CloudFolks HUB - Application Load Balancer Setup Guide

This guide will help you set up two Application Load Balancers (ALBs) in different regions (AP-South-1 and US-East-1) using the default VPC and the `alb-sg` security group. Each ALB will target two web servers.

# Overview

You will:

1. Create a security group (`alb-sg`) to allow HTTP traffic specifically for the ALBs.

2. Set up two Application Load Balancers:

- One in the AP-South-1 (India) region.

- One in the US-East-1 (N. Virginia) region.

# Prerequisites

Before you begin, ensure you have the following:

- Four EC2 instances set up as web servers (two in AP-South-1 and two in US-East-1).

- Security group (`alb-sg`) to allow HTTP traffic on port 80 for the ALBs.

# Step 1: Create the Security Group (`alb-sg`)

## 1.1 Create the Security Group in AP-South-1 (India)

1. \*\*Select the Region\*\*: Ensure you are in the \*\*AP-South-1 (Mumbai)\*\* region.

2. In the \*\*EC2 Dashboard\*\*, navigate to \*\*Security Groups\*\* under the \*\*Network & Security\*\* section.

3. Click \*\*Create Security Group\*\*.

4. \*\*Security Group Name\*\*: Enter `alb-sg`.

5. \*\*Description\*\*: Enter a description, e.g., `Security group for ALB allowing HTTP traffic`.

6. \*\*VPC\*\*: Select your \*\*default VPC\*\*.

7. \*\*Inbound Rules\*\*:

- Click \*\*Add Rule\*\*.

- \*\*Type\*\*: Select \*\*HTTP\*\*.

- \*\*Protocol\*\*: Should automatically be \*\*TCP\*\*.

- \*\*Port Range\*\*: Should automatically be \*\*80\*\*.

- \*\*Source\*\*: Select \*\*Anywhere-IPv4\*\* (0.0.0.0/0).

8. \*\*Outbound Rules\*\*: Leave as default (All traffic allowed).

9. Click \*\*Create Security Group\*\*.

## 1.2 Create the Security Group in US-East-1 (N. Virginia)

Repeat the steps above in the \*\*US-East-1\*\* region.

1. \*\*Select the Region\*\*: Change to the \*\*US-East-1 (N. Virginia)\*\* region in the AWS Management Console.

2. Repeat the steps to create a security group named `alb-sg`, allowing HTTP traffic on port 80.

# Step 2: Create the Application Load Balancer in AP-South-1 (India)

1. \*\*Select the Region\*\*: Ensure you are in the \*\*AP-South-1 (Mumbai)\*\* region.

2. Click on \*\*Create Load Balancer\*\*.

3. Choose \*\*Application Load Balancer\*\* and click \*\*Create\*\*.

## 2.1 Configure the Load Balancer

1. \*\*Name\*\*: Enter a name for your load balancer, e.g., `India-ALB`.

2. \*\*Scheme\*\*: Select \*\*Internet-facing\*\*.

3. \*\*IP address type\*\*: Choose \*\*IPv4\*\*.

4. \*\*Listeners\*\*: Under \*\*Listeners\*\*, ensure there is a default listener on port \*\*80\*\* for HTTP.

5. \*\*Availability Zones\*\*:

- Select your \*\*default VPC\*\*.

- Choose the subnets in your \*\*default VPC\*\* that correspond to the availability zones you want your ALB to be in.

6. \*\*Security Groups\*\*:

- Under \*\*Security Groups\*\*, select \*\*alb-sg\*\*.

## 2.2 Configure the Target Group

1. Click on \*\*Create a new target group\*\*.

2. \*\*Target Group Name\*\*: Enter a name, e.g., `India-TG`.

3. \*\*Target Type\*\*: Choose \*\*Instance\*\*.

4. \*\*Protocol\*\*: HTTP.

5. \*\*Port\*\*: 80.

6. \*\*VPC\*\*: Select your \*\*default VPC\*\*.

7. \*\*Health Checks\*\*:

- Protocol: HTTP

- Path: `/`

8. Click \*\*Next\*\* to register your targets.

## 2.3 Register Targets (Web-Server-1 and Web-Server-2)

1. \*\*Instances\*\*:

- Select the instances for `Web-Server-1` and `Web-Server-2` in the AP-South-1 region.

2. Click \*\*Include as pending below\*\*.

3. Click \*\*Create target group\*\*.

## 2.4 Review and Create the ALB

1. Review all settings, ensuring that the target group is associated with the correct instances.

2. Click \*\*Create load balancer\*\*.

# Step 3: Create the Application Load Balancer in US-East-1 (N. Virginia)

Repeat the same steps as in Step 2, but in the \*\*US-East-1\*\* region.

1. \*\*Select the Region\*\*: Change to the \*\*US-East-1 (N. Virginia)\*\* region.

2. \*\*Create Load Balancer\*\*:

- Name: `US-ALB`.

- Target Group Name: `US-TG`.

- Follow the same configuration steps as for the AP-South-1 region.

3. \*\*Register Targets\*\*:

- Select the instances for `Web-Server-1` and `Web-Server-2` in the US-East-1 region.

4. \*\*Create the Load Balancer\*\*.

# Step 4: Test Your Load Balancers

1. After both load balancers are created, navigate to the \*\*Load Balancers\*\* section in the EC2 Dashboard for each region.

2. Copy the \*\*DNS name\*\* of each ALB.

3. Paste the DNS name into your browser to verify that the load balancers are distributing traffic to the `Web-Server-1` and `Web-Server-2` instances.

# Conclusion

You now have two Application Load Balancers set up: one in the AP-South-1 (India) region and one in the US-East-1 (N. Virginia) region. Each ALB targets two web servers (`Web-Server-1` and `Web-Server-2`) within its respective region. The ALBs are protected by the `alb-sg` security group, ensuring secure access.

This setup allows you to demonstrate load balancing across different regions, providing a reliable and scalable solution for distributing traffic to your web servers.