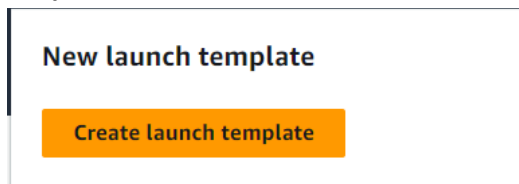


## Assignment 11: Build Scaling plans in AWS that balance the load on different EC2 instances.

### 1. Creating a launch template

a. In the left panel, under instances, go to **Launch Templates** option and click on **Create launch template**.



b. Give the name and description of the template and select the checkbox. Under **Application and OS Images** under **Quick Start** select **UBUNTU**, under **Instance type** select **t2.micro**, and create a key pair.

**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*

Ishika

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

Template version description

this is a template for my App

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

**Quick Start**

Amazon Linux macOS **Ubuntu** Windows Red Hat

Amazon Machine Image (AMI)

Ubuntu Server 22.04 LTS (HVM), SSD Volume Type

ami-007855ac798b5175e (64-bit (x86)) / ami-0c6c29c5125214c77 (64-bit (Arm))

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

Free tier eligible

Description

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

Architecture AMI ID

64-bit (x86) ami-007855ac798b5175e **Verified provider**

▼ **Instance type** [Info](#) [Advanced](#)

Instance type

t2.micro

Family: t2 1 vCPU 1 GiB Memory Current generation: true

Free tier eligible

On-Demand Windows pricing: 0.0162 USD per Hour

On-Demand SUSE pricing: 0.0116 USD per Hour

On-Demand RHEL pricing: 0.0716 USD per Hour

On-Demand Linux pricing: 0.0116 USD per Hour

► All generations [Compare instance types](#)

c. Under **Network Settings**, select the **security group** created before.

▼ **Network settings** [Info](#)

Subnet [Info](#)

Don't include in launch template

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

ishika sg-0600feefc12afceba X

VPC: vpc-0578cd21c70e5f11f

► Advanced network configuration

d. Go to **Advanced details** and in user data write the required data/commands.

- #!/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 https://github.com/ishika-ghosh/awsproject.git
- cd repo awsproject
- npm install
- node index.js

(Before creating the Template make the required GitHub repo public)

User data - *optional* [Info](#)

Enter user data in the field.

```
#!/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 https://github.com/ishika-ghosh/awsproject.git
cd awsproject
npm install
node index.js
```

- e. Create the template.

## 2. Creating Auto Scaling Group

- a. In the left panel, under **Auto Scaling**, go to **Auto Scaling Groups**. Click on **Create Auto Scaling Group**.

### Create Auto Scaling group

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

Create Auto Scaling group

- b. Give Name of the auto scaling group, select the launch template created and select version as **Latest(1)**. Click on **Next**.

Name

Auto Scaling group name
Enter a name to identify the group.

momsco

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

Launch template
Info

Switch to launch configuration

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.

Ishika

Create a launch template

Version

Latest (1)

Create a launch template version

- c. Choose all the **Availability zones** and **subnets** and go to next page.

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-0578cd21c70e5f11f
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-060bf7582ed657ab4
172.31.0.0/20
Default

us-east-1b | subnet-04369055cb8585ef4
172.31.80.0/20
Default

us-east-1c | subnet-0b03b483bd3bfcc23
172.31.16.0/20
Default

us-east-1d | subnet-03703c7970523e39f
172.31.32.0/20
Default

us-east-1e | subnet-0fbd11ffb94136bd8
172.31.48.0/20
Default

us-east-1f | subnet-00a914f3d0ea865d5
172.31.64.0/20
Default

Create a subnet

- d. Select **Attach to a new load balancer**. Choose Load balancer schema as **Internet-facing**.

### 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.

#### Load balancer scheme

Scheme cannot be changed after the load balancer is created.

☐ Internal

☒ Internet-facing

- e. In **Listeners and routing** give **Port** as **4000** and for **default routing** select **Create a target group** and click the target group showing. Click on **next**.

#### Listeners and routing

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

Protocol	Port	Default routing (forward to)
HTTP	4000	Create a target group ▼
New target group name		
An instance target group with default settings will be created.		
momsco-1		

- f. In **Group Size** give the **Desired**, **Minimum** and **Maximum** capacity as **2,2 and 3** respectively.
- g. In **Scaling policies** select **Target tracking scaling policy**. Select **Target value** as **50** and set Instances need **300 seconds warmup**.

