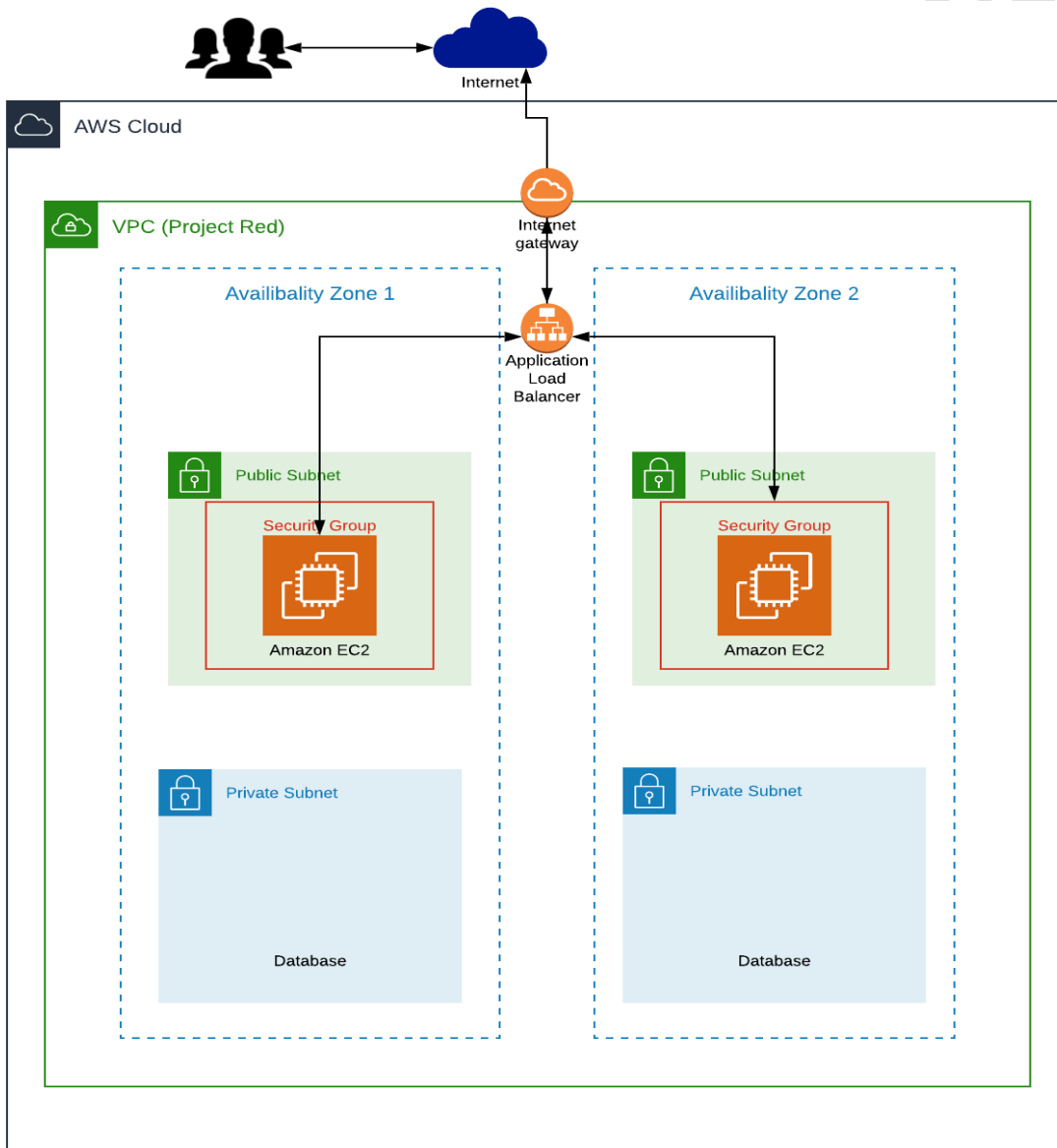


# Lab 6 - High Availability

For High availability it is important to host application on more than one data centers i.e. Availability Zones.

