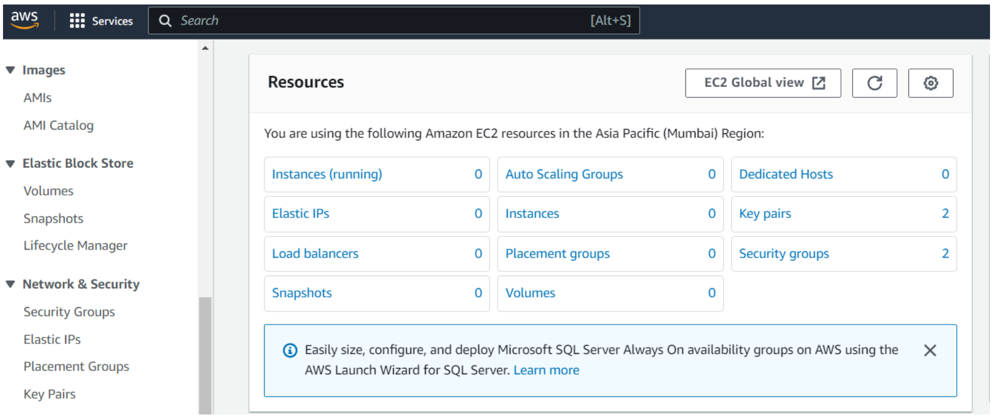
ASSIGNMENT – 10

Problem Statement: Deploy project from GitHub to EC2 by creating new security group and user data.

Procedure:

1. Sign in to your AWS account.
2. Go to your EC2 dashboard
3. Scroll down and Click on Security Groups option on the left side nav bar under Network & Security option.



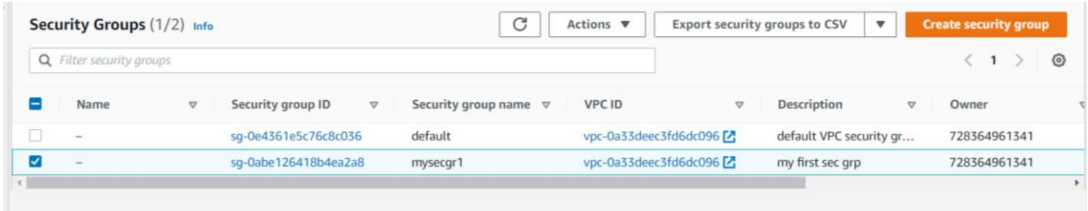
Resources

You are using the following Amazon EC2 resources in the Asia Pacific (Mumbai) Region:

Instances (running)	0	Auto Scaling Groups	0	Dedicated Hosts	0
Elastic IPs	0	Instances	0	Key pairs	2
Load balancers	0	Placement groups	0	Security groups	2
Snapshots	0	Volumes	0		

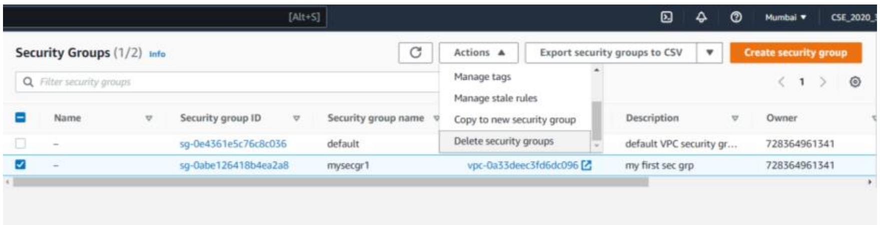
Easily size, configure, and deploy Microsoft SQL Server Always On availability groups on AWS using the AWS Launch Wizard for SQL Server. Learn more

4. Select all the Security Groups other than the one named "default".



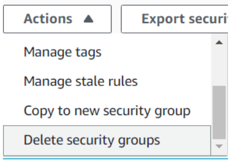
☐	Name	Security group ID	Security group name	VPC ID	Description	Owner
☐	–	sg-0e4361e5c76c8c036	default	vpc-0a33deec3fd6dc096	default VPC security gr...	728364961341
☑	–	sg-0abe126418b4ea2a8	mysecgr1	vpc-0a33deec3fd6dc096	my first sec grp	728364961341

5. Then Click on the Actions button.

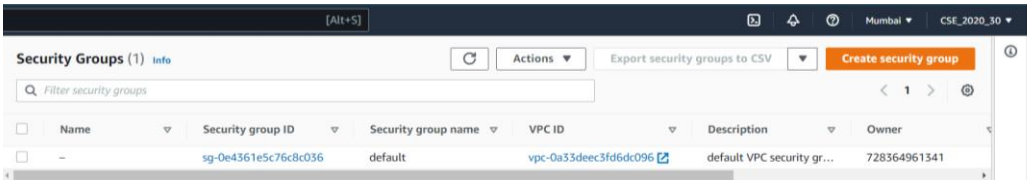


☐	Name	Security group ID	Security group name	VPC ID	Description	Owner
☐	–	sg-0e4361e5c76c8c036	default		default VPC security gr...	728364961341
☑	–	sg-0abe126418b4ea2a8	mysecgr1	vpc-0a33deec3fd6dc096	my first sec grp	728364961341

