

Deployed Highly Available and Scalable Application on EC2

In this project I have hosted one website using autoscaling group and loadbalancer. In this project i have used autoscaling group for scaleup and scaledown purpose.

I have attached load balancer to autoscaling group. for the load balancer i have created one security group and one target group. In target group i have configured healthcheck to check the healthy instances.

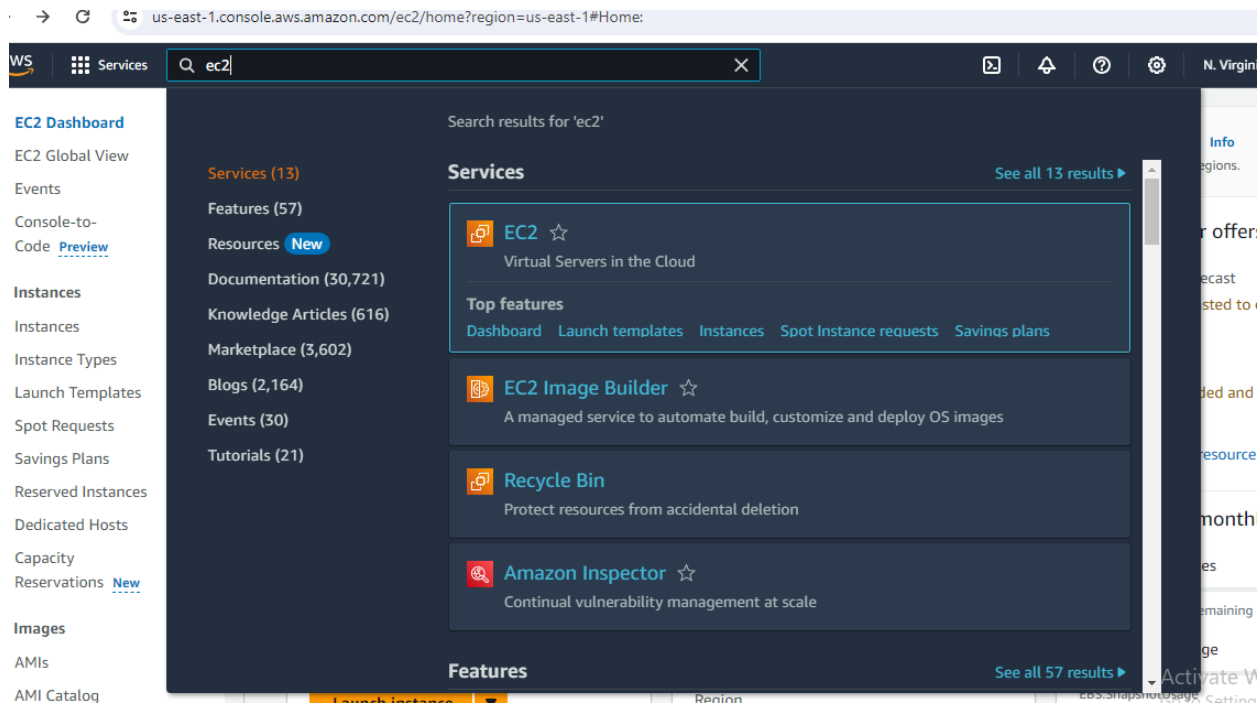
To achieve high availability I have hosted a website in multiple region used load balancer and autoscaling group with target group.

Step 1: Logging In to the Amazon Web Services Console

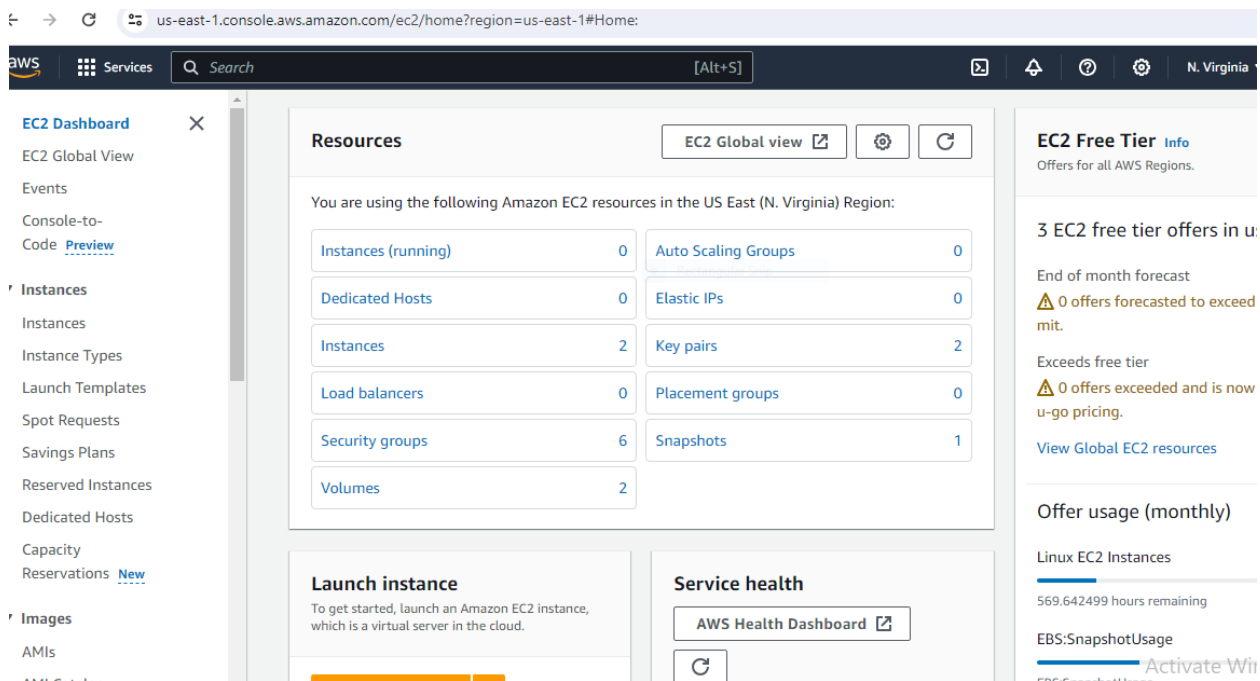
login to your AWS account using your credentials.

Step 2: Create a template

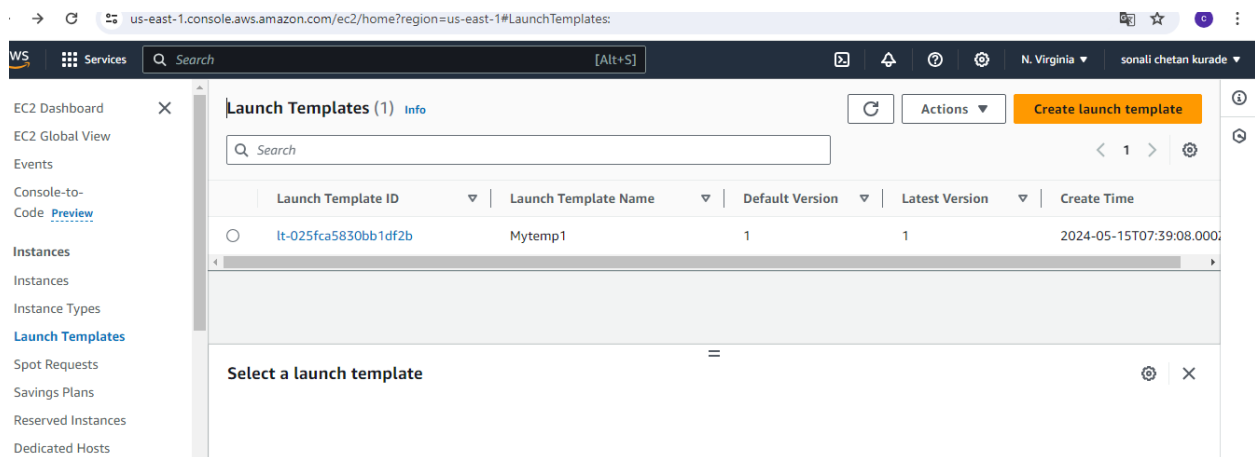
1. In the AWS Management Console search bar, enter EC2, and click the EC2 result under Services:



2. Click on launch template , in the left side below the instance

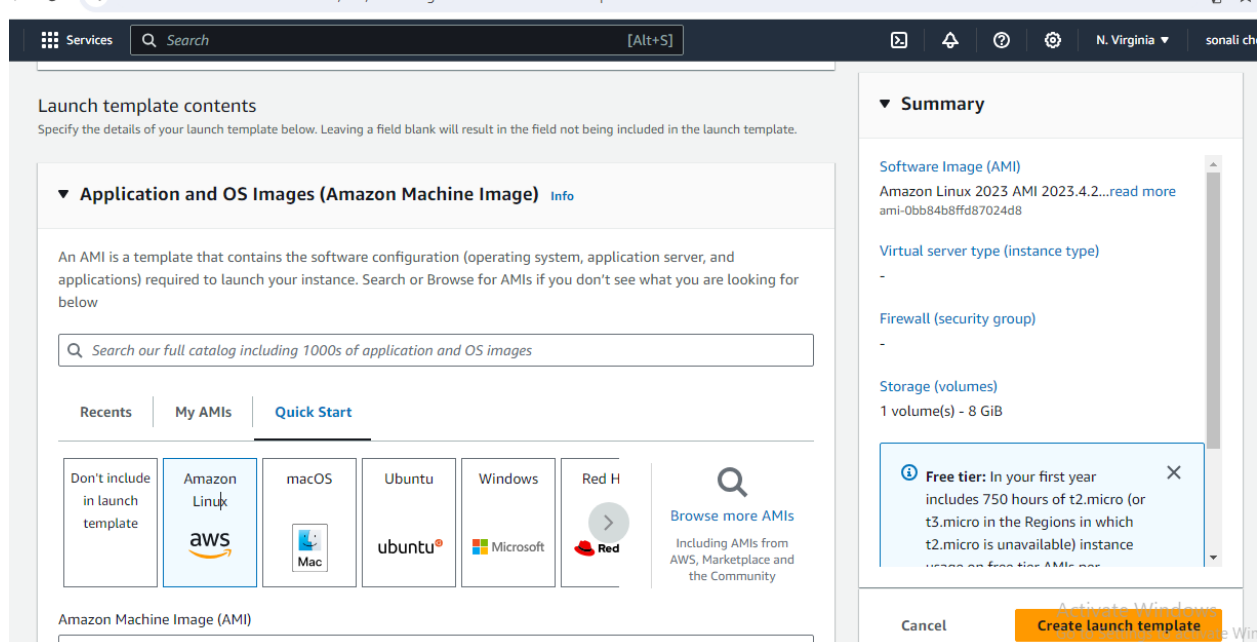
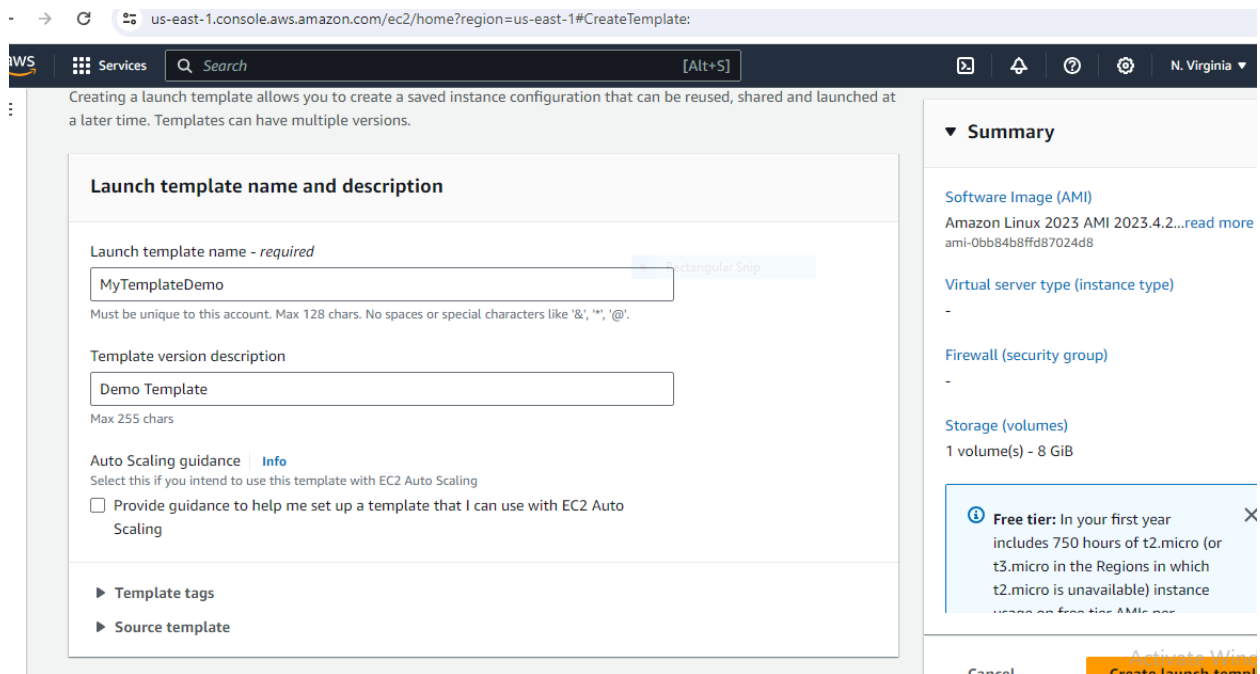


2. To start creating a new template , in the top-right, click Create launch template:



4.To create template need to the details

- * Template name
- * Template version description
- * Select the os image
- * Select instance Type
- * Select Key pair



5. Click on Create Security group and create new security group by entering the below details:

- Security group name
- Description

- **Inbound Security Group Rules**
 - Enter Source type and CIDR Range

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate:

Services Search [Alt+S] N. Virginia

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 group name - required

MyWebServerGroup

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and _-:/[]+=&:{}\$*

Description - required [Info](#)

Allows SSH access to developers

VPC [Info](#)

vpc-036ee9c914cd500da (default) [Refresh](#)

172.31.0.0/16

Inbound Security Group Rules

Security group rule 1 (TCP, 0) [Remove](#)

[Add security group rule](#)

Summary

Software Image (AMI)

Amazon Linux 2023 AMI 2023.4.2...[read more](#)
ami-0bb84b8ffd87024d8

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

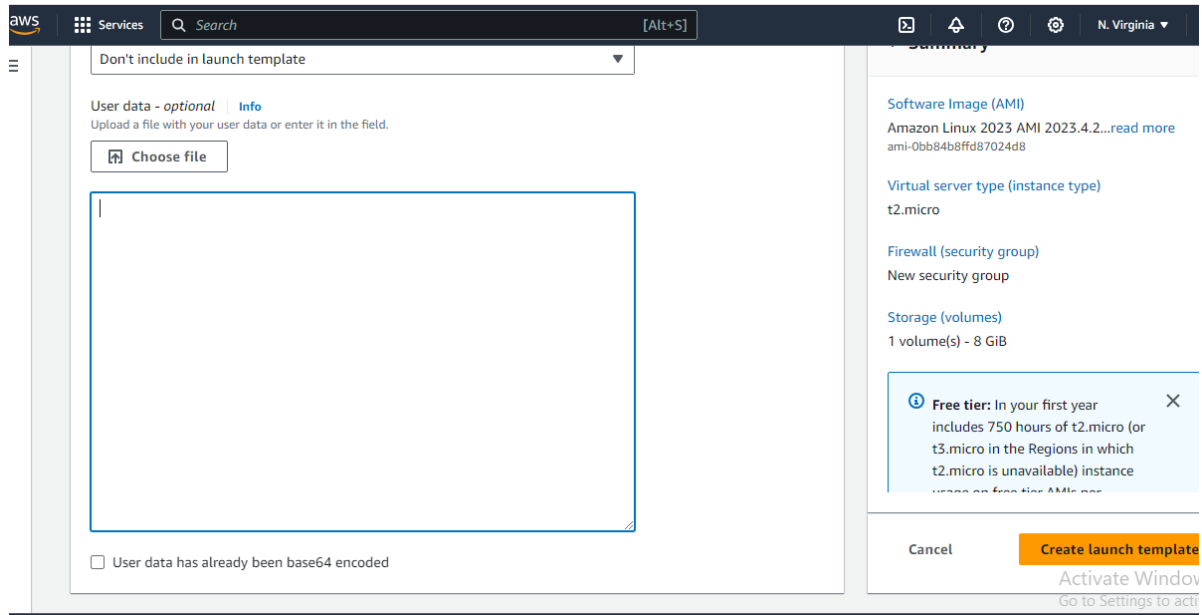
Storage (volumes)

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

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

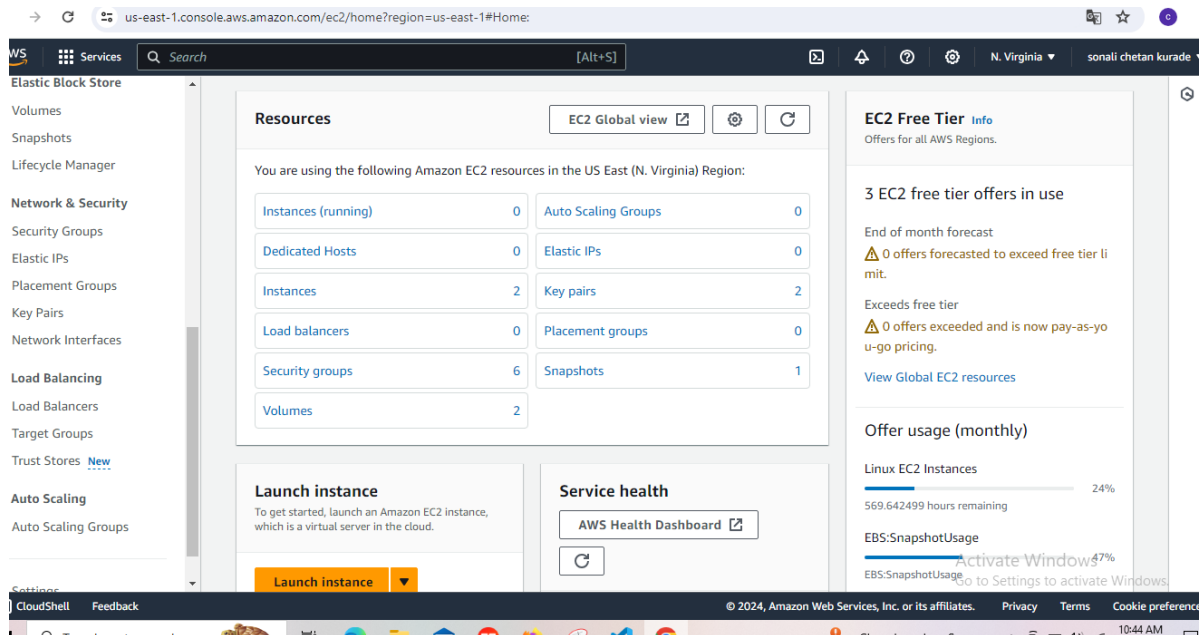
6. Go inside the advance details and write User Data Script



