# Cloud Computing Lab

Roll no. : 03
Batch : B1
Branch : CSE

## Practical 5 : Application Load Balancer

**Aim :** To configure and deploy an Application Load Balancer (ALB) in AWS to evenly distribute web traffic across multiple EC2 instances running Windows Server and IIS. By launching two EC2 instances, setting up IIS on each, creating a target group, and assigning it to the load balancer, the goal is to demonstrate how an ALB can improve application scalability and ensure high availability by routing incoming HTTP requests efficiently to healthy instances.

## Steps :

### 1. Launch Two EC2 Instances:

i. **Login to AWS Management Console:**
   - Navigate to the EC2 Dashboard.
   - Click **Launch Instance**.

ii. **Choose AMI:**
   - Select **Microsoft Windows Server 2022 Base** (or any other Windows Server version).

iii. **Instance Type:**
   - Choose **t2.micro** (or another type depending on your needs).

iv. **Configure Instance Details:**
   - Ensure the instances are launched in the desired VPC and subnet.
   - Leave other settings as default or modify them as needed.

v. **Add Storage:**
   - Use the default storage or adjust according to your requirements.

vi. **Configure Security Group:**
   - Create a new security group allowing inbound **RDP (port 3389)** for Windows access and **HTTP (port 80)** for web access. ( Or can select default)

vii. **Launch the Instance:**
   - Select an existing key pair or create a new one to access the instance.
   - Launch the instances and wait until they are in the **running** state.

### 2. Access EC2 Instances & Install IIS:

i. **Access the Instances:**
   - Use **Remote Desktop Protocol (RDP)** to connect to both instances using the public IP address or DNS.

ii. **Install IIS on Both Instances:**
   - Open the **Server Manager** on the Windows EC2 instance.
   - Click **Add roles and features**.
   - Select **Web Server (IIS)** and complete the installation.

iii. **Verify IIS Installation:**
   - After installation, open a browser in the RDP session and navigate to http://localhost. ( access inetpub -- wwwroot -- iis html)
   - You should see the default IIS welcome page, confirming that IIS is installed and running.

### 3. Create a Target Group:

i. **Navigate to the EC2 Dashboard:**
   - On the left panel, scroll down and click on **Target Groups** under **Load Balancing**.

ii. **Create a New Target Group:**
   - Click **Create Target Group**.
   - Choose **Instances** as the target type and set the protocol as **HTTP** and port **80**.
   - Select VPC where ec2 instances are launced.

iii. **Configure Health Checks:**
   - In the health check settings, choose **HTTP** for protocol and / for the path.
   - You can adjust the healthy threshold, interval, and timeout values as needed.

iv. **Register EC2 Instances:**

- Select the EC2 instances that were previously launched and click **Add to register**.
- Once both instances are registered, click **Create target group**.

### 4. Create an Application Load Balancer (ALB):

i. **Navigate to Load Balancers:**
   - On the EC2 dashboard, click **Load Balancers** under **Load Balancing**.

ii. **Create a New Load Balancer:**
   - Click **Create Load Balancer** and select **Application Load Balancer**.

iii. **Configure Basic Settings:**
   - Name your load balancer.
   - Choose **internet-facing** if you want the ALB to be accessible from the internet.
   - Set the **protocol** to **HTTP** and **port** to **80**.
   - Select your **VPC** and **subnets**.

iv. **Configure Security Group:**
   - Assign a security group to the load balancer that allows inbound **HTTP (port 80)** traffic.

v. **Configure Listeners and Routing:**
   - In the **Listener Configuration**, choose the target group created in step 3.
   - Click **Next** and review the settings.

vi. **Create the Load Balancer:**
   - Review all the configurations and click **Create Load Balancer**.

### 5. Test the Application Load Balancer:

i. **Get the DNS Name of the ALB:**
   - After the ALB is created, go to the **Load Balancers** section and copy the **DNS name** of your load balancer.

ii. **Test Load Balancing:**
   - Open a web browser and paste the ALB's DNS name into the address bar.
   - The request will be routed to one of the EC2 instances running IIS.
   - Refresh the page multiple times to observe the load balancer distributing traffic between both instances.

