

# AWS Cloud & DevOps

## Ebubechukwu Azozie

### ELB Homework

---

#### Description

Elastic Load Balancer

Homework 1: Internet-facing Load Balancer with Public Subnet

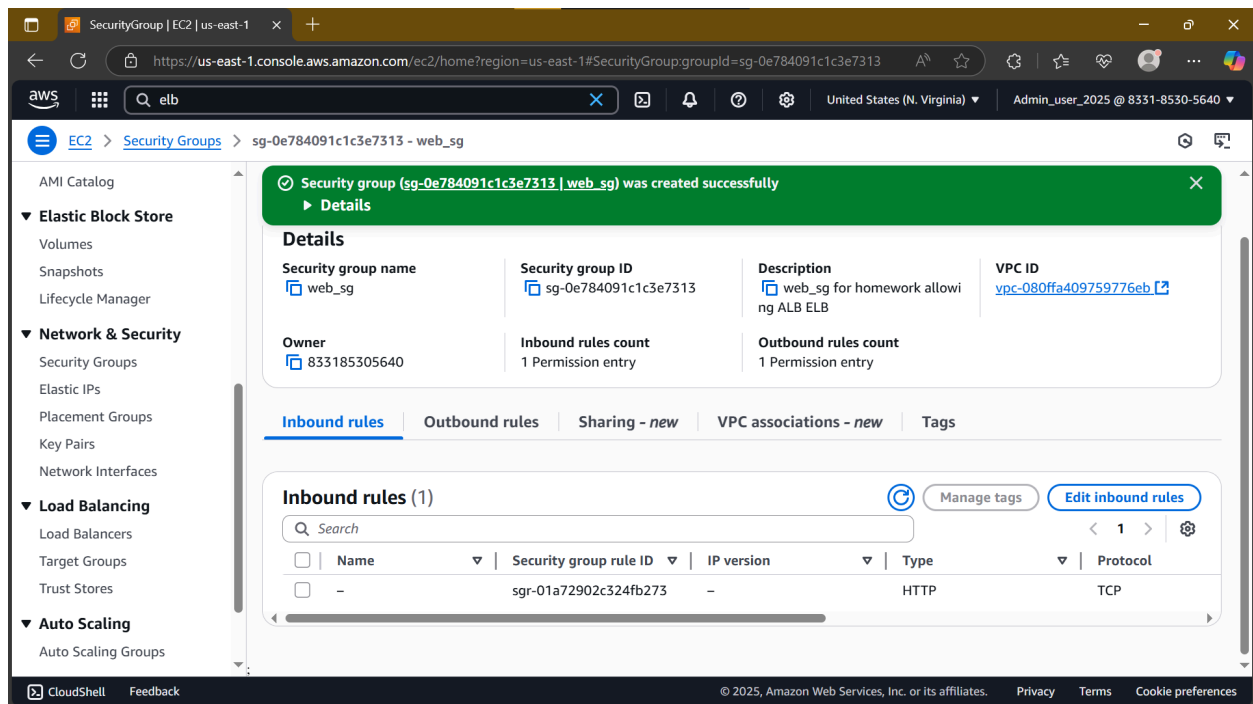
Build a Highly available Website using the instructions below from today's class

NB: please read carefully the instructions and if needed refer to the video recording  
find user data script at the bottom

Step 1: Create ALB and Webserver Security Group —> “alb\_sg” and “web\_sg” alb\_sg should allow 0.0.0.0/0 on port 80

web\_sg should allow alb\_sg on port 80

take screenshot showing inbound rule of web\_sg



NB: please make sure you TAG your resources and note the alb\_sg id

Step 2: Create your Public webserver Image —> tag: image\_server\_1 and tag: image\_server\_2

test using public ip address

take screenshot showing timeout of both in the browser

Instances | EC2 | us-east-1

54.146.136.248

https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:

Search [Alt+S] United States (N. Virginia) Admin\_user\_2025 @ 8331-8530-5640

EC2 > Instances

EC2

Dashboard

EC2 Global View

Events

▼ Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

▼ Images

AMIs

AMI Catalog

▼ Elastic Block Store

CloudShell Feedback

Instances (2) Info Last updated less than a minute ago

Connect Instance state Actions Launch instances

Find Instance by attribute or tag (case-sensitive) Running

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status
<input type="checkbox"/>	image_server_2	i-0d2394f3ef506e466	Running	t2.micro	2/2 checks passed	View alarms +
<input type="checkbox"/>	image_server_1	i-0e2e749b25eec0a63	Running	t2.micro	2/2 checks passed	View alarms +

Select an instance

© 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Instances | EC2 | us-east-1

54.146.136.248

3.208.16.87

54.146.136.248

Hmmm... can't reach this page

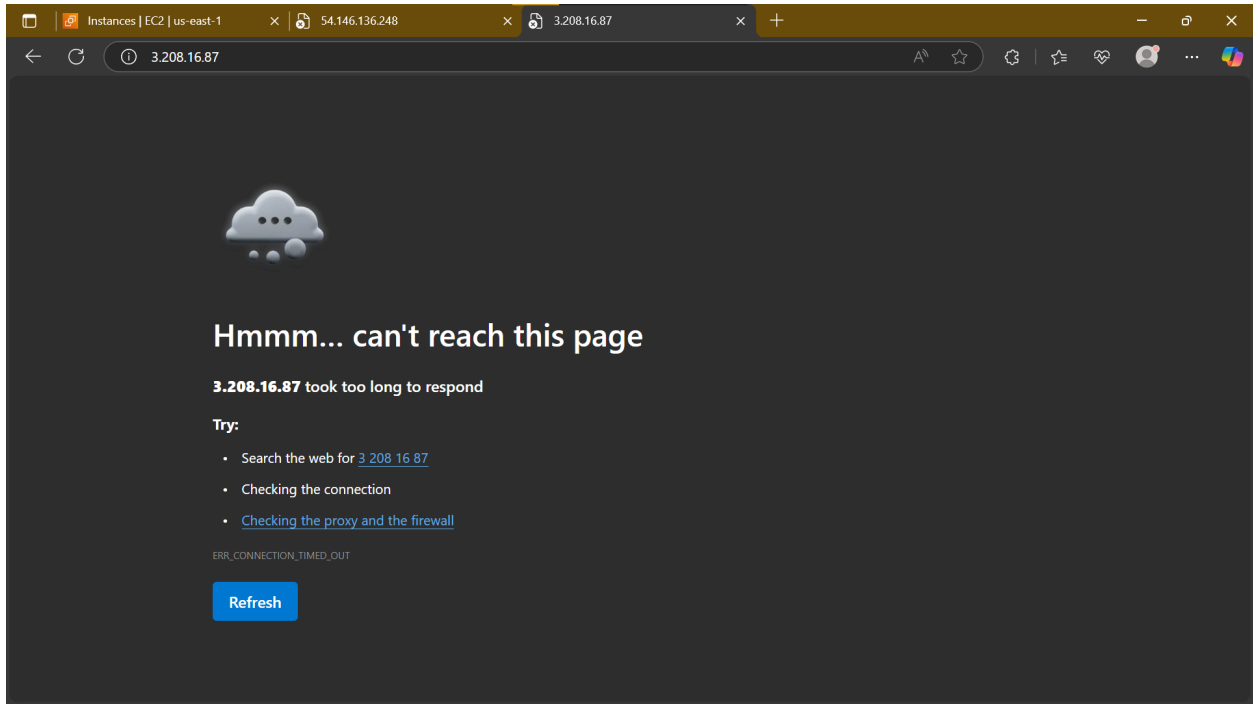
54.146.136.248 took too long to respond

Try:

