Lab 10: Application Load Balancer Demo with Path-Based Routing

Objective

This lab demonstrates how to set up an Application Load Balancer (ALB) in AWS to route HTTP traffic to three different EC2 instances representing microservices in an e-commerce application. Traffic is routed based on the request path in the HTTP header.

Architecture Overview

- EC2 Instance 1: Serves the main e-commerce homepage (/)
- EC2 Instance 2: Serves the products page (/products)
- EC2 Instance 3: Serves the billing page (/billing)
- Application Load Balancer (ALB): Routes traffic to each instance based on HTTP path rules.

Prerequisites

- AWS Free Tier account
- AWS CLI configured or CloudShell access
- Existing VPC and subnets
- IAM permissions to create EC2, ALB, Target Groups, and Security Groups

Lab Steps

Step 1: Launch Three EC2 Instances

Launch three Amazon Linux 2 **t2.micro** EC2 instances in the same VPC and subnet. Ensure they are in the same Availability Zone and have a security group that allows HTTP (port 80) & SSH (port 22) access.

Use user-data scripts to configure each instance to serve a different HTML page:

EC2 1 (Homepage):

```
#!/bin/bash
echo "<h1>Welcome to E-Commerce Site</h1>" >
/var/www/html/index.html
yum install -y httpd
systemctl start httpd
systemctl enable httpd
```

EC2 2 (Products):

```
#!/bin/bash
echo "<h1>Products Page</h1>" > /var/www/html/index.html
yum install -y httpd
systemctl start httpd
systemctl enable httpd
```

EC2 3 (Billing):

```
#!/bin/bash
echo "<h1>Billing Page</h1>" > /var/www/html/index.html
yum install -y httpd
systemctl start httpd
systemctl enable httpd
```

Step 2: Create Target Groups

Create three target groups in the same VPC:
- ecommerce-home
- ecommerce-products
- ecommerce-billing

Register each EC2 instance with its corresponding target group.

Step 3: Create the Application Load Balancer

Create an ALB in the same VPC and Availability Zone. Attach at least two subnets and the security group that allows HTTP access (port 80).

Step 4: Add Listener Rules

Configure the HTTP (port 80) listener with rules:
- Rule 1: If path is /, forward to target group ecommerce-home
- Rule 2: If path is /products, forward to target group ecommerce-products
- Rule 3: If path is /billing, forward to target group ecommerce-billing

Step 5: Test the Setup

Use a browser or curl to test:
- http://<ALB-DNS>/ → E-Commerce Homepage
- http://<ALB-DNS>/products → Products Page
- http://<ALB-DNS>/billing → Billing Page

Cleanup (Optional)
Terminate the EC2 instances, delete the ALB, target groups, and security groups created for this lab.

Summary

In this lab, you learned how to deploy a basic microservices architecture using EC2 instances behind an Application Load Balancer. You implemented path-based routing using listener rules to serve different content from each instance.