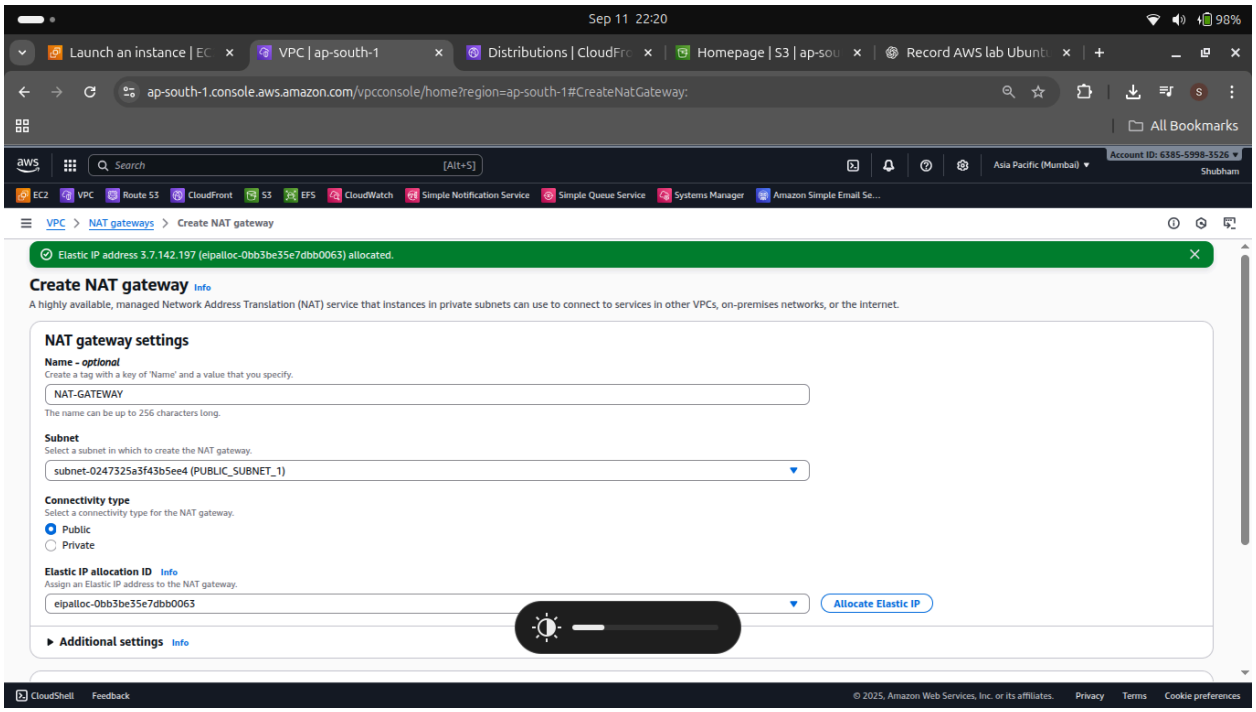
STEP 4

“Created an Internet Gateway and attached it to the VPC to provide internet access to the public subnets.



