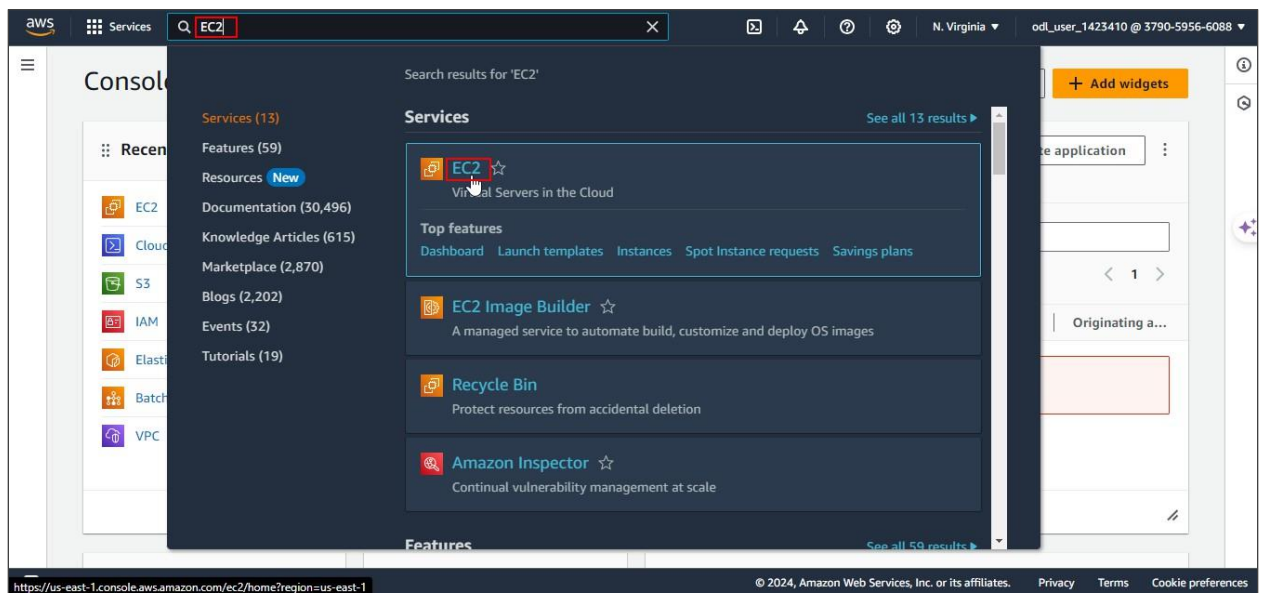


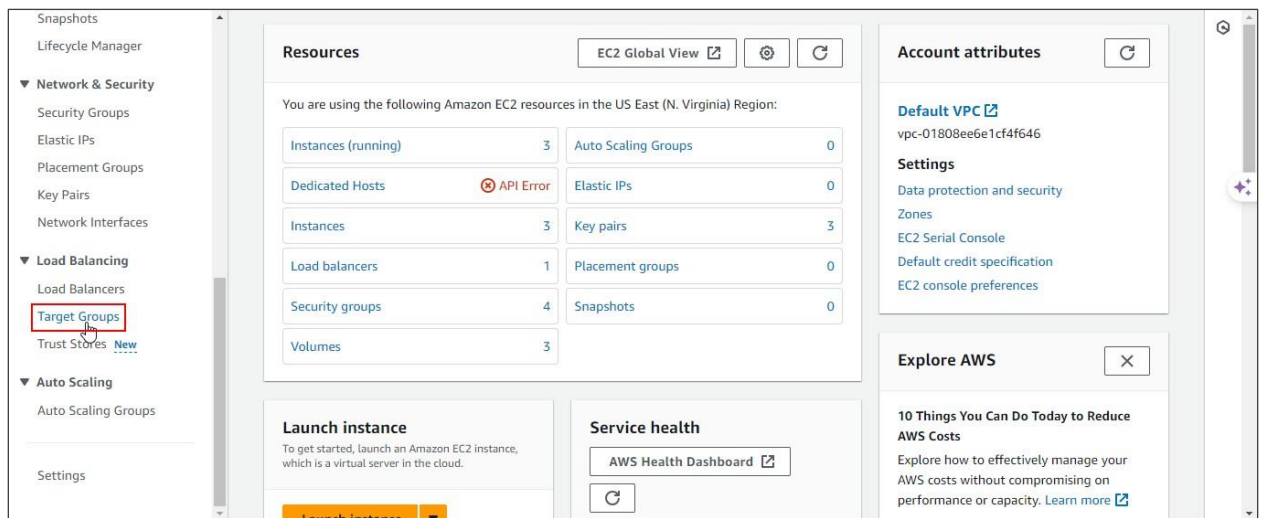
# Configuring an Application Load Balancer

## Step 1: Create a target group

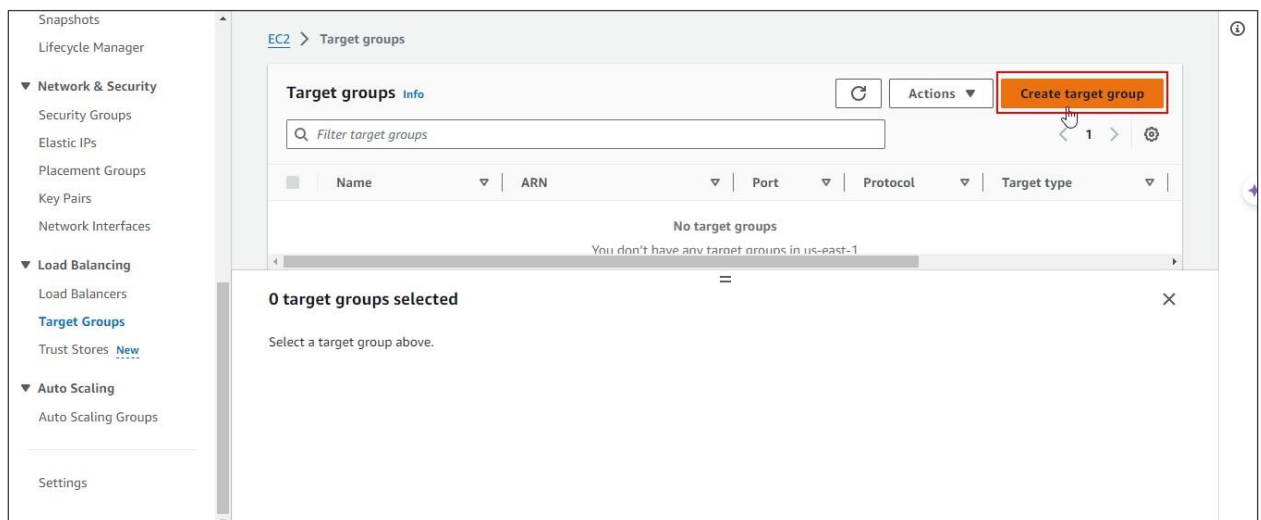
1.1 Navigate to the AWS console home dashboard, search for and click on **EC2**



## 1.2 Navigate to the Load Balancing section and click on Target Groups



## 1.3 Click on Create target group



1.4 In the **Basic configuration** section, choose **Instances** as the target type and enter a name for the target group, such as **MyTargetGroup**

EC2 > Target groups > Create target group

Step 1  
**Specify group details**

Step 2  
Register targets

### Specify group details

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

#### Basic configuration

Settings in this section can't be changed after the target group is created.

Choose a target type

☒ **Instances**

- Supports load balancing to instances within a specific VPC.
- Facilitates the use of [Amazon EC2 Auto Scaling](#) to manage and scale your EC2 capacity.

☐ IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.
- Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.

Target group name

**MyTargetGroup**

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Protocol : Port

Choose a protocol for your target group that corresponds to the Load Balancer type that will route traffic to it. Some protocols now include anomaly detection for the targets and you can set mitigation options once your target group is created. This choice cannot be changed after creation

HTTP 80

1-65535

IP address type

Only targets with the indicated IP address type can be registered to this target group.