1. Create two web server in two different AZ.
2. Create an application load balancer to balance a load between two web servers.



## Prerequisite:

1. One VPC
  - a. name : VPCGreen
  - b. CIDR : 172.25.0.0/16
  - c. Region : Ohio
2. Internet gateway attached to VPCGreen
  - a. Name:GreenIG
3. Two PublicSubnets

-----

  - a. name: GreenPublic1
  - b. AZ : us-east-2a
  - c. CIDR: 172.25.1.0/24
  - d. Auto Assign Public IP : Enable

-----

  - e. name: GreenPublic2
  - f. AZ : us-east-2b
  - g. CIDR: 172.25.2.0/24
  - h. Auto Assign Public IP : Enable

-----
4. Route table
  - a. Name: GreenRT
  - b. Subnet Association : GreenPublic1 & GreenPublic1
  - c. Routes:
    - i. Destination : 0.0.0.0
    - ii. Target : Internet Gateway (GreenIG)
5. Security Group
  - a. Name: Web
  - b. Description : For web servers
  - c. Inbound Rule
    - i. Type :SSH                      Source : Anywhere
    - ii. Type :HTTP                      Source : Anywhere
    - iii. Type :ALL ICMP IPV4              Source : Anywhere
6. Two instances for web servers

-----

- a. name : Web1
- b. AMI : **Amazon Linux 2 AMI (HVM), SSD Volume Type**
- c. Type : t2.micro
- d. Network : VPCGreen
- e. Subnet : GreeCome to EC2 service dashboard
- f.
- g. Select target group from EC2 service features which are at the left side.nPublic1
- h. User Data :

```
#!/bin/bash
yum update -y
yum install httpd -y
cd /var/www/html
echo "<h1>Welcome to my first web server</h1>" > index.html
systemctl start httpd
systemctl enable httpd
```

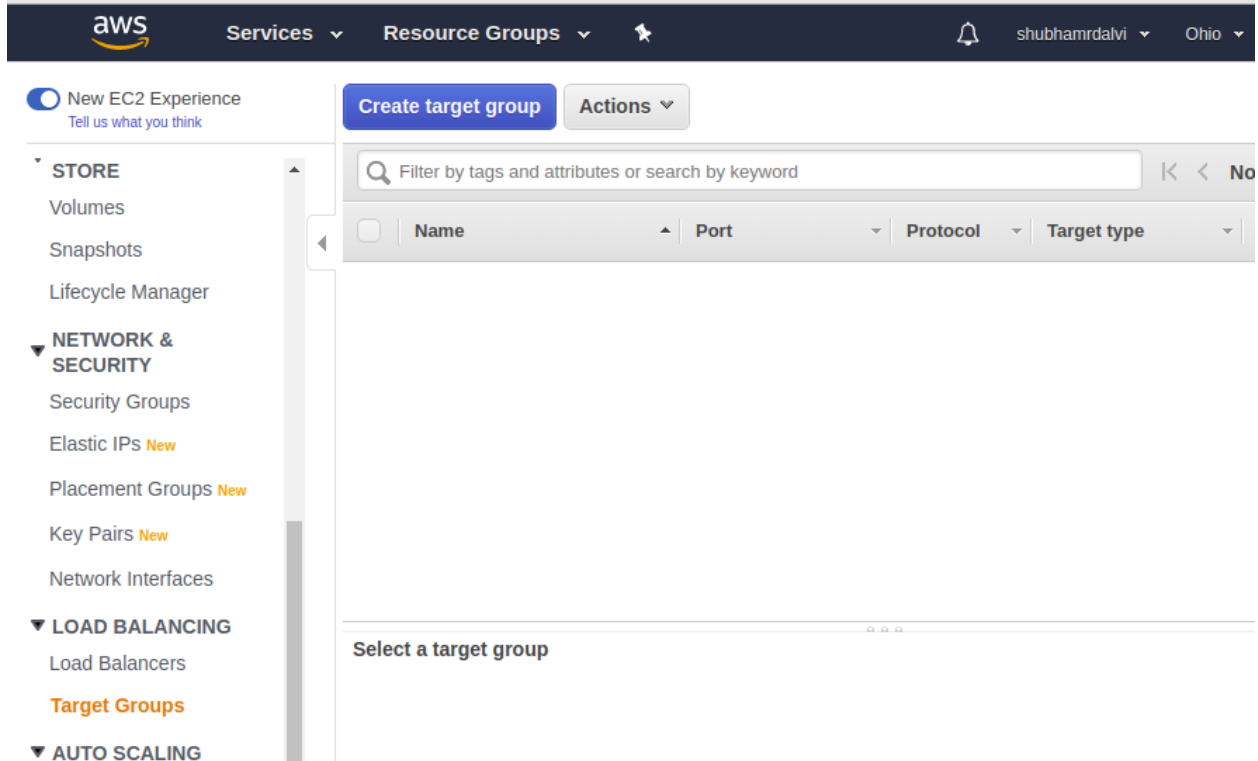
- 
- a. name : Web2
  - b. AMI : **Amazon Linux 2 AMI (HVM), SSD Volume Type**
  - c. Type : t2.micro
  - d. Network : VPCGreen
  - e. Subnet : GreenPublic2
  - f. User Data :

```
#!/bin/bash
yum update -y
yum install httpd -y
cd /var/www/html
echo "<h1>Welcome to my Second web server</h1>" > index.html
systemctl start httpd
systemctl enable httpd
```