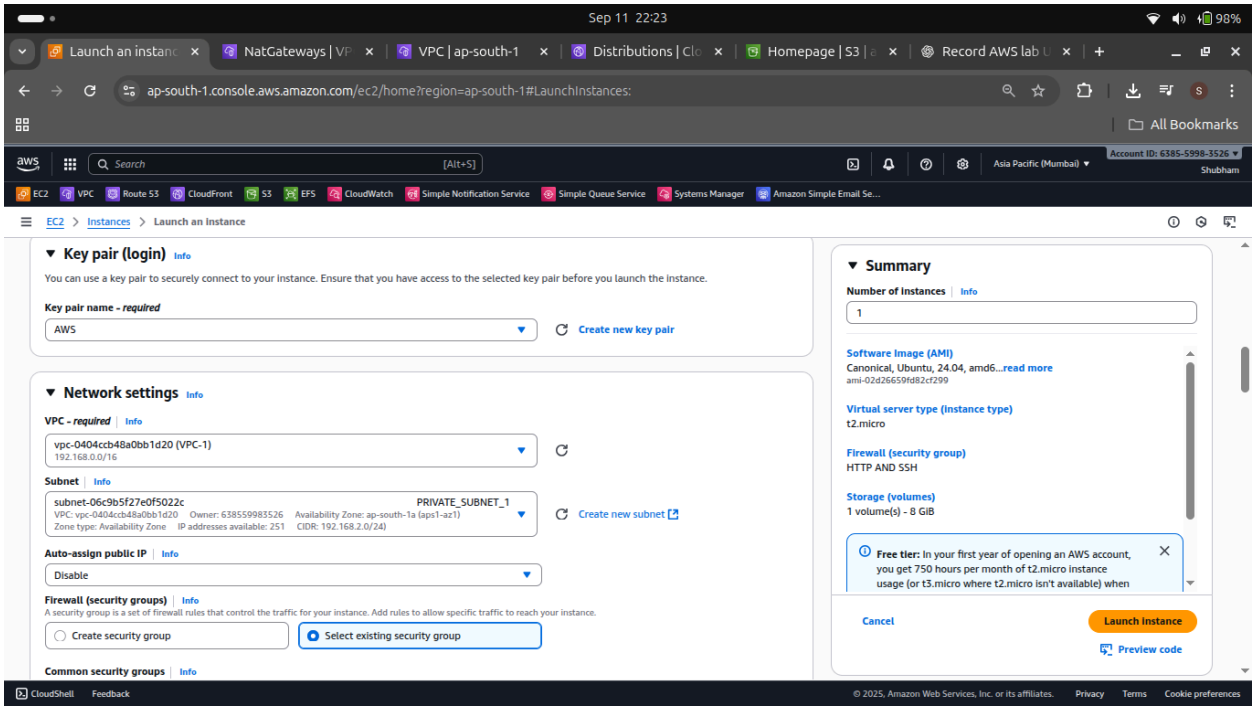
STEP 5

Created NAT gateway to provide outbound internet access to private subnets



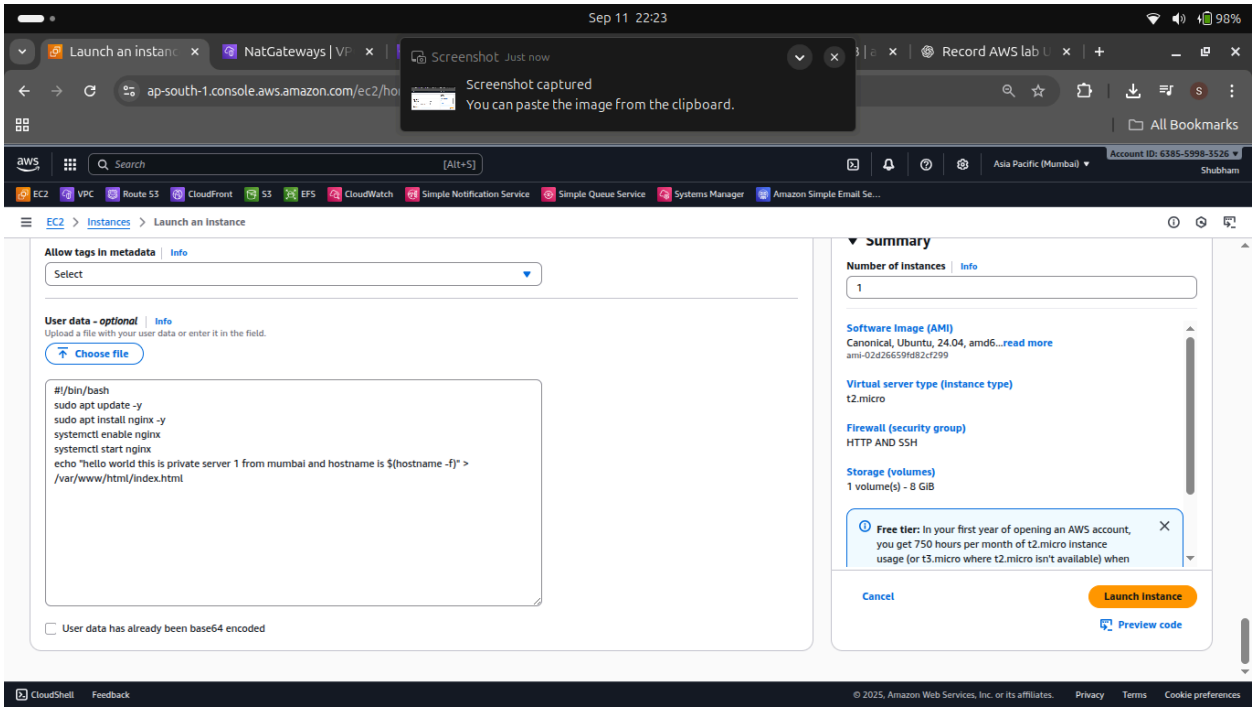
STEP 6

Launched two ec2 instances into private subnets



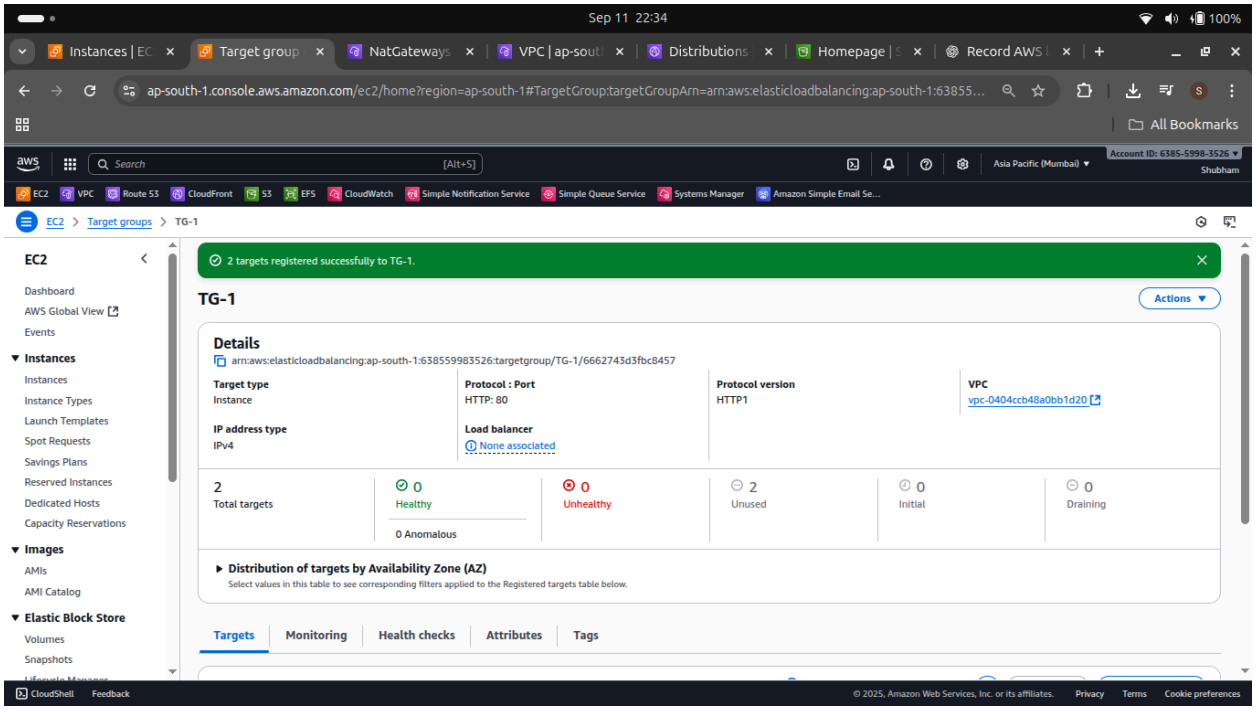
STEP 7

Added user data scripts on both private servers to install nginx web server

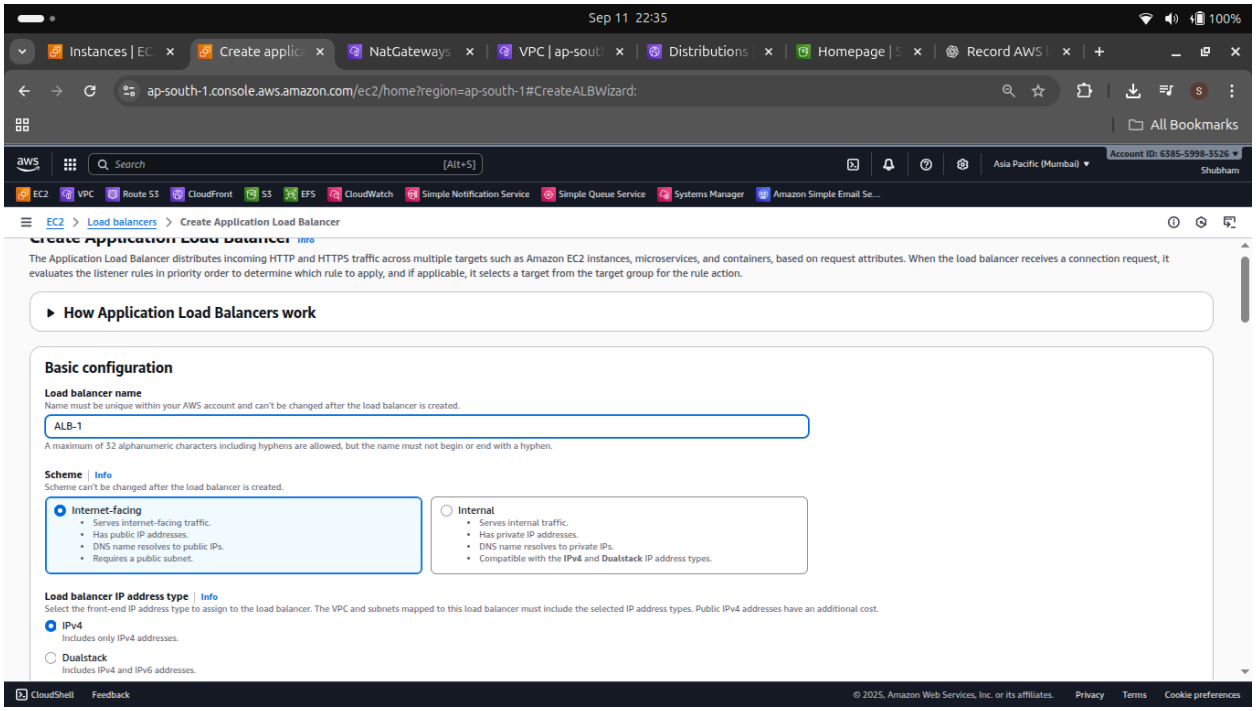


STEP 8

Created Target group

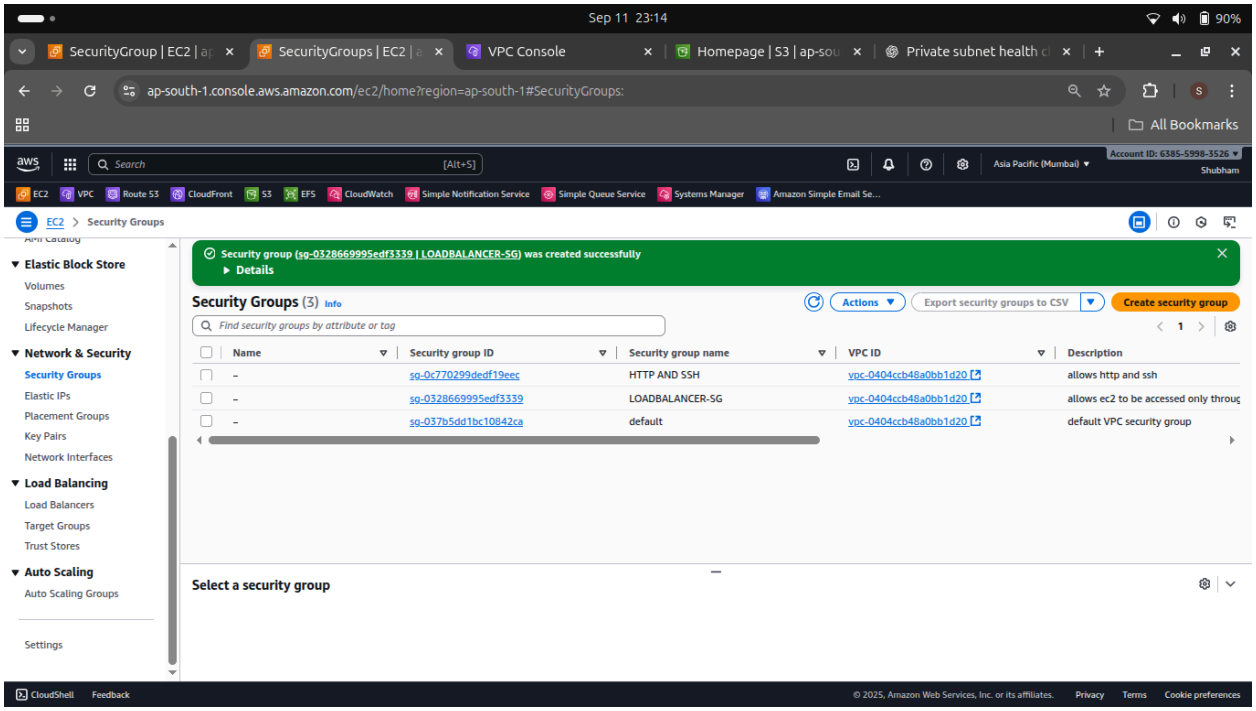


STEP 9
Created Application Load Balancer