☒ **IPv4**

Each instance has a default network interface (eth0) that is assigned the primary private IPv4 address. The instance's primary private IPv4 address is the one that will be applied to the target.

☐ IPv6

Each instance you register must have an assigned primary IPv6 address. This is configured on the instance's default network interface (eth0). [Learn more](#)

VPC

Select the VPC with the instances that you want to include in the target group. Only VPCs that support the IP address type selected above are available in this list.

vpc-01808ee6e1cf4f646  
IPv4 VPC CIDR: 172.31.0.0/16

## 1.5 Set the protocol to **HTTP** and the path to **/index.html** in the **Health checks** section

Send requests to targets using HTTP/2. Supported when the request protocol is HTTP/2 or gRPC, but gRPC-specific features are not available.

☐ gRPC  
Send requests to targets using gRPC. Supported when the request protocol is gRPC.

### Health checks

The associated load balancer periodically sends requests, per the settings below, to the registered targets to test their status.

Health check protocol  
HTTP

Health check path  
Use the default path of "/" to perform health checks on the root, or specify a custom path if preferred.  
/index.html  
Up to 1024 characters allowed.

► Advanced health check settings

### Attributes

## 1.6 Click on **Next**

Health check path  
Use the default path of "/" to perform health checks on the root, or specify a custom path if preferred.  
/index.html  
Up to 1024 characters allowed.

► Advanced health check settings

### Attributes

ⓘ Certain default attributes will be applied to your target group. You can view and edit them after creating the target group.

► Tags - *optional*  
Consider adding tags to your target group. Tags enable you to categorize your AWS resources so you can more easily manage them.

Cancel Next

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

## 1.7 Review the configurations and click on **Create target group**

80  
1-65535 (separate multiple ports with commas)

Include as pending below

### Review targets

Targets (0) Remove all pending

All  < 1 > ⚙️

Remove	Health status	Instance ID	Name	Port	State	Security groups	Zone	Sub
No instances added yet								
Specify instances above, or leave the group empty if you prefer to add targets later.								

0 pending

Cancel Previous **Create target group**

EC2 Dashboard ×  
EC2 Global View  
Events  
Console-to-Code [Preview](#)

▼ Instances  
Instances  
Instance Types  
Launch Templates  
Spot Requests  
Savings Plans  
Reserved Instances  
Dedicated Hosts  
Capacity Reservations

▼ Images  
AMIs  
AMI Catalog

✓ Successfully created the target group: **MyTargetGroup**. Anomaly detection is automatically applied to all registered targets. Results can be viewed in the **Targets** tab.

[EC2](#) > [Target groups](#) > MyTargetGroup

## MyTargetGroup

Actions ▼

### Details

arn:aws:elasticloadbalancing:us-east-1:379059566088:targetgroup/MyTargetGroup/ab5f6a4a1fe4668f

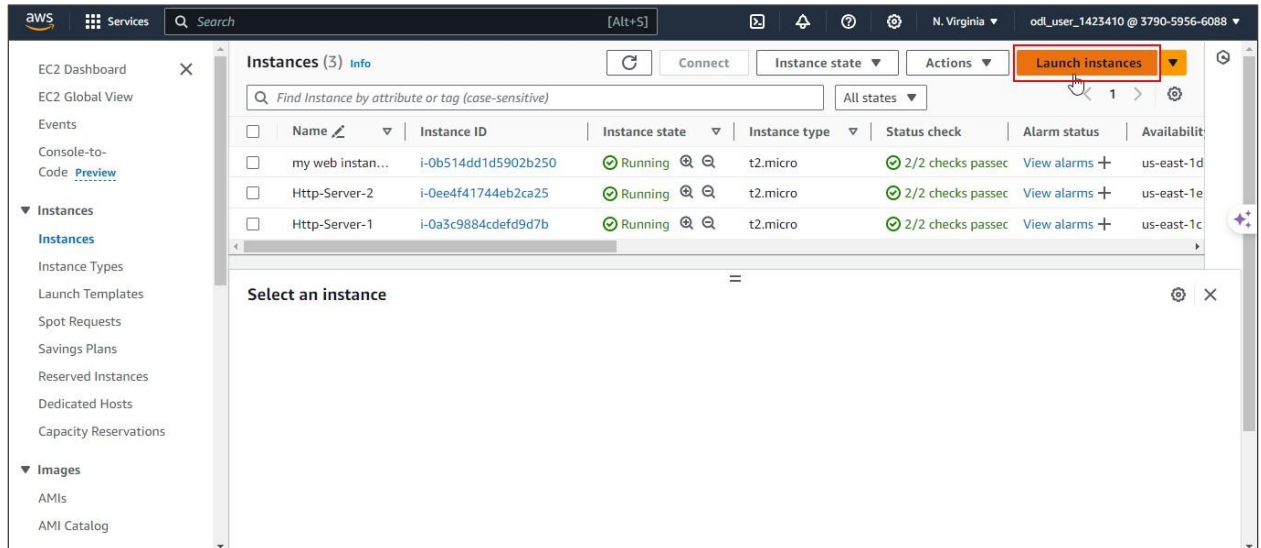
Target type Instance	Protocol : Port HTTP: 80	Protocol version HTTP1	VPC <a href="#">vpc-01808ee6e1cf4f646</a>
IP address type IPv4	Load balancer <a href="#">None associated</a>		

0 Total targets	✓ 0 Healthy	✗ 0 Unhealthy	⏸ 0 Unused	⌚ 0 Initial	⌚ 0 Draining
	0 Anomalous				

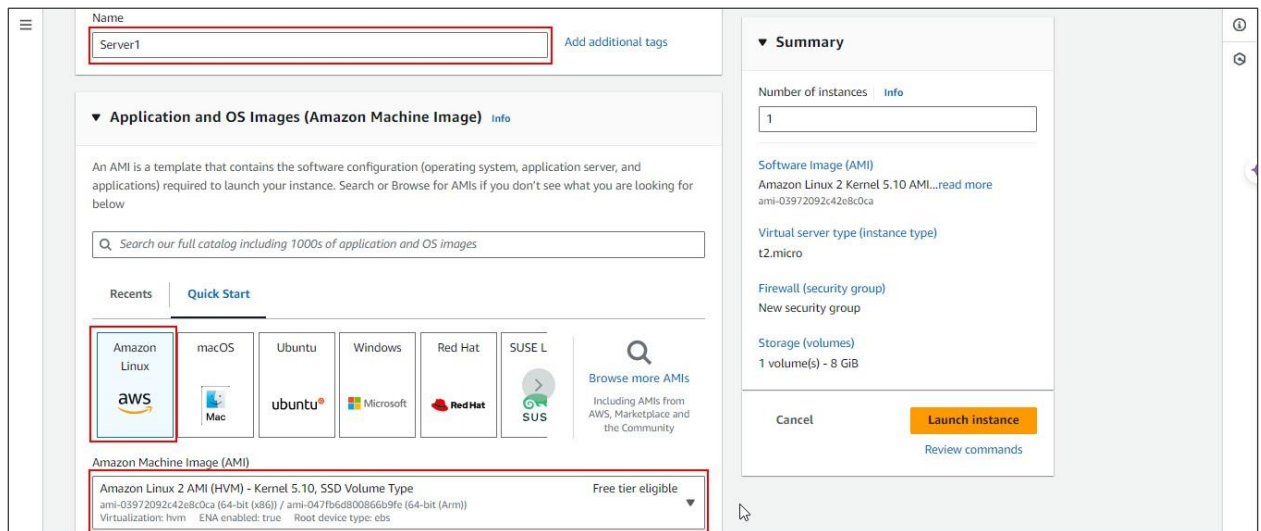
The target group has been successfully created.

