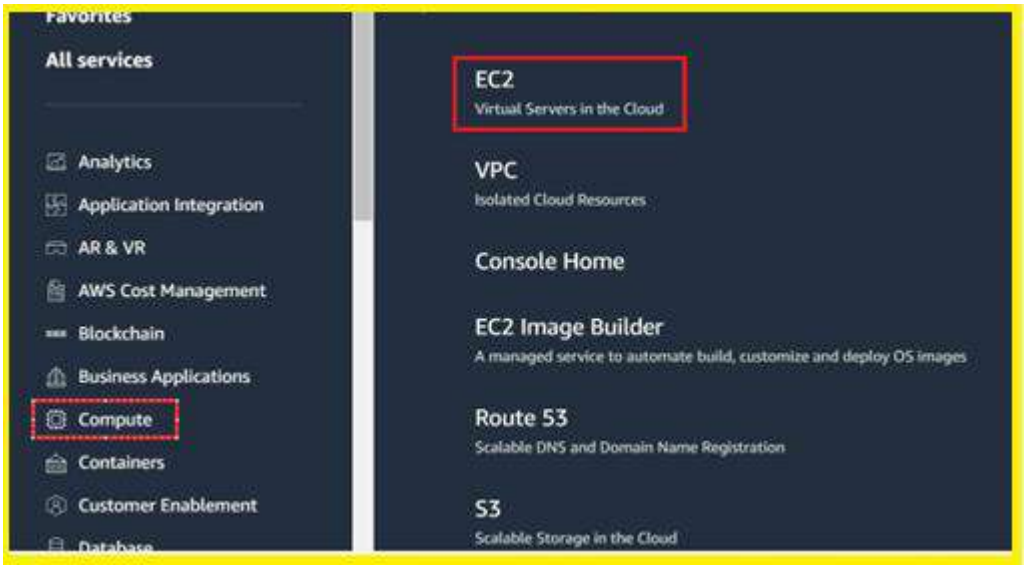
**Assignment**

1. EC2 instances (2 machines - 1st machine - name, 2nd machine - sur name)
2. EBS volume
3. Snapshot
4. AMI
5. Load Balancer
6. VPC with 2 public subnets & 2 private subnet having Internet gateway and NAT gateway
7. VPC Peering

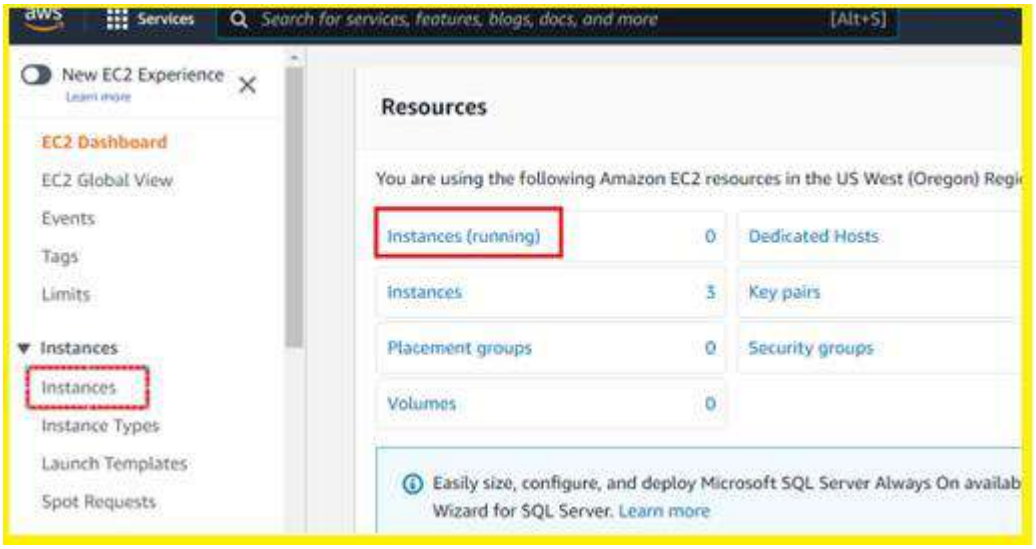
Note: Follow the powerpoint for VPC & VPC peering architecture and reiterate.

User your names & Sur names with all the practical topics and share the screen shots and step wise information.

