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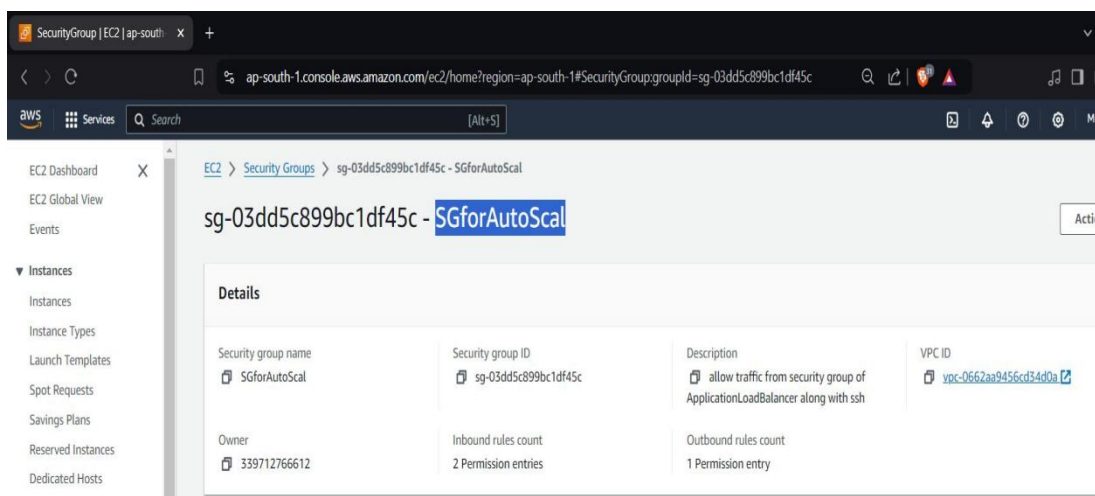
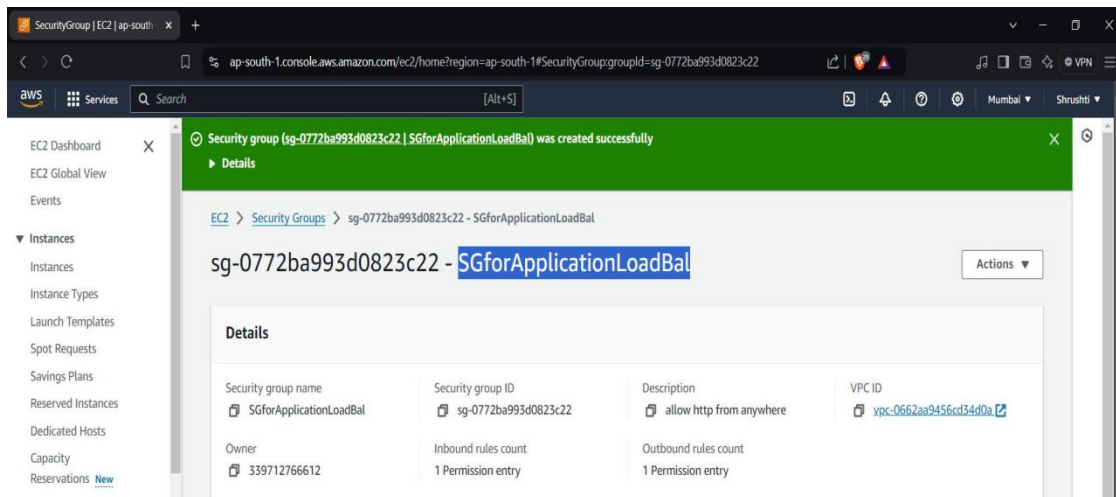
Subject: Advance Cloud Computing(ACC)

Name of the Student: Shrushti Krishna Shrivastav

PRN: 20220801024

Title of Practicle : Creating an Application Load Balancer and Auto Scaling Group in AWS

Step1: create one security group for application load balancer and one for autoscaling



ALB--inbound--http from anywhere

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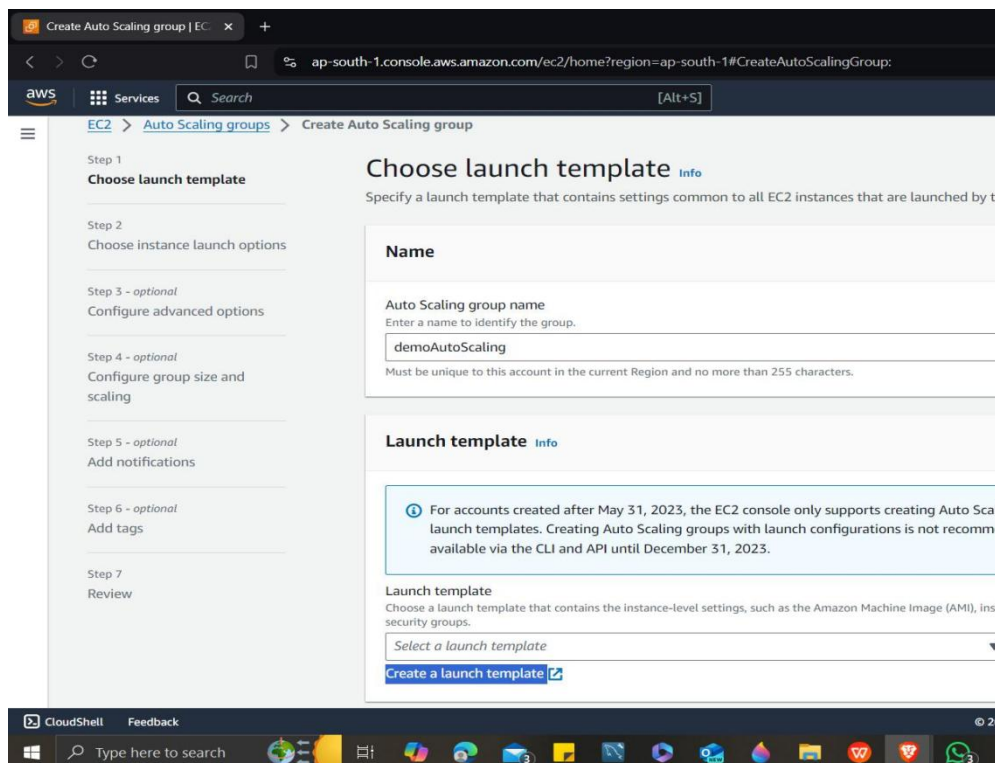
AutoScaling--inbound--ssh from anywhere and AllTCP from source of ALB

Step2: create autoscaling:

A--

Name

Launch template-- create(new tab will be opened)



Name ; AMI ; Instance ; KeyPair ; Security group ;

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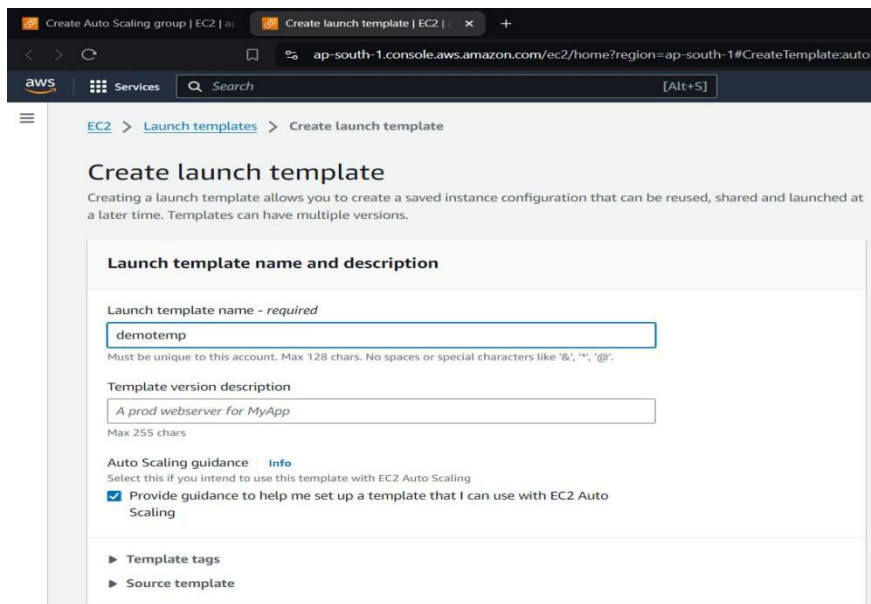
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Adv detail: (at bottom)-- user data -- add script



Create Auto Scaling group | EC2 | **Create launch template | EC2** | x +

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateTemplate:autoS

aws Services Search [Alt+S]

EC2 > Launch templates > Create launch template

Create launch template

Creating a launch template allows you to create a saved instance configuration that can be reused, shared and launched at a later time. Templates can have multiple versions.