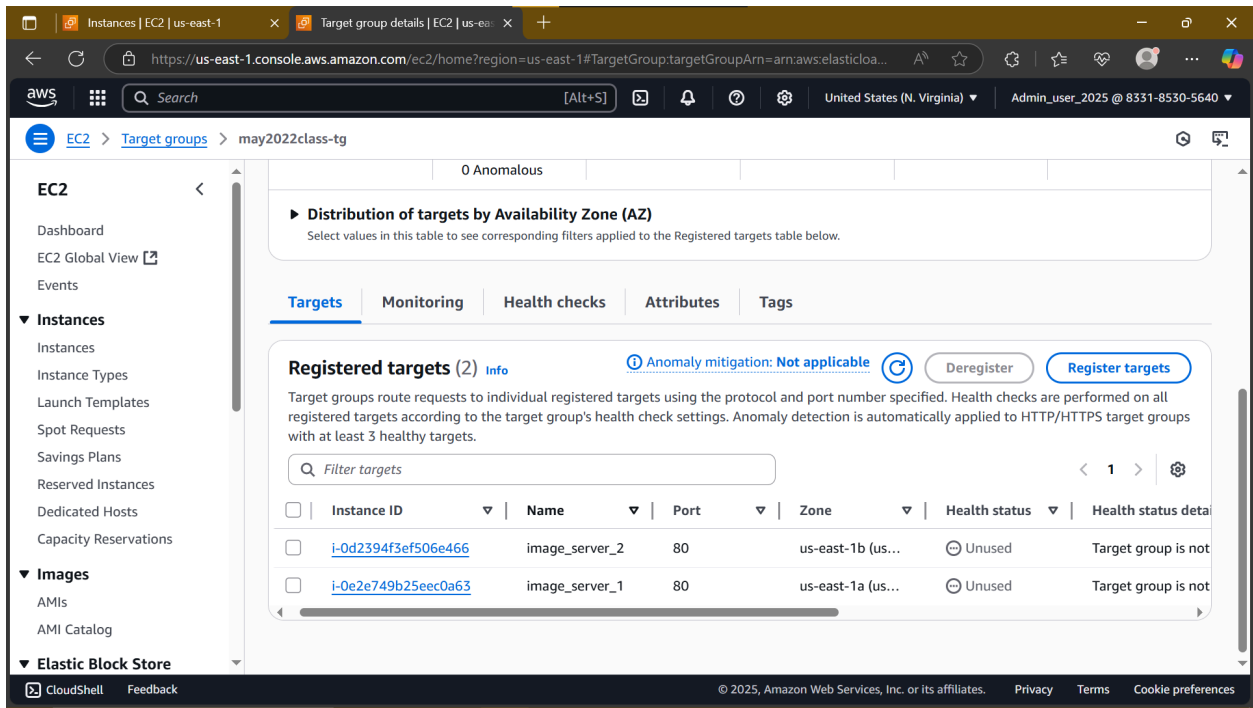
- Checking the connection
- Checking the proxy and the firewall