## Step 2: Launch EC2 instances

### 2.1 Navigate to the **Instances** section and click on **Launch instances**



### 2.2 Provide a name for the instance and choose an appropriate AMI (**Amazon Linux 2**)



## 2.3 Select the instance type as **t2.micro**, create a key pair, and name it **Server-1**

**▼ Instance type** [Info](#) | [Get advice](#)

Instance type

**t2.micro** Free tier eligible

Family: t2 1 vCPU 1 GiB Memory Current generation: true  
On-Demand Windows base pricing: 0.0162 USD per Hour  
On-Demand SUSE base pricing: 0.0116 USD per Hour  
On-Demand RHEL base pricing: 0.026 USD per Hour  
On-Demand Linux base pricing: 0.0116 USD per Hour

Additional costs apply for AMIs with pre-installed software

☒ All generations [Compare instance types](#)

**▼ Key pair (login)** [Info](#)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

Server-1 [Create new key pair](#)

**▼ Network settings** [Info](#) [Edit](#)

**▼ Summary**

Number of instances [Info](#)

1

Software Image (AMI)  
Amazon Linux 2 Kernel 5.10 AMI...[read more](#)  
ami-03972092c42e8c0ca

Virtual server type (instance type)  
t2.micro

Firewall (security group)  
New security group

Storage (volumes)  
1 volume(s) - 8 GiB

Cancel [Launch instance](#) [Review commands](#)

## 2.4 Configure the network settings as shown:

**▼ Network settings** [Info](#)

VPC - *required* [Info](#)

vpc-01808ee6e1cf4f646 (default) [Refresh](#)

Subnet [Info](#)

No preference [Create new subnet](#)

Auto-assign public IP [Info](#)

Enable

Additional charges apply when outside of free tier allowance

Firewall (security groups) [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☒ Create security group ☐ Select existing security group

Security group name - *required*

launch-wizard-2

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and \_-./!@#%&'()\*+,-=:;[]\$\*

Description - *required* [Info](#)

launch-wizard-2 created 2024-08-12T13:50:25.331Z

**▼ Summary**

Number of instances [Info](#)

1

Software Image (AMI)  
Amazon Linux 2 Kernel 5.10 AMI...[read more](#)  
ami-03972092c42e8c0ca

Virtual server type (instance type)  
t2.micro

Firewall (security group)  
New security group

Storage (volumes)  
1 volume(s) - 8 GiB

Cancel [Launch instance](#) [Review commands](#)

**Inbound Security Group Rules**

▼ Security group rule 1 (TCP, 22, 0.0.0.0/0) Remove

Type: [Info](#) | Protocol: [Info](#) | Port range: [Info](#)

ssh | TCP | 22

Source type: [Info](#) | Source: [Info](#) | Description - optional: [Info](#)

Anywhere | Add CIDR, prefix list or security group | e.g. SSH for admin desktop

0.0.0.0/0 ✕

▼ Security group rule 2 (TCP, 80, 0.0.0.0/0) Remove

Type: [Info](#) | Protocol: [Info](#) | Port range: [Info](#)

HTTP | TCP | 80

Source type: [Info](#) | Source: [Info](#) | Description - optional: [Info](#)

Anywhere | Add CIDR, prefix list or security group | e.g. SSH for admin desktop

0.0.0.0/0 ✕

⚠ Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only. ✕

**Summary**

Number of instances: [Info](#)

1

Software image (AMI)

Amazon Linux 2 Kernel 5.10 AMI...read more  
ami-03972092c42e8c0ca

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

1 volume(s) - 8 GiB

Cancel Launch instance  
[Review commands](#)

2.5 Add the following user data script in the **Advance details** section, and click on **Launch instance**:

```
#!/bin/bash
yum update -y
yum install httpd -y
echo "<html><body><h1>This is Webserver1</h1></body></html>" >
/var/www/html/index.html
systemctl start httpd
systemctl enable httpd
```

**User data - optional** [Info](#)

Upload a file with your user data or enter it in the field.

Choose file

#!/bin/bash  
yum update -y  
yum install httpd -y  
echo "<html><body><h1>This is Webserver1</h1></body></html>" >  
/var/www/html/index.html  
systemctl start httpd  
systemctl enable httpd

☐ User data has already been base64 encoded

**Summary**

Number of instances: [Info](#)

1

Software image (AMI)

Amazon Linux 2 Kernel 5.10 AMI...read more  
ami-03972092c42e8c0ca

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

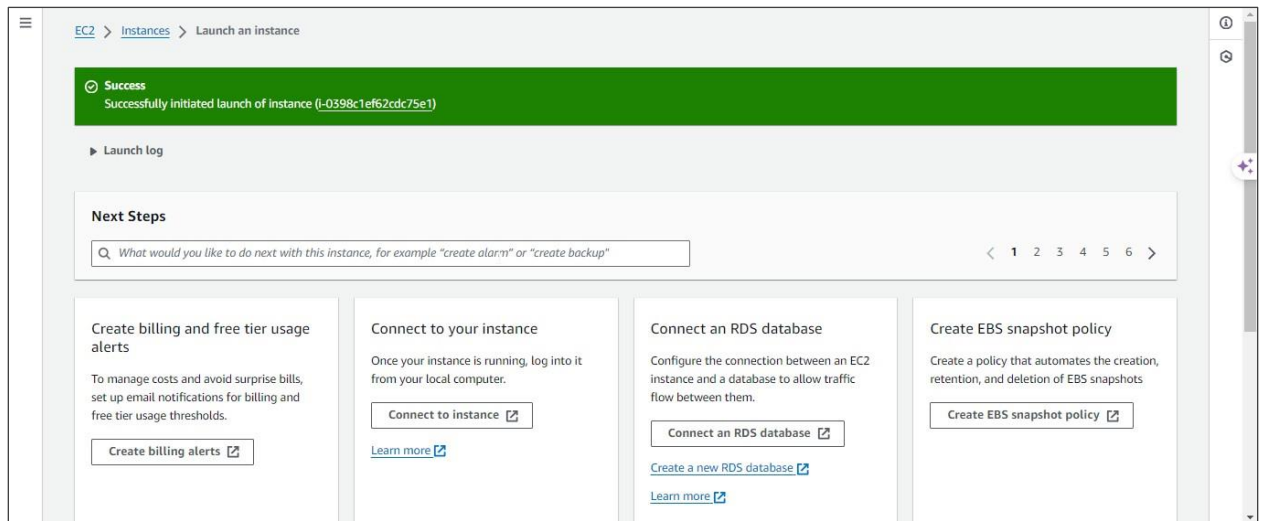
Storage (volumes)

1 volume(s) - 8 GiB

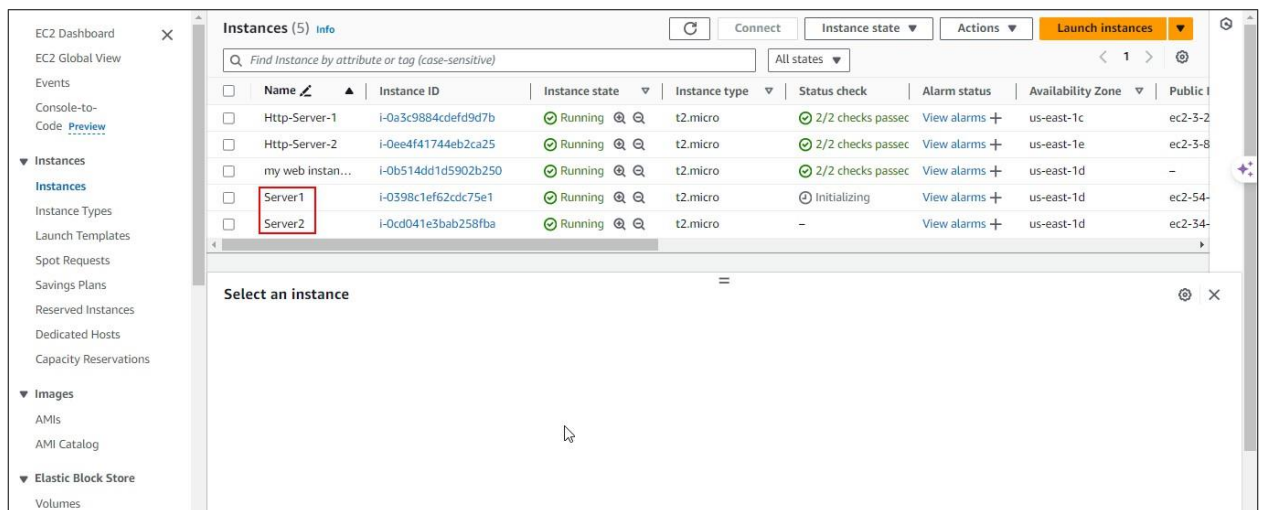
Cancel Launch instance  
[Review commands](#)



