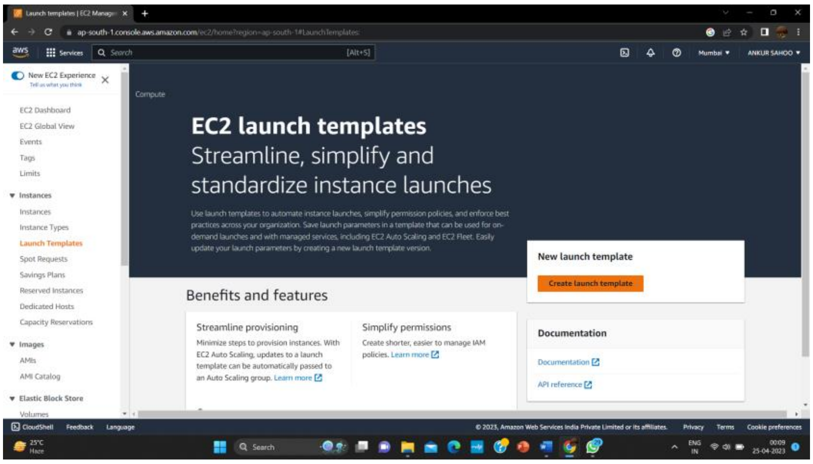
Assignment – 10

Problem Statement – Build scaling plans in AWS that balance load on different EC2 instances.

- Log in to your AWS account and go to EC2, then click on Launch Templates and then click on Create launch template.



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

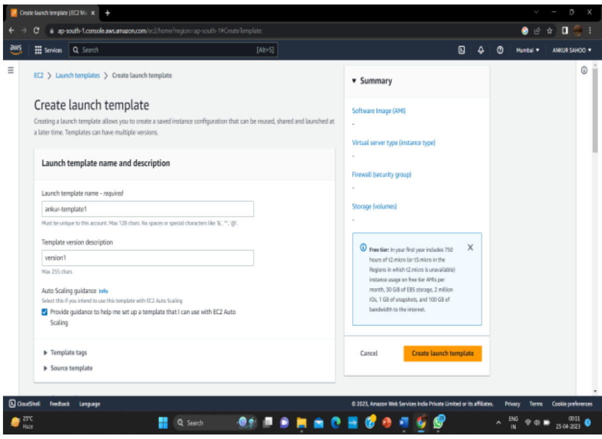
Create shorter, easier to manage IAM policies. Learn more

Documentation

Documentation

API reference

- Set the Launch template name and Template version description and tick the Auto Scaling guidance box.



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*

ankur-template1

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

Template version description

version1

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

Summary

Software Image (AMI)

-

Virtual server type (instance type)

-

Firewall (security group)

-

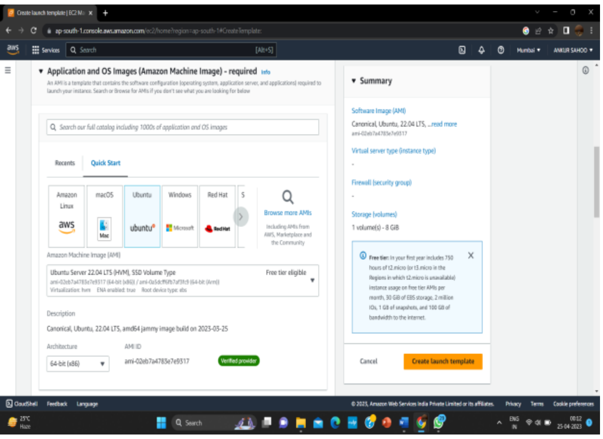
Storage (volumes)

-

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.

Cancel

Create launch template



Application and OS Images (Amazon Machine Image) - required 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

Search our full catalog including 1000s of application and OS images

Recents | Quick Start

Amazon Linux | macOS | Ubuntu | Windows | Red Hat | S

Browse more AMIs

Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

Ubuntu Server 22.04 LTS (HVM), SSD Volume Type — Free tier eligible

ami-02eb7a4783e7e9317 (64-bit (x86)) / ami-0a5dcff6fb7af3fc9 (64-bit (Arm))

Virtualization: hvm ENA enabled: true Root device type: ebs

Description

Canonical, Ubuntu, 22.04 LTS, amd64 jammy image build on 2023-03-25

Architecture: 64-bit (x86)

AMI ID: ami-02eb7a4783e7e9317

Verified provider

Summary

Software Image (AMI)

Canonical, Ubuntu, 22.04 LTS, ...read more

ami-02eb7a4783e7e9317

Virtual server type (instance type)

-

Firewall (security group)

-

Storage (volumes)