6. Scroll-Down the dropdown list until you find the "delete all security groups" option. Click on it.

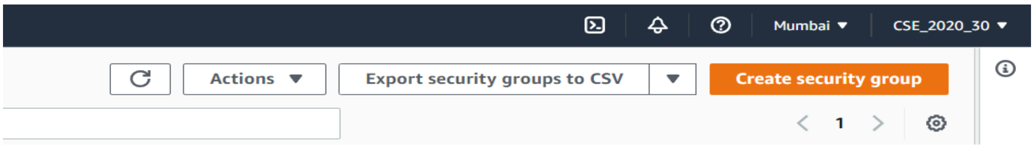


7. Now only the "default" security group remains and we keep it that way.

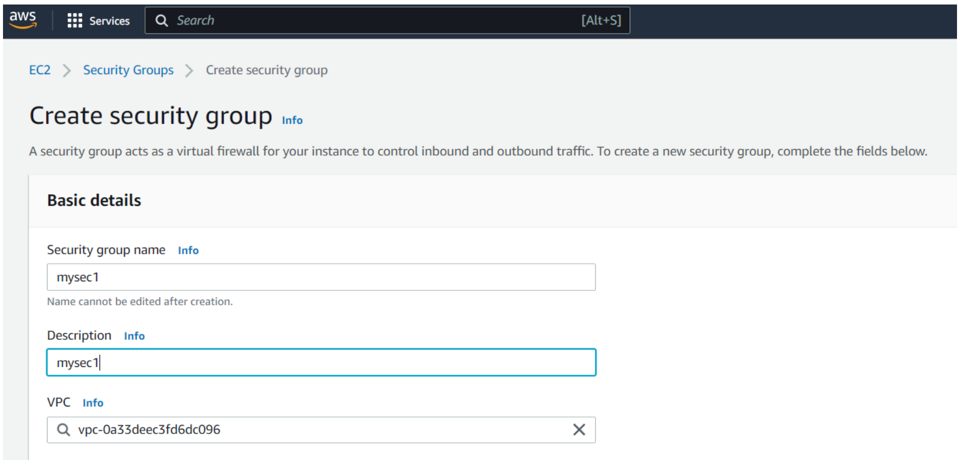


☐	Name	Security group ID	Security group name	VPC ID	Description	Owner
☐	–	sg-0e4361e5c76c8c036	default	vpc-0a33deec3fd6dc096	default VPC security gr...	728364961341

8. Now click on the "Create Security Group" button.



9. Now start by giving a name to the security group and giving its description (anything). Let the VPC remain unchanged.



EC2 > Security Groups > Create security group

Create security group Info

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security group, complete the fields below.

Basic details

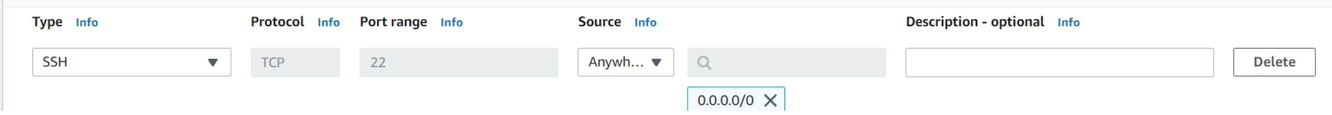
Security group name Info
mysec1
Name cannot be edited after creation.

Description Info
mysec1

VPC Info
vpc-0a33deec3fd6dc096

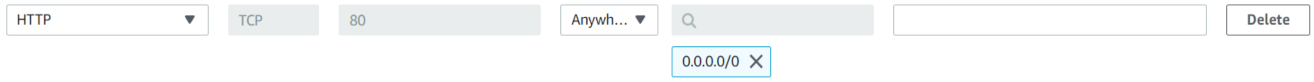
10. Next, we will add Inbound Rules. Start adding by clicking the Add rule button. These include:

a) SSH



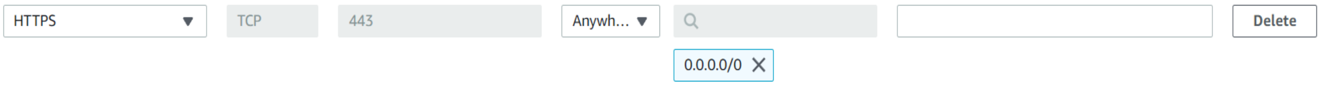
Type Info	Protocol Info	Port range Info	Source Info		Description - optional Info	
SSH	TCP	22	Anywh...	0.0.0.0/0		Delete