You will see the following interface:



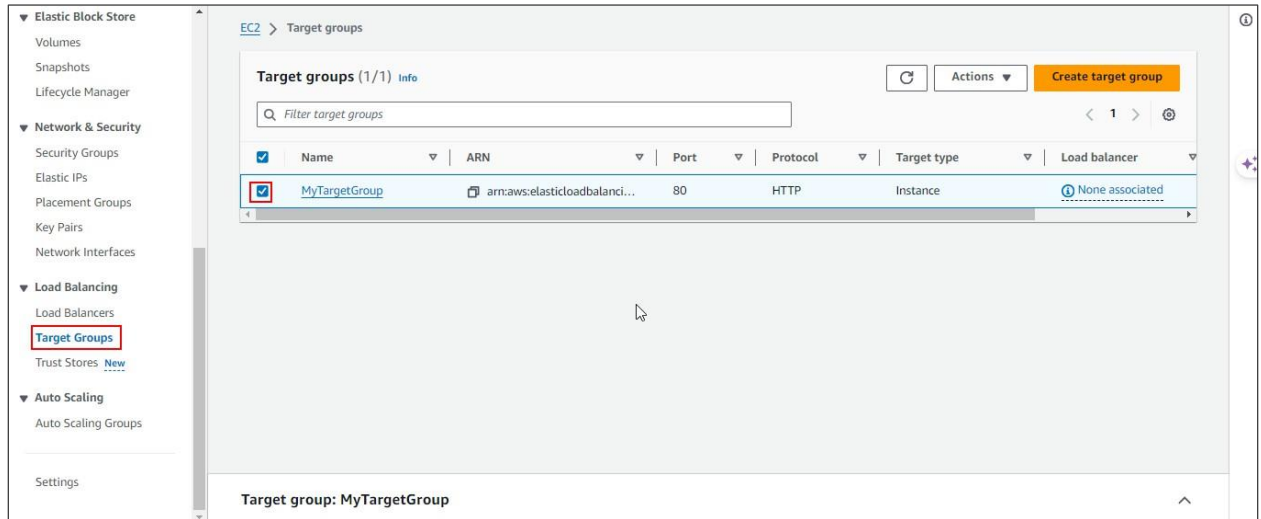
2.6 Launch another EC2 instance using the same steps, but modify the user data script to display the message **This is Webserver2**



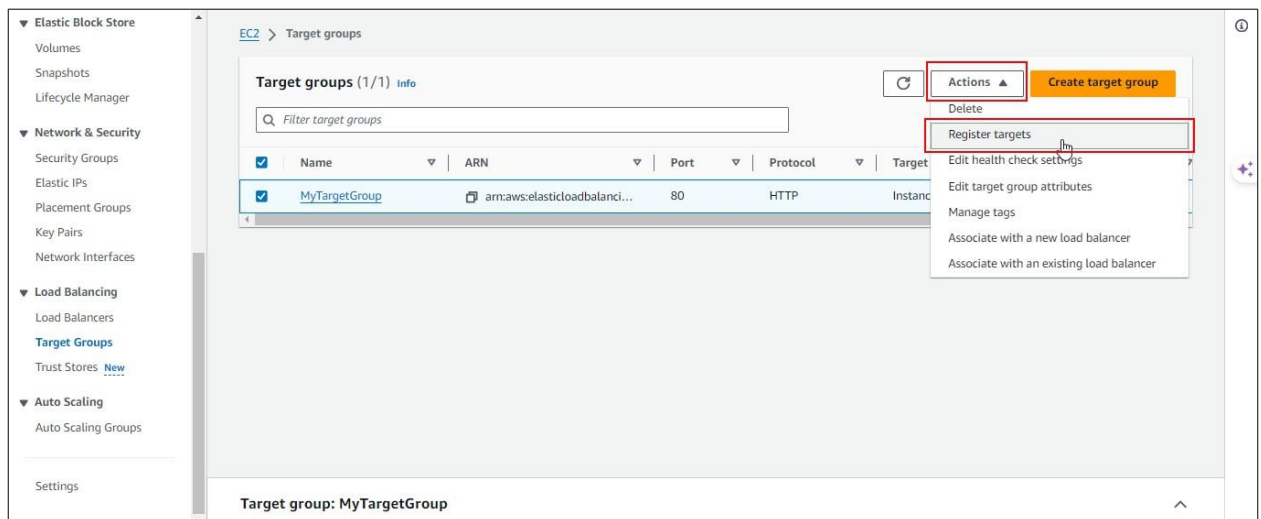
The EC2 instances have been successfully launched.

## Step 3: Configure the target group

### 3.1 Navigate to the **Target Groups** section and select the target group created in Step 1



### 3.2 Click on **Register targets** from the **Actions** menu



### 3.3 Select the instances (**Server1** and **Server2**) that were launched in Step 2 and click on **Include as pending below**

Available instances (2/4)

Filter instances

	Instance ID	Name	State	Security groups	Zone
<input checked="" type="checkbox"/>	i-0cd041e3bab258fba	Server2	Running	launch-wizard-3	us-east-1d
<input checked="" type="checkbox"/>	i-0398c1ef62cdc75e1	Server1	Running	launch-wizard-2	us-east-1d
<input type="checkbox"/>	i-0ee4f41744eb2ca25	Http-Server-2	Running	MyHttpServer	us-east-1e
<input type="checkbox"/>	i-0a3c9884cdefd9d7b	Http-Server-1	Running	MyHttpServer	us-east-1c

2 selected

Ports for the selected instances  
Ports for routing traffic to the selected instances.

80

1-65535 (separate multiple ports with commas)

Include as pending below

### 3.4 Click on **Register pending targets** to register the instances with the target group

1-65535 (separate multiple ports with commas)

Include as pending below

2 selections are now pending below. Include more or register targets when ready.

Review targets

Targets (2)

Filter targets

Show only pending

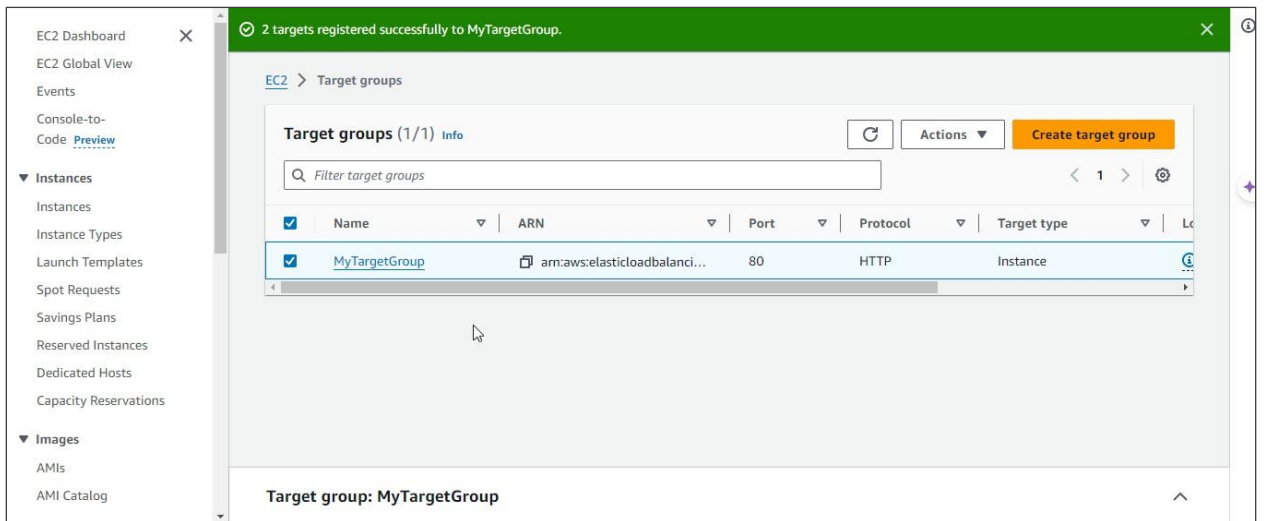
Remove all pending

Instance ID	Name	Port	State	Security groups	Zone	Private IPv4 address	Subnet ID	Laun
i-0cd041e3bab258fba	Server2	80	Running	launch-wizard-3	us-east-1d	172.31.89.225	subnet-005a925283ef33008	Augu
i-0398c1ef62cdc75e1	Server1	80	Running	launch-wizard-2	us-east-1d	172.31.95.124	subnet-005a925283ef33008	Augu

