High Availability Deployment Using Auto Scaling Group and Load Balancer

Introduction

This project demonstrates the setup of an Auto Scaling Group (ASG) integrated with an Application Load Balancer (ALB) on AWS. The goal is to ensure high availability, scalability, and fault tolerance for deployed applications

Architecture Overview

Application Load Balancer (ALB) distributes incoming traffic across healthy instances.

Target Group registers instances created by the ASG.

Launch Template/Launch Configuration defines EC2 instance settings (AMI, instance type, security group, key pair).

Auto Scaling Group (ASG) manages scaling policies based on demand (CPU utilization, request count, etc).

Prerequisites

• AWS Account

• IAM role with required permissions

• Amazon VPC with public/private subnets

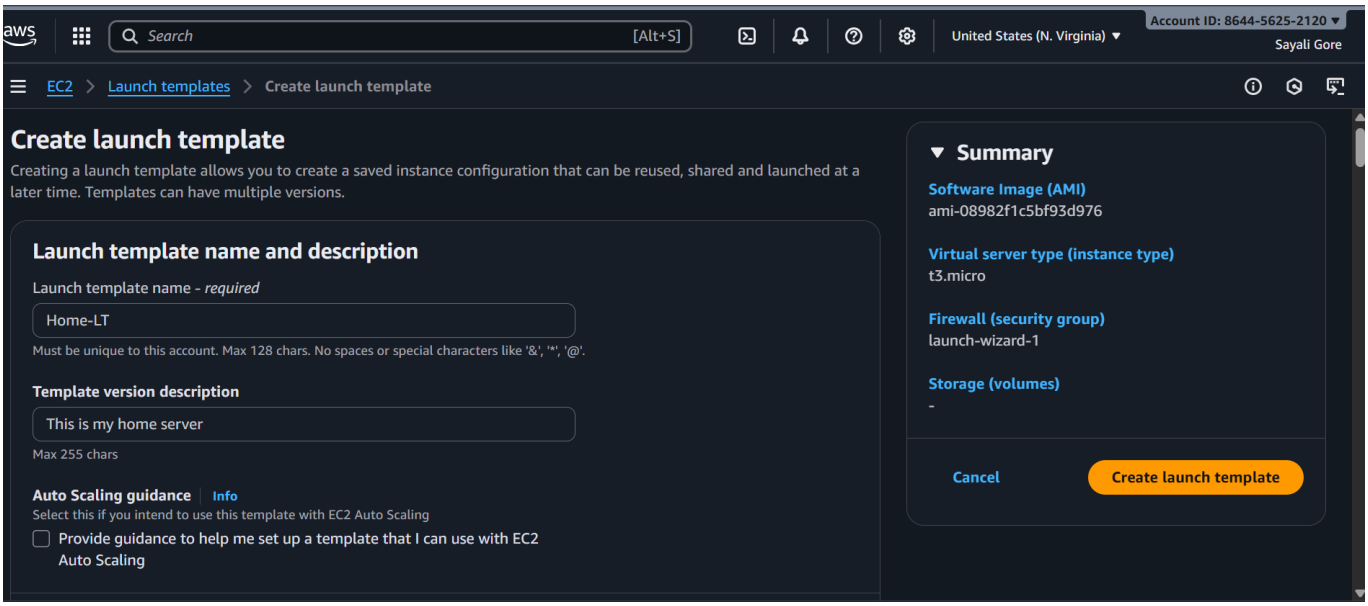
• Key Pair for EC2 access

• Security Groups for ALB and EC2

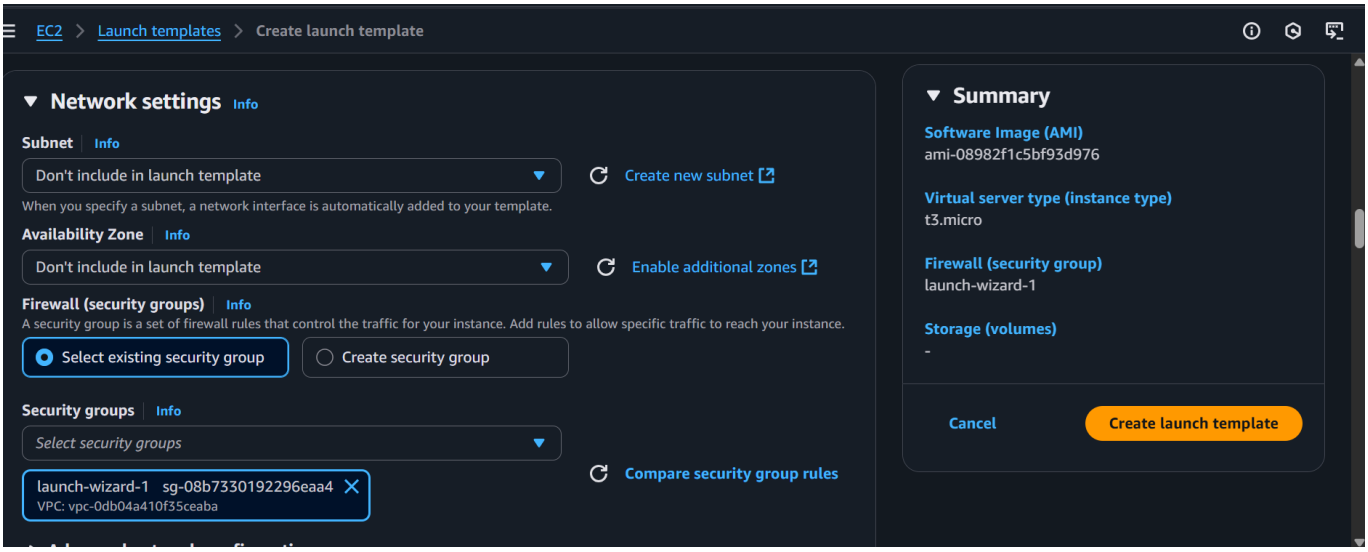
Steps to Deploy

Step1 - Launch template

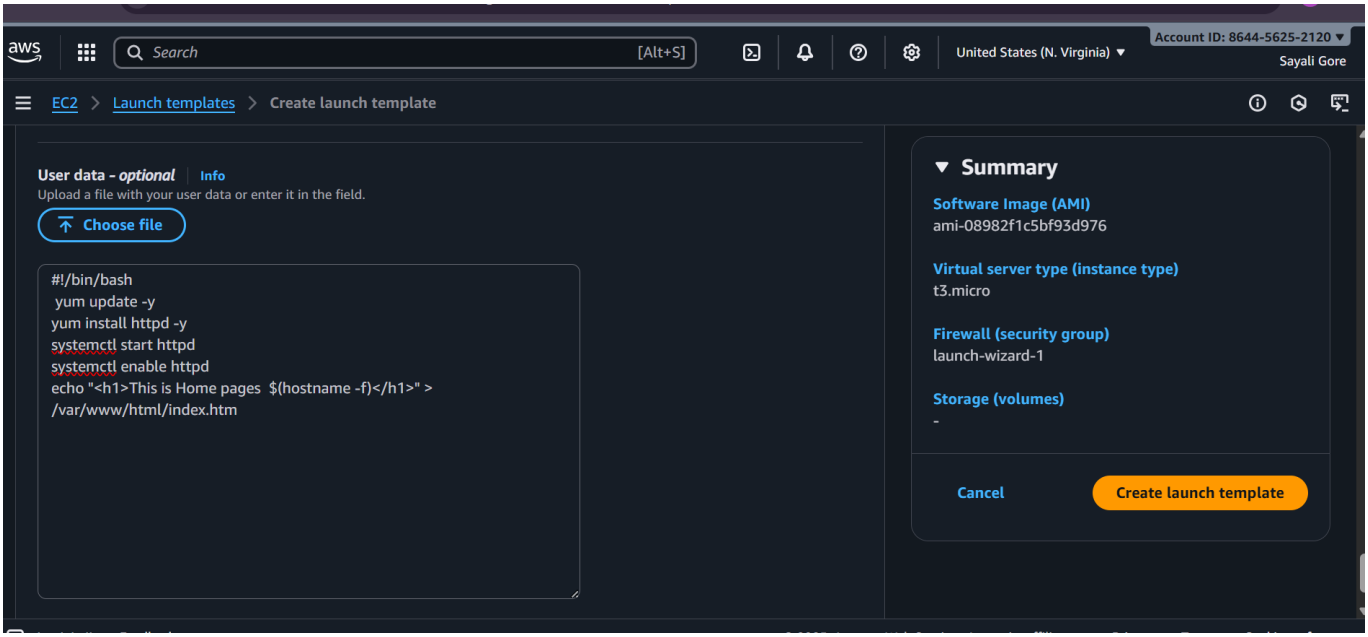
• Create launch Template.



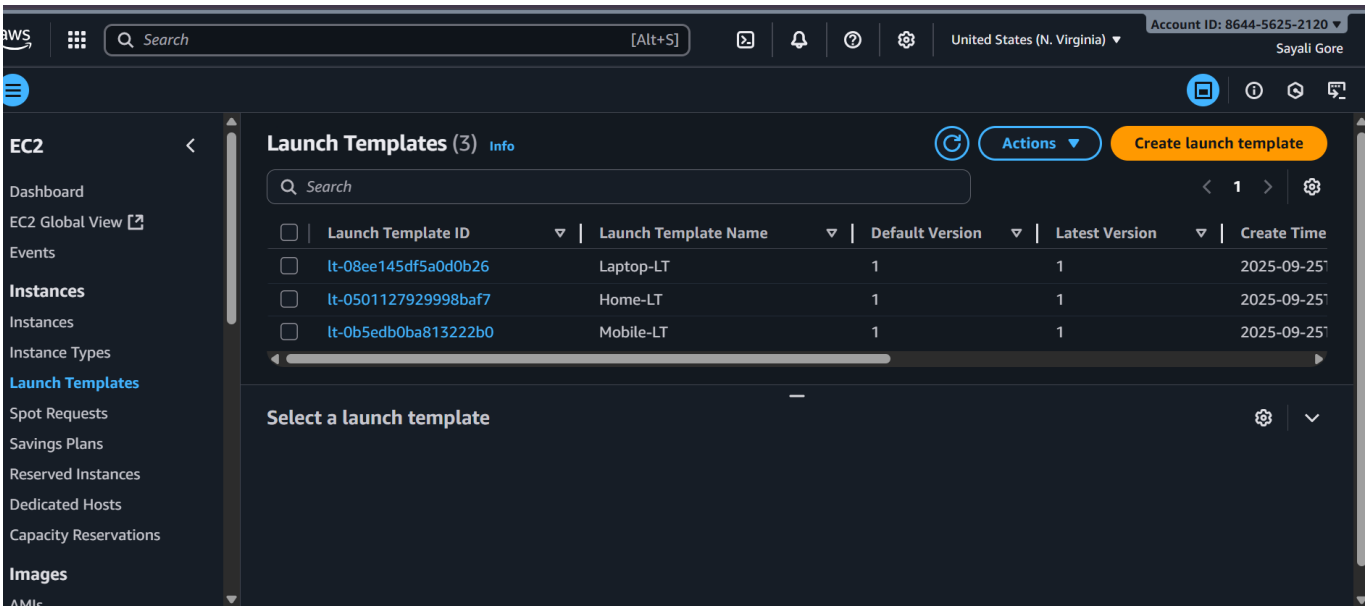
• Attach Security Group (allow SSH/HTTP).