b) HTTP



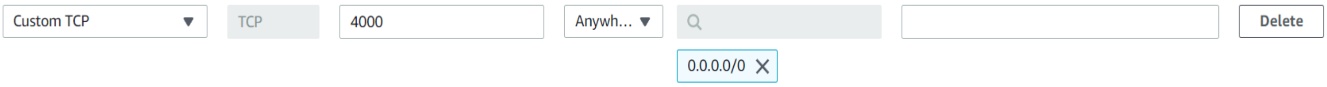
HTTP	TCP	80	Anywh...	0.0.0.0/0		Delete

c) HTTPS



HTTPS	TCP	443	Anywh...	0.0.0.0/0		Delete

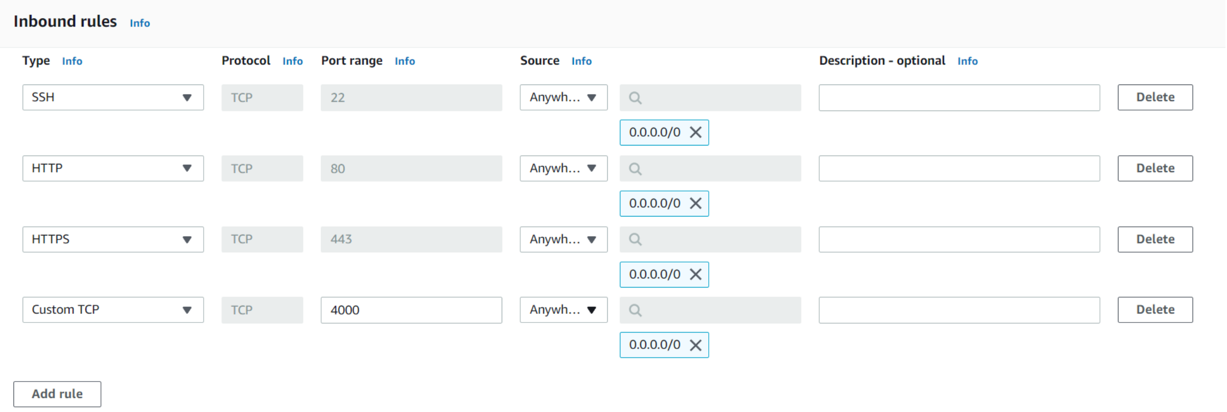
d) Custom TCP



Custom TCP	TCP	4000	Anywh...	0.0.0.0/0		Delete

The last one with custom TCP has a specific port range that we require to connect to our project. It has been specified in our index.js file (refer Ass9).

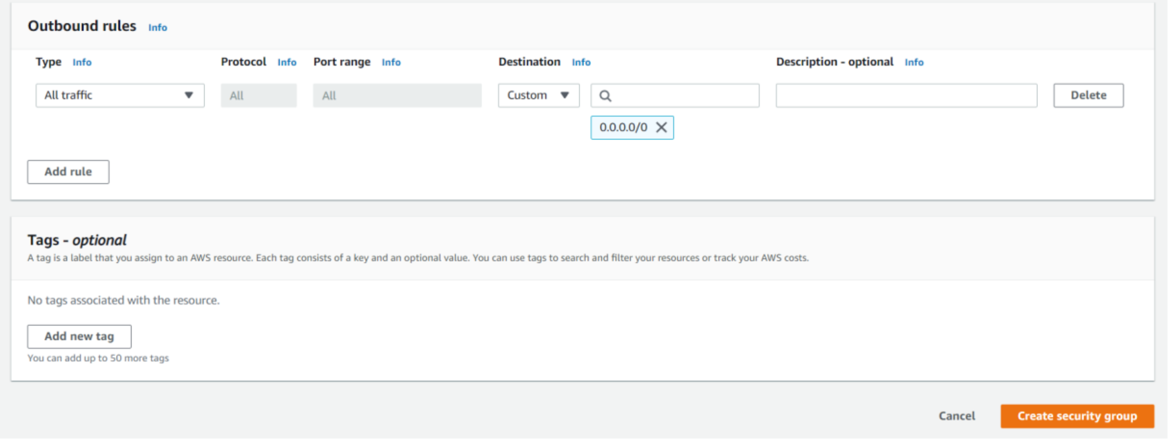
Now the final Inbound Rules section should look like this.



Inbound rules Info

Type Info	Protocol Info	Port range Info	Source Info		Description - optional Info	
SSH	TCP	22	Anywh...	0.0.0.0/0		Delete
HTTP	TCP	80	Anywh...	0.0.0.0/0		Delete
HTTPS	TCP	443	Anywh...	0.0.0.0/0		Delete
Custom TCP	TCP	4000	Anywh...	0.0.0.0/0		Delete

11. Next outbound rules and all other sections remain unchanged. Now Click on the create security group button.



Outbound rules Info

Type Info	Protocol Info	Port range Info	Destination Info		Description - optional Info	
All traffic	All	All	Custom	0.0.0.0/0		Delete

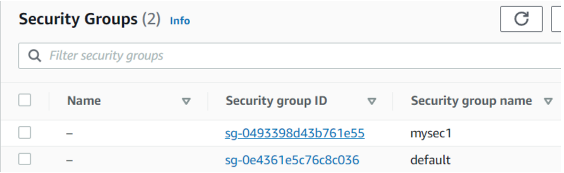
Tags - *optional*

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

No tags associated with the resource.

