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aftab0045 Update README.md

8462d98 · 1 minute ago



167 lines (109 loc) · 3.96 KB

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# Auto Scaling Group with Application Load Balancer

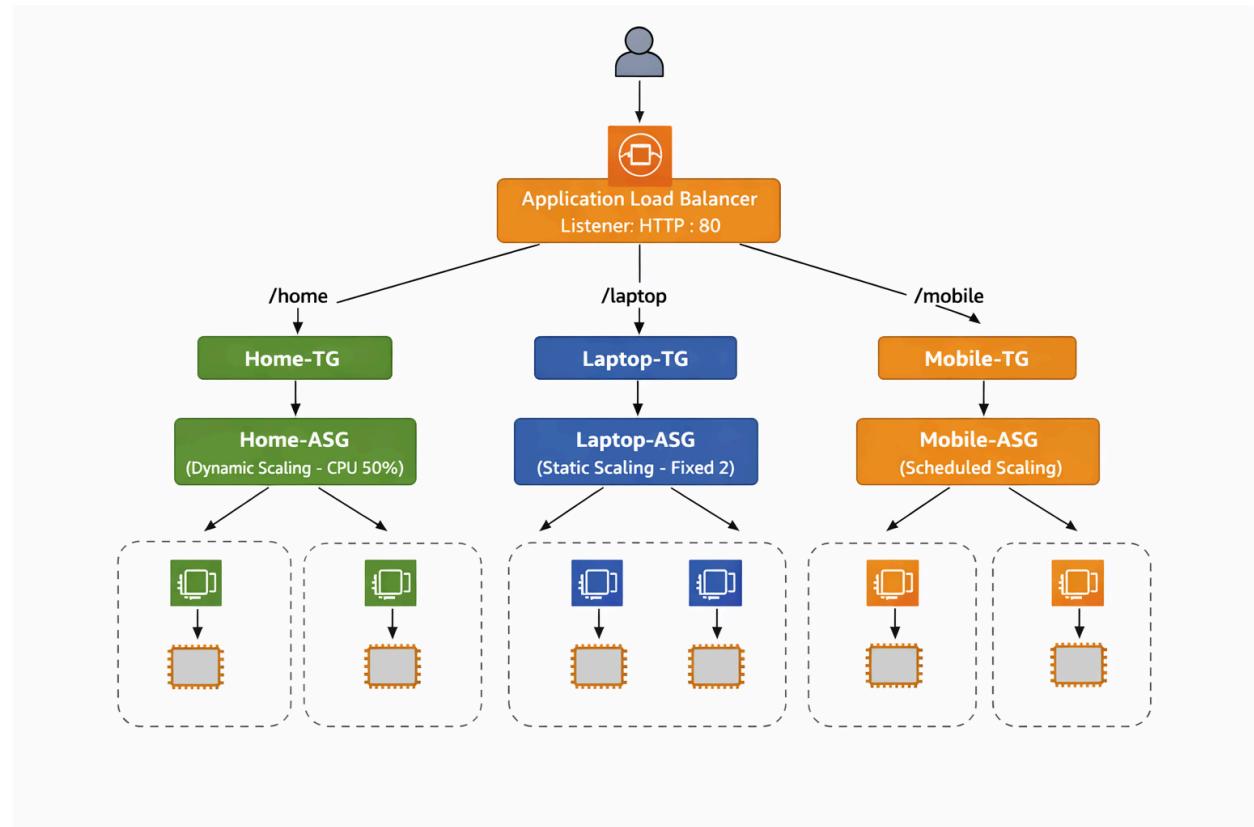
This project demonstrates how to build a scalable AWS architecture using an **Application Load Balancer (ALB)** and **multiple Auto Scaling Groups**, each configured with a different scaling strategy.

## Project Components

- Application Load Balancer (ALB)
- 3 Target Groups
  - Home-TG
  - Laptop-TG
  - Mobile-TG
- 3 Launch Templates
- 3 Auto Scaling Groups
  - Home-ASG → Dynamic Scaling
  - Laptop-ASG → Static Scaling
  - Mobile-ASG → Scheduled Scaling

## Architecture Diagram

The ALB routes traffic based on URL paths to different Target Groups. Each Target Group is connected to its own Auto Scaling Group.