Launch template name and description

Launch template name - *required*

demotemp

Must be unique to this account. Max 128 chars. No spaces or special characters like '&', "'", '@'.

Template version description

A prod webserver for MyApp

Max 255 chars

Auto Scaling guidance [Info](#)

Select this if you intend to use this template with EC2 Auto Scaling

☒ Provide guidance to help me set up a template that I can use with EC2 Auto Scaling

► Template tags

► Source template

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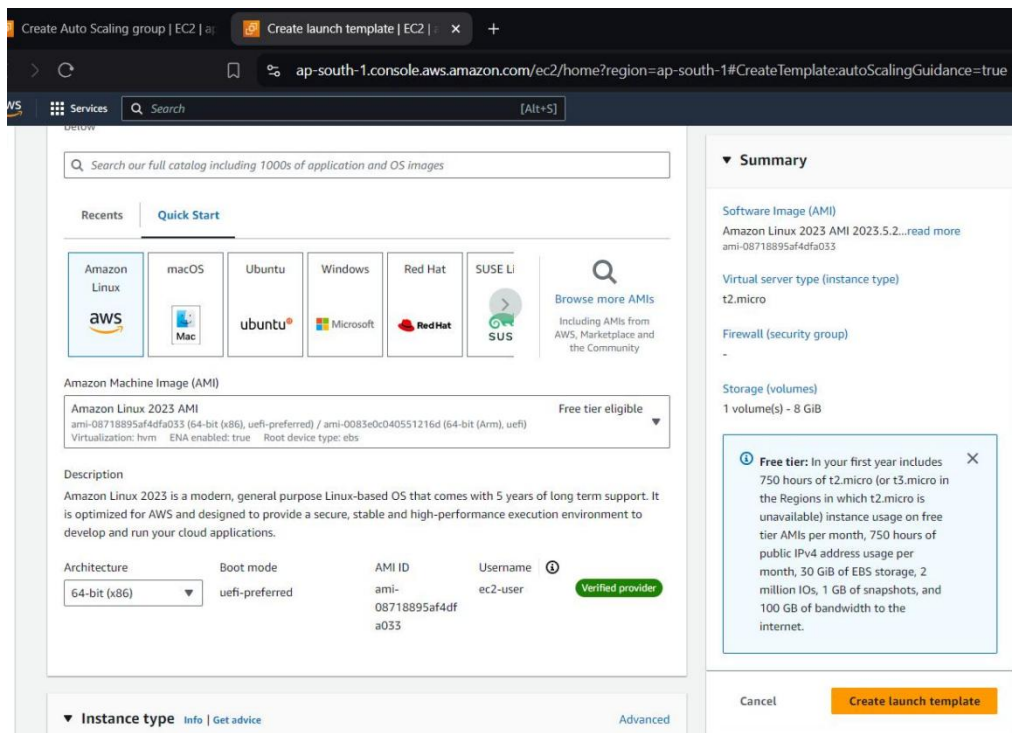
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Create Auto Scaling group | EC2 | [Create launch template | EC2](#) | [+](#)

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateTemplate:autoScalingGuidance=true

Network settings [Info](#)

Subnet [Info](#)

Don't include in launch template [Create new subnet](#)

When you specify a subnet, a network interface is automatically added to your template.

Firewall (security groups) [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☒ Select existing security group ☐ Create security group

Security groups [Info](#)

Select security groups

SGforAutoScal sg-03dd5c899bc1df45c [X](#)

VPC: vpc-0662aa9456cd34daa [Compare security group rules](#)

[Advanced network configuration](#)

Storage (volumes) [Info](#)

EBS Volumes [Hide details](#)

Volume 1 (AMI Root) (8 GiB, EBS, General purpose SSD (gp3))

AMI Volumes are not included in the template unless modified

[Free tier eligible customers can get up to 30 GiB of EBS General Purpose \(SSD\) or Magnetic storage](#) [X](#)

[Add new volume](#)

Summary

Software Image (AMI)

Amazon Linux 2023 AMI 2023.5.2...[read more](#)

ami-08718895af4dfa033

Virtual server type (instance type)

t2.micro

Firewall (security group)

SGforAutoScal

Storage (volumes)

1 volume(s) - 8 GiB

[Free tier](#): In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

[Cancel](#) [Create launch template](#)

Create Auto Scaling group | EC2 | [Create launch template | EC2](#) | [+](#)

ap-south-1.console.aws.amazon.com/e

Advanced network configuration

V2 only (token required)

[For V2 requests, you must include a session token in all instance metadata requests. Applications or agents that use V1 for instance metadata access will break.](#)

Metadata response hop limit [Info](#)

2

Allow tags in metadata [Info](#)

Don't include in launch template

User data - optional [Info](#)

Upload a file with your user data or enter it in the field.

[Choose file](#)

```
#!/bin/bash
yum update -y
yum install -y httpd
systemctl start httpd
systemctl enable httpd
echo "<h1>This message from : $(hostname -i)</h1>" >
/var/www/html/index.html
```

Create launch template

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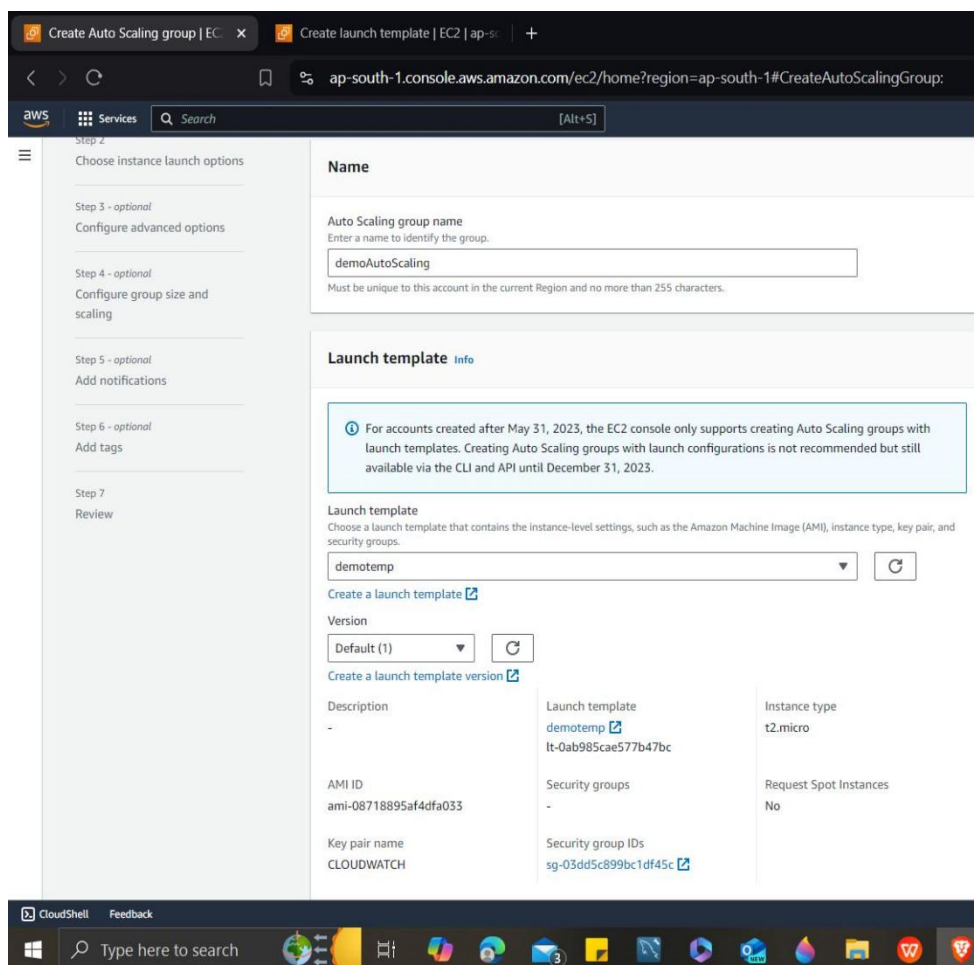
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Now go back to previous tab of autoscaling group----

In launch template attach the created one.