You can add up to 50 more tags

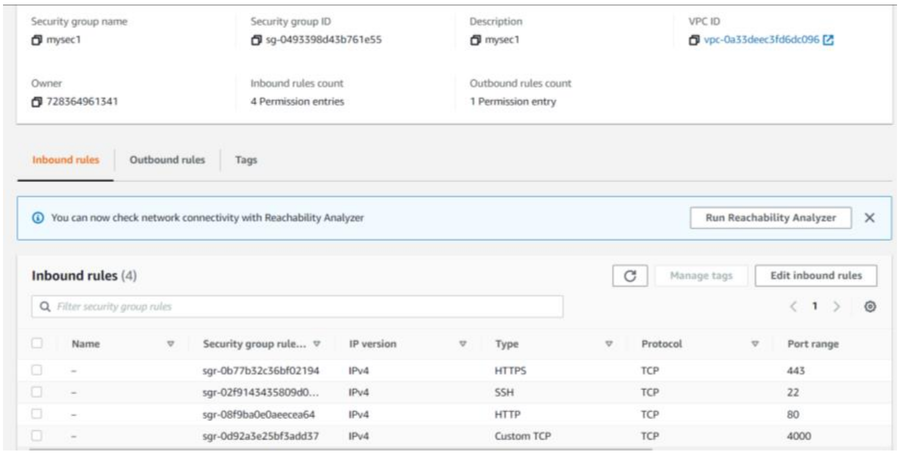
12. Now go back to the security groups list and click on the security group ID of the newly created Security Group.



Security Groups (2) Info

Filter security groups

□	Name	Security group ID	Security group name
□	–	sg-0493398d43b761e55	mysec1
□	–	sg-0e4361e5c76c8c036	default



Security group name	Security group ID	Description	VPC ID
mysec1	sg-0493398d43b761e55	mysec1	vpc-0a33deec3fd6dc096

Owner	Inbound rules count	Outbound rules count
728364961341	4 Permission entries	1 Permission entry

You can now check network connectivity with Reachability Analyzer

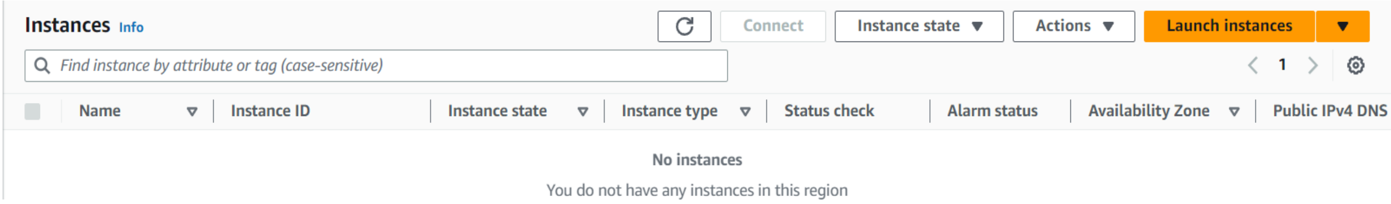
Inbound rules (4)

Filter security group rules

□	Name	Security group rule...	IP version	Type	Protocol	Port range
□	-	sgr-0b77b32c36bf02194	IPv4	HTTPS	TCP	443
□	-	sgr-02f9143435809d0...	IPv4	SSH	TCP	22
□	-	sgr-08f9ba0e0aeecea64	IPv4	HTTP	TCP	80
□	-	sgr-0d92a3e25bf3add37	IPv4	Custom TCP	TCP	4000

After clicking we can view the inbound rules that we added during its creation.

13. Now we go to the instances section from the left side nav bar.
14. Now we Create a new EC2 instance. Click on the Launch Instance button.



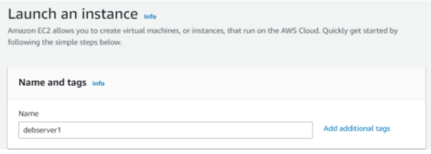
□	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS

No instances

You do not have any instances in this region

Now,

a) Give the name



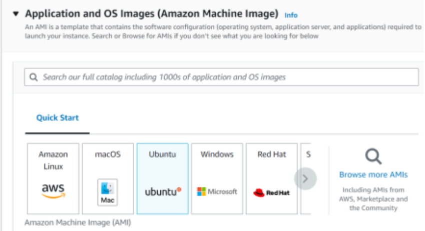
Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name: debserver1

b) Select Ubuntu as OS.

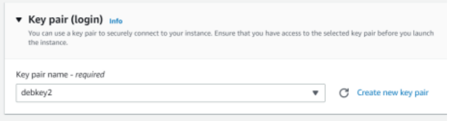


▼ Application and OS Images (Amazon Machine Image) Info

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

Search our full catalog including 1000s of application and OS images
Quick Start
Amazon Linux
aws
macOS
Mac
Ubuntu
ubuntu
Windows
Microsoft
Red Hat
Red Hat
S
Browse more AMIs
Including AMIs from AWS, Marketplace and the Community
Amazon Machine Image (AMI)

c) Select a keypair or generate a new one if none is available.

