Pandit Deendayal Energy University, Gandhinagar

School of Technology

Department of Computer Science & Engineering

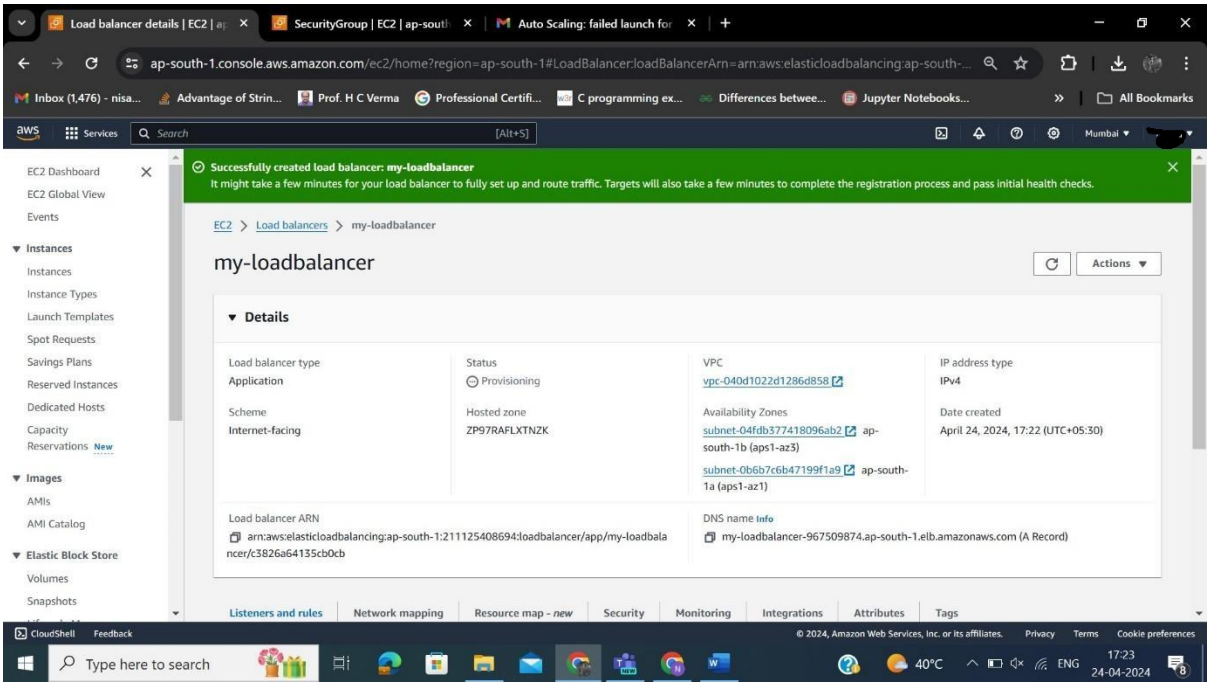
Cloud Computing Lab (20CP322P)

B.Tech-Computer Science & Engineering (Sem-VI)

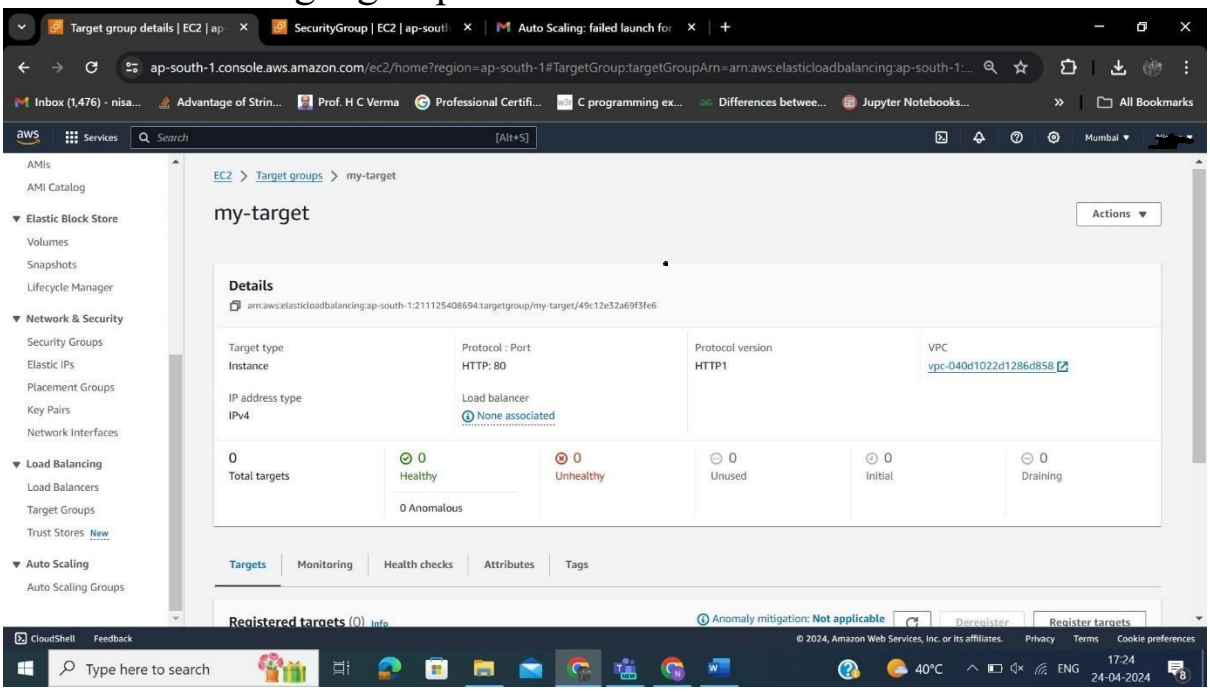
Lab 11 Assignment: Working on AWS Cloud**.**

Aim: Create infrastructure using auto-scaling, load balancer, SNS, cloud watch where you have to set the metrics for the CPU utilization. If CPU utilization is more than 70% for a 5 minutes than EC2 instance increases as per the requirement and if the CPU utilization goes below 40% then EC2 instances are removed one by one and send a notification to the email.

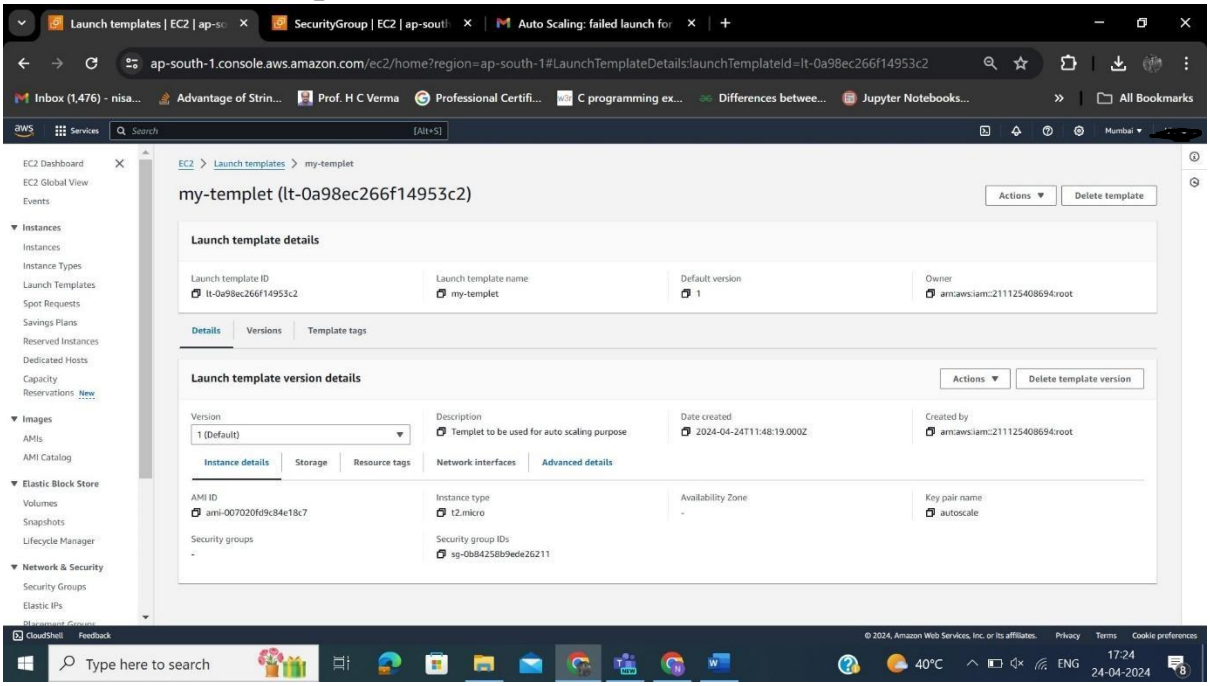
1. Create a load balancer:.



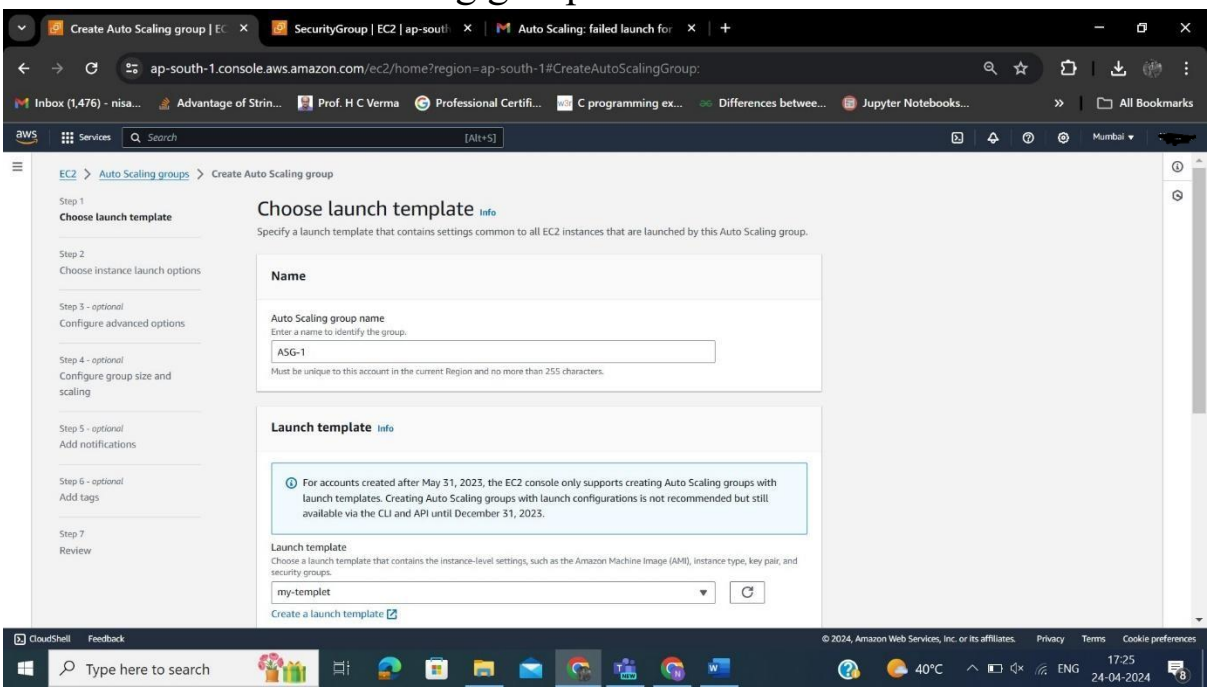
2. Create a target group:

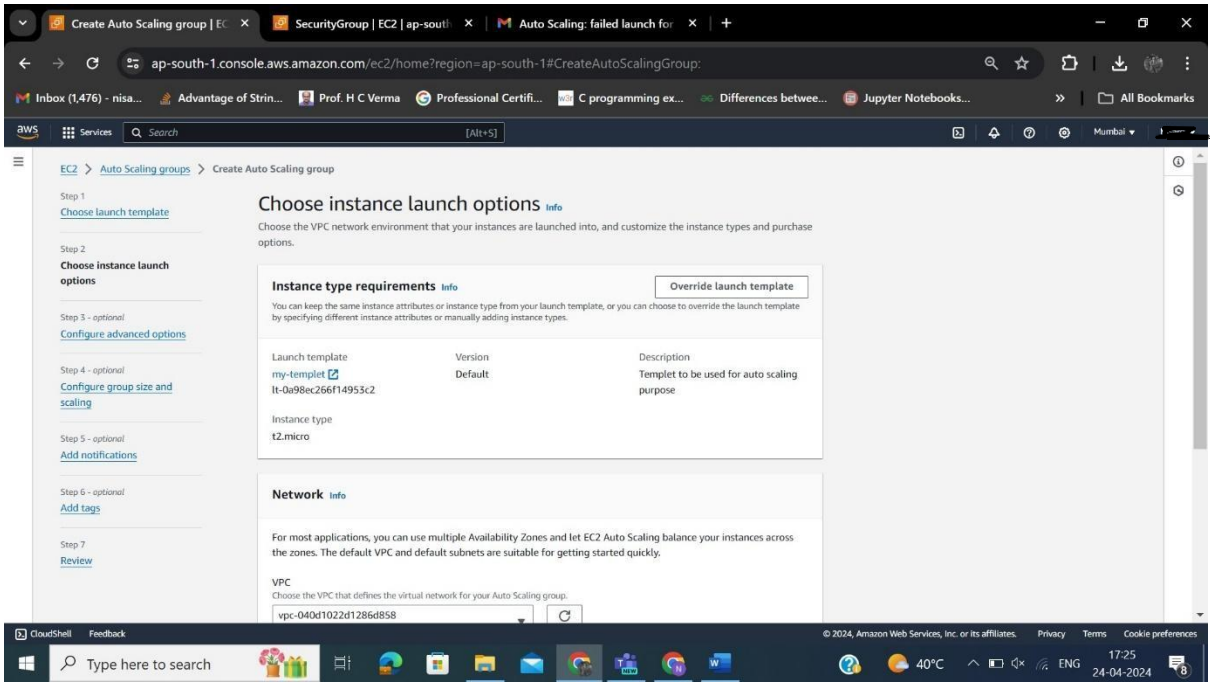


3. Create a template:



4. Create an auto scaling group:




Create Auto Scaling group | EC
SecurityGroup | EC2 | ap-south
Auto Scaling: failed launch for
ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateAutoScalingGroup:
Inbox (1,476) - nisa...
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Professional Certifi...
C programming ex...
Differences betwee...
Jupyter Notebooks...
All Bookmarks
Services
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Mumbai
EC2 > Auto Scaling groups > Create Auto Scaling group
Step 1
Choose launch template
Step 2
Choose instance launch options
Step 3 - optional
Configure advanced options
Step 4 - optional
Configure group size and scaling
Step 5 - optional
Add notifications
Step 6 - optional
Add tags
Step 7
Review
Choose instance launch options Info
Choose the VPC network environment that your instances are launched into, and customize the instance types and purchase options.
Instance type requirements Info
Override launch template
You can keep the same instance attributes or instance type from your launch template, or you can choose to override the launch template by specifying different instance attributes or manually adding instance types.
Launch template
my-templet
lt-0a98ec266f14953c2
Version
Default
Description
Templet to be used for auto scaling purpose
Instance type
t2.micro
Network Info
For most applications, you can use multiple Availability Zones and let EC2 Auto Scaling balance your instances across the zones. The default VPC and default subnets are suitable for getting started quickly.
VPC
Choose the VPC that defines the virtual network for your Auto Scaling group.
vpc-040d1022d1286d858
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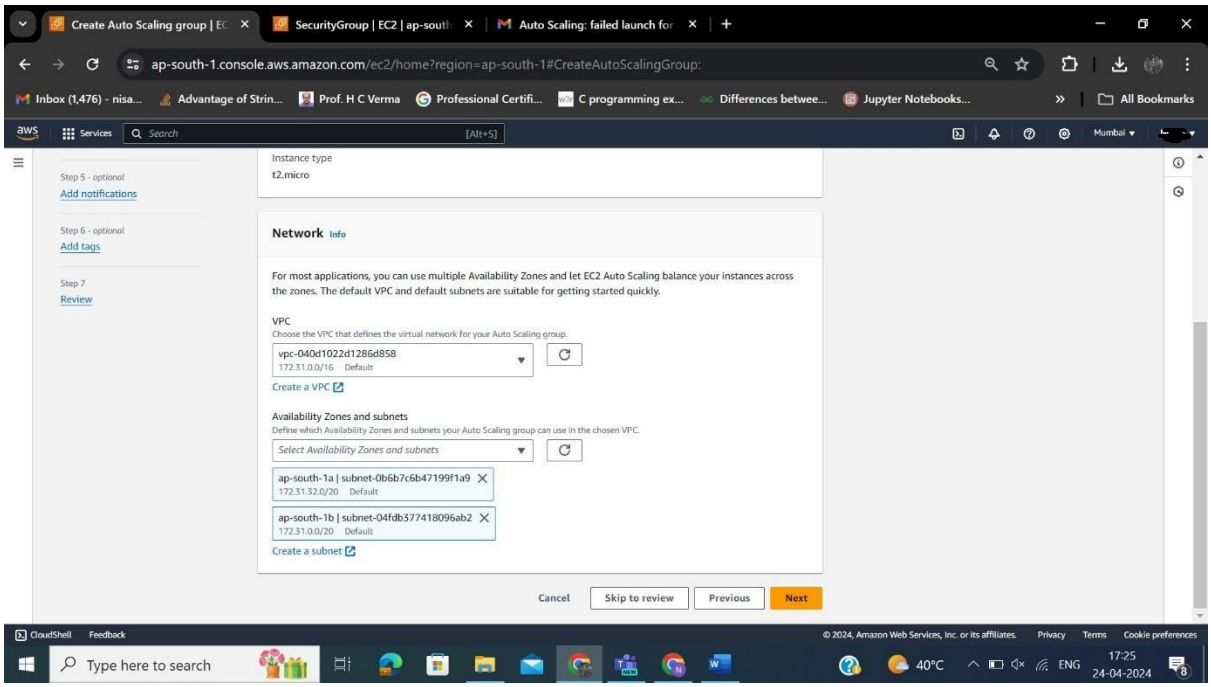
Create Auto Scaling group | EC
SecurityGroup | EC2 | ap-south
Auto Scaling: failed launch for
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Instance type
t2.micro
Step 5 - optional
Add notifications
Step 6 - optional
Add tags
Step 7
Review
Network Info
For most applications, you can use multiple Availability Zones and let EC2 Auto Scaling balance your instances across the zones. The default VPC and default subnets are suitable for getting started quickly.
VPC
Choose the VPC that defines the virtual network for your Auto Scaling group.
vpc-040d1022d1286d858
172.31.0.0/16 Default
Create a VPC
Availability Zones and subnets
Define which Availability Zones and subnets your Auto Scaling group can use in the chosen VPC.
Select Availability Zones and subnets
ap-south-1a | subnet-0b6b7c6b47199f1a9
172.31.32.0/20 Default
ap-south-1b | subnet-04fdb377418096ab2
172.31.0.0/20 Default
Create a subnet
Cancel
Skip to review
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Next
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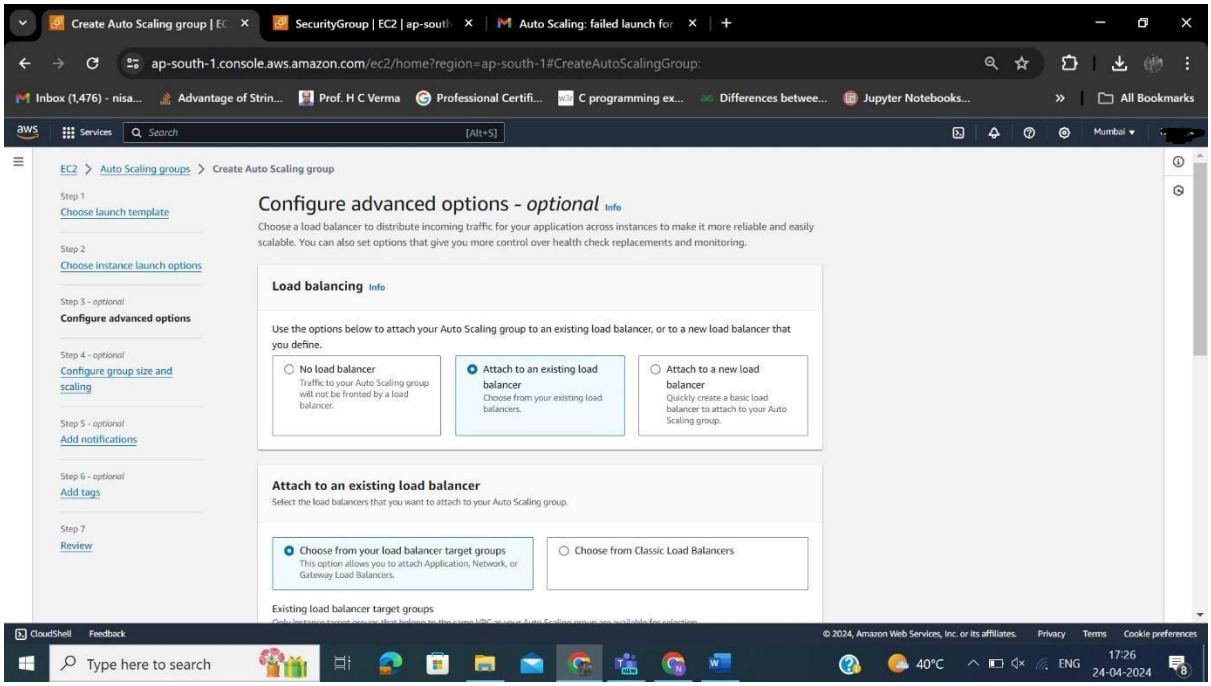
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EC2 > Auto Scaling groups > Create Auto Scaling group
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Configure group size and scaling
Step 5 - optional
Add notifications
Step 6 - optional
Add tags
Step 7
Review
Configure advanced options - optional Info
Choose a load balancer to distribute incoming traffic for your application across instances to make it more reliable and easily scalable. You can also set options that give you more control over health check replacements and monitoring.
Load balancing Info
Use the options below to attach your Auto Scaling group to an existing load balancer, or to a new load balancer that you define.
No load balancer
Traffic to your Auto Scaling group will not be fronted by a load balancer.
Attach to an existing load balancer
Choose from your existing load balancers.
Attach to a new load balancer
Quickly create a basic load balancer to attach to your Auto Scaling group.
Attach to an existing load balancer
Select the load balancers that you want to attach to your Auto Scaling group.
Choose from your load balancer target groups
This option allows you to attach Application, Network, or Gateway Load Balancers.
Choose from Classic Load Balancers
Existing load balancer target groups
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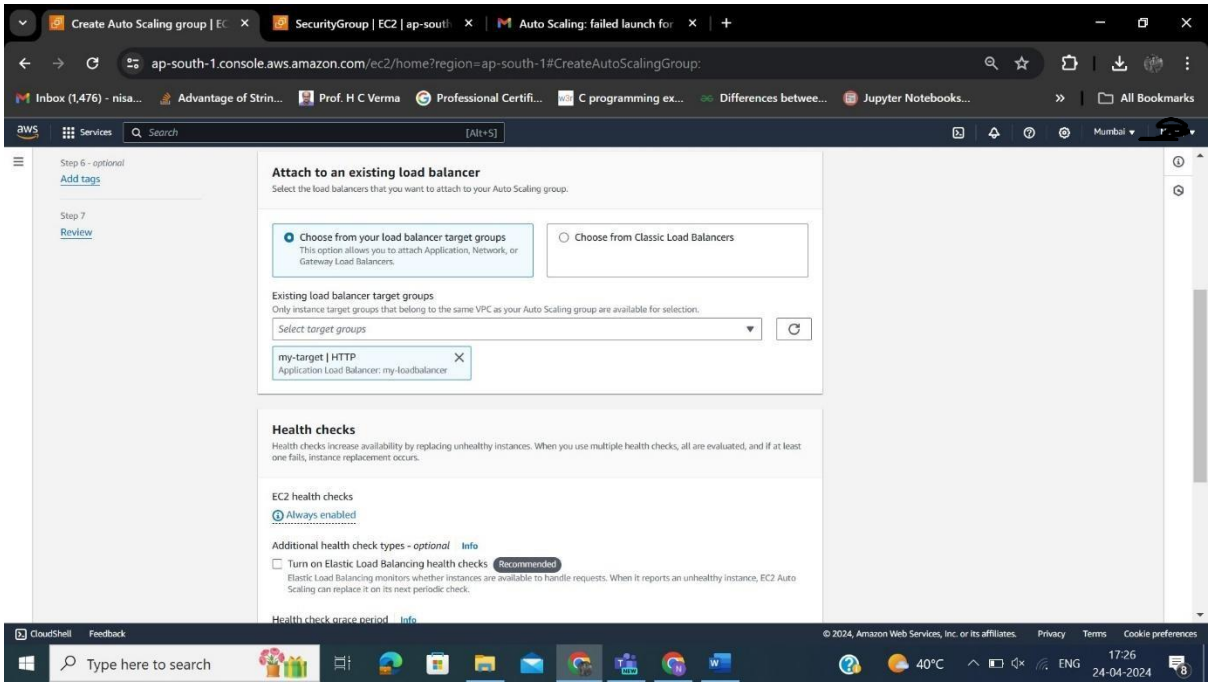
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Step 6 - optional
Add tags
Step 7
Review
Attach to an existing load balancer
Select the load balancers that you want to attach to your Auto Scaling group.
Choose from your load balancer target groups
This option allows you to attach Application, Network, or Gateway Load Balancers.
Choose from Classic Load Balancers
Existing load balancer target groups
Only instance target groups that belong to the same VPC as your Auto Scaling group are available for selection.
Select target groups
my-target | HTTP
Application Load Balancer: my-loadbalancer
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.
Health check grace period Info
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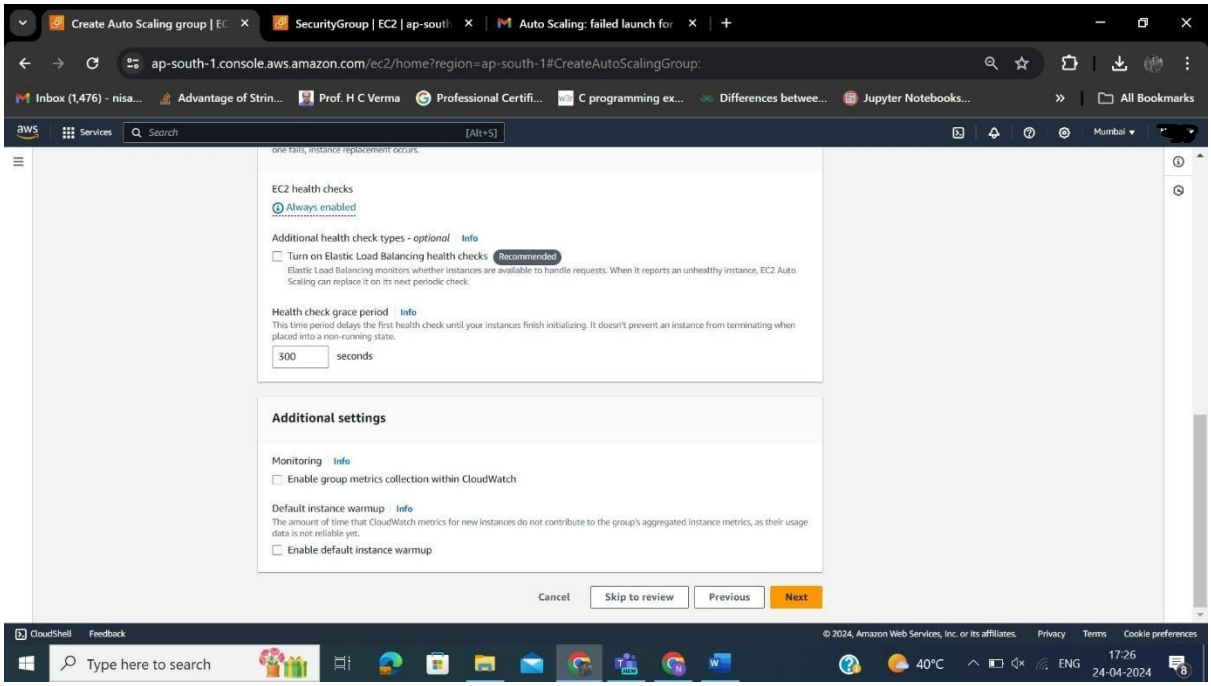
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EC2 health checks
Always enabled
Additional health check types - optional Info
Turn on Elastic Load Balancing health checks Recommended
