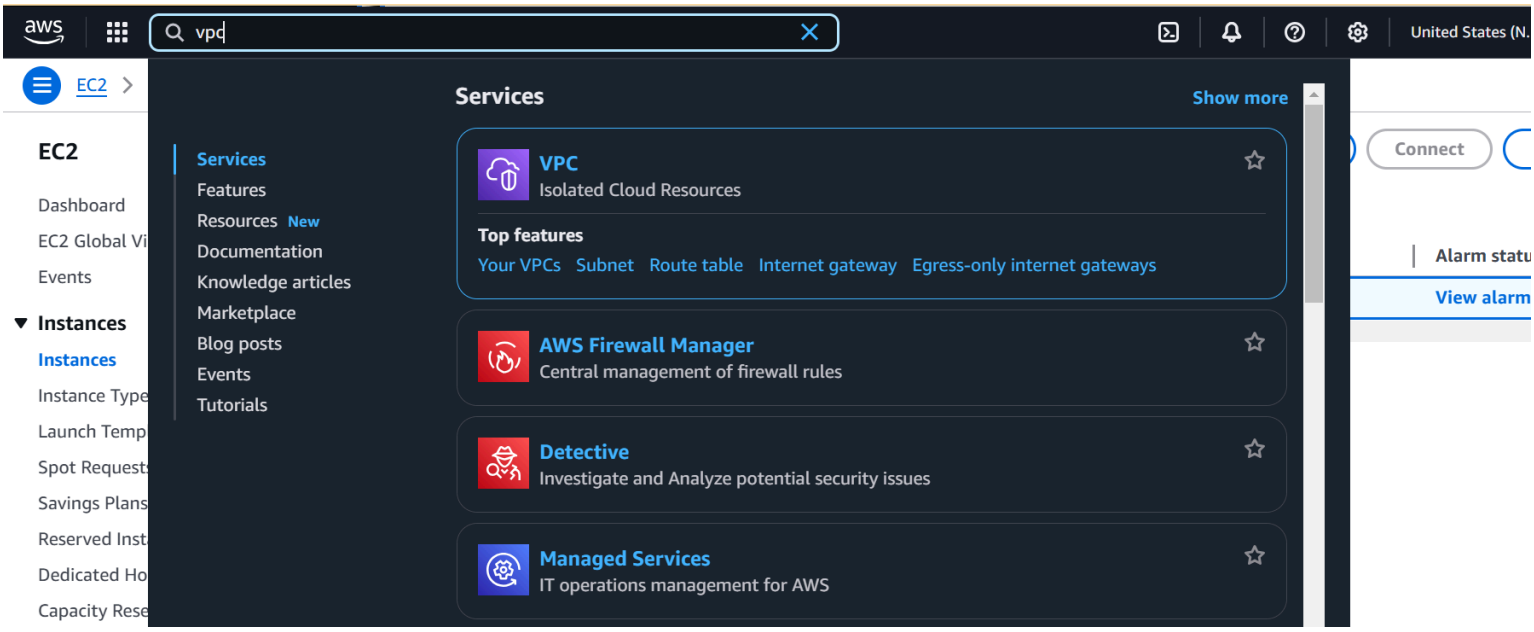
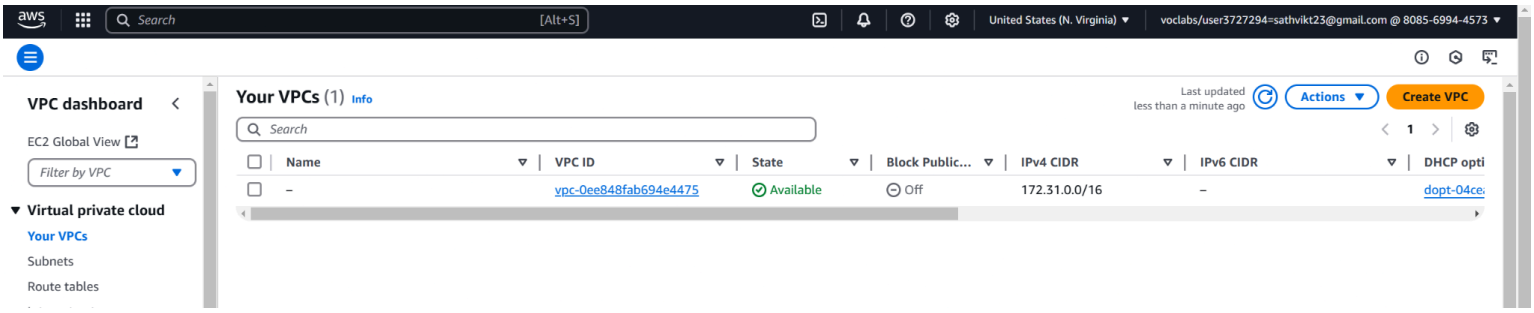
Experiment 5

Creating an **Amazon Virtual Private Cloud (VPC)** that includes a **Bastion Host** for secure access.

Step 1 : Go to the VPC Section in AWS



Step 2 : Click on Create VPC



Step 3 : VPC Setting:

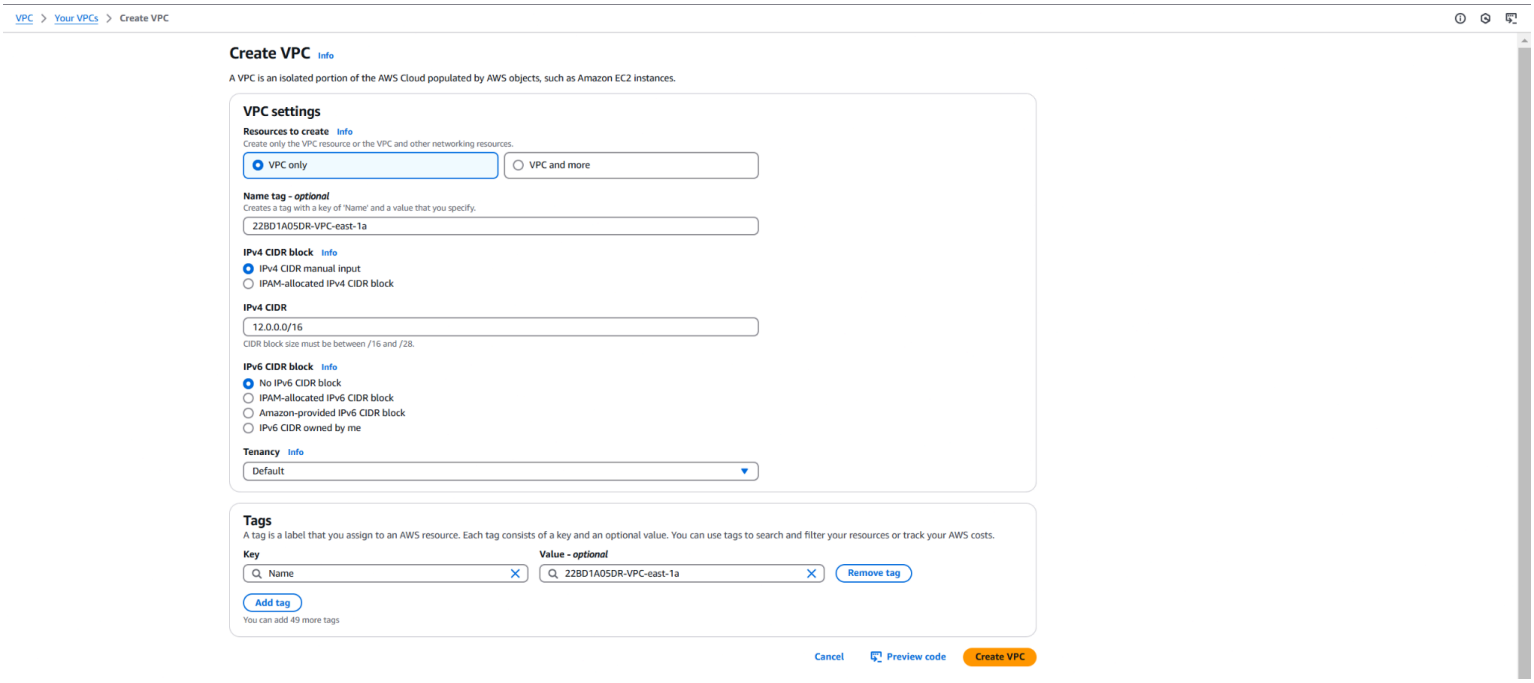
Resources to create: select Resources to create