## Step-by-Step Implementation

### Step 1 : Create Security Group

- Allow **HTTP (80)** from anywhere
- Allow **SSH (22)** from your IP
- Same security group used by ALB and EC2 instances

### Step 2 : Create Launch Templates

Created three Launch Templates with:

- Amazon Linux 2 AMI
- t3.micro instance type
- Apache ( httpd ) installed using User Data
- Different web content for identification

Launch Template	Page Served
Home-LT	Home Page

Launch Template	Page Served
Laptop-LT	Laptop Page
Mobile-LT	Mobile Page

The screenshot shows the AWS Launch Templates console. On the left, there's a navigation sidebar with sections like Dashboard, AWS Global View, Instances, Launch Templates (which is selected), Images, Elastic Block Store, and Network & Security. The main area is titled "Launch Templates (3) Info". It contains a table with three rows, each representing a launch template. The columns are: Launch Template ID, Launch Template Name, Default Version, Latest Version, Create Time, and Created By. The entries are:

Launch Template ID	Launch Template Name	Default Version	Latest Version	Create Time	Created By
lt-0f72dd6d51293825	Home-LT	1	1	2025-12-17T07:02:26.000Z	arn:aws:iam::003380
lt-0687b228651d50a61	Laptop-LT	1	1	2025-12-17T07:05:01.000Z	arn:aws:iam::003380
lt-0e7e8b4858f7d6fb3	Mobile-LT	1	1	2025-12-17T07:03:49.000Z	arn:aws:iam::003380

Below the table, a message says "Select a launch template". At the bottom right of the main area, there are links for CloudShell, Feedback, and Console Mobile App.

## Step 3 : Create Target Groups

- Target type: **Instance**
- Protocol: **HTTP**
- Port: **80**
- Health check path: **/**

Target Group
Home-TG
Laptop-TG
Mobile-TG

## Step 4 : Create Application Load Balancer

- Type: Application Load Balancer
- Scheme: Internet-facing
- Listener: HTTP : 80
- Attached to public subnets

## Step 5 : Configure ALB Listener Rules

Path-based routing rules configured as:

Path	Forward To
/home*	Home-TG
/laptop*	Laptop-TG
/mobile*	Mobile-TG
Default	Home-TG

The screenshot shows the AWS CloudWatch Metrics console. A CloudWatch Metrics Insights query is displayed, showing metrics for CloudWatch Metrics Insights. The query includes filters for 'CloudWatch Metrics Insights' and 'CloudWatch Metrics Insights Metrics'. It lists various metrics such as 'CloudWatch Metrics Insights Metrics: CloudWatch Metrics Insights Metrics' and 'CloudWatch Metrics Insights Metrics: CloudWatch Metrics Insights Metrics'. The results are paginated, with page 1 of 1 shown.

## Step 6 : Create Auto Scaling Groups

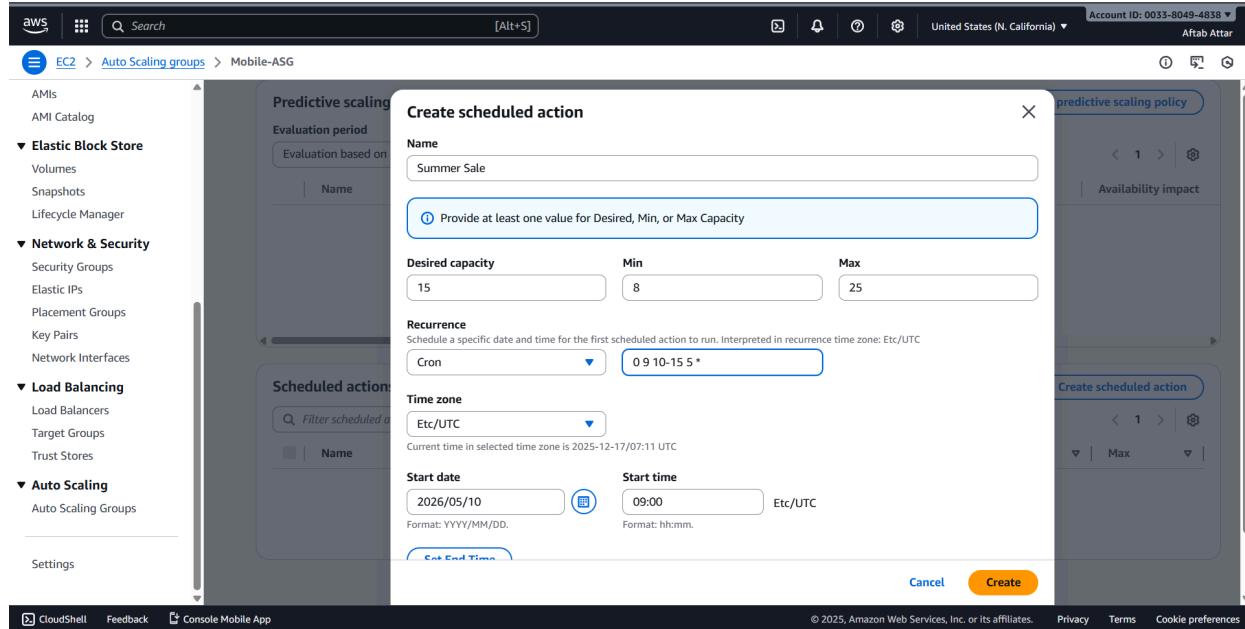
### ◆ Home-ASG (Dynamic Scaling)

