

## AWS RESOURCES CREATED IN MANAGEMENT CONSOLE

1. Created a VPC
2. Created 2 public subnets & 2 private subnets in two availability zones respectively
3. Created 1 public route table and 2 private route table
4. Associated 2 public subnets to that 1 public route table and 2 private subnets to 2 different private route table respectively
5. Created an igw and attached it with the vpc and with 1 public route table
6. Created 2 elastic ips and 2 NAT gateways
7. Attached 2 NAT gateways to 2 different private route tables
8. Created an autoscaling group to create 2 ec2 instances in 2 private subnets in two different availability zones and to maintain the instances stable
9. Through the bastion host we will be login to private instances
10. And created an application load balancer to route the traffic properly between two ec2 instance

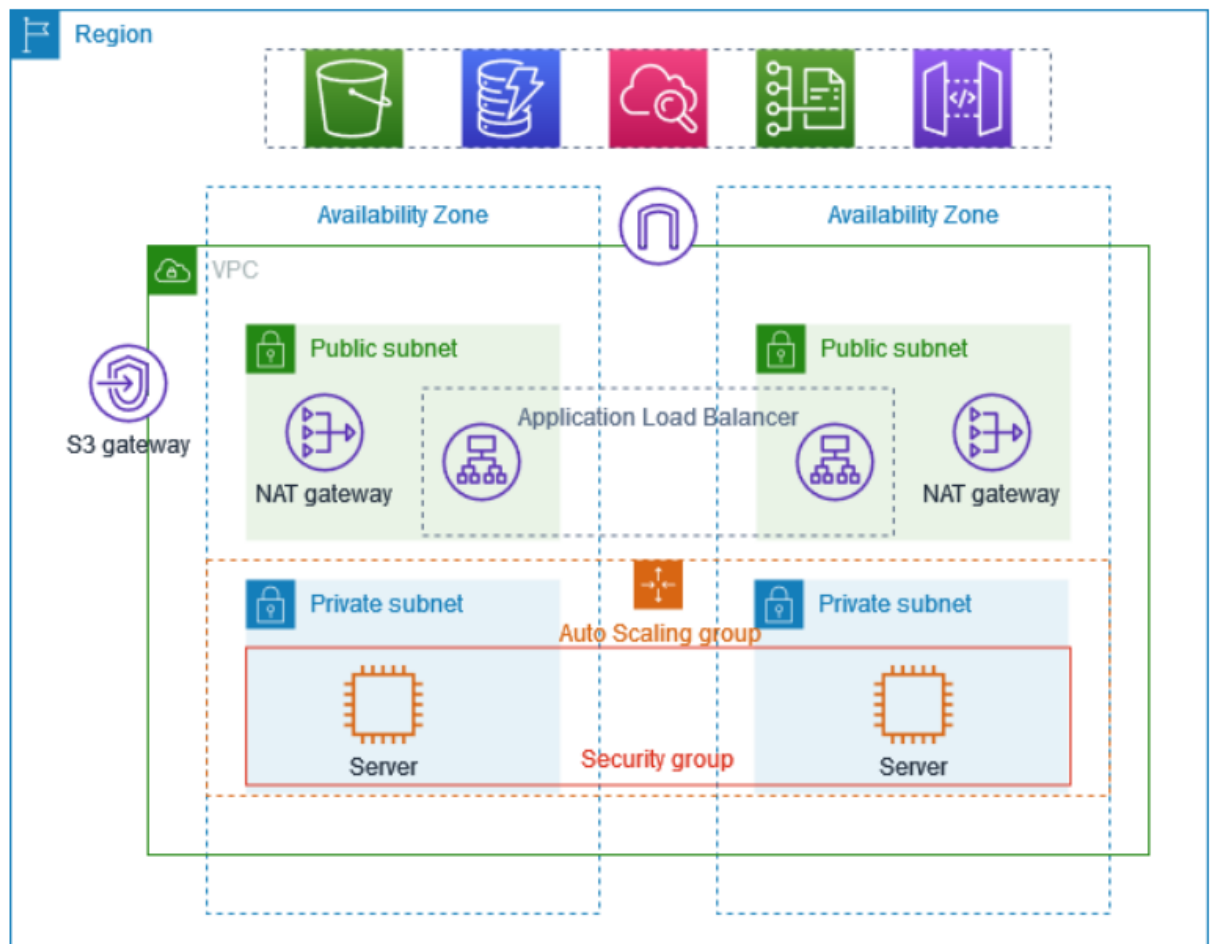
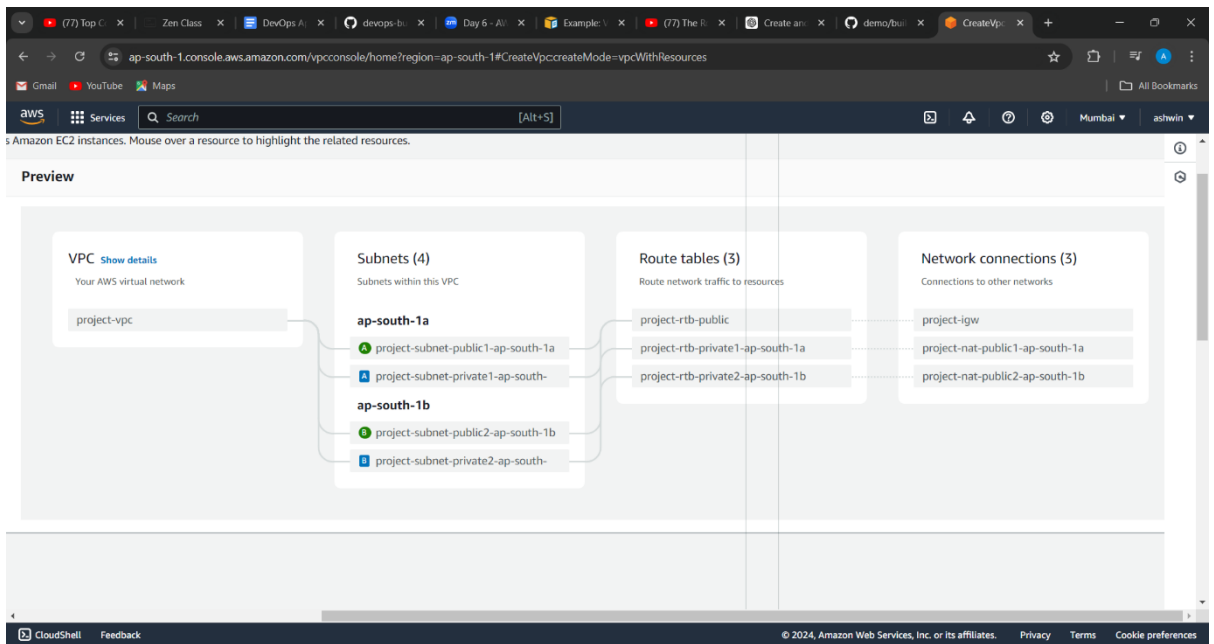