Elastic Load Balancing monitors whether instances are available to handle requests. When it reports an unhealthy instance, EC2 Auto Scaling can replace it on its next periodic check.
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
Additional settings
Monitoring Info
Enable group metrics collection within CloudWatch
Default instance warmup Info
The amount of time that CloudWatch metrics for new instances do not contribute to the group's aggregated instance metrics, as their usage data is not reliable yet.
Enable default instance warmup
Cancel
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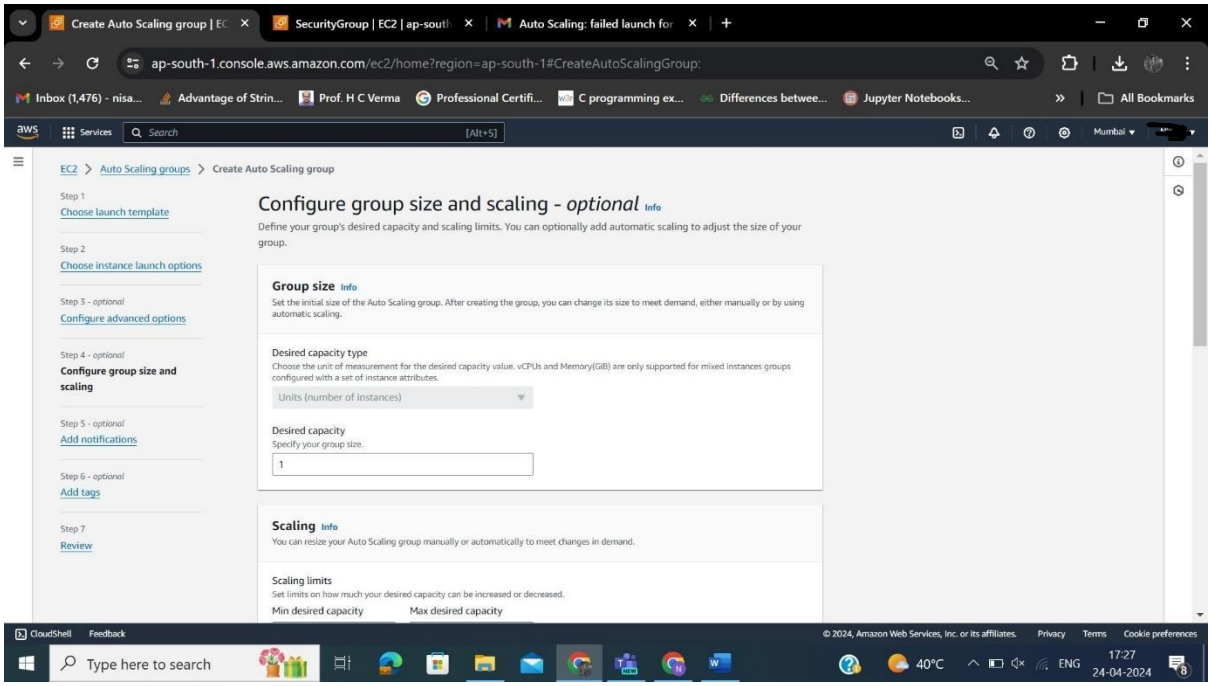
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EC2 > Auto Scaling groups > Create Auto Scaling group
Step 1
Choose launch template
Step 2
Choose instance launch options
Step 3 - optional
Configure advanced options
Step 4 - optional
Configure group size and scaling
Step 5 - optional
Add notifications
Step 6 - optional
Add tags
Step 7
Review
Configure group size and scaling - optional Info
Define your group's desired capacity and scaling limits. You can optionally add automatic scaling to adjust the size of your group.
Group size Info
Set the initial size of the Auto Scaling group. After creating the group, you can change its size to meet demand, either manually or by using automatic scaling.
Desired capacity type
Choose the unit of measurement for the desired capacity value. vCPUs and Memory(GiB) are only supported for mixed instances groups configured with a set of instance attributes.
Units (number of instances)
Desired capacity
Specify your group size.
1
Scaling Info
You can resize your Auto Scaling group manually or automatically to meet changes in demand.
Scaling limits
Set limits on how much your desired capacity can be increased or decreased.
Min desired capacity
Max desired capacity
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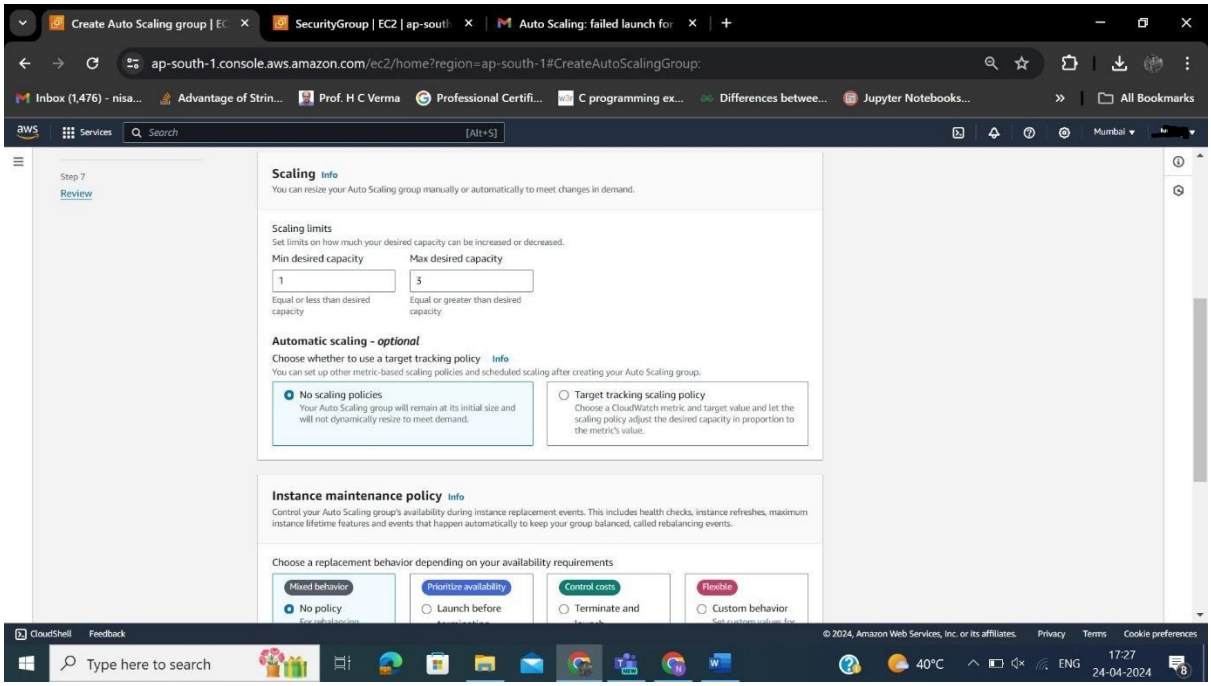
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Step 7
Review
Scaling Info
You can resize your Auto Scaling group manually or automatically to meet changes in demand.
Scaling limits
Set limits on how much your desired capacity can be increased or decreased.
Min desired capacity
1
Equal or less than desired capacity
Max desired capacity
3
Equal or greater than desired capacity
Automatic scaling - optional
Choose whether to use a target tracking policy Info
You can set up other metric-based scaling policies and scheduled scaling after creating your Auto Scaling group.
No scaling policies
Your Auto Scaling group will remain at its initial size and will not dynamically resize to meet demand.
Target tracking scaling policy
Choose a CloudWatch metric and target value and let the scaling policy adjust the desired capacity in proportion to the metric's value.
Instance maintenance policy Info
Control your Auto Scaling group's availability during instance replacement events. This includes health checks, instance refreshes, maximum instance lifetime features and events that happen automatically to keep your group balanced, called rebalancing events.
Choose a replacement behavior depending on your availability requirements
Mixed behavior
No policy
Prioritize availability
Launch before
Control costs
Terminate and
Flexible
Custom behavior
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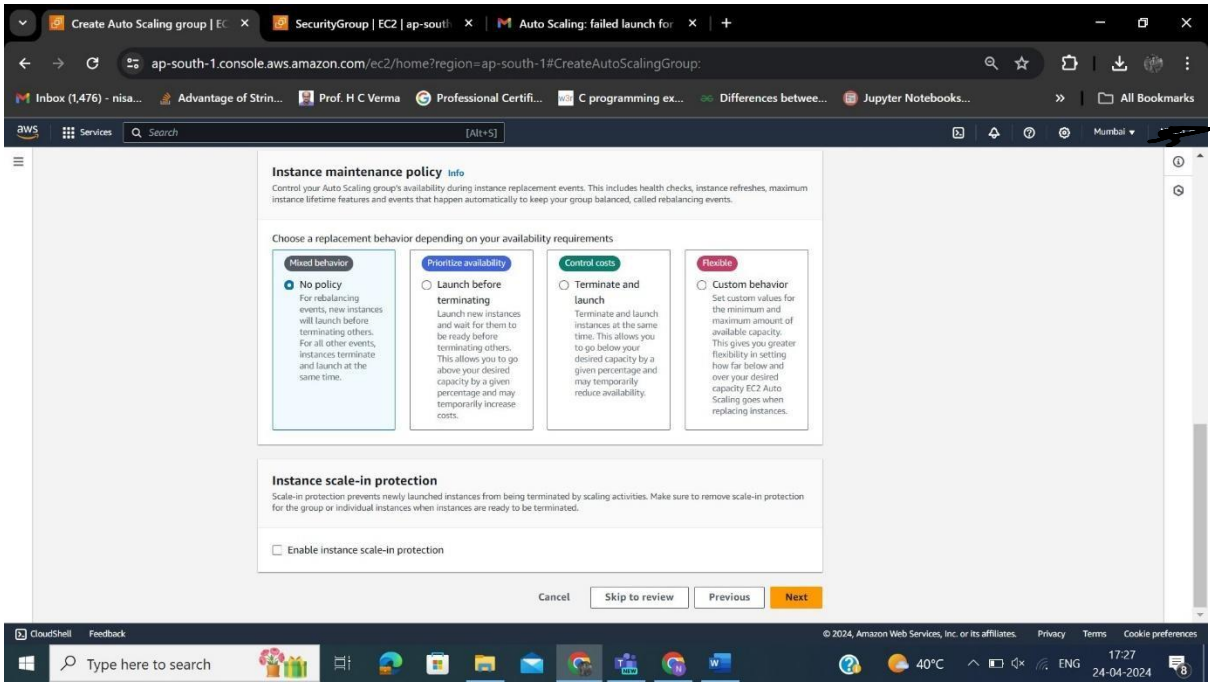
Create Auto Scaling group | EC
SecurityGroup | EC2 | ap-south
Auto Scaling: failed launch for
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Instance maintenance policy Info
Control your Auto Scaling group's availability during instance replacement events. This includes health checks, instance refreshes, maximum instance lifetime features and events that happen automatically to keep your group balanced, called rebalancing events.
Choose a replacement behavior depending on your availability requirements
Mixed behavior
No policy
For rebalancing events, new instances will launch before terminating others. For all other events, instances terminate and launch at the same time.
Prioritize availability
Launch before terminating
Launch new instances and wait for them to be ready before terminating others. This allows you to go above your desired capacity by a given percentage and may temporarily increase costs.
Control costs
Terminate and launch
Terminate and launch instances at the same time. This allows you to go below your desired capacity by a given percentage and may temporarily reduce availability.
Flexible
Custom behavior
Set custom values for the minimum and maximum amount of available capacity. This gives you greater flexibility in setting how far below and over your desired capacity EC2 Auto Scaling goes when replacing instances.
Instance scale-in protection
Scale-in protection prevents newly launched instances from being terminated by scaling activities. Make sure to remove scale-in protection for the group or individual instances when instances are ready to be terminated.
Enable instance scale-in protection
Cancel
Skip to review
Previous
Next
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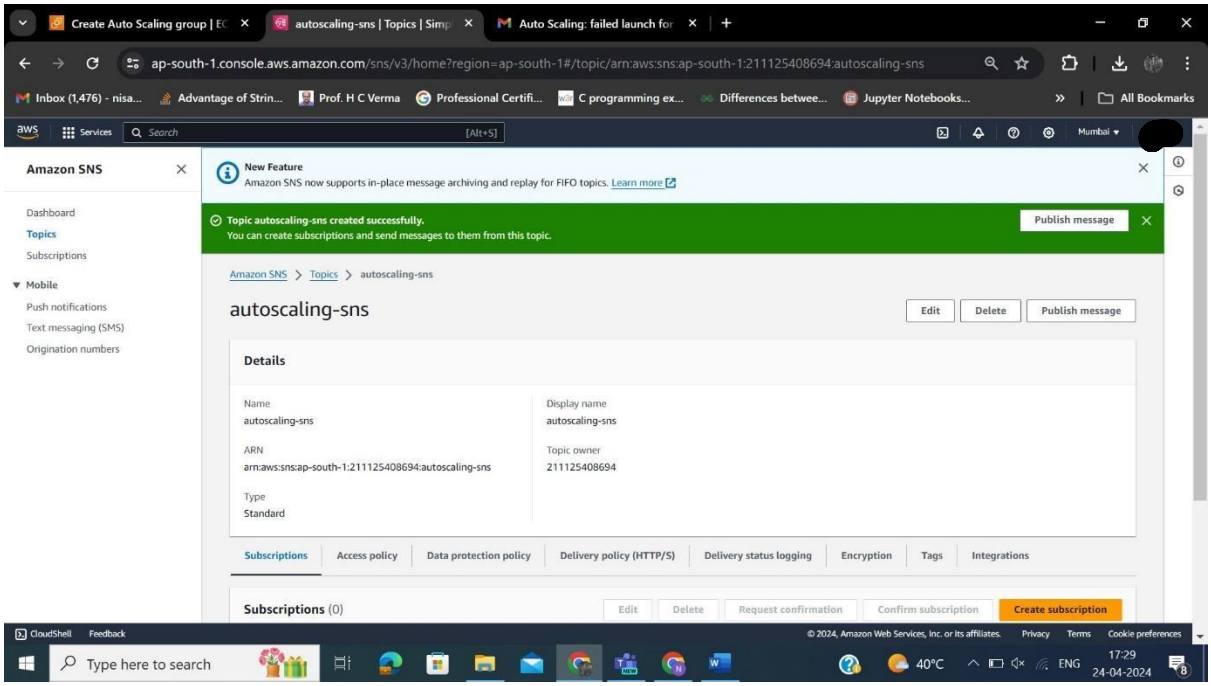
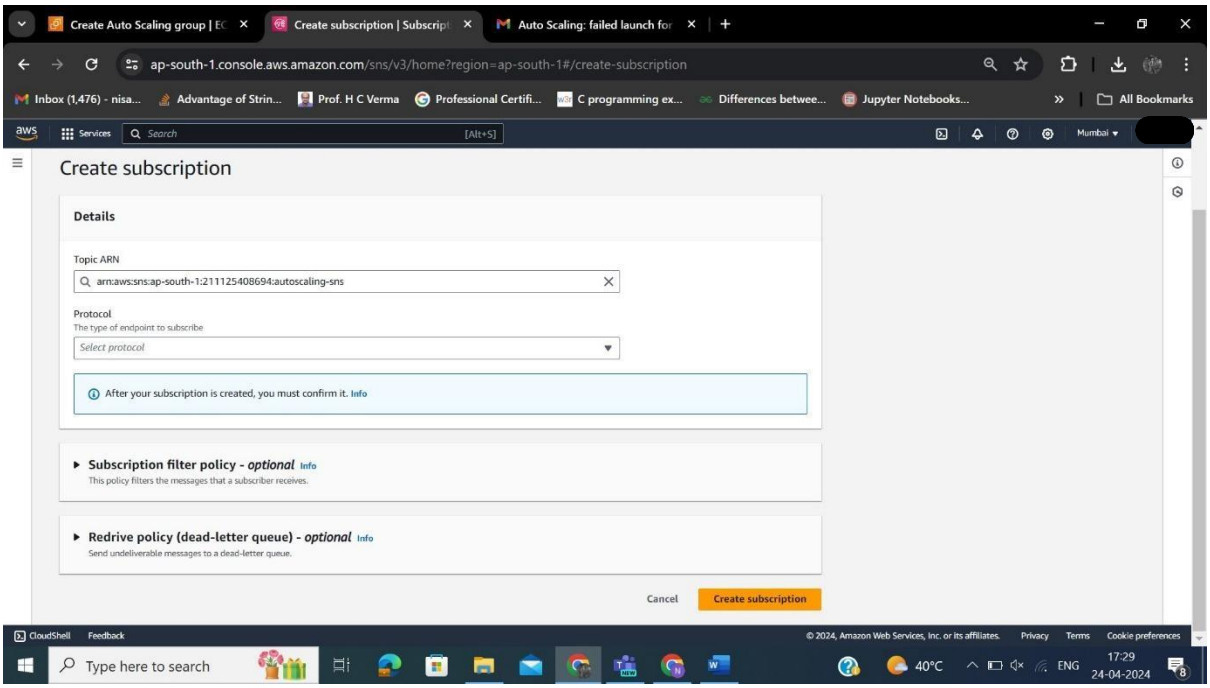
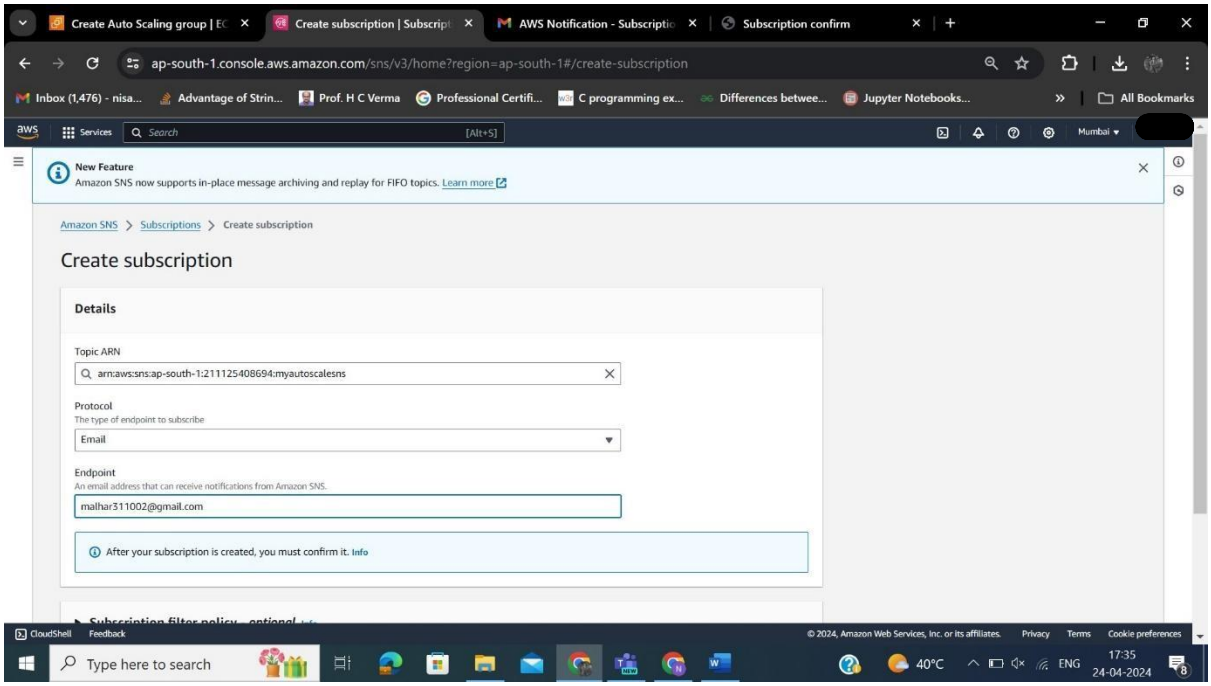
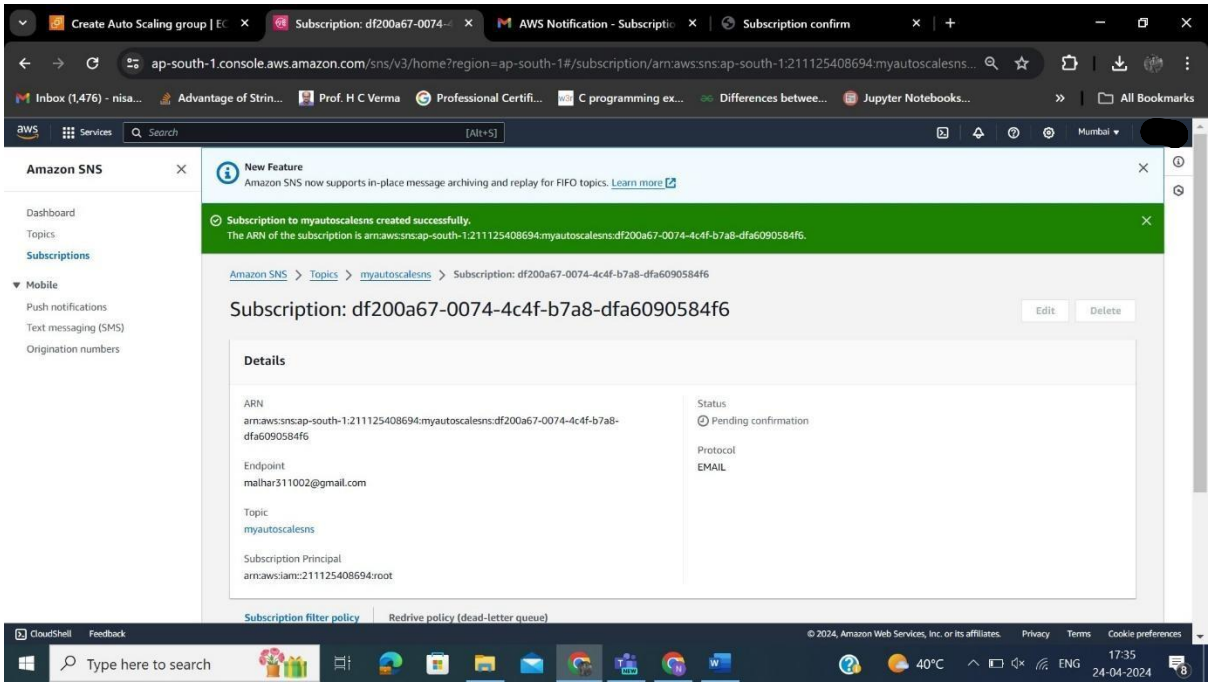