Name tag - *optional* : Write ur Rollno-VPC

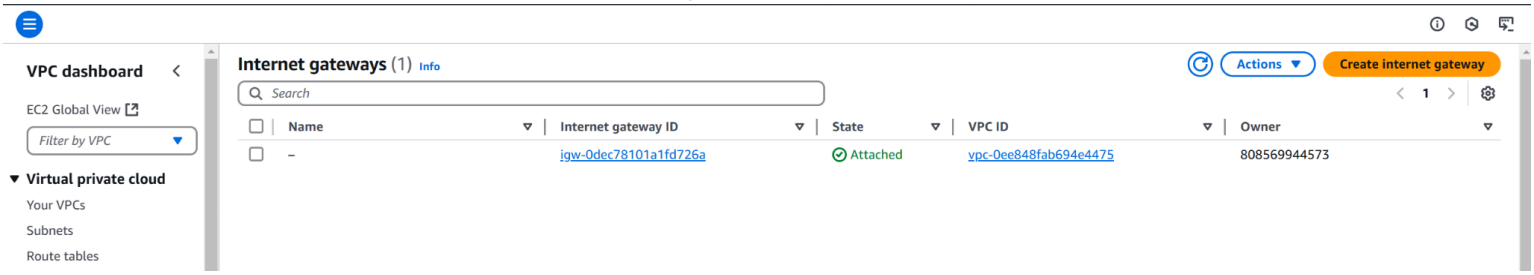
IPv4 CIDR block : IPv4 CIDR manual input

IPv4 CIDR: 12.0.0.0/16
IPv6 CIDR block: No IPv6 CIDR block
Tenancy: Default
Tags: Key : Your Name Value- Rollno-VPC