Next

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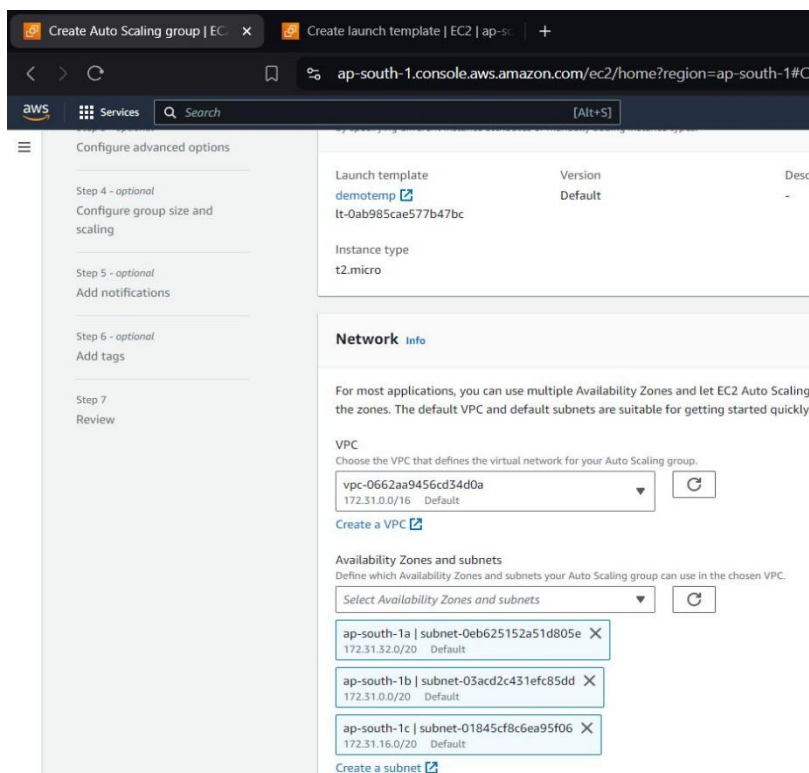
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Creating an Application Load Balancer and Auto Scaling Group in AWS

B--

Select all AZ



C--

Attach new loadbalancer

Application load balancer

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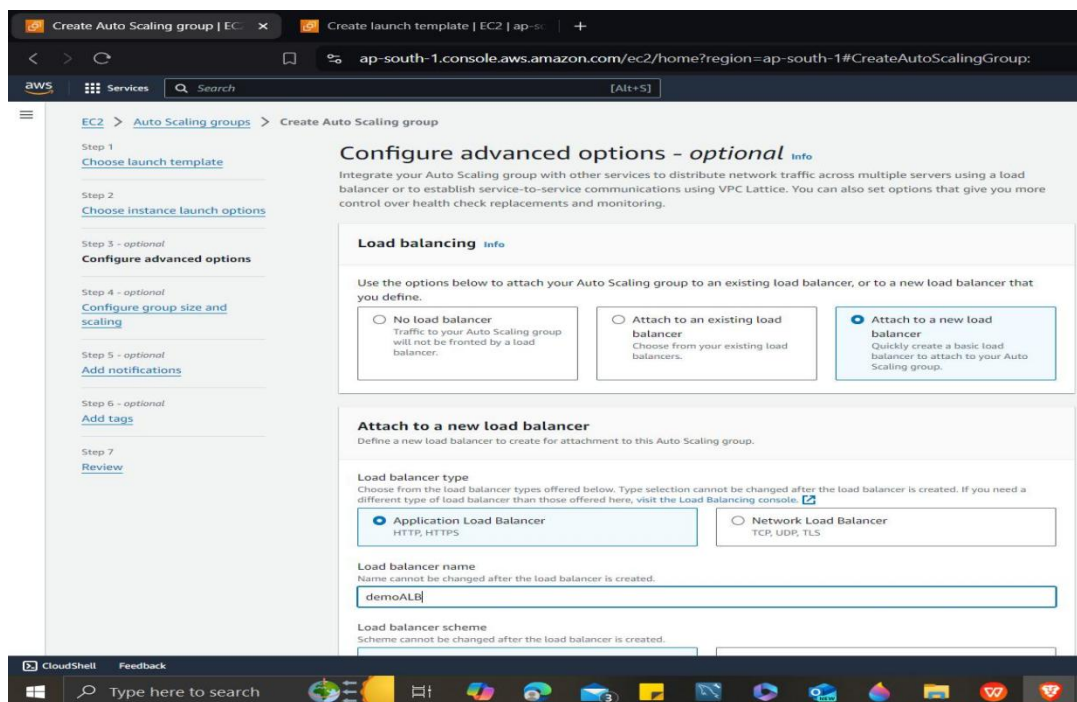
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Name

Internet facing

Creat target group





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Load balancer scheme
Scheme cannot be changed after the load balancer is created.

☐ Internal ☒ Internet-facing

Network mapping
Your new load balancer will be created using the same VPC and Availability Zone selections as your Auto Scaling group. You can select different subnets and add subnets from additional Availability Zones.

VPC
vpc-0662aa9456cd34d0a

Availability Zones and subnets
You must select a single subnet for each Availability Zone enabled. Only public subnets are available for selection to support DNS resolution.

☒ ap-south-1a subnet-0eb625152a51d805e
☒ ap-south-1c subnet-01845cf8c6ea95f06
☒ ap-south-1b subnet-03acd2c431efc85dd

Listeners and routing
If you require secure listeners, or multiple listeners, you can configure them from the [Load Balancing console](#) after your load balancer is created.

Protocol HTTP **Port** 80

Default routing (forward to)
Create a target group
New target group name
An instance target group with default settings will be created.
demoALB

Tags - optional
Consider adding tags to your load balancer. Tags enable you to categorize your AWS resources so you can more easily manage them.
Add tag
50 remaining