ERR\_CONNECTION\_TIMED\_OUT

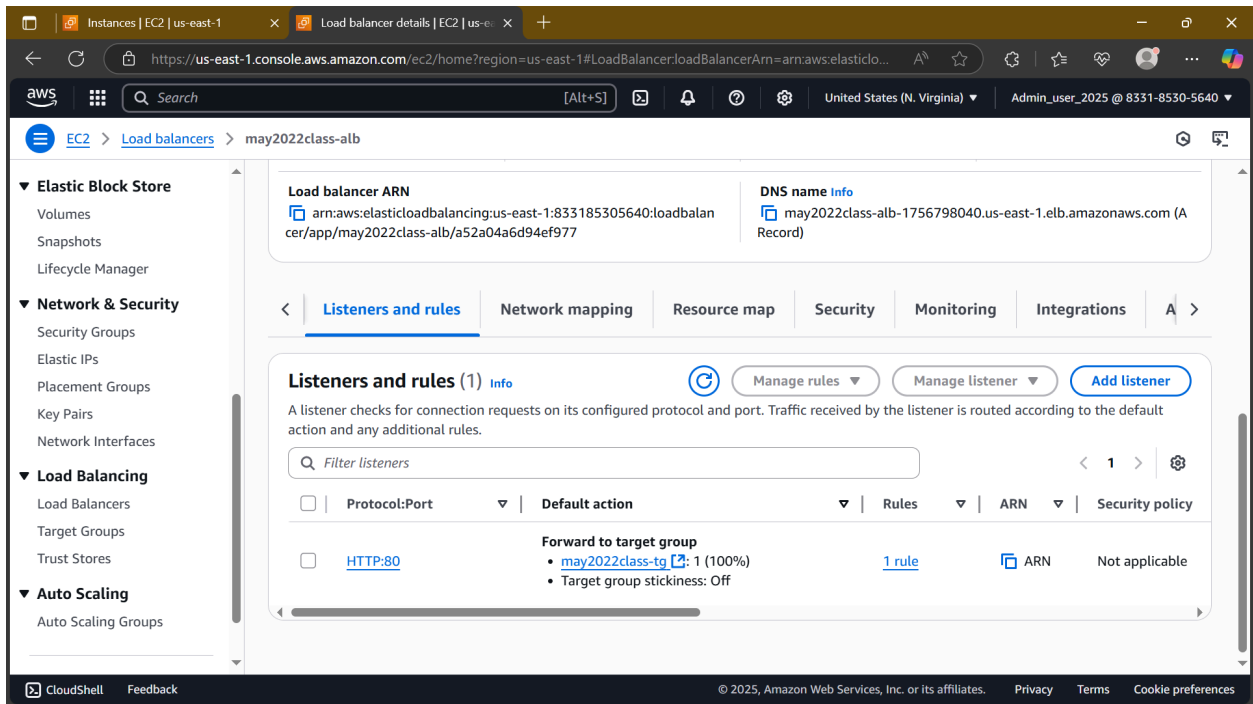
Refresh



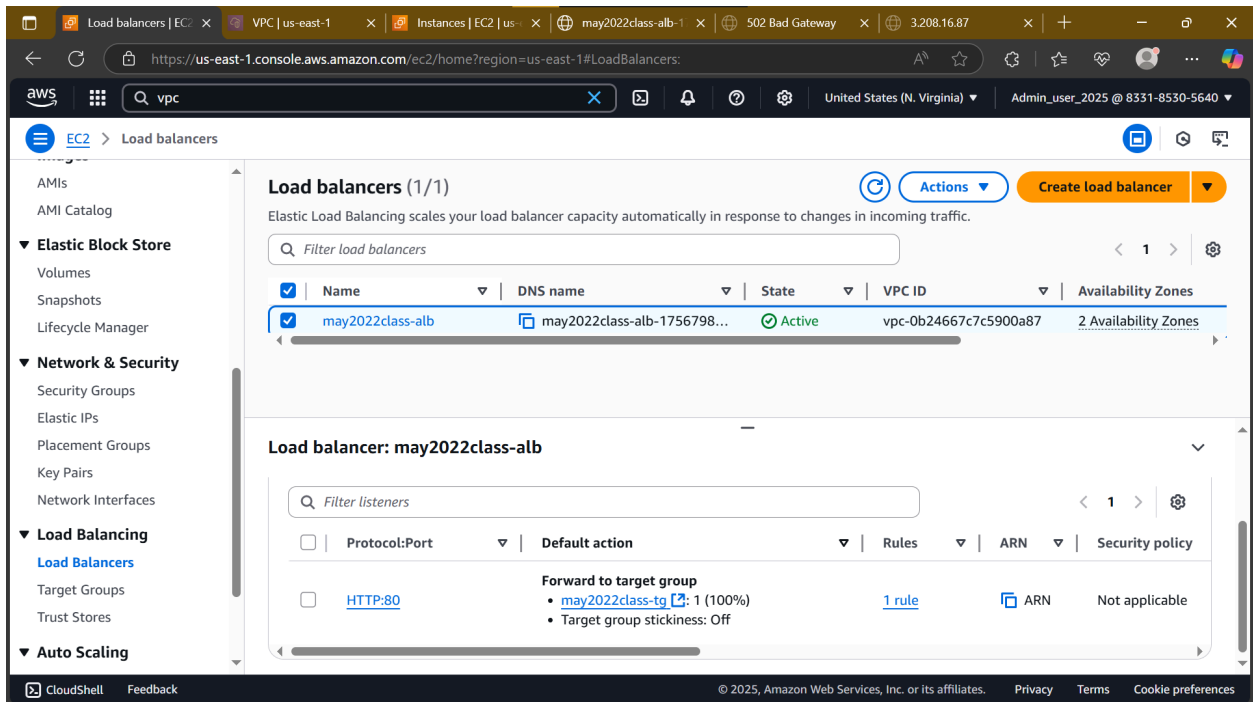
- Step 3: Create Target Group with targets (Webservers) —> name: “may2022class-tg”  
please observe the status
  - take screenshot showing “Health status details”



Step 4: Create an Application Load Balancer (ALB) —> name: “may2022class-alb”  
listener on http (80) only

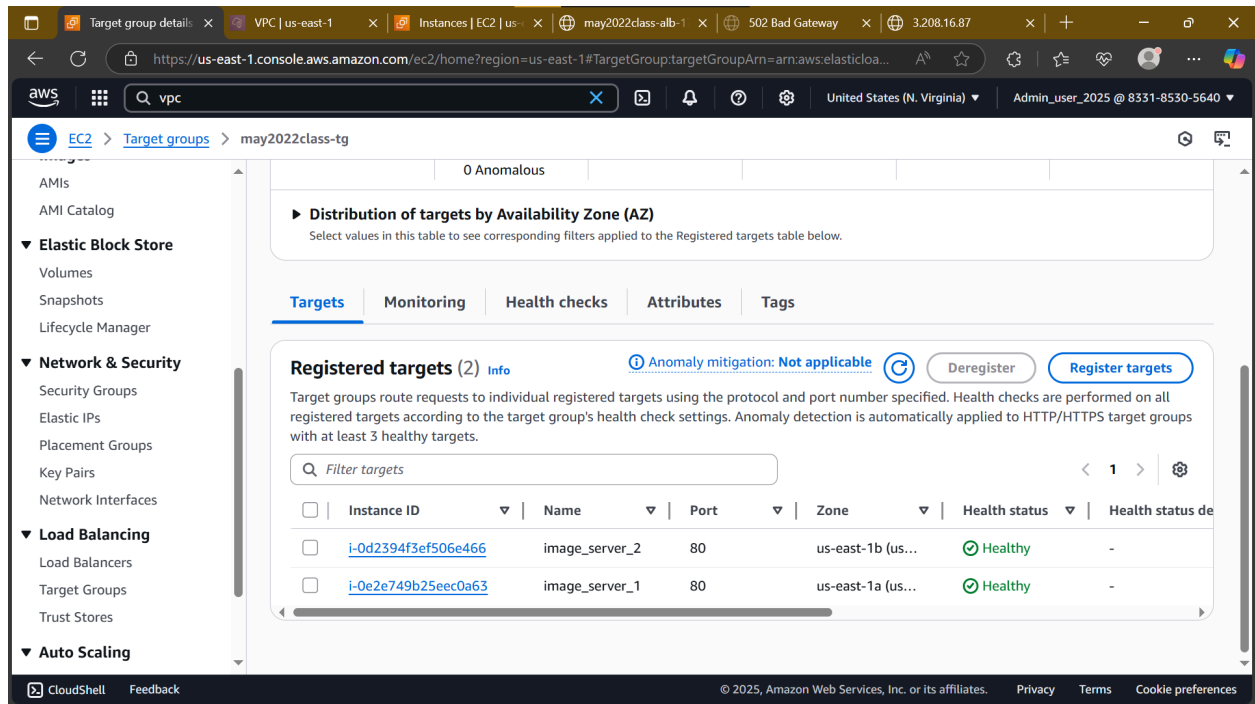


select may2022class-alb > click on Listener and take a screenshot



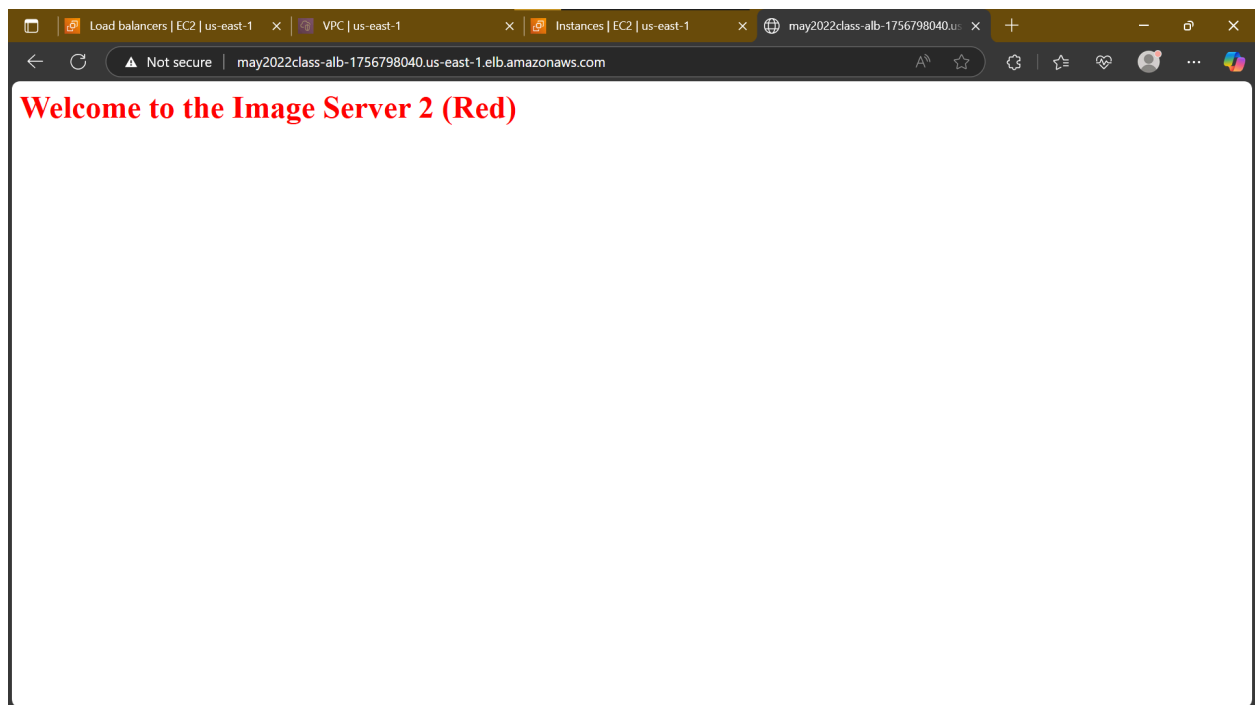
Step 5: Observe the target group status again in the console