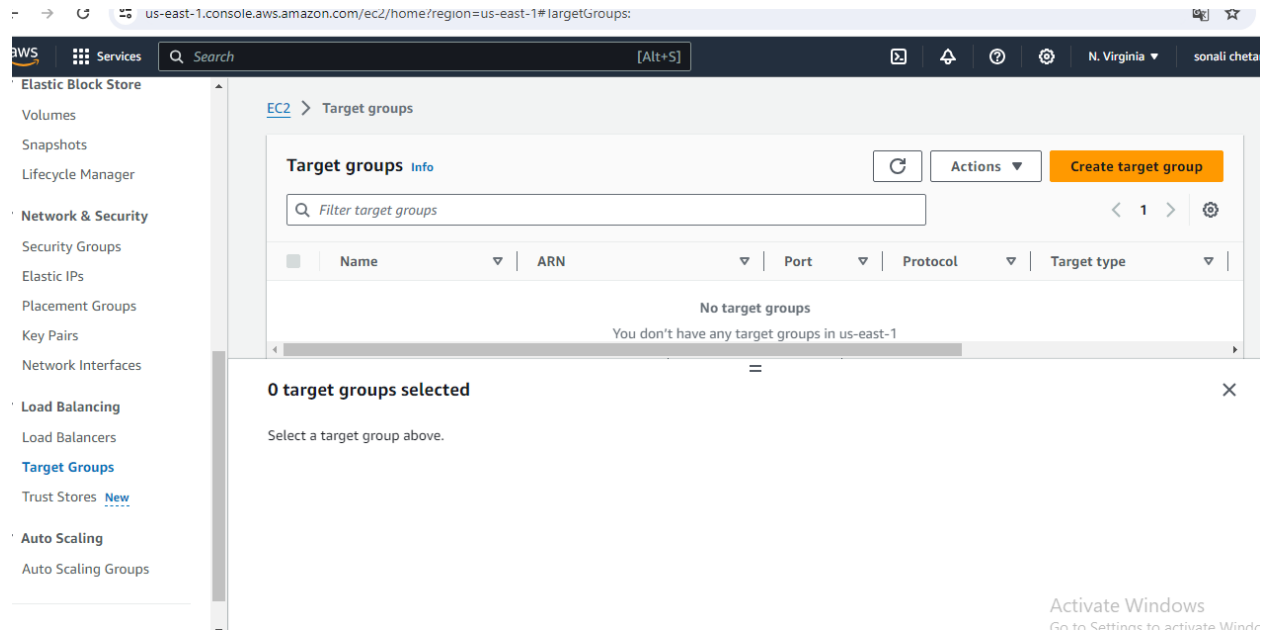
7. click on create launch template and create a template.

Step 3 : Create Target Group

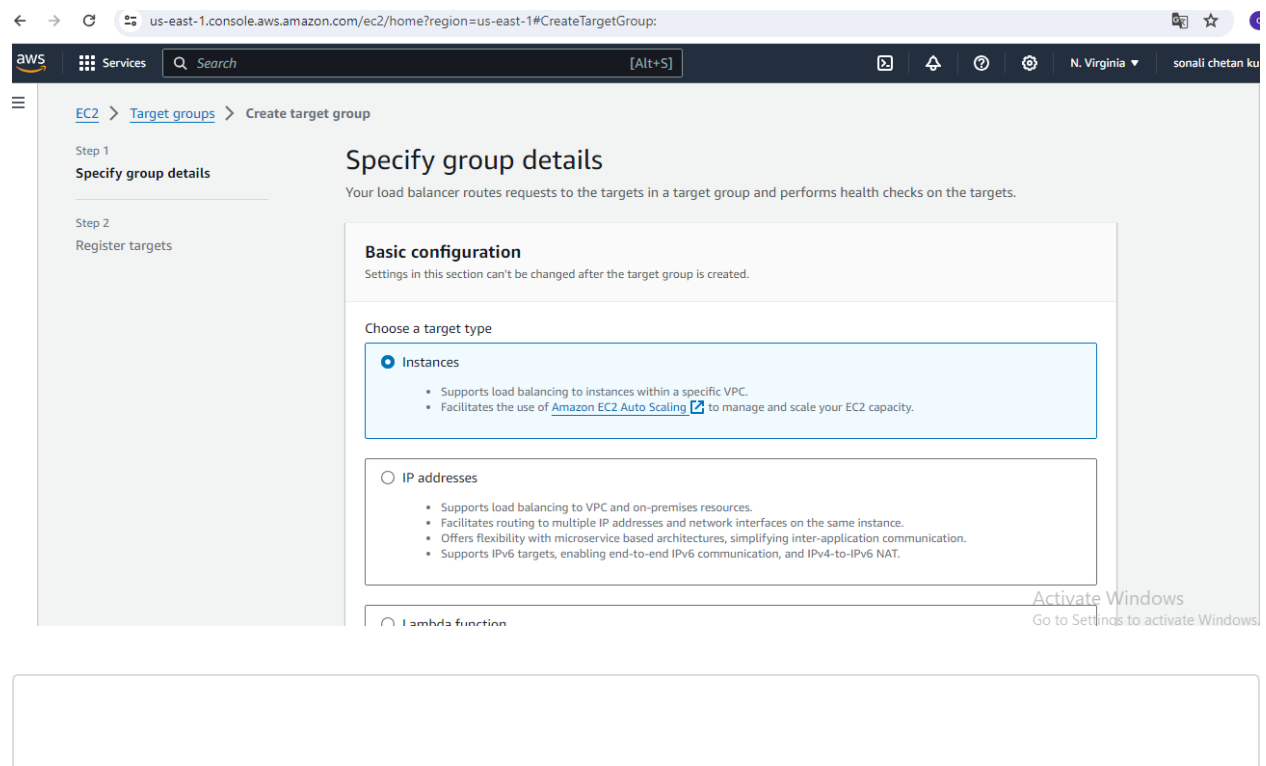
1. Go inside the Load Balancer which is present left down side. Click on Target Group.



2. Click on create target Group



3. Select Instance in Choose a target type



4. Give Name to the Target group name and IP address type

Application Load Balancer

- Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.
- Facilitates using static IP addresses and PrivateLink with an Application Load Balancer.

Target group name

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Protocol : Port

Choose a protocol for your target group that corresponds to the Load Balancer type that will route traffic to it. Some protocols now include anomaly detection for the targets and you can set mitigation options once your target group is created. This choice cannot be changed after creation

HTTP 80

1-65535

IP address type

Only targets with the indicated IP address type can be registered to this target group.

☒ IPv4

Each instance has a default network interface (eth0) that is assigned the primary private IPv4 address. The instance's primary private IPv4 address is the one that will be applied to the target.

☐ IPv6

Each instance you register must have an assigned primary IPv6 address. This is configured on the instance's default network interface (eth0). [Learn more](#)

VPC

5. Click on next to save all the changes

The approximate amount of time between health checks for this target

5 seconds

5-300

Success codes

The HTTP codes to use when checking for a successful response from a target. You can specify multiple values (for example, "200,202") or a range of values (for example, "200-299").