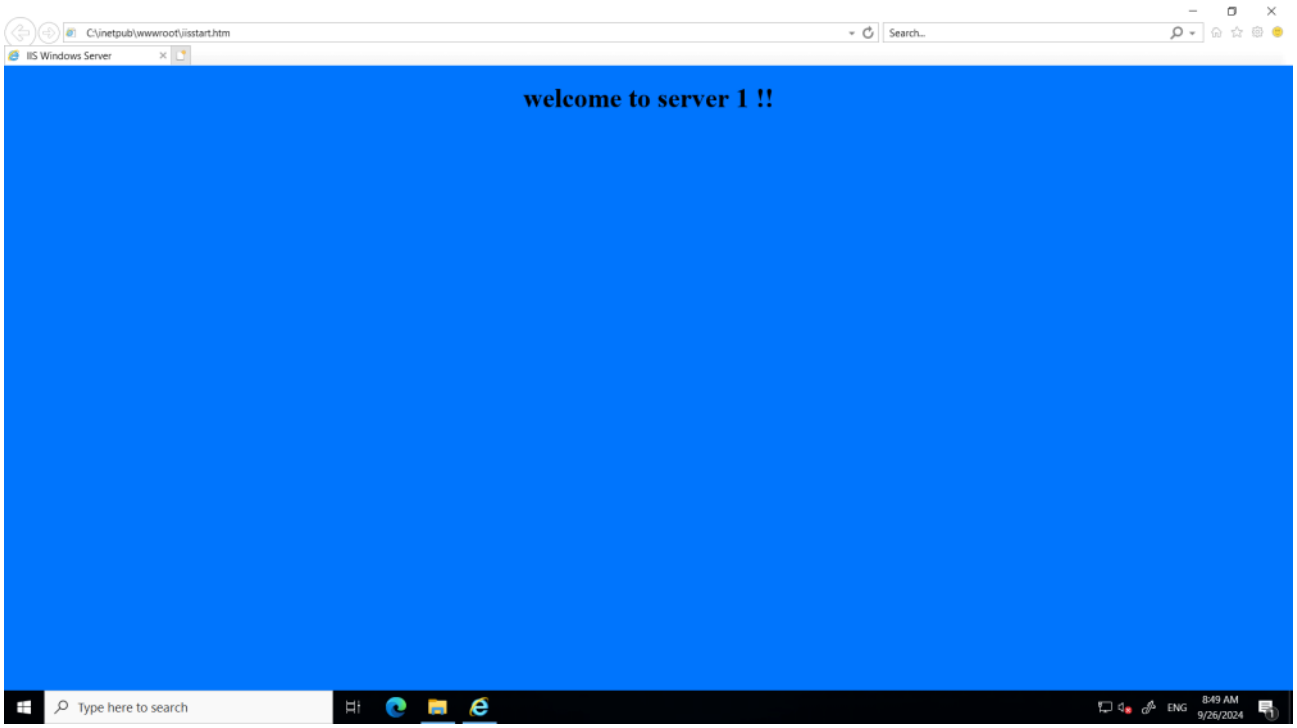
iii. **Verify Load Balancing:**
   - You should see the IIS welcome page served from both EC2 instances when the traffic is distributed.