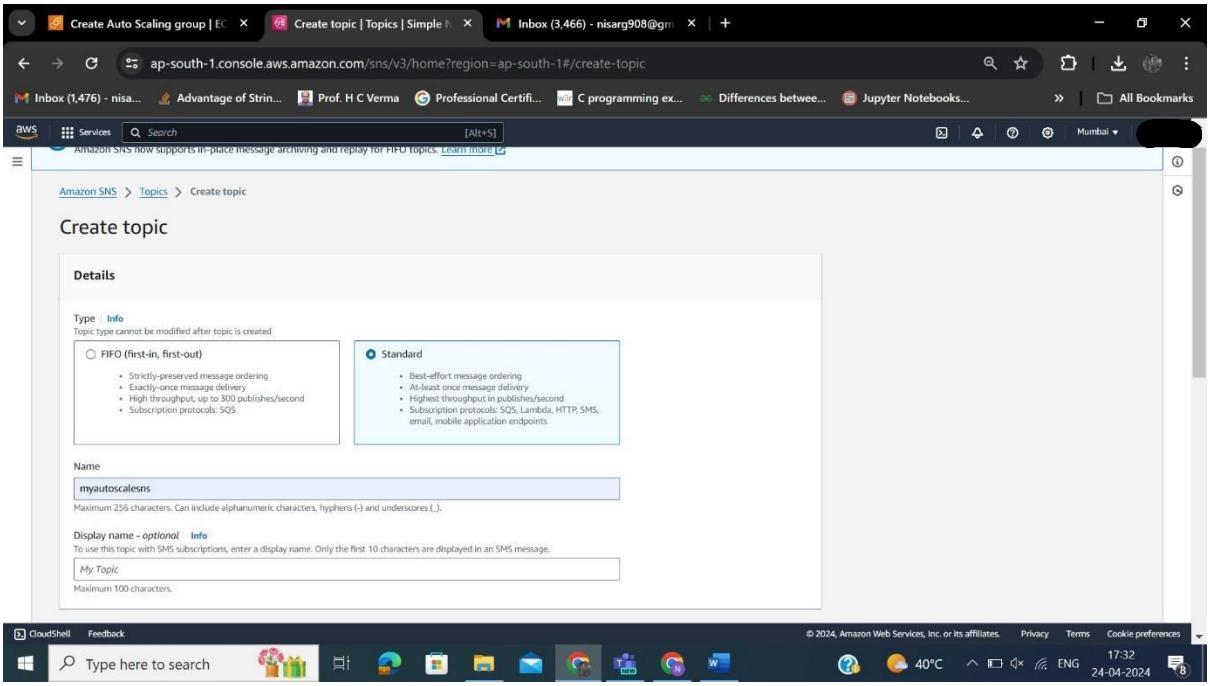
5. Create an SNS:







6. Create an SNS topic:


Create Auto Scaling group | EC
Create topic | Topics | Simple
Inbox (3,466) - nisarg908@gm
ap-south-1.console.aws.amazon.com/sns/v3/home?region=ap-south-1#/create-topic
Amazon SNS > Topics > Create topic
Create topic
Details
Type Info
Topic type cannot be modified after topic is created
FIFO (first-in, first-out)
Strictly-preserved message ordering
Exactly-once message delivery
High throughput, up to 300 publishes/second
Subscription protocols: SQS
Standard
Best-effort message ordering
At-least once message delivery
Highest throughput in publishes/second
Subscription protocols: SQS, Lambda, HTTP, SMS, email, mobile application endpoints
Name
myautoscalesns
Maximum 256 characters. Can include alphanumeric characters, hyphens (-) and underscores (_).
Display name - optional Info
To use this topic with SMS subscriptions, enter a display name. Only the first 10 characters are displayed in an SMS message.
My Topic
Maximum 100 characters.
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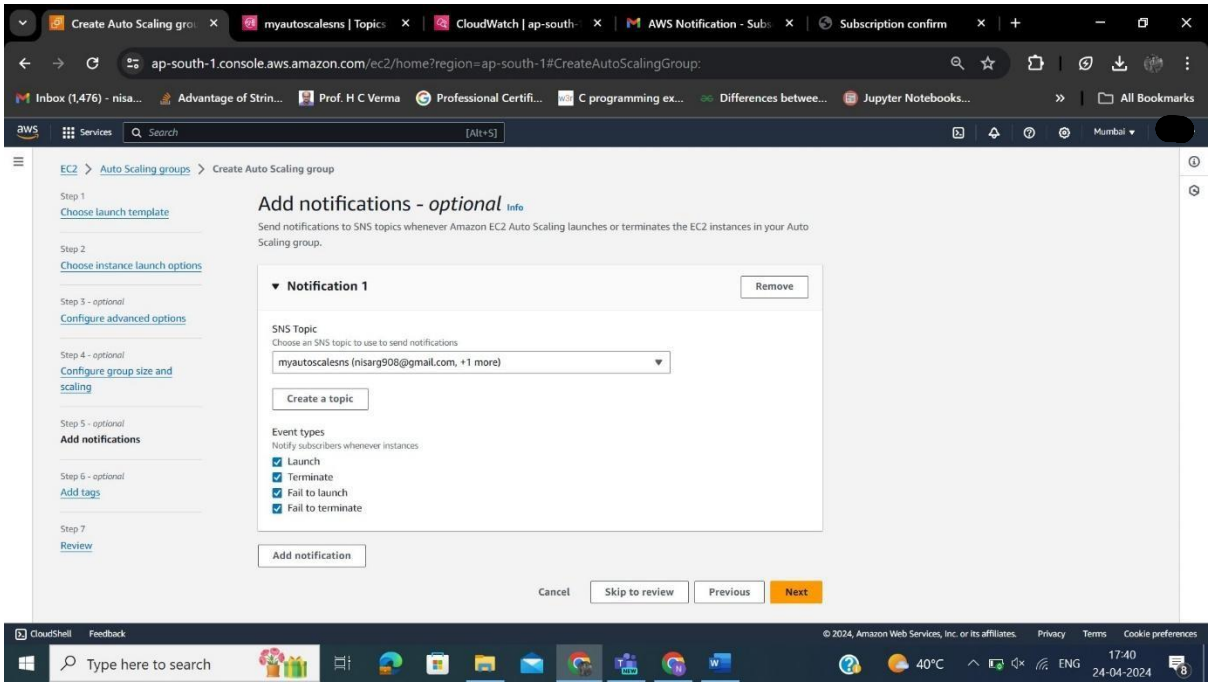
Create Auto Scaling grou
myautoscalesns | Topics
CloudWatch | ap-south-
AWS Notification - Subs
Subscription confirm
ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateAutoScalingGroup:
EC2 > Auto Scaling groups > Create Auto Scaling group
Step 1
Choose launch template
Step 2
Choose instance launch options
Step 3 - optional
Configure advanced options
Step 4 - optional
Configure group size and scaling
Step 5 - optional
Add notifications
Step 6 - optional
Add tags
Step 7
Review
Add notifications - optional Info
Send notifications to SNS topics whenever Amazon EC2 Auto Scaling launches or terminates the EC2 instances in your Auto Scaling group.
Notification 1
Remove
SNS Topic
Choose an SNS topic to use to send notifications
myautoscalesns (nisarg908@gmail.com, +1 more)
Create a topic
Event types
Notify subscribers whenever instances
Launch
Terminate
Fail to launch
Fail to terminate
Add notification
Cancel
Skip to review
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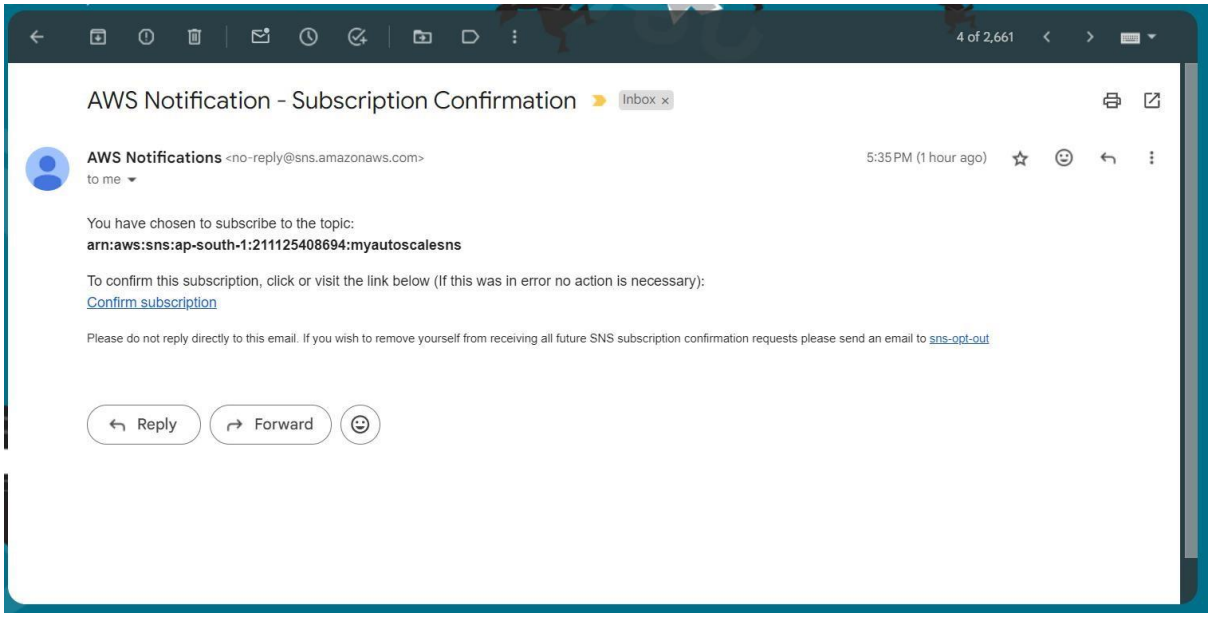
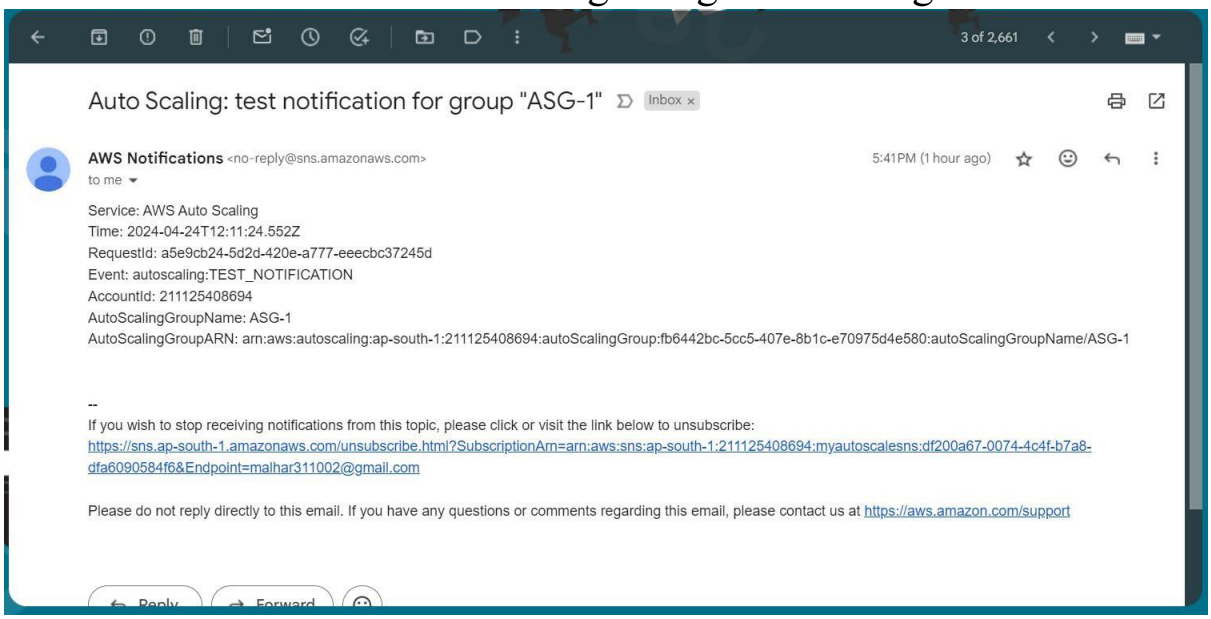
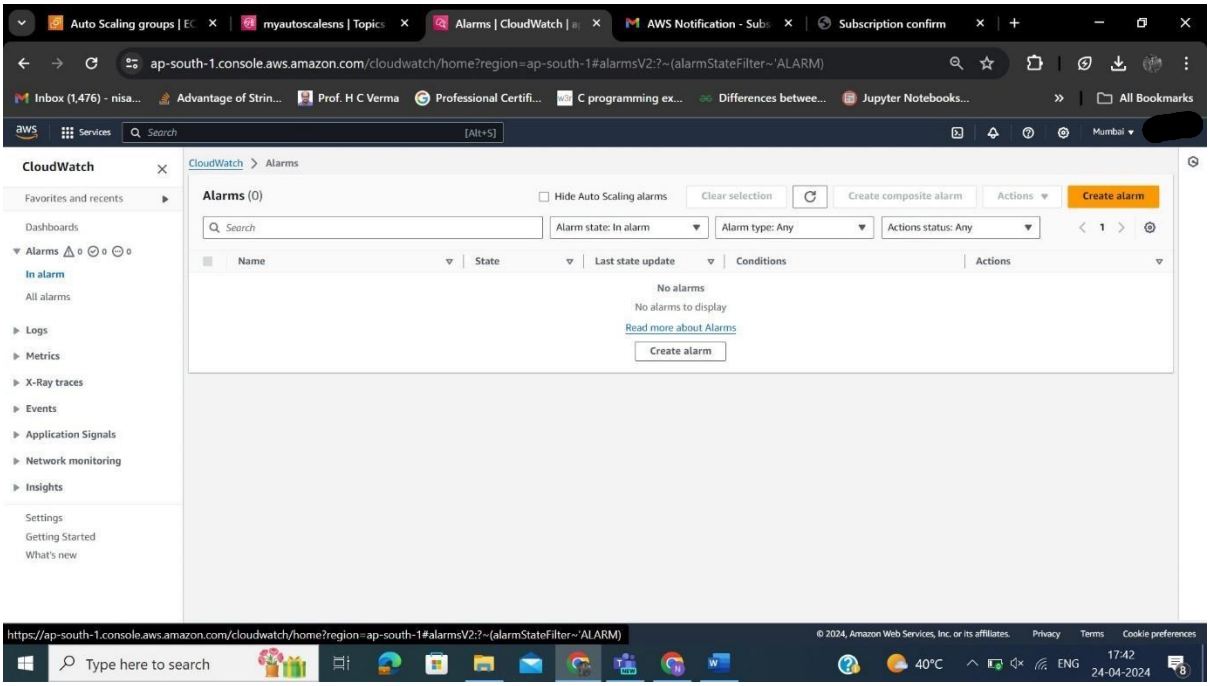