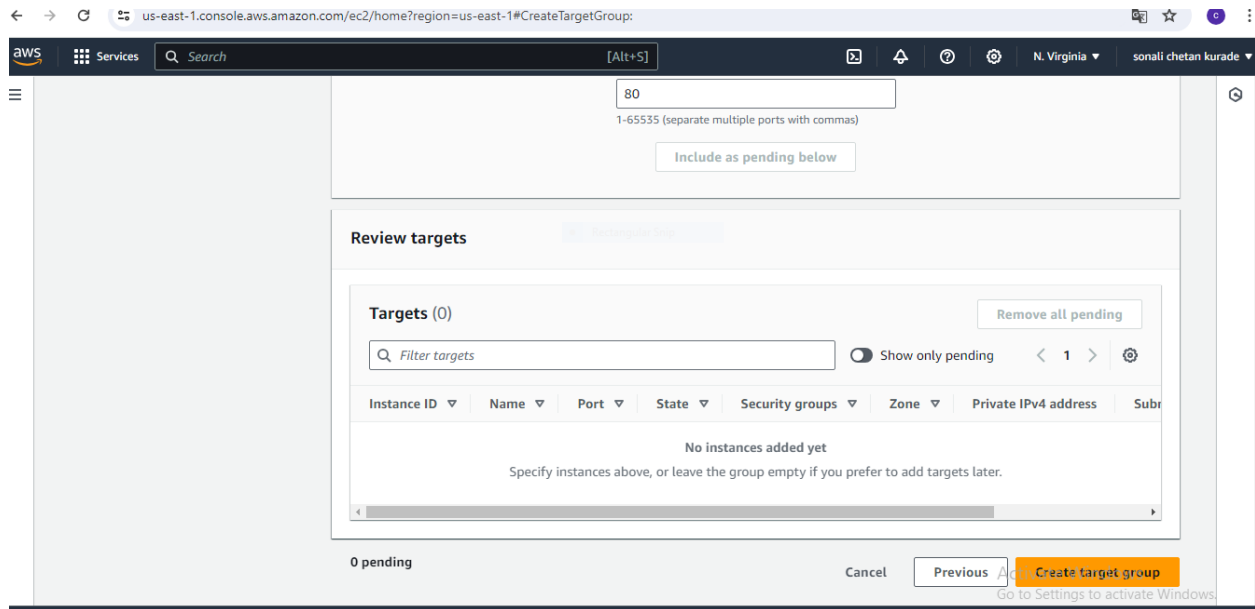
200

Attributes

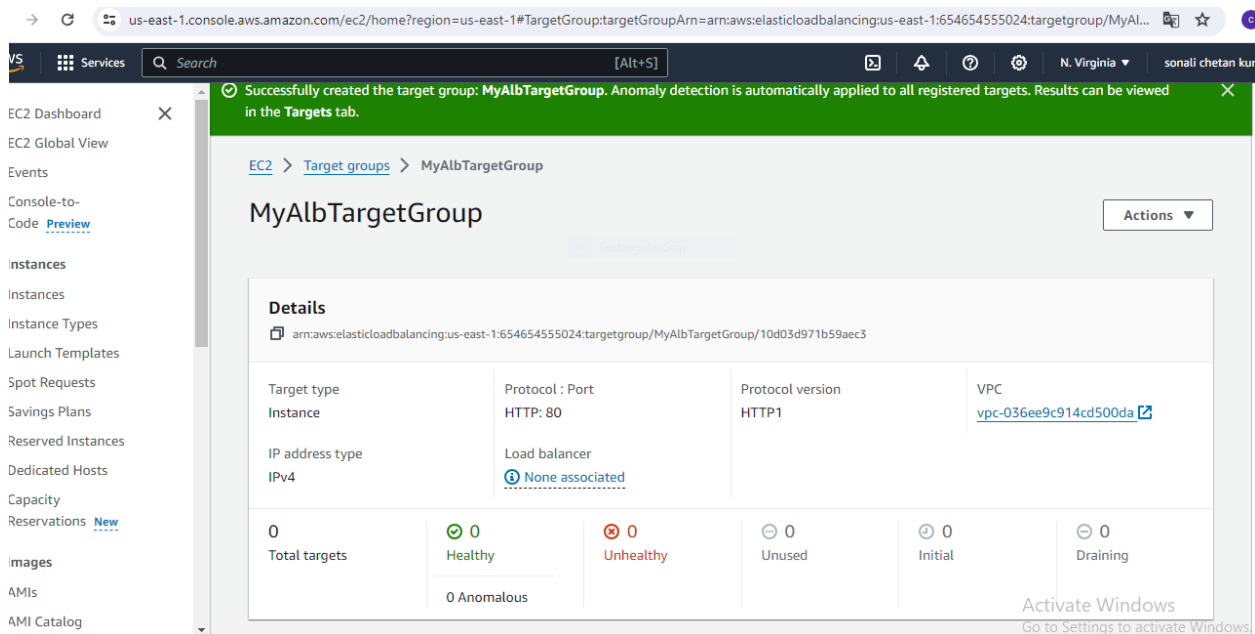
Tags - optional

Consider adding tags to your target group. Tags enable you to categorize your AWS resources so you can more easily manage them.

6. Click on Create Target Group

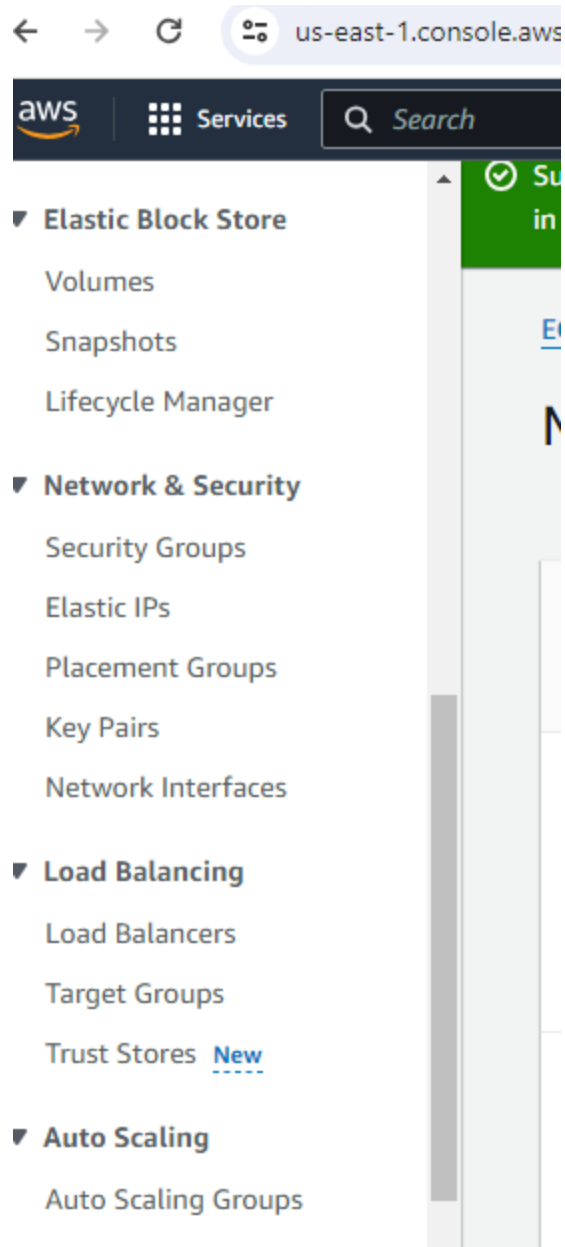


7. Your Target Group is ready

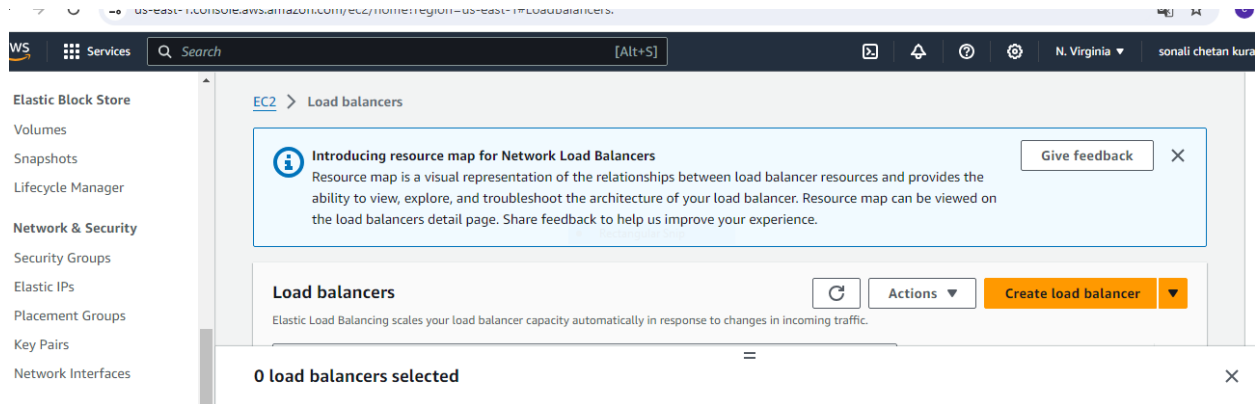


Step 4 : To Create Load Balancer

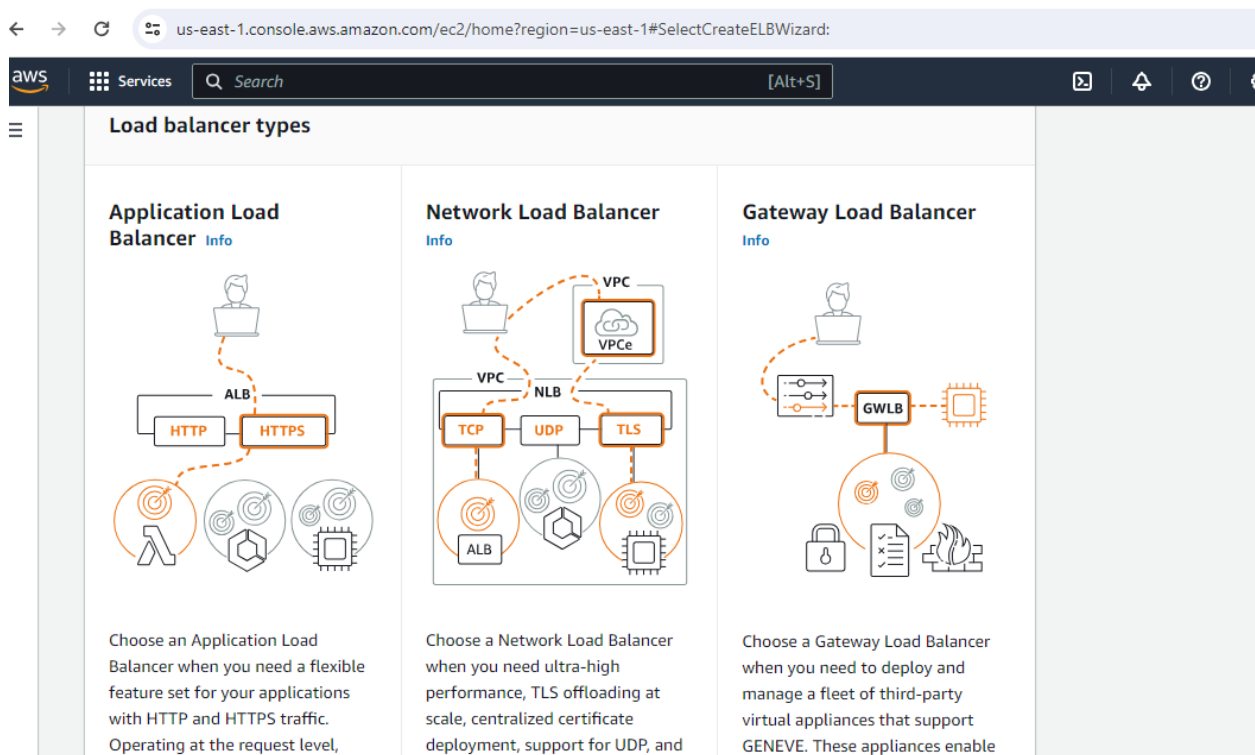
1. Go inside the Load Balancer which is present left down side. Click on Load Balancers.



