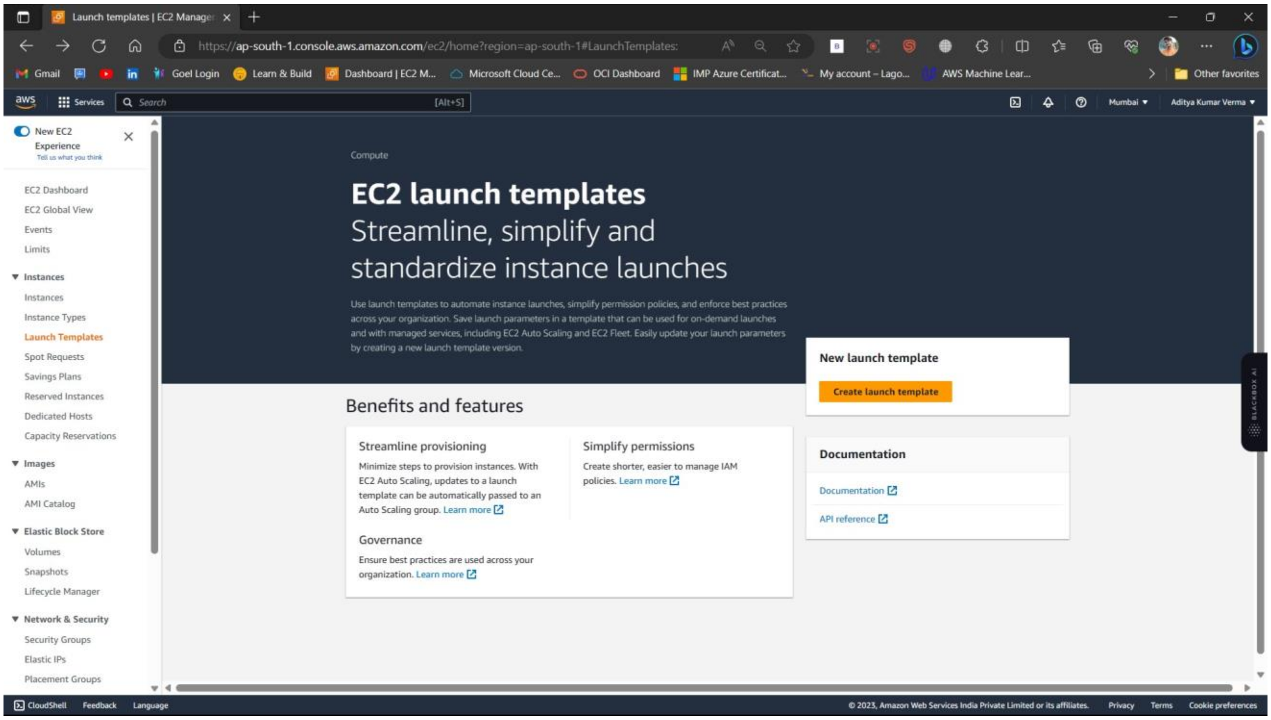
TASK 3(b)

Auto-Scaling as accordance with CPU-utilization:

Min: 2 Desired: 2 Maximum: 5

Step 1: Open you AWS Management Console.

Step 2: Go to Launch Template and Launch one.



Compute

EC2 launch templates

Streamline, simplify and standardize instance launches

Use launch templates to automate instance launches, simplify permission policies, and enforce best practices across your organization. Save launch parameters in a template that can be used for on-demand launches and with managed services, including EC2 Auto Scaling and EC2 Fleet. Easily update your launch parameters by creating a new launch template version.

New launch template

Create launch template

Benefits and features

Streamline provisioning

Minimize steps to provision instances. With EC2 Auto Scaling, updates to a launch template can be automatically passed to an Auto Scaling group. Learn more

Simplify permissions

Create shorter, easier to manage IAM policies. Learn more

Governance

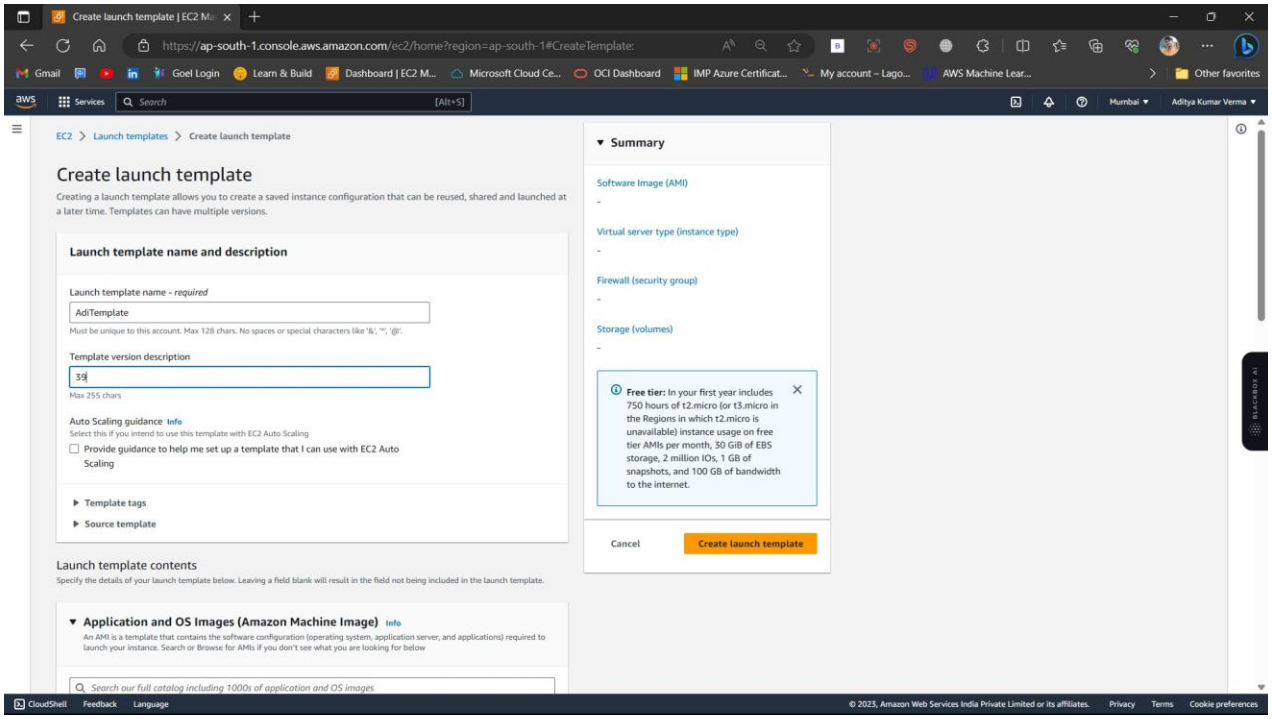
Ensure best practices are used across your organization. Learn more

Documentation

Documentation

API reference

Step 3: Give a name as “AdiTemplate”, and type “39” in version.



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

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*

AdiTemplate

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

Template version description

39

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

Launch template contents

Specify the details of your launch template below. Leaving a field blank will result in the field not being included in the launch template.