7. You will receive a mail regarding auto scaling



8. Create an alarm


Auto Scaling groups | EC
myautoscalesns | Topics
Alarms | CloudWatch
AWS Notification - Subs
Subscription confirm
ap-south-1.console.aws.amazon.com/cloudwatch/home?region=ap-south-1#alarmsV2:?~(alarmStateFilter~'ALARM)
CloudWatch
Favorites and recents
Dashboards
Alarms
In alarm
All alarms
Logs
Metrics
X-Ray traces
Events
Application Signals
Network monitoring
Insights
Settings
Getting Started
What's new
CloudWatch > Alarms
Alarms (0)
Hide Auto Scaling alarms
Clear selection
Create composite alarm
Actions
Create alarm
Search
Alarm state: In alarm
Alarm type: Any
Actions status: Any
Name
State
Last state update
Conditions
Actions
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No alarms to display
Read more about Alarms
Create alarm
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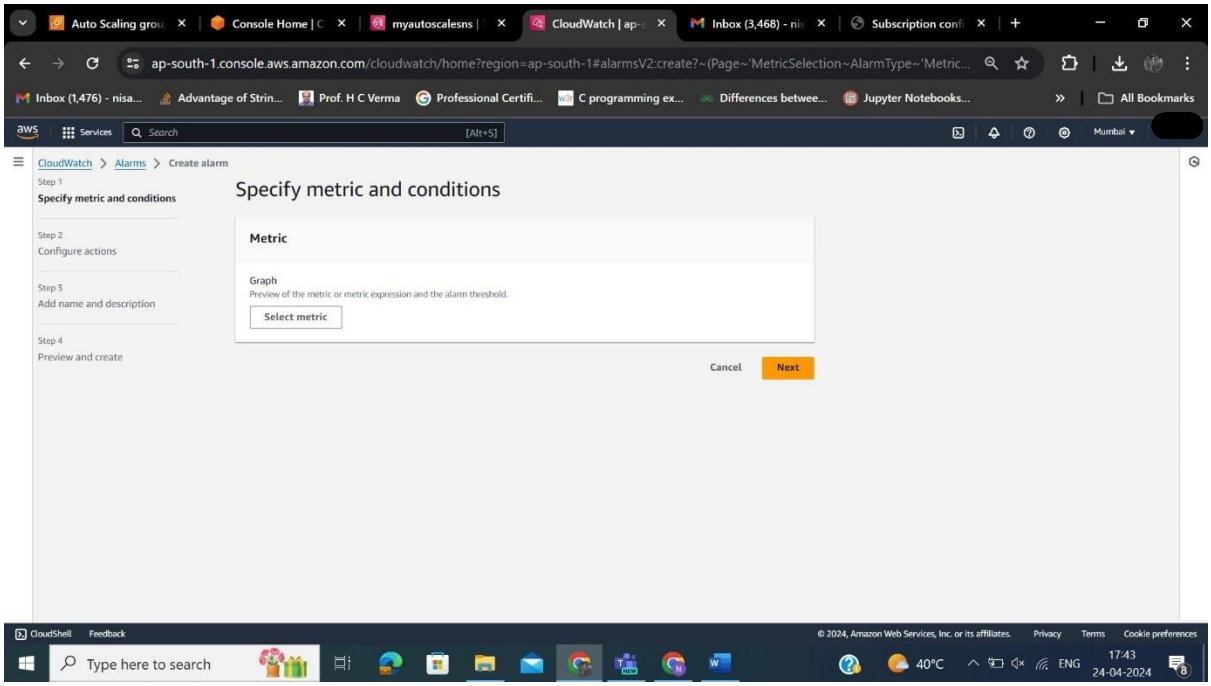
Auto Scaling grou
Console Home | C
myautoscalesns |
CloudWatch | ap-
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Subscription confi
ap-south-1.console.aws.amazon.com/cloudwatch/home?region=ap-south-1#alarmsV2:create?~(Page~'MetricSelection~AlarmType~'Metric...
CloudWatch > Alarms > Create alarm
Step 1
Specify metric and conditions
Step 2
Configure actions
Step 3
Add name and description
Step 4
Preview and create
Specify metric and conditions
Metric
Graph
Preview of the metric or metric expression and the alarm threshold.
Select metric
Cancel
Next
CloudShell
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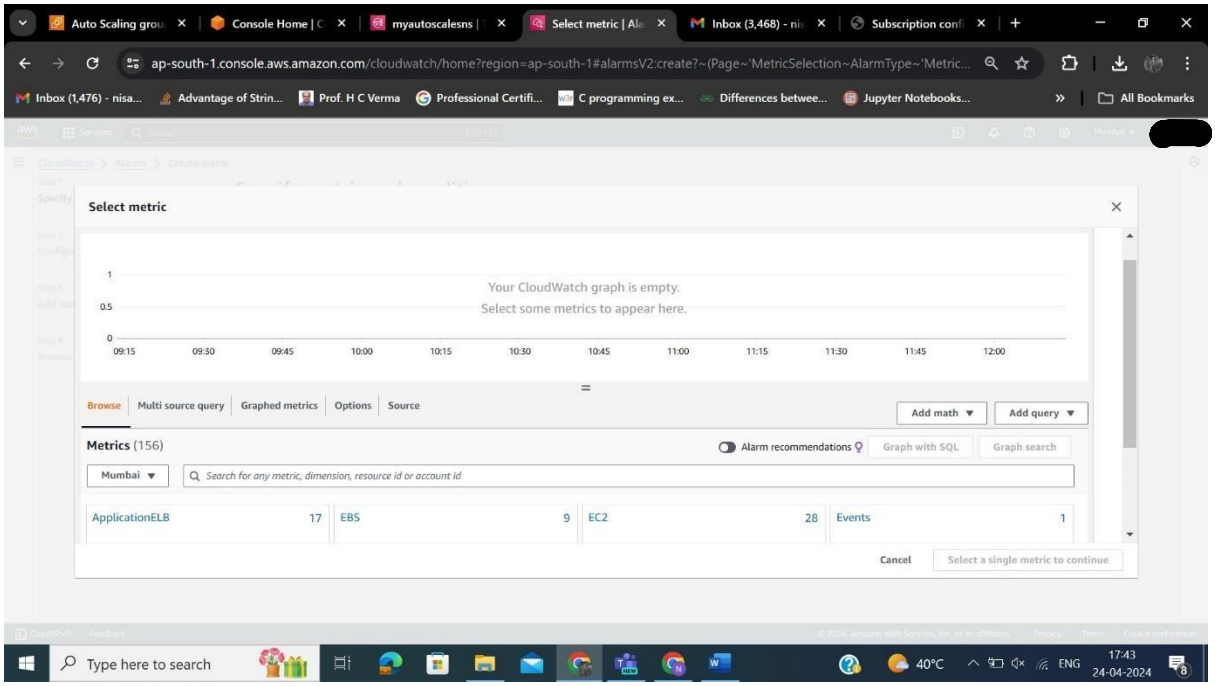
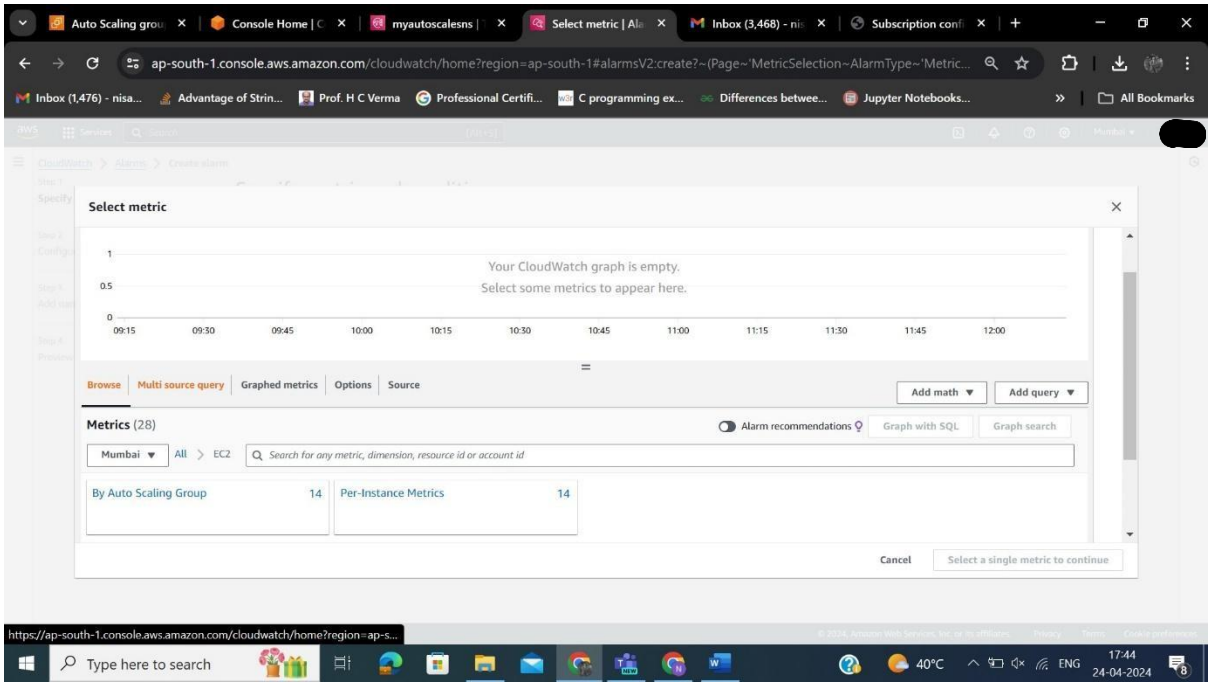
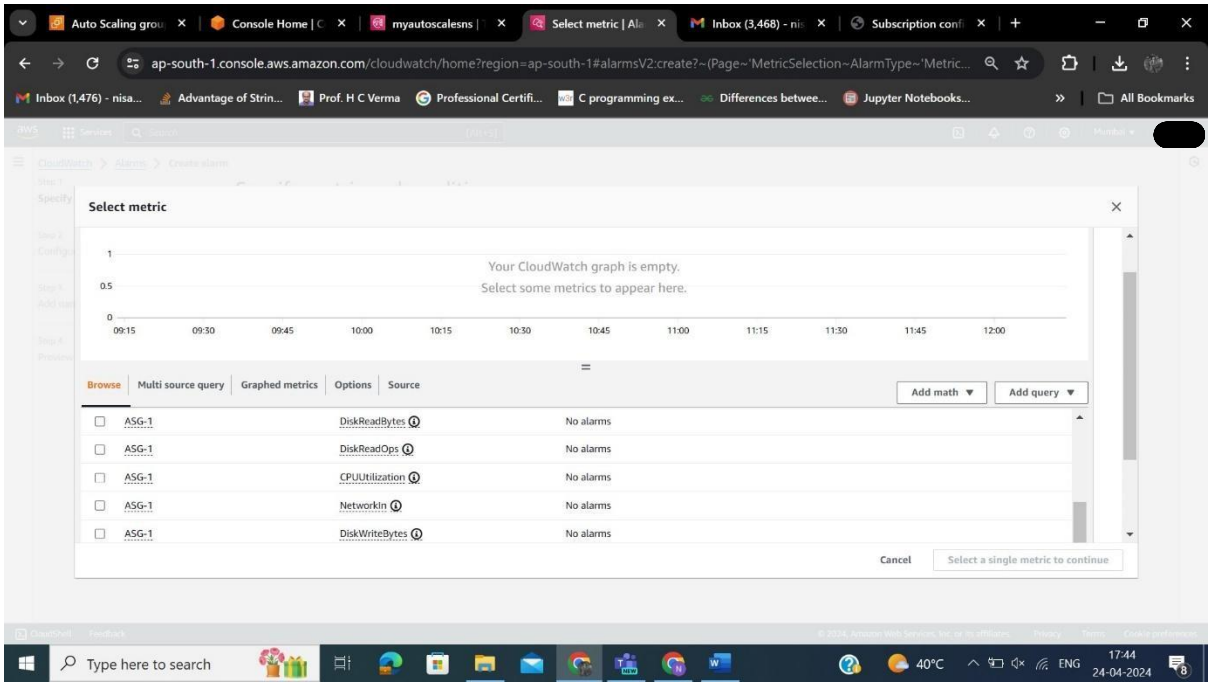
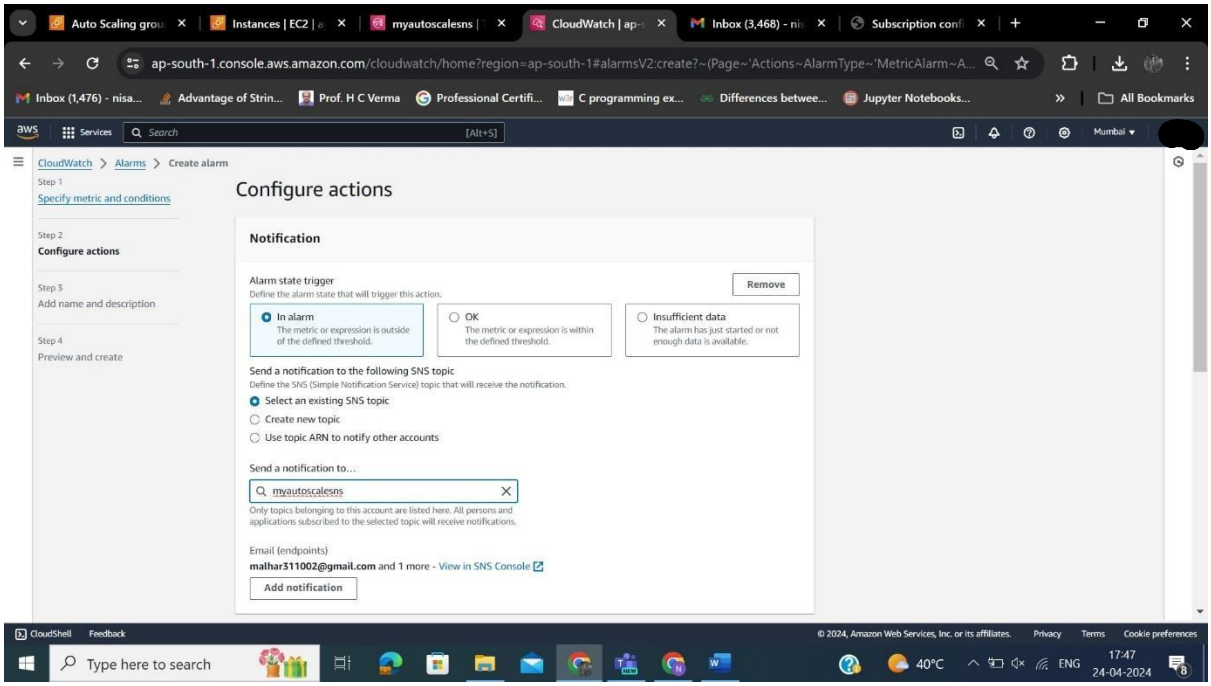
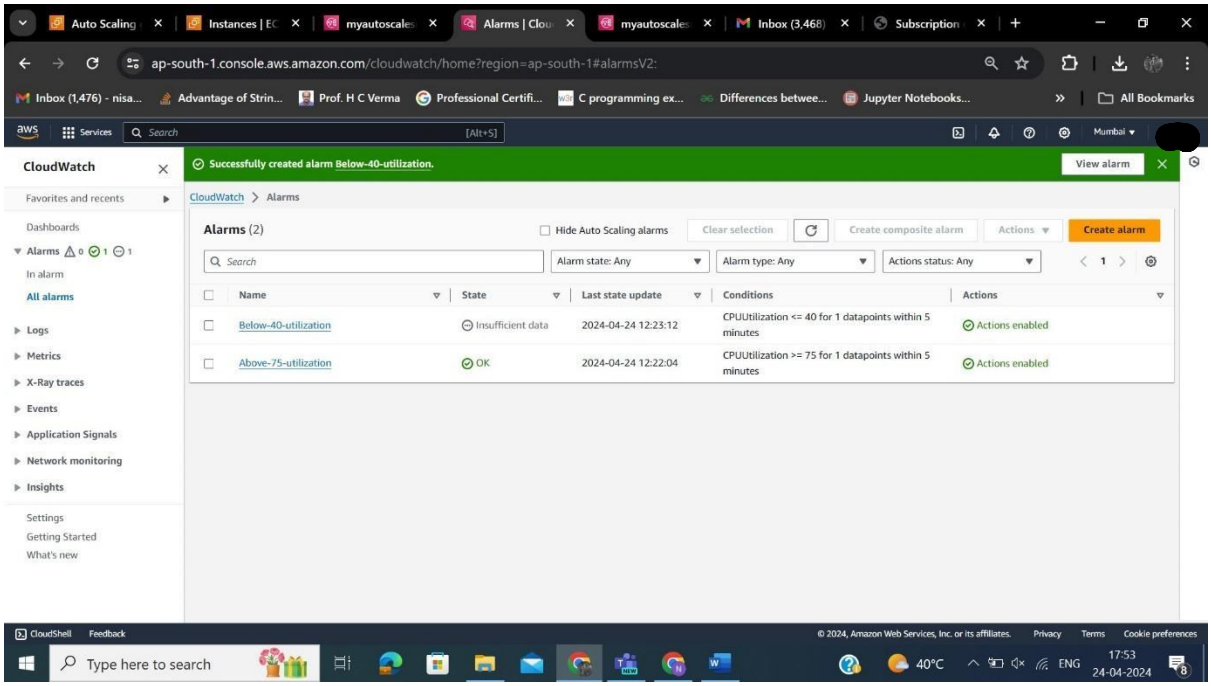
17:43
24-04-2024