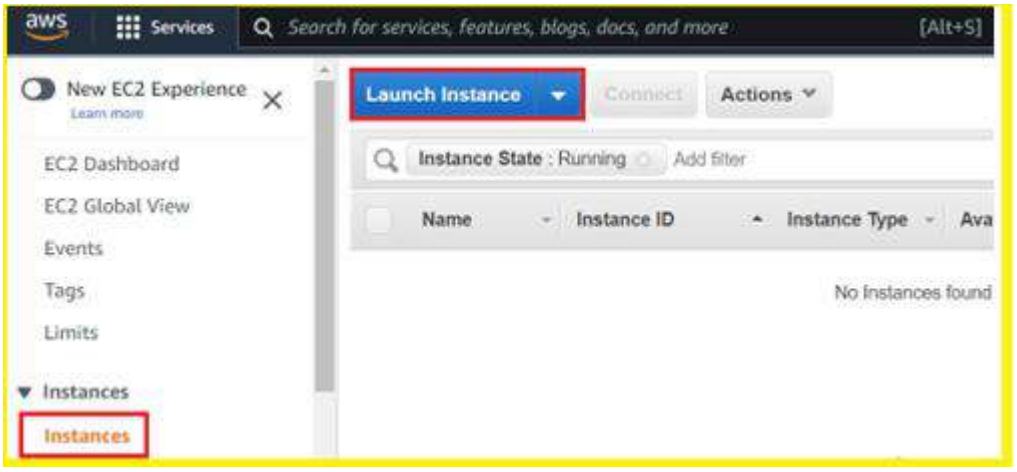
1. **Create & connect an amazon Linux AWS EC2 machine: Created two EC2 instances**
    a) Login into the AWS console page
    b) Once you login go to Services.
    c) Services -> Compute -> EC2



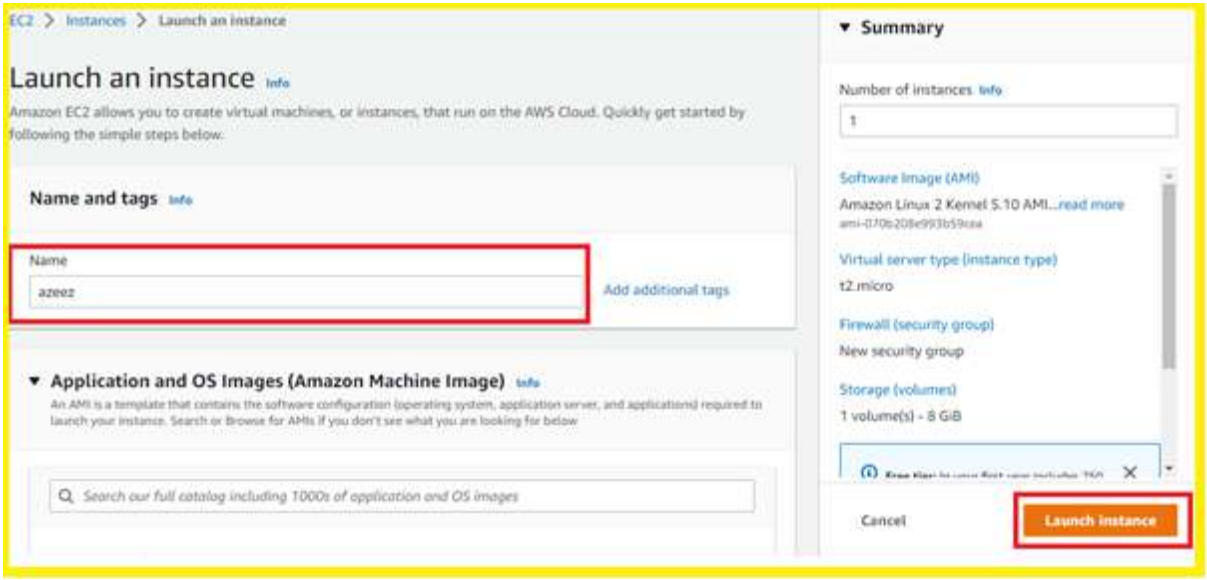
d) Then go to instances and click on Launch Instance:



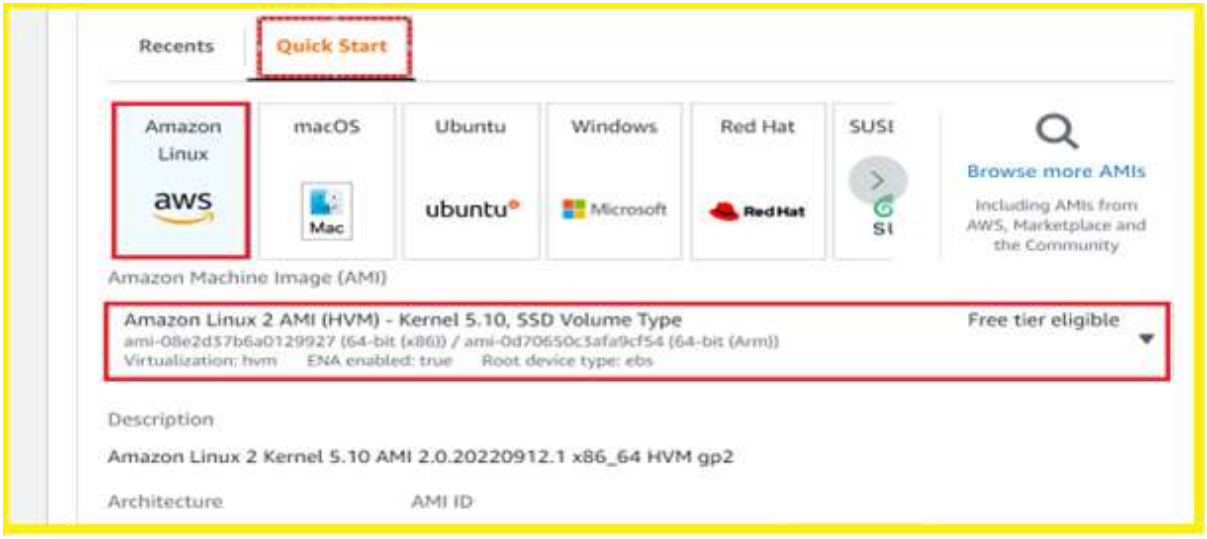

e) Then click on Launch instance option:



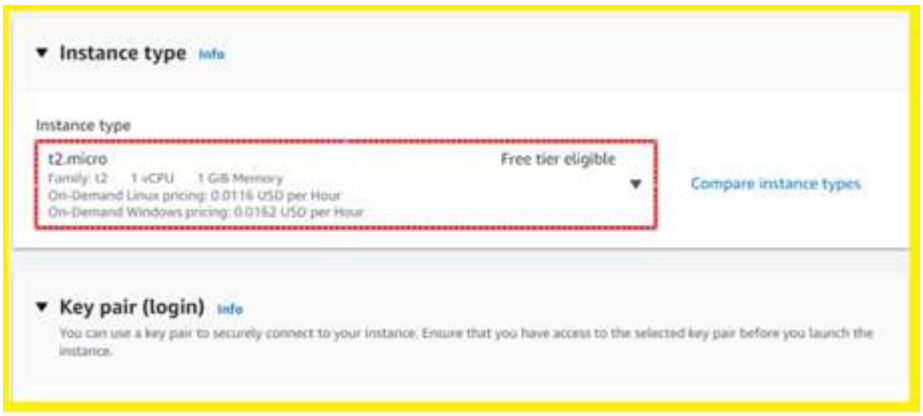

f) Then give the name to the instance machine:



g) Then select OS Image and the version:



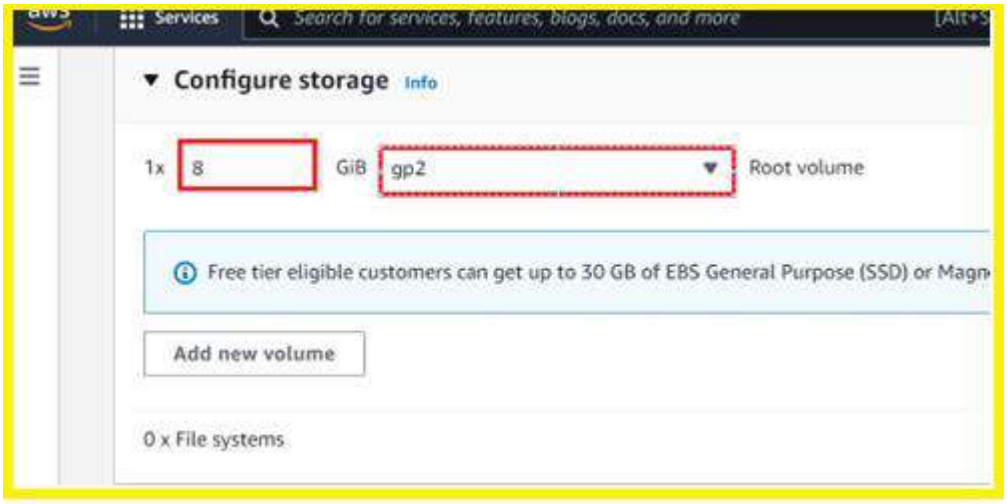

h) Under the Instance type: Select – t2.micro machine



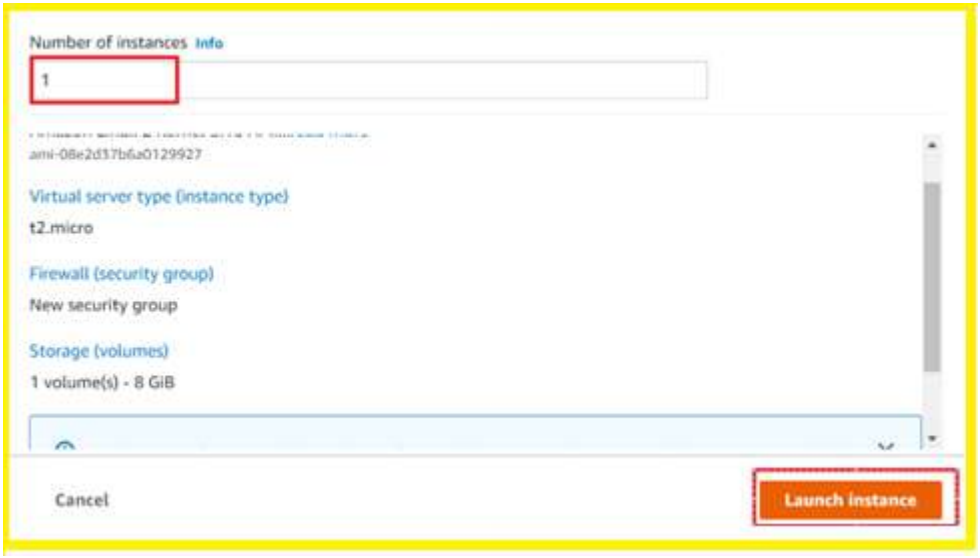

i) Then select the keypair, if you don't have the keypair please click on "create new keypair"


j) Under network settings, use the existing network and go to the next step:

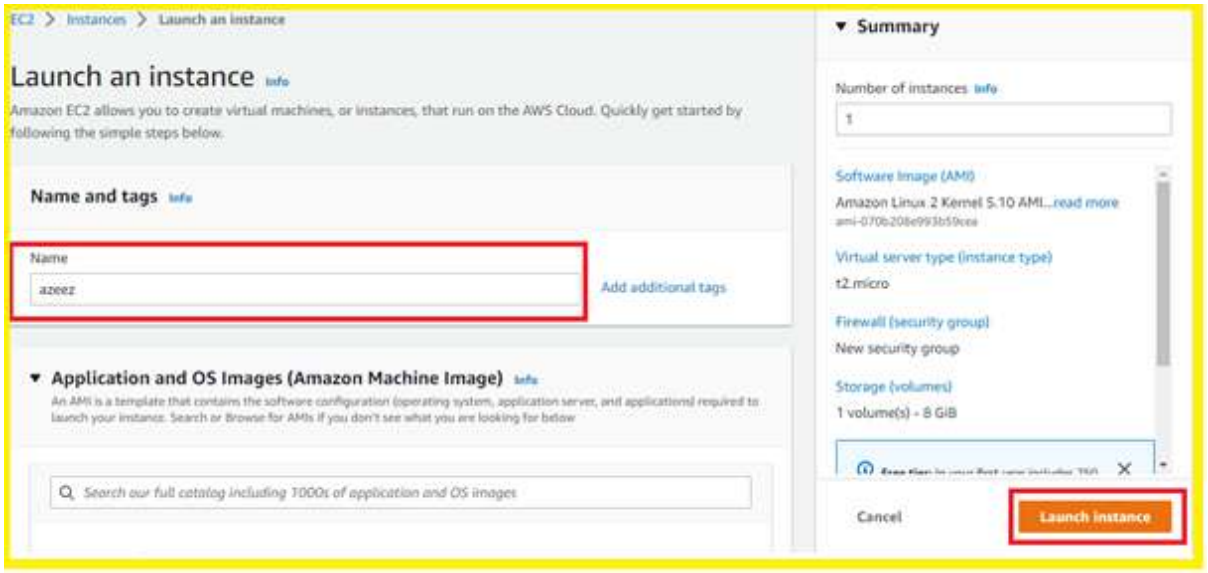
k) Under Configure storage, please provide our required configure storage:

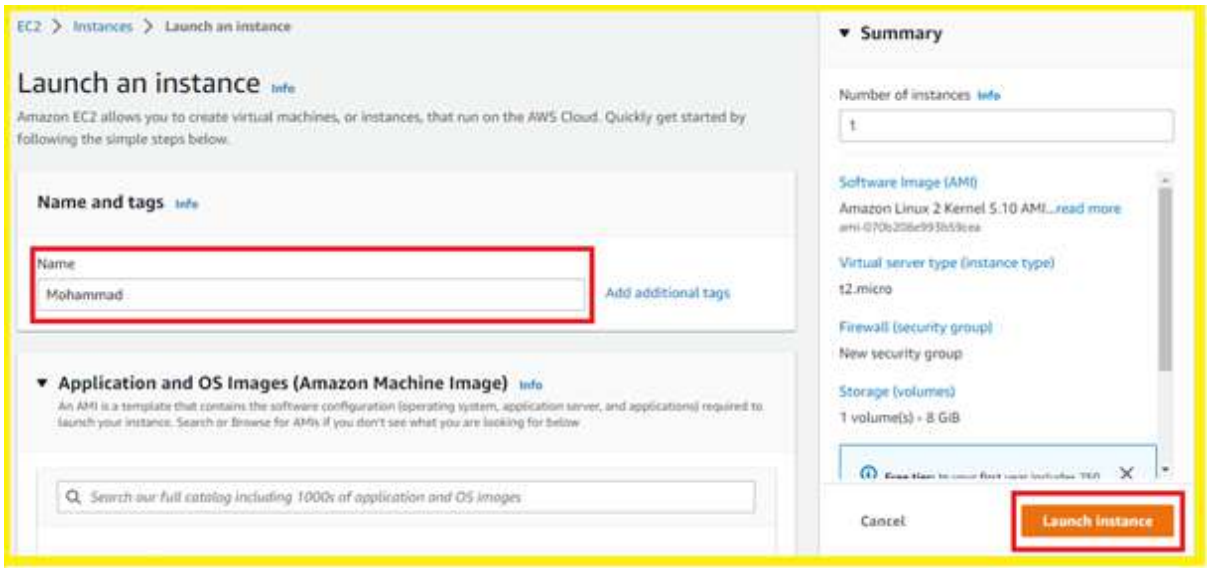



l) Provide the number of instances we required: 1



m) Then go to EC2 instances again:
I have Created 2 EC2 Instances first on is azeez and another one is Mohammad