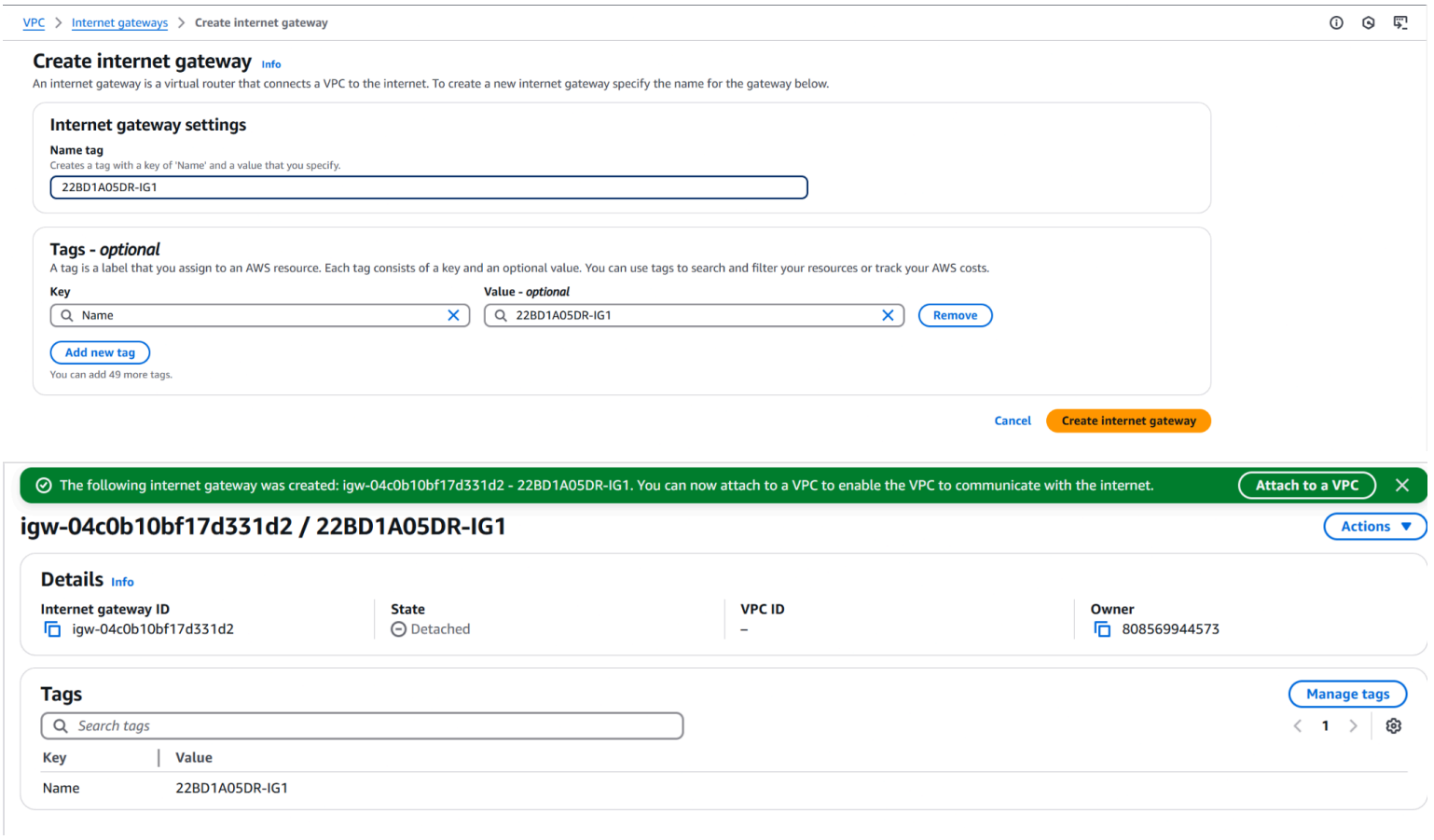
Finally Click Create VPC



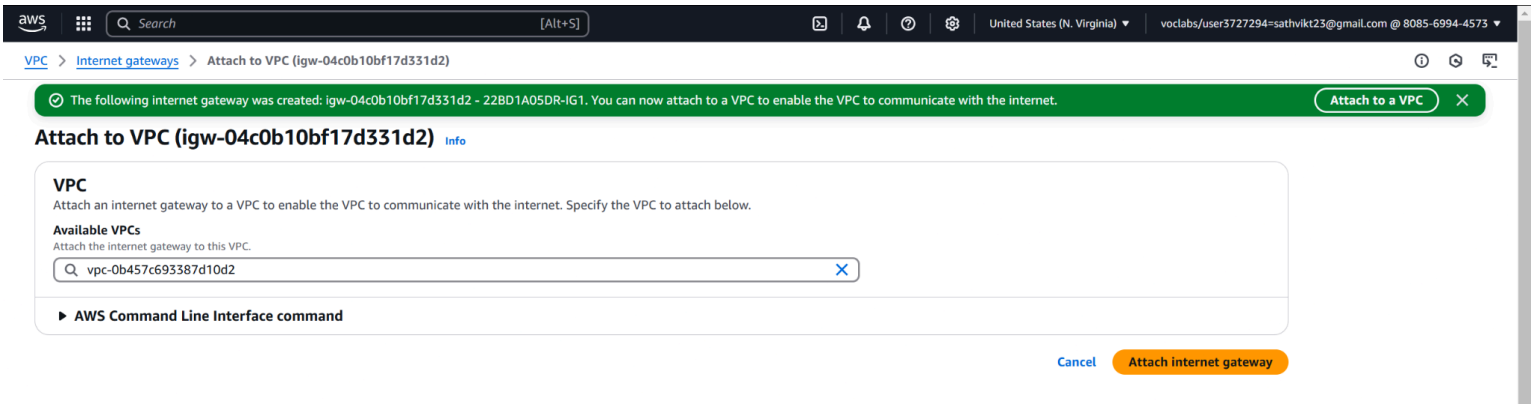
Step 4 : Click on Create Internet GateWays



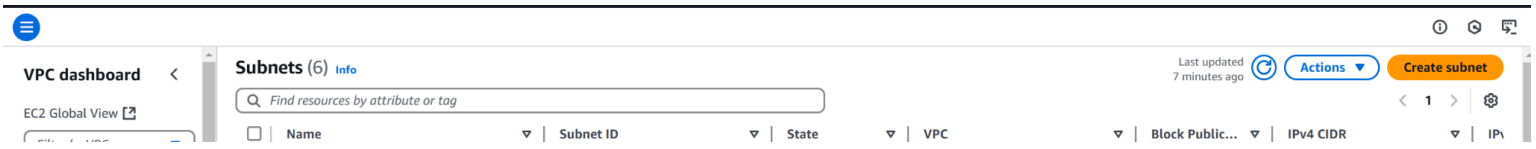
Step 5 : Enter the Name tag details by starting with roll no