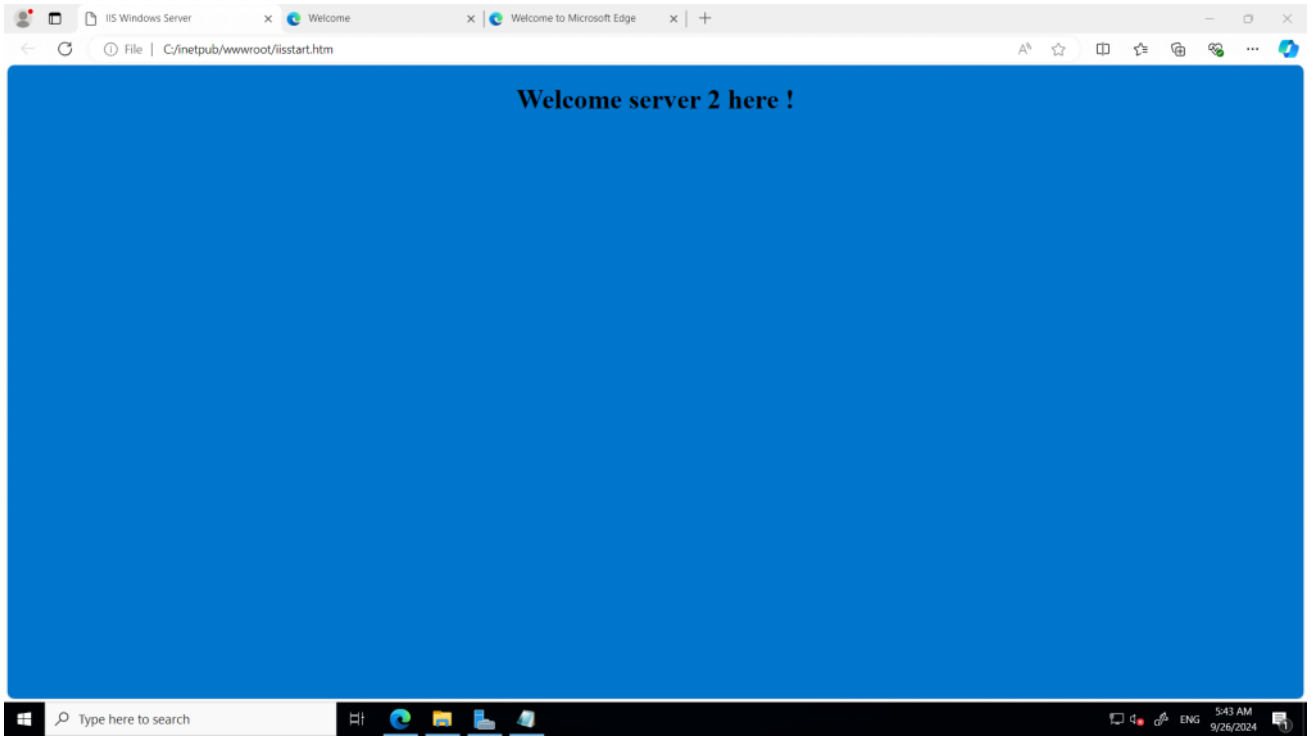
## Below are screenshots attached :