Diagram of the project



1.console diagram of the resources

The screenshot shows the AWS VPC console with the 'Your VPCs' list and the details for 'project-vpc'. The 'Your VPCs' table is as follows:

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP opt
-	vpc-0ad6bfc3fd7f65190	Available	172.31.0.0/16	-	dopt-0bcf
project-vpc	vpc-0be05c82d3fcec59e	Available	10.0.0.0/16	-	dopt-0bcf

The details for 'vpc-0be05c82d3fcec59e / project-vpc' are shown below:

Details			
VPC ID	State	DNS hostnames	DNS resolution
vpc-0be05c82d3fcec59e	Available	Enabled	Enabled
Tenancy	DHCP option set	Main route table	Main network ACL
Default	dopt-0bcf841eb6401f589b		

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2.created a VPC

Screenshot of the AWS Management Console showing the VPC dashboard. The left sidebar displays the navigation menu with options like EC2 Global View, Virtual private cloud, and Security. The main content area shows the 'Subnets (7) Info' page. A table lists 7 subnets, including 2 private and 2 public subnets. The table columns are Name, Subnet ID, State, VPC, IPv4 CIDR, and IP. Below the table, there is a 'Select a subnet' section.

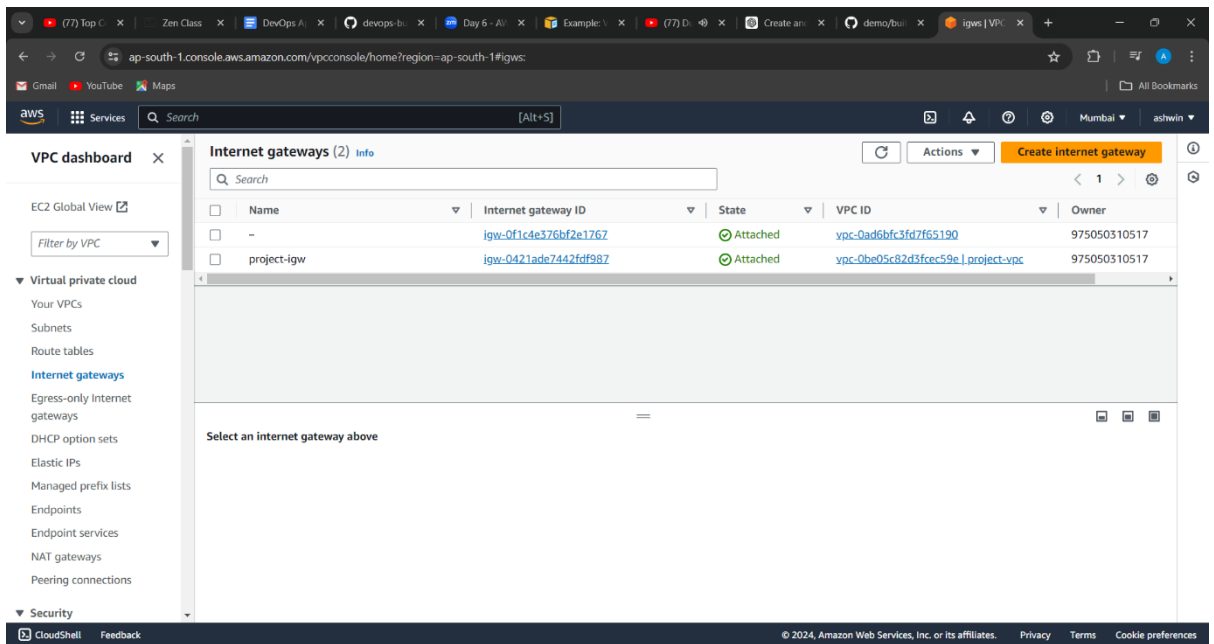
Name	Subnet ID	State	VPC	IPv4 CIDR	IP
project-subnet-private1-ap-south-1a	subnet-0e4c9e6e571d5066e	Available	vpc-0be05c82d3fcec59e	10.0.128.0/20	-
-	subnet-0496a94822b0d3246	Available	vpc-0ad6bfc3fd7f65190	172.31.16.0/20	-
-	subnet-0318cd89a992d29dc	Available	vpc-0ad6bfc3fd7f65190	172.31.0.0/20	-
-	subnet-0b4153c6b16eb6f60	Available	vpc-0ad6bfc3fd7f65190	172.31.32.0/20	-
project-subnet-private2-ap-south-1b	subnet-0387a9f5e3012a012	Available	vpc-0be05c82d3fcec59e	10.0.144.0/20	-
project-subnet-public1-ap-south-1a	subnet-018ffa78d351f8bc	Available	vpc-0be05c82d3fcec59e	10.0.0.0/20	-
project-subnet-public2-ap-south-1b	subnet-02a2b4a74c3c614df	Available	vpc-0be05c82d3fcec59e	10.0.16.0/20	-