### Group size - optional [Info](#)

Specify the size of the Auto Scaling group b maximum capacity limits. Your desired capa

Desired capacity

Minimum capacity

Maximum capacity

### 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

Scaling policy name

Metric type

Target value

Instances need

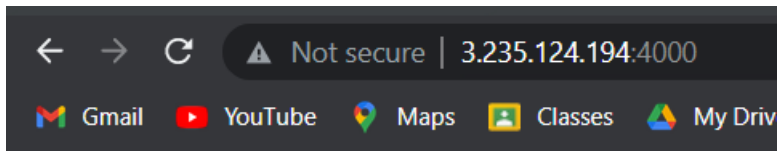
 seconds warm up before including in metric
 

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

- h. Go clicking on Next and create auto scaling group. **Auto scaling group created**.

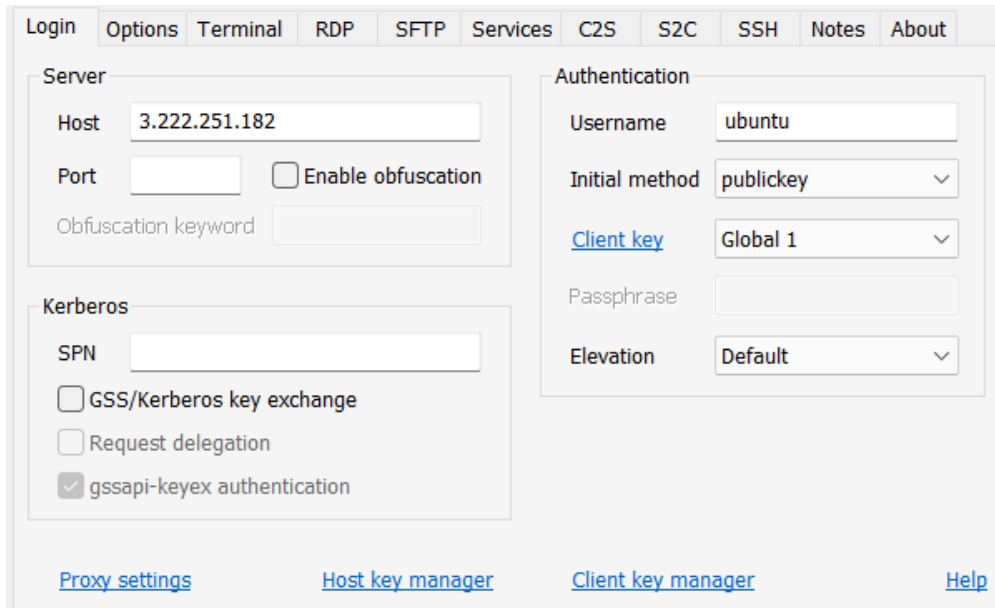
### Auto Scaling groups (1/1) [Info](#)



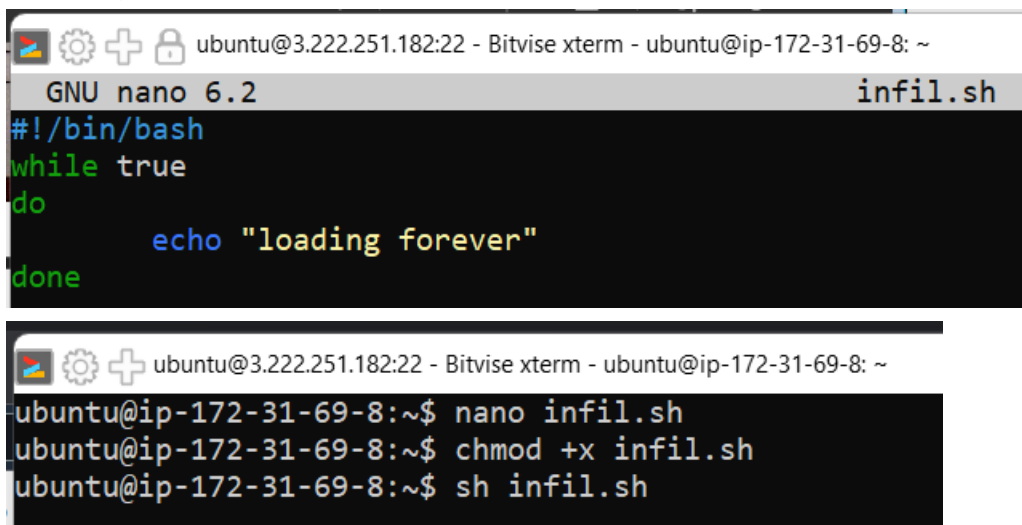


Hello from MCKVIE

7. Open **Bitwise SSH Client** and connect a running instance.



8. Login and open a new terminal console. Write an infinite loop code save and necessary permission (**chmod +x infil.sh**) and execute it.