2 pending

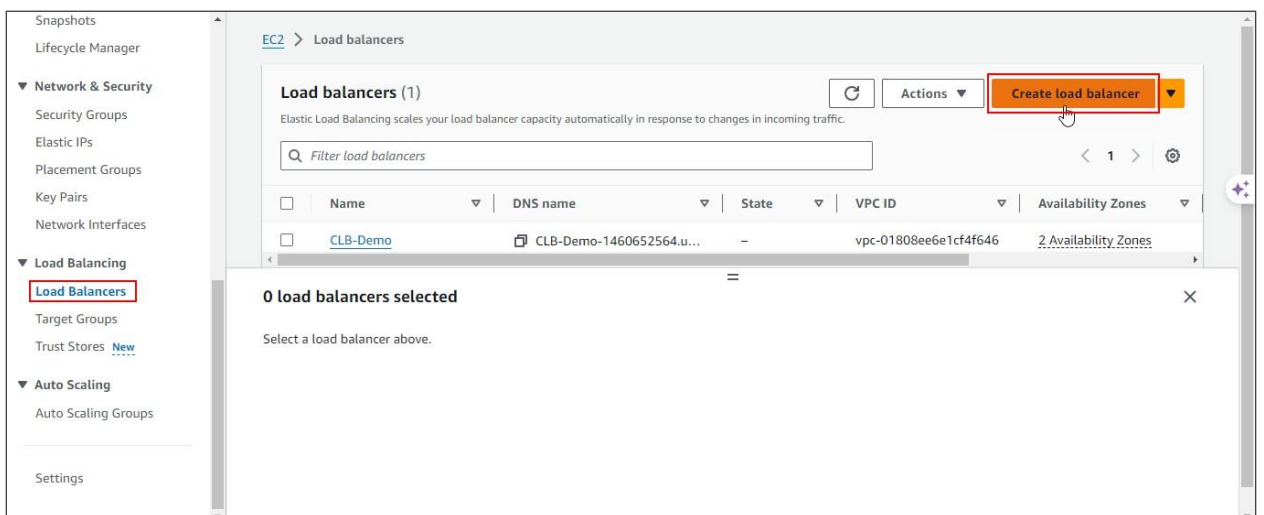
Cancel

Register pending targets

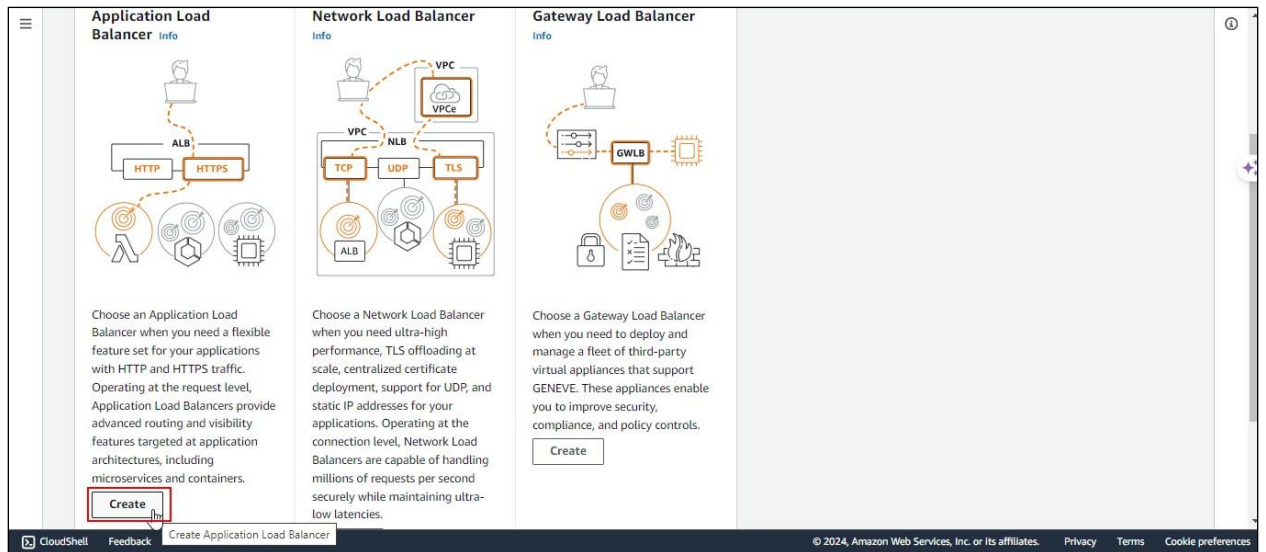


## Step 4: Create a Load Balancer

### 4.1 Navigate to the Load Balancers section under Load Balancing and click Create load balancer

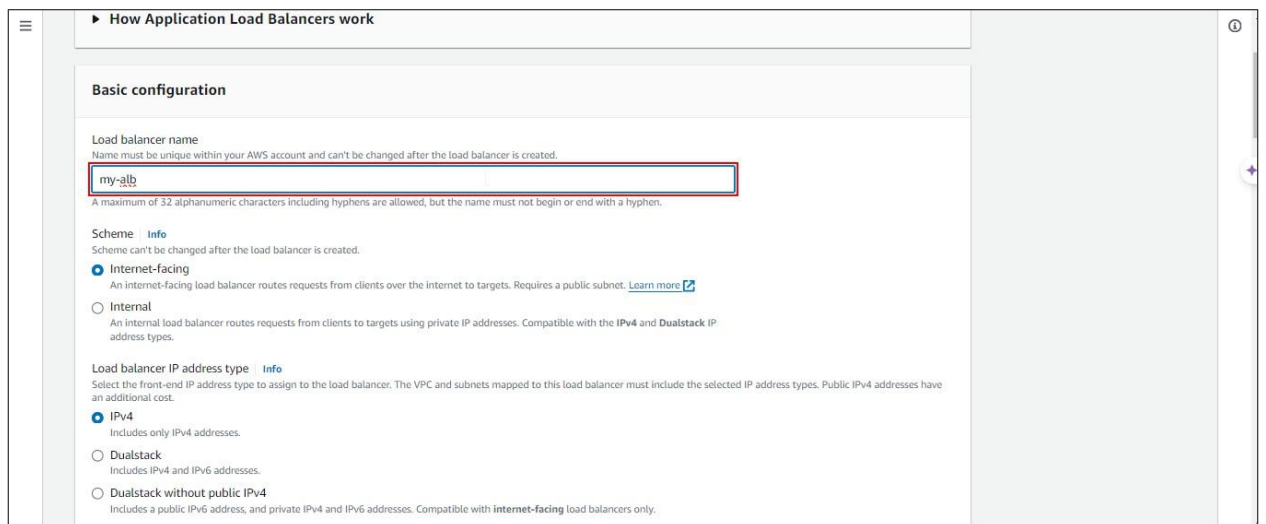


## 4.2 Choose **Application Load Balancer** and click **Create**



The screenshot shows the AWS Management Console's 'Create Application Load Balancer' page. It features three columns for different load balancer types: Application Load Balancer, Network Load Balancer, and Gateway Load Balancer. The Application Load Balancer column is active, showing a diagram of its architecture and a description. The 'Create' button at the bottom of the Application Load Balancer column is highlighted with a red box. The footer of the console shows the 'CloudShell' tab and the 'Create Application Load Balancer' button.