3.created 4 subnets with 2 public and 2 private subnets

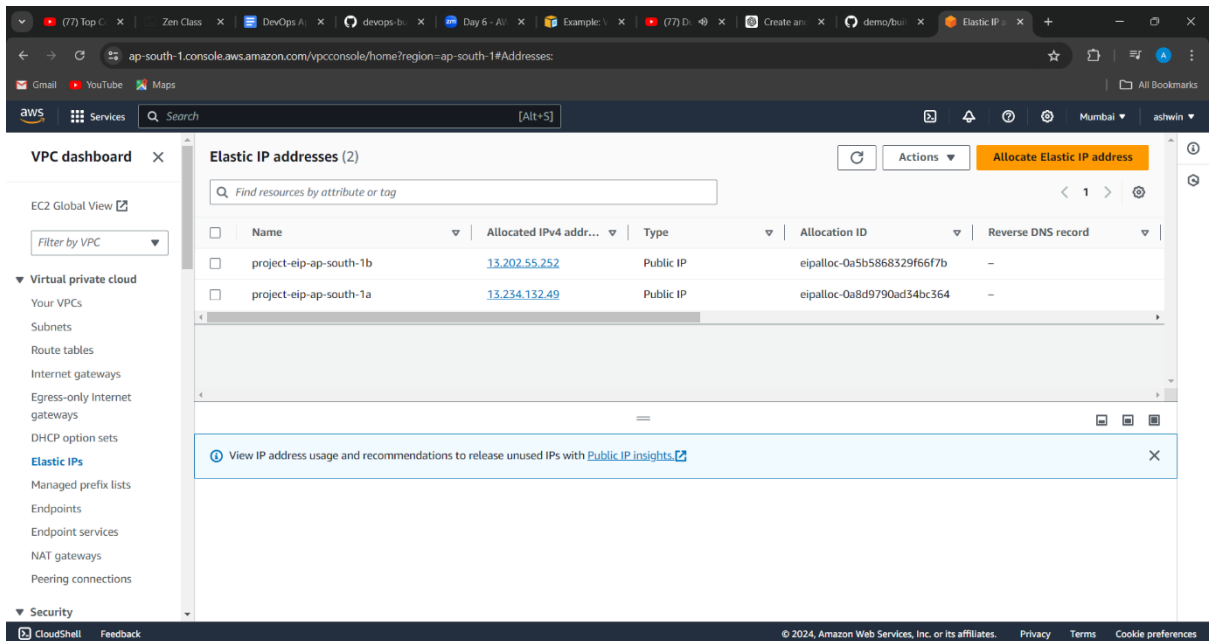
Screenshot of the AWS Management Console showing the VPC dashboard. The left sidebar displays the navigation menu with options like EC2 Global View, Virtual private cloud, and Security. The main content area shows the 'Route tables (5) Info' page. A table lists 5 route tables, including 1 public and 2 private route tables. The table columns are Name, Route table ID, Explicit subnet associ..., Edge associations, Main, and VPC. Below the table, there is a 'Select a route table' section.

Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC
project-rtb-private1-ap-south-1a	rtb-04f43c0942295ee5d	subnet-0e4c9e6e571d50...	-	No	vpc-0be05c82d3fcec59e
-	rtb-0413b22ff194bfc65	-	-	Yes	vpc-0be05c82d3fcec59e
project-rtb-public	rtb-0e6a74bb8ce2e7100	2 subnets	-	No	vpc-0be05c82d3fcec59e
project-rtb-private2-ap-south-1b	rtb-0d70502c8cb7a2200	subnet-0387a9f5e3012a...	-	No	vpc-0be05c82d3fcec59e
-	rtb-01ff595c85deaa63	-	-	Yes	vpc-0ad6bfc3fd7f65190

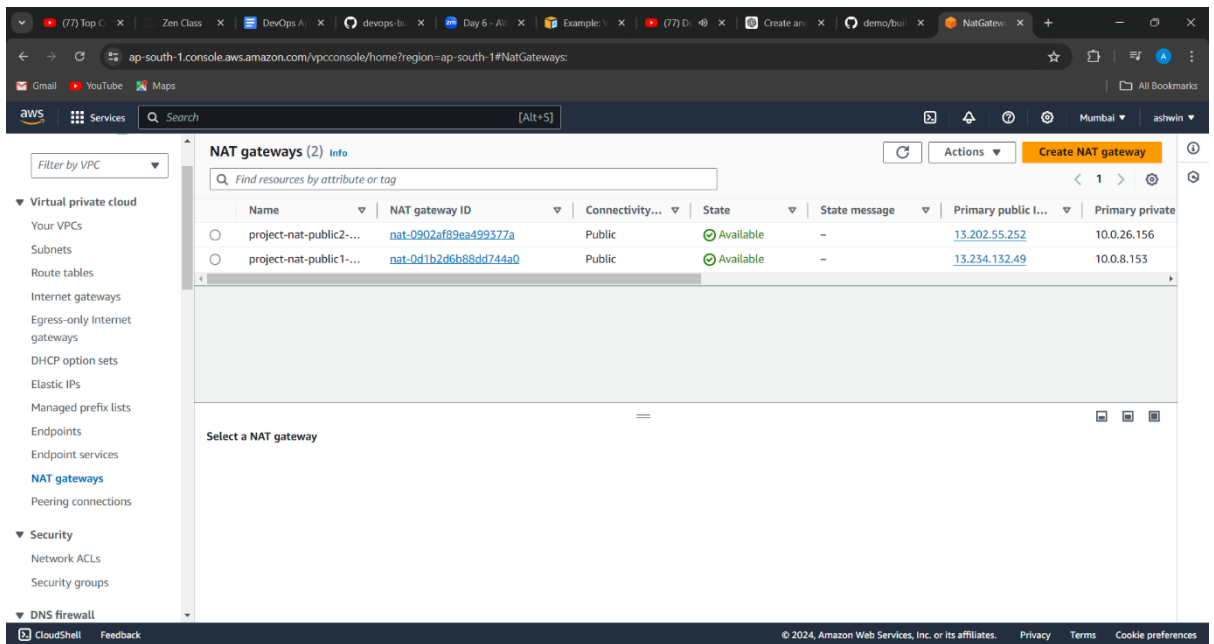
4.created 3 route tables 1 for public and 2 for private subnets