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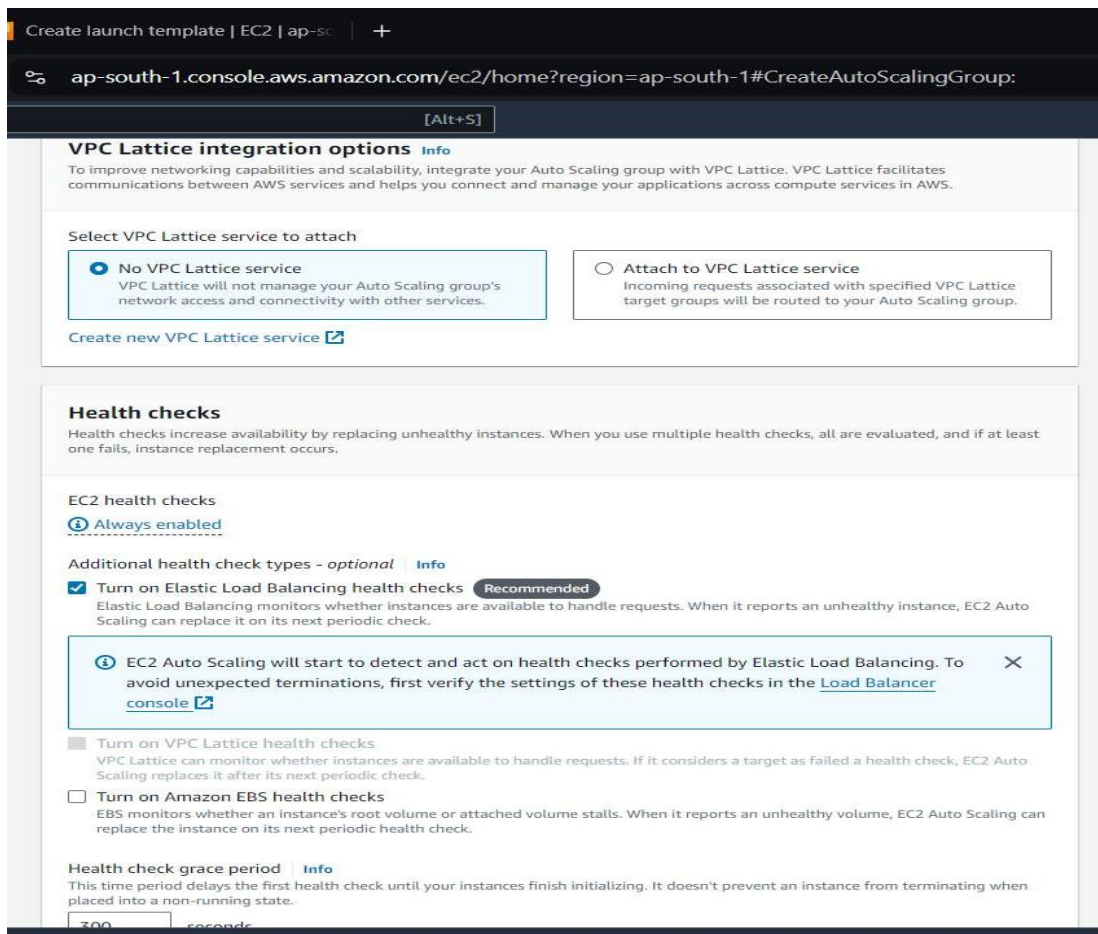
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Create launch template | EC2 | ap-sc | +

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateAutoScalingGroup:

[Alt+S]

VPC Lattice integration options Info

To improve networking capabilities and scalability, integrate your Auto Scaling group with VPC Lattice. VPC Lattice facilitates communications between AWS services and helps you connect and manage your applications across compute services in AWS.

Select VPC Lattice service to attach

☒ No VPC Lattice service
VPC Lattice will not manage your Auto Scaling group's network access and connectivity with other services.

☐ Attach to VPC Lattice service
Incoming requests associated with specified VPC Lattice target groups will be routed to your Auto Scaling group.

[Create new VPC Lattice service](#)

Health checks

Health checks increase availability by replacing unhealthy instances. When you use multiple health checks, all are evaluated, and if at least one fails, instance replacement occurs.

EC2 health checks

[Always enabled](#)

Additional health check types - optional Info

☒ Turn on Elastic Load Balancing health checks Recommended
Elastic Load Balancing monitors whether instances are available to handle requests. When it reports an unhealthy instance, EC2 Auto Scaling can replace it on its next periodic check.

☐ EC2 Auto Scaling will start to detect and act on health checks performed by Elastic Load Balancing. To avoid unexpected terminations, first verify the settings of these health checks in the [Load Balancer console](#)

☐ Turn on VPC Lattice health checks
VPC Lattice can monitor whether instances are available to handle requests. If it considers a target as failed a health check, EC2 Auto Scaling replaces it after its next periodic check.

☐ Turn on Amazon EBS health checks
EBS monitors whether an instance's root volume or attached volume stalls. When it reports an unhealthy volume, EC2 Auto Scaling can replace the instance on its next periodic health check.

Health check grace period Info

This time period delays the first health check until your instances finish initializing. It doesn't prevent an instance from terminating when placed into a non-running state.

300 seconds

Ensure to check 'turn on elastic load balancing health check'

Next

D--

Desired: 1 --- min: 1 ----- max: 2



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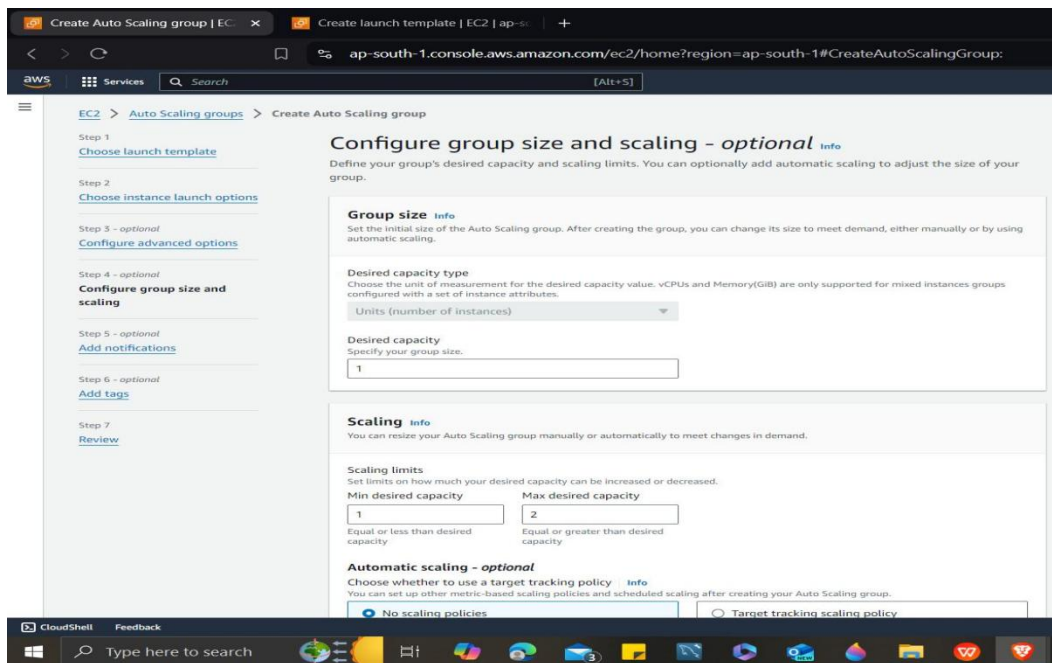
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Title of Practicle :

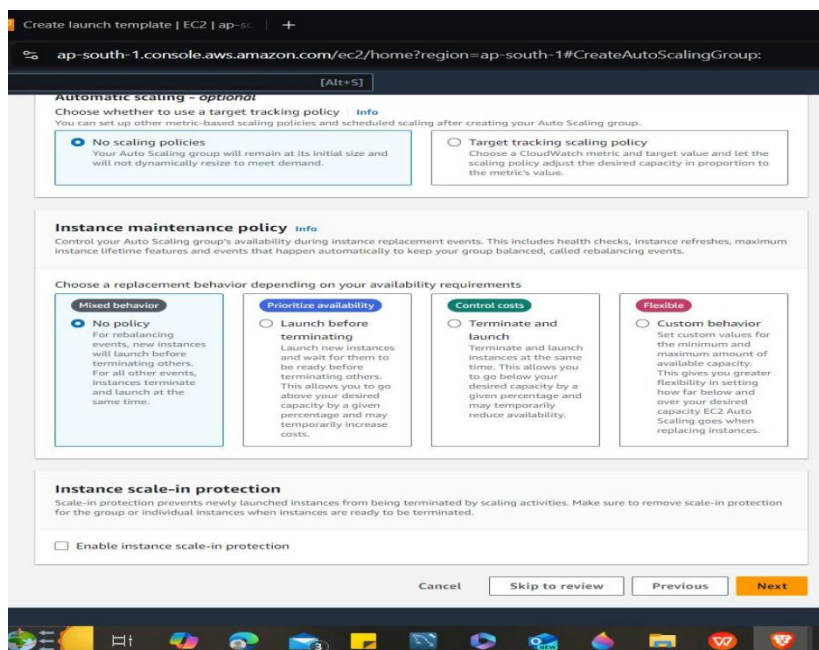
Creating an Application Load Balancer and Auto Scaling Group in AWS



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Next

No changes for rest of the steps.