Select metric
Your CloudWatch graph is empty.
Select some metrics to appear here.
Browse
Multi source query
Graphed metrics
Options
Source
Add math
Add query
Metrics (156)
Alarm recommendations
Graph with SQL
Graph search
Mumbai
Search for any metric, dimension, resource id or account id
ApplicationELB 17
EBS 9
EC2 28
Events 1
Cancel
Select a single metric to continue

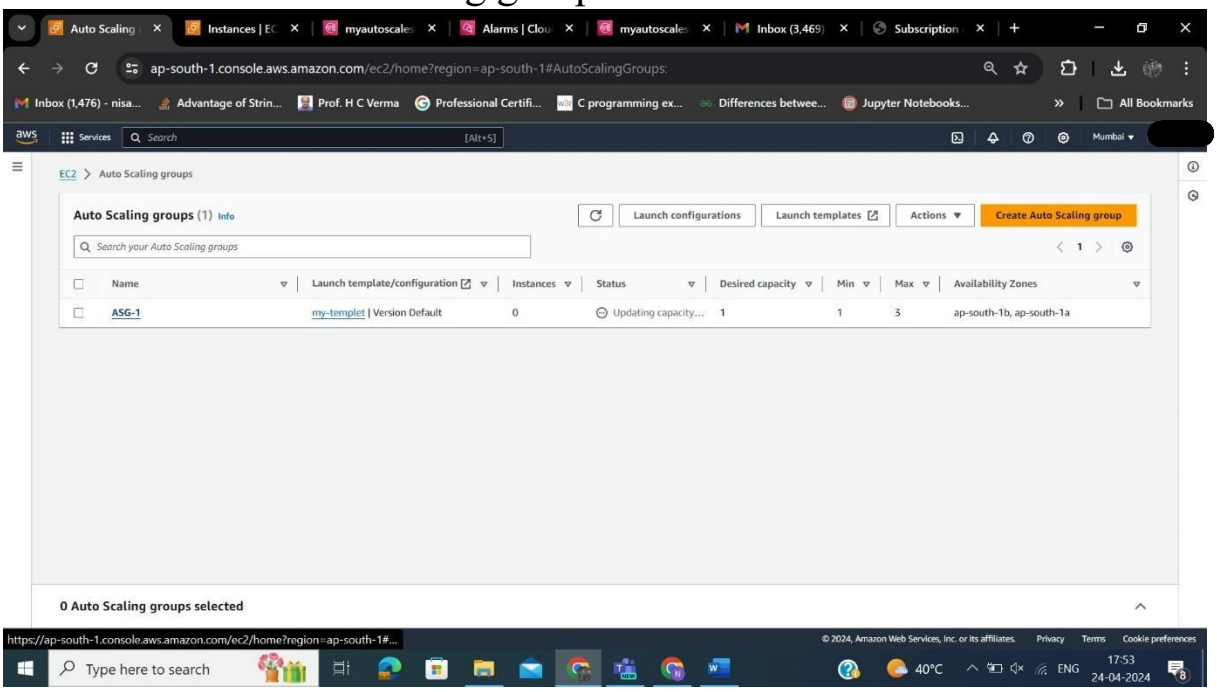

Select metric
Your CloudWatch graph is empty.
Select some metrics to appear here.
Browse
Multi source query
Graphed metrics
Options
Source
Add math
Add query
Metrics (28)
Alarm recommendations
Graph with SQL
Graph search
Mumbai
All
EC2
Search for any metric, dimension, resource id or account id
By Auto Scaling Group 14
Per-Instance Metrics 14
Cancel
Select a single metric to continue

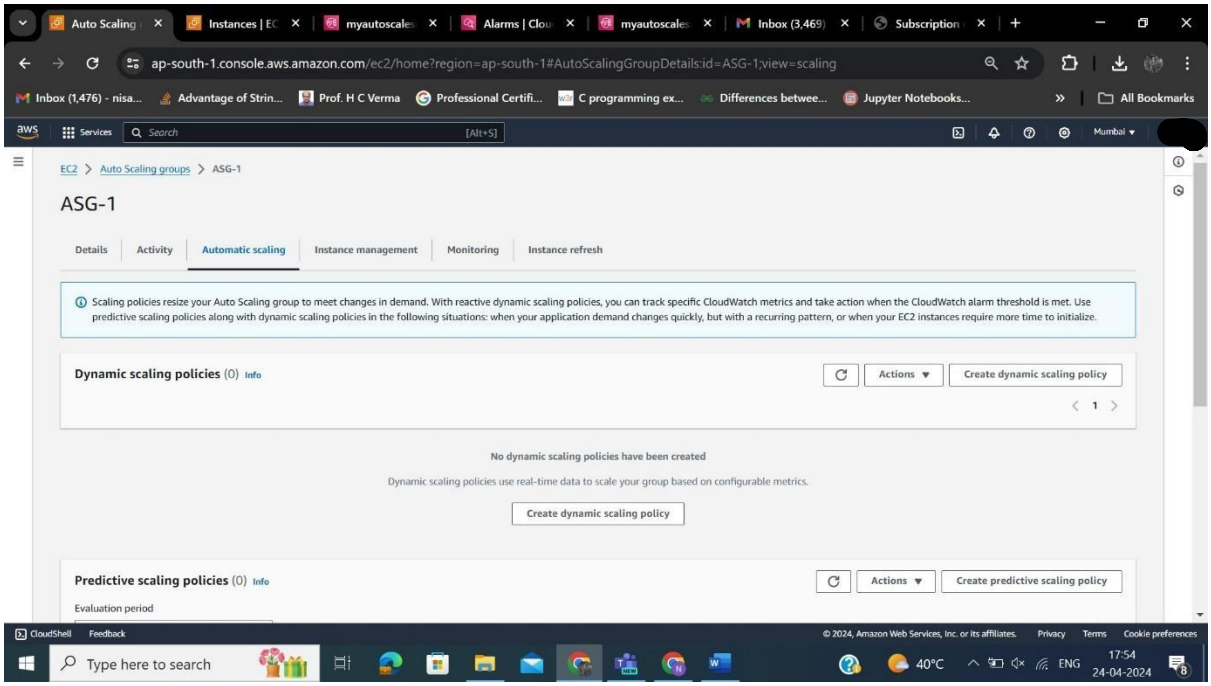

Select metric
Your CloudWatch graph is empty.
Select some metrics to appear here.
Browse
Multi source query
Graphed metrics
Options
Source
Add math
Add query
ASG-1 DiskReadBytes No alarms
ASG-1 DiskReadOps No alarms
ASG-1 CPUUtilization No alarms
ASG-1 NetworkIn No alarms
ASG-1 DiskWriteBytes No alarms
Cancel
Select a single metric to continue