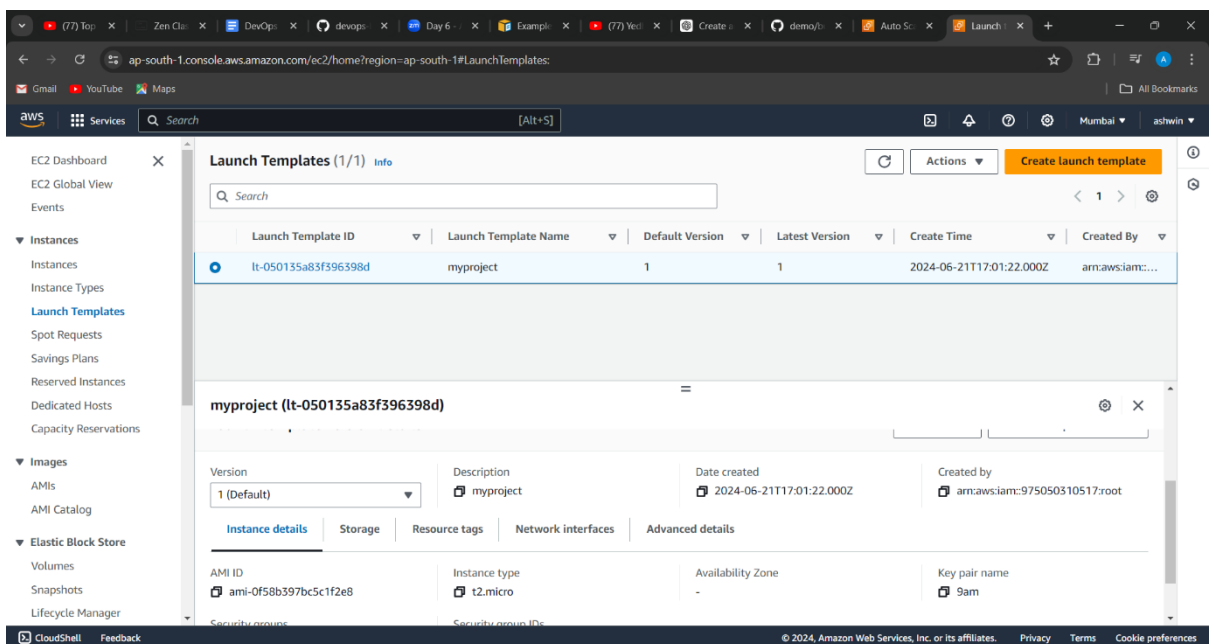
5.created an igw and attached to vpc and public route table



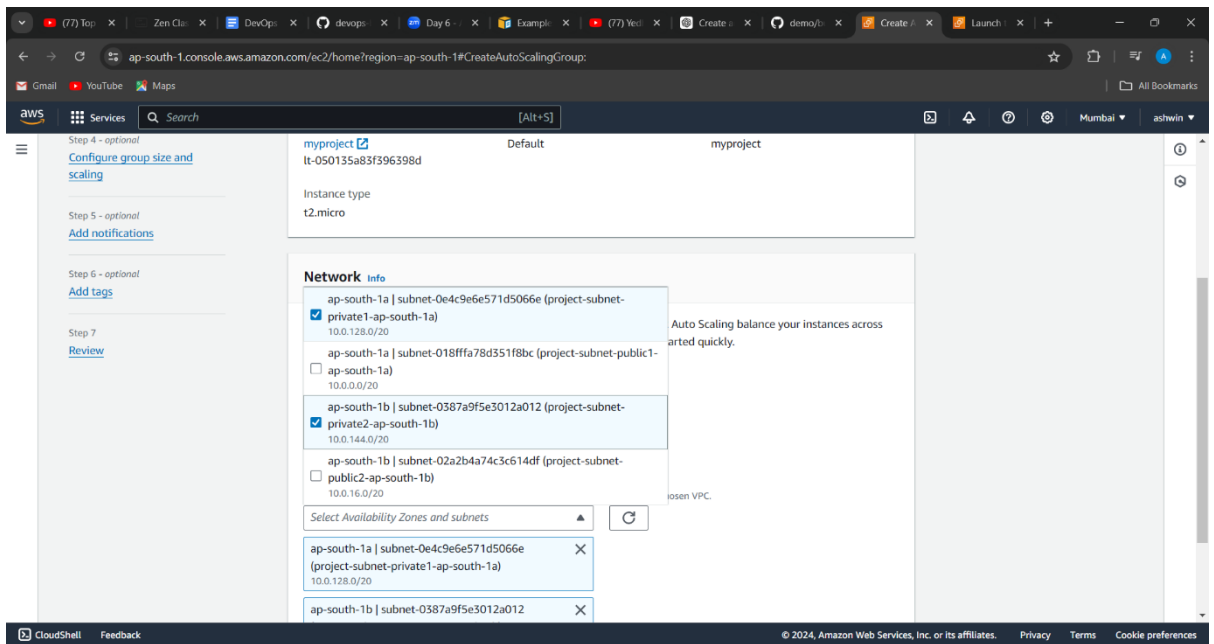
6.created 2 elastic ips to create 2 NAT gateways