▾ **Application and OS Images (Amazon Machine Image)** Info

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

▾ **Summary**

Software Image (AMI)

-

Virtual server type (instance type)

-

Firewall (security group)

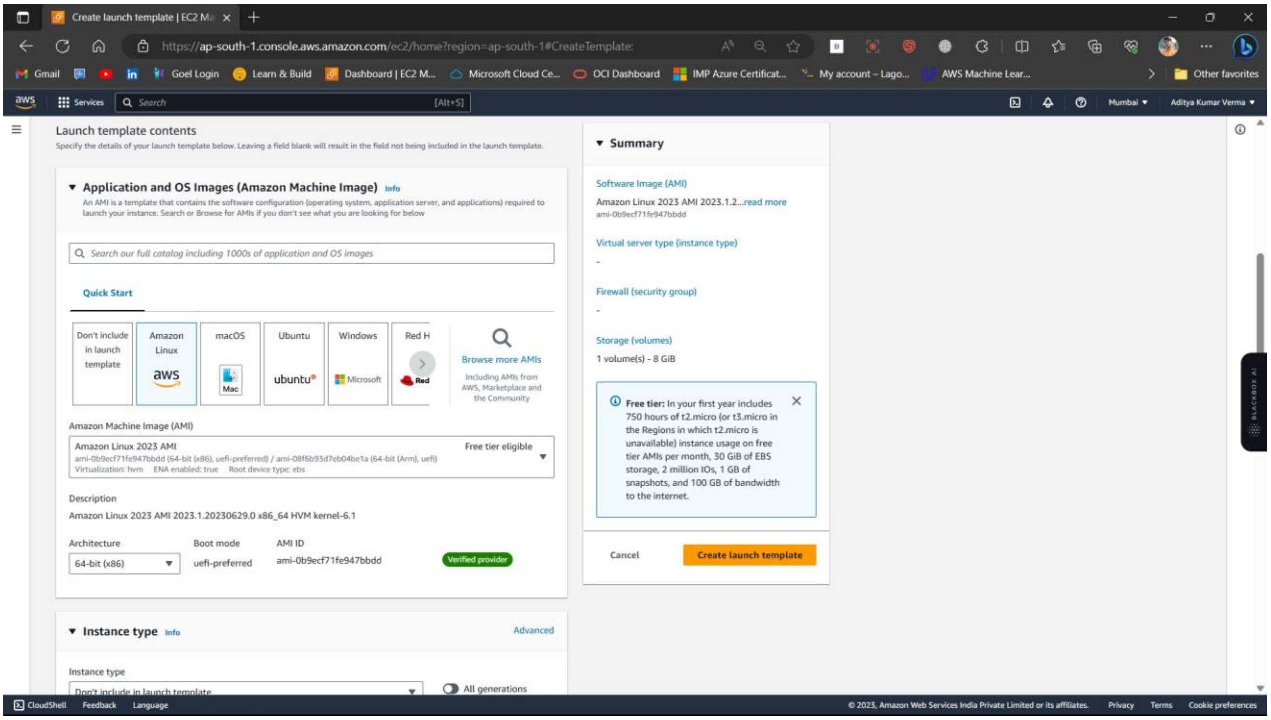
-

Storage (volumes)

-

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, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Step 4: Select “AWS Linux” for OS.



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

Launch template contents

Specify the details of your launch template below. Leaving a field blank will result in the field not being included in the launch template.

▾ **Application and OS Images (Amazon Machine Image)** Info

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Amazon Machine Image (AMI)

Amazon Linux 2023 AMI — Free tier eligible
ami-0b9ecf71fe947bbdd (64-bit (x86), uefi-preferred) / ami-08f6b93d7eb04be1a (64-bit (Arm), uefi)
Virtualization: hvm ENA enabled: true Root device type: ebs

Description

Amazon Linux 2023 AMI 2023.1.20230629.0 x86_64 HVM kernel-6.1

Architecture: 64-bit (x86)

Boot mode: uefi-preferred

AMI ID: ami-0b9ecf71fe947bbdd

▾ **Instance type** Info

Instance type: Don't include in launch template

▾ **Summary**

Software Image (AMI)

Amazon Linux 2023 AMI 2023.1.2...read more
ami-0b9ecf71fe947bbdd

Virtual server type (instance type)

-

Firewall (security group)

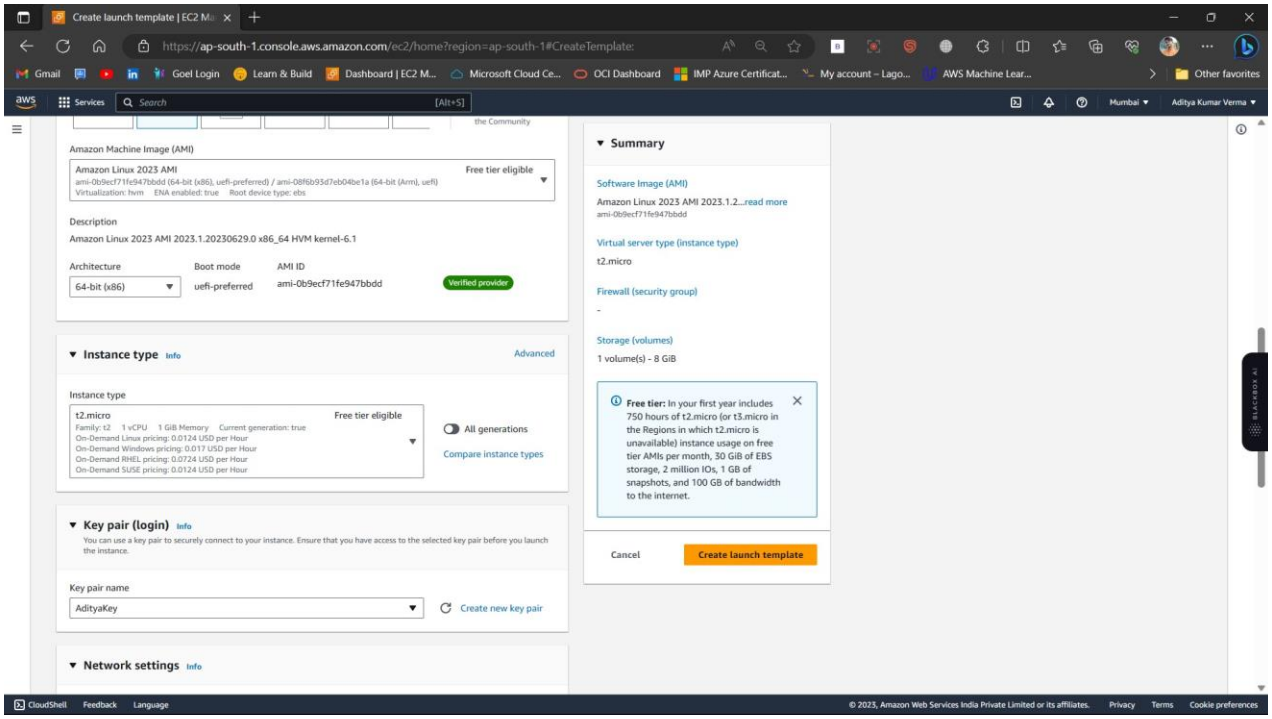
-

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 month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Step 5: Select “t2 micro” at instance and select a keypair “AdityaKey”.