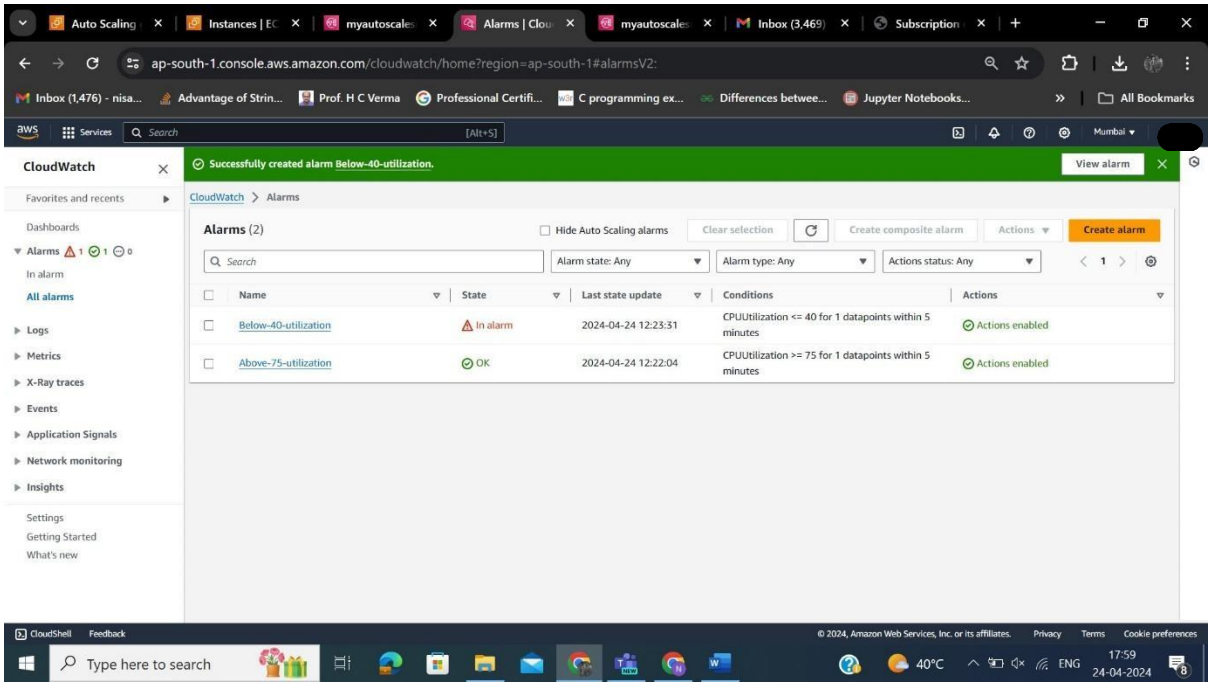

CloudWatch > Alarms > Create alarm
Step 1
Specify metric and conditions
Step 2
Configure actions
Step 3
Add name and description
Step 4
Preview and create
Configure actions
Notification
Alarm state trigger
Define the alarm state that will trigger this action.
Remove
In alarm
The metric or expression is outside of the defined threshold.
OK
The metric or expression is within the defined threshold.
Insufficient data
The alarm has just started or not enough data is available.
Send a notification to the following SNS topic
Define the SNS (Simple Notification Service) topic that will receive the notification.
Select an existing SNS topic
Create new topic
Use topic ARN to notify other accounts
Send a notification to...
myautoscalesns
Only topics belonging to this account are listed here. All persons and applications subscribed to the selected topic will receive notifications.
Email (endpoints)
malhar311002@gmail.com and 1 more - View in SNS Console
Add notification

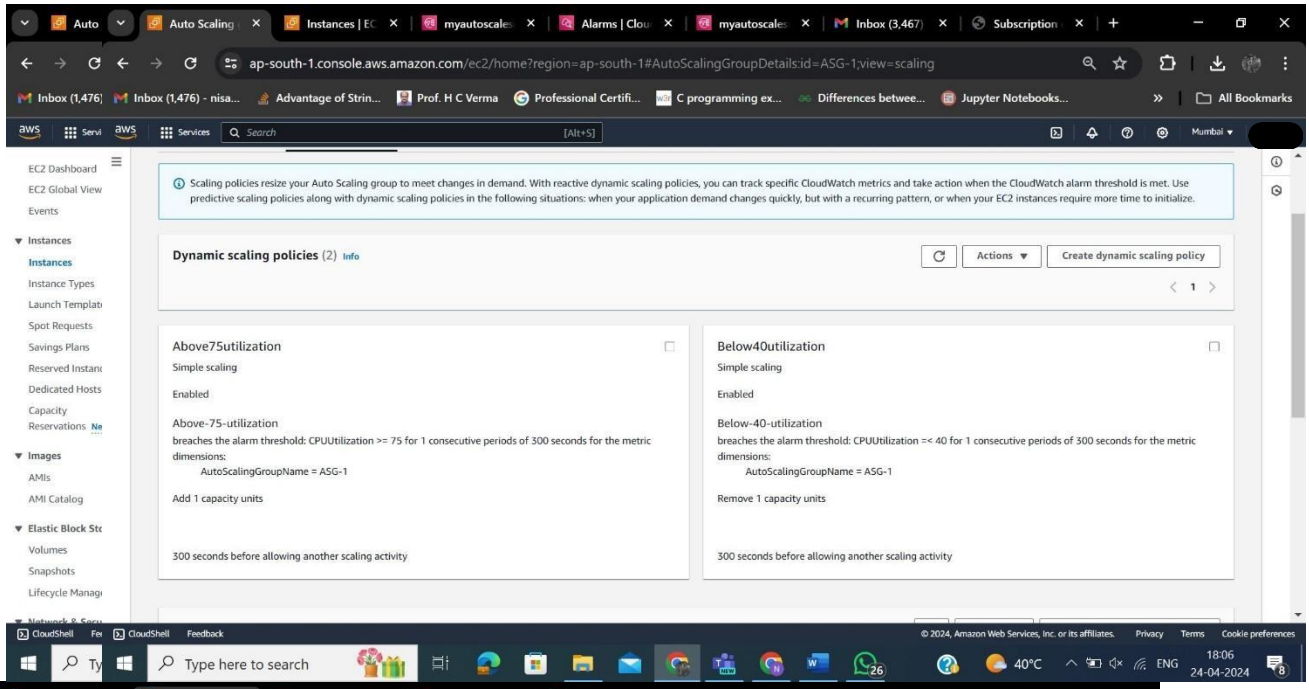


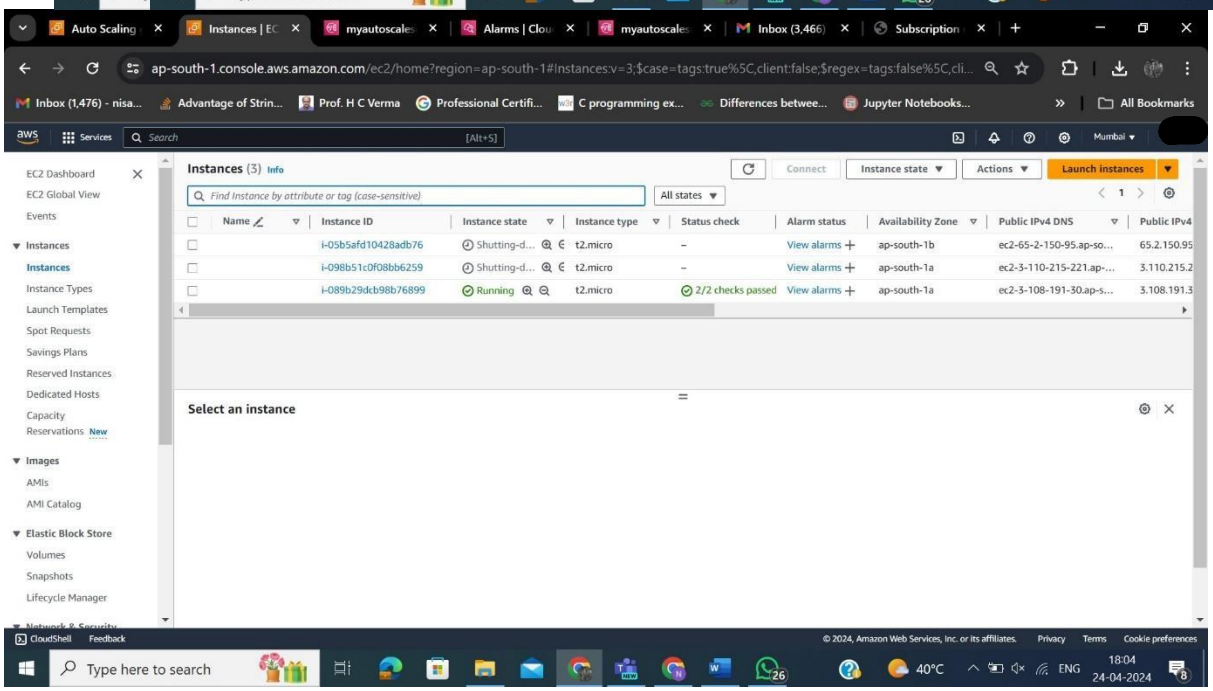
9. Check the auto scaling groups




ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#AutoScalingGroupDetails:id=ASG-1;view=scaling
EC2 > Auto Scaling groups > ASG-1
ASG-1
Details
Activity
Automatic scaling
Instance management
Monitoring
Instance refresh
Scaling policies resize your Auto Scaling group to meet changes in demand. With reactive dynamic scaling policies, you can track specific CloudWatch metrics and take action when the CloudWatch alarm threshold is met. Use predictive scaling policies along with dynamic scaling policies in the following situations: when your application demand changes quickly, but with a recurring pattern, or when your EC2 instances require more time to initialize.
Dynamic scaling policies (0) Info
Actions
Create dynamic scaling policy
No dynamic scaling policies have been created
Dynamic scaling policies use real-time data to scale your group based on configurable metrics.
Create dynamic scaling policy
Predictive scaling policies (0) Info
Actions
Create predictive scaling policy
Evaluation period
CloudShell
Feedback
© 2024, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
40°C
ENG
17:54
24-04-2024


ap-south-1.console.aws.amazon.com/cloudwatch/home?region=ap-south-1#alarmsV2:
CloudWatch
Successfully created alarm Below-40-utilization.
View alarm
CloudWatch > Alarms
Alarms (2)
Hide Auto Scaling alarms
Clear selection
Create composite alarm
Actions
Create alarm
Search
Alarm state: Any
Alarm type: Any
Actions status: Any
Name
State
Last state update
Conditions
Actions
Below-40-utilization
In alarm
2024-04-24 12:23:31
CPUUtilization <= 40 for 1 datapoints within 5 minutes
Actions enabled
Above-75-utilization
OK
2024-04-24 12:22:04
CPUUtilization >= 75 for 1 datapoints within 5 minutes
Actions enabled
Favorites and recents
Dashboards
Alarms
In alarm
All alarms
Logs
Metrics
X-Ray traces
Events
Application Signals
Network monitoring
Insights
Settings
Getting Started
What's new
CloudShell
Feedback
© 2024, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
40°C
ENG
17:59
24-04-2024





10. The metrics are as follows:
11. As you can see, the auto scaling group has been applied in accordance to the given metrics and limits.