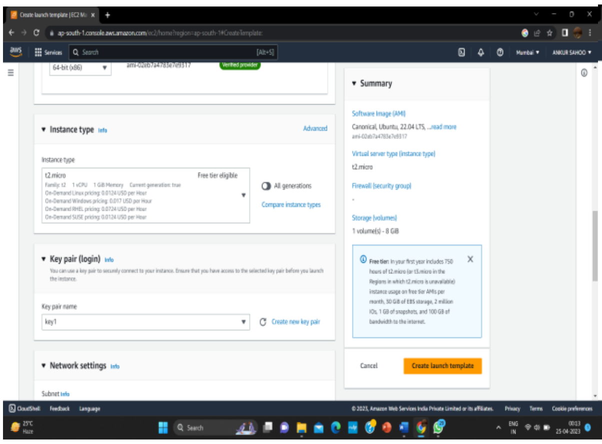
1 volume(s) - 8 GiB

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.

Cancel

Create launch template

- Select the machine type Ubuntu, instance type t2.micro, select an exiting key pair and lastly select an existing security group.



64-bit (x86) — ami-02eb7a4783e7e9317 — 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

key1

Create new key pair

Network settings Info

Subnet Info

Summary

Software Image (AMI)

Canonical, Ubuntu, 22.04 LTS, ...read more

ami-02eb7a4783e7e9317

Virtual server type (instance type)

t2.micro

Firewall (security group)

-

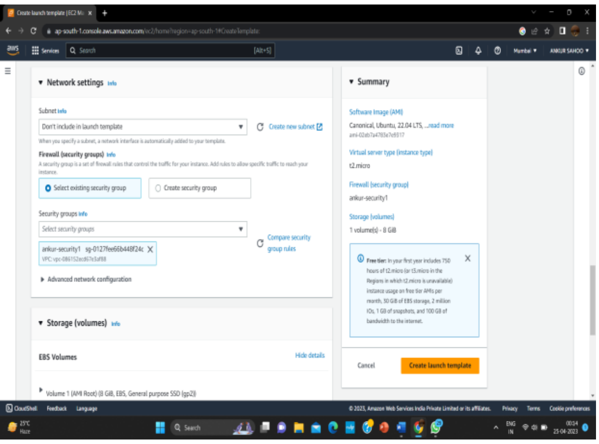
Storage (volumes)

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



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

ankur-security1 sg-0127fee66b448f24c

VPC: vpc-086152ecd67e5af88

Compare security group rules

Advanced network configuration

Storage (volumes) Info

EBS Volumes — Hide details

Volume 1 (AMI Root) (8 GiB, EBS, General purpose SSD (gp2))

Summary

Software Image (AMI)

Canonical, Ubuntu, 22.04 LTS, ...read more

ami-02eb7a4783e7e9317

Virtual server type (instance type)

t2.micro

Firewall (security group)

ankur-security1

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

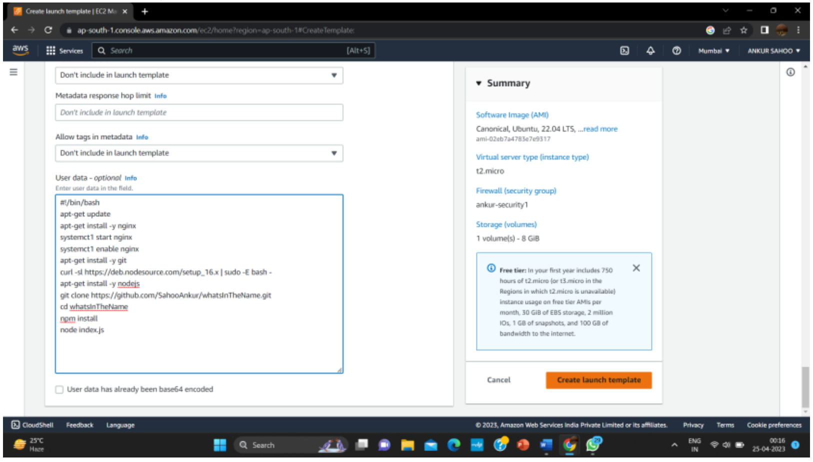
Create launch template

Assignment – 10

Problem Statement – Build scaling plans in AWS that balance load on different EC2 instances.