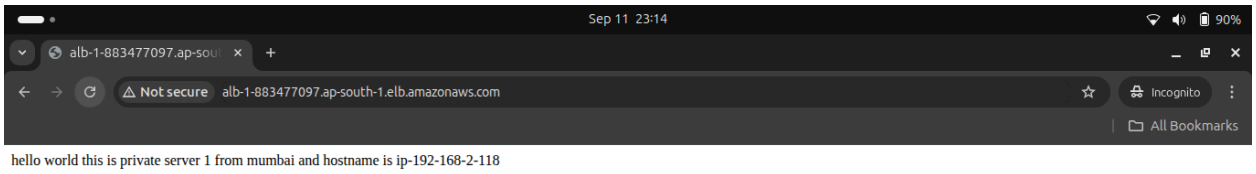
STEP 10

Configured security groups and created two security groups 1 for private instances and 1 for load balancer and only traffic to reach ec2 instances through load balancer and ssh using my ip

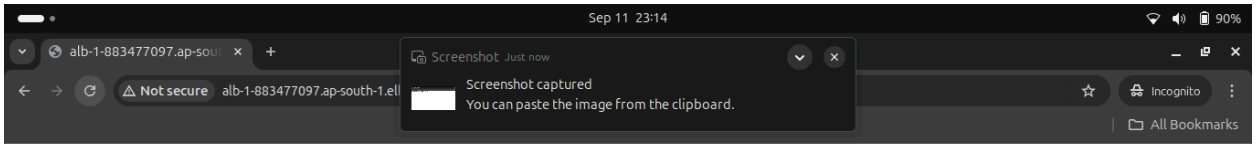


STEP 11

After successful target group and load balancer reaching instances can see the result



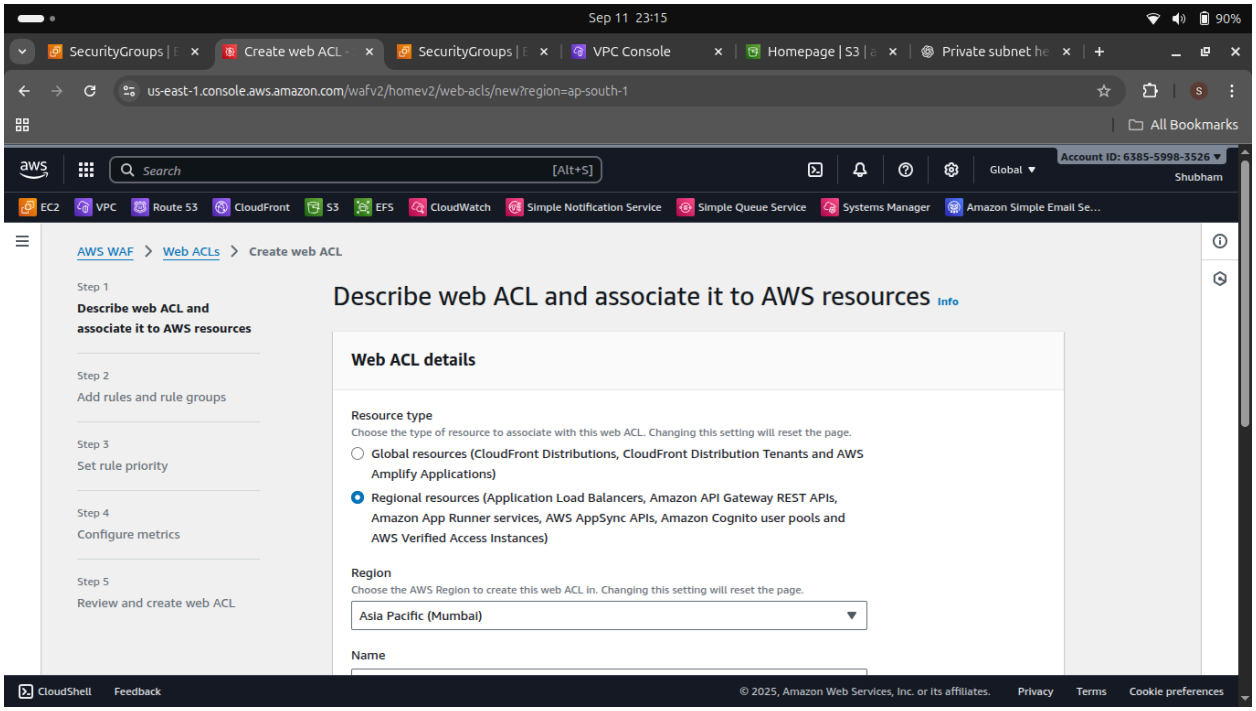
hello world this is private server 1 from mumbai and hostname is ip-192-168-2-118