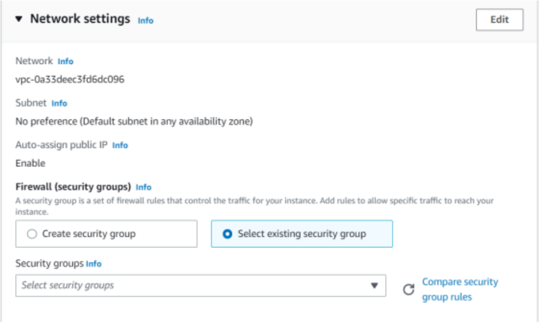


▼ Key pair (login) Info

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 - *required*: debkey2

d) Then under Network settings select the Select Existing Security Group option.



▼ Network settings Info

Network: vpc-0a33deec3fd6dc096

Subnet: No preference (Default subnet in any availability zone)

Auto-assign public IP: Enable

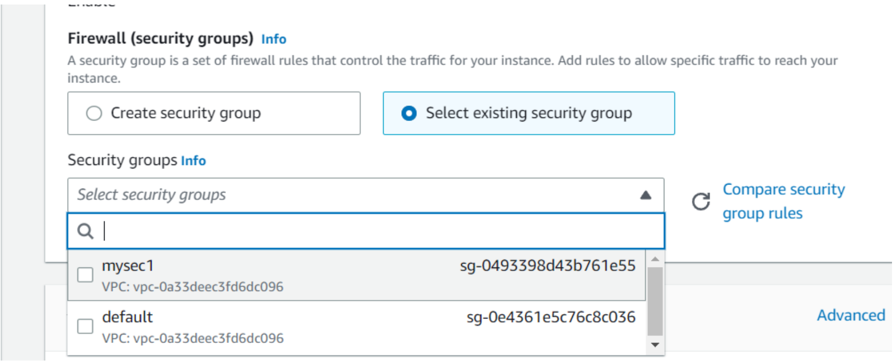
Firewall (security groups) Info

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.

○ Create security group ● Select existing security group

Security groups: Select security groups

e) Now under the security groups dropdown menu select the one we just created.



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.

○ Create security group ● Select existing security group

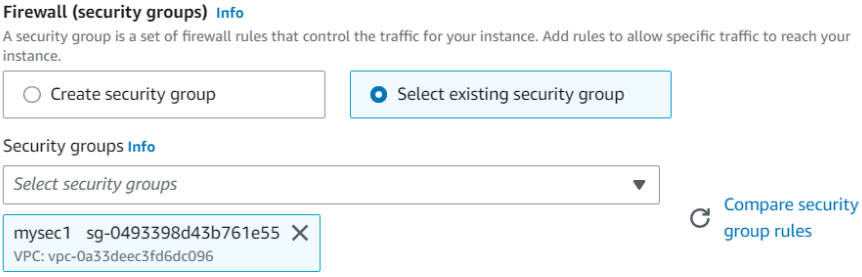
Security groups Info

Select security groups

□ mysec1 sg-0493398d43b761e55
VPC: vpc-0a33deec3fd6dc096

□ default sg-0e4361e5c76c8c036
VPC: vpc-0a33deec3fd6dc096

It should look like this.....



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.

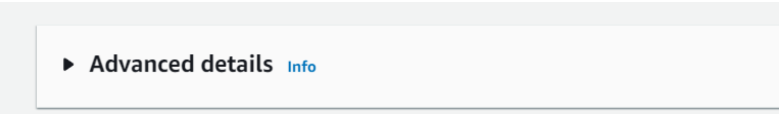
○ Create security group ● Select existing security group

Security groups Info

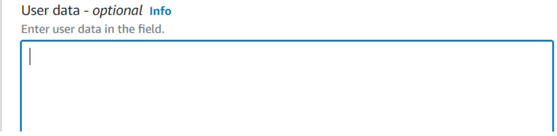
Select security groups

mysec1 sg-0493398d43b761e55 ✕
VPC: vpc-0a33deec3fd6dc096

f) Now scroll down and click on the Advanced Details option.



g) Now again scroll-down to the newly appeared sub-sections until you find User Data section.