- Then click on the Advanced settings, scroll down and paste the code given below on User data section. Lastly click Create launch template.

```
#!/bin/bash
apt-get update
apt-get install -y nginx
systemctl start nginx
systemctl enable nginx
apt-get install -y git
curl -sL https://deb.nodesource.com/setup_18.x | sudo -E bash -
apt-get install -y nodejs
git clone *your repository link*
cd *folder name where the repo is cloned*
npm install
node index.js
```



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

Allow tags in metadata: Don't include in launch template

User data - *optional*

Enter user data in the field.

```
#!/bin/bash
apt-get update
apt-get install -y nginx
systemct1 start nginx
systemct1 enable nginx
apt-get install -y git
curl -sl https://deb.nodesource.com/setup_16.x | sudo -E bash -
apt-get install -y nodejs
git clone https://github.com/SahooAnkur/whatsInTheName.git
cd whatsInTheName
npm install
node index.js
```

□ User data has already been base64 encoded

Summary

Software Image (AMI): Canonical, Ubuntu, 22.04 LTS, ...read more ami-02eb7a4783e7e9317

Virtual server type (instance type): t2.micro

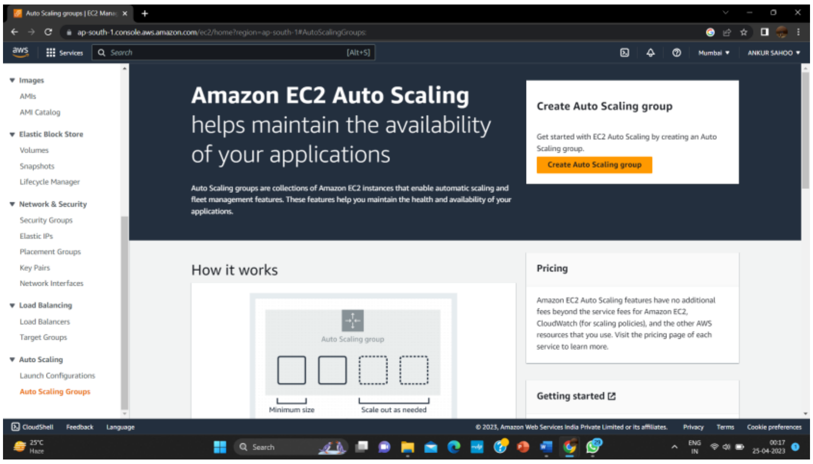
Firewall (security group): ankur-security1

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.

Create launch template | EC2 Ma
ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateTemplate:
Services
Search [Alt+S]
Mumbai
ANKUR SAHOO
Cancel
Create launch template
CloudShell
Feedback
Language
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences
25°C Haze
00:16 25-04-2023

- Now go back to EC2 dashboard, click on Auto Scaling Groups and then 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.

How it works

Pricing

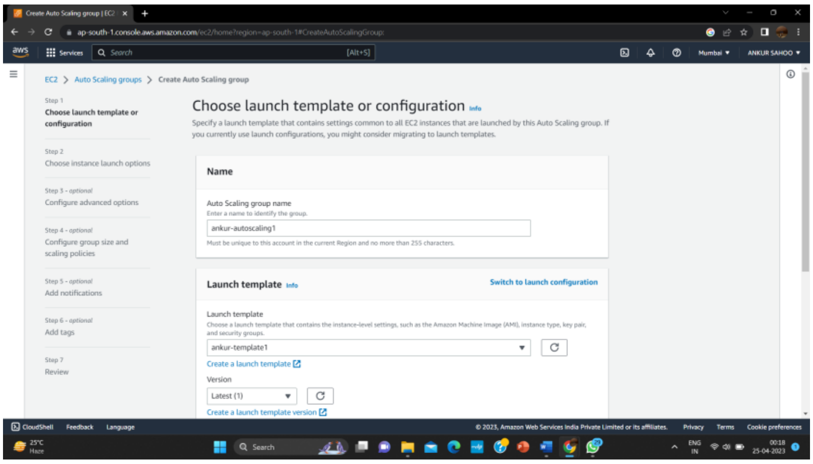
Amazon EC2 Auto Scaling features have no additional fees beyond the service fees for Amazon EC2, CloudWatch (for scaling policies), and the other AWS resources that you use. Visit the pricing page of each service to learn more.

Getting started

- Set the Auto Scaling group name and select the newly created Launch template and select the Version Latest(1). Then scroll down and click on next.

Assignment – 10

Problem Statement – Build scaling plans in AWS that balance load on different EC2 instances.



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 launch template or configuration

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.
ankur-autoscaling1
Must be unique to this account in the current Region and no more than 255 characters.