9. The server running the infinite loop will be overloaded and new instance will be created.
10. Selecting the 3 running instances, go to **Monitoring** section and enlarge the **CPU Utilization** section. Go to **custom** and select the **local time zone**. We can see new instance is created when one of the servers crossed 50% and the performance of these instances.



## Assignment 12: Deploy and run the project in AWS without using Port.

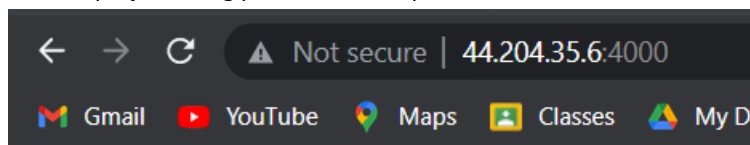
1. Create an **EC2 instance** with **Ubuntu OS** and the **security Group** created before. In Advanced details type the following in user data field.

- `#!/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 repo link`
- `cd repo name`
- `npm install`
- `node index.js`

create the instance.

Instance summary for i-0a569ee0ba27d00db (ishika) <a href="#">Info</a>	
Updated less than a minute ago	
Instance ID i-0a569ee0ba27d00db (ishika)	Public IPv4 address 44.212.4.158   <a href="#">open address</a>
IPv6 address -	Instance state <span>Running</span>
Hostname type IP name: ip-172-31-95-6.ec2.internal	Private IP DNS name (IPv4 only) ip-172-31-95-6.ec2.internal
Answer private resource DNS name IPv4 (A)	Instance type t2.micro
Auto-assigned IP address 44.212.4.158 [Public IP]	VPC ID vpc-0578cd21c70e5f11f
IAM Role -	Subnet ID subnet-04369055cb8585ef4
IMDSv2 Optional	

2. Run the project using public IPv4 and port 4000.



3. Connect to the instance using Bitvise SSH Client and open new terminal console.
4. Go to the directory `cd /etc/nginx/sites-available` and open the default file using command `:sudo nano default`.

```
ubuntu@44.204.35.6:22 - Bitvise xterm - ubuntu@ip-172-31-85-139: /etc/nginx/sites-available
ubuntu@ip-172-31-85-139:/$ cd /etc/nginx/sites-available
ubuntu@ip-172-31-85-139:/etc/nginx/sites-available$ sudo nano default
ubuntu@ip-172-31-85-139:/etc/nginx/sites-available$ sudo systemctl restart nginx
ubuntu@ip-172-31-85-139:/etc/nginx/sites-available$
```

5. Comment the existing location part of the code and write the given code in that place.

```
location / {
    proxy_pass http://localhost:4000;
    proxy_http_version 1.1;
    proxy_set_header Upgrade $http_upgrade;
```



```
proxy_set_header Connection 'Upgrade';

proxy_set_header Host $host;

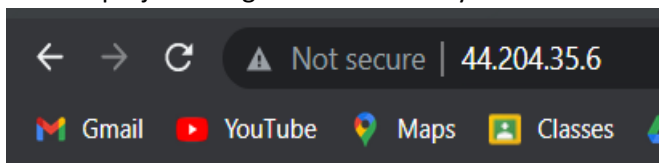
proxy_cache_bypass $http_upgrade;

}
```

6. Save and close the file.

```
#         location / {
#             # First attempt to serve request as file, then
#             # as directory, then fall back to displaying a 404.
#             try_files $uri $uri/ =404;
#         }
location / {
    proxy_pass http://localhost:4000;
    proxy_http_version 1.1;
    proxy_set_header Upgrade $http_upgrade;
    proxy_set_header Connection 'Upgrade';
    proxy_set_header Host $host;
    proxy_cache_bypass $http_upgrade;
}
```

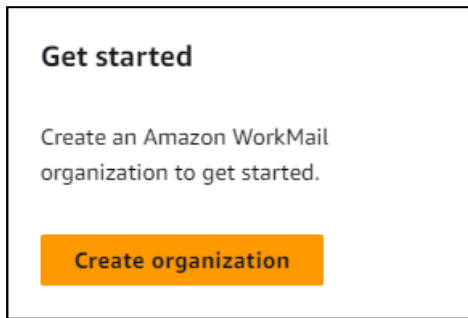
7. Type the command to restart nginx : **sudo systemctl restart nginx**
8. Run the project using IPv4 address only.