Amazon Machine Image (AMI)

Amazon Linux 2023 AMI — Free tier eligible
ami-0b9ecf71fe947bbdd (64-bit (x86), uefi-preferred) / ami-08f6b93d7eb04be1a (64-bit (Arm), uefi)
Virtualization: hvm ENA enabled: true Root device type: ebs

Description
Amazon Linux 2023 AMI 2023.1.20230629.0 x86_64 HVM kernel-6.1

Architecture	Boot mode	AMI ID	
64-bit (x86)	uefi-preferred	ami-0b9ecf71fe947bbdd	Verified provider

Instance type Info — Advanced

Instance type

t2.micro — Free tier eligible
Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Linux pricing: 0.0124 USD per Hour
On-Demand Windows pricing: 0.017 USD per Hour
On-Demand RHEL pricing: 0.0724 USD per Hour
On-Demand SUSE pricing: 0.0124 USD per Hour

All generations
Compare instance types

Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name
AdityaKey
Create new key pair

Network settings Info

Summary

Software Image (AMI)
Amazon Linux 2023 AMI 2023.1.2...read more
ami-0b9ecf71fe947bbdd

Virtual server type (instance type)
t2.micro

Firewall (security group)
-

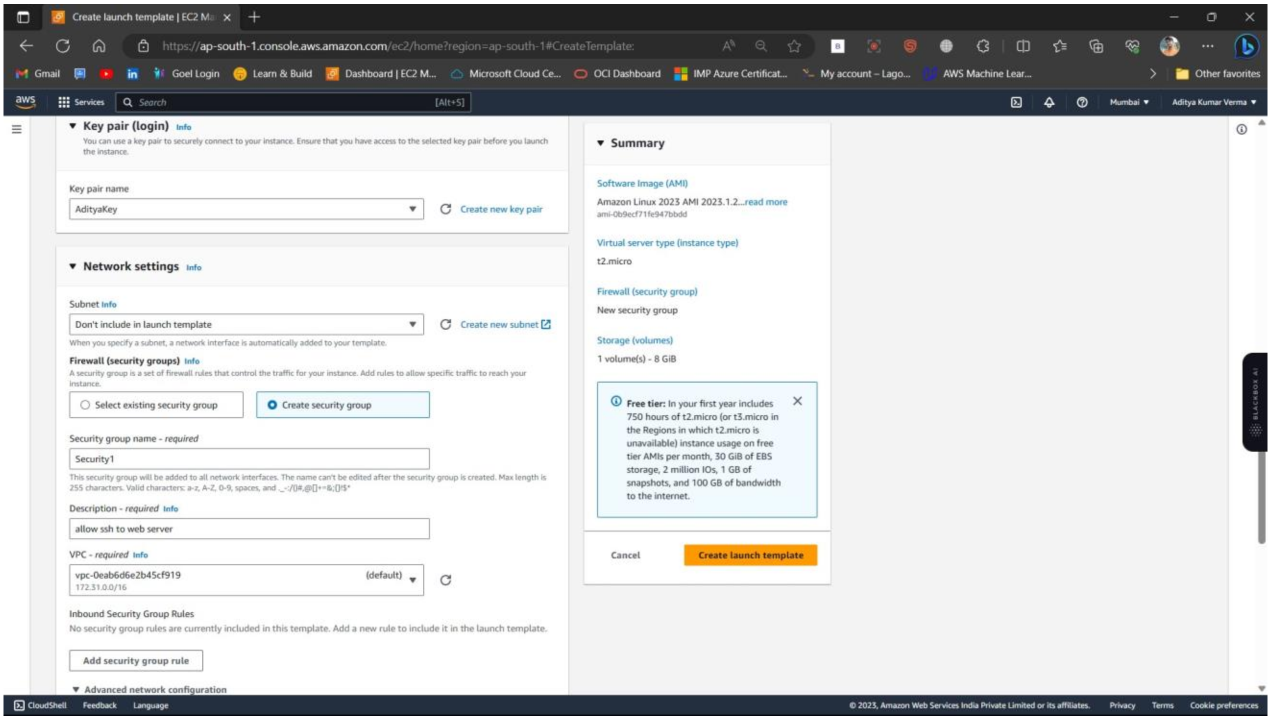
Storage (volumes)
1 volume(s) - 8 GiB

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 month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel | Create launch template

Step 6: Create a security group and give it a name as “Security1”

& add description.



Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name
AdityaKey
Create new key pair

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 group name - *required*
Security1
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
allow ssh to web server

VPC - *required* Info
vpc-0eab6d6e2b45cf919 (default)
172.31.0.0/16

Inbound Security Group Rules
No security group rules are currently included in this template. Add a new rule to include it in the launch template.

Add security group rule

▼ Advanced network configuration

Summary

Software Image (AMI)
Amazon Linux 2023 AMI 2023.1.2...read more
ami-0b9ecf71fe947bbdd

Virtual server type (instance type)
t2.micro

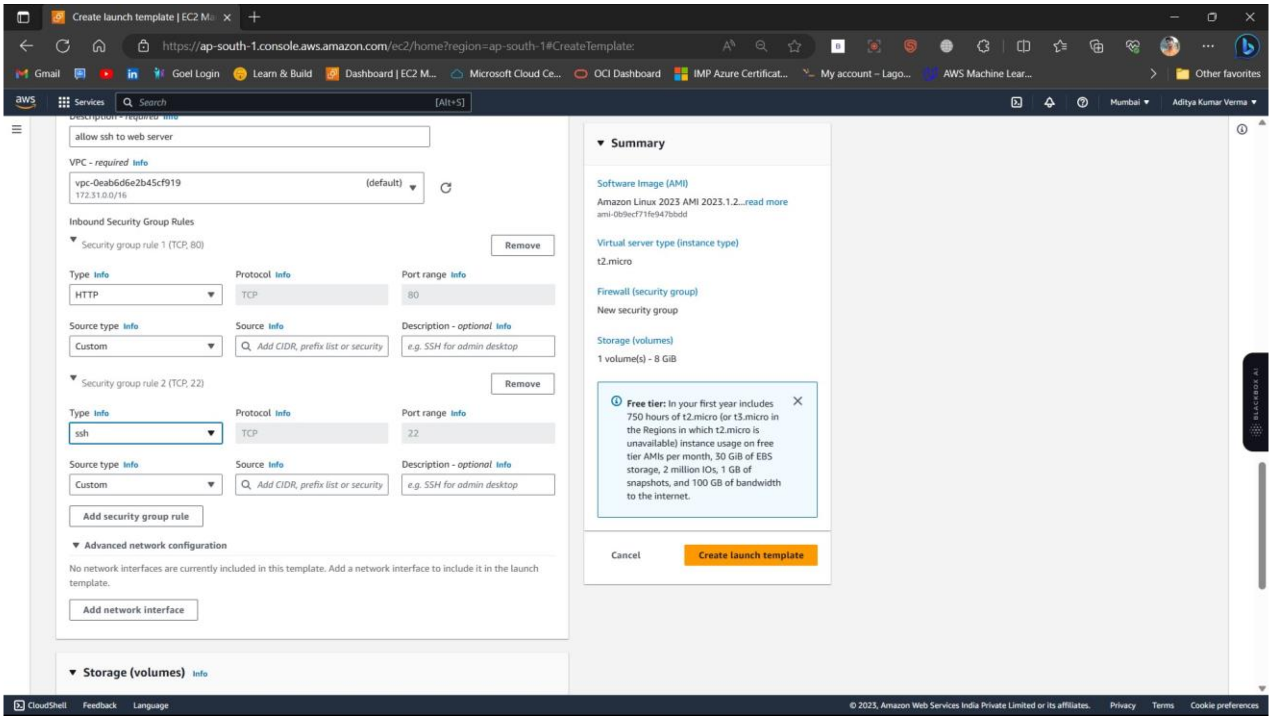
Firewall (security group)
New security group