- take a screenshot when it shows healthy

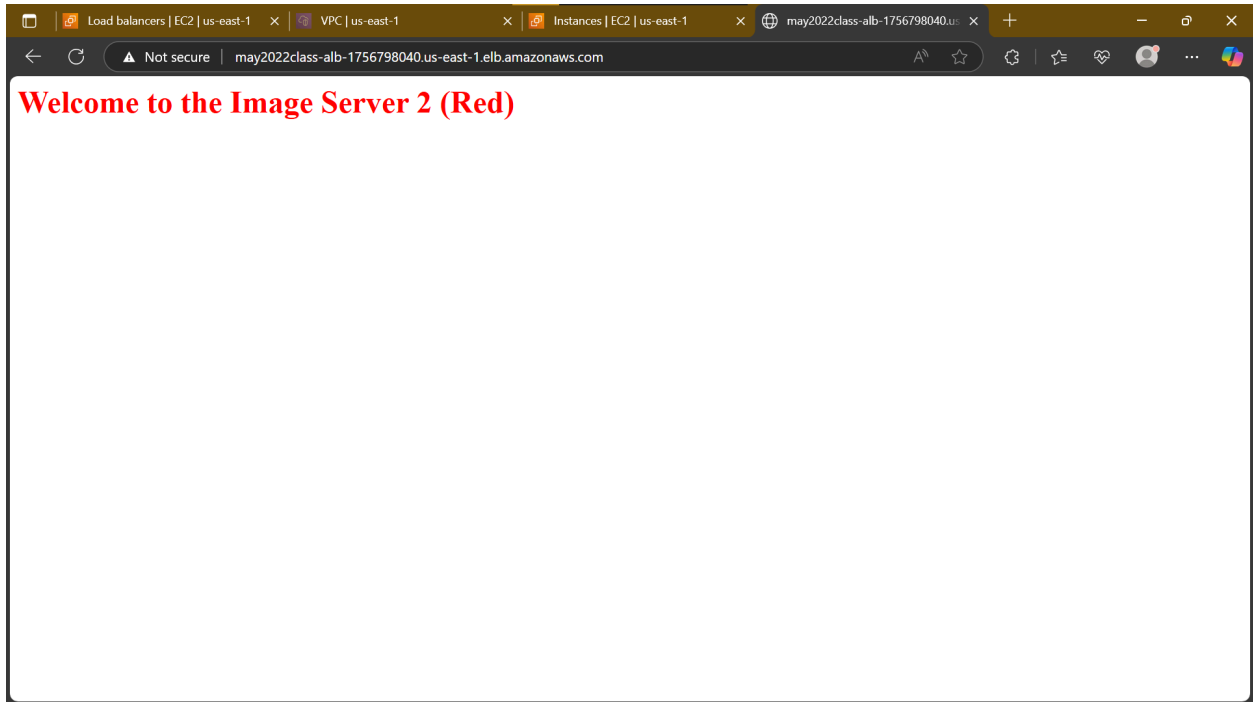


Step 6: test your website in a browser using the ALB dns name and refresh multiple time

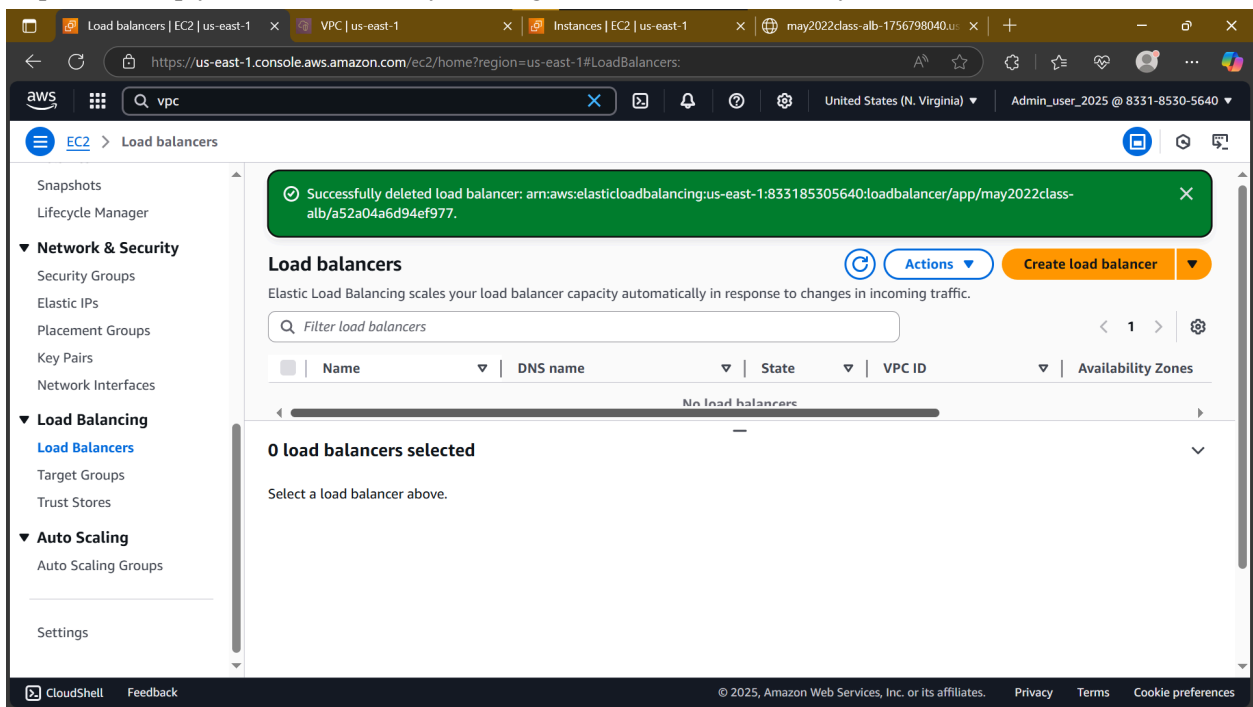
- take screenshots of both Blue and Red



•  
Step 7: stop webserver 1 and test again to see which server is now responding  
take a screenshot



Step 8: clean up your environment by deleting in the reverse order that you created all resources



Step 9: clean up your environment by deleting in the reverse order that you created all resources

User Data Script used for the homework  
SERVER 1 USER DATA (Public us-east-1a)

```
#!/bin/bash
yum update -y
yum install httpd -y
echo '<html><body><h1 style="color:Blue;">Welcome to the Image Server 1
(Blue)</h1></body></html>' > /var/www/html/index.html
sudo systemctl start httpd
sudo systemctl enable httpd
```