User data - *optional* Info

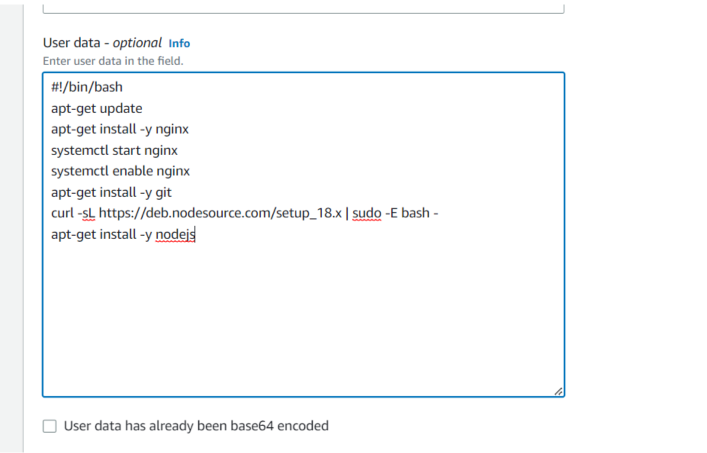
Enter user data in the field.

h) Write the following commands in the given box. Remember this user data is given to execute the given commands once the server starts. So essentially, we can provide all commands that we entered in our Assignment 9 previously and execute them without connecting to our server itself!! They will be executed sequentially.

```
#!/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
```

Now, here is a caveat. We have created a private repository in GitHub. So, whenever we run the git clone command it asks for our username and password. Hence this cannot be executed directly through our User Data instructions. We have to connect manually and enter all commands starting from the git clone command.

i) Now we click on the launch instance button.

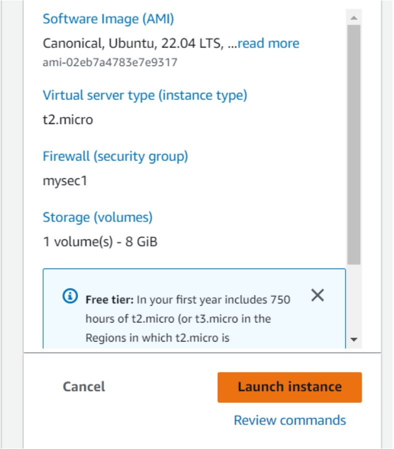


User data - *optional* Info

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
```

□ User data has already been base64 encoded



Software Image (AMI)

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

ami-02eb7a4783e7e9317

Virtual server type (instance type)

t2.micro

Firewall (security group)

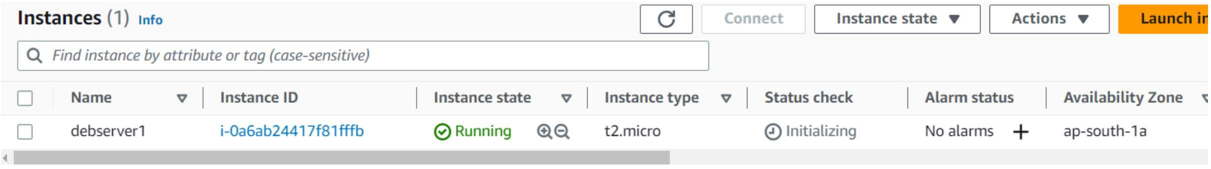
mysec1

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

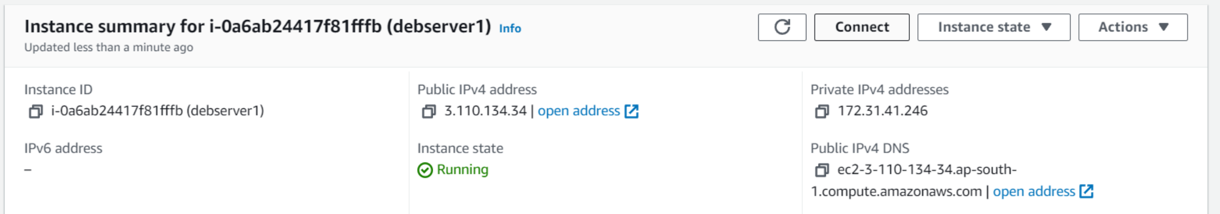
15. Now we Click on the 'Instance Id' link of our newly created server in our Instances list.