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 month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel | Create launch template

Step 7: Add two inbound rules 1. HTTP and 2. SSH.



Description - required Info

allow ssh to web server

VPC - required Info

vpc-0eab6d6e2b45cf919 (default)
172.31.0.0/16

Inbound Security Group Rules

▾ Security group rule 1 (TCP, 80) Remove

Type	Protocol	Port range
HTTP	TCP	80

Source type	Source	Description - optional
Custom	Add CIDR, prefix list or security	e.g. SSH for admin desktop

▾ Security group rule 2 (TCP, 22) Remove

Type	Protocol	Port range
ssh	TCP	22

Source type	Source	Description - optional
Custom	Add CIDR, prefix list or security	e.g. SSH for admin desktop

Add security group rule

▾ Advanced network configuration

No network interfaces are currently included in this template. Add a network interface to include it in the launch template.

Add network interface

▾ Storage (volumes) Info

▾ Summary

Software Image (AMI)
Amazon Linux 2023 AMI 2023.1.2...read more
ami-0b9ecf71fe947bbdd

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 month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel Create launch template

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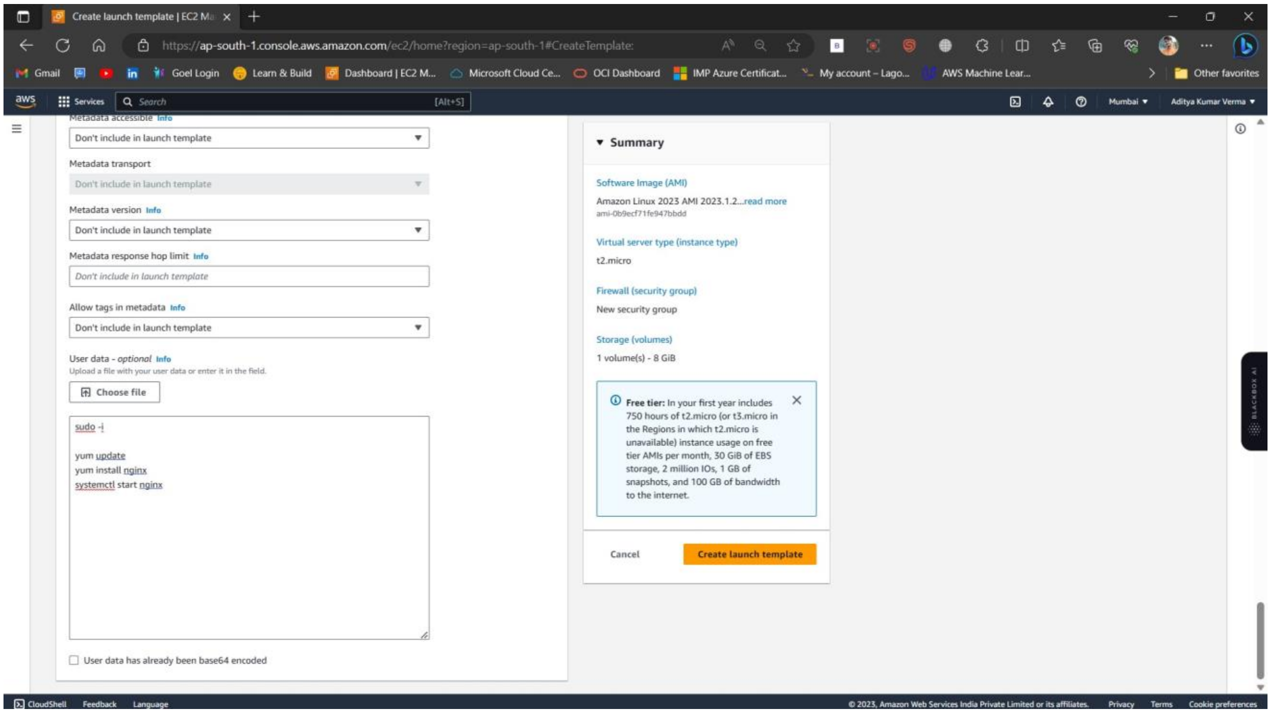
Step 8: In additional settings add this script and click on "Create launchtemplate".



Metadata accessible Info
Don't include in launch template

Metadata transport
Don't include in launch template

Metadata version Info
Don't include in launch template

Metadata response hop limit Info
Don't include in launch template

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

```
sudo -i

yum update
yum install nginx
systemctl start nginx
```

□ User data has already been base64 encoded

▾ Summary

Software Image (AMI)
Amazon Linux 2023 AMI 2023.1.2...read more
ami-0b9ecf71fe947bbdd

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 month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel Create launch template

