

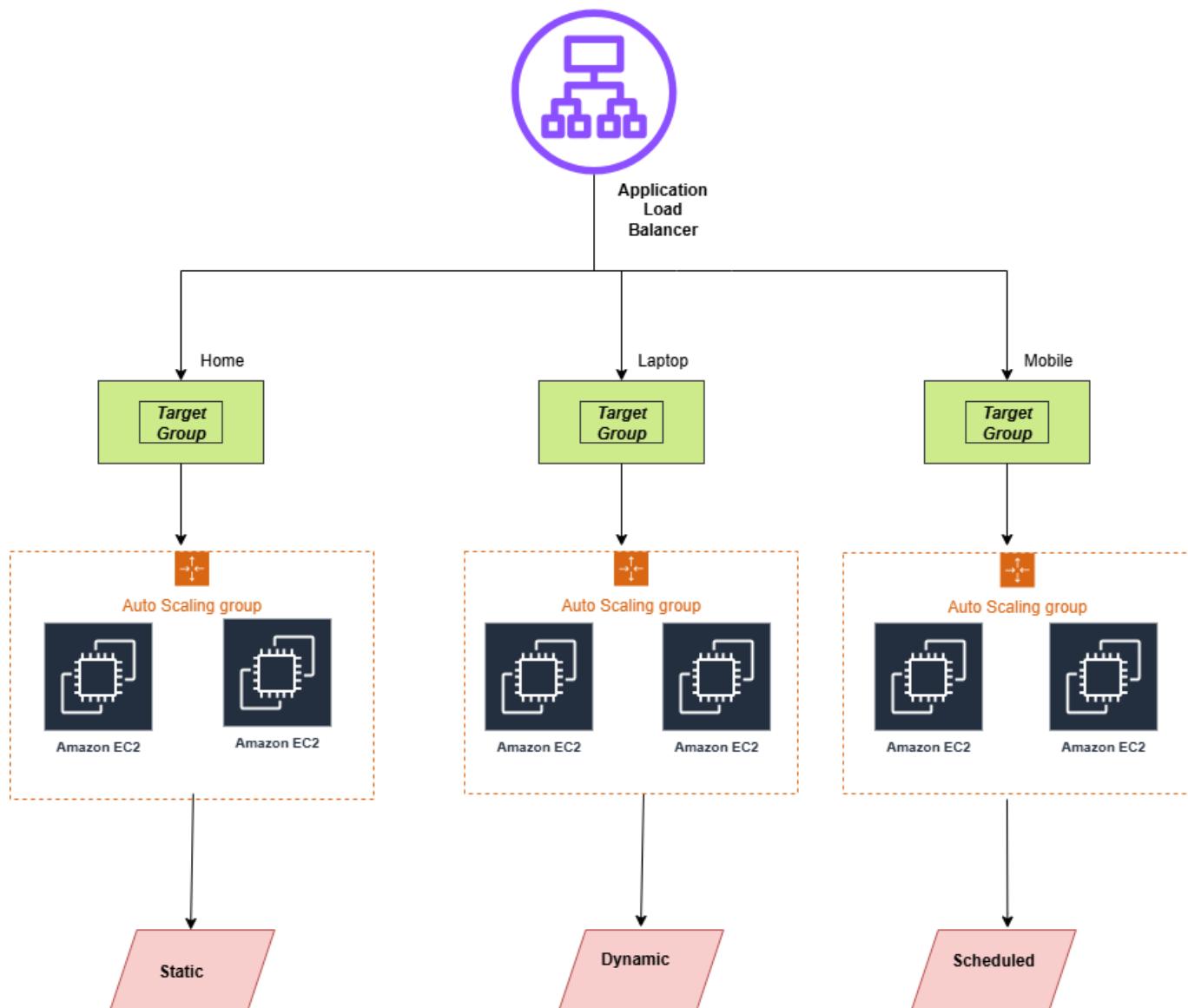
Application Load Balancer with Auto Scaling Group Project

Project Overview

This project demonstrates how to deploy a highly available and scalable web application on AWS using:

- **Application Load Balancer (ALB)** for distributing traffic.
- **Auto Scaling Group (ASG)** for automatic scaling of EC2 instances.
- **Launch Template** (or Launch Configuration) to define instance settings.
- **Target Group** to register healthy EC2 instances behind the ALB.