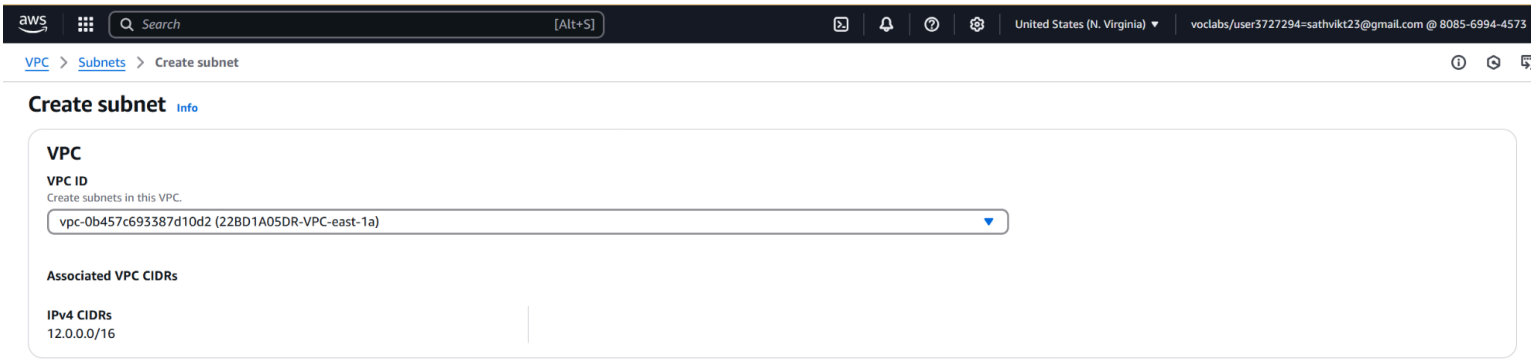
Step 6 : Attach the Internet gateway to the VPC



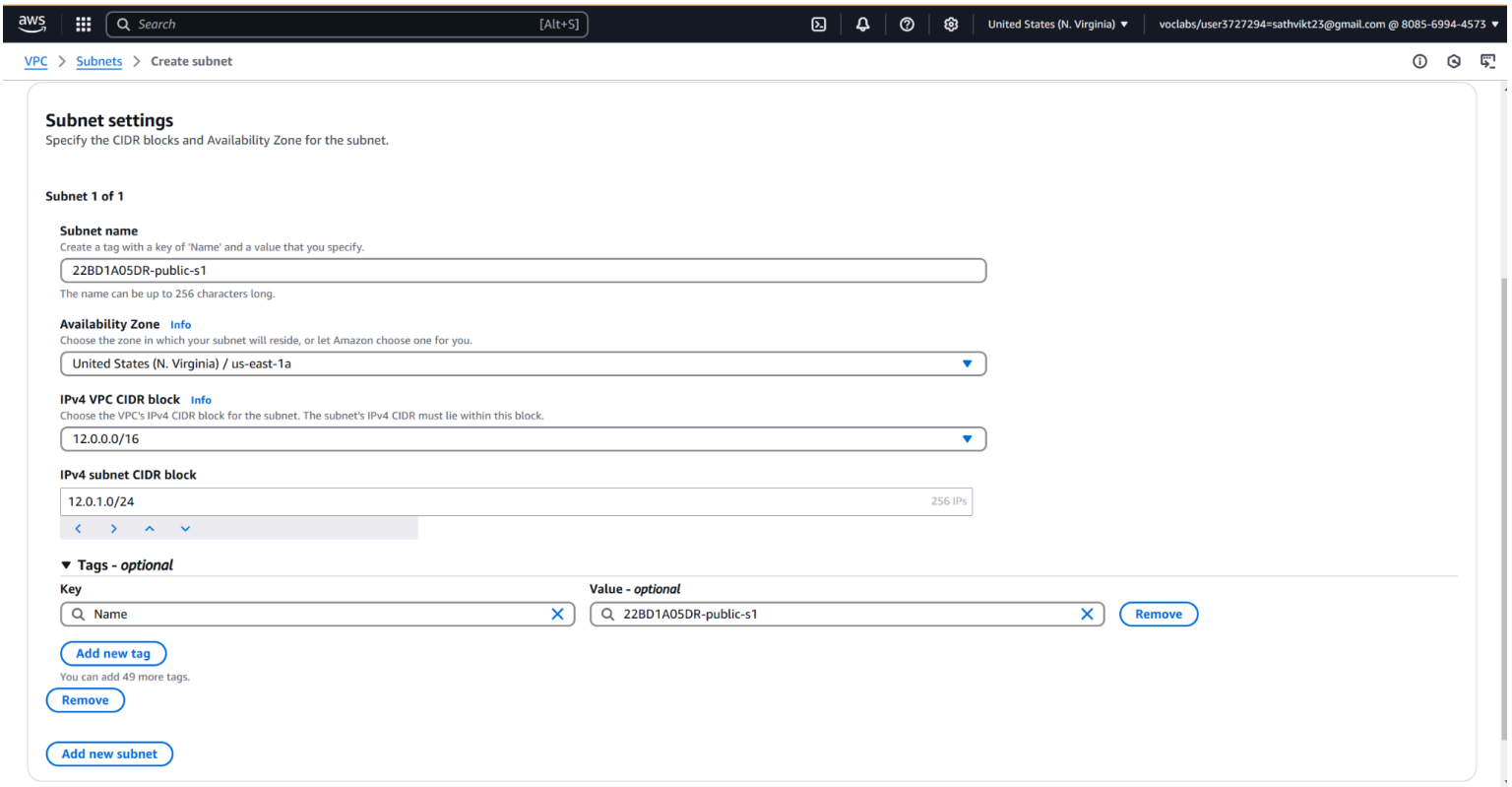
Step 7 : Go to the subnet section and click on create subnets