#### SERVER 2 USER DATA (Public us-east-1b)

```
#!/bin/bash
yum update -y
yum install httpd -y
echo '<html><body><h1 style="color:Red;">Welcome to the Image Server 2
(Red)</h1></body></html>' > /var/www/html/index.html
systemctl start httpd
systemctl enable httpd
```

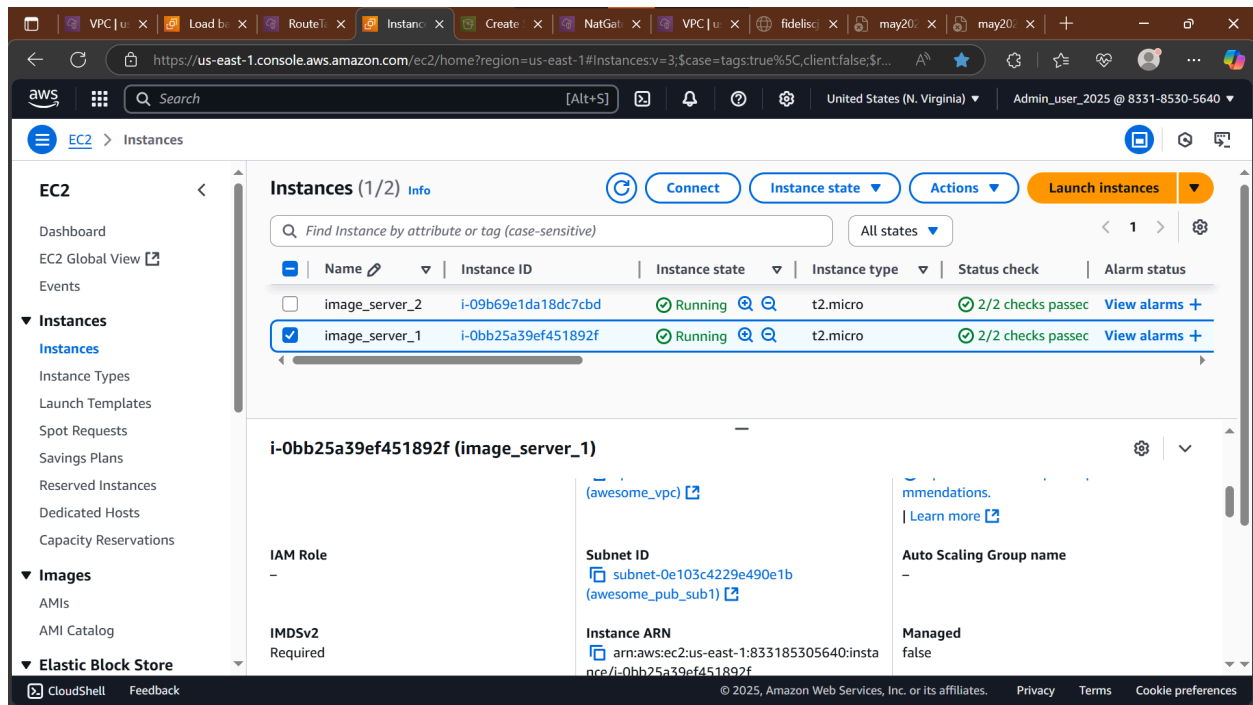


## Homework 2: Internet-facing Load Balancer with Private Subnet

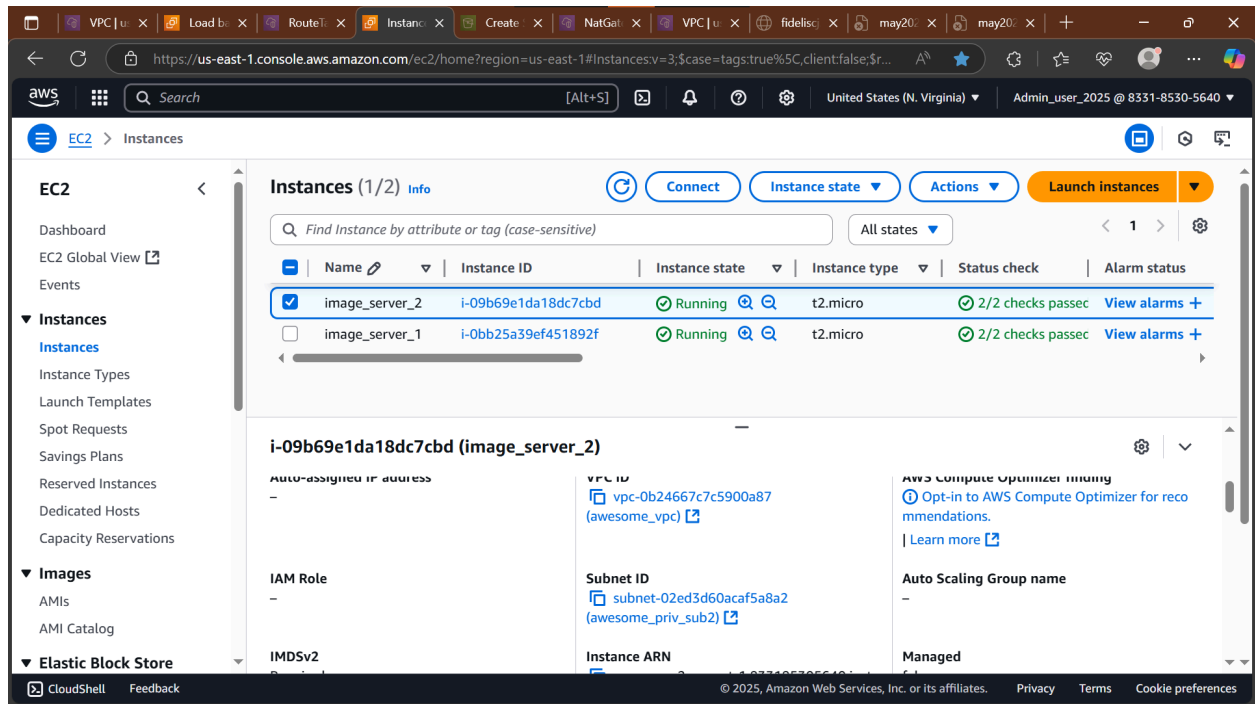
Repeat All step in Homework 1 except step 2, create your EC2 Instance in the Private Subnet