• Add User Data.



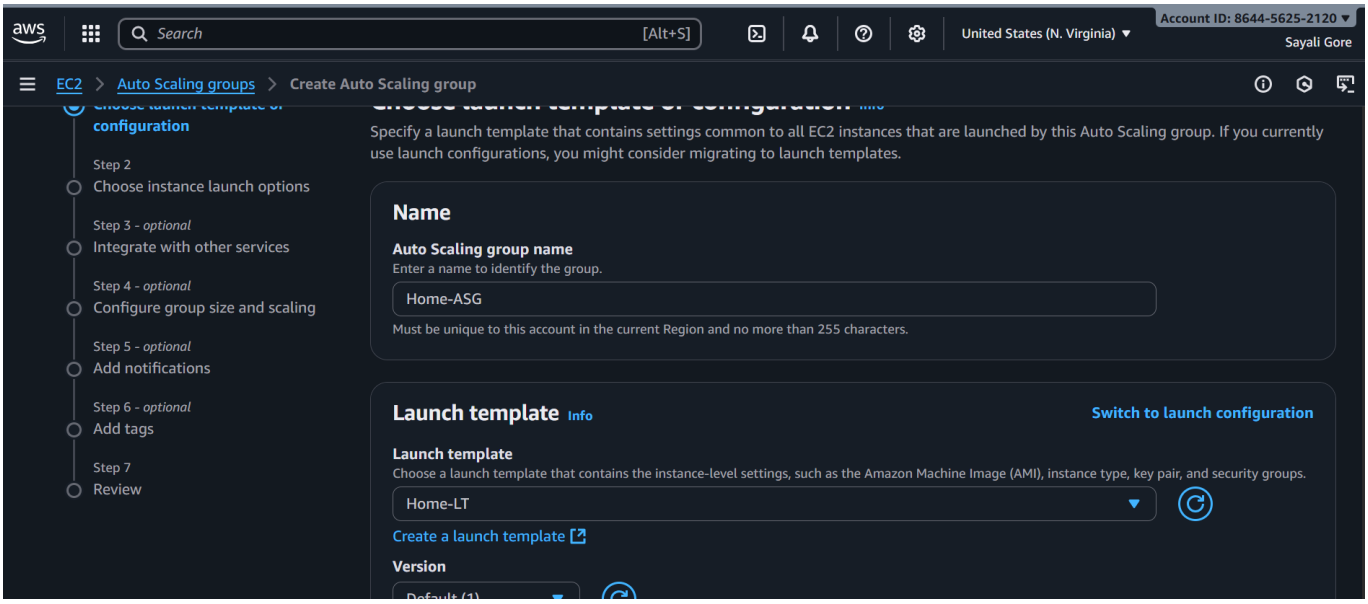
• Launch Three sets of template (Home,Laptop,Mobile).



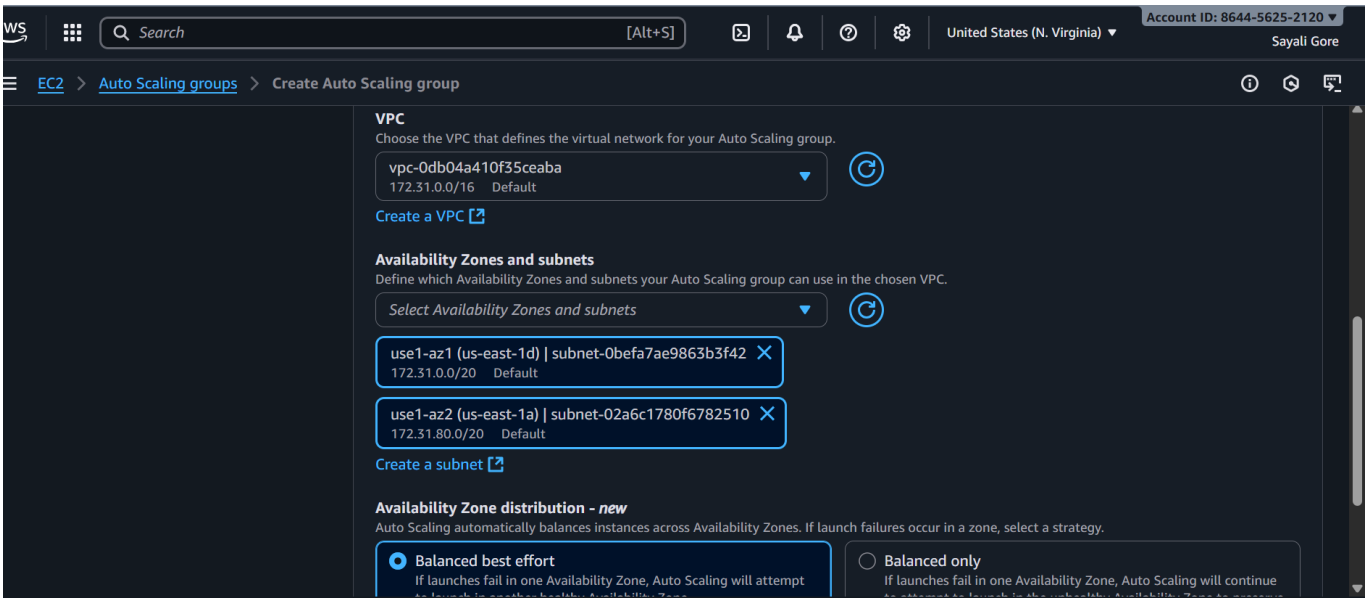
Step2- Create Auto Scaling Groups (ASG)

a) Home ASG (Static Scaling)

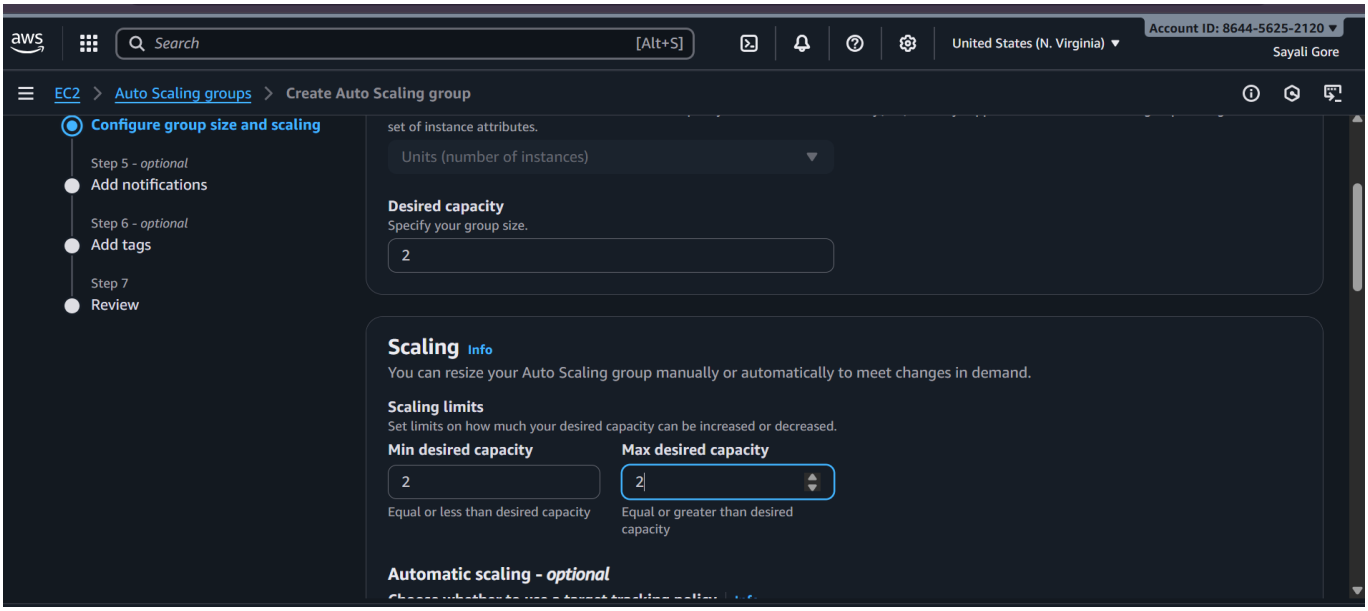
• Launch configuration / Launch template with Amazon Linux 2 AMI.



• Select Availability Zone and subnets

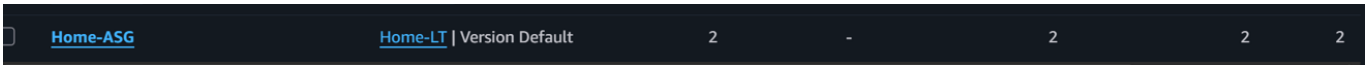


• Fixed capacity (e.g., Desired = 2, Min = 2, Max = 2).