**Note: Copy public ip of both web servers and paste to web browser for web server validation.**

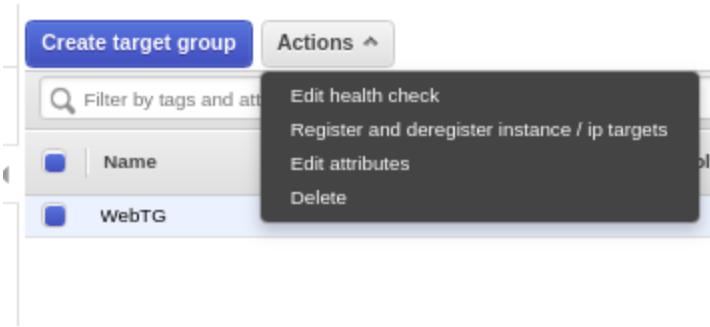
## Lab 6 - A .High Availability Solution

1. Come to EC2 service dashboard
2. Select target group from EC2 service features which are at the left side.



The screenshot shows the AWS Management Console interface for the EC2 service. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and user information. The left sidebar contains a navigation menu with categories like 'STORE', 'NETWORK & SECURITY', 'LOAD BALANCING', and 'AUTO SCALING'. Under 'LOAD BALANCING', 'Target Groups' is highlighted. The main content area shows a 'Create target group' button and a table with columns for Name, Port, Protocol, and Target type. The text 'Select a target group' is visible below the table.

3. click on **Create Target Group**.
  - a. Name: WebTG
  - b. Target Type: Instance
  - c. Protocol: HTTP
  - d. Port: 80
  - e. VPC: GreenVPC
  - f. **Create**
4. Select WebTG --> **Actions --> Register/Deregister instances**.



5. Select web1 and web2 instance and click on the **Add to registered**.
6. **Save**.

### Register and deregister targets ✕

**Registered targets**

To deregister instances, select one or more registered instances and then click Remove.