Launch template

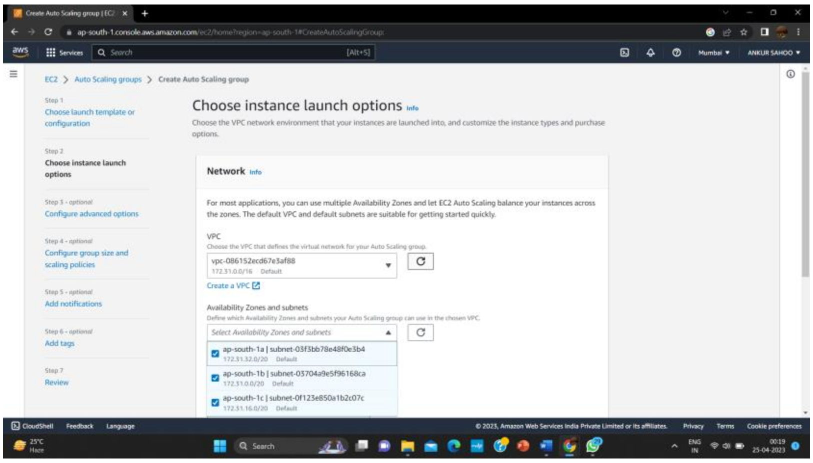
Launch template
Choose a launch template that contains the instance-level settings, such as the Amazon Machine Image (AMI), instance type, key pair, and security groups.
ankur-template1

Version
Latest (1)

© 2023, Amazon Web Services India Private Limited or its affiliates.

Create Auto Scaling group | EC2
ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateAutoScalingGroup:
aws
Services
Search
[Alt+S]
Mumbai
ANKUR SAHOO
Info
Switch to launch configuration
Create a launch template
Create a launch template version
CloudShell
Feedback
Language
Privacy
Terms
Cookie preferences
25°C
Haze
Search
ENG
IN
00:18
25-04-2023

- Now in Availability Zones and subnets, select all the available zones, scroll down and click on 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

Choose the VPC network environment that your instances are launched into, and customize the instance types and purchase options.

Network

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-086152ecd67e3af88
172.31.0.0/16 Default

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

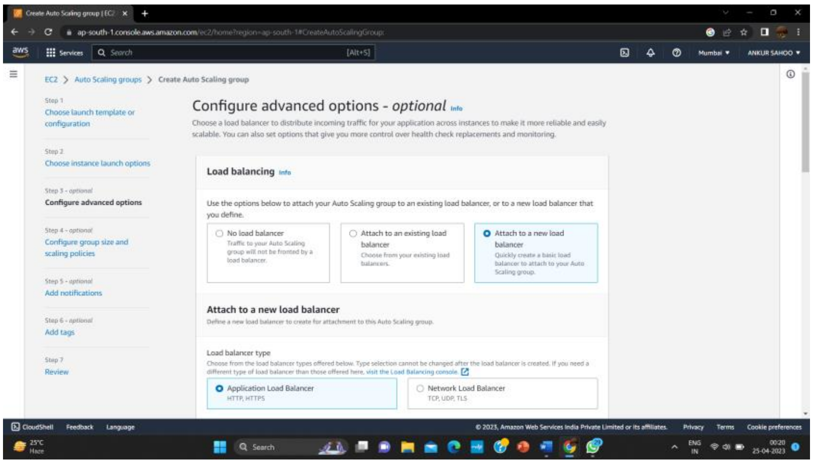
☑ ap-south-1a | subnet-03f3bb78e48f0e3b4
172.31.32.0/20 Default

☑ ap-south-1b | subnet-03704a9e5f96168ca
172.31.0.0/20 Default

☑ ap-south-1c | subnet-0f123e850a1b2c07c
172.31.16.0/20 Default

© 2023, Amazon Web Services India Private Limited or its affiliates.

- Now in Load balancing, select Attach to a new load balancer and scroll down.



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

Configure advanced options - *optional*

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

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 a new load balancer
Define a new load balancer to create for attachment to this Auto Scaling group.

Load balancer type
Choose from the load balancer types offered below. Type selection cannot be changed after the load balancer is created. If you need a different type of load balancer than those offered here, visit the Load Balancing console.

● Application Load Balancer
HTTP, HTTPS

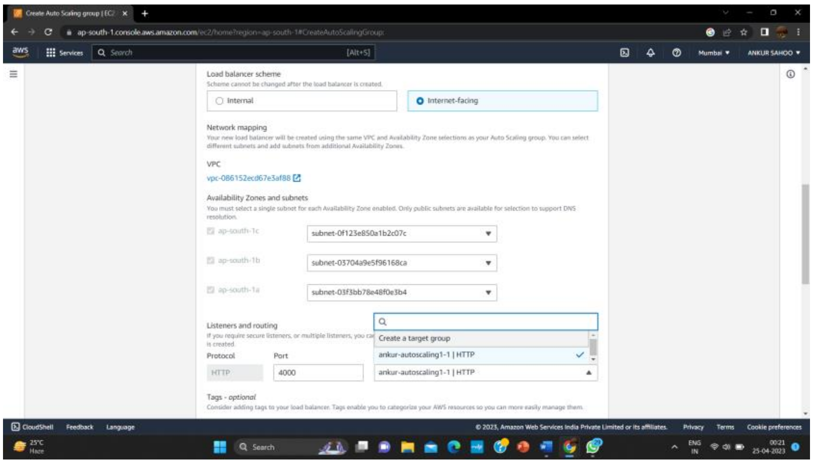
○ Network Load Balancer
TCP, UDP, TLS

© 2023, Amazon Web Services India Private Limited or its affiliates.