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Feedback
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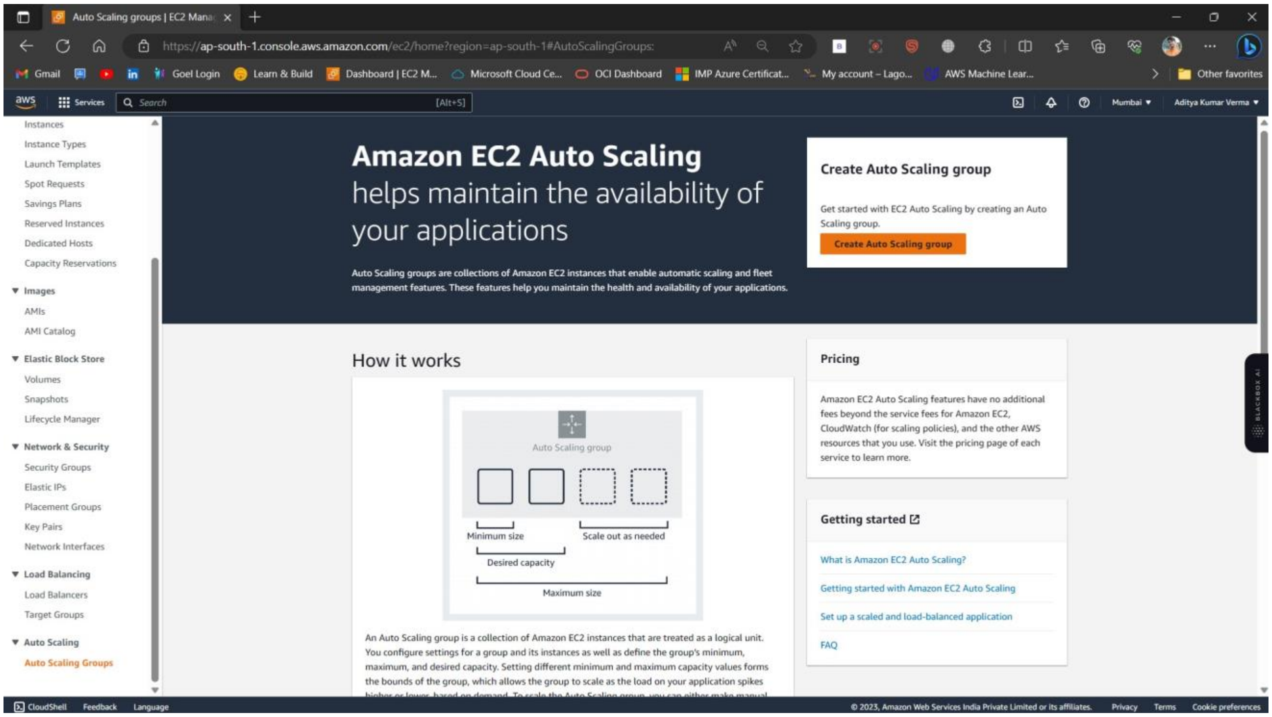
Step 9: Now go to Auto-Scaling and click on “create Auto Scaling group”.



Amazon EC2 Auto Scaling helps maintain the availability of your applications

Auto Scaling groups are collections of Amazon EC2 instances that enable automatic scaling and fleet management features. These features help you maintain the health and availability of your applications.

Create Auto Scaling group

Get started with EC2 Auto Scaling by creating an Auto Scaling group.

Create Auto Scaling group

How it works

An Auto Scaling group is a collection of Amazon EC2 instances that are treated as a logical unit. You configure settings for a group and its instances as well as define the group's minimum, maximum, and desired capacity. Setting different minimum and maximum capacity values forms the bounds of the group, which allows the group to scale as the load on your application spikes

Pricing

Amazon EC2 Auto Scaling features have no additional fees beyond the service fees for Amazon EC2, CloudWatch (for scaling policies), and the other AWS resources that you use. Visit the pricing page of each service to learn more.

Getting started

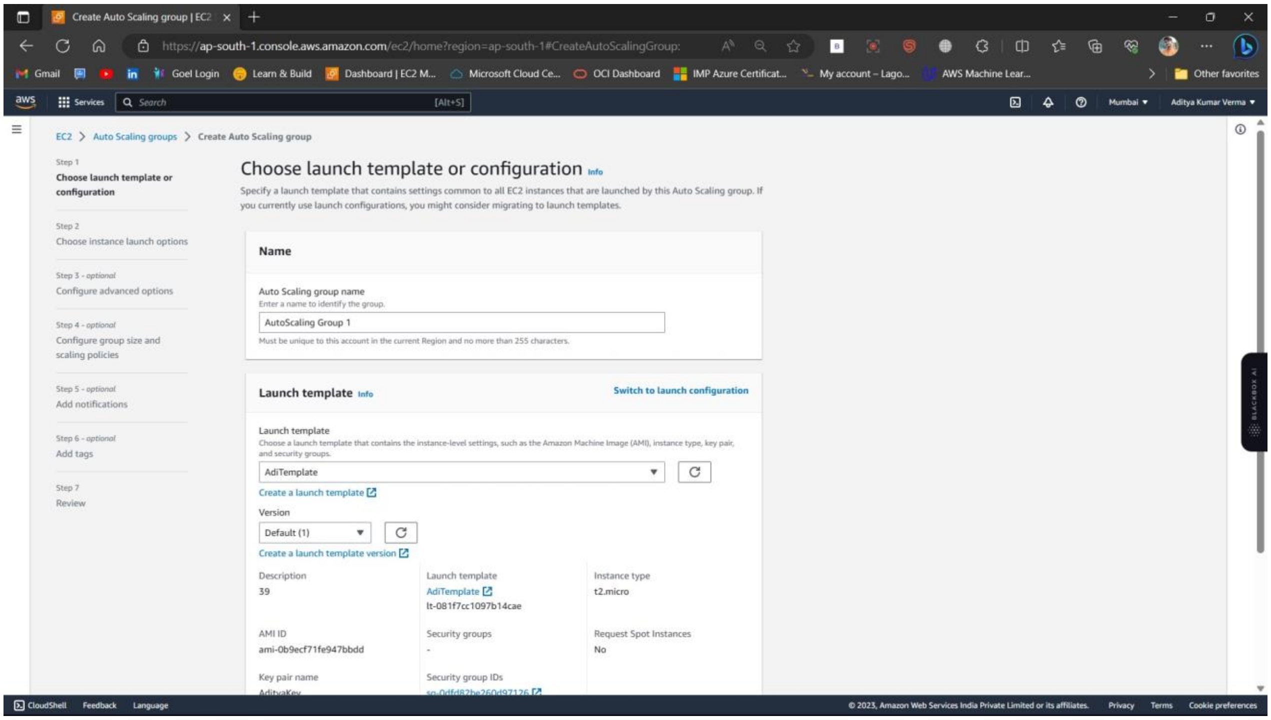
What is Amazon EC2 Auto Scaling?

Getting started with Amazon EC2 Auto Scaling

Set up a scaled and load-balanced application

FAQ

Step 10: Give a name as “AutoScaling Group 1” and select the template you just created.



EC2 > Auto Scaling groups > Create Auto Scaling group

Choose launch template or configuration Info

Specify a launch template that contains settings common to all EC2 instances that are launched by this Auto Scaling group. If you currently use launch configurations, you might consider migrating to launch templates.

Name

Auto Scaling group name
Enter a name to identify the group.
AutoScaling Group 1
Must be unique to this account in the current Region and no more than 255 characters.