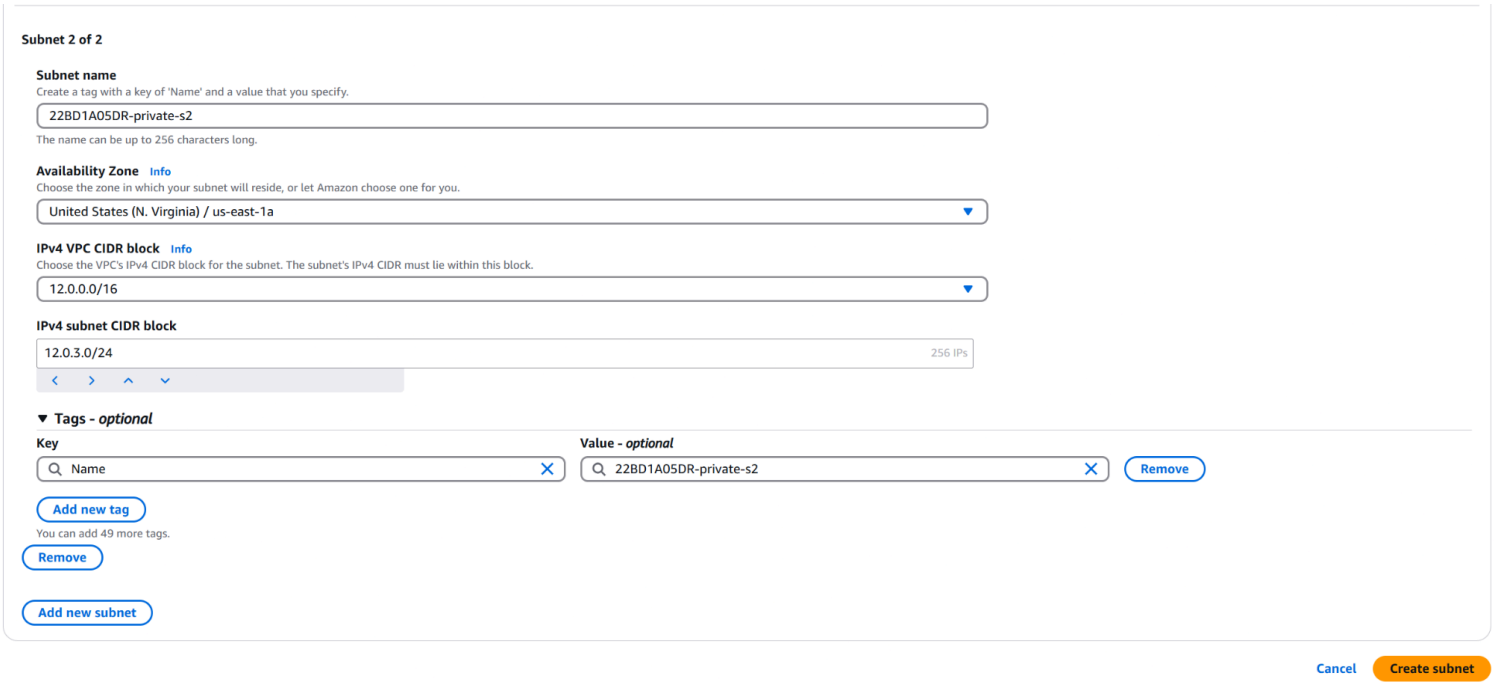
Step 8 : Select the VPC created earlier



Step 9 : Configure subnet 1 IPV4 CIDR block being 12.0.1.0/24

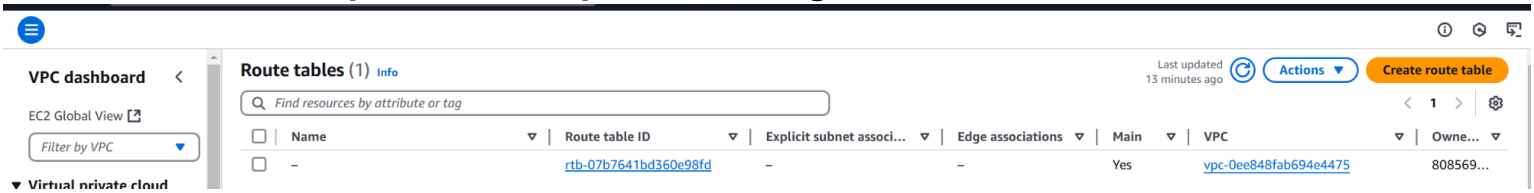


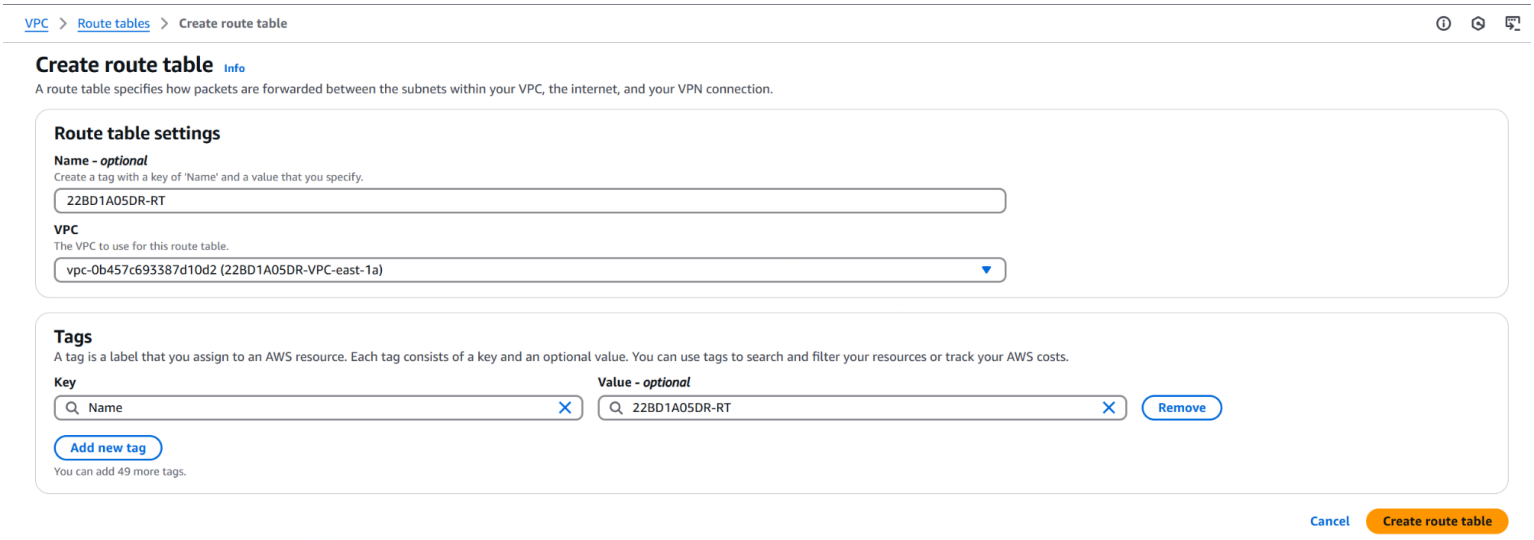
Step 10 Configure Subnet 2 IPV4 CIDR block being 12.0.3.0/24



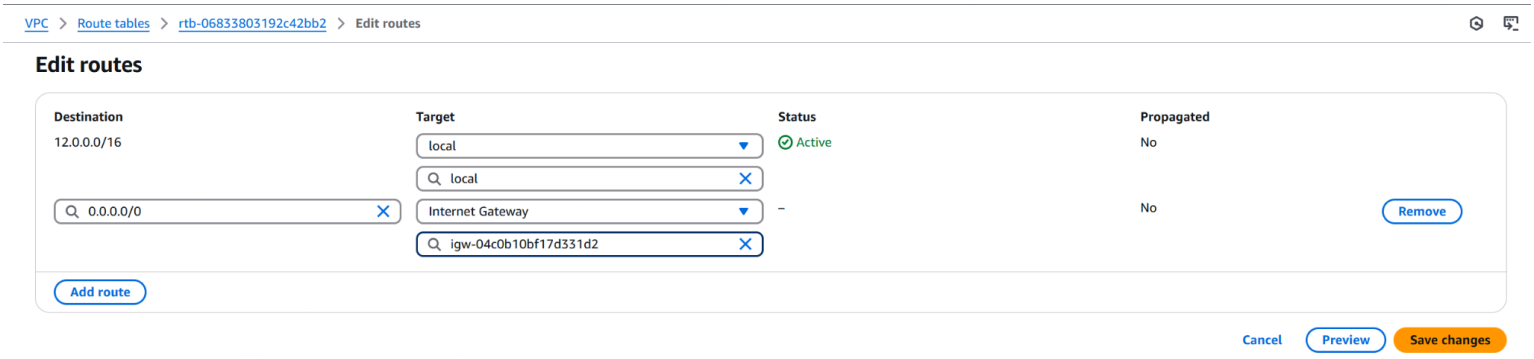
Step 11 : Go to the Route tables section and click on Create route table
Give name to the route table and select the VPC created earlier

***Note : This represents the public routing table**

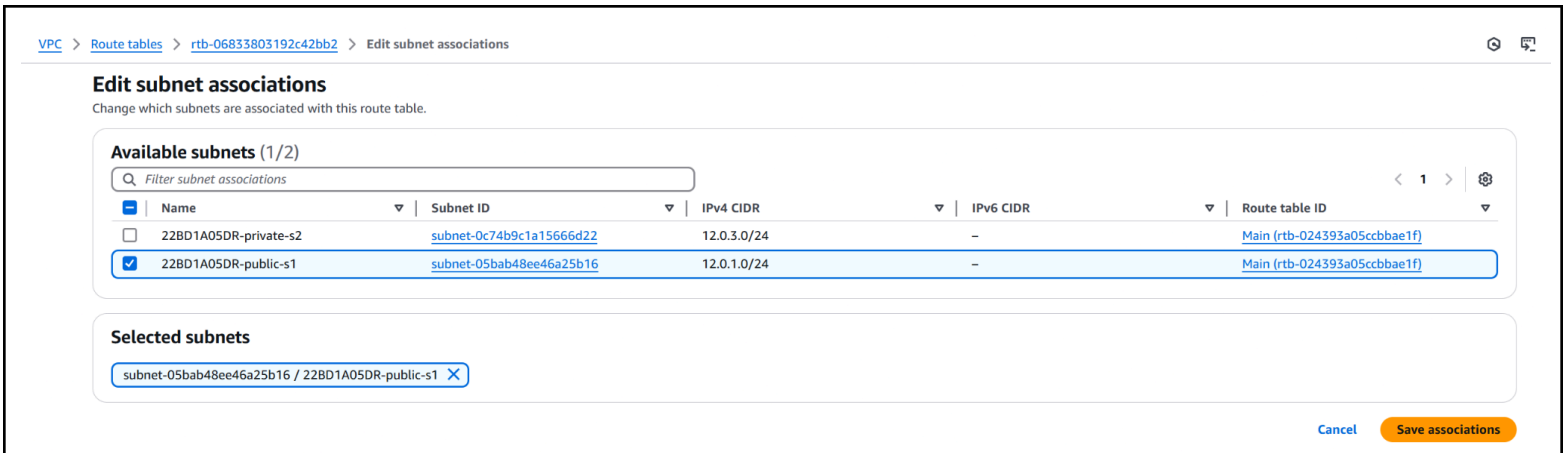




Step 12 : In the Route table settings click on Edit routes where add route 0.0.0.0/0 and keeping the target Internet Gateway of the VPC created earlier .