## # Ec 2 instances successfully launched

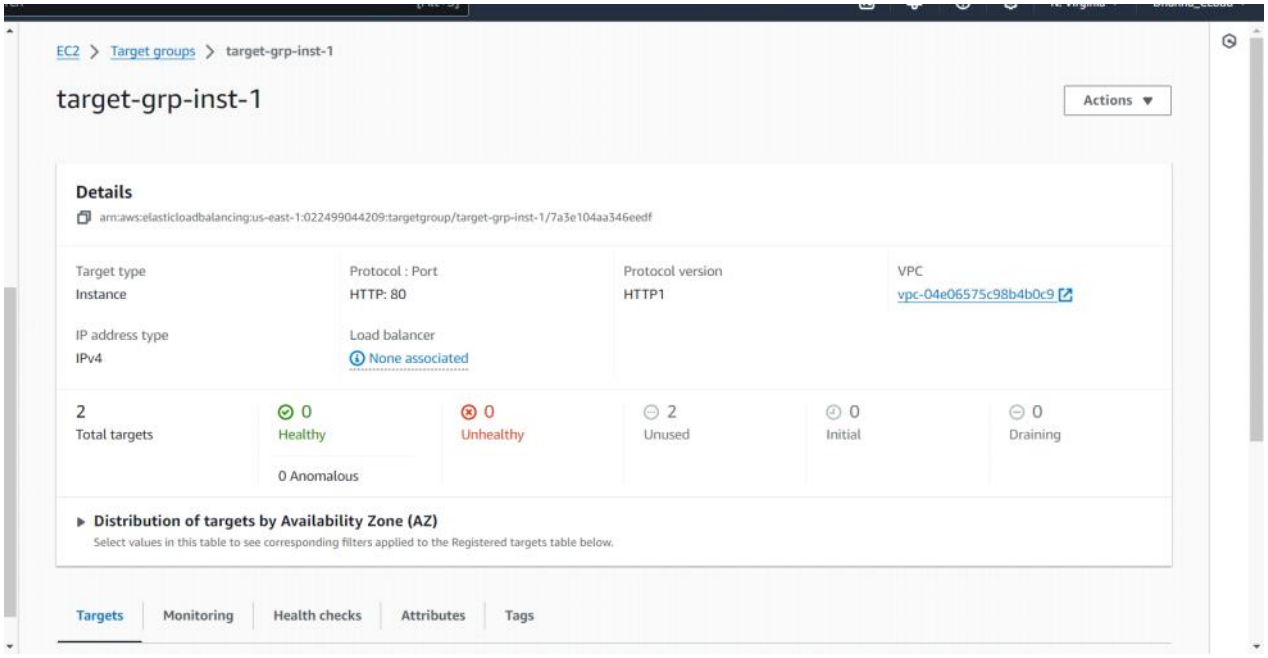


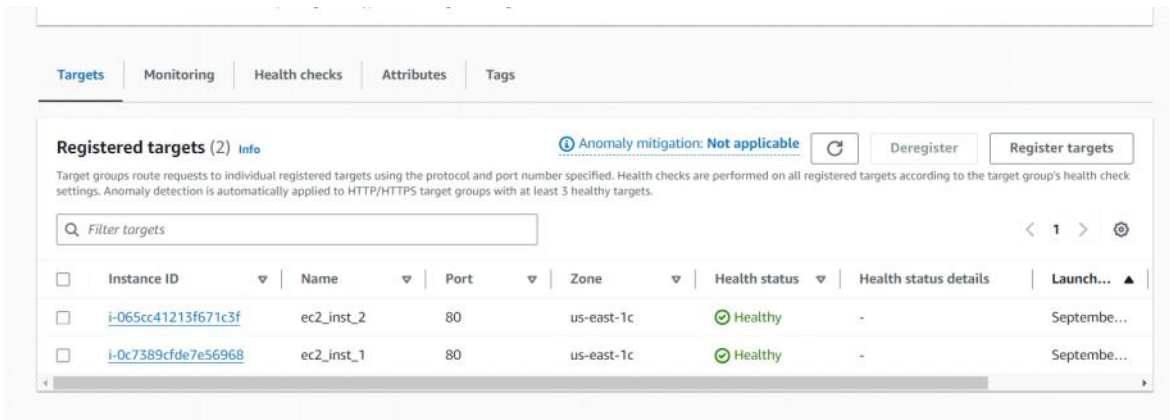