NB: read step 2 in Homework 1 carefully

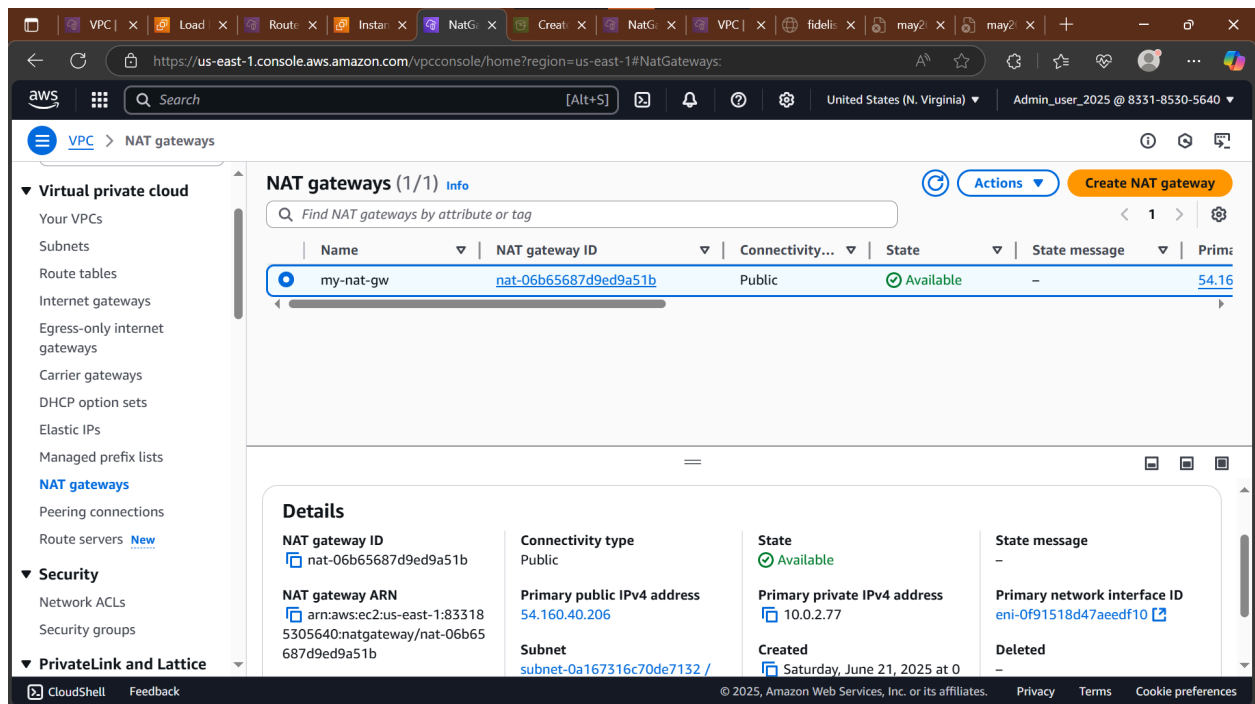
use any resource to make this to work



Instance 1 (image\_server\_1) created on a public subnet



Instance 2 (image\_server\_2) created on a private subnet



NAT gateway created on a public subnet with associated elastic IP

https://us-east-1.console.aws.amazon.com/vpccconsole/home?region=us-east-1#RouteTables:

Search [Alt+S]

United States (N. Virginia) Admin\_user\_2025 @ 8331-8530-5640

VPC > Route tables

Virtual private cloud

- Your VPCs
- Subnets
- Route tables
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways
- Peering connections
- Route servers [New](#)

Security

- Network ACLs
- Security groups

PrivateLink and Lattice

CloudShell Feedback

© 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

### Route tables (1/10) Info

Last updated 2 minutes ago

Find route tables by attribute or tag

Name	Route table ID	Explicit subnet associ...	Edge associations	Ma
<input type="checkbox"/> public-gps-rt	<a href="#">rtb-0b442d828625578f8</a>	<a href="#">subnet-04175e740b2080...</a>	-	No
<input type="checkbox"/> Private_Route	<a href="#">rtb-08daec316625c3f63</a>	2 subnets	-	No
<input type="checkbox"/> -	<a href="#">rtb-0452a1027bd986d2a</a>	-	-	Yes
<input type="checkbox"/> -	<a href="#">rtb-06bb92e97f3b53554</a>	-	-	Yes
<input checked="" type="checkbox"/> private-route-with-nat	<a href="#">rtb-0b960b9532aa5461d</a>	2 subnets	-	No
<input type="checkbox"/> private-qos-rt	<a href="#">rtb-0e352106d43f7116d</a>	2 subnets	-	No

### Routes (2)

Filter routes

Destination	Target	Status	Propagated
0.0.0.0/0	<a href="#">nat-06b65687d9ed9a51b</a>	Active	No
10.0.0.0/16	local	Active	No

The NAT gateway associated with a route table

https://us-east-1.console.aws.amazon.com/vpccconsole/home?region=us-east-1#RouteTables:

Search [Alt+S]

United States (N. Virginia) Admin\_user\_2025 @ 8331-8530-5640

VPC > Route tables

Virtual private cloud

- Your VPCs
- Subnets
- Route tables
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways
- Peering connections
- Route servers [New](#)

Security

- Network ACLs
- Security groups

PrivateLink and Lattice

CloudShell Feedback

© 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

### Route tables (1/10) Info

Last updated 2 minutes ago

Find route tables by attribute or tag

Name	Route table ID	Explicit subnet associ...	Edge associations	Ma
<input type="checkbox"/> public-gps-rt	<a href="#">rtb-0b442d828625578f8</a>	<a href="#">subnet-04175e740b2080...</a>	-	No
<input type="checkbox"/> Private_Route	<a href="#">rtb-08daec316625c3f63</a>	2 subnets	-	No
<input type="checkbox"/> -	<a href="#">rtb-0452a1027bd986d2a</a>	-	-	Yes
<input type="checkbox"/> -	<a href="#">rtb-06bb92e97f3b53554</a>	-	-	Yes
<input checked="" type="checkbox"/> private-route-with-nat	<a href="#">rtb-0b960b9532aa5461d</a>	2 subnets	-	No
<input type="checkbox"/> private-qos-rt	<a href="#">rtb-0e352106d43f7116d</a>	2 subnets	-	No

### Explicit subnet associations (2)

Find subnet association

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
awesome_priv_sub1	<a href="#">subnet-047880ef9b900fbc0</a>	10.0.3.0/24	-
awesome_priv_sub2	<a href="#">subnet-02ed3d60acaf5a8a2</a>	10.0.4.0/24	-

The route table associated with the private subnets

Virtual private cloud

Subnets

subnet-02ed3d60caf5a8a2

IPv4 CIDR reservations

Resource name DNS A record

Auto-assign customer-owned IPv4 address

IPv6 CIDR reservations

Resource name DNS AAAA record

IPv6-only

DNS64

Hostname type

Owner

Flow logs

Route table

Network ACL

CIDR reservations

Sharing

Tags

Route table: rtb-0b960b9532aa5461d / private-route-with-nat

Routes (2)