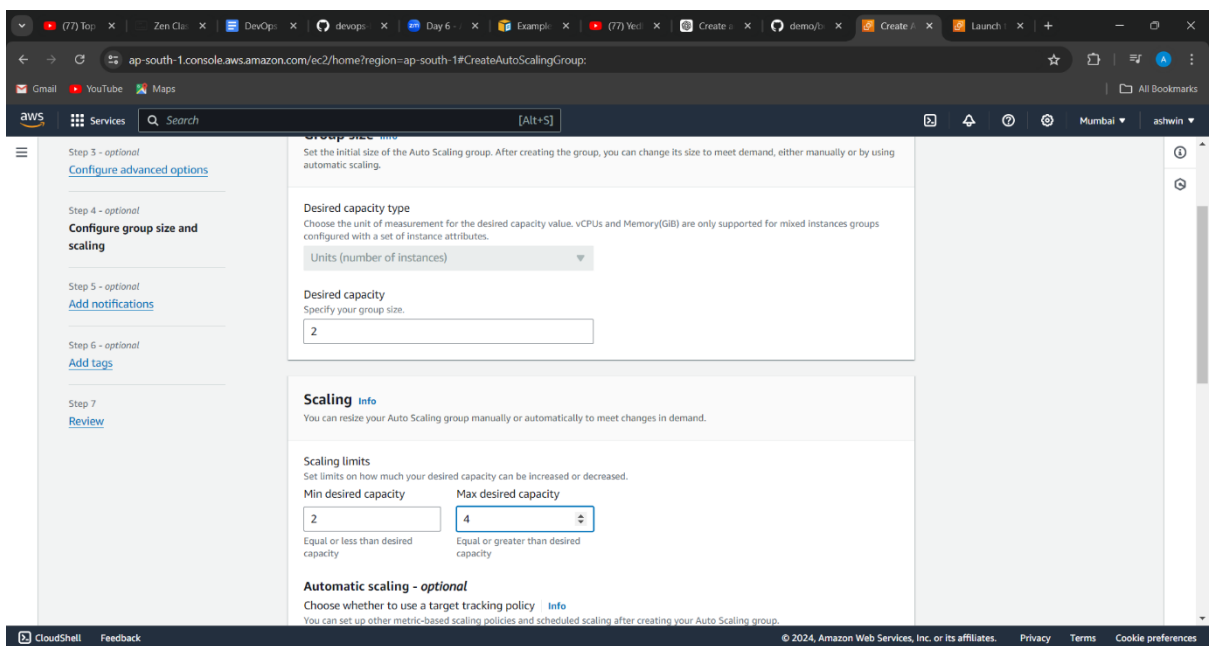
7.created two nat gateways for each route tables



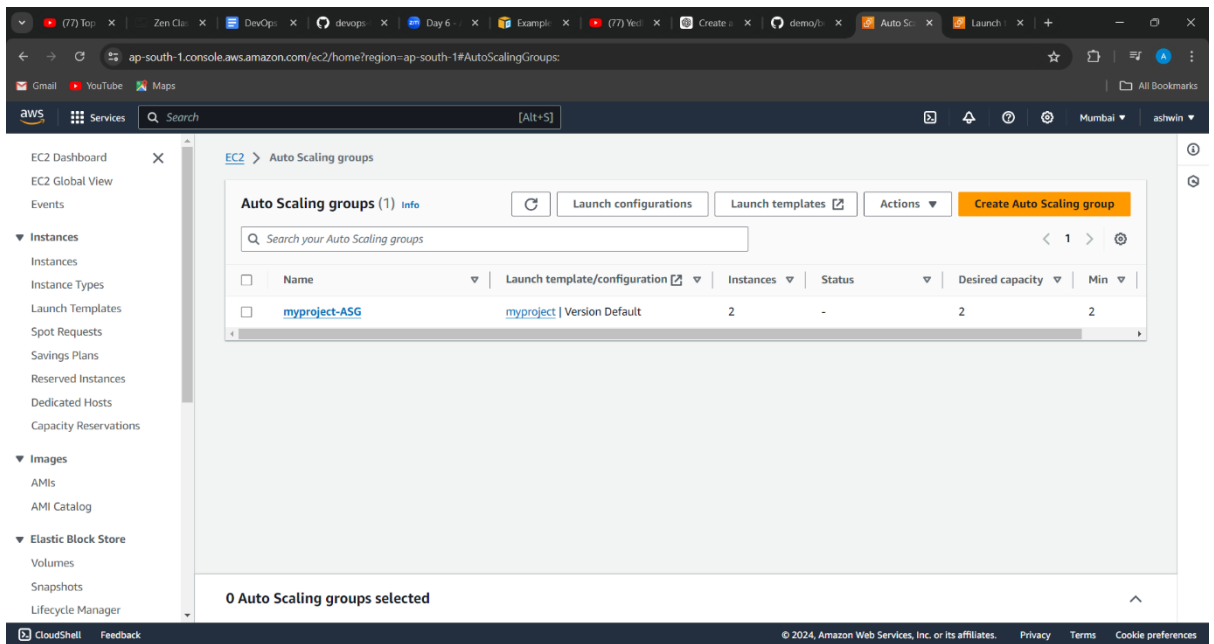
8. Created a launch template to create autoscaling group