# **IIS installed successfully**



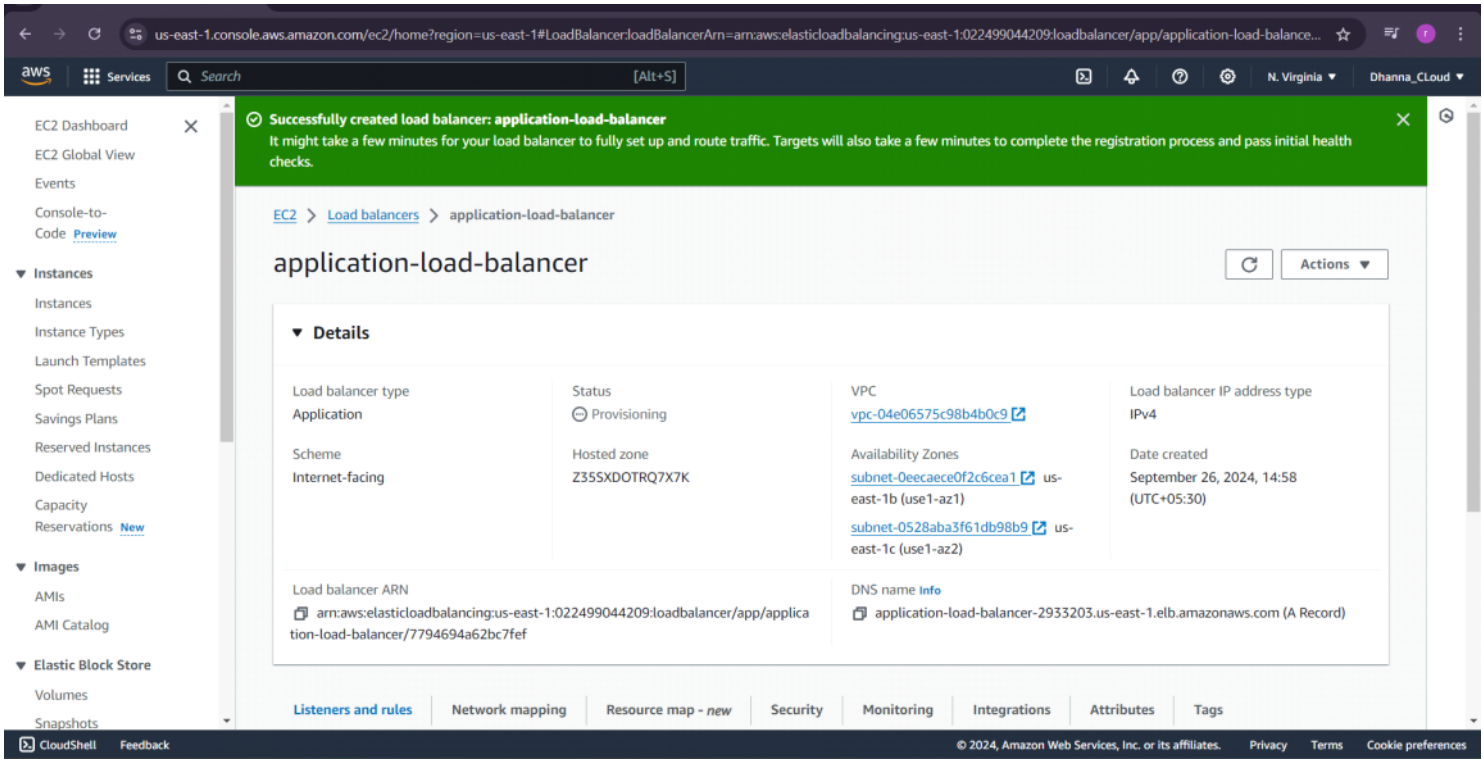


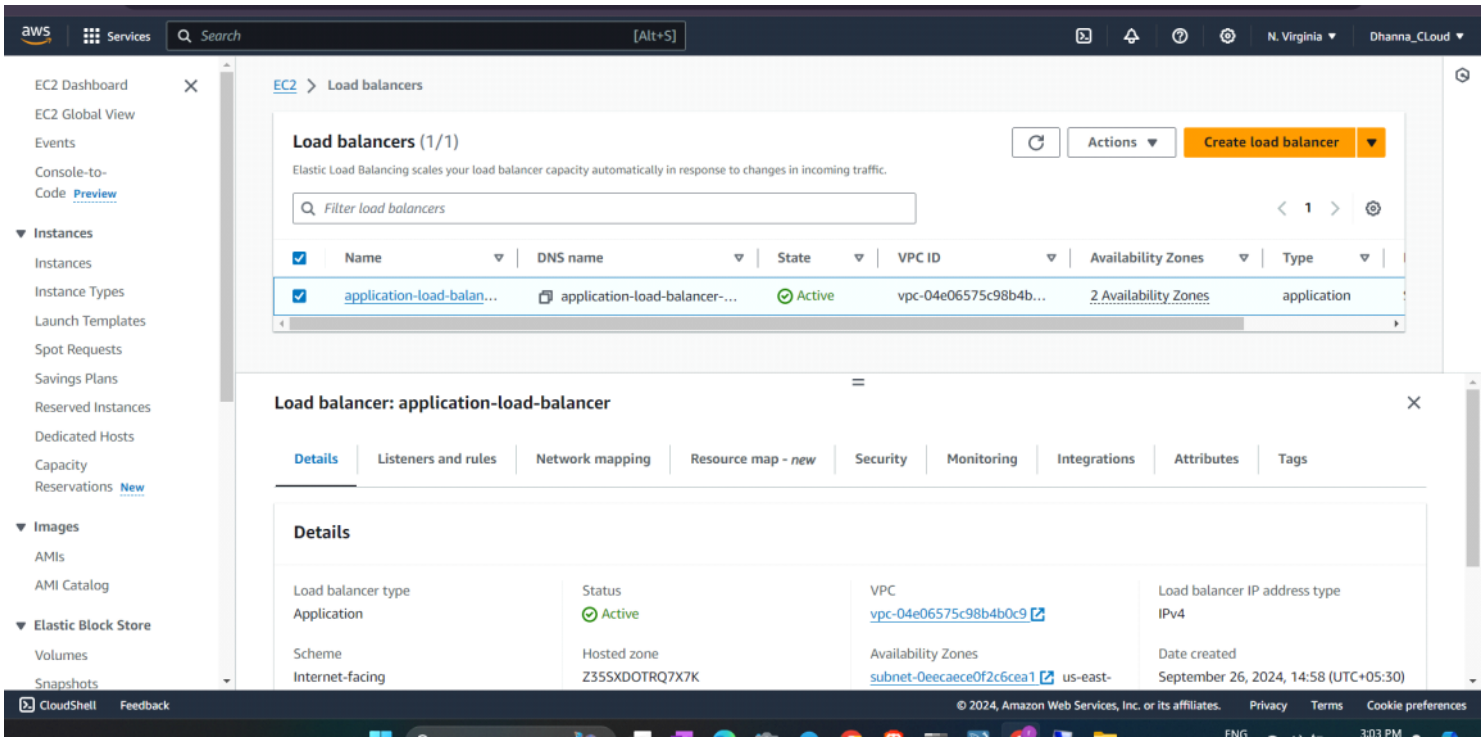