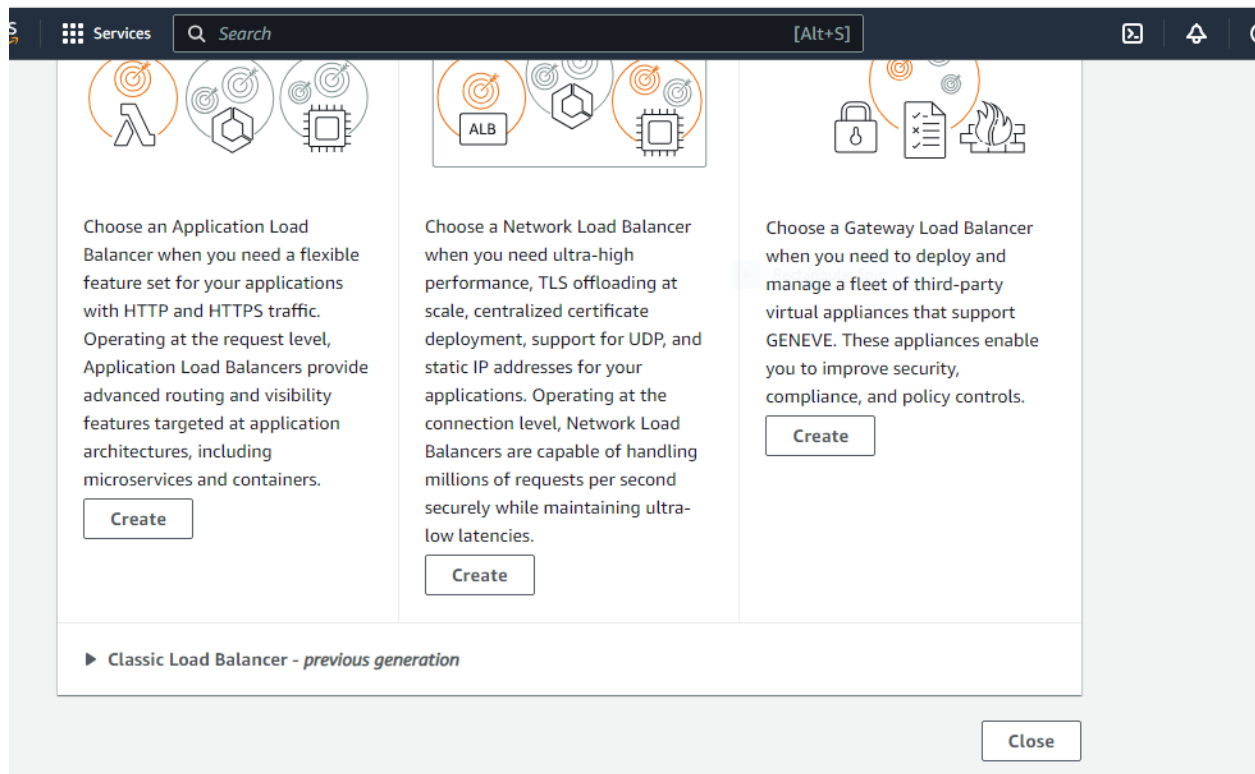
2. Click on create Load Balancer



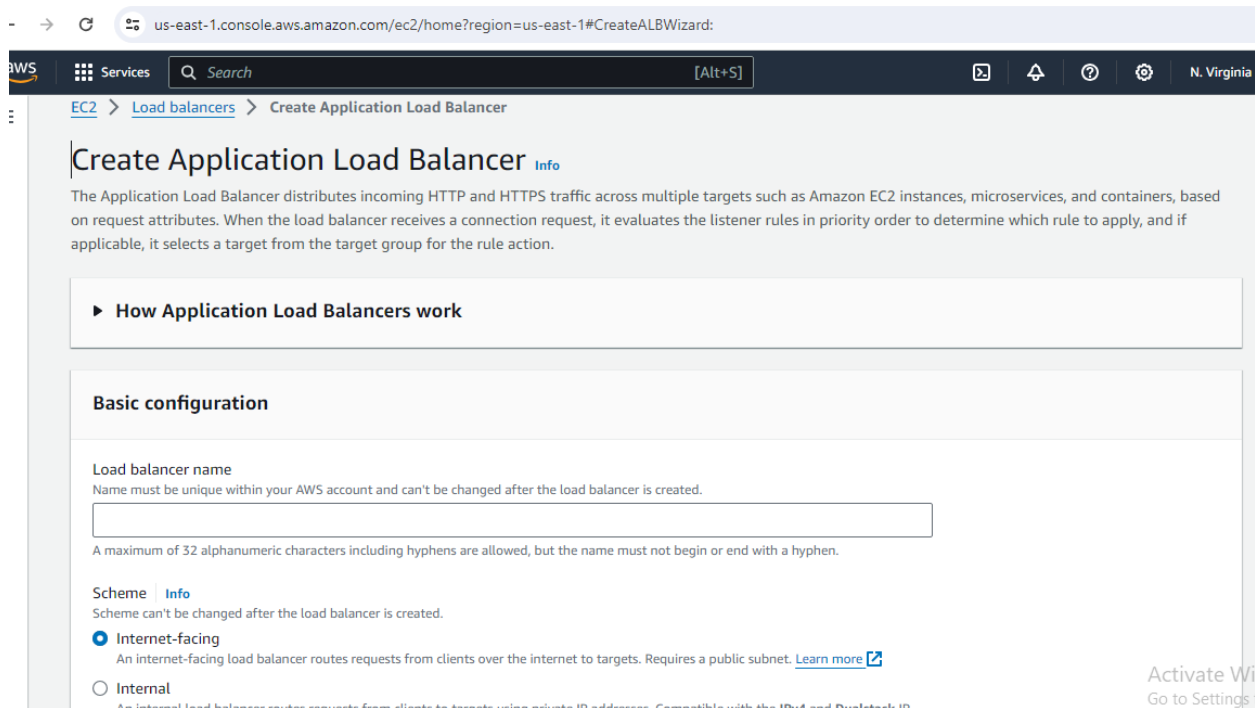
3. Select the type of Load Balancer Which you are Going to create depending on your requirement.



4. Click on Create option to create a Load Balancer



5. Give the name for that Load Balancer. Select "Scheme" as Internet-facing for public data



6. Select 3-4 Availability Zone For High Availability

us-east-1 console.aws.amazon.com/ec2/home?region=us-east-1#CreateALBWizard

Services Search [Alt+S]

IPv4 VPC CIDR: 172.31.0.0/16

Mappings Info

Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

☒ **us-east-1a (use1-az4)**

Subnet

subnet-00893f4f150751d5f Rectangular Shp ▼

IPv4 address

Assigned by AWS

☒ **us-east-1b (use1-az6)**

Subnet

subnet-0f7014b8390e6f112 ▼

IPv4 address

Assigned by AWS

☒ **us-east-1c (use1-az1)**

Subnet

subnet-0bf4b67c4bb9dc997 ▼

IPv4 address

Assigned by AWS

Ac Go

7. Select Security Group Which we have already Created

Services

Search

[Alt+S]

IPv4 address

Assigned by AWS

☐ us-east-1e (use1-az3)

☐ us-east-1f (use1-az5)

Security groups

Info

A security group is a set of firewall rules that control the traffic to your load balancer. Select an existing security group, c

Security groups

Select up to 5 security groups

mySecurityGroup

sg-001e589126d68467f VPC: vpc-036ee9c914cd500da

×

Listeners and routing

Info

8. Select the target group which we have created. If your Target Group is not ready then you can create here also

Listeners and routing [Info](#)

A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

▼ Listener HTTP:80 Remove

Protocol

HTTP ▼

Port

80

1-65535

Default action

Forward to

MyAlbTargetGroup

Target type: Instance, IPv4

HTTP ▼

↻

[Create target group](#)

Listener tags - optional

Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

Add listener tag

You can add up to 50 more tags.