Last step: review

Now create autoscaling group.

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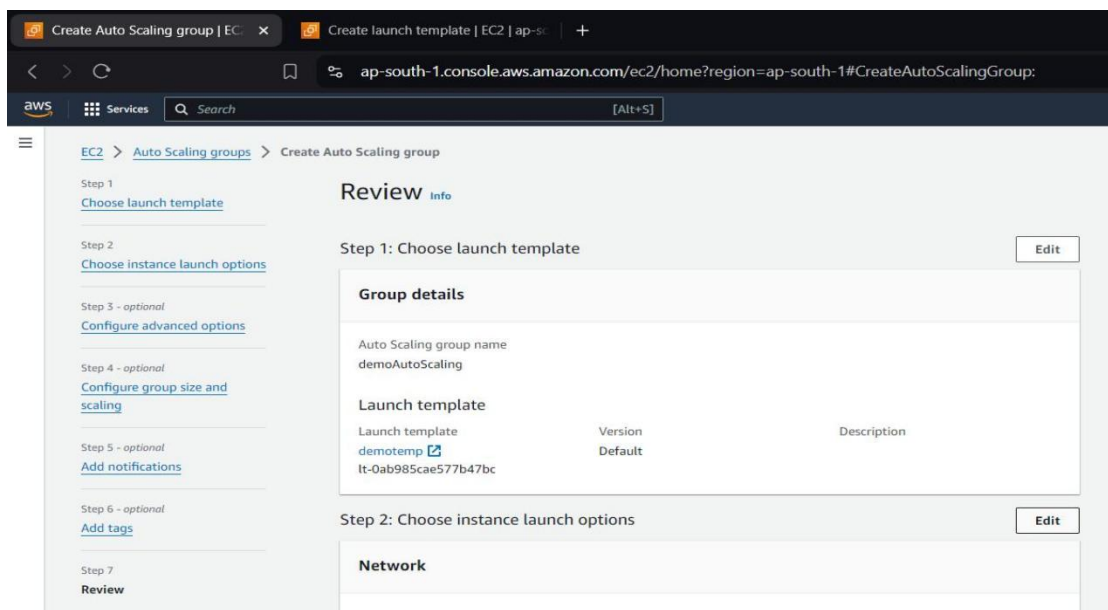
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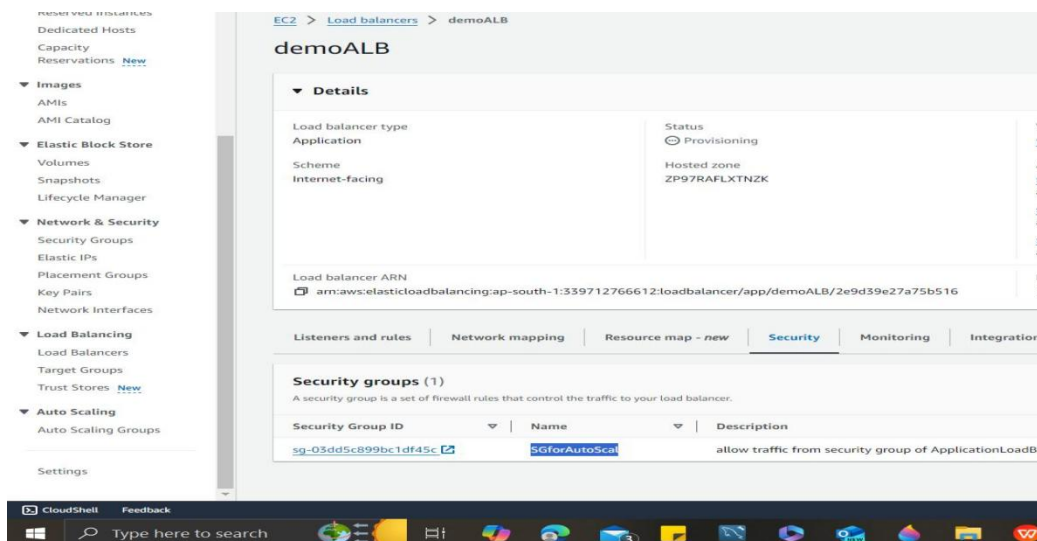
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Step 3: load balancer

Loadbalancer will be automatically created now edit it. Select SGforALB



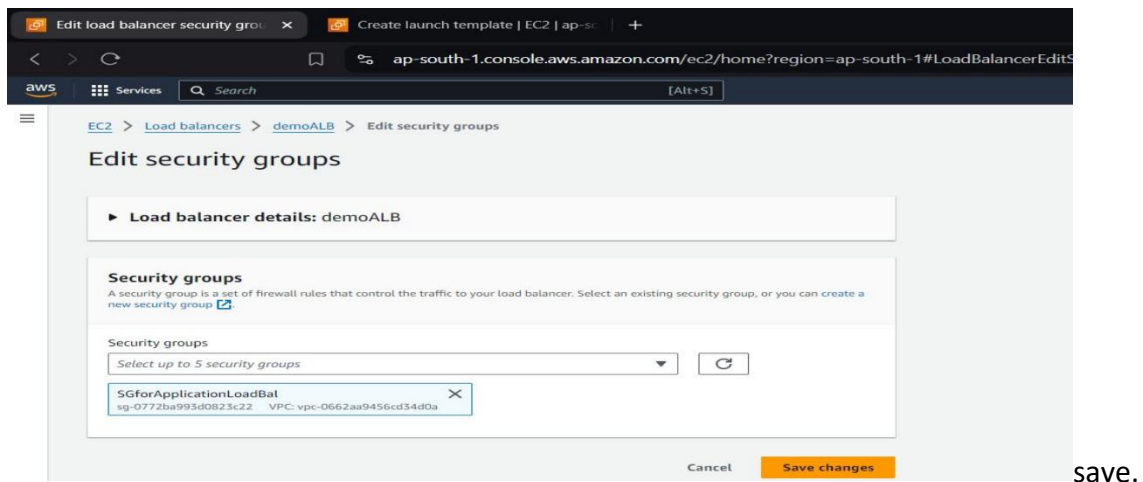
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Step4: autoscaling group

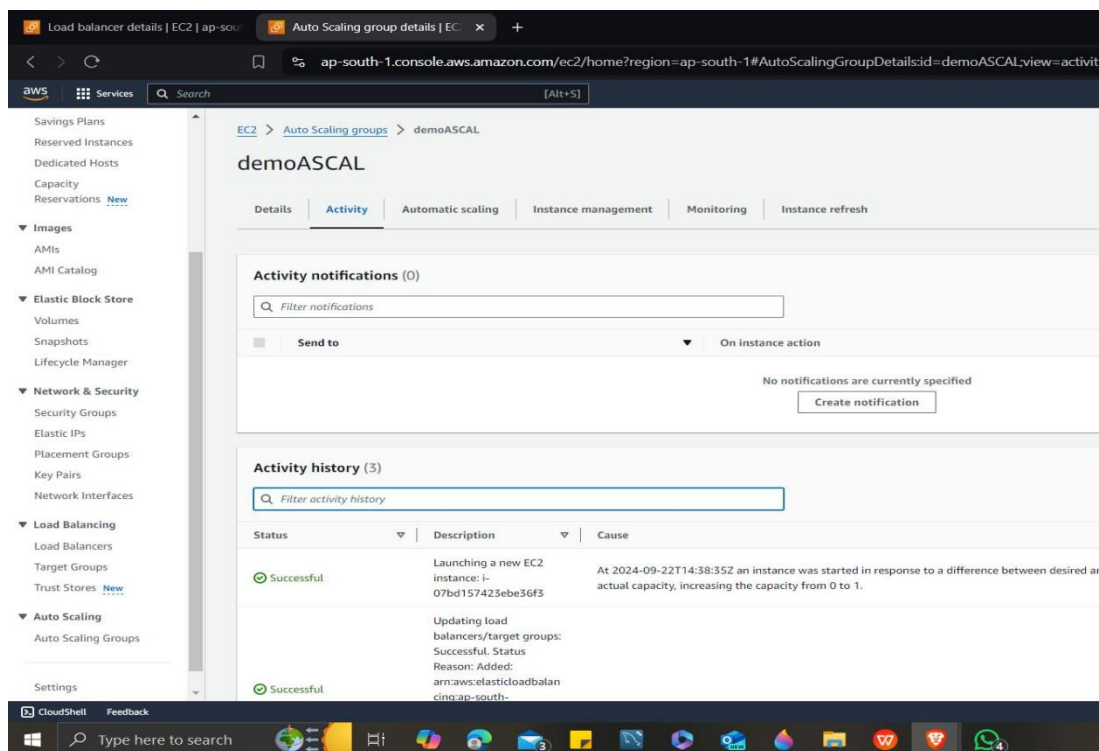
ASG-- activity -- now view what it is doing