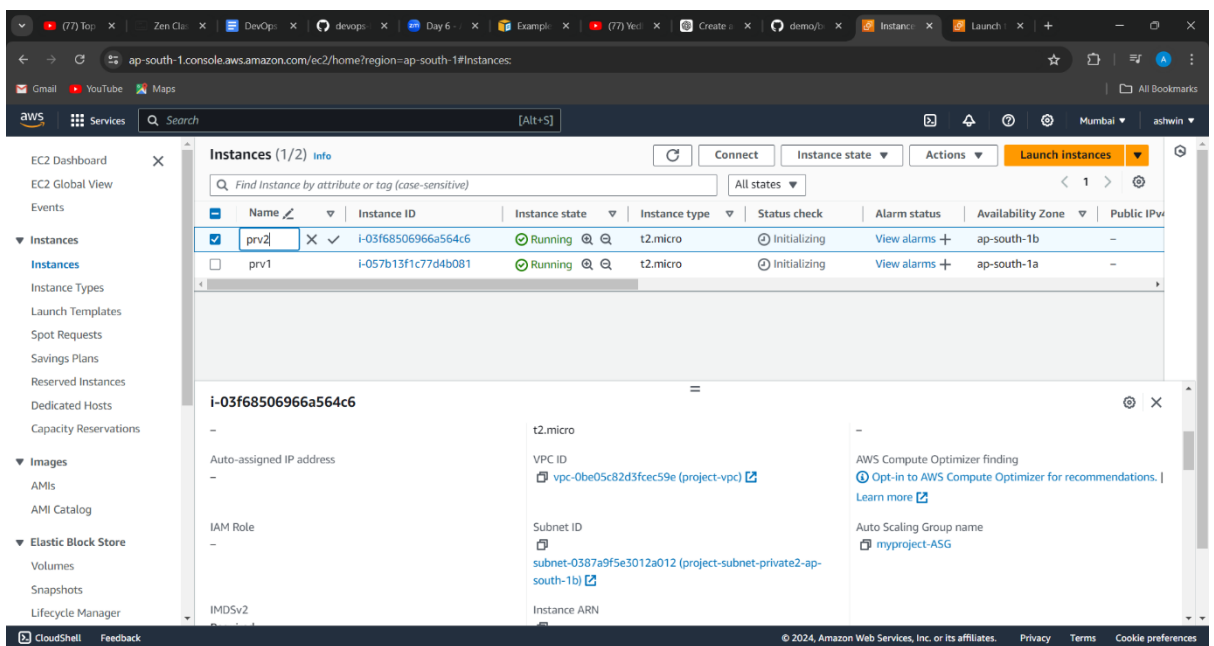
9. in autoscaling group selecting the 2 private subnets were the ec2 instance has to be created



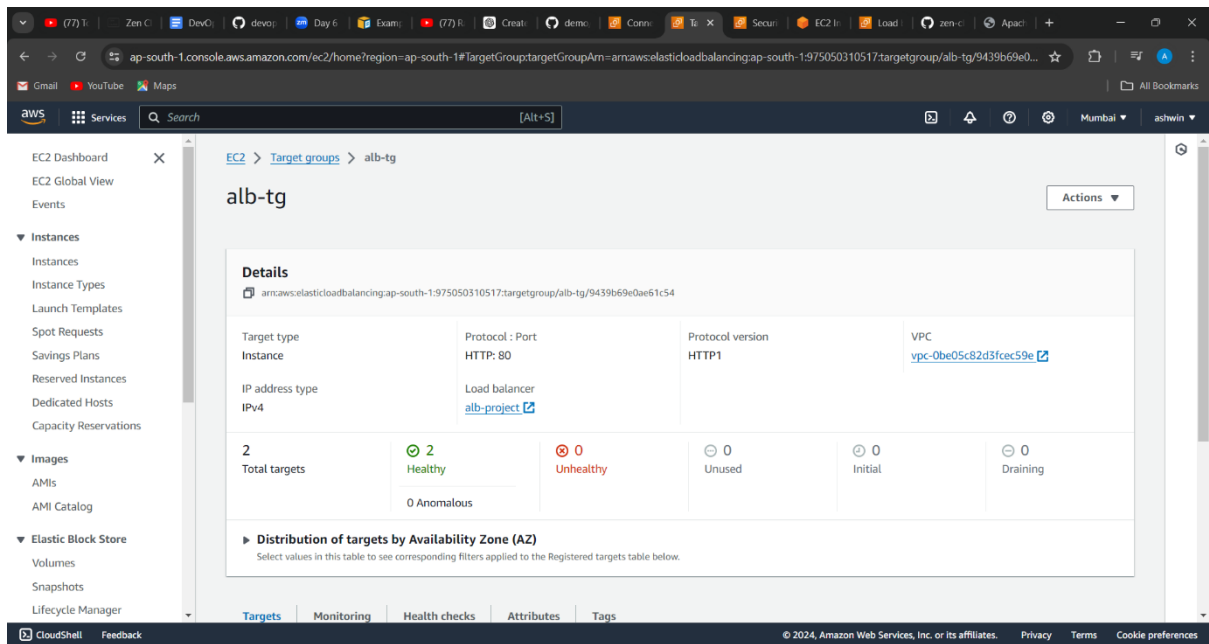
10 specifying desired capacity of ec2 instances and min & max capacity to maintain the load