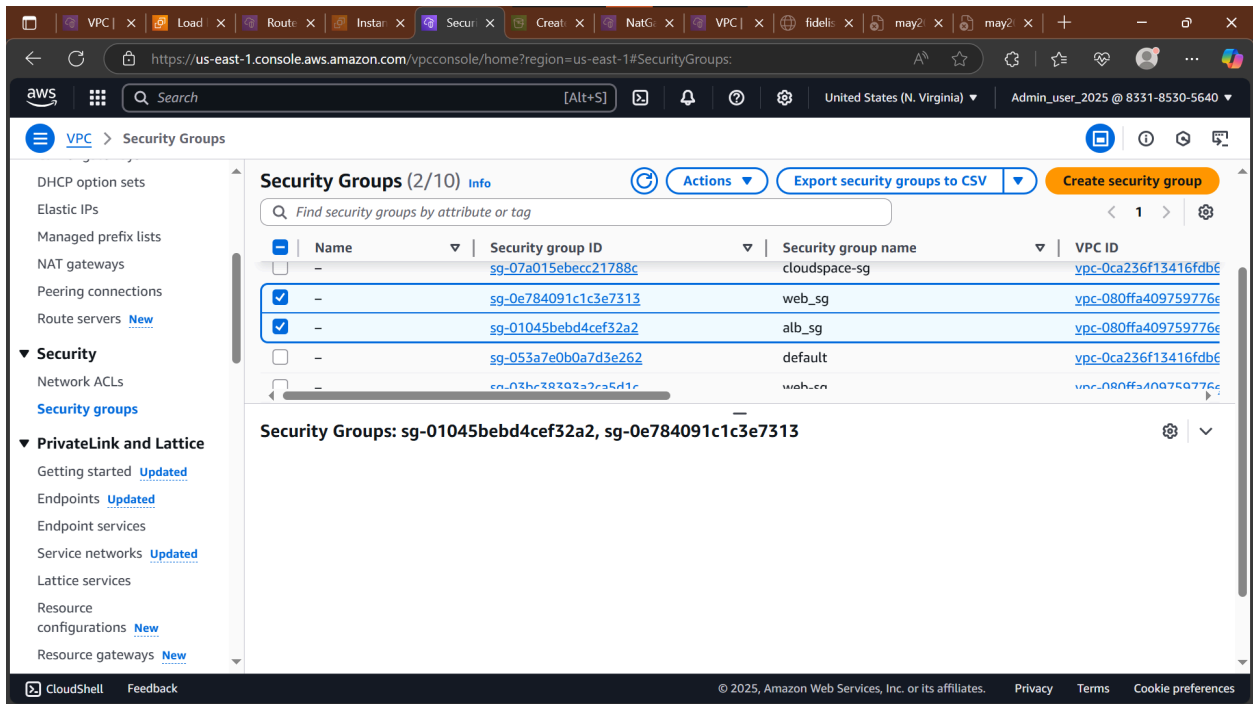
Filter routes

Destination	Target
10.0.0.0/16	local
0.0.0.0/0	<a href="#">nat-06b65687d9ed9a51b</a>

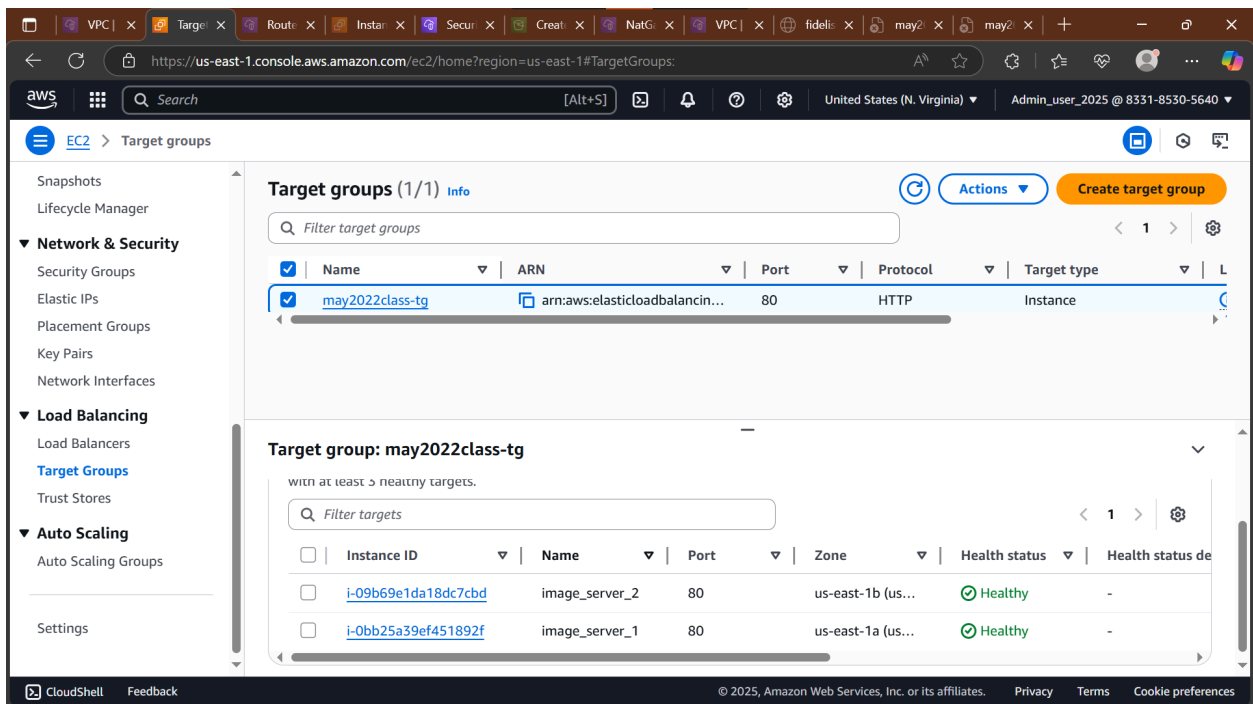
CloudShell Feedback

© 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

The private subnet attached to a NAT gateway



The two security groups of homework 1 in use



Target group

Load balancers (1/1)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

Filter load balancers

Name	DNS name	State	VPC ID	Availability Zones
may2022class-alb	may2022class-alb-1075745...	Active	vpc-0b24667c7c5900a87	2 Availability Zones

Load balancer: may2022class-alb

Scheme: Internet-facing

Hosted zone: Z35XDOTRQ7X7K

Availability Zones: subnet-02ed3d60acaf5a8a2 (us-east-1b (use1-az4)), subnet-0e103c4229e490e1b (us-east-1a (use1-az2))

Date created: June 21, 2025, 09:06 (UTC-02:30)

Load balancer showing the two subnets in different AZs (public and private subnets)

Target groups (1/1)

Filter target groups

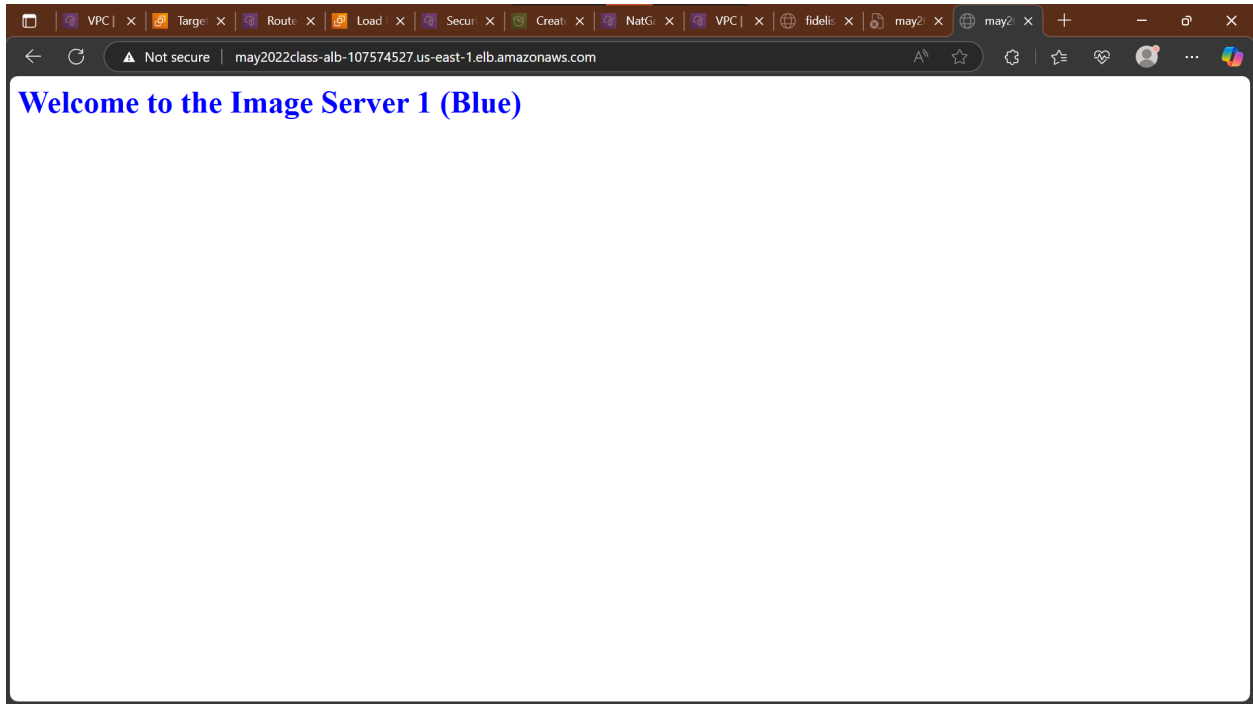
Name	ARN	Port	Protocol	Target type
may2022class-tg	arn:aws:elasticloadbalancing...	80	HTTP	Instance