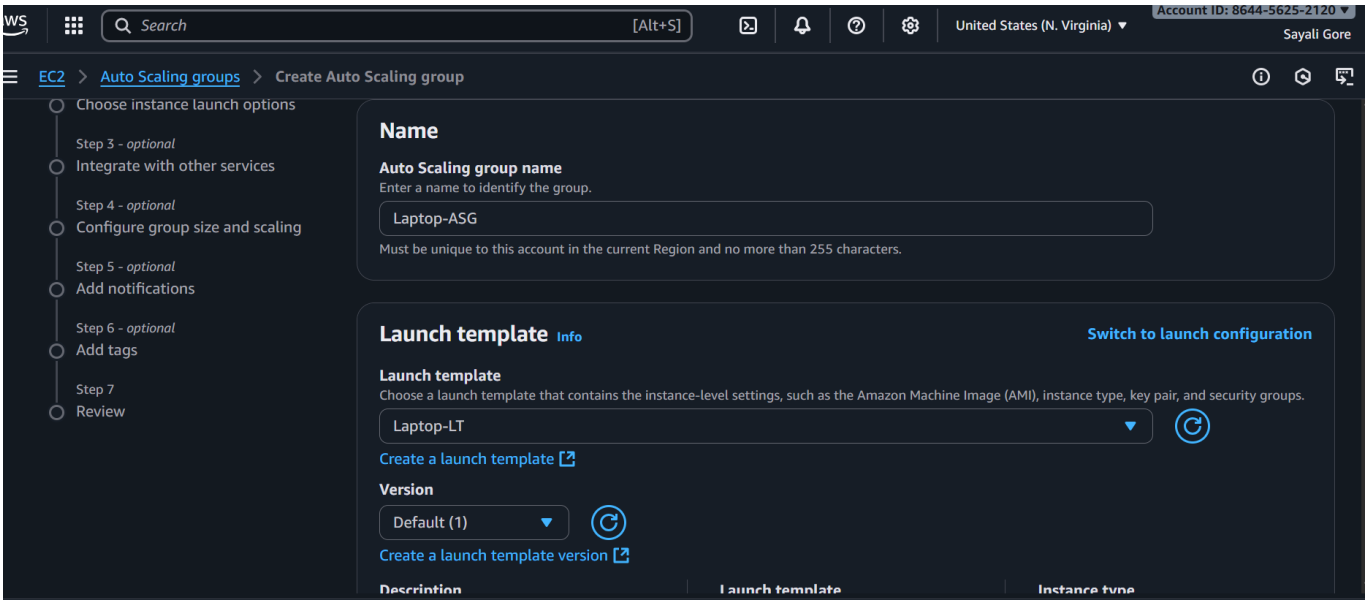
• Create Auto Scaling Group.

• Review

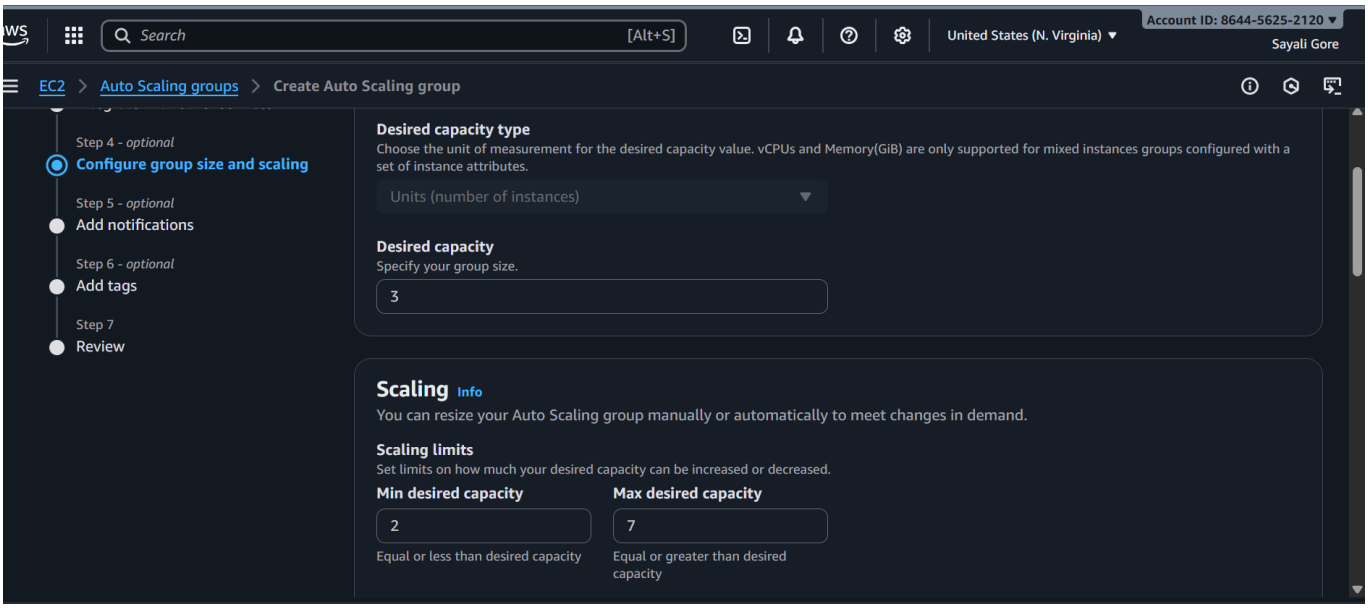


b) Laptop ASG (Dynamic Scaling)

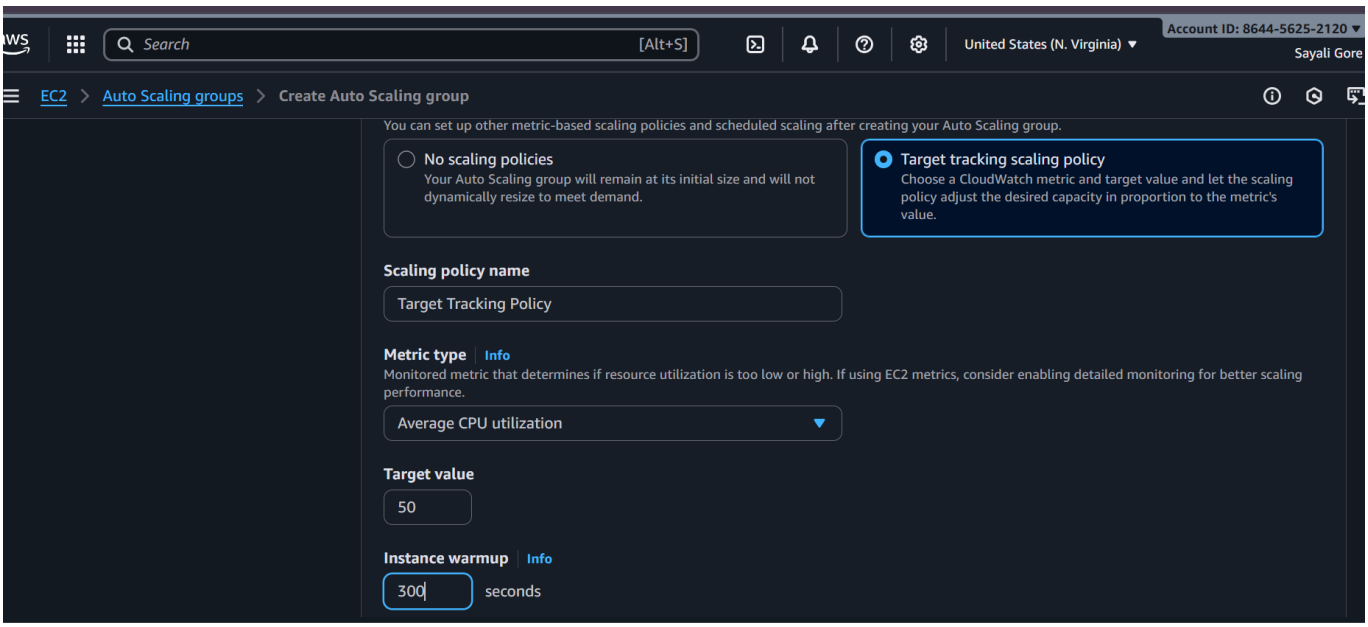
• Launch configuration / Launch template.



• Set Desired = 3, Min = 2, Max = 7.



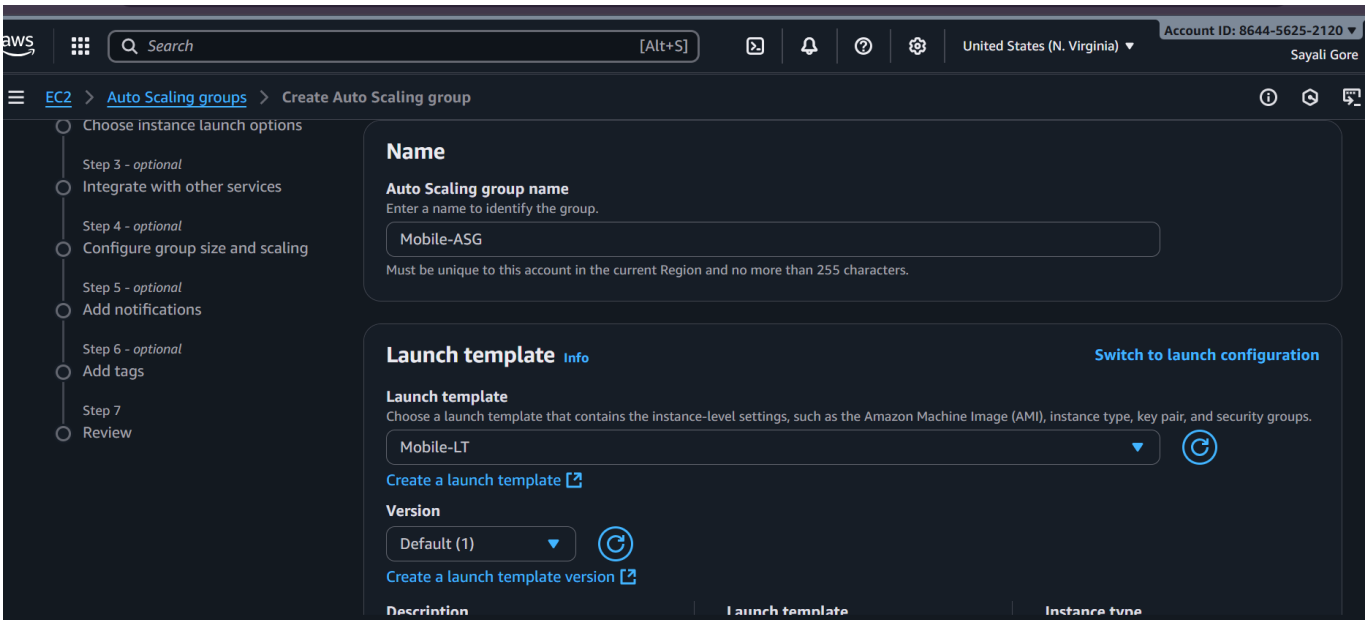
• Add scaling policy:



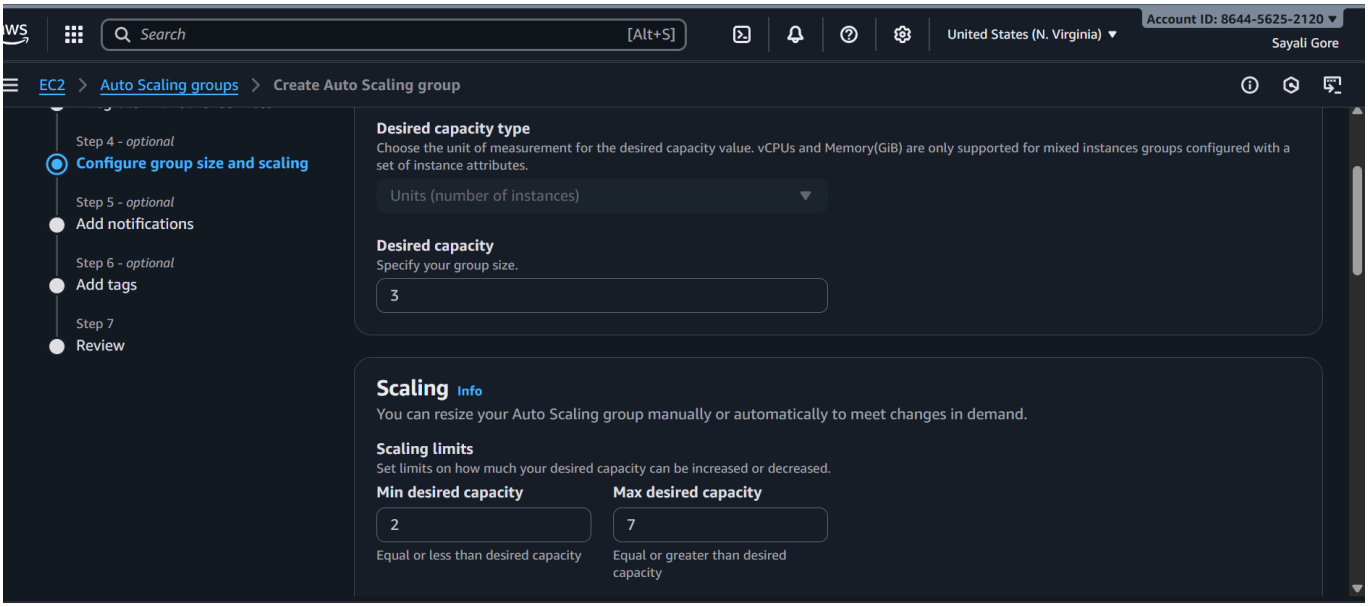
• Review

c) Mobile ASG (Scheduled Scaling)

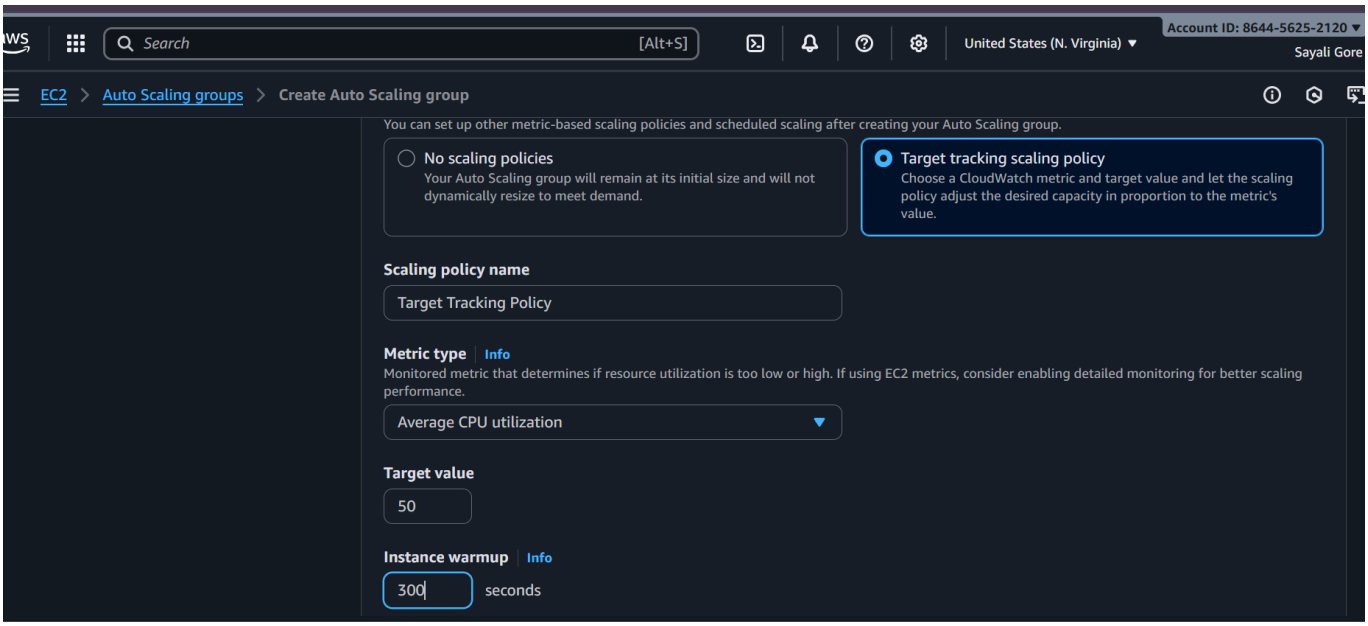
• Launch configuration / Launch template.



• Set Desired = 3, Min = 2, Max = 7.

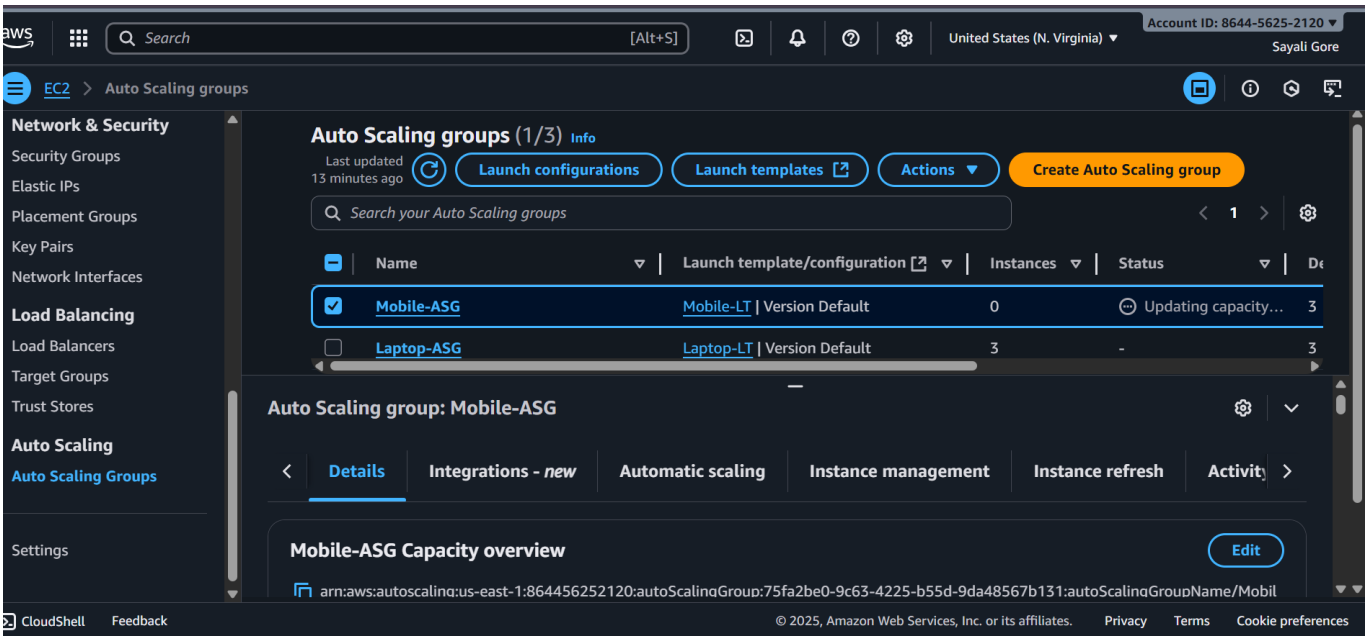


• Add schedule policy:

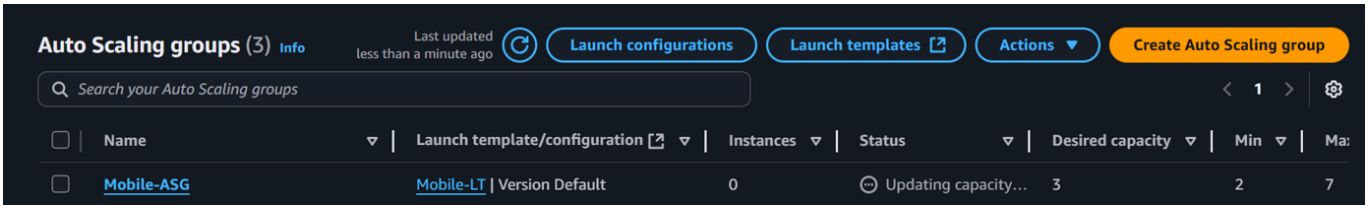


• Set Scheduled Action(Mobile)