Add listener

► **Load balancer tags - optional**

9. Go Down and click on create Load Balancer

Services [Alt+S] ⌵ 🔔 ? ⚙️ N. Virginia ▼

[subnet-0bf4b67c4bb9dc997](#)
 • us-east-1d
[subnet-0113e765fb2a45113](#)

Service integrations [Edit](#)

AWS WAF: None

AWS Global Accelerator: None

Tags [Edit](#)

None

[Longpolling Snp](#)

Attributes

? Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.

Creation workflow and status

► **Server-side tasks and status**

After completing and submitting the above steps, all server-side tasks and their statuses become available for monitoring.

Cancel
Create load balancer

10. Load Balancer is created successfully

×

✓

Successfully created load balancer: **MyAlb**

It might take a few minutes for your load balancer to fully set up and route traffic. Targets will also take a few minutes to complete the registration process and pass initial health checks.

×

EC2

>

Load balancers

>

MyAlb

MyAlb

Refresh

Actions

▼ Details

Load balancer type	Status	VPC	IP address type
Application	⌚ Provisioning	vpc-036ee9c914cd500da	IPv4
Scheme	Hosted zone	Availability Zones	Date created
Internet-facing	Z35SXDOTRQ7X7K	subnet-00893f4f150751d5f us-east-1a (use1-az4) subnet-0f7014b8390e6f112 us-east-1b (use1-az6) subnet-0113e765fb2a45113 us-east-1c (use1-az7)	May 23, 2024, 11:29 (UTC+05:30)

Activate Windows

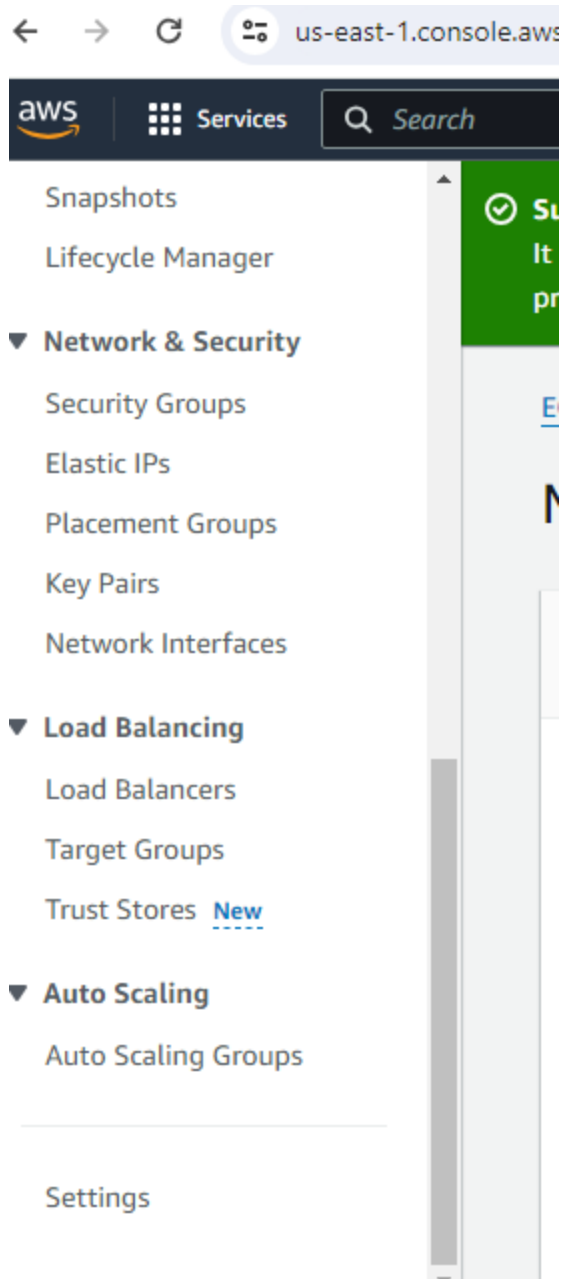
Go to Settings to activate Windows

Step 5: Create Autoscaling Group

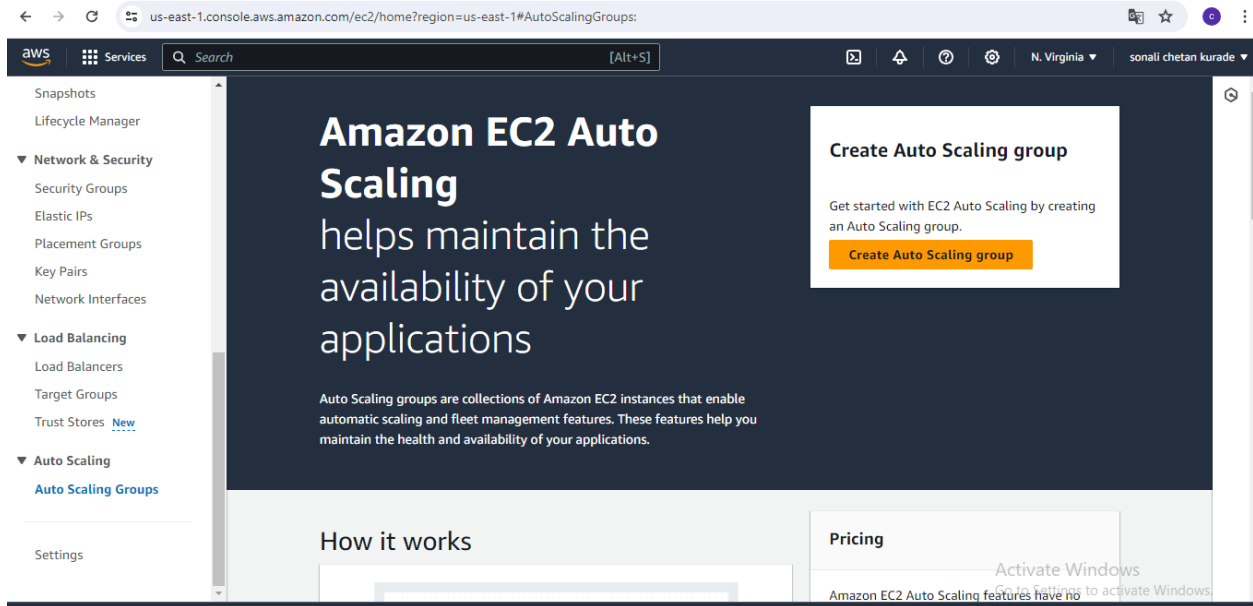
1.Go inside the Auto Scaling which is present left down side. Click on Auto Scaling Group.

Deployed Highly Available and Scalable Application on EC2

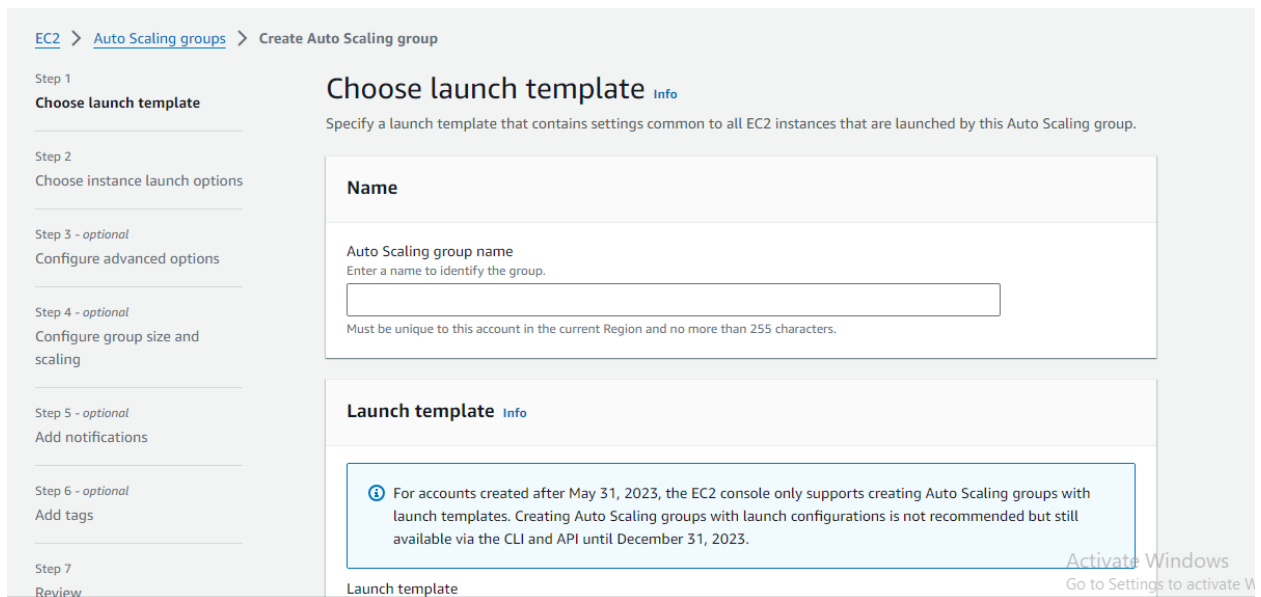
16



2. Click on Create Auto Scaling Group which is present top right side of the window



3. Give the name for auto scaling group



4. Select the launch template which we have already created. If you not created before then you can create here also.

Optional configurations

Optional configurations

Launch template [Info](#)

ⓘ For accounts created after May 31, 2023, the EC2 console only supports creating Auto Scaling groups with launch templates. Creating Auto Scaling groups with launch configurations is not recommended but still available via the CLI and API until December 31, 2023.