- In Load balancer scheme, select Internet-facing, in Listeners and routing, set the port to 4000 and click on Create a target group and select the default one. Scroll down and click on next.

Assignment – 10

Problem Statement – Build scaling plans in AWS that balance load on different EC2 instances.



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-086152ecd67e3af88

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-1c	subnet-0f123e850a1b2c07c
☑ ap-south-1b	subnet-03704a9e5f96168ca
☑ ap-south-1a	subnet-03f3bb78e48f0e3b4

Listeners and routing

If you require secure listeners, or multiple listeners, you ca[n] ... is created.

Protocol	Port	
HTTP	4000	ankur-autoscaling1-1 | HTTP

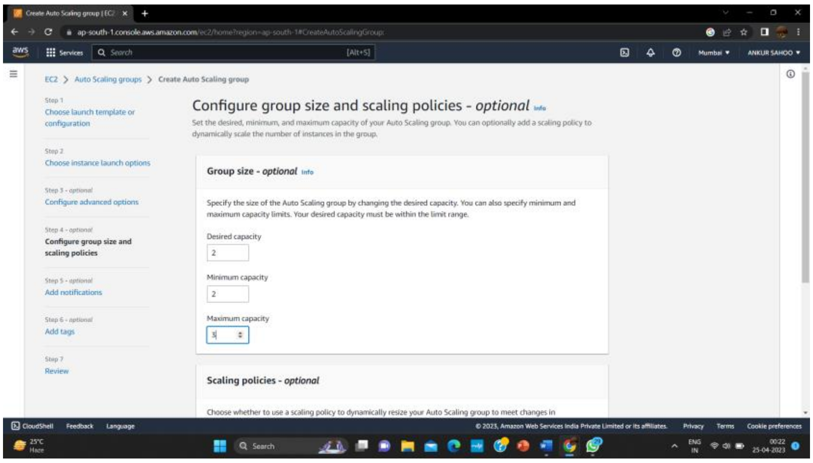
Create a target group

ankur-autoscaling1-1 | HTTP ✓

Tags - *optional*

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

- In Group size, set the Desired capacity, Minimum capacity and Maximum capacity to 2, 2, 3 respectively and scroll down.



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

Configure group size and scaling policies - *optional*

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.

Group size - *optional*

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

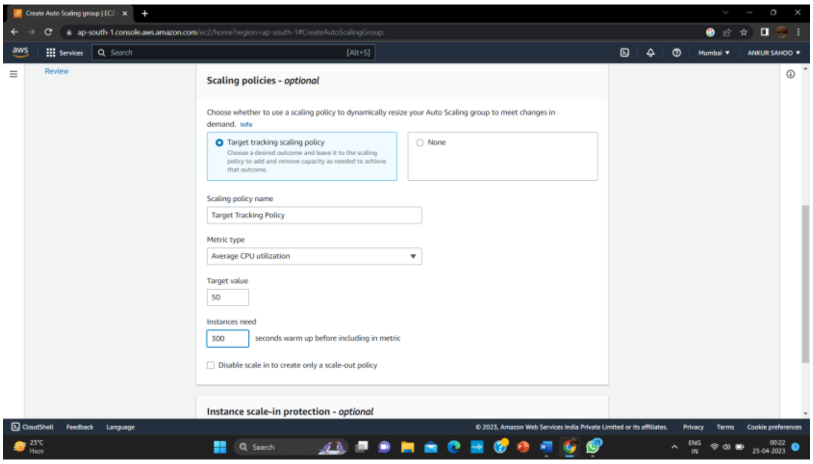
Minimum capacity: 2

Maximum capacity: 3

Scaling policies - *optional*

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

- In Scaling policies, select Target tracking scaling policy and set the timer to 300 sec, then scroll down and click on next.