Architecture Diagram



Steps to Deploy

1. Create a Launch Template:

- Choose an AMI (Amazon Linux 2 or Ubuntu).
- Select instance type (e.g., t2.micro).
- Add User Data to install web server

The screenshot shows the AWS Management Console with the URL us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchTemplates. The page displays a list of three launch templates:

Launch Template ID	Launch Template Name	Default Version	Latest Version	Create Time
lt-0b82820de79d13669	Laptop-LT	1	1	2025-09-25
lt-05cc90bf8ab8a7b32	Home-LT	1	1	2025-09-25
lt-03f1eb0fa22cb3ca9	Mobile-LT	1	1	2025-09-25

The left sidebar shows navigation links for EC2 Global View, Events, Instances, Instance Types, Launch Templates (which is selected), Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, and Capacity Reservations. The bottom of the screen shows the Windows taskbar with various pinned icons.

2.Create Target Group:

- Protocol: HTTP
- Port: 80
- Health check path: /

Target groups (3)

Name	ARN	Port	Protocol	Target type
Mobile-TG	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/Mobile-TG/5555555555555555	80	HTTP	Instance
Laptop-TG	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/Laptop-TG/5555555555555555	80	HTTP	Instance
Home-TG	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/Home-TG/5555555555555555	80	HTTP	Instance

0 target groups selected

Select a target group above.

3.Create Auto Scaling Group:

Auto Scaling groups (3/3)

Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max
Mobile-ASG	Mobile-LT Version Default	0	Updating capacity...	3	2	7
Laptop-ASG	Laptop-LT Version Default	3	-	3	2	7
Home-ASG	Mobile-LT Version Default	2	-	2	2	2

3 Auto Scaling groups selected

4.Create Application Load Balancer and add rules with particular path:

The screenshot shows the AWS Management Console interface for an Application Load Balancer (ALB). The left sidebar navigation includes options like Elastic IPs, Placement Groups, Key Pairs, Network Interfaces, Load Balancing, Auto Scaling, and Settings. The main content area is titled "Listener rules (3) Info" and displays three rules:

Priority	Name tag	Conditions (If)	Actions (Then)
1	Mbile-rule	Path = /mobile/*	• Forward to target group Mobile-TG [1: 1 (100%) Target group stickiness: Off]
2	Laptop-rule	Path = /laptop/*	• Forward to target group Laptop-TG [1: 1 (100%) Target group stickiness: Off]
Last	Default	If no other rule applies	• Forward to target group [1: 1 (100%) Target group stickiness: Off]

At the bottom of the page, there are links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences, along with system status indicators for ENG IN, 08:01 PM, and 25-09-2025.

5. Attach the Target Group:

The screenshot shows the AWS Management Console interface for editing an Auto Scaling group named "Home-ASG". The left sidebar navigation includes options like Elastic IPs, Placement Groups, Key Pairs, Network Interfaces, Load Balancing, Auto Scaling, and Settings. The main content area is titled "Load balancers - optional". Under the "Application, Network or Gateway Load Balancer target groups" section, the "Home-TG | HTTP" target group is selected. A note indicates that one target group is not yet associated with any load balancer, prompting the user to attach it later. At the bottom of the page, there are links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences, along with system status indicators for ENG IN, 07:54 PM, and 25-09-2025.

The screenshot shows the AWS Management Console for the EC2 service, specifically the 'Edit Auto Scaling group' page for 'Laptop-ASG'. The left sidebar has sections for 'Elastic IPs', 'Placement Groups', 'Key Pairs', 'Network Interfaces', 'Load Balancing' (which is expanded), 'Auto Scaling' (which is also expanded), and 'Settings'. The main content area is titled 'Load balancing - optional'. It contains a section for 'Load balancers' with a checked checkbox for 'Application, Network or Gateway Load Balancer target groups'. Below this is a dropdown menu showing 'Select target groups' with an item 'Laptop-TG | HTTP' highlighted. A note below the dropdown states: 'One of your target groups is not yet associated with any load balancer. In order for routing and scaling to occur, you will need to attach the target group to a load balancer. This can be done later in the [Load Balancing console](#)'. At the bottom of the main content area, there is a section for 'Classic Load Balancers' with an unchecked checkbox and a link to 'Create and attach new load balancers'.