Launch template

Choose a launch template that contains the instance-level settings, such as the Amazon Machine Image (AMI), instance type, key pair, and security groups.

Mytemp1

↕

[Create a launch template](#) [↗](#)

Version

Default (1)

↕

[Create a launch template version](#) [↗](#)

<p>Description</p> <p>Template for web hosting</p>	<p>Launch template</p> <p>Mytemp1 ↗</p> <p>lt-025fca5830bb1df2b</p>	<p>Instance type</p> <p>t2.micro</p>
<p>AMI ID</p> <p>ami-0bb84b8ffd87024d8</p>	<p>Security groups</p> <p>-</p>	<p>Request Spot Instances</p> <p>No</p>

5. Click on next

Default (1) ▼

↺

Create a launch template version [↗](#)

Description	Launch template	Instance type
Template for web hosting	Mytemp1 ↗	t2.micro
	lt-025fca5830bb1df2b	
AMI ID	Security groups	Request Spot Instances
ami-0bb84b8ffd87024d8	-	No
Key pair name	Security group IDs	
linux_key	sg-031911be38c649a6a ↗	

Additional details

Storage (volumes)	Date created
/dev/xvda	Wed May 15 2024 13:09:08 GMT+0530 (India Standard Time)

6. If you want overwrite something change something that you can do here

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](#)

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](#)

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	Version	Description
Mytemp1 ✕ lt-025fca5830bb1df2b	Default	Template for web hosting

Instance type
t2.micro

[Override launch template](#)

Network [Info](#)

7. Select the availability Zone and click on next

Search

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-036ee9c914cd500da
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

us-east-1a | subnet-00893f4f150751d5f [✕](#)
172.31.16.0/20 Default

us-east-1b | subnet-0f7014b8390e6f112 [✕](#)
172.31.32.0/20 Default

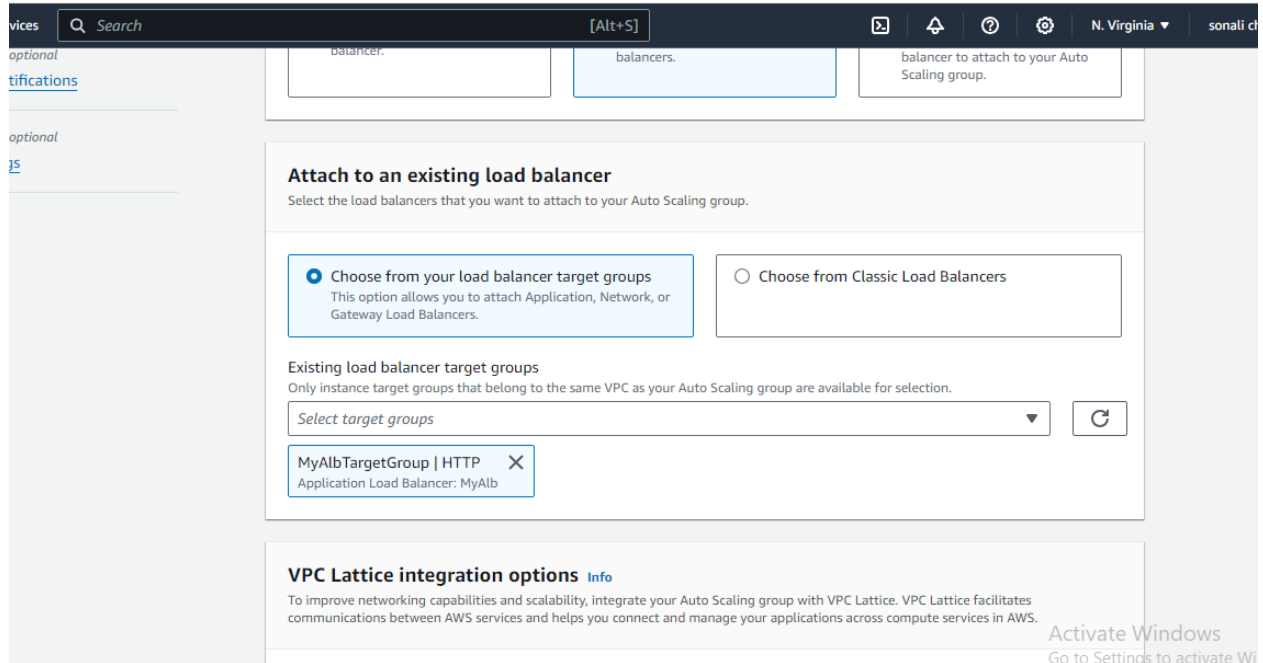
[Create a subnet](#) [✕](#)

Cancel Skip to review Previous **Next**

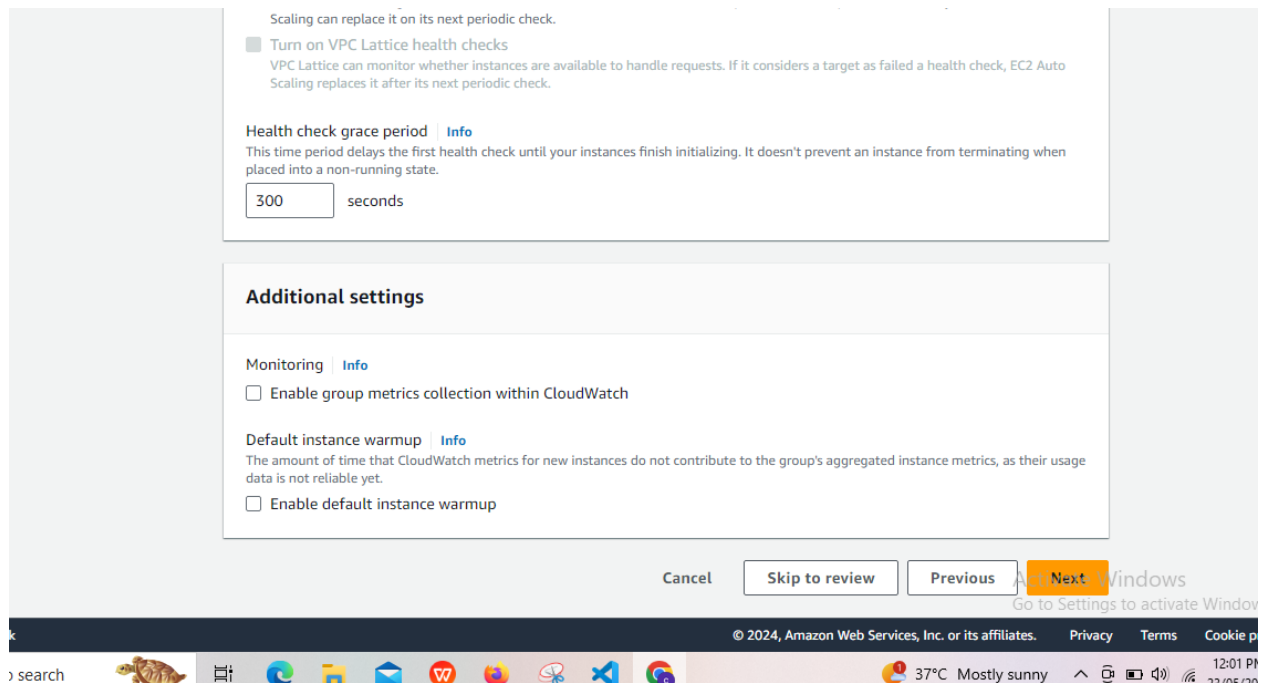
Go to Settings to activate Windows

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8. Select an option that is Attach to an existing load balancer. Because we have created a load balancer.



9. Go down and Click on next



10. Enter the Desire capacity, Minimum capacity and Maximum Capacity.

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

Services Search [Alt+S] N. Virginia sonali chetani

Step 4 - optional
Configure group size and scaling

Step 5 - optional
[Add notifications](#)

Step 6 - optional
[Add tags](#)

Step 7
[Review](#)

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.

2

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**

1 4

Equal or less than desired capacity 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.

Activate Windows
Go to Settings to activate Windows

11. Go Down and Click on next

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.