Scaling policies - *optional*

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

● 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

Scaling policy name: Target Tracking Policy

Metric type: Average CPU utilization

Target value: 50

Instances need: 300 seconds warm up before including in metric

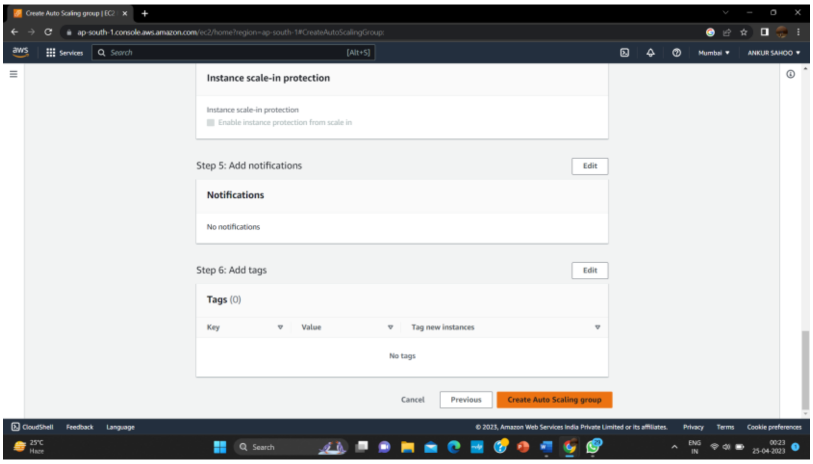
□ Disable scale in to create only a scale-out policy

Instance scale-in protection - *optional*

- Then just click on next twice and review the settings and scroll down and click on Create Auto Scaling group.

Assignment – 10

Problem Statement – Build scaling plans in AWS that balance load on different EC2 instances.



Instance scale-in protection

Instance scale-in protection
□ Enable instance protection from scale in

Step 5: Add notifications

Notifications

No notifications

Step 6: Add tags

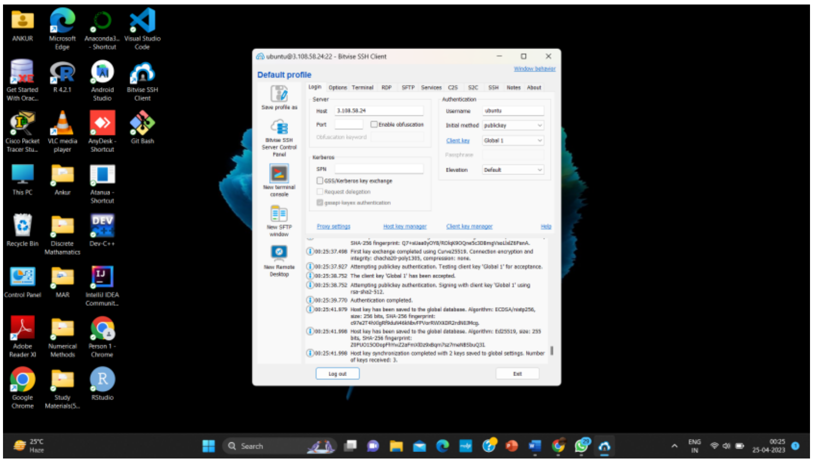
Tags (0)

Key	Value	Tag new instances

No tags

Create Auto Scaling group | EC2
ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateAutoScalingGroup:
Services
Search
[Alt+S]
Mumbai
ANKUR SAHOO
Edit
Edit
Cancel
Previous
Create Auto Scaling group
CloudShell
Feedback
Language
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences
25°C
Haze
Search
ENG
IN
00:23
25-04-2023

- Two new instances will be created. Copy the public IPv4 of any one them and open Bitvise SSH Client and Log in.



ubuntu@3.108.58.24:22 - Bitvise SSH Client

Default profile

Server
Host: 3.108.58.24
Port:
□ Enable obfuscation
Obfuscation keyword:

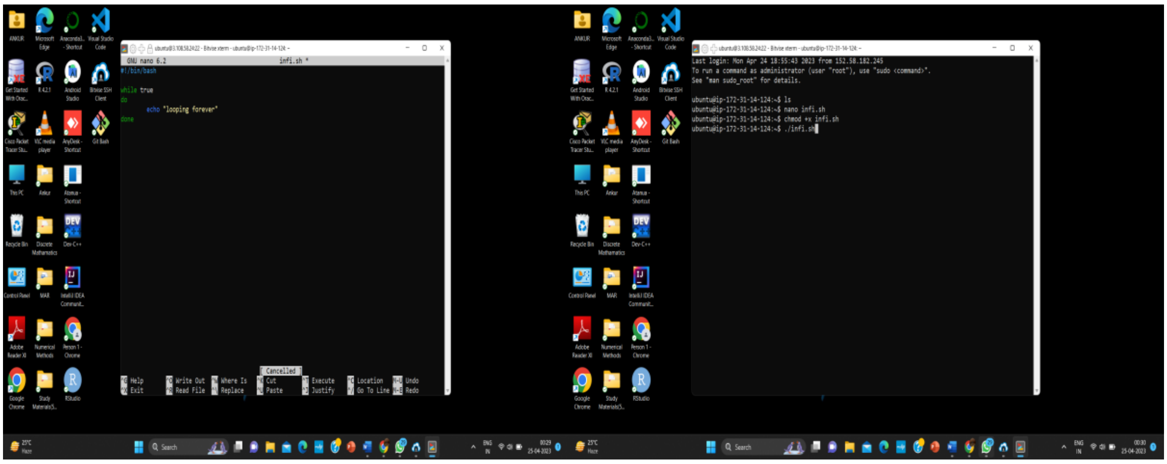
Kerberos
SPN:
□ GSS/Kerberos key exchange
□ Request delegation
☑ gssapi-keyex authentication