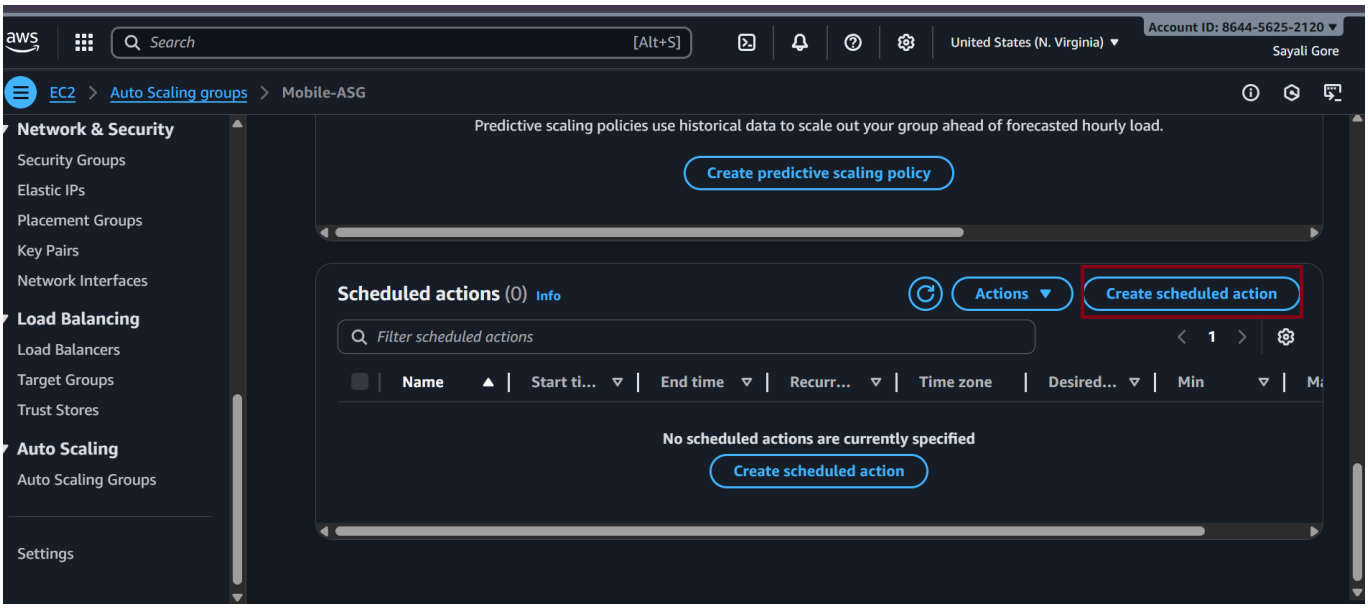
• Select Mobile ASG.



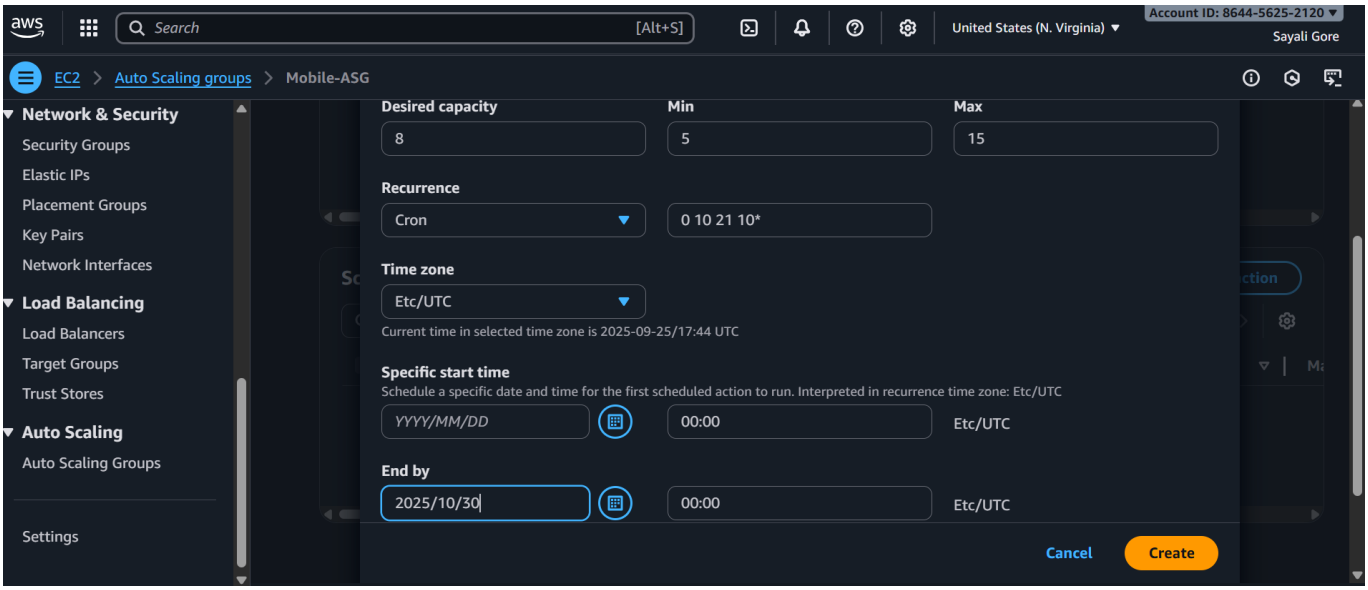
• Review

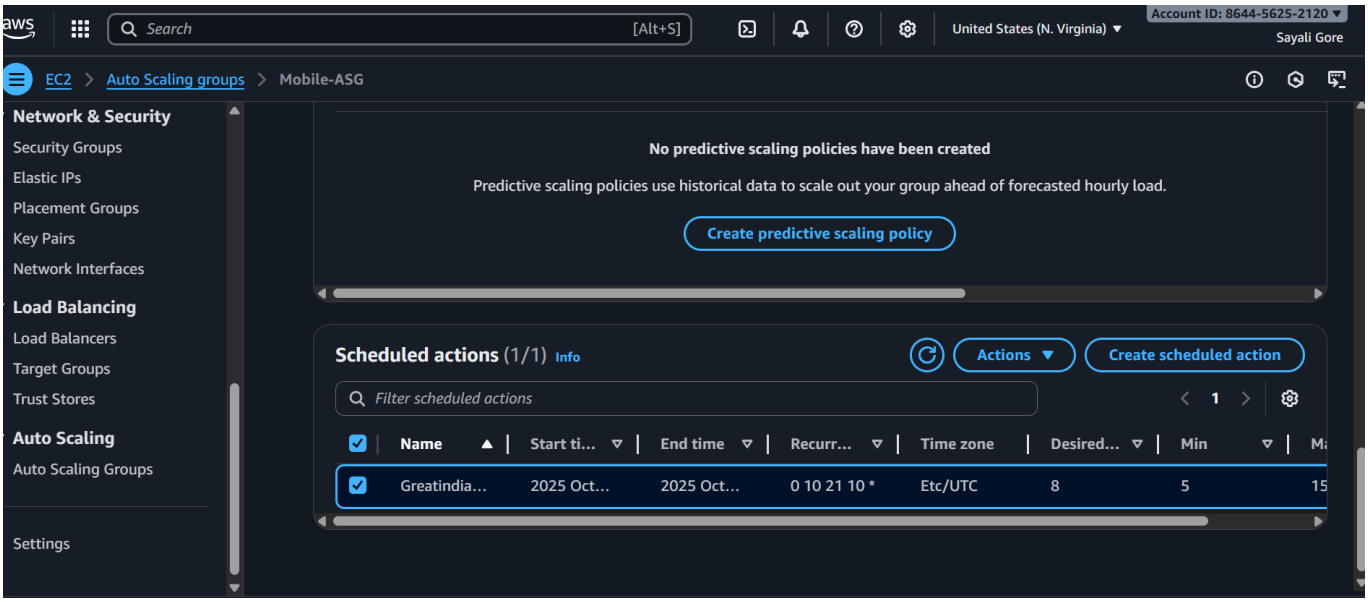


• Create Schedule Action

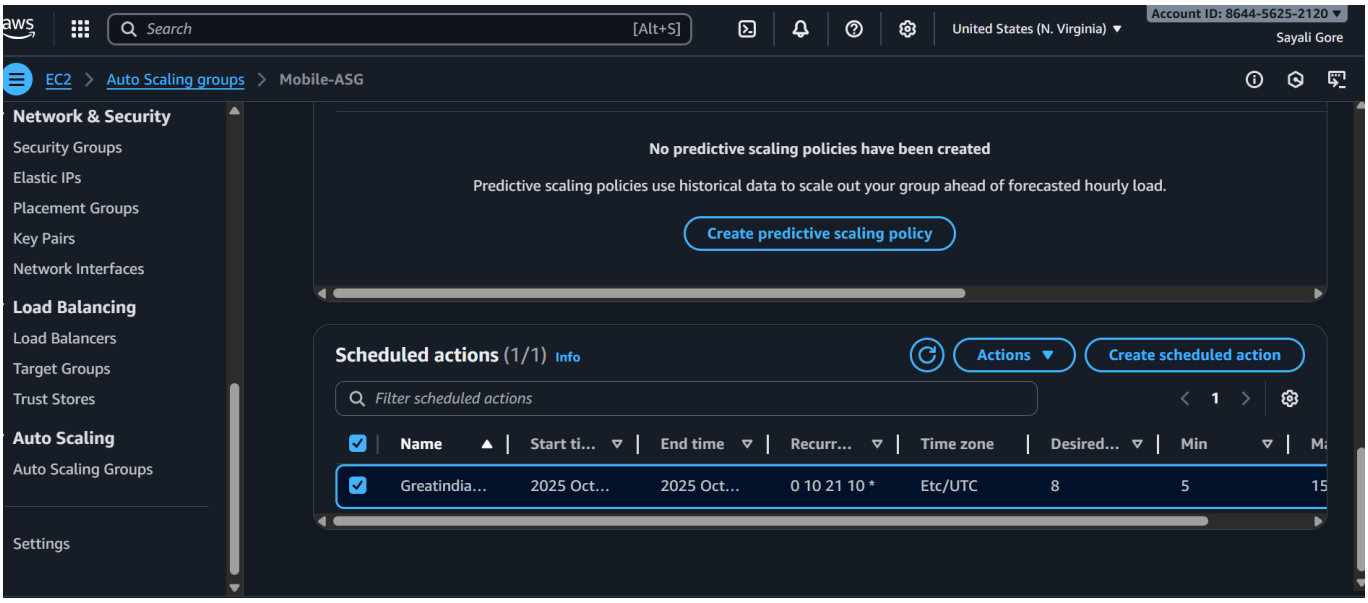


• Set Desired = 8, Min = 5, Max = 15.