<input type="checkbox"/>	Instance	Name	Port	State	Security groups	Zone
<input type="checkbox"/>	i-050172136153d869e	web1	80	<span style="color: green;">●</span> running	web	us-east-2a
<input type="checkbox"/>	i-0424840b296aa7d7e	web2	80	<span style="color: green;">●</span> running	web	us-east-2b

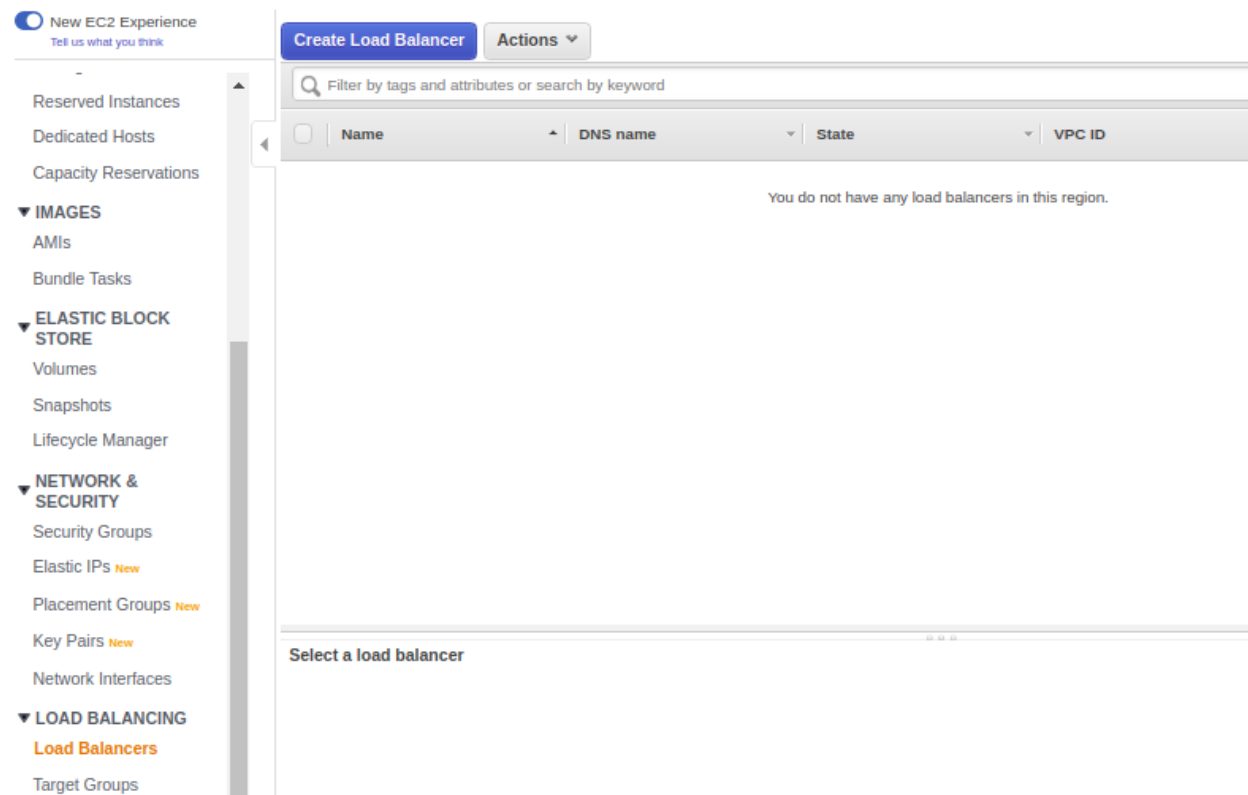
**Instances**

To register additional instances, select one or more running instances, specify a port, and then click Add. The default port is the port specified for the target group. If the instance is already registered on the specified port, you must specify a different port.

on port

<input type="checkbox"/>	Instance	Name	State	Security	Zone	Subnet ID	Subnet CIDR
<input checked="" type="checkbox"/>	i-0501721361...	web1	<span style="color: green;">●</span> running	web	us-east-2a	subnet-01ffc2e04fa233a5e	172.25.1.0/24
<input checked="" type="checkbox"/>	i-0424840b29...	web2	<span style="color: green;">●</span> running	web	us-east-2b	subnet-01b42547d986b24d2	172.25.2.0/24