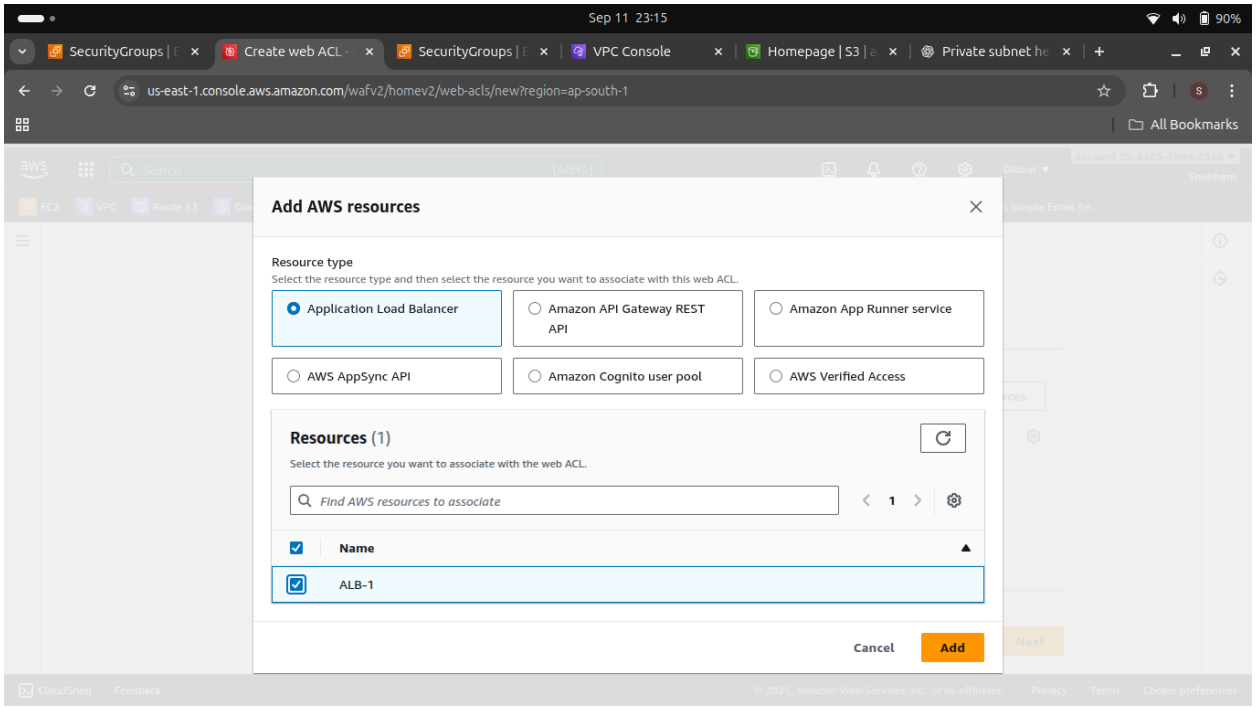


hello world this is private server 2 from mumbai and hostname is ip-192-168-3-175

STEP 12

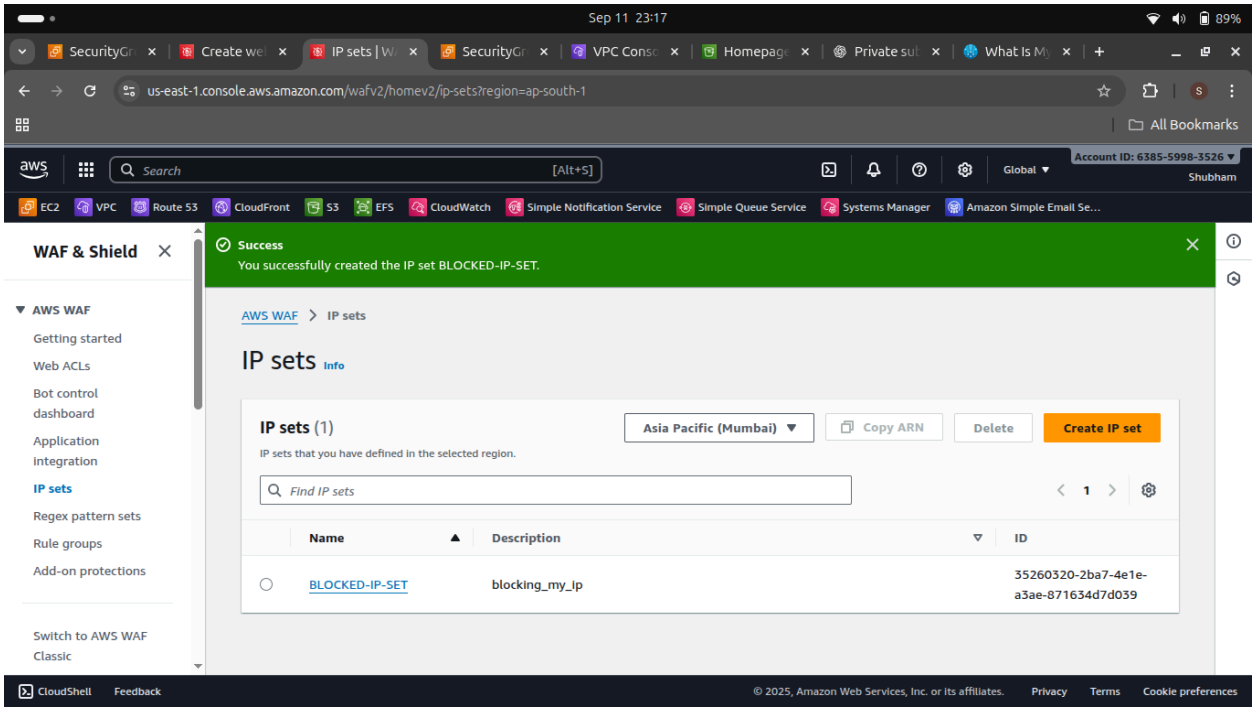
Now creating WAF and attaching to the load balancer

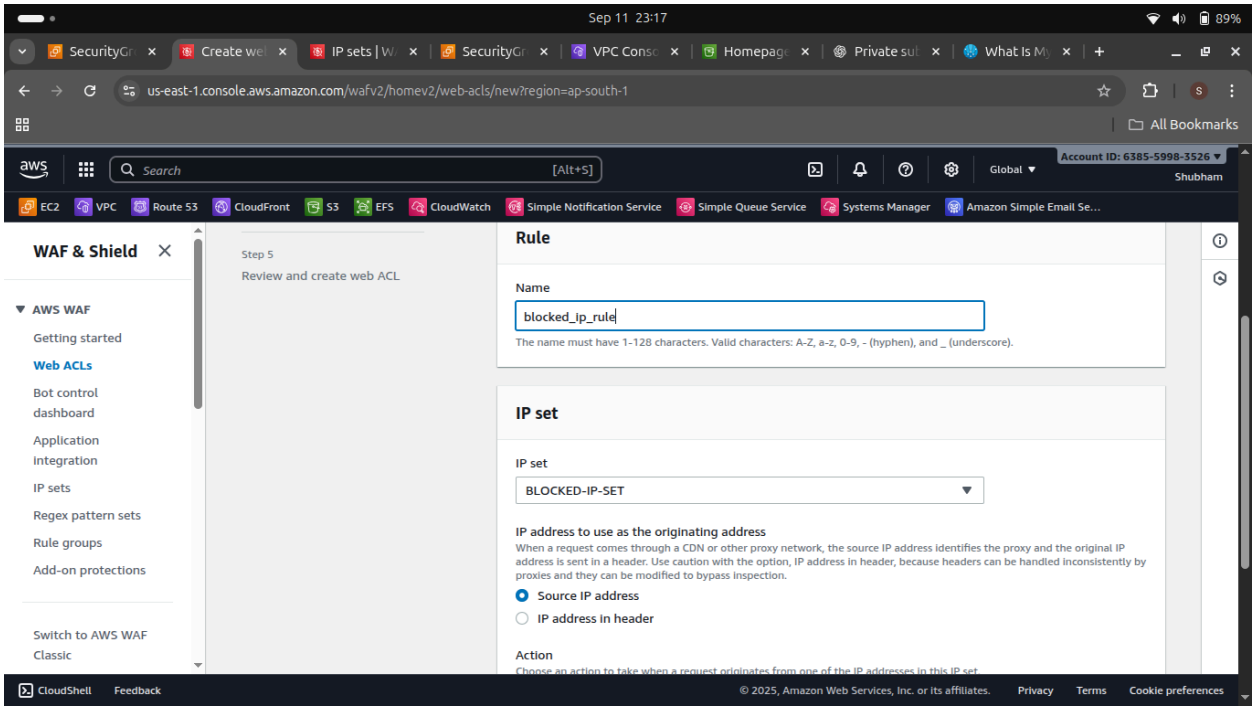




STEP 13

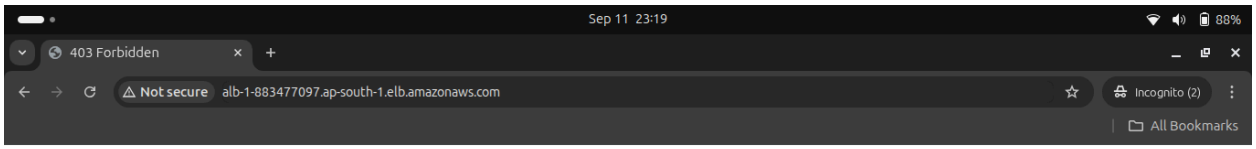
Created IP SET to set blocking from my ip