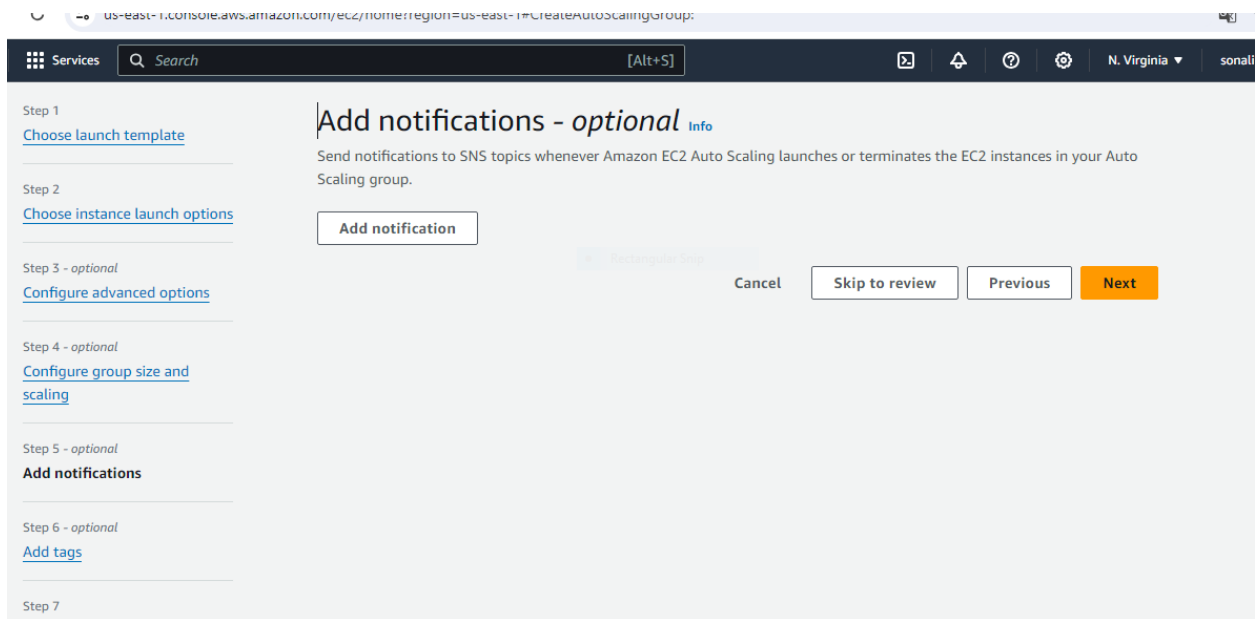
Instance scale-in protection
Scale-in protection prevents newly launched instances from being terminated by scaling activities. Make sure to remove scale-in protection for the group or individual instances when instances are ready to be terminated.

☐ **Enable instance scale-in protection**

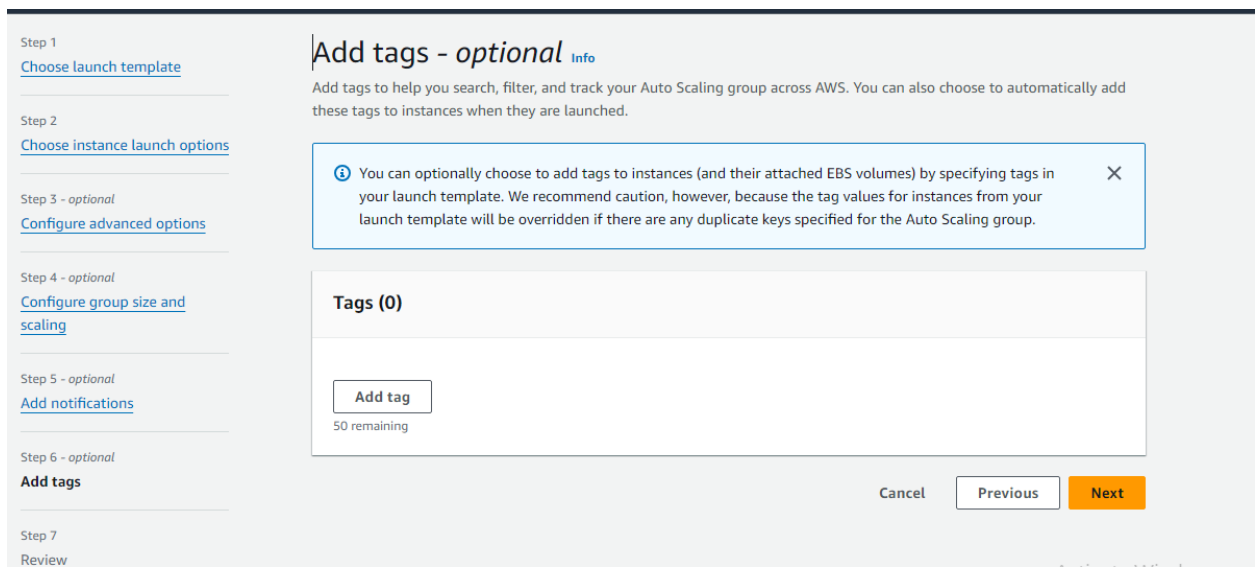
Cancel Skip to review Previous **Next**

Activate Windows
Go to Settings to activate Windows

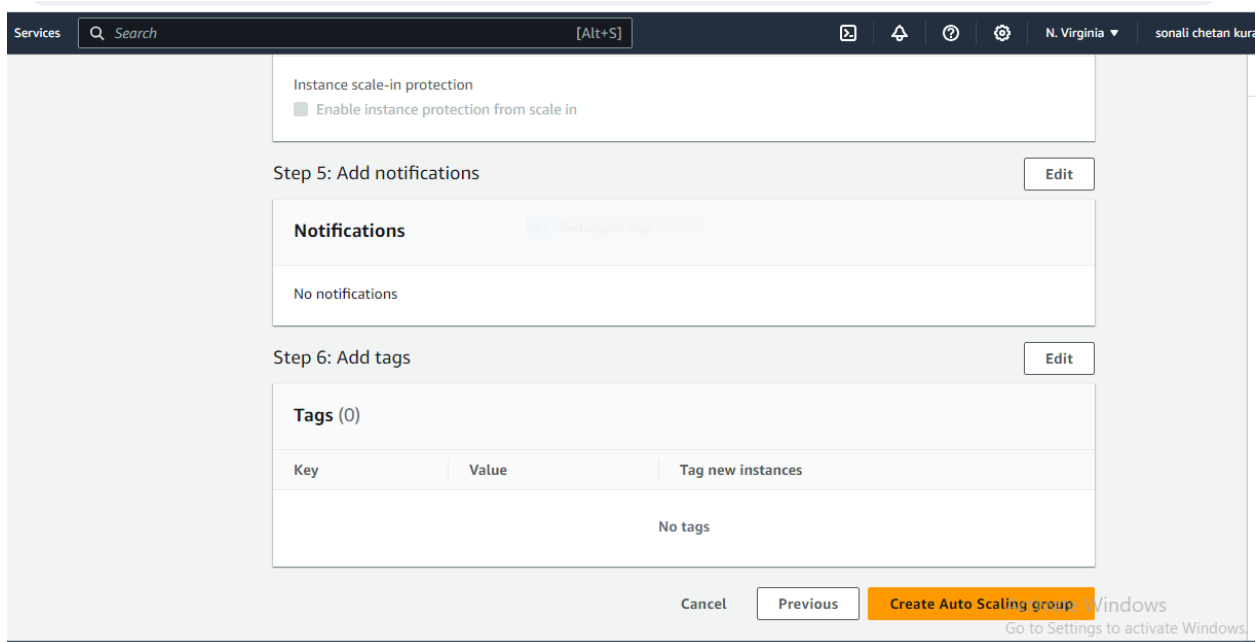
11. Click on next



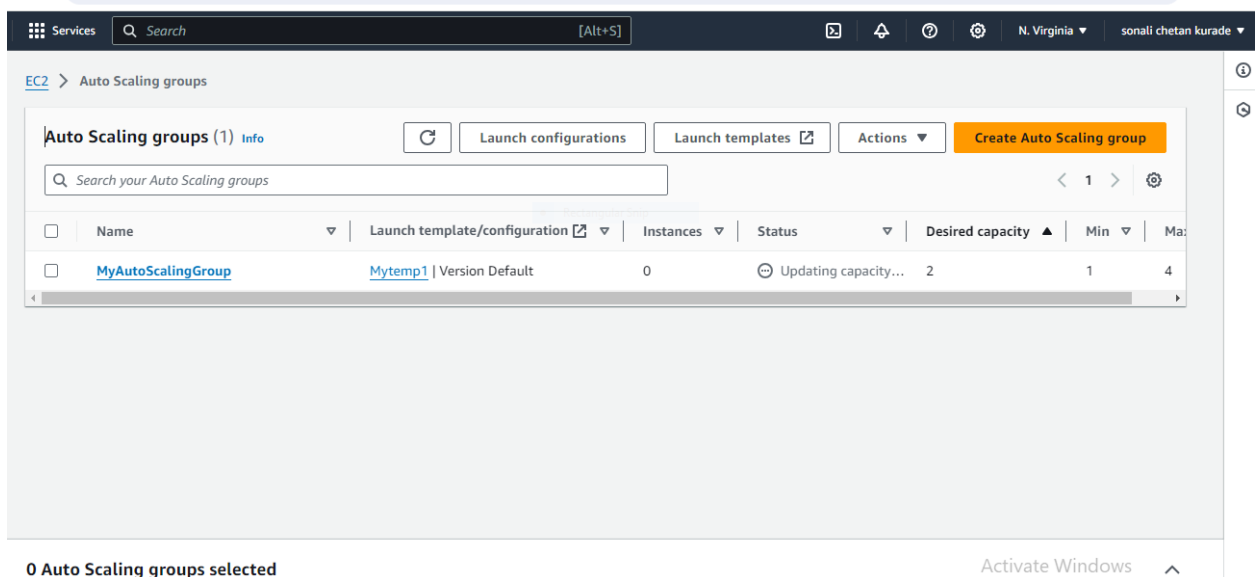
12. Add tag option and click on next



13. Go down and click on create autoscaling Group



14. Auto Scaling Group is ready



15. Go to the load balancer and copy the DNS and paste it on browser.