- Launch Template: Home-LT
- Min: 1 | Desired: 2 | Max: 3
- Scaling Policy:
  - Target Tracking
  - CPU Utilization = 50%

### ◆ Mobile-ASG (Scheduled Scaling)

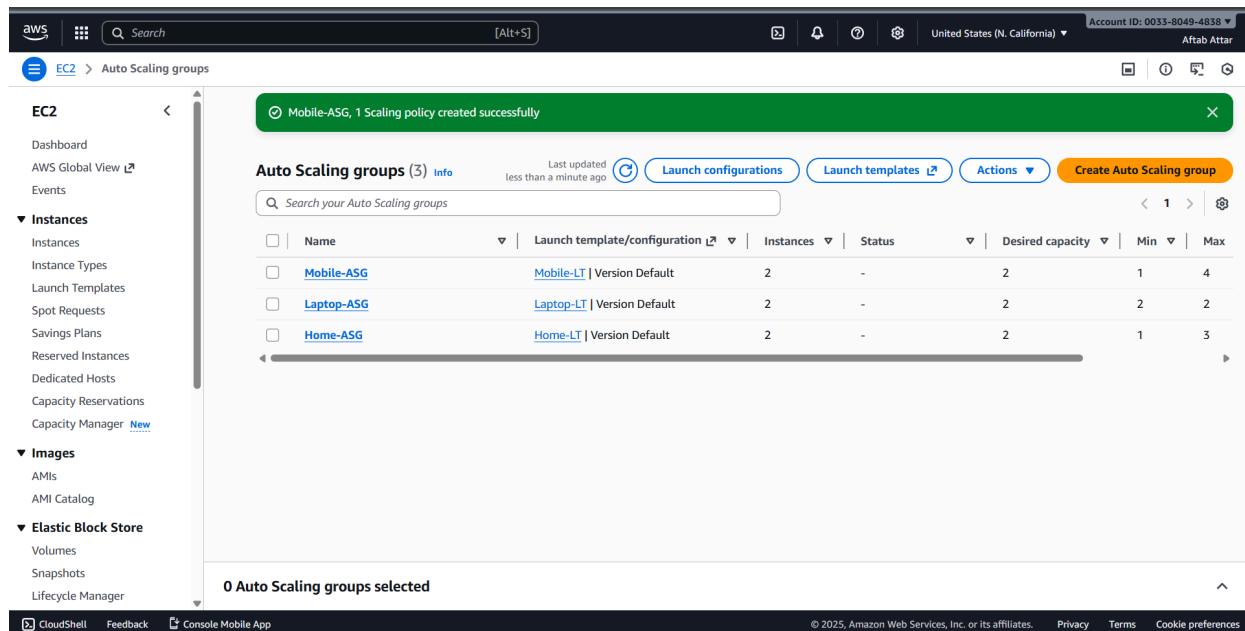
- Launch Template: Mobile-LT
- Base capacity:

- Min: 1 | Desired: 1 | Max: 3
- Scheduled actions:
  - Scale up during peak time
  - Scale down during off-hours



## ◆ Laptop-ASG (Static Scaling)

- Launch Template: Laptop-LT
- Fixed capacity:
  - Min = Desired = Max = 2
- No scaling policy attached



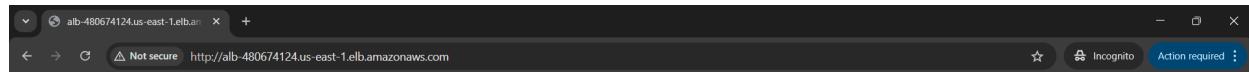
## Step 7 : Verify Target Group Health

- All instances registered in target groups
- Health status shows **Healthy**

## Step 8 : Test Application

Access the application using ALB DNS:

```
http://<ALB-DNS>
http://<ALB-DNS>/laptop/
http://<ALB-DNS>/mobile/
```



This is Home page ip-172-31-75-104.ec2.internal



This is laptop page ip-172-31-70-50.ec2.internal



This is mobile page ip-172-31-45-187.ec2.internal

## Summary

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This project demonstrates a scalable AWS web architecture using an Application Load Balancer integrated with multiple Auto Scaling Groups, each implementing a different scaling strategy. An internet-facing Application Load Balancer routes incoming traffic to three separate Target Groups based on URL path patterns (/home, /laptop, /mobile). Each Target Group is backed by its own Auto Scaling Group created using Launch Templates and Amazon EC2 instances running Apache web servers. The Home Auto Scaling Group uses dynamic scaling with CPU-based target tracking, the Laptop Auto Scaling Group maintains a fixed static capacity, and the Mobile Auto Scaling Group uses scheduled scaling to handle predictable traffic patterns. This project highlights key AWS concepts such as path-based routing, launch templates, health checks, automatic instance replacement, and high availability, providing hands-on experience with real-world scaling and load-balancing scenarios.