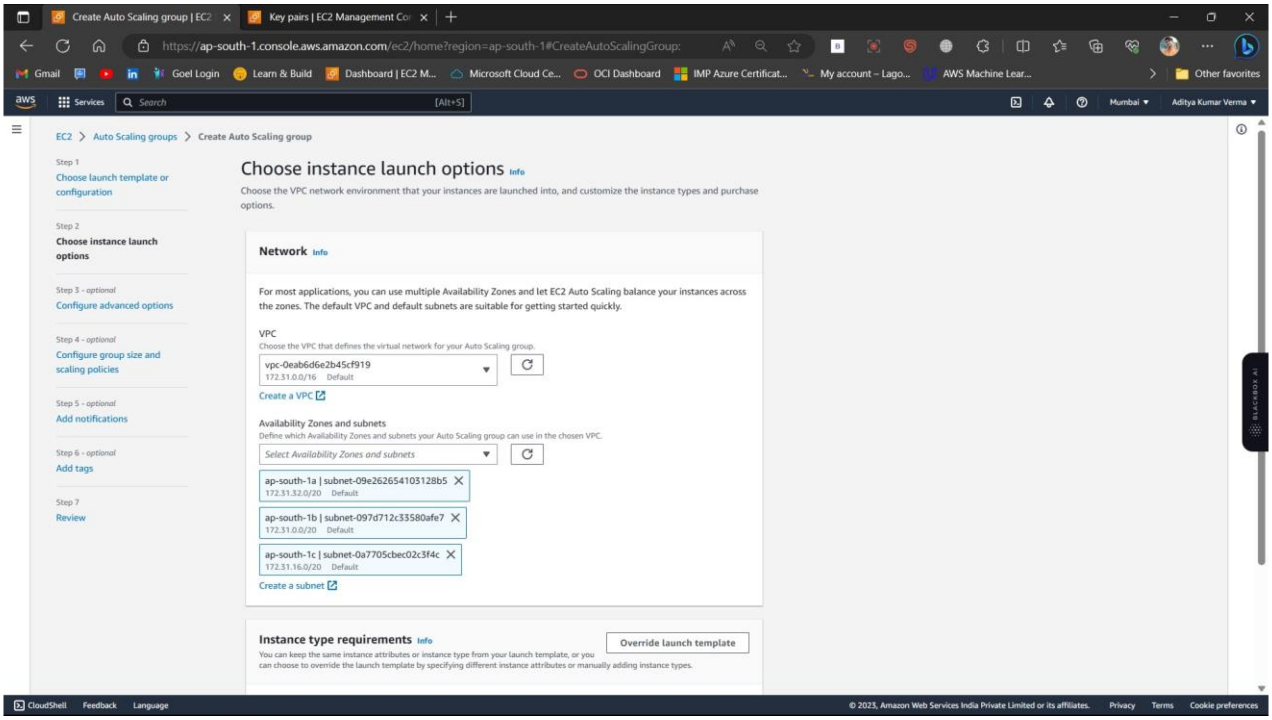
Launch template Info

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.
AdiTemplate

Version
Default (1)

Description: 39
Launch template: AdiTemplate lt-081f7cc1097b14cae
Instance type: t2.micro
AMI ID: ami-0b9ecf71fe947bbdd
Security groups: -
Request Spot Instances: No
Key pair name: AdityaKey
Security group IDs: sg-0dfd82be260d97126

Step 11: Select “ap-south 1a” and “ap-south 1b” zones and click next.



EC2 > Auto Scaling groups > Create Auto Scaling group

Step 1
Choose launch template or configuration

Step 2
Choose instance launch options

Step 3 - *optional*
Configure advanced options

Step 4 - *optional*
Configure group size and scaling policies

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.

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-0eab6d6e2b45cf919 ▾
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-09e262654103128b5 ✕
172.31.32.0/20 Default

ap-south-1b | subnet-097d712c33580afe7 ✕
172.31.0.0/20 Default

ap-south-1c | subnet-0a7705cbec02c3f4c ✕
172.31.16.0/20 Default

Create a subnet

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.

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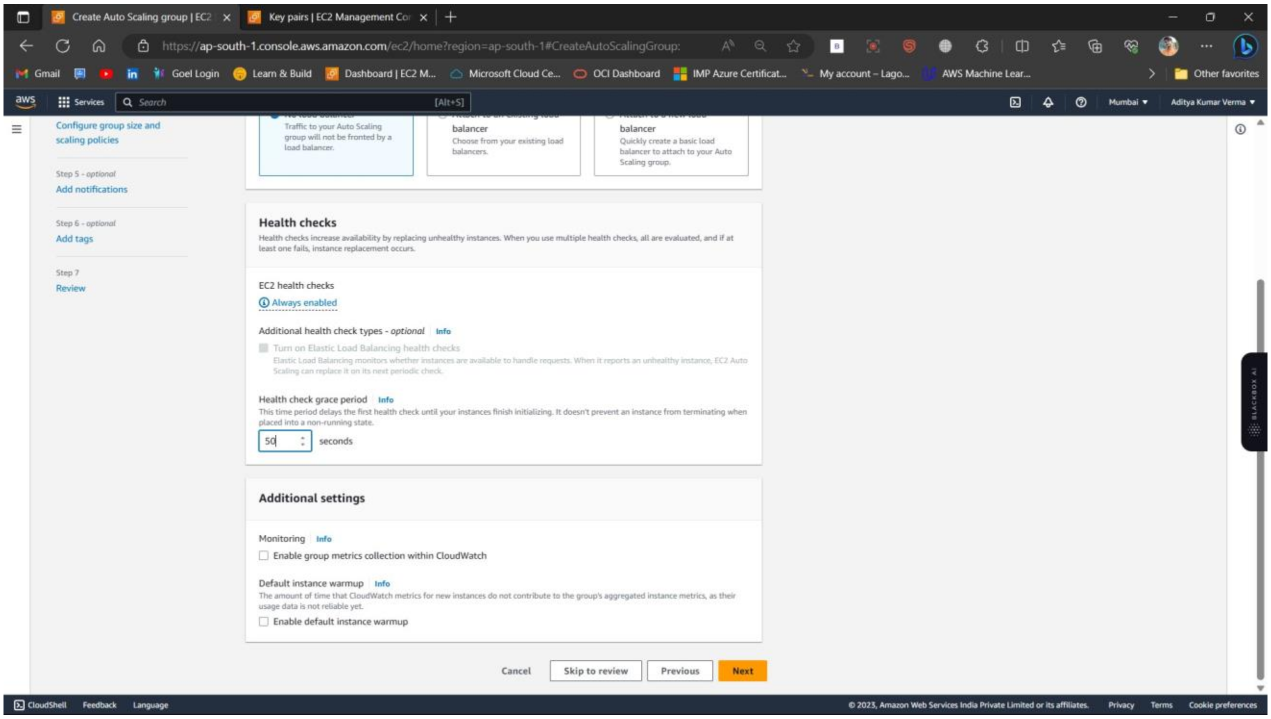
Step 12: Reduce health period to “50” seconds .



Configure group size and scaling policies

Step 5 - *optional*
Add notifications

Step 6 - *optional*
Add tags

Step 7
Review

Traffic to your Auto Scaling group will not be fronted by a load balancer.

balancer
Choose from your existing load balancers.

balancer
Quickly create a basic load balancer to attach to your Auto Scaling group.