**# target group created under name target-grp-inst-1**

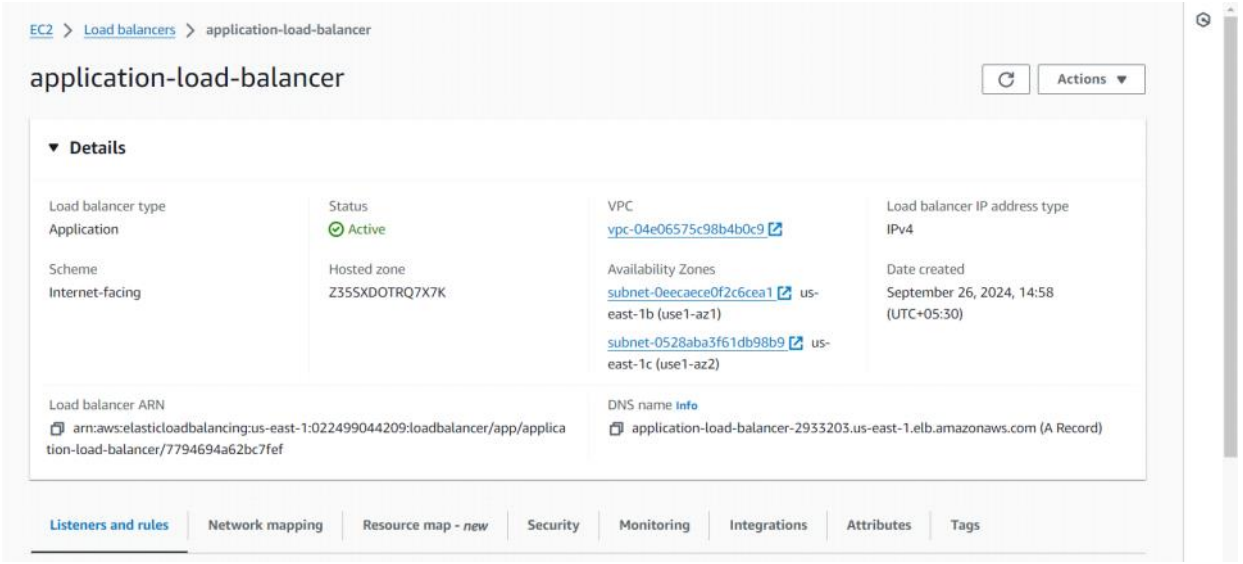