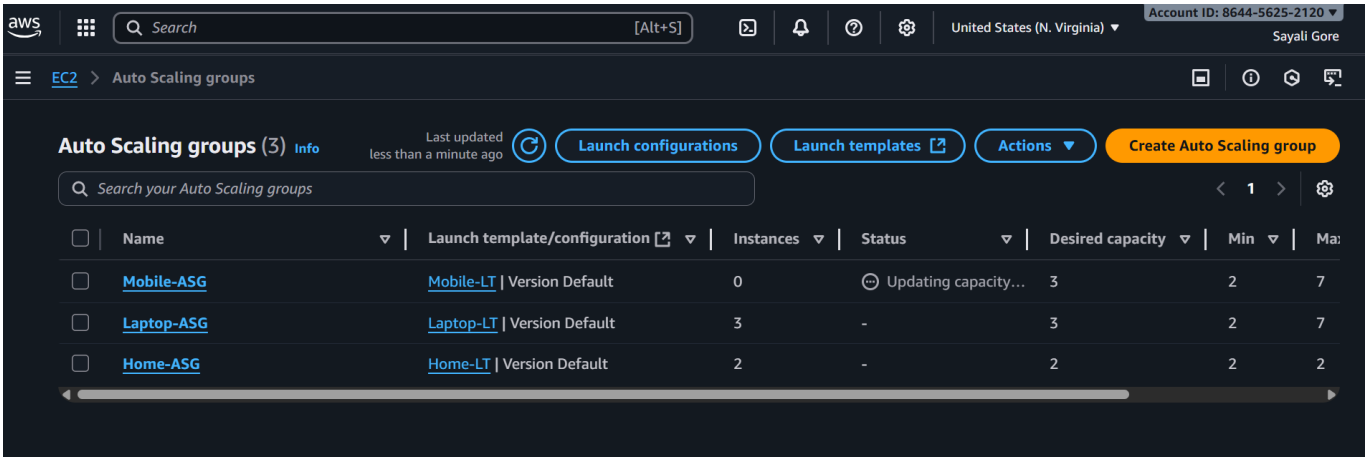




• Review

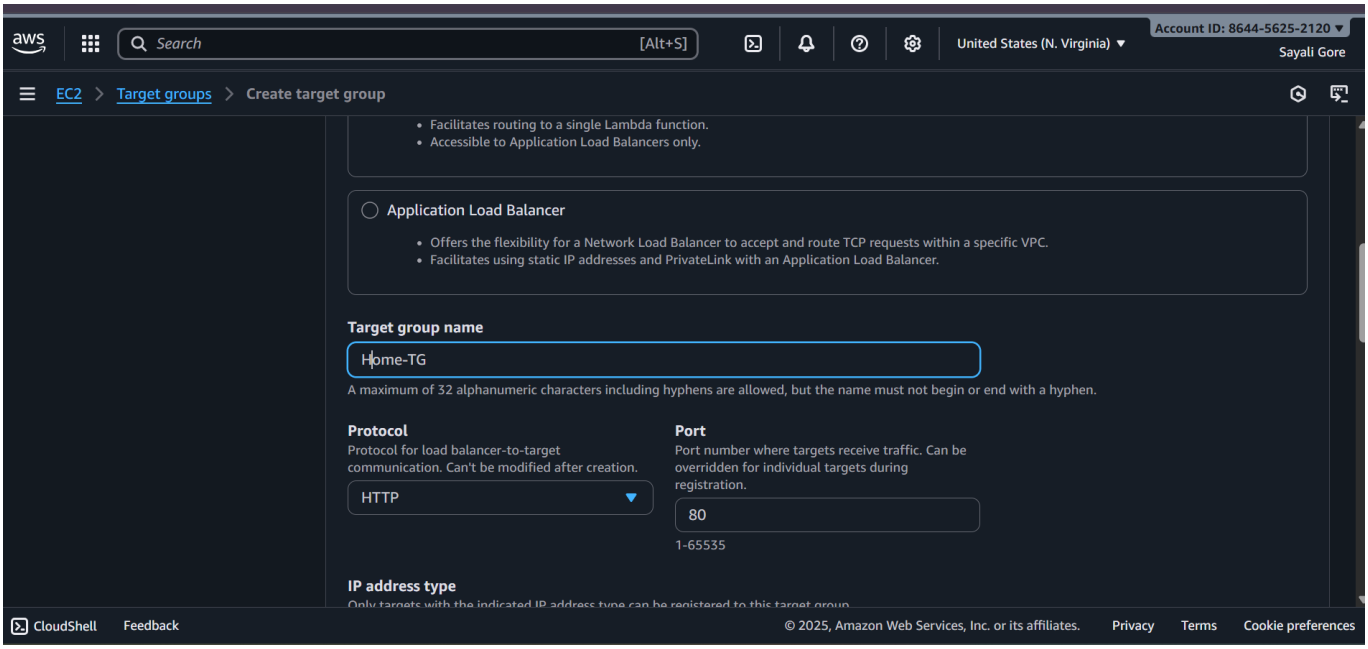


• Launch Three sets of Auto Scaling Groups (Home,Laptop,Mobile).

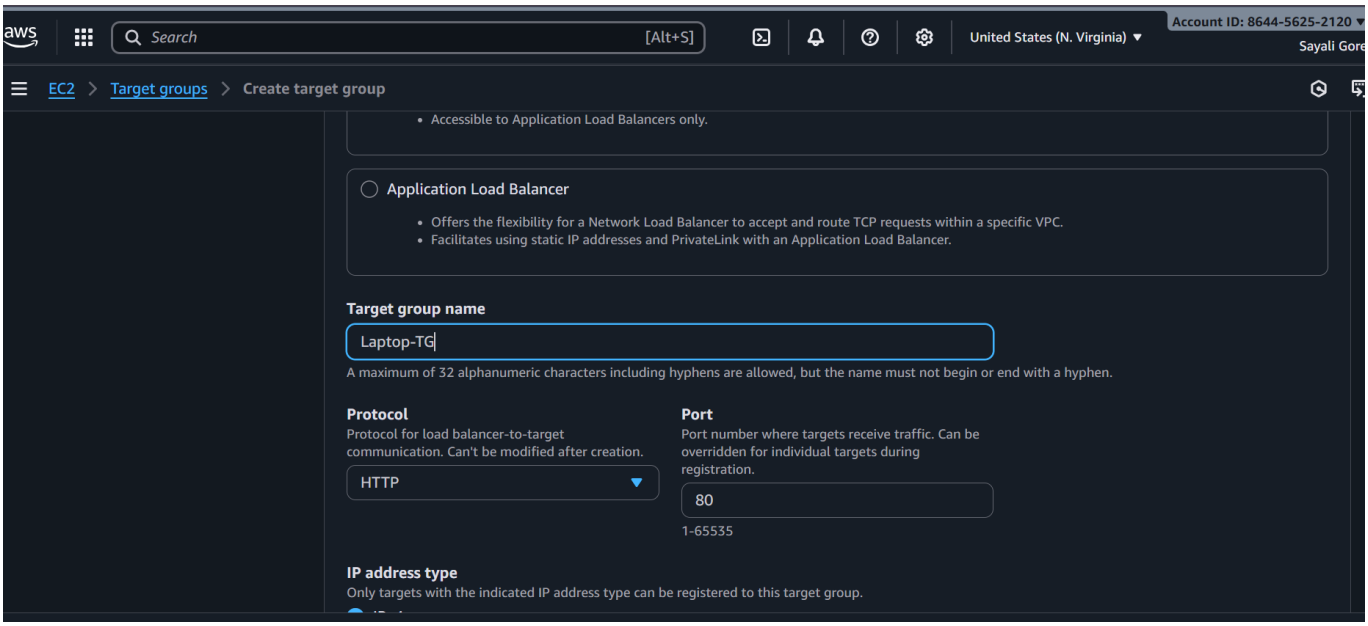


Step3 - Create Target Groups

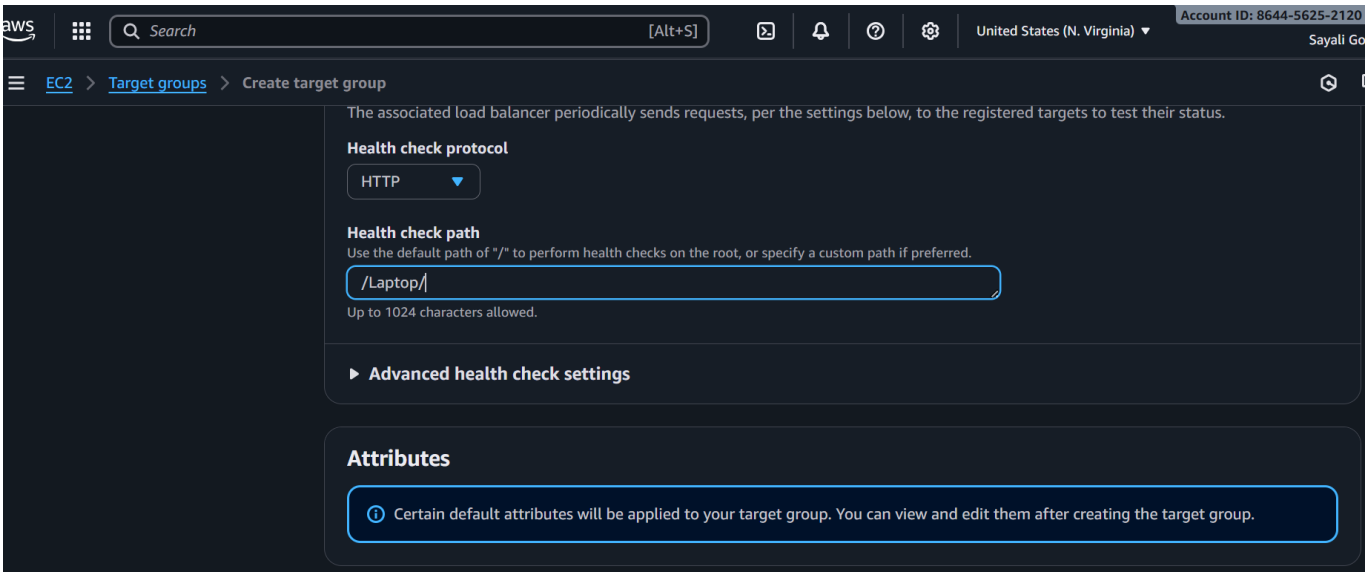
• Create Target group (Home).