This screenshot shows the same 'Edit Auto Scaling group | EC2' page for 'Mobile-ASG'. The left sidebar and main content area are identical to the first screenshot, except for the target group name which has changed to 'Mobile-TG | HTTP'. The note at the bottom of the main content area remains the same, indicating that one target group is not yet associated with a load balancer.

6.Get the ALB DNS Name:

The screenshot shows the AWS Management Console interface for an Application Load Balancer (ALB). The top navigation bar includes the AWS logo, search bar, and account information (Account ID: 1408-7326-4862, United States (N. Virginia)). The main content area displays the ALB configuration, specifically the 'Listeners and rules' tab. Key details shown include:

- Source:** Oaabcc11ac21948e1a us-east-1b (use1-az4)
- subnet-** 068c997a06adb0dda us-east-1a (use1-az2)
- Load balancer ARN:** arn:aws:elasticloadbalancing:us-east-1:140873264862:loadbalancer/app/ALB/807826df8fd6ae21
- DNS name:** ALB-93853000.us-east-1.elb.amazonaws.com (A Record)

The 'Listeners and rules' section contains one rule with the following configuration:

- Condition:** Path /
- Action:** Forward to Backend

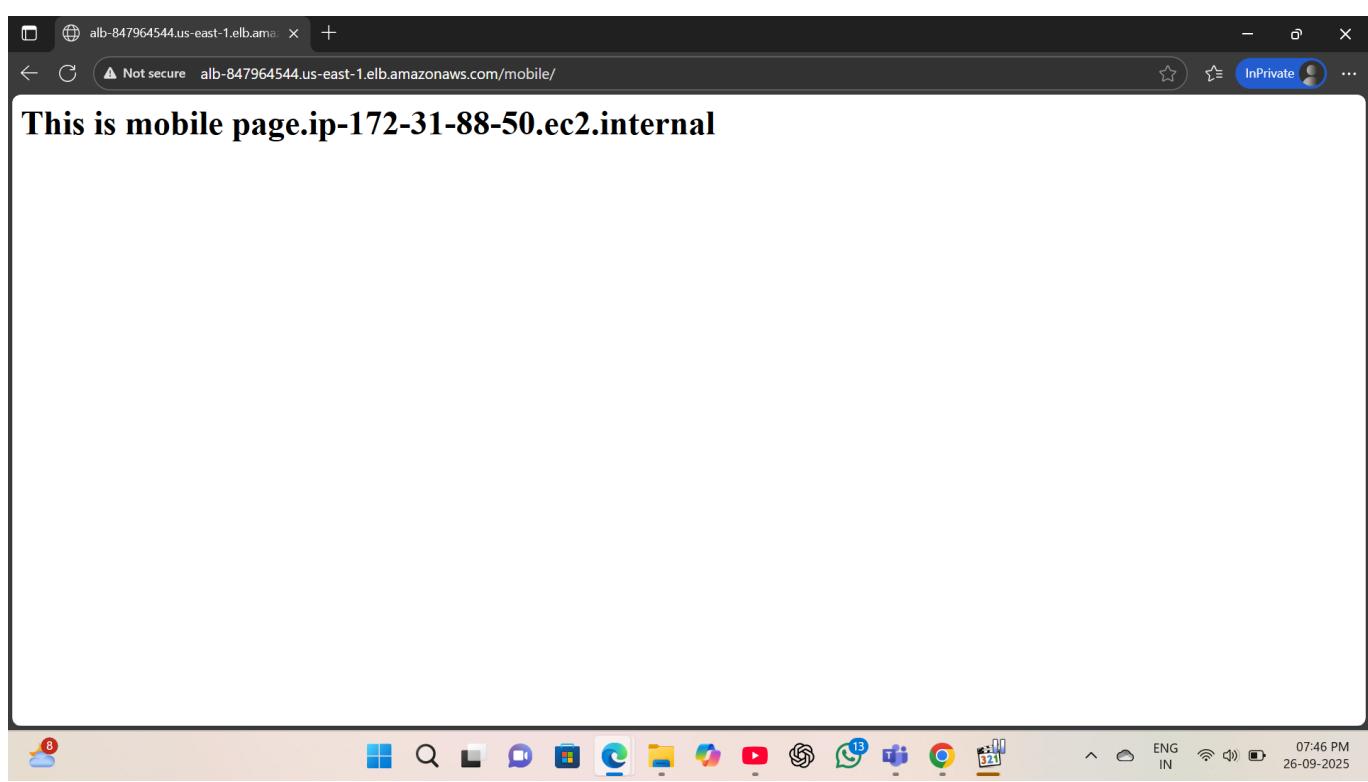
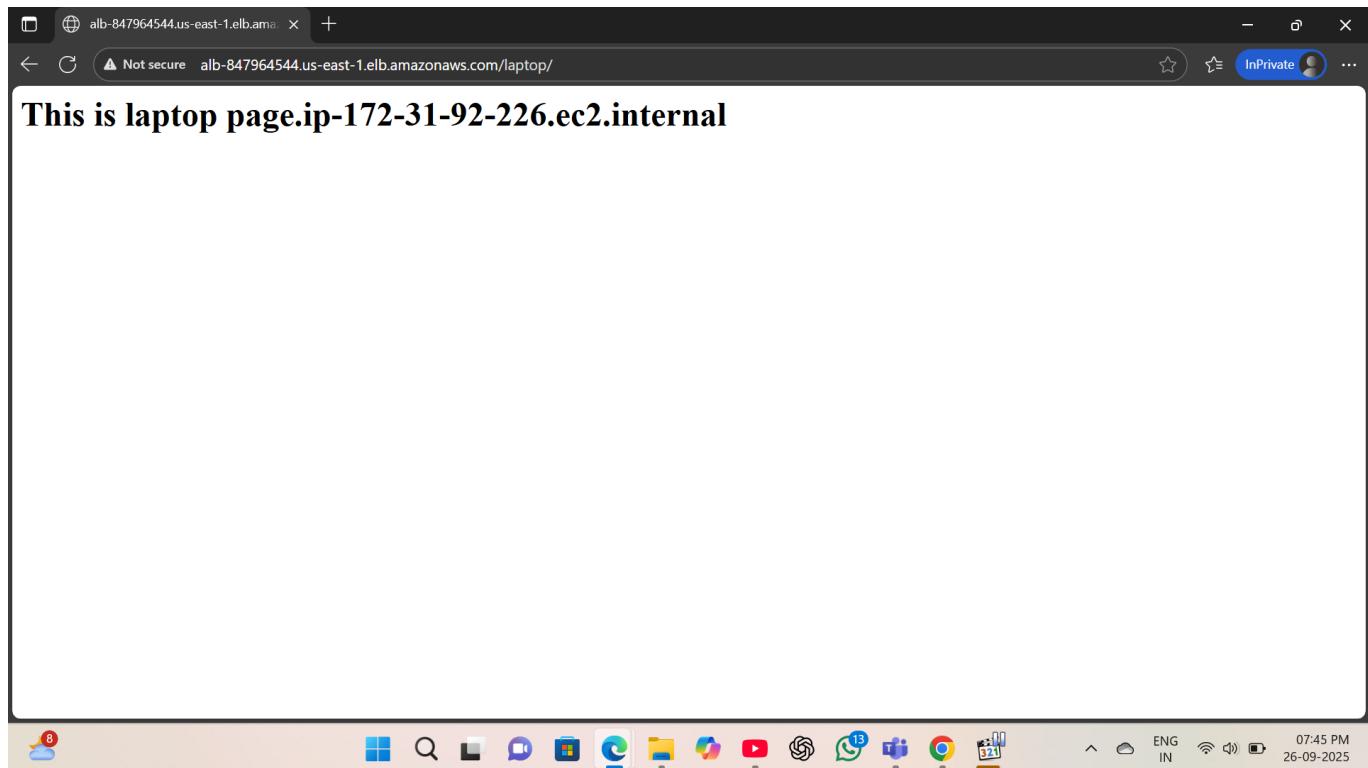
7. Test the Setup:

The screenshot shows a Microsoft Edge browser window displaying the response from the Application Load Balancer (ALB). The URL in the address bar is `alb-847964544.us-east-1.elb.amazonaws.com`. The page content is:

Hello World from ip-172-31-87-249.ec2.internal

The browser status bar at the bottom indicates the following information:

- CloudShell
- Feedback
- Not secure
- alb-847964544.us-east-1.elb.amazonaws.com
- InPrivate
- 08:03 PM
- 25-09-2025



Summary

In this project, we deployed a highly available, fault-tolerant, and scalable web application using AWS services. The Application Load Balancer evenly distributed incoming traffic, while the Auto Scaling Group ensured that the right number of EC2 instances were always running based on demand.