Instance management --- to view if instance is created

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Step5: load balancer

Copy DNS name and paste on browser

Should get msg ----- 'this msg from ip-address'



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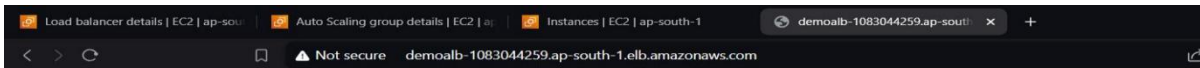
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Title of Practicle :

Creating an Application Load Balancer and Auto Scaling Group in AWS

The screenshot displays the AWS Management Console interface for an Application Load Balancer named 'demoALB'. The left sidebar shows navigation options like EC2 Global View, Events, Instances, and Images. The main content area shows the 'demoALB' details, including its status (Active), hosted zone (ZP97RAFLXTNZK), VPC (vpc-0662aa9456cd34d0a), and availability zones (ap-south-1a, ap-south-1c, ap-south-1b). A notification bubble indicates 'DNS name copied'.

Property	Value
Load balancer type	Application
Status	Active
VPC	vpc-0662aa9456cd34d0a
Load balancer IP address type	IPv4
Scheme	Internet-facing
Hosted zone	ZP97RAFLXTNZK
Availability Zones	subnet-0eb625152a51d805e (ap-south-1a), subnet-01845cf8c6ea95f06 (ap-south-1c), subnet-03acd2c431efc85dd (ap-south-1b)
Date created	September 22, 2024, 20:08 (UTC+05:30)
Load balancer ARN	arn:aws:elasticloadbalancing:ap-south-1:339712766612:loadbalancer/app/demoALB/2e9d39e27a75b516
DNS name	demoALB-1083044259.ap-south-1.elb.amazonaws.com



This message from : 172.31.8.144

Step6: autoscaling

Dynamic scaling policy --



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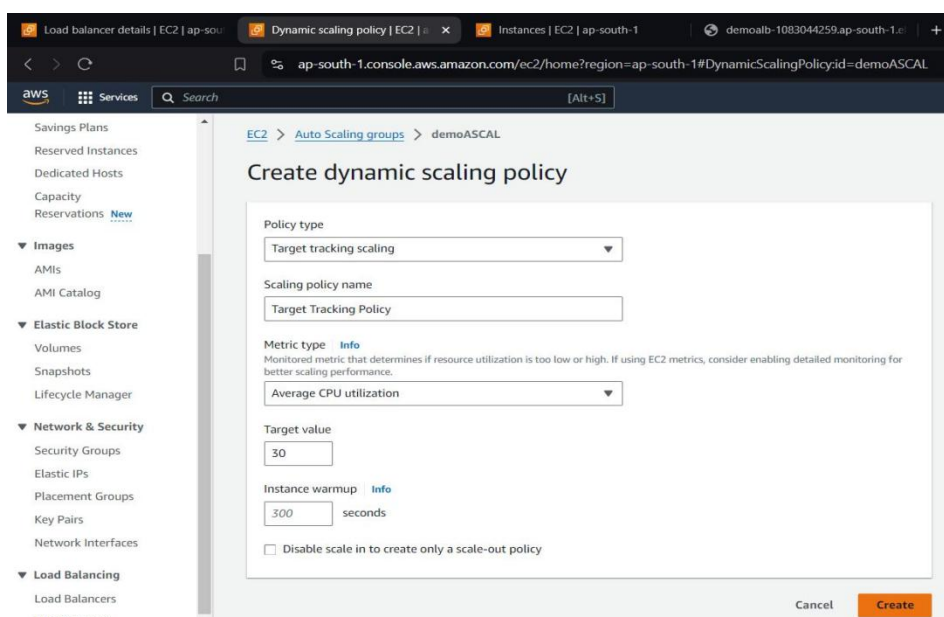
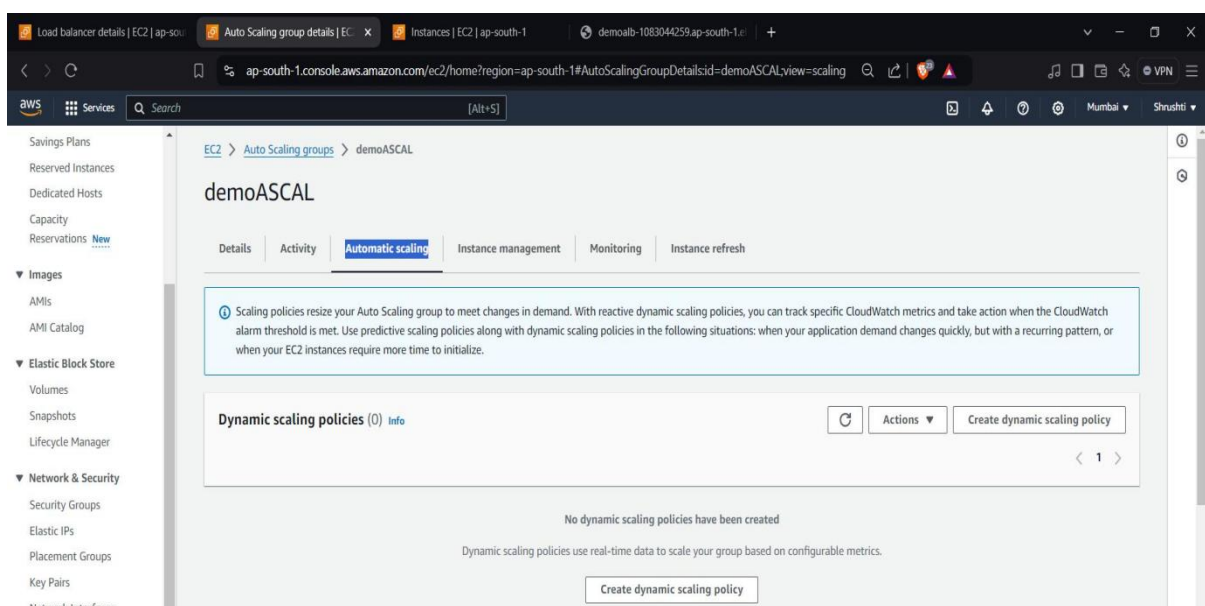
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target tracking scaling -----avg cpu utilization ----- 30(target value)