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
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.
50 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 Skip to review Previous Next

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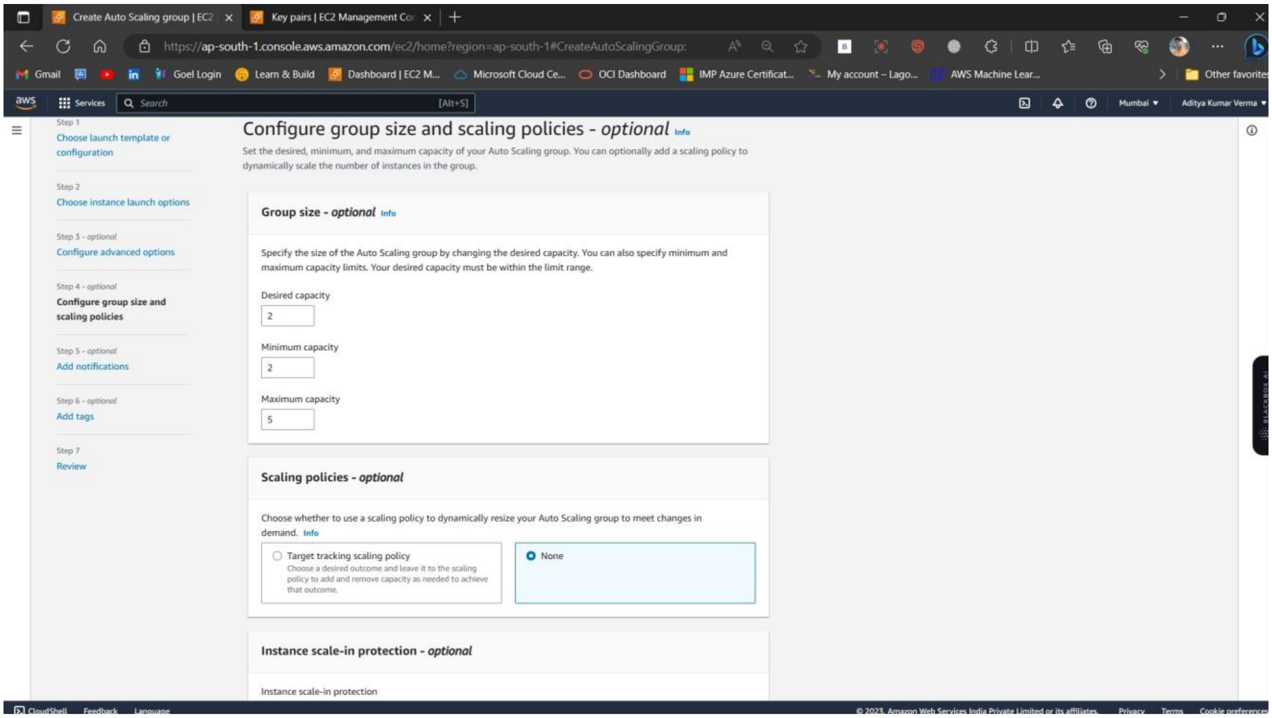
Step 13: Select Group size as –>minimum: 2; desired:2;
maximum:5



Configure group size and scaling policies - *optional* Info

Set the desired, minimum, and maximum capacity of your Auto Scaling group. You can optionally add a scaling policy to dynamically scale the number of instances in the group.

Step 1 Choose launch template or configuration
Step 2 Choose instance launch options
Step 3 - optional Configure advanced options
Step 4 - optional **Configure group size and scaling policies**
Step 5 - optional Add notifications
Step 6 - optional Add tags
Step 7 Review

Group size - *optional* Info

Specify the size of the Auto Scaling group by changing the desired capacity. You can also specify minimum and maximum capacity limits. Your desired capacity must be within the limit range.

Desired capacity: 2

Minimum capacity: 2

Maximum capacity: 5

Scaling policies - *optional*

Choose whether to use a scaling policy to dynamically resize your Auto Scaling group to meet changes in demand. Info

○ Target tracking scaling policy
Choose a desired outcome and leave it to the scaling policy to add and remove capacity as needed to achieve that outcome.

● None

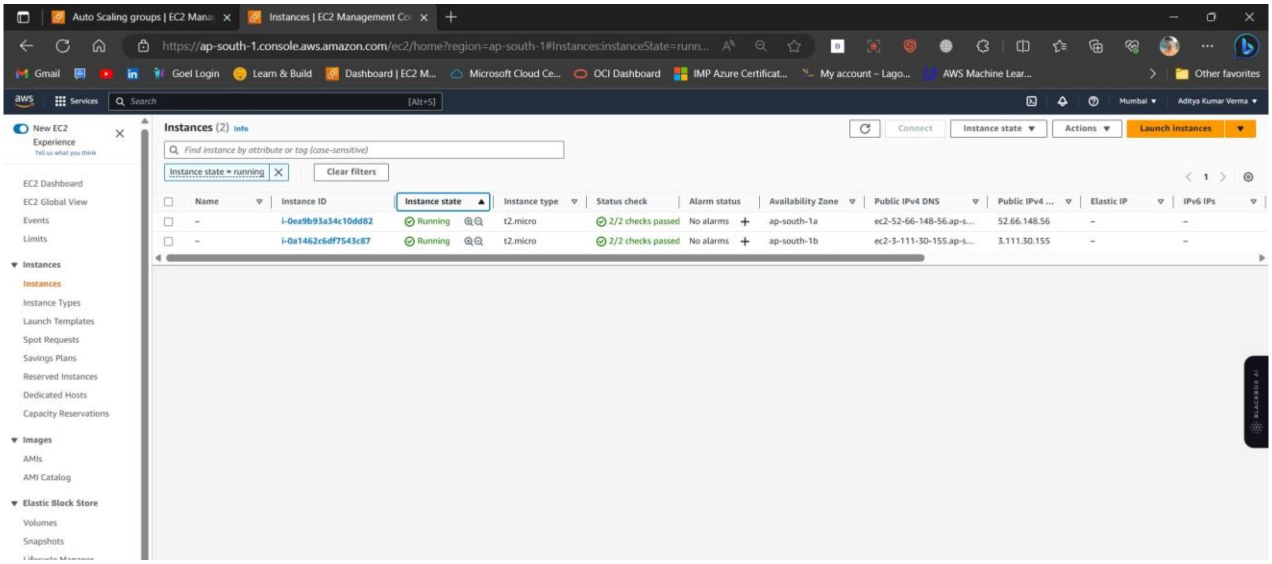
Instance scale-in protection - *optional*

Instance scale-in protection

Step 14: Select “Target Tracking scaling policy”

& set Target Value at 30.

Go back to instances you will find two unnamed instances running.