## 4.3 Configure the load balancer settings, enter a name for the load balancer, such as **my-alb**, and select availability zones, such as **us-east-1a** and **us-east-1b**



The screenshot shows the 'How Application Load Balancers work' page in the AWS Management Console. The 'Basic configuration' section is visible, showing the 'Load balancer name' field with the value 'my-alb' entered. The 'Scheme' is set to 'Internet-facing' and the 'Load balancer IP address type' is set to 'IPv4'. The 'my-alb' text is highlighted with a red box.

**Mappings** [info](#)

Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

**Availability Zones**

☒ **us-east-1a (use1-az4)**

Subnet

subnet-07ed5daff56349b53  
IPv4 subnet CIDR: 172.31.16.0/20

IPv4 address  
Assigned by AWS

☒ **us-east-1b (use1-az6)**

Subnet

subnet-08742ed07763637c1  
IPv4 subnet CIDR: 172.31.32.0/20

IPv4 address  
Assigned by AWS

☐ us-east-1c (use1-az1)

☐ us-east-1d (use1-az2)

☐ us-east-1e (use1-az3)

☐ us-east-1f (use1-az5)

4.4 Choose the default action for the listener configuration to accept HTTP traffic on port **80**, and select the target group created in Step 1

**Listeners and routing** [info](#)

A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

▼ Listener HTTP:80 [Remove](#)

Protocol: HTTP Port: 80

Default action [info](#)

Forward to: MyTargetGroup HTTP [Create target group](#)

Target type: Instance, IPv4

**Listener tags - optional**

Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

[Add listener tag](#)

You can add up to 50 more tags.

[Add listener](#)

#### 4.5 Review the configuration and click **Create load balancer**

This screenshot shows the 'Create load balancer' configuration page in the AWS Management Console. The page is divided into several sections: 'Service integrations' (AWS WAF: None, AWS Global Accelerator: None), 'Tags' (None), 'Attributes' (a message about default attributes), and 'Creation workflow and status'. At the bottom right, there are two buttons: 'Cancel' and 'Create load balancer'. A red box highlights the 'Create load balancer' button, and a mouse cursor is pointing at it.

IPv4

subnet-07ed5daff56349b53

us-east-1b

subnet-08742ed07763637c1

Service integrations [Edit](#)

AWS WAF: None

AWS Global Accelerator: None

Tags [Edit](#)

None

Attributes

ⓘ Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.

Creation workflow and status

► Server-side tasks and status

After completing and submitting the above steps, all server-side tasks and their statuses become available for monitoring.

Cancel **Create load balancer**

Wait until the **Status** changes from **Provisioning** to **Active**

This screenshot shows the 'my-alb' details page in the AWS Management Console. The page displays various configuration details for the load balancer, including its type, status, VPC, availability zones, and ARN. The 'Status' is highlighted with a red box and shows a green checkmark and the word 'Active'. The page also includes a sidebar with navigation links and a bottom navigation bar with tabs for 'Listeners and rules', 'Network mapping', 'Resource map - new', 'Security', 'Monitoring', 'Integrations', 'Attributes', and 'Tags'.

EC2 Dashboard

EC2 Global View

Events

Console-to-Code [Preview](#)

▼ Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

▼ Images

AMIs

AMI Catalog

EC2 > Load balancers > my-alb

my-alb

⌂ Actions ▼

▼ Details

Load balancer type	Status	VPC	Load balancer IP address type
Application	⊙ Active	vpc-01808ee6e1cf4f646	IPv4
Scheme	Hosted zone	Availability Zones	Date created
Internet-facing	Z35SXDOTRQ7X7K	subnet-08742ed07763637c1 us-east-1b (use1-az6)	August 12, 2024, 19:51 (UTC+05:30)
		subnet-07ed5daff56349b53 us-east-1a (use1-az4)	
Load balancer ARN		DNS name <a href="#">Info</a>	
arn:aws:elasticloadbalancing:us-east-1:379059566088:loadbalancer/app/my-alb/0bdb80cffc42d9e7		my-alb-505116050.us-east-1.elb.amazonaws.com (A Record)	

[Listeners and rules](#) | [Network mapping](#) | [Resource map - new](#) | [Security](#) | [Monitoring](#) | [Integrations](#) | [Attributes](#) | [Tags](#)

#### 4.6 Click on the **Security** tab

The screenshot shows the AWS Management Console interface for an Elastic Load Balancing (ELB) instance named 'my-alb'. The left sidebar contains navigation options like 'EC2 Dashboard', 'Instances', 'Images', etc. The main content area displays the 'Details' tab for the load balancer. Below the details, there is a horizontal navigation bar with tabs: 'Listeners and rules', 'Network mapping', 'Resource map - new', 'Security', 'Monitoring', 'Integrations', 'Attributes', and 'Tags'. The 'Security' tab is currently selected and highlighted with a red box and a mouse cursor.

Details			
Load balancer type Application	Status Active	VPC vpc-01808ee6e1cf4f646	Load balancer IP address type IPv4
Scheme Internet-facing	Hosted zone Z35SXDOTRQ7X7K	Availability Zones subnet-08742ed07763637c1 us-east-1b (use1-az6) subnet-07ed5daff56349b53 us-east-1a (use1-az4)	Date created August 12, 2024, 19:51 (UTC+05:30)
Load balancer ARN arn:aws:elasticloadbalancing:us-east-1:379059566088:loadbalancer/app/my-alb/0bdb80cfc42d9e7		DNS name info my-alb-505116050.us-east-1.elb.amazonaws.com (A Record)	

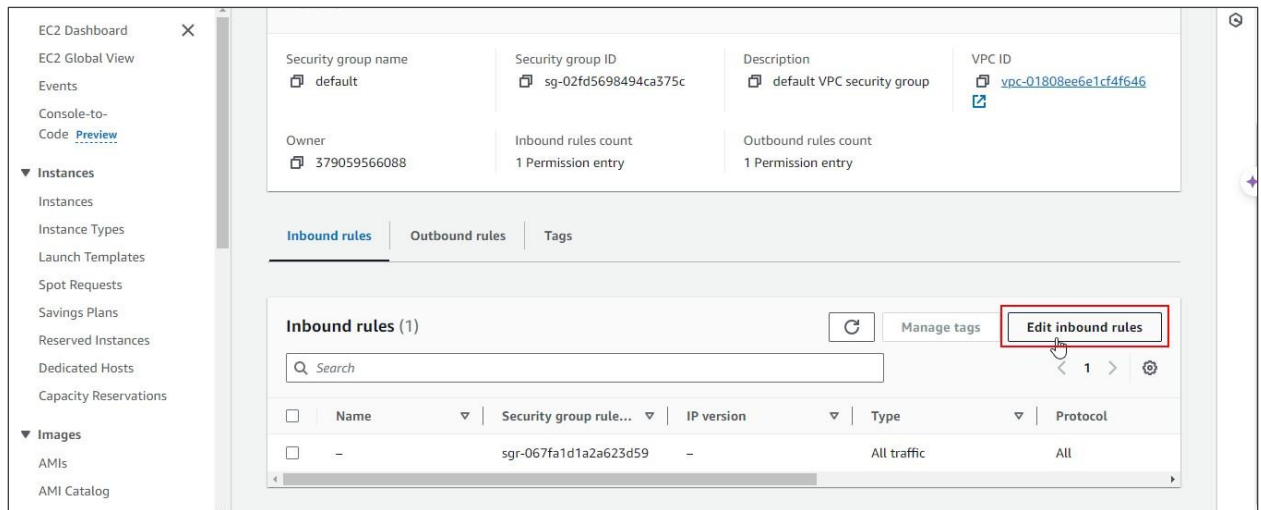
#### 4.7 Click on the **Security Group ID** name

This screenshot shows the 'Security' tab within the 'my-alb' details page. It displays a table of security groups associated with the load balancer. The 'Security Group ID' column contains the value 'sg-02fd5698494ca375c', which is highlighted with a red box and a mouse cursor. The table also shows the name 'default' and the description 'default VPC security group'.