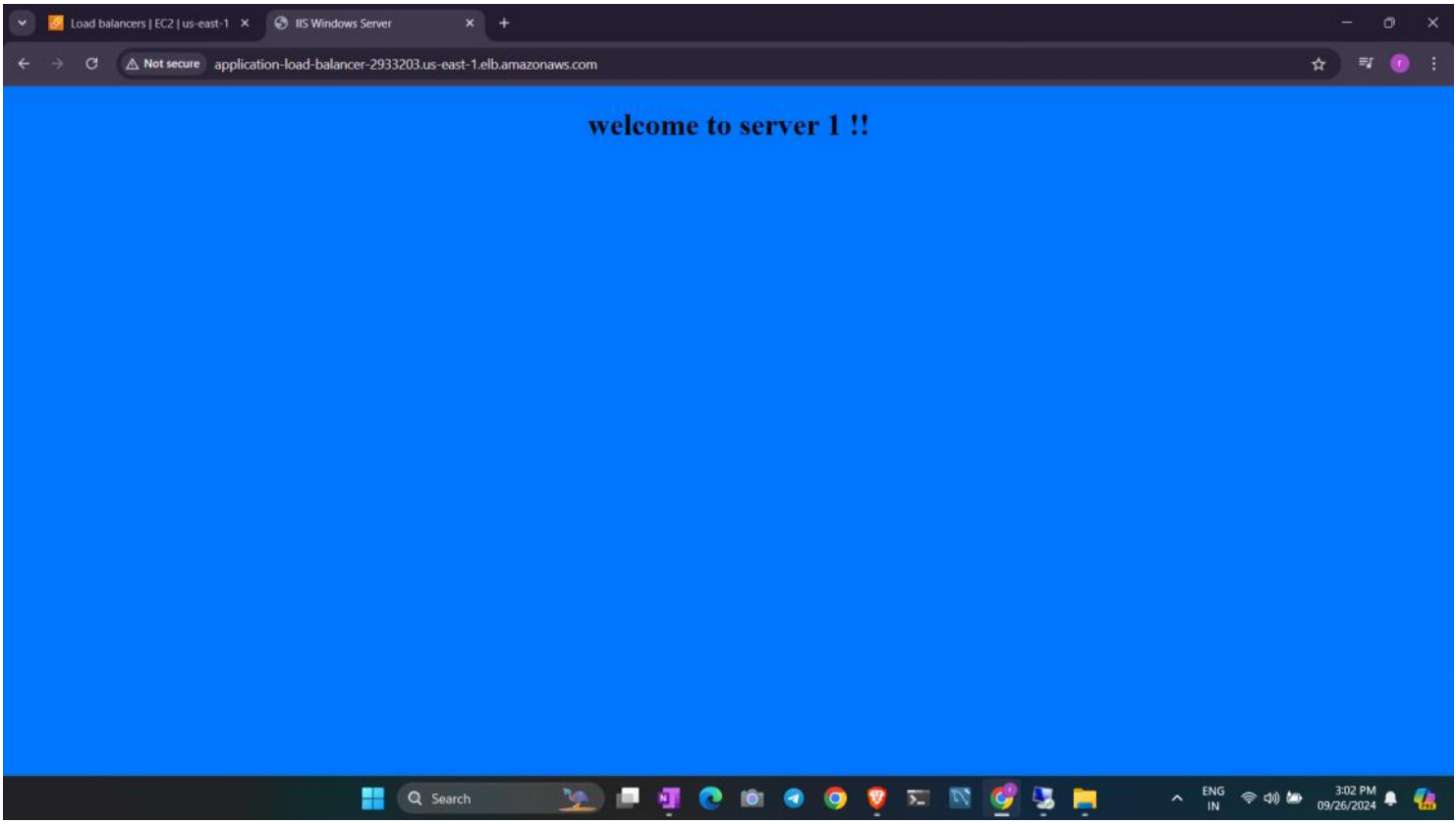
# Application Load balancer creted successfully and details are shown below