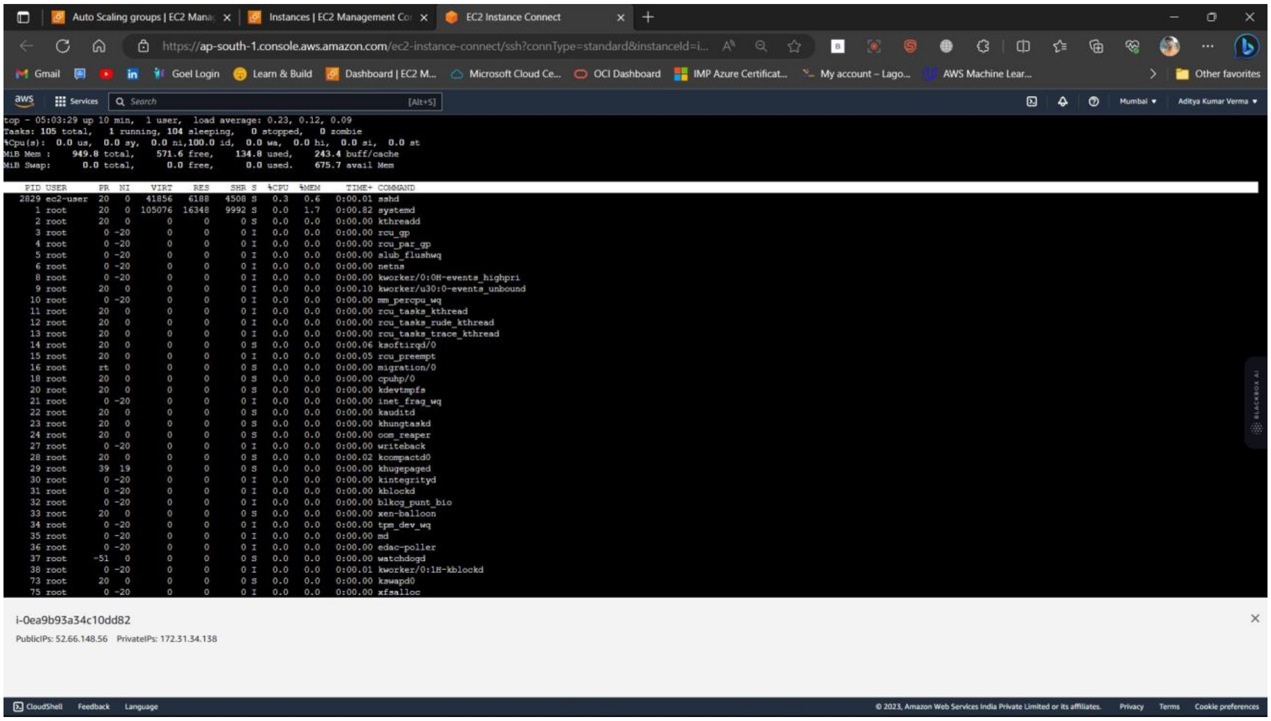


Instances (2) Info

Instance state = running

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP	IPv6 IPs
-	i-0ea9b93a34c10dd82	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1a	ec2-52-66-148-56.ap-s...	52.66.148.56	-	-
-	i-0a1462c6df7543c87	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1b	ec2-3-111-30-155.ap-s...	3.111.30.155	-	-

Step 15: Launch one of the instances and check the cpu capacity running by typing “top” command.



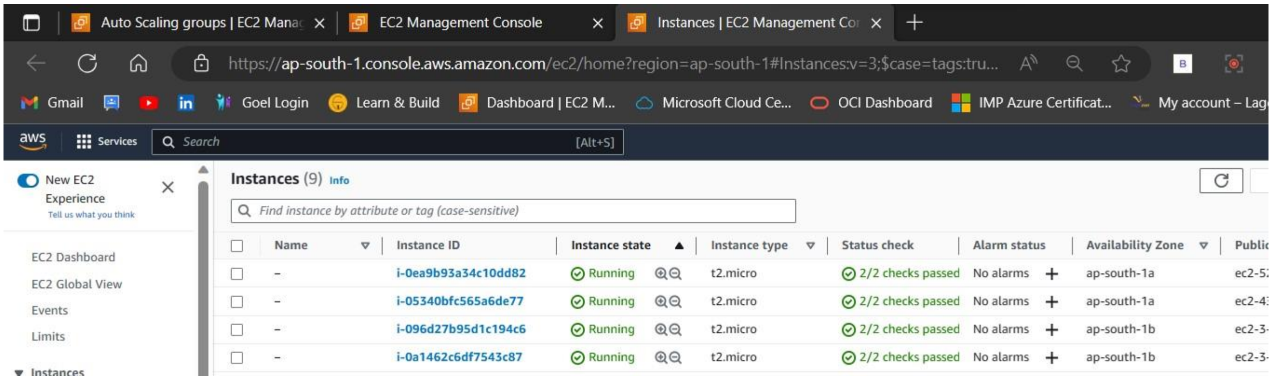
```
top - 05:03:29 up 10 min,  1 user,  load average: 0.23, 0.12, 0.09
Tasks: 105 total,   1 running, 104 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :    949.8 total,    571.6 free,    134.8 used,    243.4 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.    675.7 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
 2829 ec2-user  20   0   41856   6188   4508 S   0.3   0.6   0:00.01 sshd
    1 root      20   0  105076  16348   9992 S   0.0   1.7   0:00.82 systemd
    2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
    3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
    4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
    5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 slub_flushwq
    6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
    8 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
    9 root      20   0       0      0      0 I   0.0   0.0   0:00.10 kworker/u30:0-events_unbound
   10 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
   11 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_kthread
   12 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_rude_kthread
   13 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_trace_kthread
   14 root      20   0       0      0      0 S   0.0   0.0   0:00.06 ksoftirqd/0
   15 root      20   0       0      0      0 I   0.0   0.0   0:00.05 rcu_preempt
   16 root      rt   0       0      0      0 S   0.0   0.0   0:00.00 migration/0
   18 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
   20 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kdevtmpfs
   21 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 inet_frag_wq
   22 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kauditd
   23 root      20   0       0      0      0 S   0.0   0.0   0:00.00 khungtaskd
   24 root      20   0       0      0      0 S   0.0   0.0   0:00.00 oom_reaper
   27 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 writeback
   28 root      20   0       0      0      0 S   0.0   0.0   0:00.02 kcompactd0
   29 root      39  19       0      0      0 S   0.0   0.0   0:00.00 khugepaged
   30 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kintegrityd
   31 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kblockd
   32 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 blkcg_punt_bio
   33 root      20   0       0      0      0 S   0.0   0.0   0:00.00 xen-balloon
   34 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 tpm_dev_wq
   35 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 md
   36 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 edac-poller
   37 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 watchdogd
   38 root       0 -20       0      0      0 I   0.0   0.0   0:00.01 kworker/0:1H-kblockd
   73 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kswapd0
   75 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 xfsalloc
```

i-0ea9b93a34c10dd82

PublicIPs: 52.66.148.56   PrivateIPs: 172.31.34.138

Step 16: Install stress command by using the command: “yum installstress” and type “stress -c 15” this will increase the load on cpu and makes to launch few more web servers to handle.



Instances (9) Info

□	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public
□	-	i-0ea9b93a34c10dd82	✓ Running	t2.micro	✓ 2/2 checks passed	No alarms +	ap-south-1a	ec2-5
□	-	i-05340bfc565a6de77	✓ Running	t2.micro	✓ 2/2 checks passed	No alarms +	ap-south-1a	ec2-4
□	-	i-096d27b95d1c194c6	✓ Running	t2.micro	✓ 2/2 checks passed	No alarms +	ap-south-1b	ec2-3
□	-	i-0a1462c6df7543c87	✓ Running	t2.micro	✓ 2/2 checks passed	No alarms +	ap-south-1b	ec2-3

-You can see in my instances that few more instances are added at us-east 1a or us-east 1b locations right after I increased the stress on cpu.

- Now you can decrease the stress by using the same command: “stress-c 1” and observe that the instances will terminate themselves.

This is the Demonstration of Auto-Scaling.