Hello from MCKVIE

## Assignment 13: Create a work-mail for your organization

1. Go to **Amazon Workmail** service and click on **Create Organization**.



2. Select **Free test domain** and give an **alias** for your organization. Then click **Create Organization**.

### Create an Amazon WorkMail organization

Create an Amazon WorkMail organization to provide email addresses to groups of users in your company. The email addresses include the domains that you select for your organization.

#### Organization settings

Email domain [Info](#)

Select the domain to use for email addresses in your organization.

☐ Existing Route 53 domain

Select a domain name that you manage with a Route 53 hosted zone.

☐ New Route 53 domain

Register a new Route 53 domain name to use with Amazon WorkMail.

☐ External domain

Enter a domain name that you manage with an external DNS provider.

☒ Free test domain

Use a free testing domain provided by Amazon WorkMail. You can add a domain later.

Alias [Info](#)

Enter the alias to use for your organization.

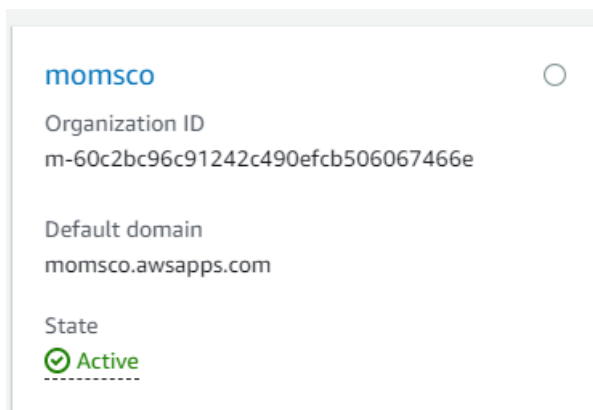
Your alias can have up to 45 characters. Aliases can only include lowercase letters (a-z), numbers (0-9), and dashes (-).

This determines the login URL for the web application: momscsco.awsapps.com/mail

► Advanced settings

Cancel

Create organization



- Go inside the organization and in the left panel go to Users and click on create user (create at least two users).

### Create a user [Info](#)

Add a user to your Amazon WorkMail organization.

#### User details

**User name**  
The user name enables the user to login to the Amazon WorkMail webmail.

User name can only contain the following characters: a-z, A-Z, 0-9, \_ (underscore), - (hyphen) and @.

**First name - optional**

**Last name - optional**

**Display name**  
The name by which the user is presented in the system.

#### Email setup

**Email address**  
Primary email address to be used for this user.

@

**Password**  
Password for the user to log in with.

Passwords have an 8-character minimum with at least one character from three of these four categories: lowercase, uppercase, numeric, and special characters.

**Repeat password**

[Cancel](#) [Create user](#)

**Users (2)** [Info](#)

[Refresh](#) [Delete](#) [Disable](#) [Enable](#) [Reset password](#) [Create user](#)

< 1 >

<input type="checkbox"/>	Display name	User name	Primary email address	State
<input type="checkbox"/>	shibangi karmarkar	shibu	shibu@momsco.awsapps.com	✔ Enabled
<input type="checkbox"/>	Archisman Das	Archi	archi@momsco.awsapps.com	✔ Enabled

- Then go back to the organization and open the Amazon WorkMail web application.

momsco

Organization details [Info](#)

Organization ID

m-60c2bc96c91242c490efcb506067466e

ARN

arn:aws:workmail:us-east-1:369058721118:organization/m-60c2bc96c91242c490efcb506067466e

State

Active

Date created

May 02, 2023 at 23:34 (UTC+5:30)

Default domain [Info](#)

momsco.awsapps.com

Directory type

WorkMail directory

Directory ID

d-906795a2b6

User login

Desktop or mobile apps

[WorkMail documentation for setting up email clients](#)

Amazon WorkMail web application

<https://momsco.awsapps.com/mail>

- Authenticate with the username and password of the created user. And sign in.



Please log in with your momsco credentials

Username (not email address)

shibu

☐ Remember username

Password

••••••••

Sign In

By continuing, you agree to the [AWS Customer Agreement](#) or other agreement for AWS services, and the [Privacy Notice](#). This site uses essential cookies. See our [Cookie Notice](#) for more information.

- Now from your gmail account send a mail to the created user's email of your organization. You will receive in the workmail

Draft saved

shibu@momsco.awsapps.com

test

This is a test email.

Send

Inbox

Search globally		<div></div>	<div>1 of 1</div>
From	Received		
<div><div></div><div>Ishika Ghosh</div><div>test</div></div>	Today, 11:45 pm		