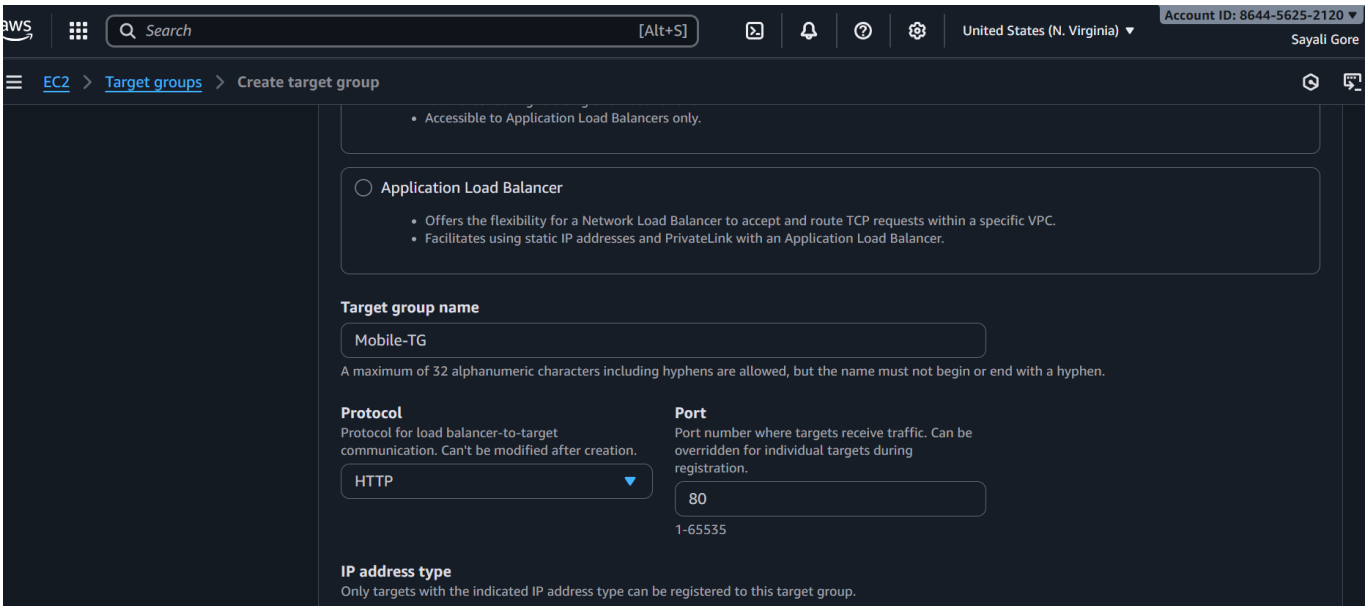
• Create Target Group(Laptop).



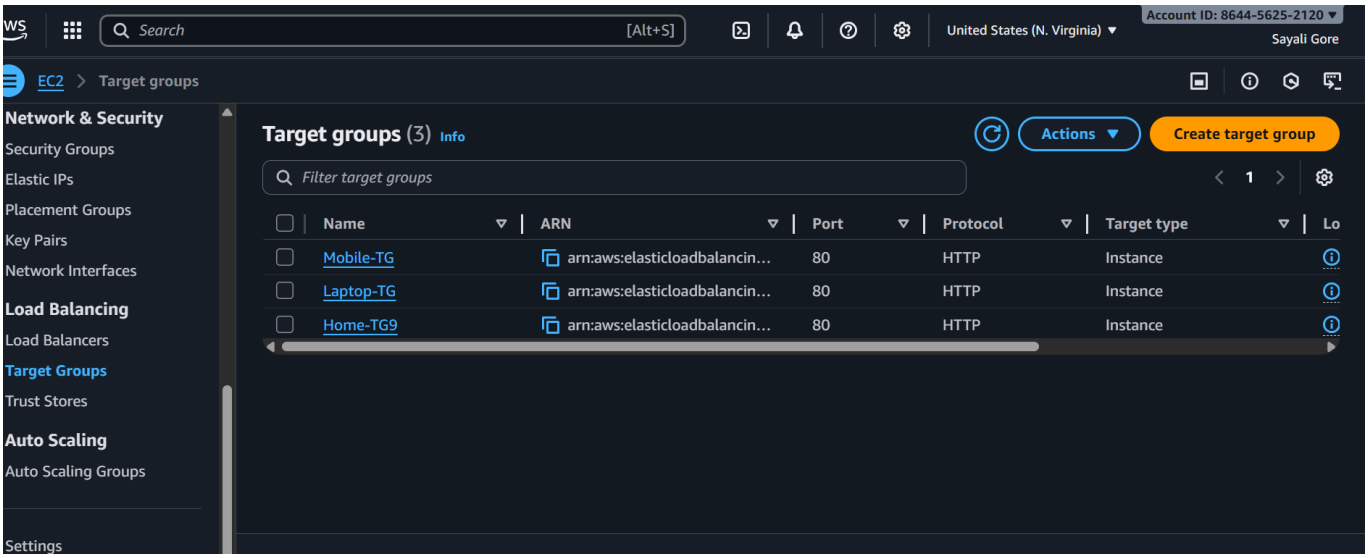
• Set health Checks.



• Create Target Group(Mobile).

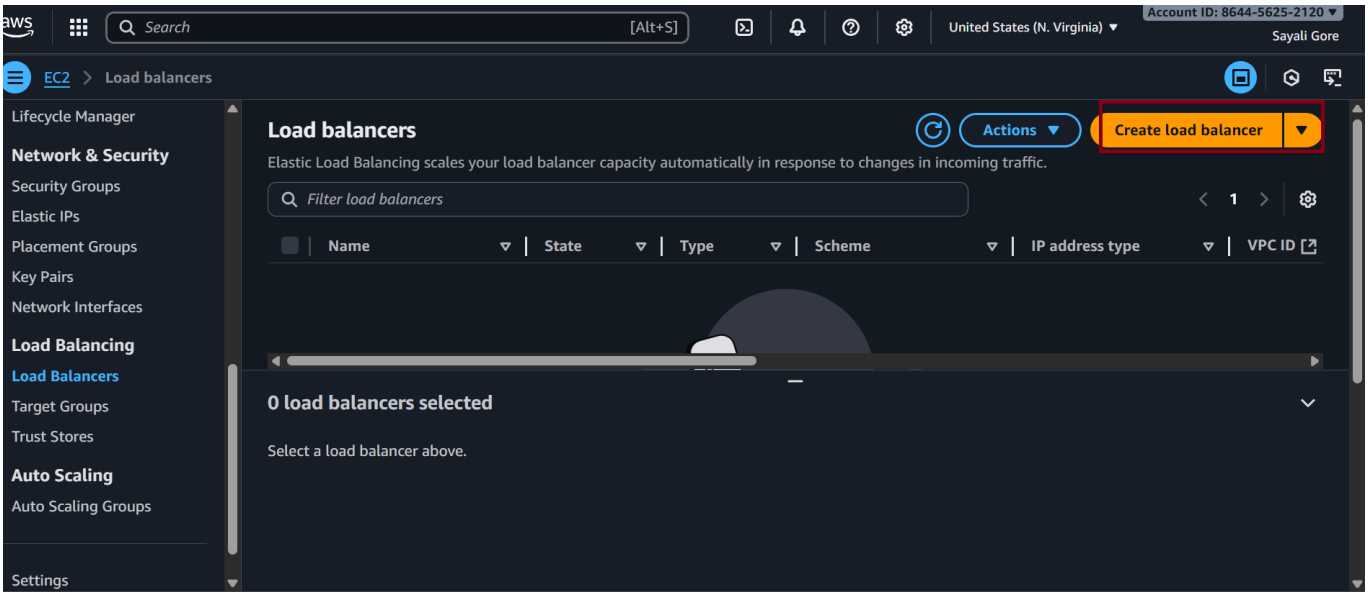


• verify three Target Groups(Home,Laptop,Mobile).

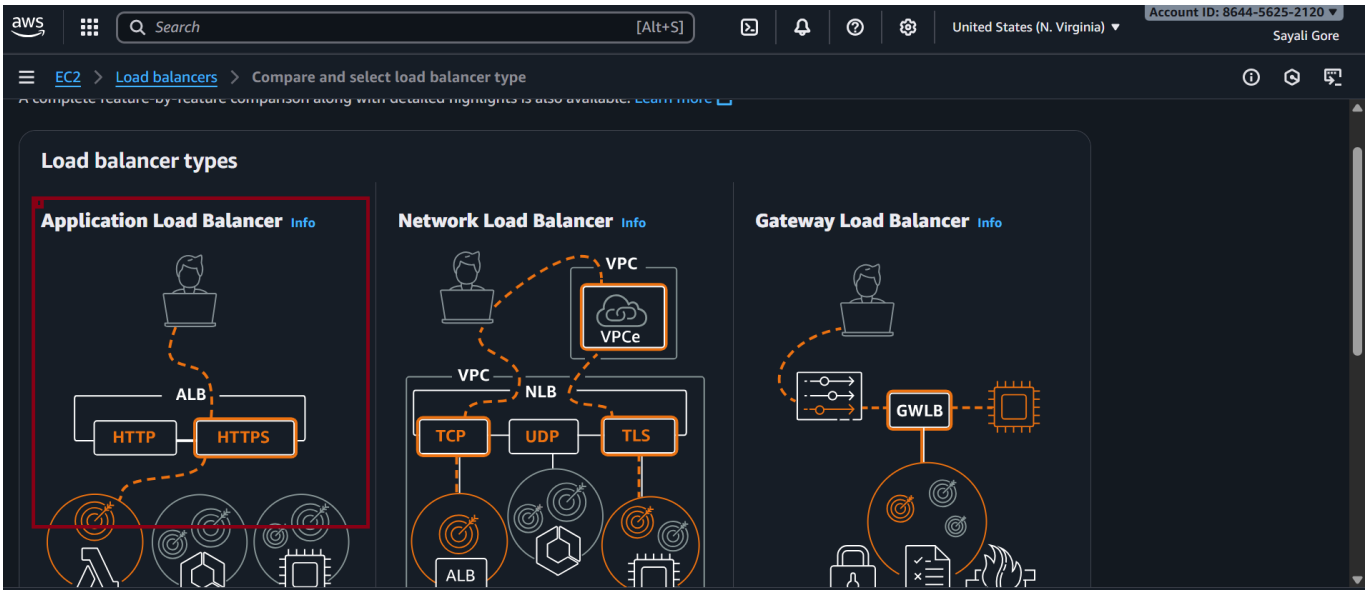


Step4 - Create Application Load Balancer (ALB)

• Load Balancers → Create Load Balancer.