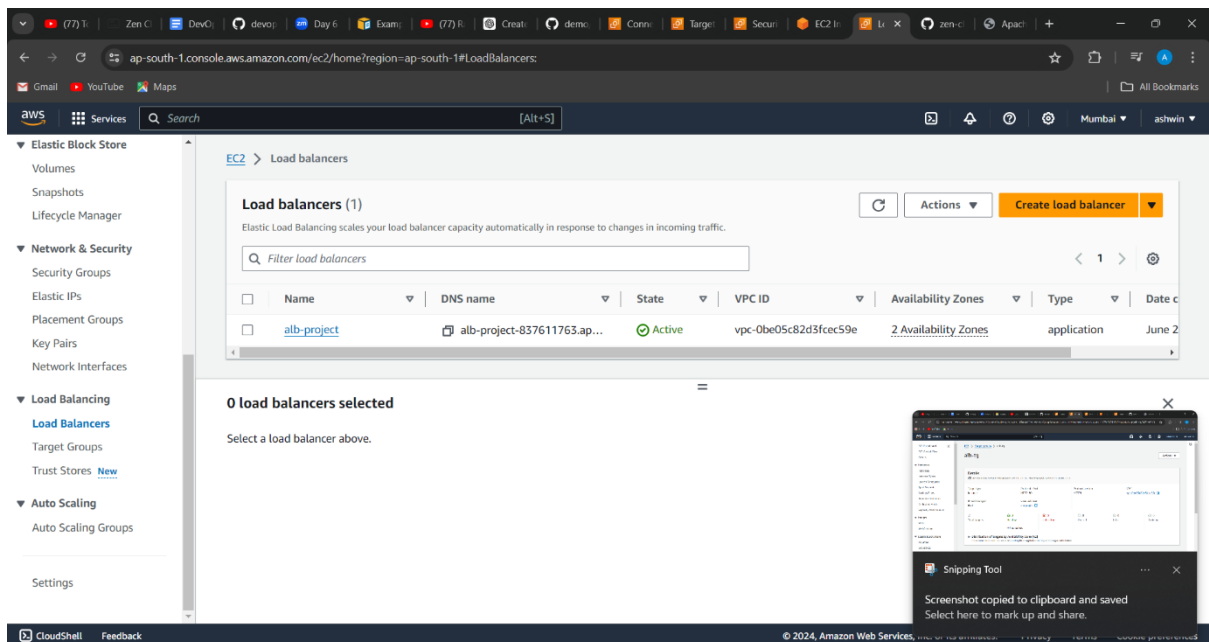
11.asg has been created



12. 2 instances has been created in 2 private subnets



13. Application load balancer target group has been created with the 2 instances



14. Alb has been created to route the traffic



```
ubuntu@ip-10-0-159-23: ~$
Load key "9am.pem": bad permissions
ubuntu@ip-10-0-159-23: ~$ chmod 400 "9am.pem"
ubuntu@ip-10-0-12-120: ~$ ssh -i "9am.pem" ubuntu@10.0.159.23
welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1008-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Fri Jun 21 17:54:59 UTC 2024

System load:  0.08               Processes:    105
Usage of /:   23.1% of 6.71GB    Users logged in: 0
Memory usage: 19%               IPV4 address for enx0: 10.0.159.23
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-10-0-159-23: ~$ sudo systemctl status nginx
Unit nginx.service could not be found.
```

15. login to the private ec2 instance with bastion host

```
ubuntu@ip-10-0-159-23: ~$
Suggested packages:
fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  nginx nginx-common
0 upgraded, 2 newly installed, 0 to remove and 77 not upgraded.
Need to get 552 kB of archives.
After this operation, 1596 kB of additional disk space will be used.
Get:1 http://ap-south-1-ec2.archive.ubuntu.com/ubuntu noble/main amd64 nginx-common all 1.24.0-2ubuntu7 [31.2 kB]
Get:2 http://ap-south-1-ec2.archive.ubuntu.com/ubuntu noble/main amd64 nginx amd64 1.24.0-2ubuntu7 [521 kB]
Fetched 552 kB in 0s (2001 kB/s)
Preconfiguring packages ...
Selecting previously unselected package nginx-common.
(Reading database ... 71839 files and directories currently installed.)
Preparing to unpack .../nginx-common_1.24.0-2ubuntu7_all.deb ...
Unpacking nginx-common (1.24.0-2ubuntu7) ...
Selecting previously unselected package nginx.
Preparing to unpack .../nginx_1.24.0-2ubuntu7_amd64.deb ...
Unpacking nginx (1.24.0-2ubuntu7) ...
Setting up nginx (1.24.0-2ubuntu7) ...
Setting up nginx-common (1.24.0-2ubuntu7) ...
Created symlink /etc/systemd/system/multi-user.target.wants/nginx.service → /usr/lib/systemd/system/nginx.service.
Processing triggers for ufw (0.36-2.6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
Starting nginx...
Synchronizing state of nginx.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable nginx
Checking nginx status...
● nginx.service - A high performance web server and a reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: enabled)
   Active: active (running) since Fri 2024-06-21 17:57:37 UTC; 8s ago
     Docs: man:nginx(8)
   Main PID: 1741 (nginx)
    Tasks: 2 (limit: 1130)
   Memory: 1.7M (peak: 1.9M)
      CPU: 12m
   CGroup: /system.slice/nginx.service
           └─1741 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             └─1742 "nginx: worker process"

Jun 21 17:57:37 ip-10-0-159-23 systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy server...
Jun 21 17:57:37 ip-10-0-159-23 systemd[1]: Started nginx.service - A high performance web server and a reverse proxy server.
nginx installation completed. You can access it via the following IP address:
10.0.159.23
Script execution completed.
ubuntu@ip-10-0-159-23: ~$
```

16 installed nginx web page into it

```
ubuntu@ip-10-0-133-81: ~
logout
Connection to 10.0.159.23 closed.
ubuntu@ip-10-0-12-120:~$ ssh -i "9am.pem" ubuntu@10.0.133.81
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1008-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

System information as of Fri Jun 21 18:00:08 UTC 2024

System load:  0.0          Processes:      103
Usage of /:   23.1% of 6.71GB   Users logged in: 0
Memory usage: 19%          IPv4 address for enx0: 10.0.133.81
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
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individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-10-0-133-81:~$ sudo systemctl status apache2
```