Instances (1) Info

□	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
□	debserver1	i-0a6ab24417f81fffb	Running	t2.micro	Initializing	No alarms	ap-south-1a

16. Now click on the connect button



Instance summary for i-0a6ab24417f81fffb (debserver1) Info

Updated less than a minute ago

Instance ID

i-0a6ab24417f81fffb (debserver1)

IPv6 address

–

Public IPv4 address

3.110.134.34 | open address

Instance state

Running

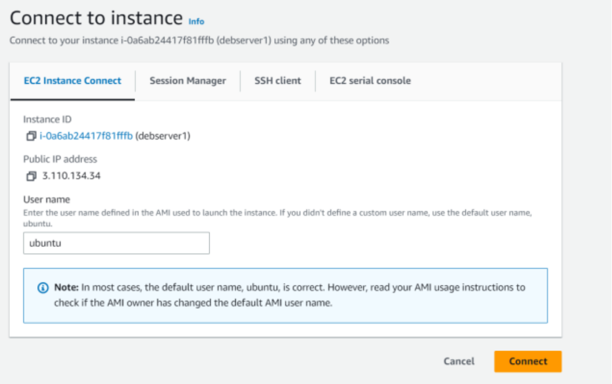
Private IPv4 addresses

172.31.41.246

Public IPv4 DNS

ec2-3-110-134-34.ap-south-1.compute.amazonaws.com | open address

17. Again, click on the connect button



Connect to instance Info

Connect to your instance i-0a6ab24417f81fffb (debserver1) using any of these options

Instance ID

i-0a6ab24417f81fffb (debserver1)

Public IP address

3.110.134.34

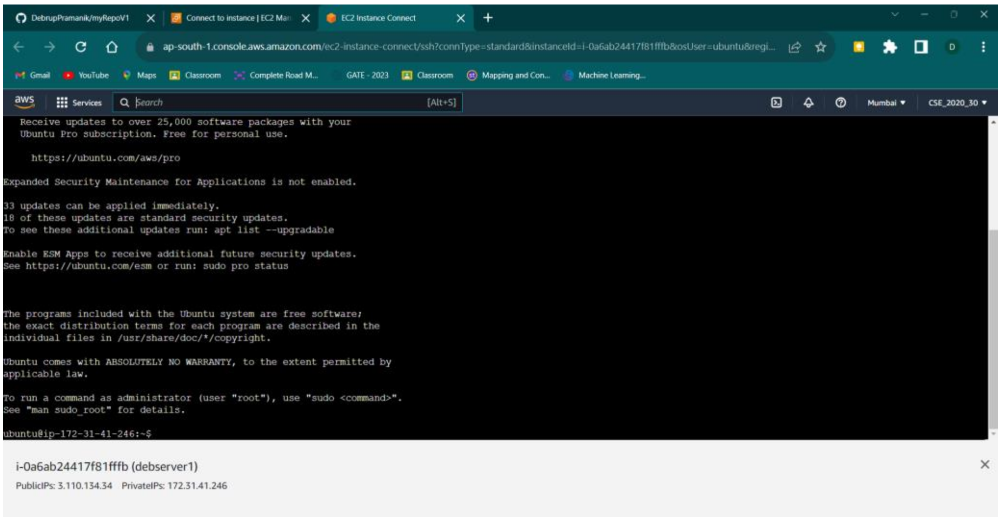
User name

Enter the user name defined in the AMI used to launch the instance. If you didn't define a custom user name, use the default user name, ubuntu.

ubuntu

Note: In most cases, the default user name, ubuntu, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.

18. After this anew Tab will open with a Bash Terminal that is of our remote EC2 server!
    Here we can type all our required commands that we used to type in a similar terminal by connecting to our remote server through our Bitvise SSH client software in our previous assignments.