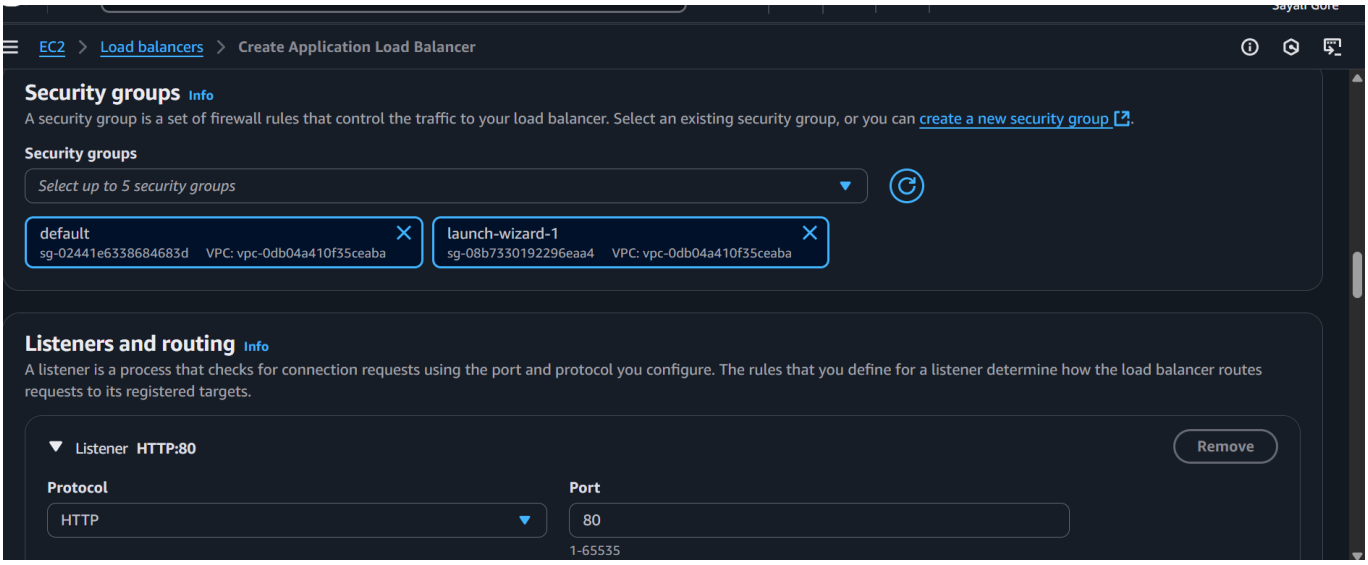


• Choose Application Load Balancer.



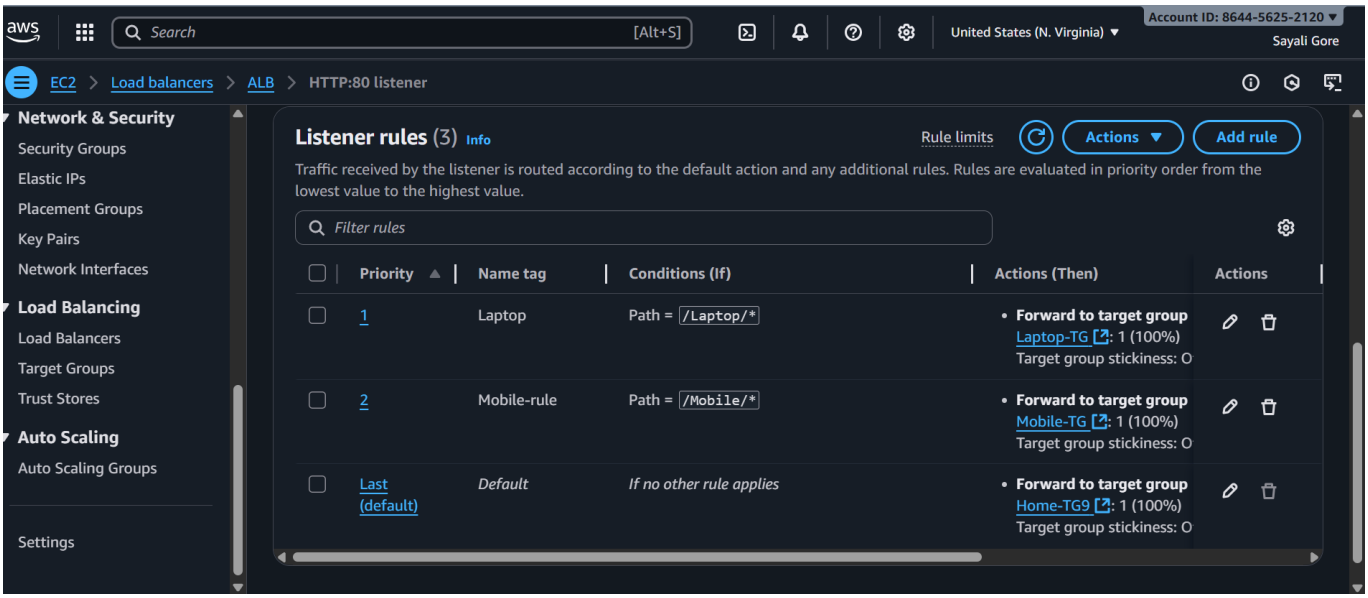
Configure:

• Listeners: HTTP on port 80



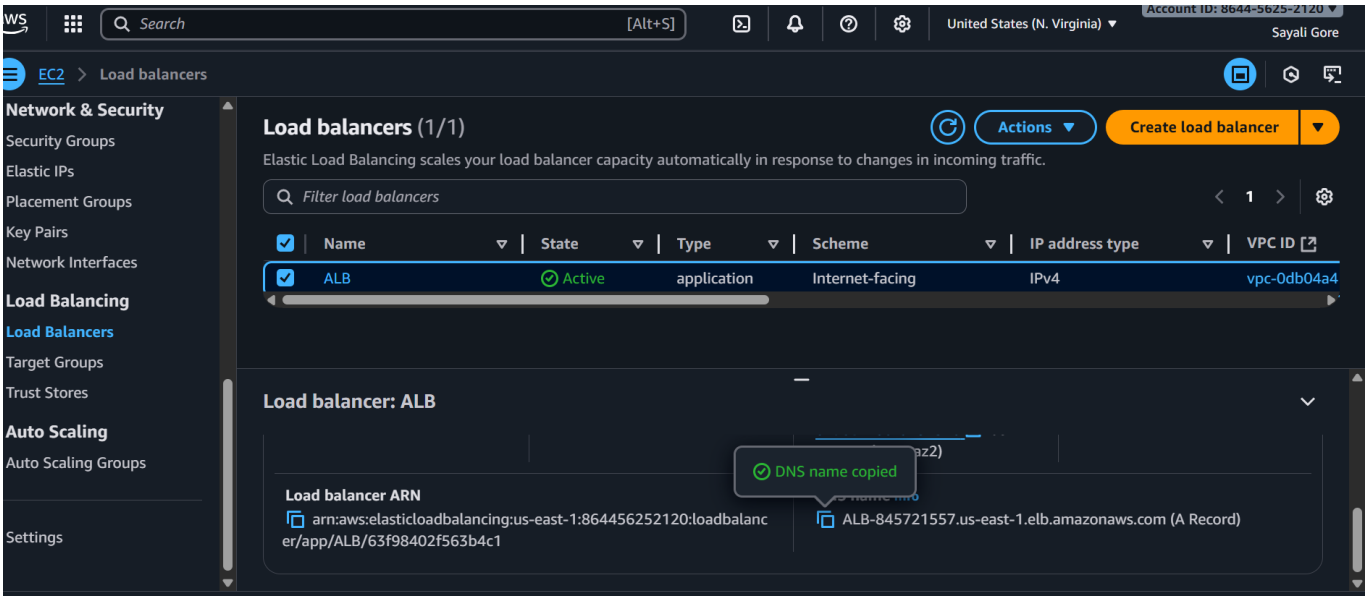
• Under Listeners and Routing:

```
Forward /home path → Home-TG

Forward /laptop path → Laptop-TG

Forward /mobile path → Mobile-TG
```



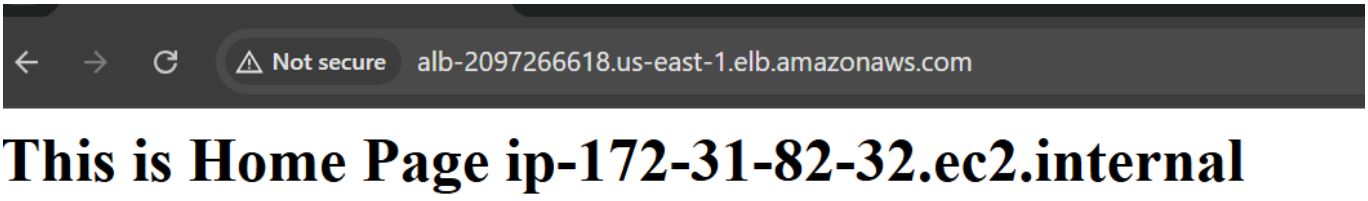
☑ Verification

• Get ALB DNS name from Load Balancer.

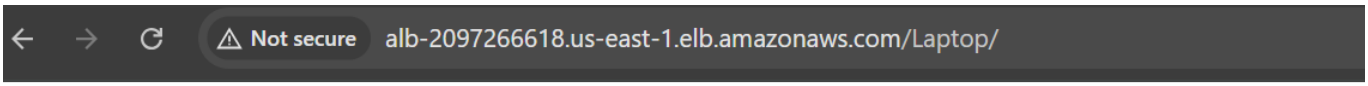


• Test in browser:

• http:///home → Routes to Home ASG instances.

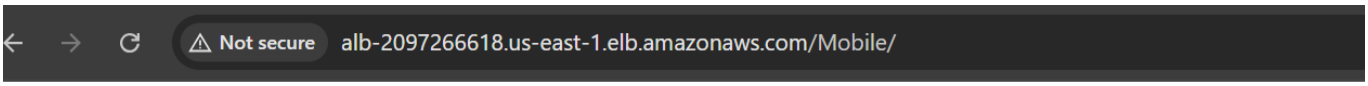


• http:///laptop → Routes to Laptop ASG instances.



This is Laptop page ip-172-31-83-22.ec2.internal

• http:///mobile → Routes to Mobile ASG instances.



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🕮 Summary

ALB distributes traffic to different Target Groups.

Home ASG → Static scaling.

Laptop ASG → Dynamic scaling.

Mobile ASG → Scheduled scaling.

This setup ensures high availability, cost optimization, and performance across different application services.