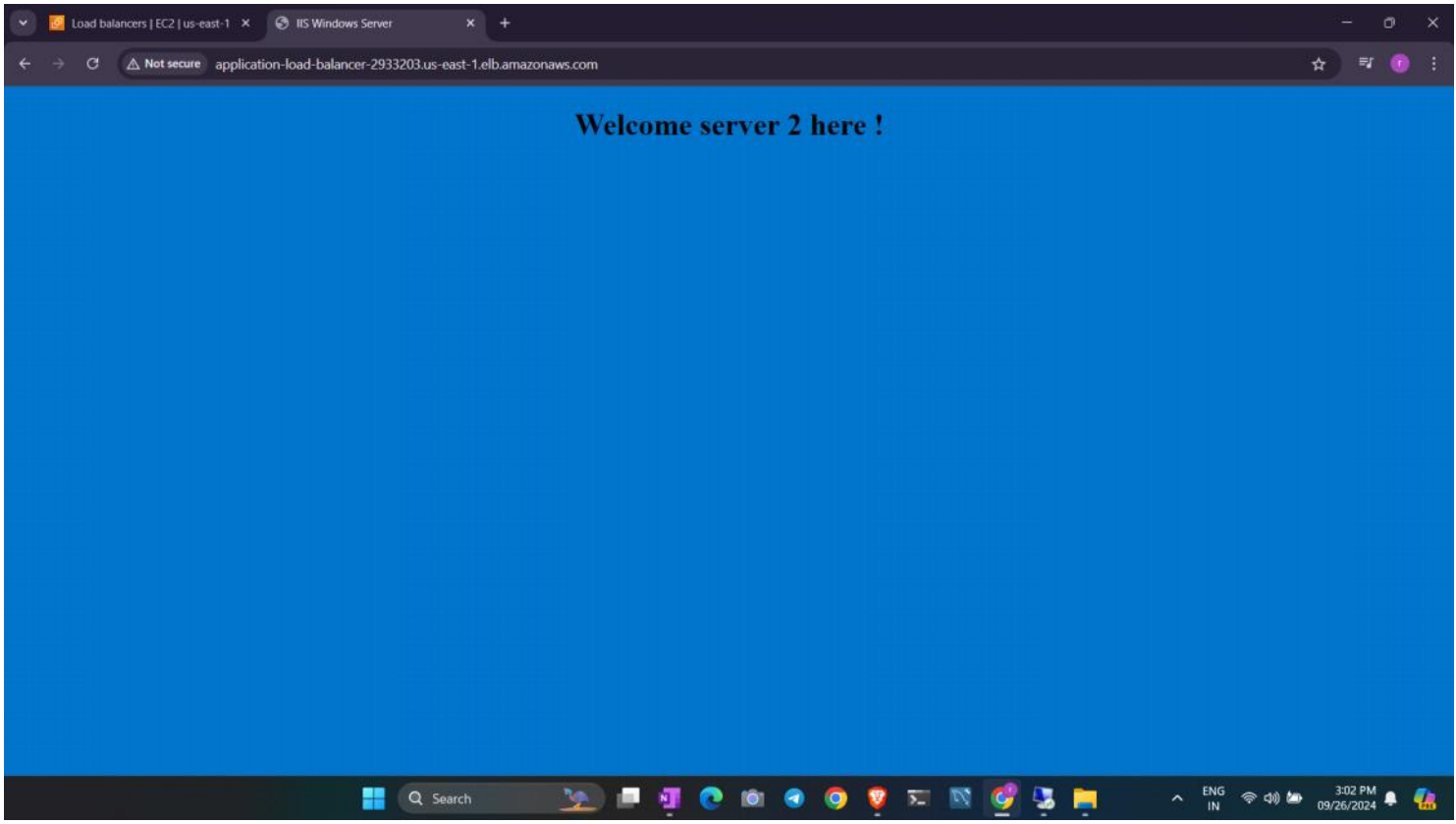





## # Testing the DNS name of load balancer




Load balancers | EC2 | us-east-1
IIS Windows Server
Not secure
application-load-balancer-2933203.us-east-1.elb.amazonaws.com
Welcome server 2 here !
Search
ENG
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