7. Select load balancer from VPC features.



The screenshot shows the AWS Management Console interface for creating a load balancer. On the left, there is a navigation menu with categories like 'IMAGES', 'ELASTIC BLOCK STORE', 'NETWORK & SECURITY', and 'LOAD BALANCING'. The 'LOAD BALANCING' section is expanded, showing 'Load Balancers' and 'Target Groups'. At the top, there is a 'Create Load Balancer' button and an 'Actions' dropdown. Below this is a search bar and a table with columns for Name, DNS name, State, and VPC ID. The table is currently empty, with a message stating 'You do not have any load balancers in this region.' Below the table, there is a 'Select a load balancer' section.

8. Click on **Create Load Balancer**.
9. Select Application load balancer.
  - a. Name : WebLB
  - b. Scheme: internet-facing
  - c. VPC : VPCGreen
  - d. Select both AZ then Public1 and Public2 subnet in particular AZ.

## Availability Zones

Specify the Availability Zones to enable for your load balancer. The load balancer routes traffic to the targets in these Availability Zones: subnets from at least two Availability Zones to increase the availability of your load balancer.



The screenshot shows the 'Availability Zones' configuration section. It includes a 'VPC' dropdown menu set to 'vpc-06fab39d7cf4b25c2 (172.25.0.0/16) | VPCGreen'. Below this, there are two checked 'Availability Zones' entries: 'us-east-2a' and 'us-east-2b'. Each entry has a dropdown menu for selecting a subnet. For 'us-east-2a', the selected subnet is 'subnet-01ffc2e04fa233a5e (GreenPublic1)'. For 'us-east-2b', the selected subnet is 'subnet-01b42547d986b24d2 (GreenPublic2)'. Below each subnet selection, there is an 'IPv4 address' field and the text 'Assigned by AWS'.

10. **Next : Configure Security Settings**

11. **Next : Configure Security Group**

12. Create New Security Group

- a. name : LBSG
- b. Inbound Rule
  - i. Type: HTTP
  - ii. Source : Anywhere

1. Configure Load Balancer 2. Configure Security Settings 3. Configure Security Groups 4. Configure Routing 5. Register Targets 6. Review

**Step 3: Configure Security Groups**

A security group is a set of firewall rules that control the traffic to your load balancer. On this page, you can add rules to allow specific traffic to reach your load balancer. First, decide whether to create a new security group or select an existing one.

Assign a security group:  Create a new security group  
 Select an existing security group

Security group name:

Description:

Type	Protocol	Port Range	Source
HTTP	TCP	80	Custom 0.0.0.0/0, ::/0

Add Rule

13. **Next : Configure Routing**

14. Target Group : Existing Target Group

15. Name: WebTG

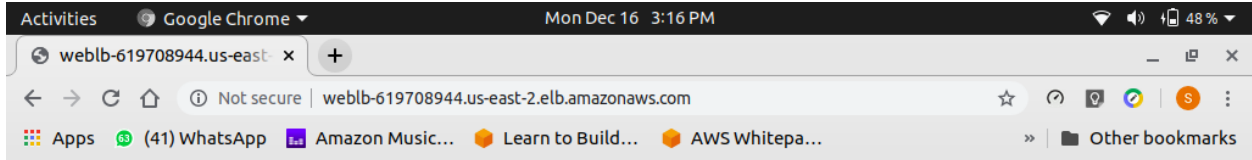
16. **Next : Register Targets**

17. **Next : Review**

18. **Create.**

19. Wait till state changes from provisioning to Active.

20. Copy DNS name from description and paste to a new tab of your web browser.



## Welcome to my second web server

21. Reload your web page message will change to

## Welcome to my first web server

or Vice-versa

22. You Load Balancer is working.
23. Delete your web1 and web2 instances.
24. Do not delete Load balancer and target group we will need it next LAB.



1.

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