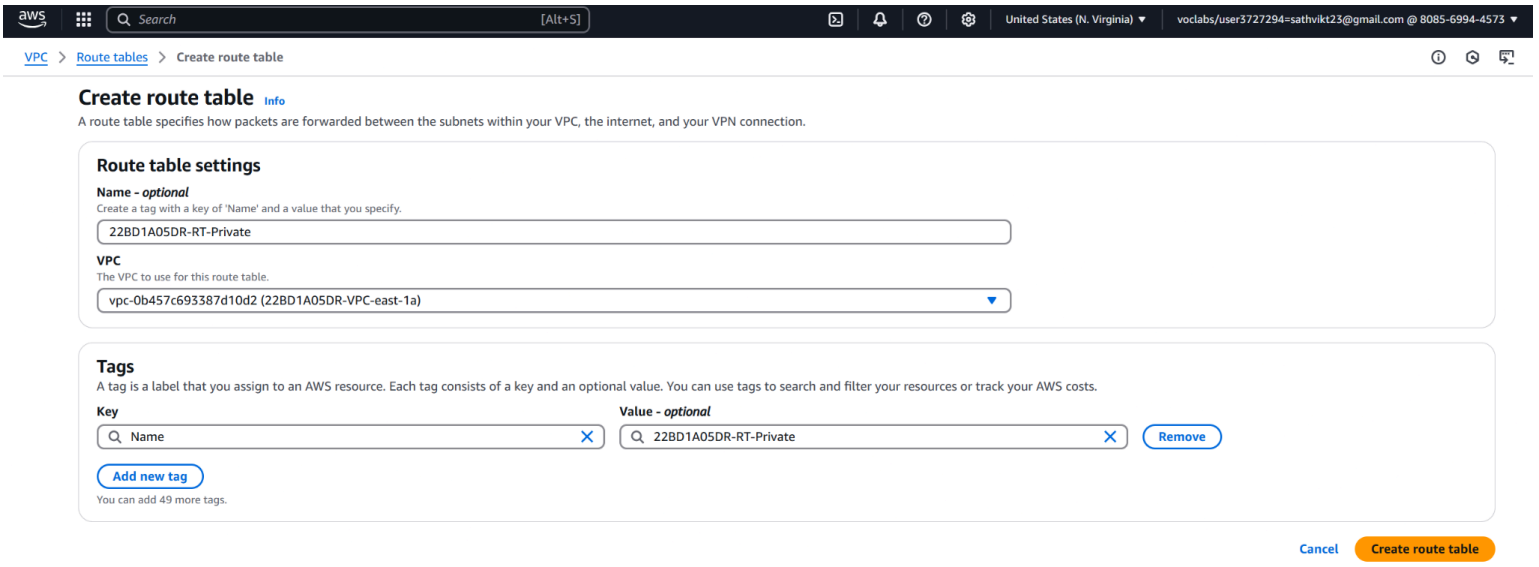


Step 13 :In the Route table settings click on Edit subnet associations and select public subnet

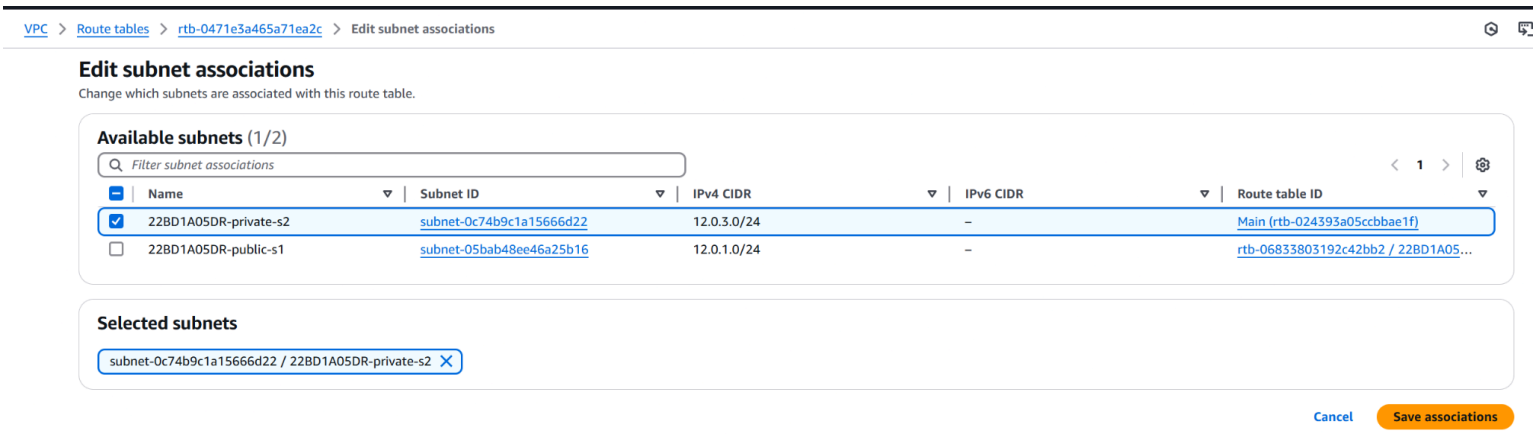


Step 14 : Go to the Route tables section and click on Create route table
Give name to the route table and select the VPC created earlier

***Note : This represents the private routing table**



Step 15 : In the Route table settings click on Edit subnet associations and select private subnet



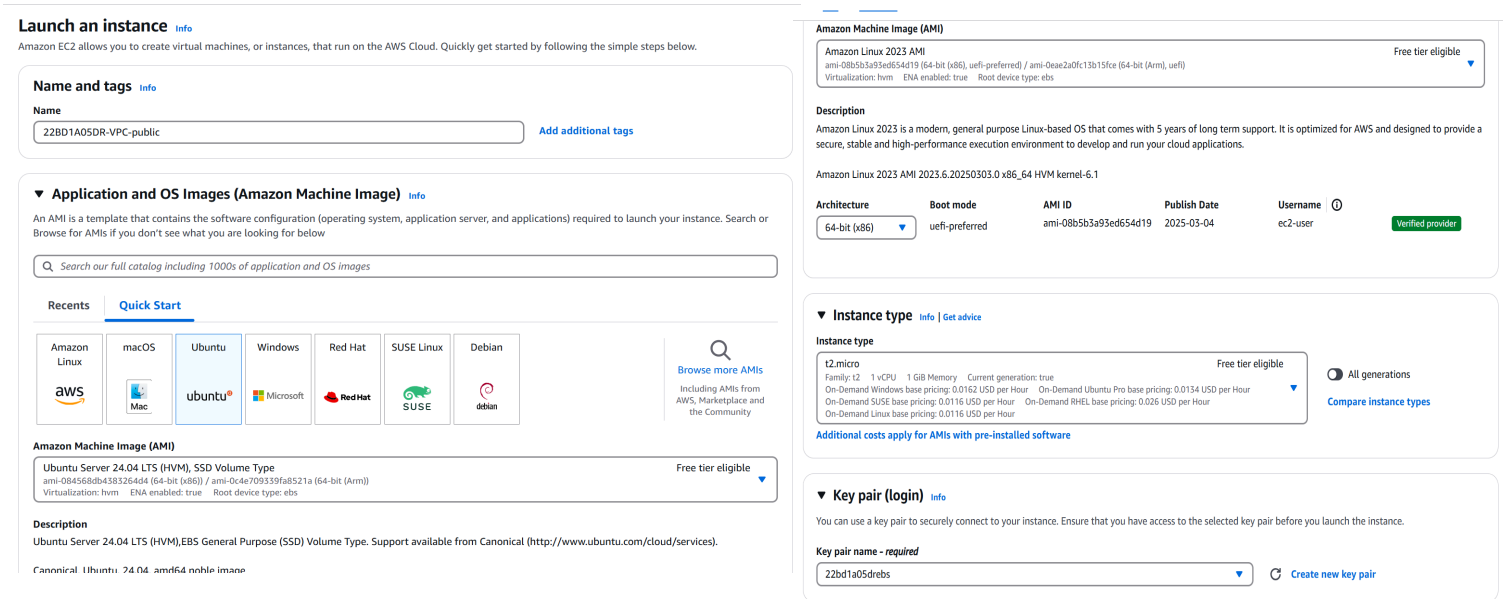
Step 16 : **Launch instance for the Bastion Host (Public)EC2 access**