```
  Receive updates to over 25,000 software packages with your
  Ubuntu Pro subscription. Free for personal use.

    https://ubuntu.com/aws/pro

Expanded Security Maintenance for Applications is not enabled.

33 updates can be applied immediately.
18 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status



The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-41-246:~$
```

i-0a6ab24417f81fffb (debserver1)

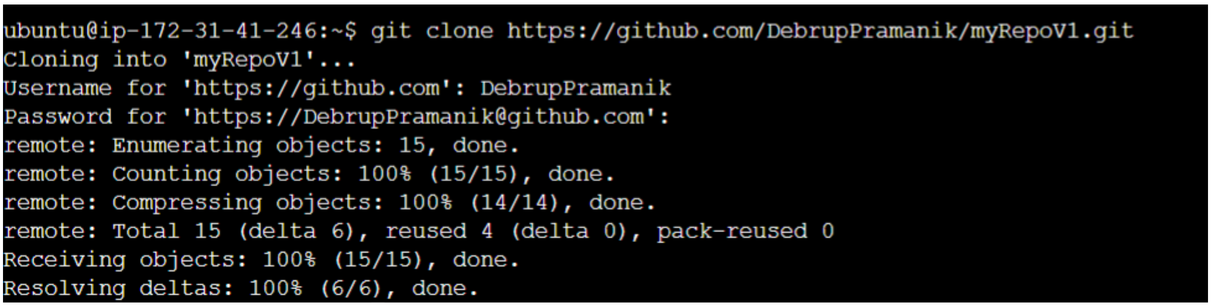
PublicIPs: 3.110.134.34 PrivateIPs: 172.31.41.246

19. Now type the following commands in the terminal:-

- ➔ git clone https://github.com/... //Your GitHub Repository URL

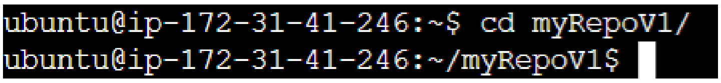
  Give your Username of GitHub when asked.

  Give your account Token when your Password is asked.



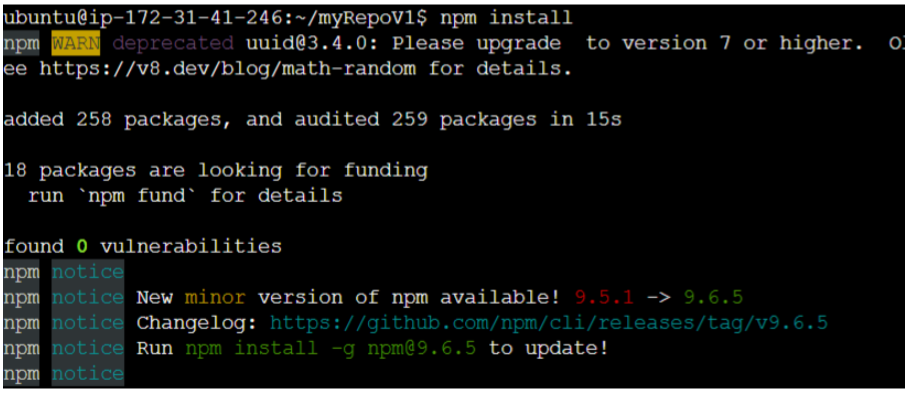
```
ubuntu@ip-172-31-41-246:~$ git clone https://github.com/DebrupPramanik/myRepoV1.git
Cloning into 'myRepoV1'...
Username for 'https://github.com': DebrupPramanik
Password for 'https://DebrupPramanik@github.com':
remote: Enumerating objects: 15, done.
remote: Counting objects: 100% (15/15), done.
remote: Compressing objects: 100% (14/14), done.
remote: Total 15 (delta 6), reused 4 (delta 0), pack-reused 0
Receiving objects: 100% (15/15), done.
Resolving deltas: 100% (6/6), done.
```

- ➔ cd YourRepositoryname/



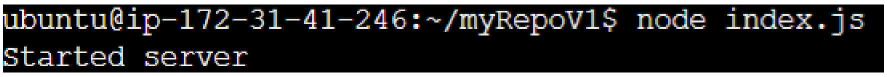
```
ubuntu@ip-172-31-41-246:~$ cd myRepoV1/
ubuntu@ip-172-31-41-246:~/myRepoV1$
```

- ➔ npm install



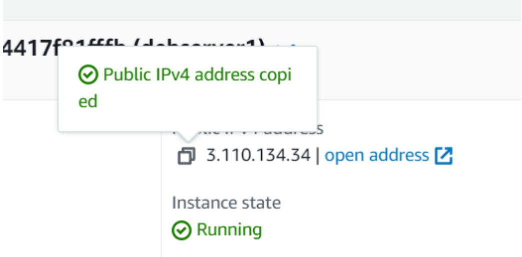
```
ubuntu@ip-172-31-41-246:~/myRepoV1$ npm install
npm WARN deprecated uuid@3.4.0: Please upgrade  to version 7 or higher.  O
ee https://v8.dev/blog/math-random for details.

added 258 packages, and audited 259 packages in 15s

18 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
npm notice
npm notice New minor version of npm available! 9.5.1 -> 9.6.5
npm notice Changelog: https://github.com/npm/cli/releases/tag/v9.6.5
npm notice Run npm install -g npm@9.6.5 to update!
npm notice
```

- ➔ node index.js



```
ubuntu@ip-172-31-41-246:~/myRepoV1$ node index.js
Started server
```

20. Now copy and paste the Public IPv4 address of your EC2 instance in another browser.



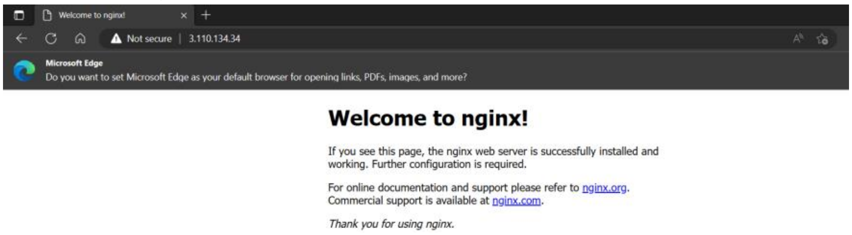
4417f01fffb (debserver1)

Public IPv4 address copied

3.110.134.34 | open address

Instance state

Running



Microsoft Edge

Do you want to set Microsoft Edge as your default browser for opening links, PDFs, images, and more?

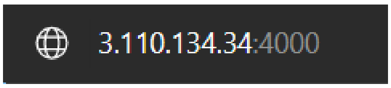
Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

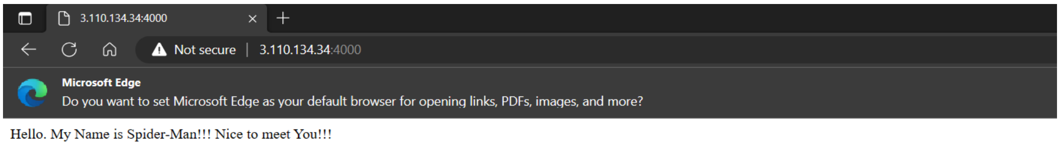
For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

21. Now append the port no. 4000 (for our case) to the IP address in the browser with a ":" sign.



3.110.134.34:4000



Microsoft Edge

Do you want to set Microsoft Edge as your default browser for opening links, PDFs, images, and more?

Hello. My Name is Spider-Man!!! Nice to meet You!!!

We have successfully Deployed a project from GitHub to EC2 by creating a new Security group and User Data.