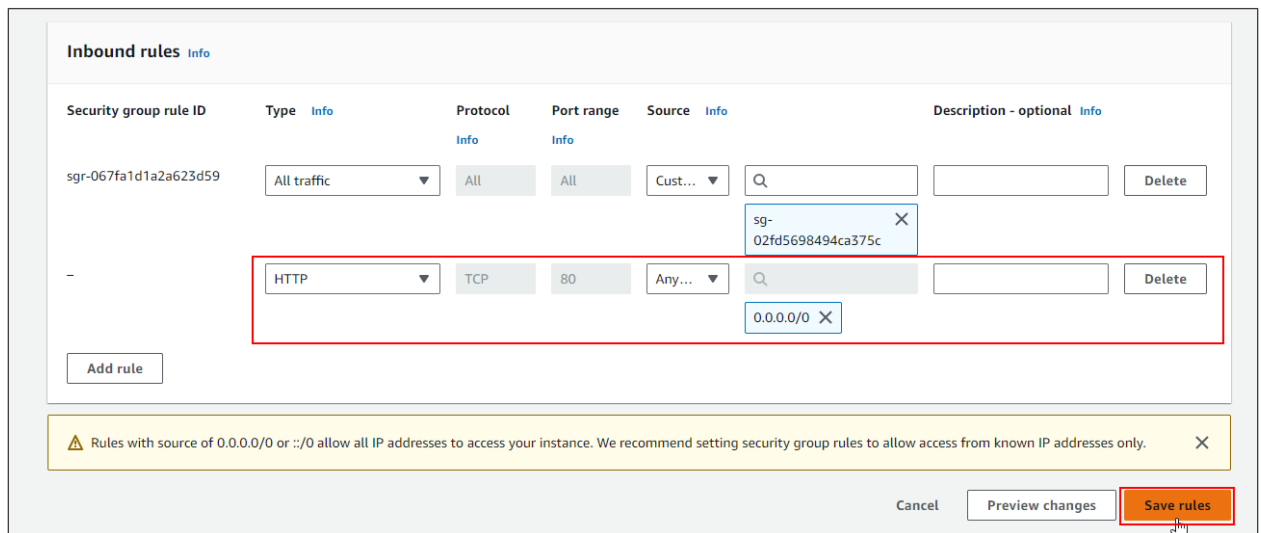
Security Group ID	Name	Description
sg-02fd5698494ca375c	default	default VPC security group



#### 4.8 Click on **Edit inbound rules**

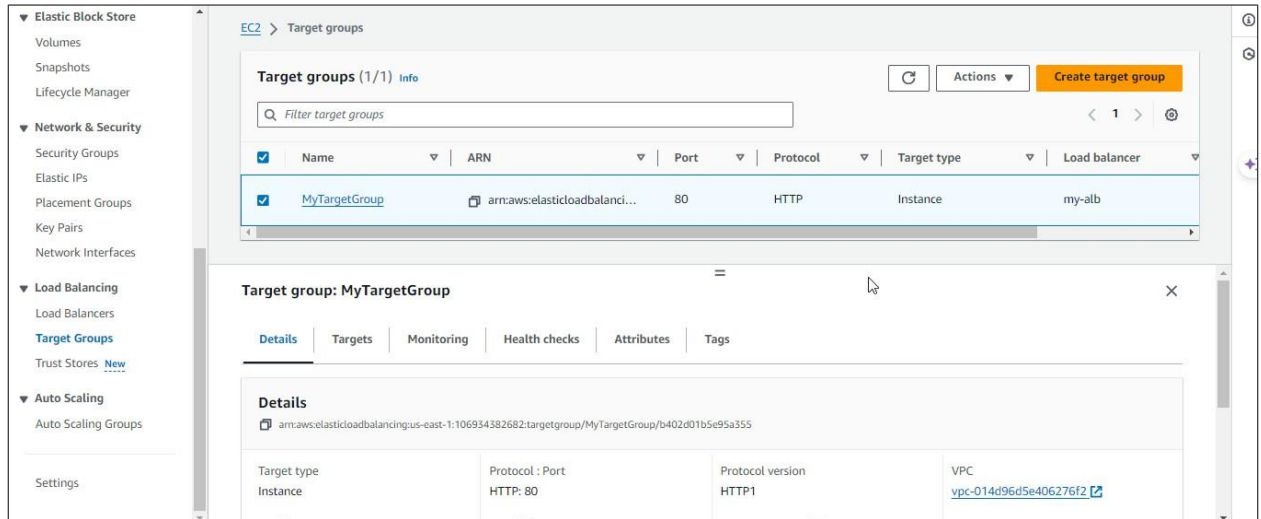


#### 4.9 Create an inbound rule to permit port **80** access for all, and click on **Save rules** as shown:



## Step 5: Test the Load Balancer

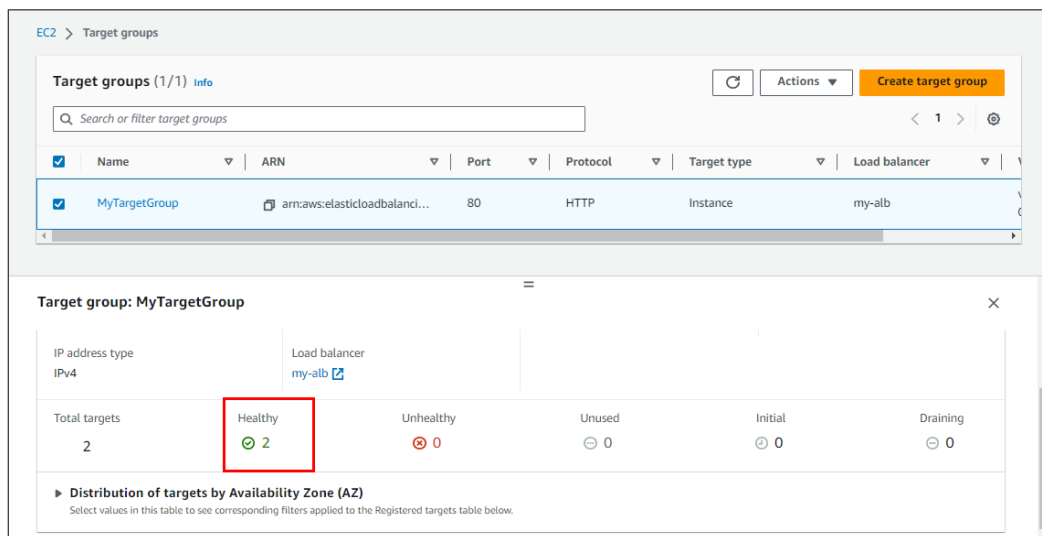
### 1.1 Navigate to the **Target Groups** section and select the target group you created



The screenshot shows the AWS Management Console interface for Target Groups. On the left, the navigation pane includes sections for Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling. The 'Target Groups' link under Load Balancing is selected. The main content area shows a list of target groups with 'MyTargetGroup' highlighted. Below the list, the 'Details' tab for 'MyTargetGroup' is open, displaying the following information:

Target type	Protocol : Port	Protocol version	VPC
Instance	HTTP: 80	HTTP1	vpc-014d96d5e406276f2