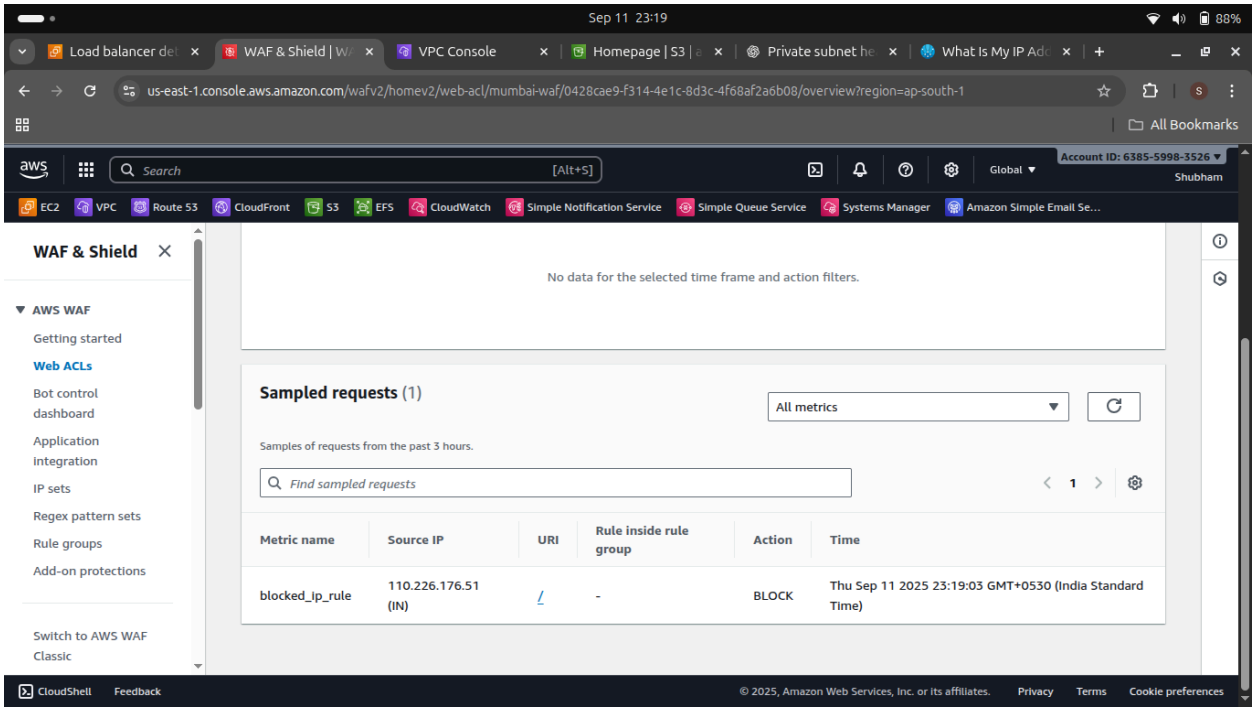


STEP 14

“Verified that the Load Balancer is inaccessible from my IP due to the WAF rules blocking traffic.”