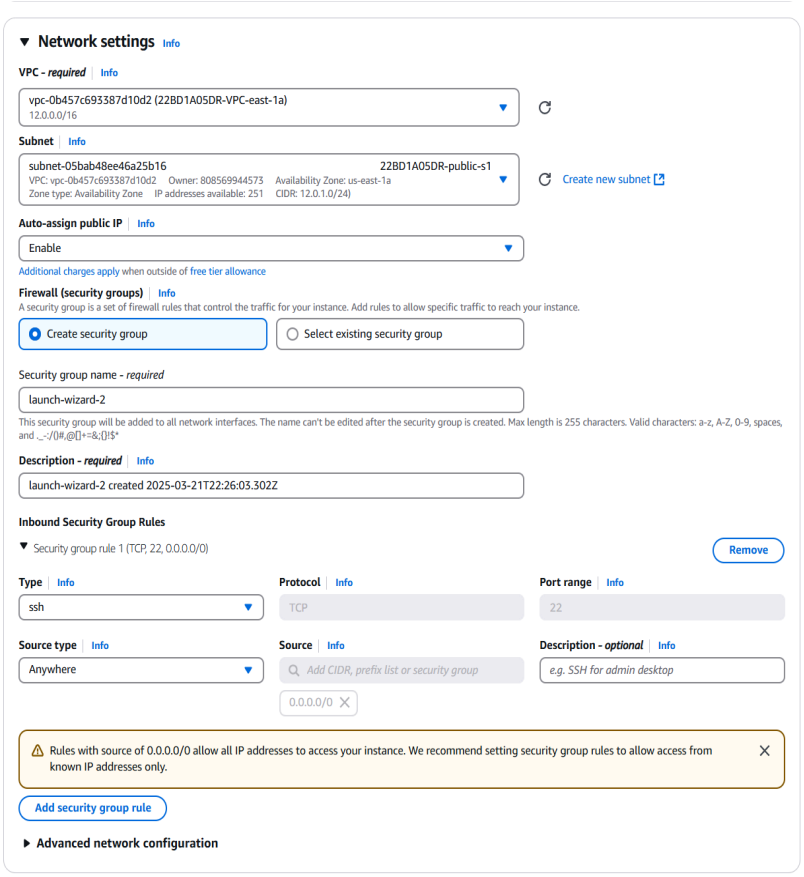
Network configurations :

Select the VPC which had been created earlier

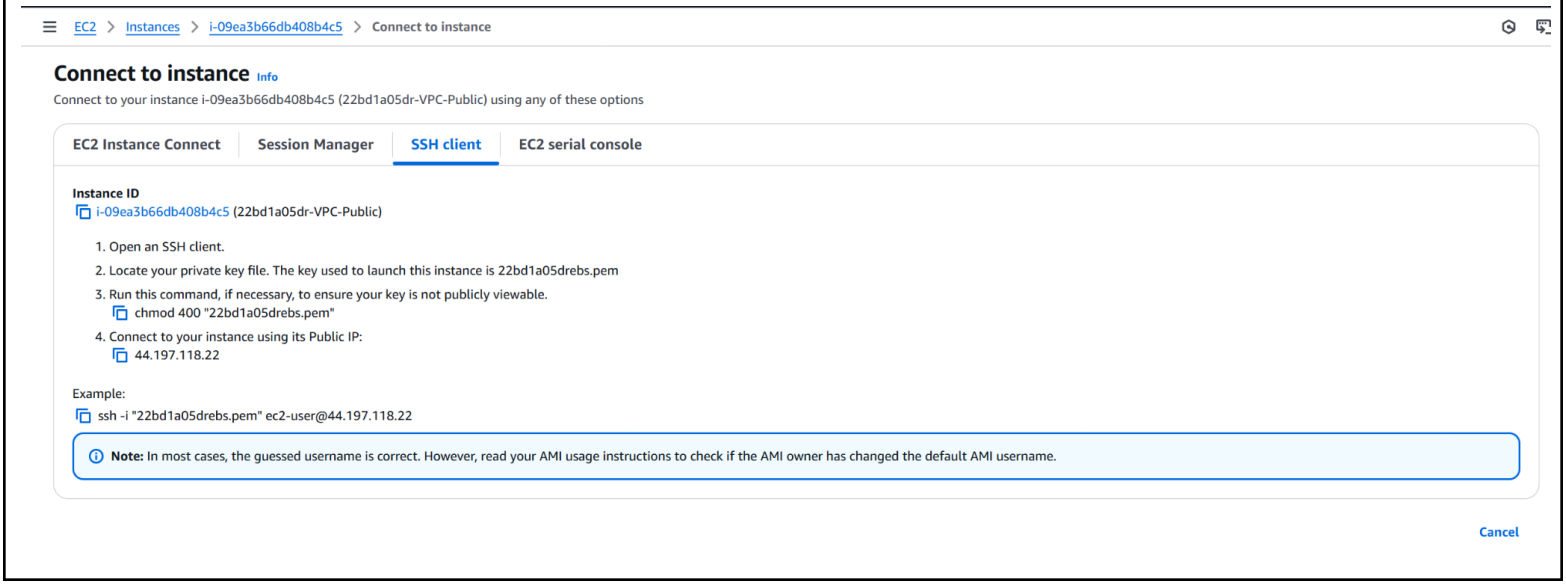
Select the public subnet which had been created earlier

Keeping the source type anywhere





Step 17 : Connect to the instance and verify the allocated IP to the public ec2



```
System information as of Fri Mar 21 22:47:59 UTC 2025

  System load:  0.31              Processes:             108
  Usage of /:   25.0% of 6.71GB   Users logged in:       0
  Memory usage: 21%               IPv4 address for enX0: 12.0.1.55
  Swap usage:   0%
```

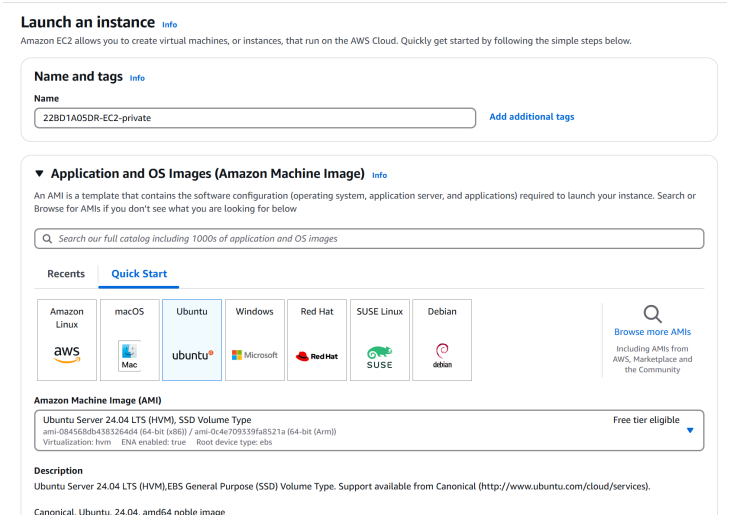
Step 18 : **Launch instance for the private EC2 access**

Network configurations :

Select the VPC which had been created earlier

Select the public subnet which had been created earlier

Keeping the source type anywhere



Amazon Machine Image (AMI)

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type — Free tier eligible
ami-084568db4383264d4 (64-bit (x86)) / ami-0c4e709339fa8521a (64-bit (Arm))
Virtualization: hvm ENA enabled: true Root device type: ebs

Description

Ubuntu Server 24.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).