Authentication
Username: ubuntu
Initial method: publickey
Client key: Global 1
Passphrase:
Elevation: Default

```
SHA-256 fingerprint: Q7+sUaa0yOY8/ROlqK9OQne5c3D8mgVseLIdZ6FenA.
00:25:37.498 First key exchange completed using Curve25519. Connection encryption and
             integrity: chacha20-poly1305, compression: none.
00:25:37.927 Attempting publickey authentication. Testing client key 'Global 1' for acceptance.
00:25:38.752 The client key 'Global 1' has been accepted.
00:25:38.752 Attempting publickey authentication. Signing with client key 'Global 1' using
             rsa-sha2-512.
00:25:39.770 Authentication completed.
00:25:41.979 Host key has been saved to the global database. Algorithm: ECDSA/nistp256,
             size: 256 bits, SHA-256 fingerprint:
             c97e2T4hXlgRf9duN46kNbvFPVorRWXkDR2rdN0JMcp.
00:25:41.998 Host key has been saved to the global database. Algorithm: Ed25519, size: 255
             bits, SHA-256 fingerprint:
             Z8PUO15ODepFhYwZ2aFmXDz9xBqm7sz7meN85buQ31
00:25:41.998 Host key synchronization completed with 2 keys saved to global settings. Number
             of keys received: 3.
```

- Click on New terminal console, run the command **nano infi1.sh**. Write the following code and save(ctrl+s) and exit(ctrl+x). Now run the following commands –

for permission -> chmod +x infi1.sh
to run -> ./infi1.sh



ubuntu@3.108.58.24:22 - Bitvise xterm - ubuntu@ip-172-31-14-124: ~

```
  GNU nano 6.2                           infi.sh *
#!/bin/bash

while true
do
        echo "looping forever"
done




                              [ Cancelled ]
^G Help       ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit       ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^/ Go To Line M-E Redo
```

ubuntu@3.108.58.24:22 - Bitvise xterm - ubuntu@ip-172-31-14-124: ~

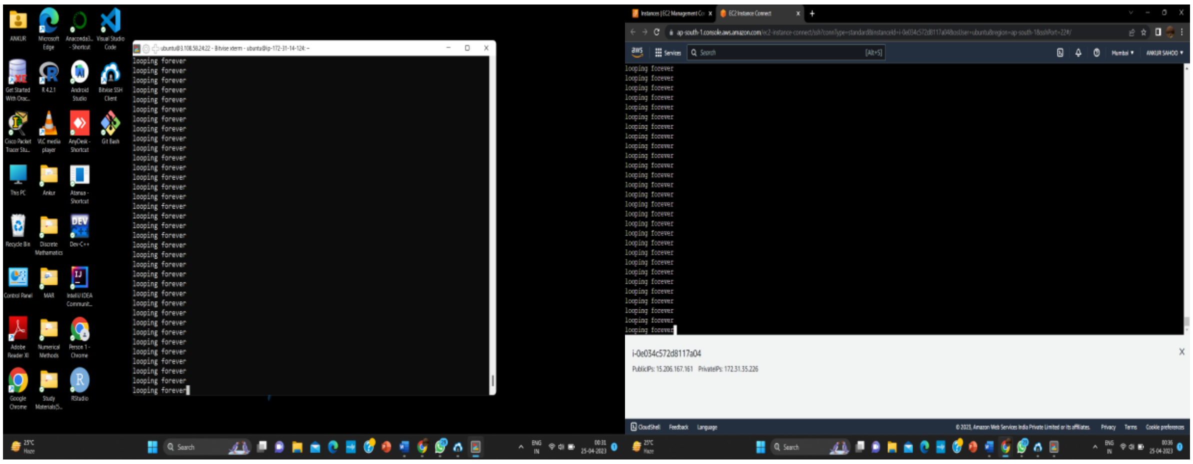
```
Last login: Mon Apr 24 18:55:43 2023 from 152.58.182.245
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-14-124:~$ ls
ubuntu@ip-172-31-14-124:~$ nano infi.sh
ubuntu@ip-172-31-14-124:~$ chmod +x infi.sh
ubuntu@ip-172-31-14-124:~$ ./infi.sh
```

Assignment – 10

Problem Statement – Build scaling plans in AWS that balance load on different EC2 instances.