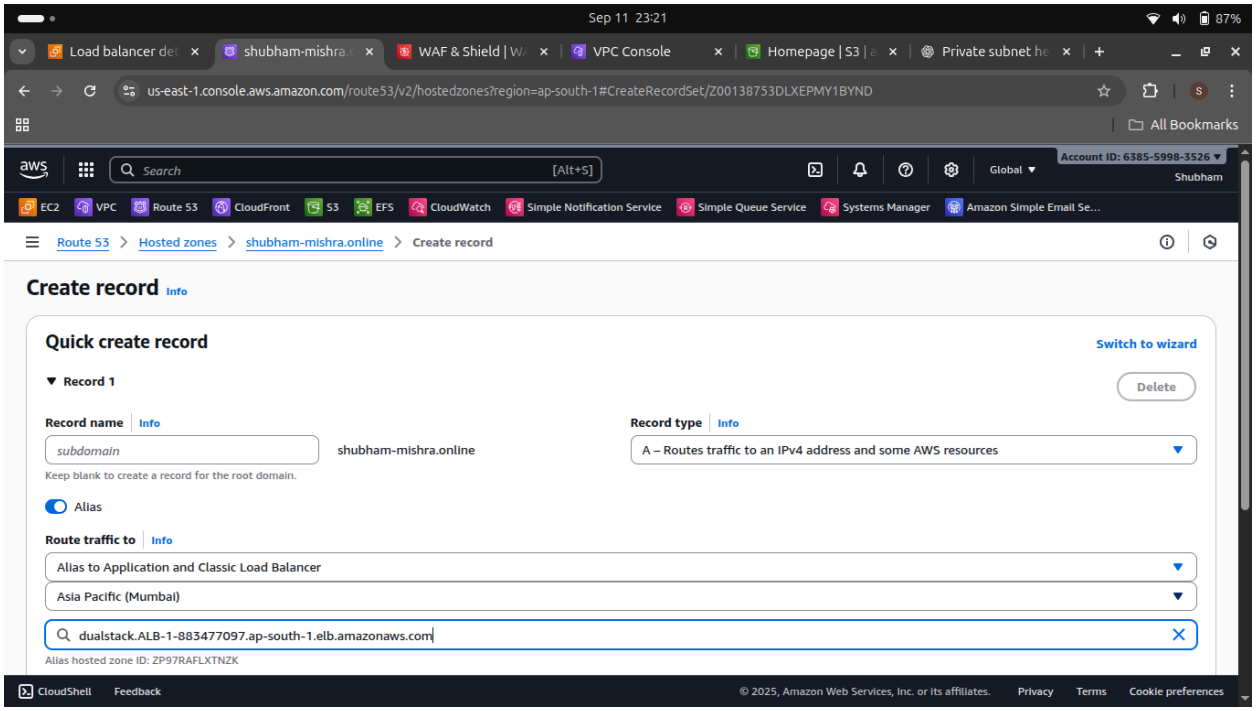


403 Forbidden



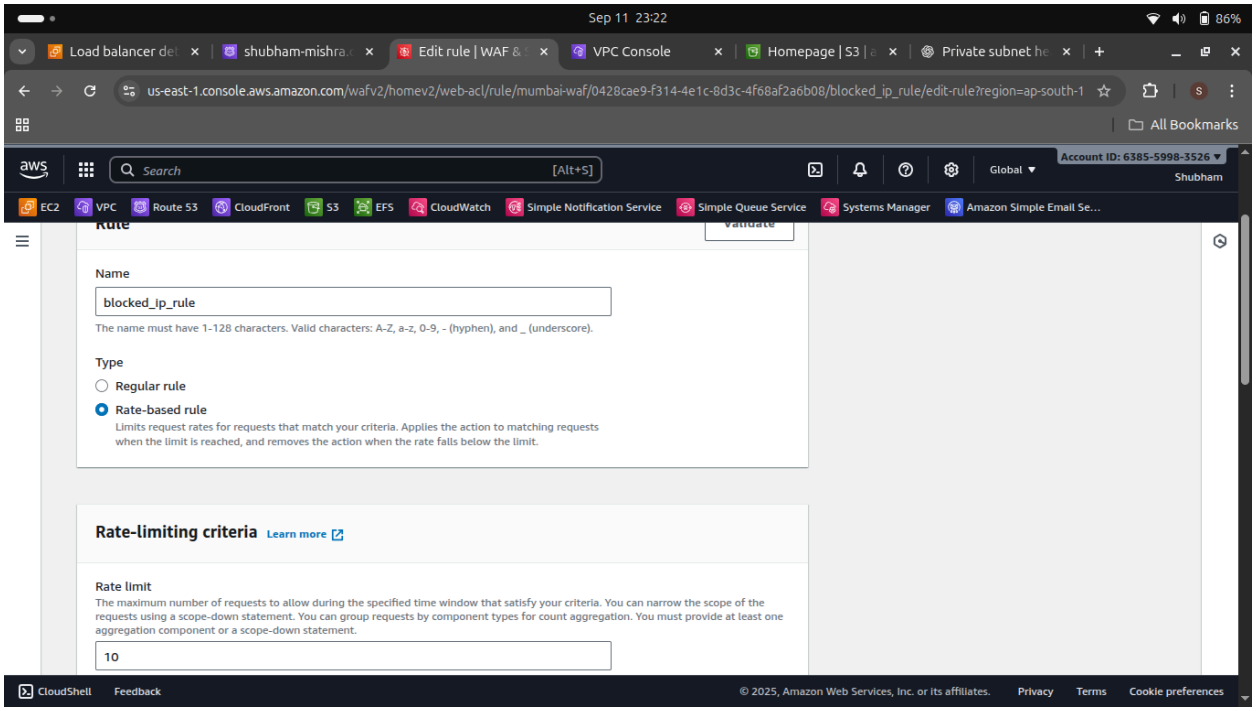
STEP 15

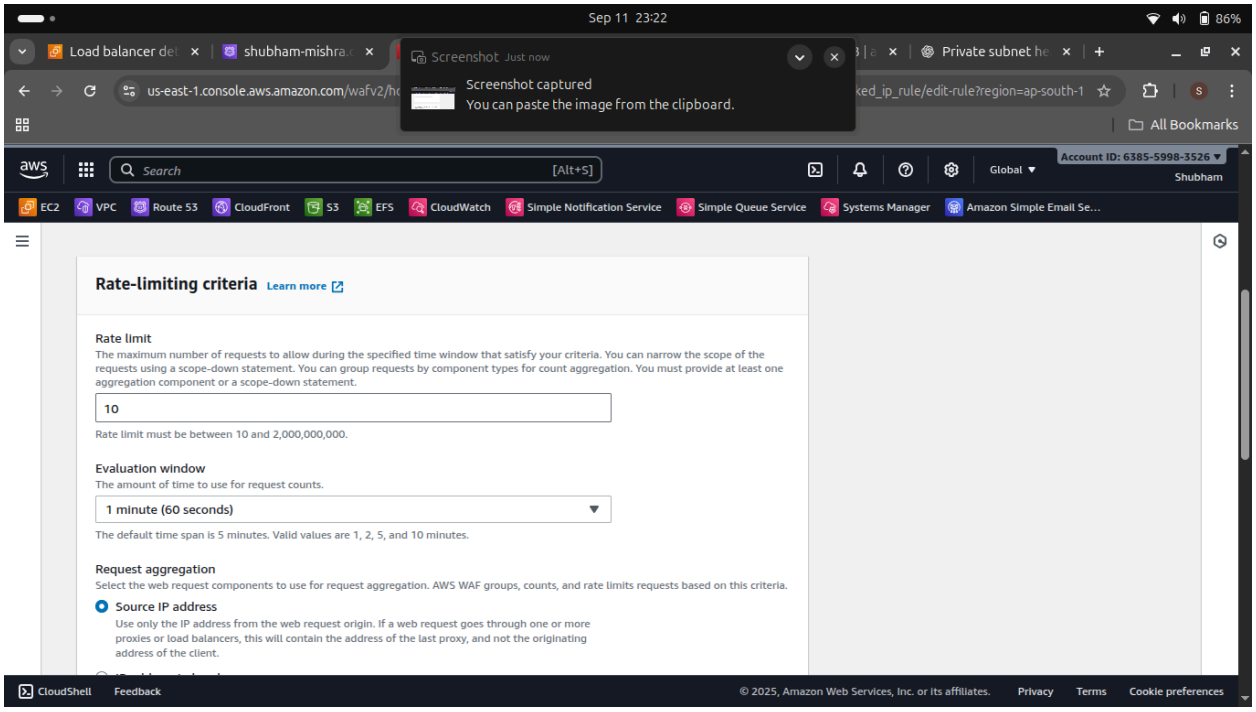
Now mapping this loadbalancer to route53 as alias record



STEP 16

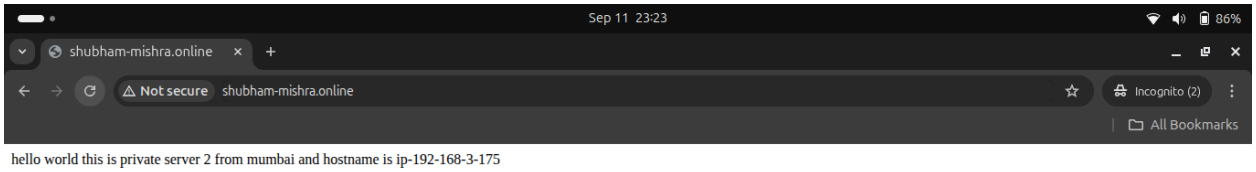
Now configuring another rate based rule in waf

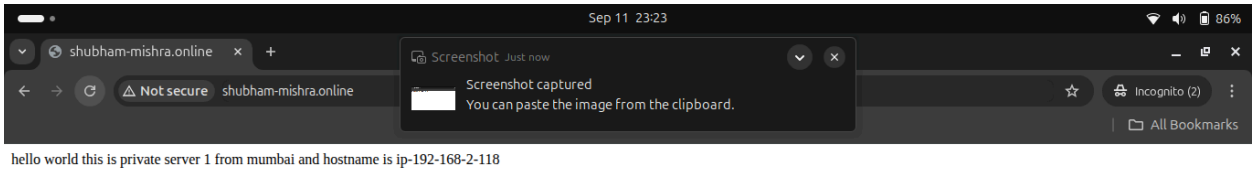




STEP 17

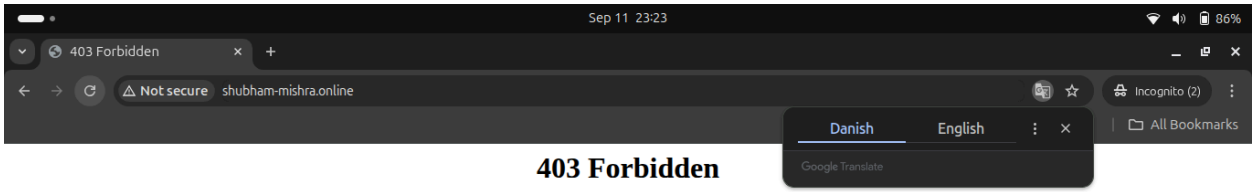
Now again i can access my webserves behind load balancer through my domain shubham-mishra.online