## 17. login to another private instance through bastion host

```
ubuntu@ip-10-0-133-81: ~
Enabling module authz_user.
Enabling module alias.
Enabling module dir.
Enabling module autoindex.
Enabling module env.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.2-0) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

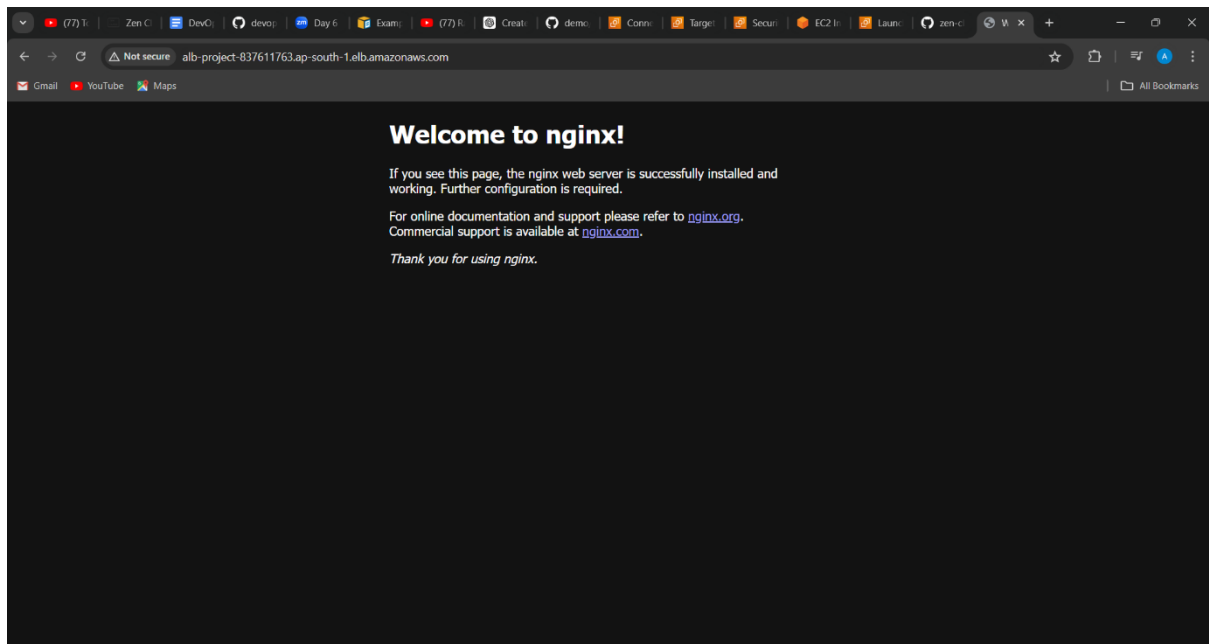
No containers need to be restarted.

No user sessions are running outdated binaries.

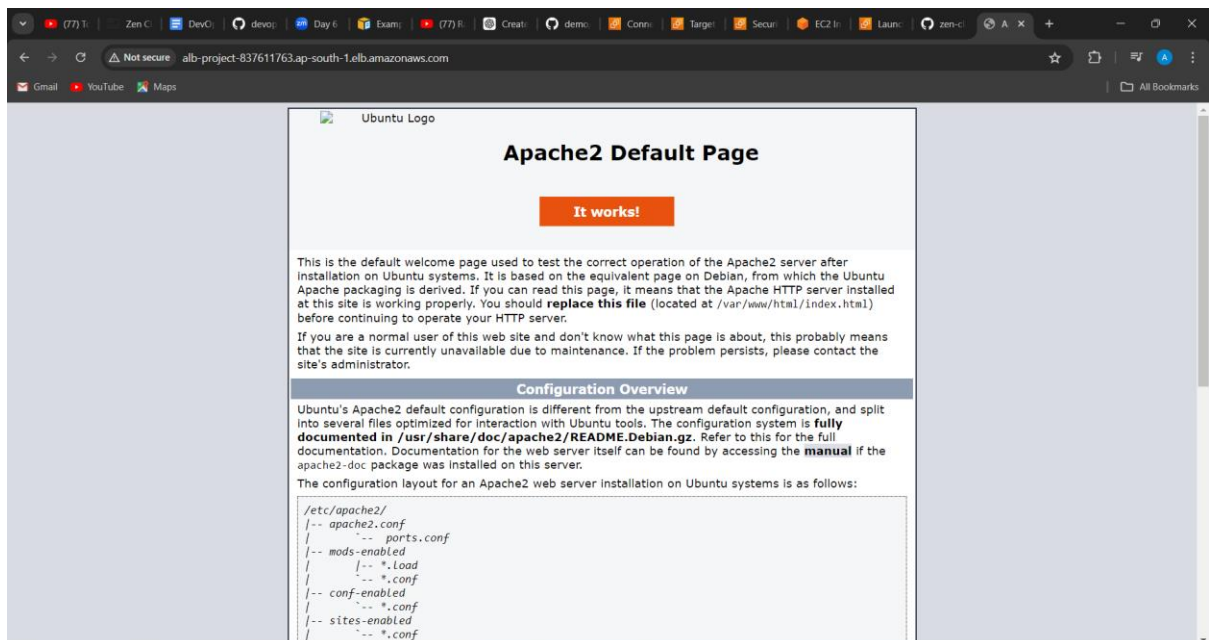
No VM guests are running outdated hypervisor (qemu) binaries on this host.
80/tcp: 2138 2141 2142
Synchronizing state of apache2.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable apache2
Rules updated
Rules updated (v6)
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
   Active: active (running) since Fri 2024-06-21 18:03:13 UTC; 1s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 2418 (apache2)
     Tasks: 55 (limit: 1130)
    Memory: 5.2M (peak: 5.3M)
       CPU: 28ms
   CGroup: /system.slice/apache2.service
           └─2418 /usr/sbin/apache2 -k start
             └─2421 /usr/sbin/apache2 -k start
               └─2422 /usr/sbin/apache2 -k start

Jun 21 18:03:12 ip-10-0-133-81 systemd[1]: apache2.service: Failed with result 'signal'.
Jun 21 18:03:13 ip-10-0-133-81 systemd[1]: apache2.service: Scheduled restart job, restart counter is at 1.
Jun 21 18:03:13 ip-10-0-133-81 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Jun 21 18:03:13 ip-10-0-133-81 systemd[1]: Started apache2.service - The Apache HTTP Server.
ubuntu@ip-10-0-133-81:~$
```

## 18. installed Apache web page to it



19. accessed nginx page with Alb id



20.accessed Apache page with Alb id