### 1.2 Click on **Details** to verify that your instances are registered and healthy

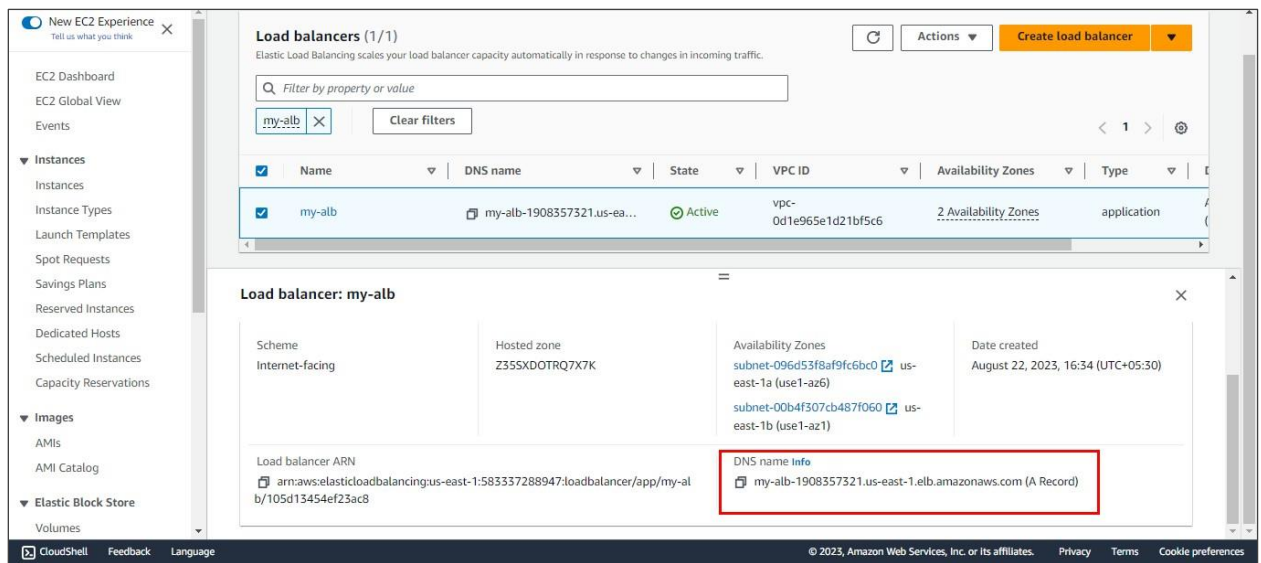


The screenshot shows the AWS Management Console interface for Target Groups. The 'MyTargetGroup' is selected, and its details are displayed. The 'Targets' tab is active, showing a table of targets. The 'Healthy' column shows a green checkmark and the number '2', which is highlighted with a red box. The 'Unhealthy' column shows a red X and the number '0'. The 'Unused' column shows a minus sign and the number '0'. The 'Initial' column shows a clock icon and the number '0'. The 'Draining' column shows a clock icon and the number '0'.

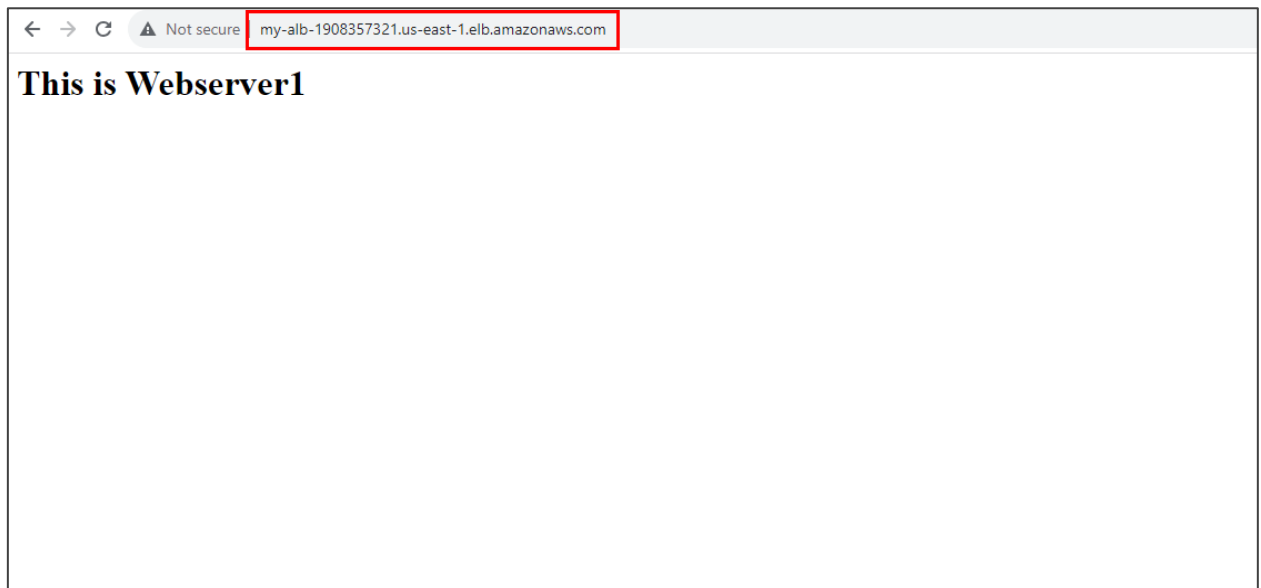
Total targets	Healthy	Unhealthy	Unused	Initial	Draining
2	2	0	0	0	0

► **Distribution of targets by Availability Zone (AZ)**  
Select values in this table to see corresponding filters applied to the Registered targets table below.

### 1.3 Navigate to the **Load Balancers** section and copy the DNS name of the Load Balancer

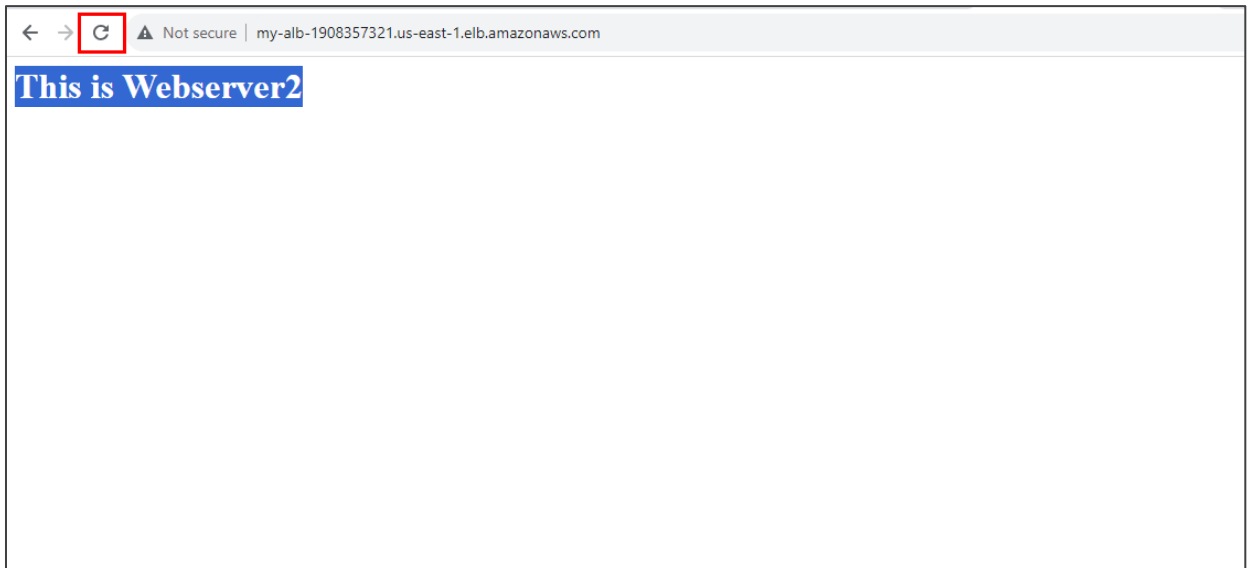


### 1.4 Open a browser window and paste the DNS URL into the address bar



You will observe the header message originating from the **Server1** instance.

1.5 Refresh the web page multiple times to see the header message originating from the **Server2** instance



By following these steps, you have successfully configured an Application Load Balancer in AWS to distribute traffic across multiple EC2 instances, ensuring load balancing and redundancy.