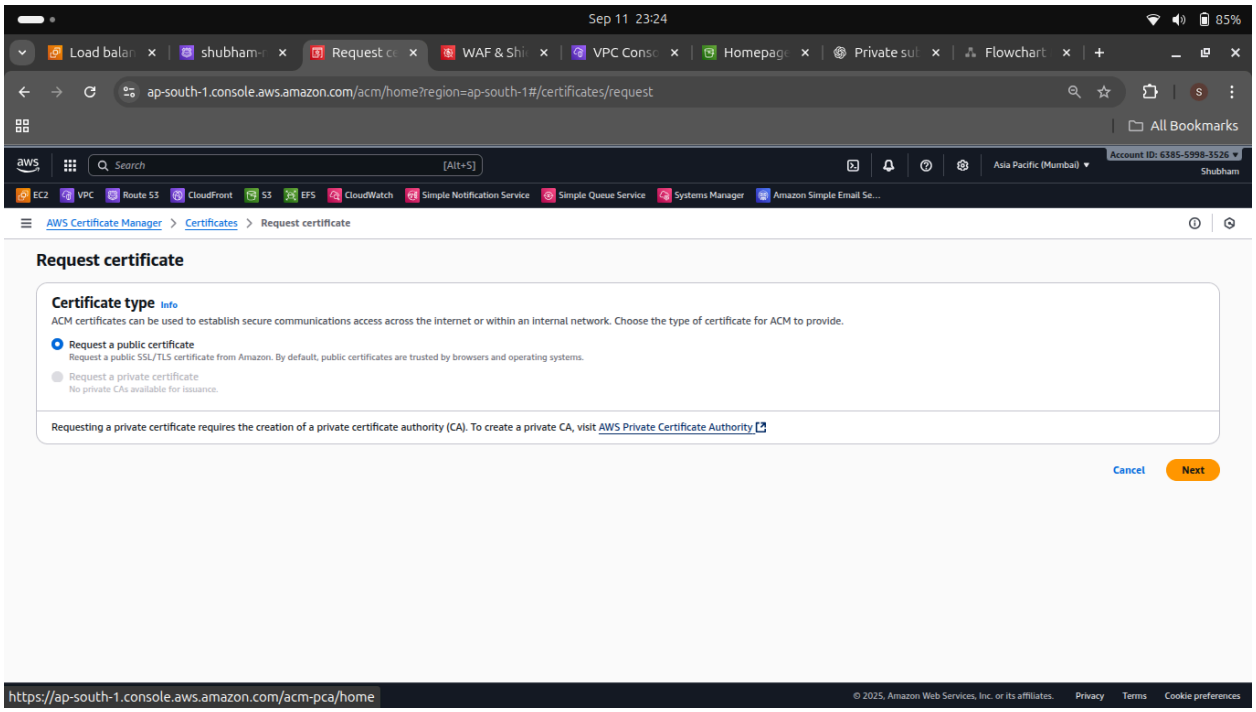
STEP 18

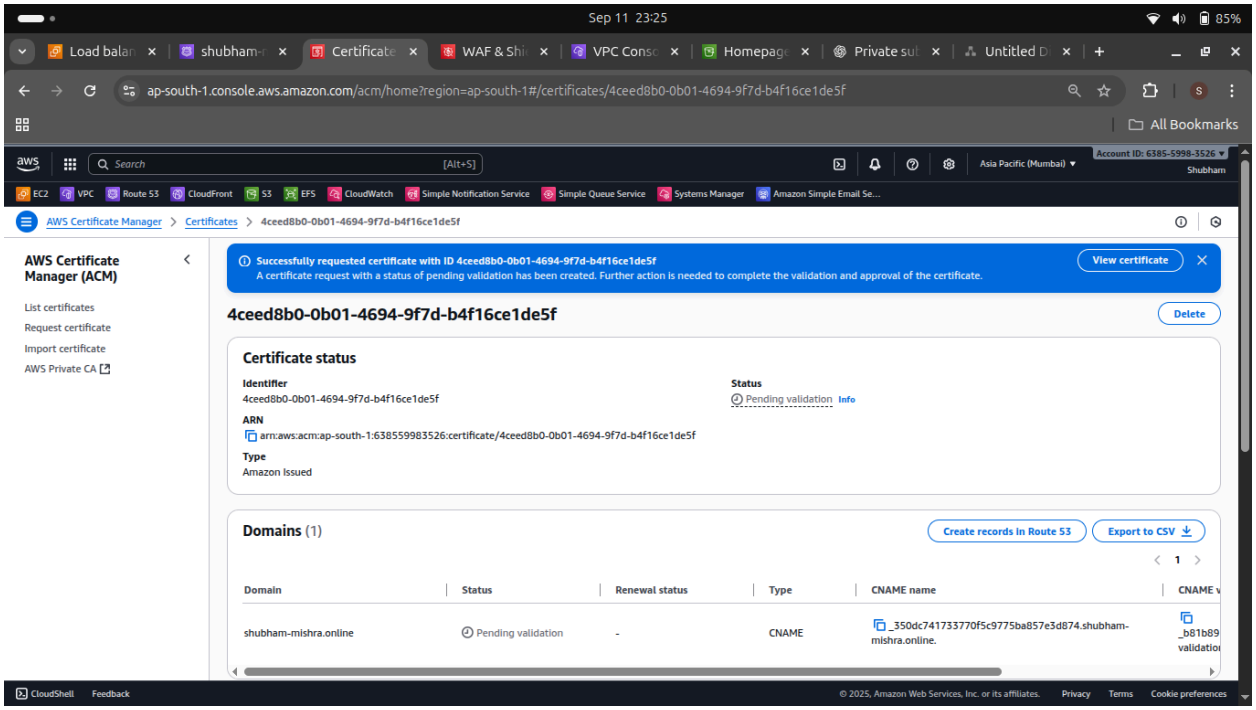
Now again after hitting rate limit of 10 request in 60 sec WAF blocked access



STEP 19

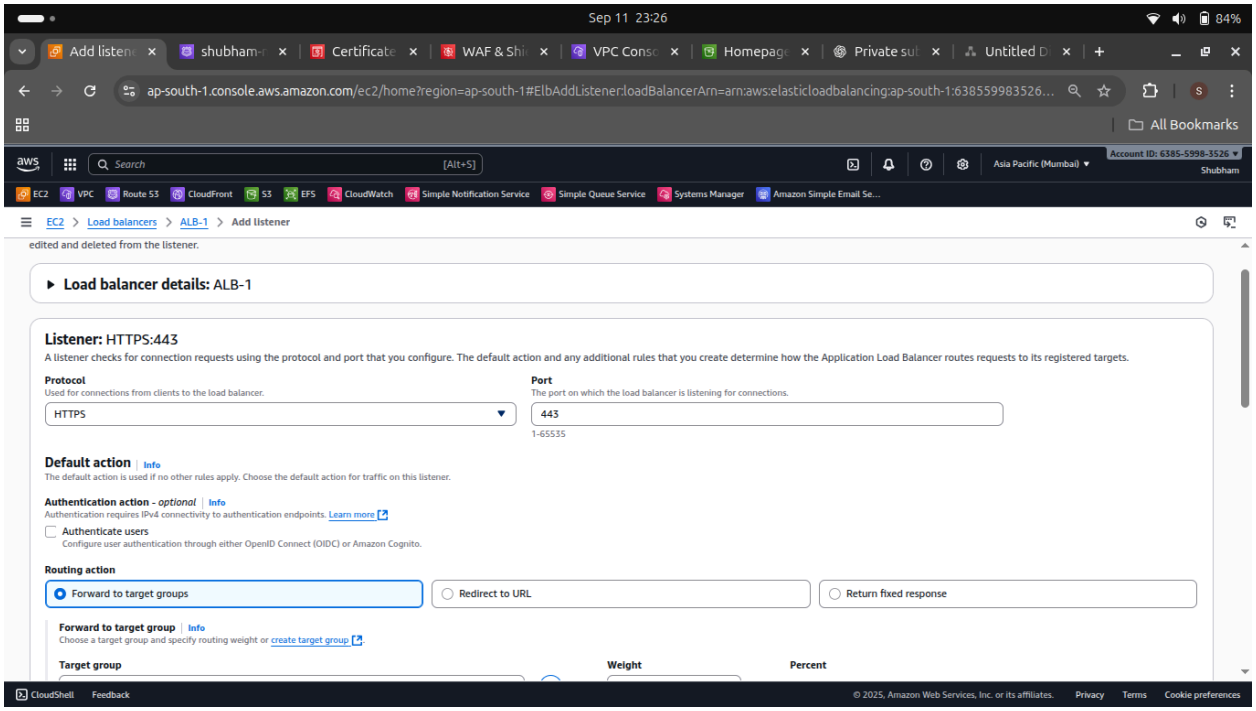
Now will add SSL certificate to my domain