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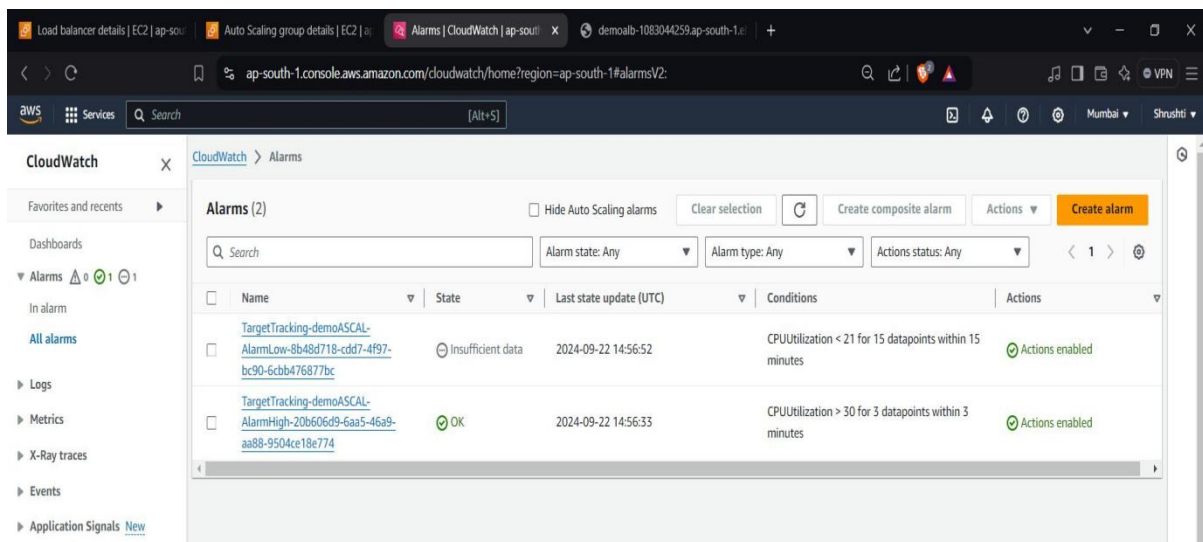
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Step7: cloud watch

Check 2 alarm are created



The screenshot shows the AWS CloudWatch Alarms console. The left sidebar contains navigation links for CloudWatch, Favorites and recents, Dashboards, Alarms (1), In alarm, All alarms, Logs, Metrics, X-Ray traces, Events, and Application Signals. The main content area displays a table of alarms. Two alarms are listed:

Name	State	Last state update (UTC)	Conditions	Actions
TargetTracking-demoASCL-AlarmLow-8b48d718-cdd7-4f97-bc90-6cbb476877bc	Insufficient data	2024-09-22 14:56:52	CPUUtilization < 21 for 15 datapoints within 15 minutes	Actions enabled
TargetTracking-demoASCL-AlarmHigh-20b606d9-6aa5-46a9-aa88-9504ce18e774	OK	2024-09-22 14:56:33	CPUUtilization > 30 for 3 datapoints within 3 minutes	Actions enabled

Now test the policy

Step8: autoscaling

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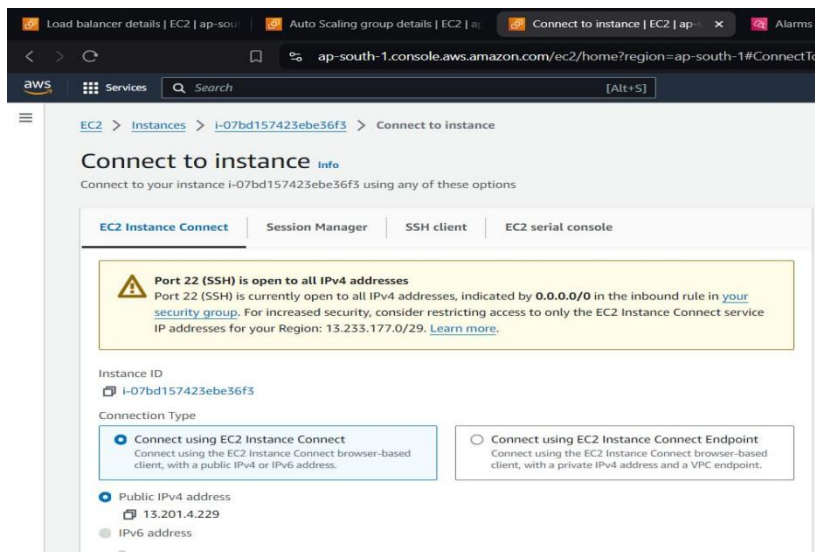
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Commands followed are :

Sudo yum install stress -y

Sudo stress --cpu 12 --timeout 240

Sudo yum install stress -y

```
[ec2-user@ip-172-31-8-144 ~]$ sudo yum install stress -y
Last metadata expiration check: 0:22:29 ago on Sun Sep 22 14:39:07 2024.
Dependencies resolved.
Package Architecture Version
Installing:
stress x86_64 1.0.7-2.amzn2023.0.1
Transaction Summary
```