- Now go back to EC2 instance, click on connect to connect to the Ubuntu server. Run the same commands and codes what you've done in the previous terminal and an infinite loop will run in both the cases.



```
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
```

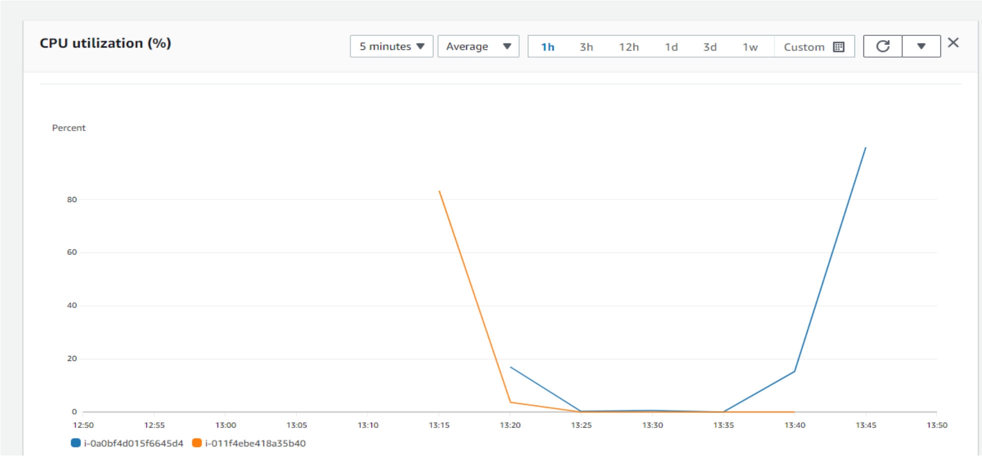
```
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
looping forever
```

i-0e034c572d8117a04

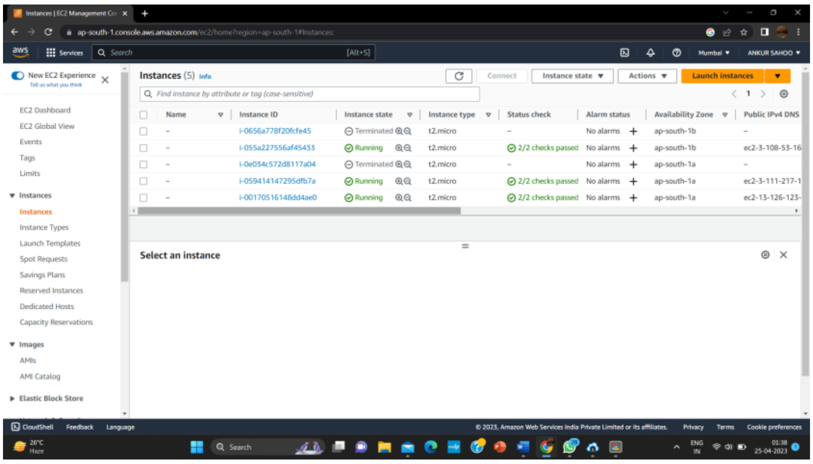
PublicIPs: 15.206.167.161 PrivateIPs: 172.31.35.226

ubuntu@3.108.58.24:22 - Bitvise xterm - ubuntu@ip-172-31-14-124: ~
Instances | EC2 Management Co
EC2 Instance Connect
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-0e034c572d8117a04&osUser=ubuntu&region=ap-south-1&sshPort=22#/
Services
Search
[Alt+S]
Mumbai
ANKUR SAHOO
CloudShell
Feedback
Language
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences
00:31
00:36
25-04-2023

- Now come back to the Instances and select the instances to check the CPU utilization.



- When <50% CPU utilization will be done by the instances because of the overload on the server, a new instance will be automatically created to balance the load.



Instances (5) Info

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
□	-	i-0656a778f20fcfe45	Terminated	t2.micro	-	No alarms	ap-south-1b	–
□	-	i-055a227556af45433	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1b	ec2-3-108-53-16
□	-	i-0e034c572d8117a04	Terminated	t2.micro	-	No alarms	ap-south-1a	–
□	-	i-059414147295dfb7a	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1a	ec2-3-111-217-1
□	-	i-00170516148dd4ae0	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1a	ec2-13-126-123-

Select an instance