Canonical, Ubuntu, 24.04, amd64 noble image

Architecture	AMI ID	Publish Date	Username
64-bit (x86)	ami-084568db4383264d4	2025-03-05	ubuntu Verified provider

Instance type Info | Get advice

Instance type

t2.micro — Free tier eligible
Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Windows base pricing: 0.0162 USD per Hour On-Demand Ubuntu Pro base pricing: 0.0134 USD per Hour
On-Demand SUSE base pricing: 0.0116 USD per Hour On-Demand RHEL base pricing: 0.026 USD per Hour
On-Demand Linux base pricing: 0.0116 USD per Hour

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

Network settings Info

VPC - *required* | Info

vpc-0b457c693387d10d2 (22BD1A05DR-VPC-east-1a)
12.0.0.0/16

Subnet | Info

subnet-0c74b9c1a15666d22 22BD1A05DR-private-s2
VPC: vpc-0b457c693387d10d2 Owner: 808569944573 Availability Zone: us-east-1a
Zone type: Availability Zone IP addresses available: 251 CIDR: 12.0.3.0/24)

Create new subnet

Auto-assign public IP | Info

Disable

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 group name - *required*

launch-wizard-5

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

launch-wizard-5 created 2025-03-21T22:59:57.003Z

Inbound Security Group Rules

Security group rule 1 (TCP, 22, 12.0.1.0/24) — Remove

Type	Protocol	Port range
ssh	TCP	22

Source type	Source	Description - *optional*
Custom	12.0.1.0/24	e.g. SSH for admin desktop

Add security group rule

Advanced network configuration

Step 19 : **Connect to the Bastion Host EC2** instance through SSH

```
PS C:\languages\aws> ssh -i "22bd1a05drebs.pem" ubuntu@44.203.234.248
Welcome to Ubuntu 24.04.2 LTS (GNU/Linux 6.8.0-1024-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

 System information as of Fri Mar 21 23:09:03 UTC 2025

  System load:  0.0               Processes:             105
  Usage of /:   25.2% of 6.71GB   Users logged in:       0
  Memory usage: 20%               IPv4 address for enX0: 12.0.1.55
  Swap usage:   0%
```

Step 20 : Make a new directory by running the command **$mkdir dir_name** and copy the .pem contents using **$nano .pem** and paste it

```
ubuntu@ip-12-0-1-55:~$ mkdir aws
ubuntu@ip-12-0-1-55:~$ cd aws
ubuntu@ip-12-0-1-55:~/aws$ nano 22bd1a05drebs.pem
```

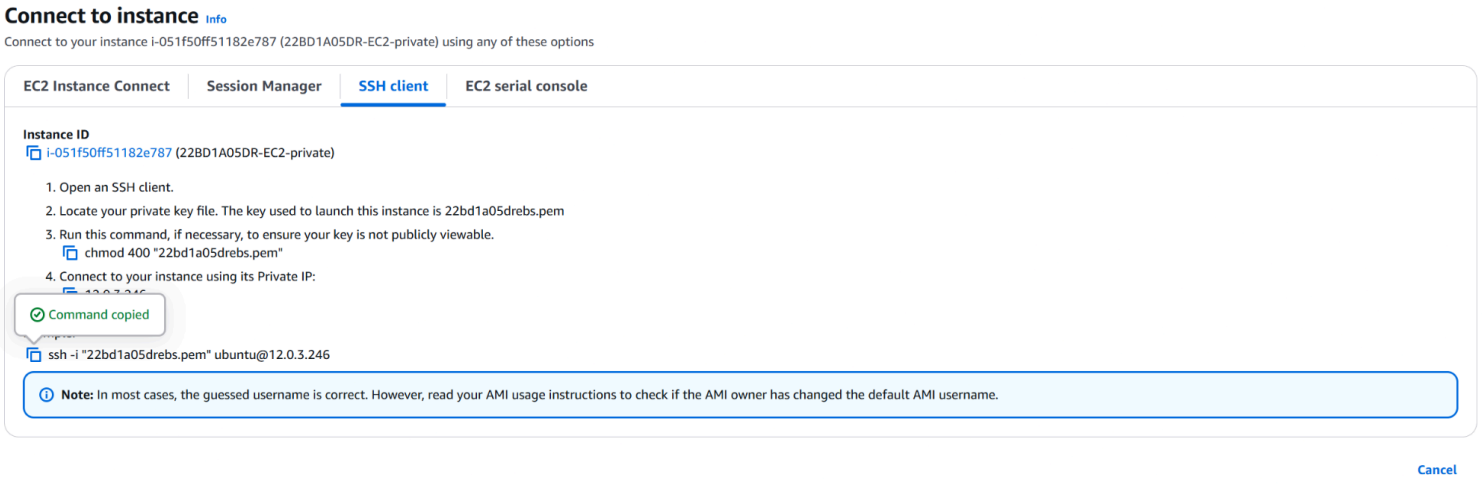
```
OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

  GNU nano 7.2
-----BEGIN RSA PRIVATE KEY-----
MIIEpQIBAAKCAQEAytBABQ54bkA+s0+KHSHlq6qR88K1pq2ZIE9LV4hvKA4QYmAZ
6srK5nbROMiB4lRHE9aH6klf0t79m0UpearkOduvfKWAhFlWjQDpDM+bC/yYwciO
8d8o+7yCFM7QpBrU95rcFM+5DOR0tToGjXoSf7WdyJBPT1pAKdcmp/SS6NnuIgst
0F6abCIgAdBHpw9XDsIg2HxAo046XIkWisheixvdeAS39K9mCb0eANh11HvteeiX
qrchcYOjiN1bGV82P5QEUAeNSmE/CXRLWbWY/mc5Mm8cgiIU1JSrp6cpqGab4WII
```

Step 21 : Copy the instance of the private EC2 and run the commands

$chmod 400 pem_name.pem

$ssh -i “pem_name.pem” ubuntu@private_ip




```
ubuntu@ip-12-0-1-55:~/aws$ chmod 400 22bd1a05drebs.pem
ubuntu@ip-12-0-1-55:~/aws$ ssh -i "22bd1a05drebs.pem" ubuntu@12.0.3.246
Welcome to Ubuntu 24.04.2 LTS (GNU/Linux 6.8.0-1024-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

 System information as of Fri Mar 21 23:27:04 UTC 2025

  System load:  0.08              Processes:             103
  Usage of /:   24.9% of 6.71GB   Users logged in:       0
  Memory usage: 20%               IPv4 address for enX0: 12.0.3.246
  Swap usage:   0%
```