Sudo stress --cpu 12 --timeout 240s

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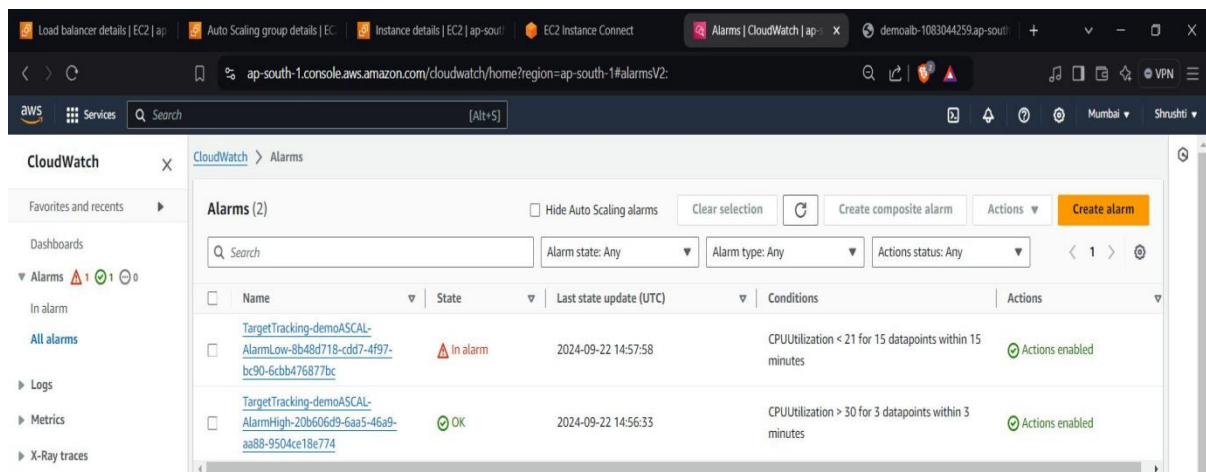
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```
[ec2-user@ip-172-31-8-144 ~]$ sudo yum install stress -y
Last metadata expiration check: 0:34:03 ago on Sun Sep 22 14:39:07 2024.
Package stress-1.0.7-2.amzn2023.0.1.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-8-144 ~]$ sudo stress --cpu 12 --timeout 240s
stress: info: [28390] dispatching hogs: 12 cpu, 0 io, 0 vm, 0 hdd
```

Step9: go to alarm and check

IN-ALARM



The screenshot shows the AWS CloudWatch Alarms console. On the left, there's a sidebar with 'Alarms' selected, showing 1 alarm in 'In alarm' state and 0 in 'OK' state. The main area displays a table of alarms:

Name	State	Last state update (UTC)	Conditions	Actions
TargetTracking-demoASCL-AlarmLow-8b48d718-cdd7-4f97-bc90-6cbb476877bc	In alarm	2024-09-22 14:57:58	CPUUtilization < 21 for 15 datapoints within 15 minutes	Actions enabled
TargetTracking-demoASCL-AlarmHigh-20b606d9-6aa5-46a9-aa88-9504ce18e774	OK	2024-09-22 14:56:33	CPUUtilization > 30 for 3 datapoints within 3 minutes	Actions enabled

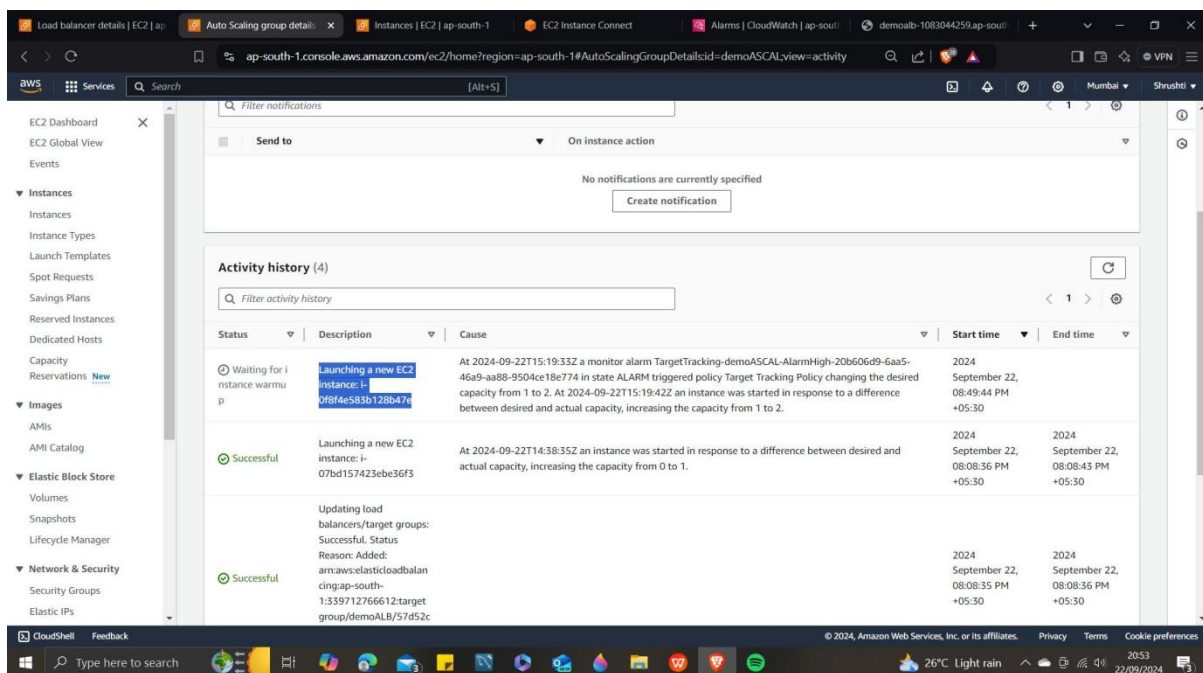
Step10: autoscaling instance management

New instance will be launched

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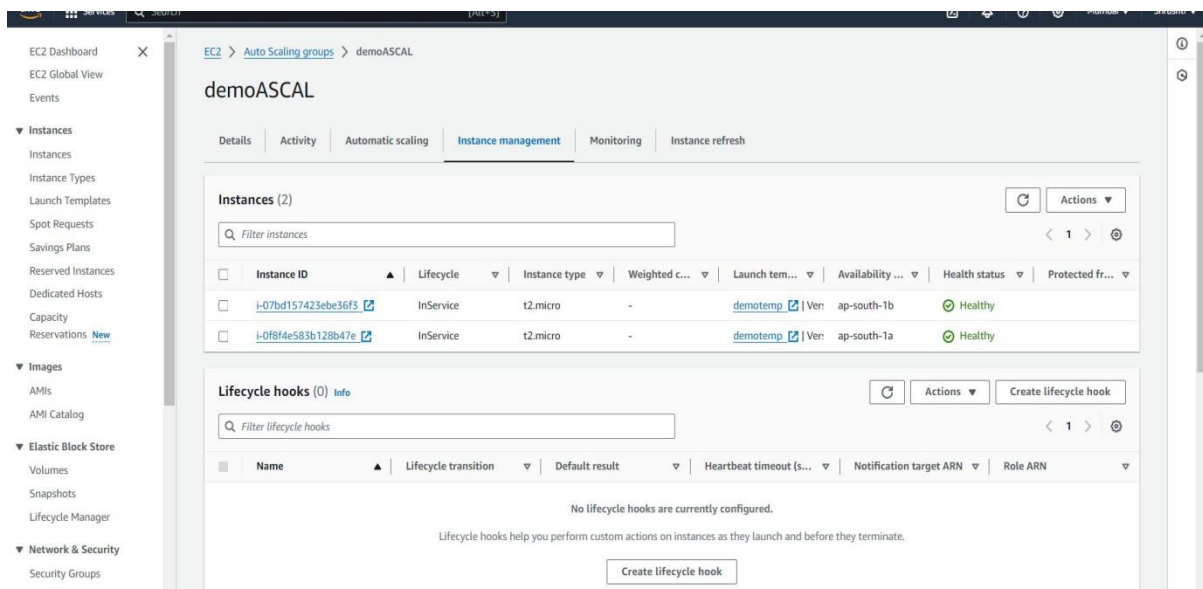
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The screenshot shows the AWS Management Console's 'Auto Scaling group details' page for a group named 'demoASCL'. The 'Activity history' tab is selected, displaying a table of recent activities. The table has columns for Status, Description, Cause, Start time, and End time. The activities include launching new EC2 instances in response to alarms and updates to the load balancer target groups.

Status	Description	Cause	Start time	End time
Waiting for i...	Launching a new EC2 instance: i-07bd157423ebe36f3	At 2024-09-22T15:19:33Z a monitor alarm TargetTracking-demoASCL-AlarmHigh-20b606d9-6aa5-46a9-aa88-9504ce18e774 in state ALARM triggered policy Target Tracking Policy changing the desired capacity from 1 to 2. At 2024-09-22T15:19:42Z an instance was started in response to a difference between desired and actual capacity, increasing the capacity from 1 to 2.	2024 September 22, 08:49:44 PM +05:30	
Successful	Launching a new EC2 instance: i-07bd157423ebe36f3	At 2024-09-22T14:38:35Z an instance was started in response to a difference between desired and actual capacity, increasing the capacity from 0 to 1.	2024 September 22, 08:08:36 PM +05:30	2024 September 22, 08:08:43 PM +05:30
Successful	Updating load balancers/target groups: Successful. Status Reason: Added: amaws:elasticloadbalancing:ap-south-1:339712766612:targetgroup/demoALB/57d52c		2024 September 22, 08:08:35 PM +05:30	2024 September 22, 08:08:43 PM +05:30



The screenshot shows the 'demoASCL' Auto Scaling Group page in the 'Instance management' tab. It displays a table of instances with columns for Instance ID, Lifecycle, Instance type, Weighted capacity, Launch template, Availability zone, Health status, and Protected from termination. Two instances are listed, both in 'InService' state with 'Healthy' status. Below the table, the 'Lifecycle hooks' section shows that no hooks are currently configured.

Instance ID	Lifecycle	Instance type	Weighted c...	Launch tem...	Availability ...	Health status	Protected fr...
i-07bd157423ebe36f3	InService	t2.micro	-	demotemp	ap-south-1b	Healthy	
i-0f84e583b128b47e	InService	t2.micro	-	demotemp	ap-south-1a	Healthy	

Step11: now refresh the browser with DNS address



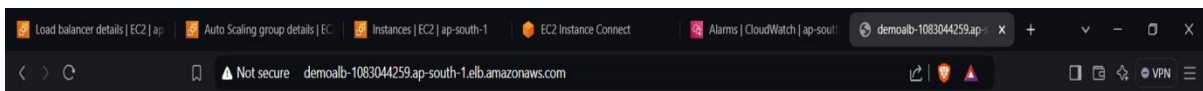
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This message from : 172.31.35.245

New dns will appear which is of new instance

Steps to delete the set-up:

- 1:loadbalancer
- 2:Autoscaling
- 3:instance
- 4:launch template
- 5:security group
- 6:target group

Done.