Target group: may2022class-tg

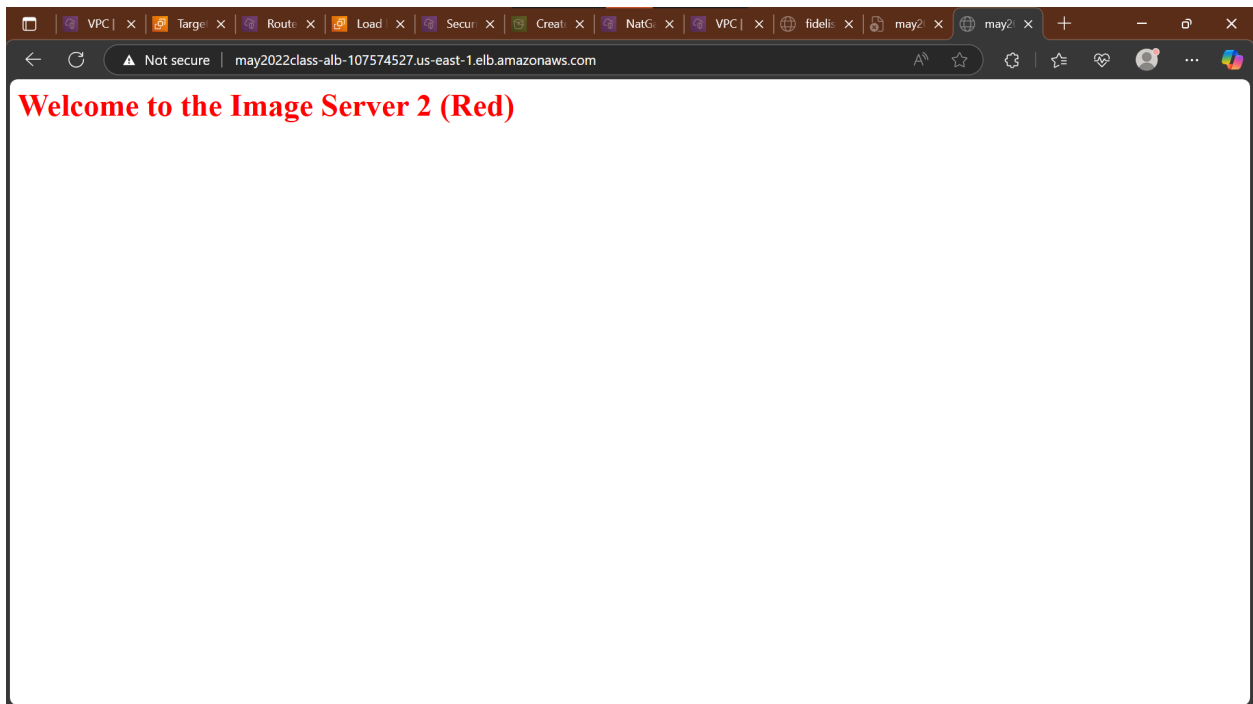
Filter targets

Instance ID	Name	Port	Zone	Health status	Health status de
i-09b69e1da18dc7cbd	image_server_2	80	us-east-1b (us...)	Healthy	-
i-0bb25a39ef451892f	image_server_1	80	us-east-1a (us...)	Healthy	-

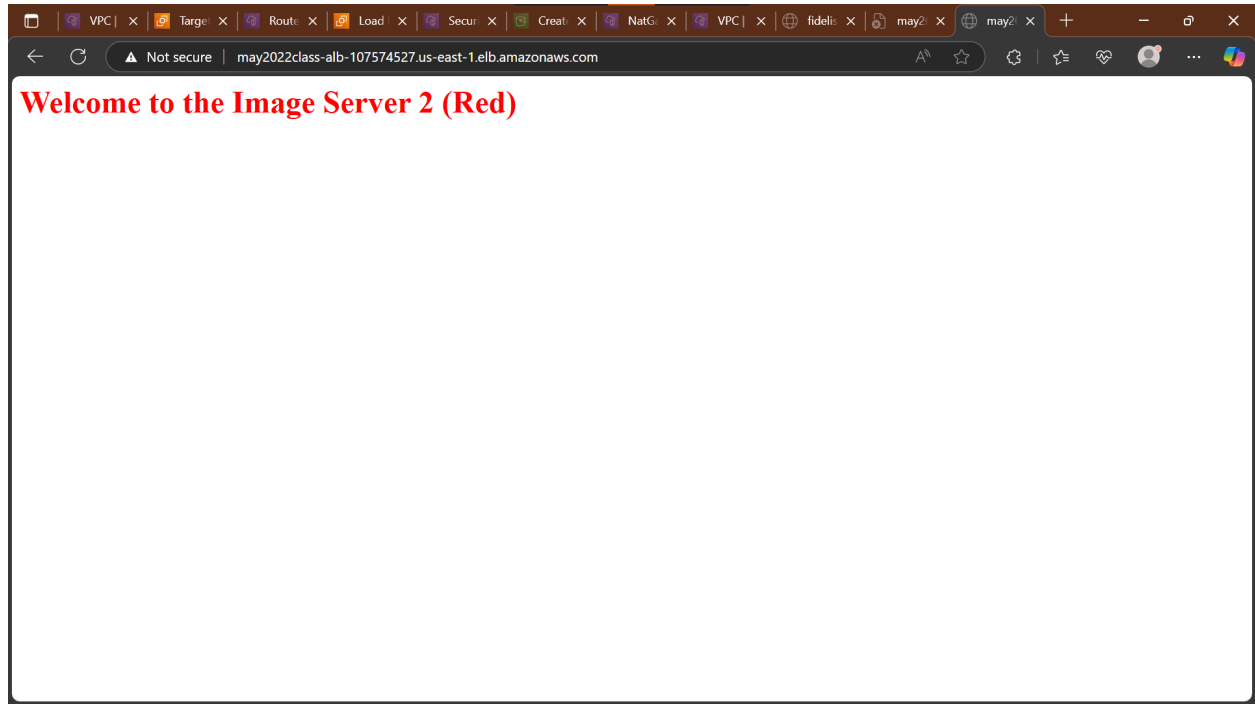
Healthy and working



Instance 1 working



Instance 2 working



Instance 1 stopped, only instance 2 working