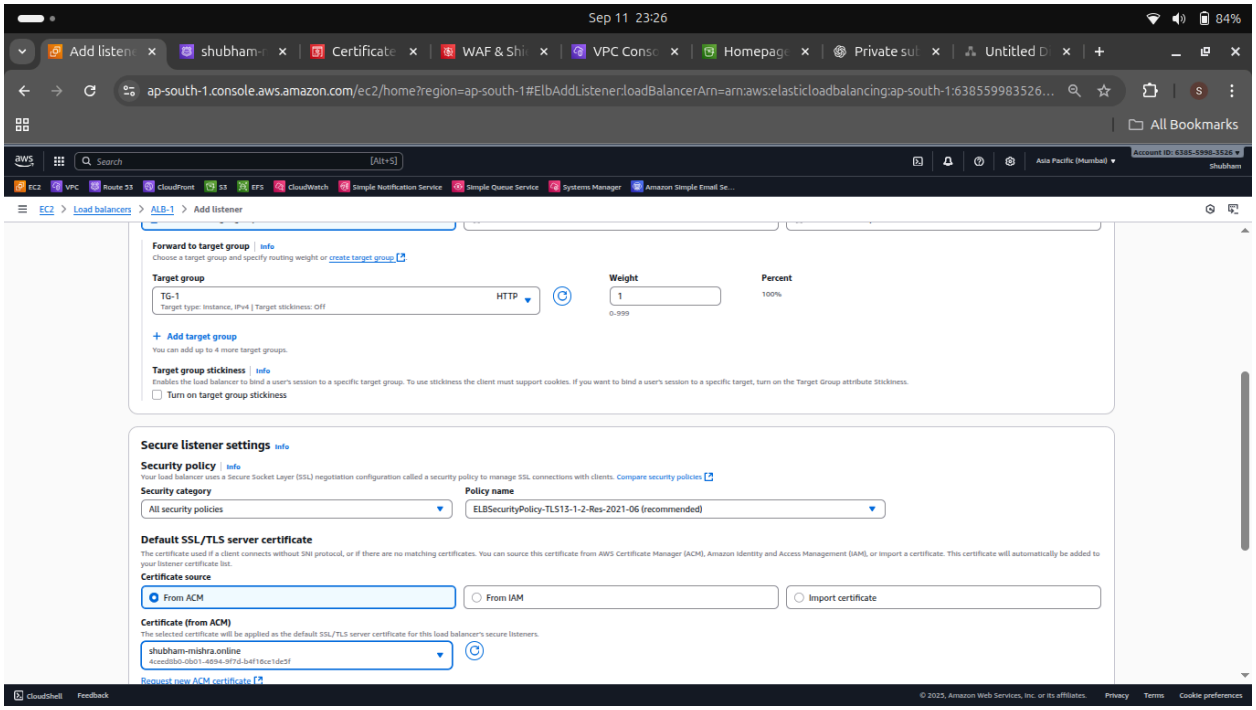




STEP 20

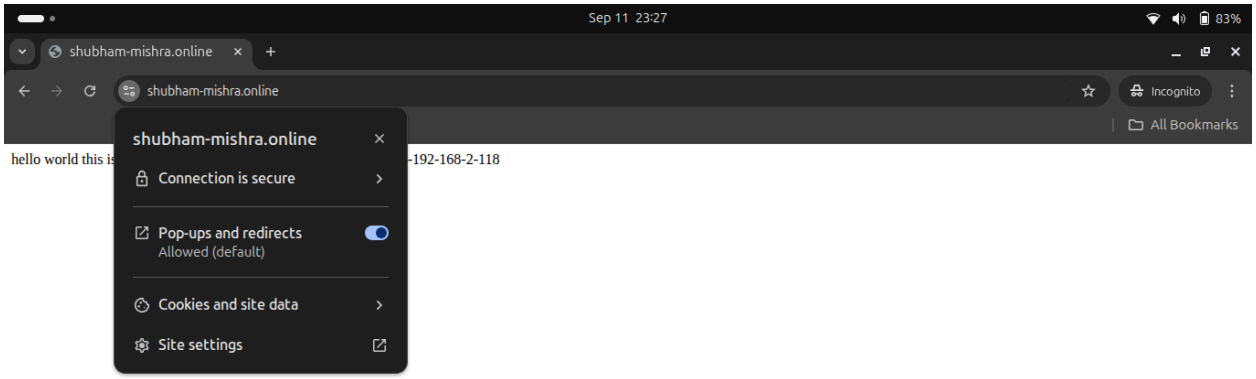
We will add https rule in loadbalancer to allows https access





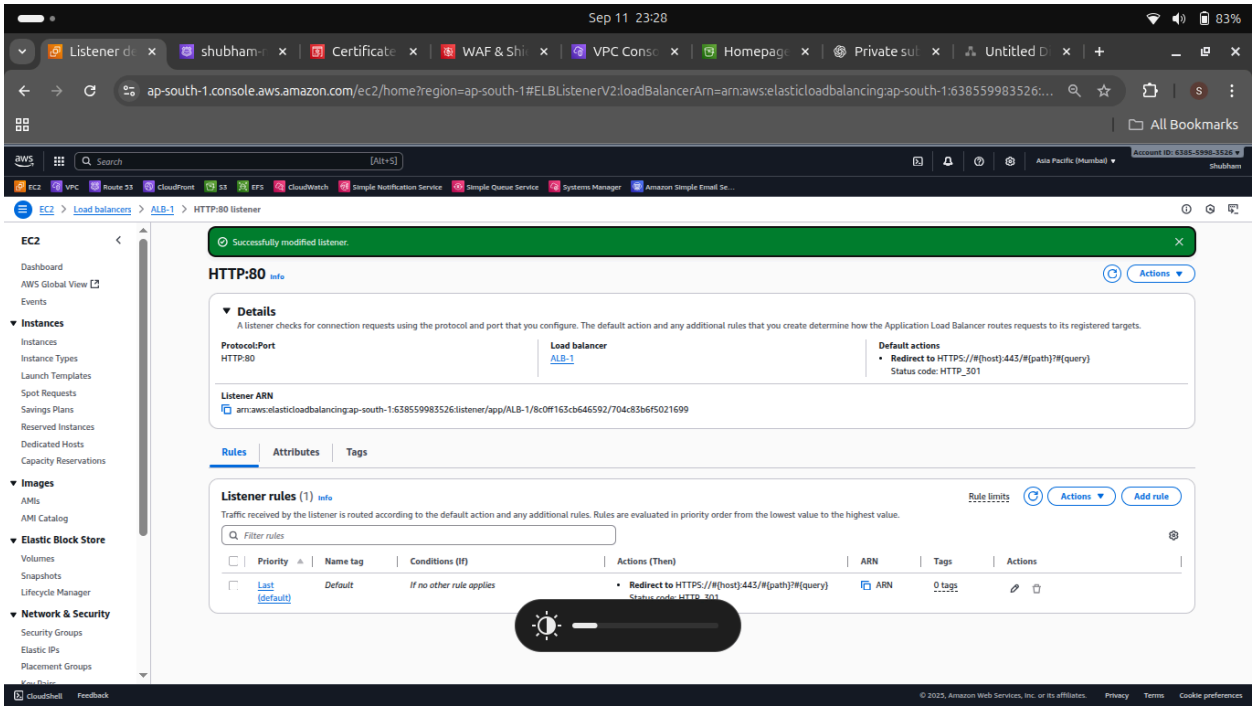
STEP 21

After successful validation we can access https://shubham-mishra.online which confirms ssl is working



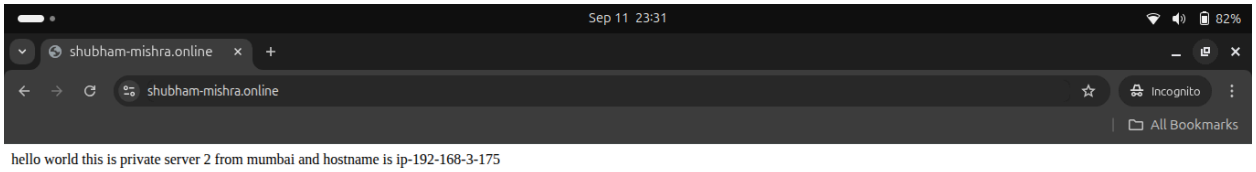
STEP 22

Now we will edit http rule in load balancer to redirect http request to https



STEP 23

We can see http://shubham-mishra.online request is redirected to https://shubham-mishra.online



This project showcases my ability to design and deploy a secure, scalable, and fault-tolerant AWS infrastructure by integrating networking, security, and

application delivery components. It reflects hands-on expertise in implementing cloud best practices suitable for production workloads.