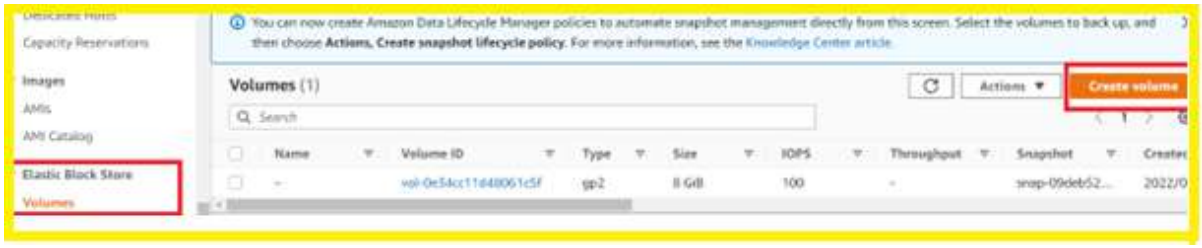


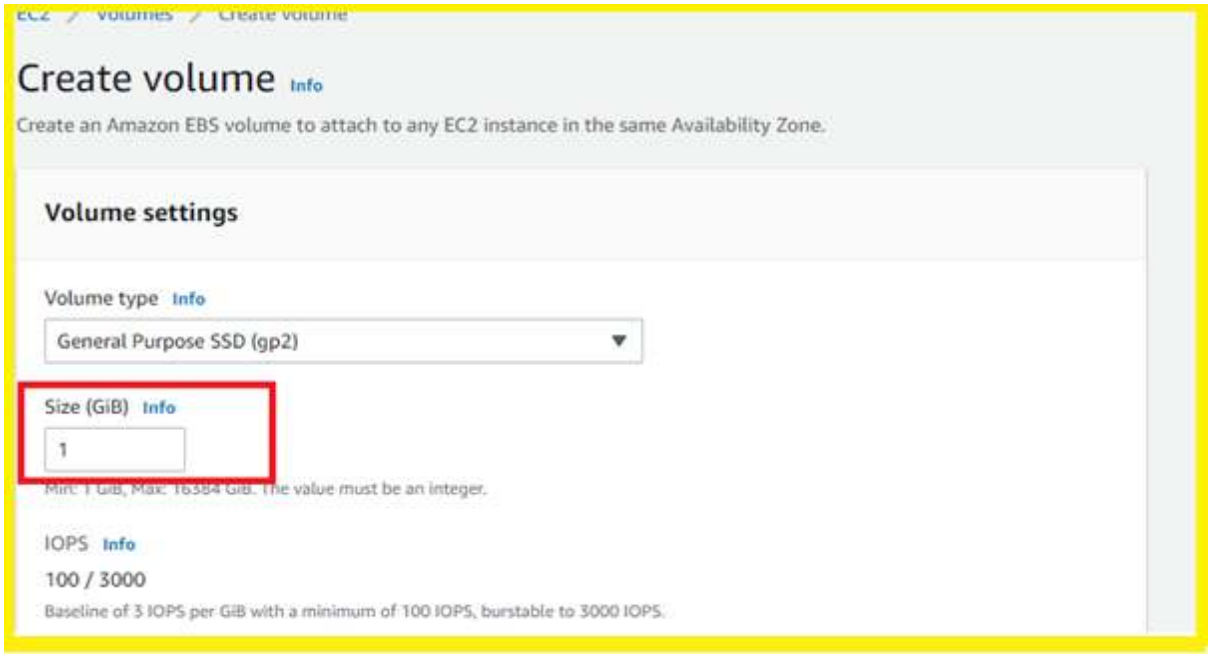

After Creation screenshot

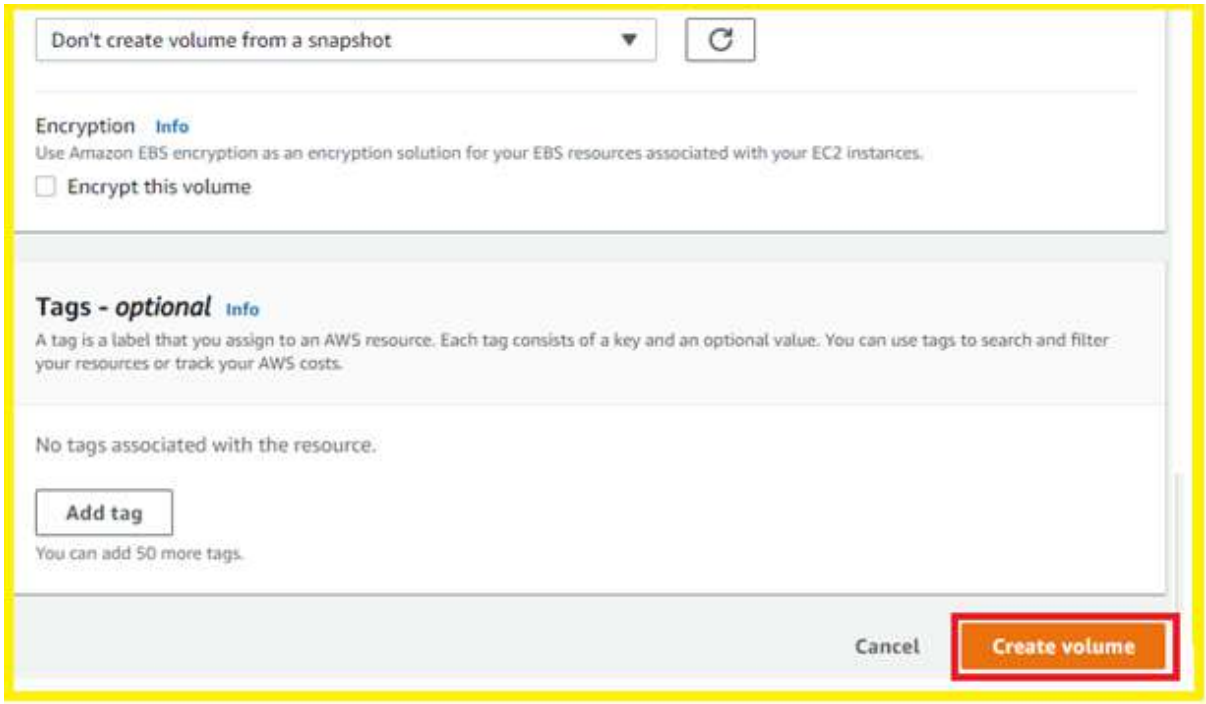
## 2. Create Elastic Block Store:

a. Go to Elastic Block Store and select Volumes




b. I selected 1 GiB Size and Create for create volume

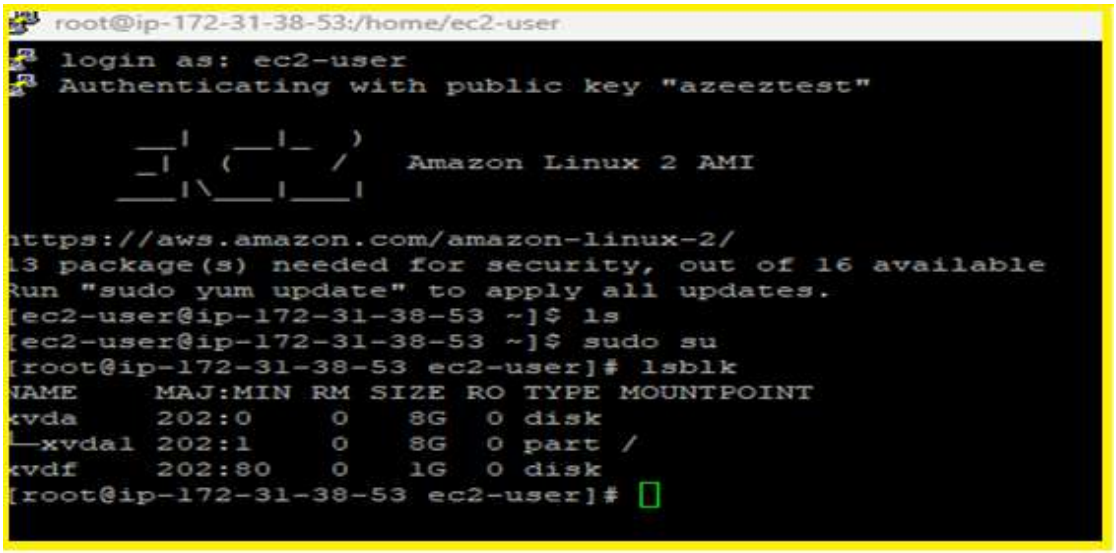





c. Created the EBS with Name: AzeezMohammad

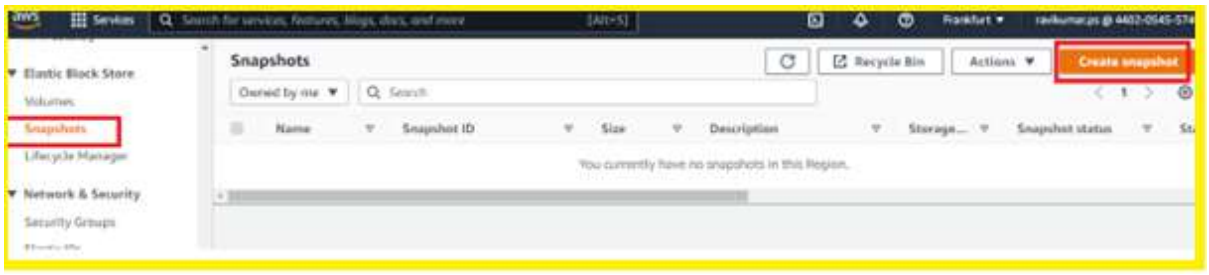

d. After attach EBS Volume to EC2 Instance:

e. EC2 Screen short:




## 3. Snapshot Screenshot:

a) Go to snapshot and select create sanpshot

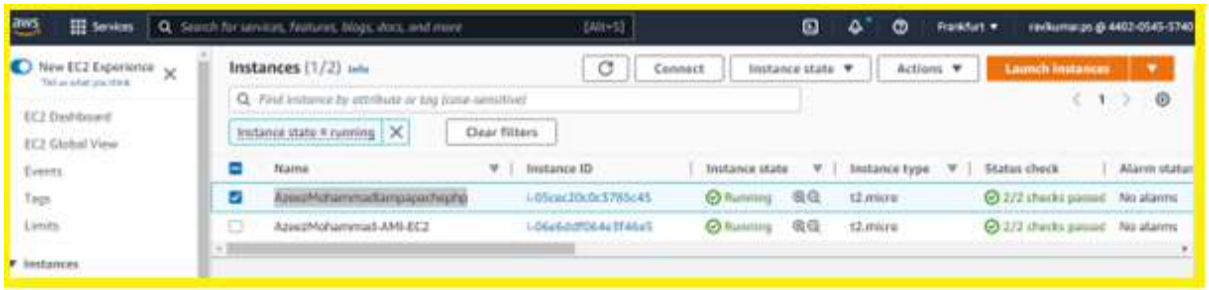



b) After creation
Description: AzeezMohammad snapshot


## 4. AMI Creation:

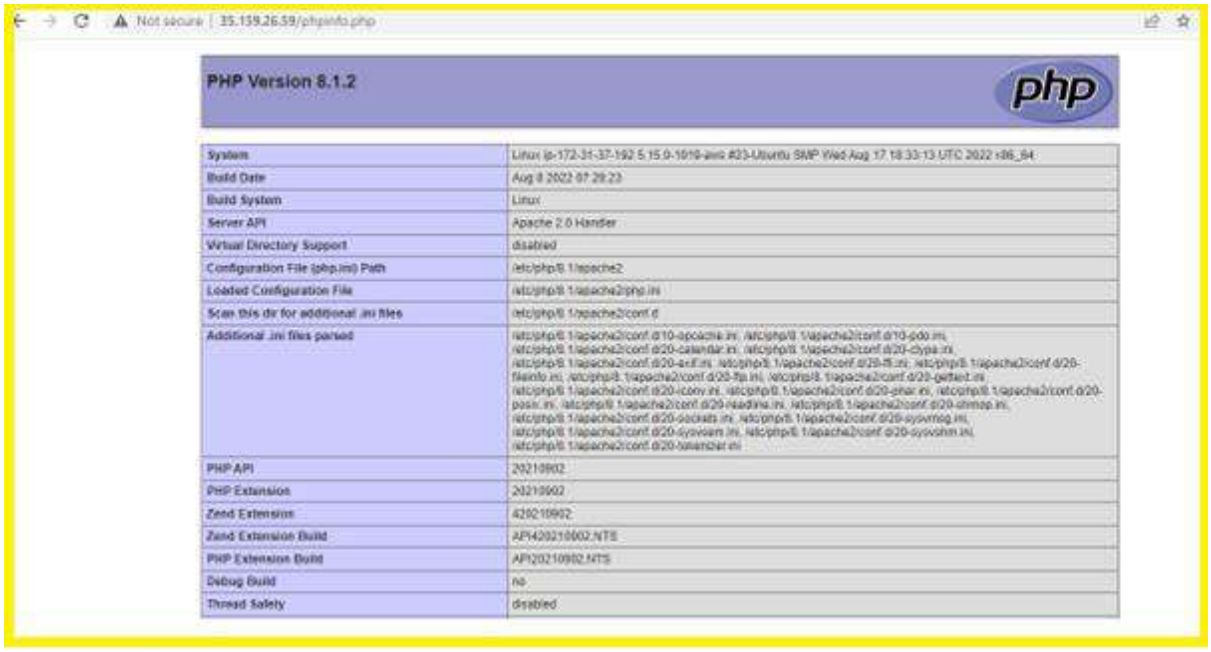
a. First created 1 EC2 Instance with Apache php install:

**Name:** AzeezMohammadlampapachephp



**Apache2:**

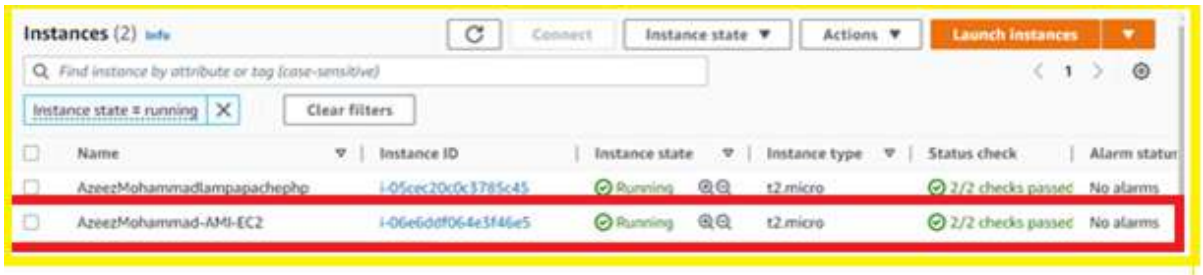

**phpinfo.php**



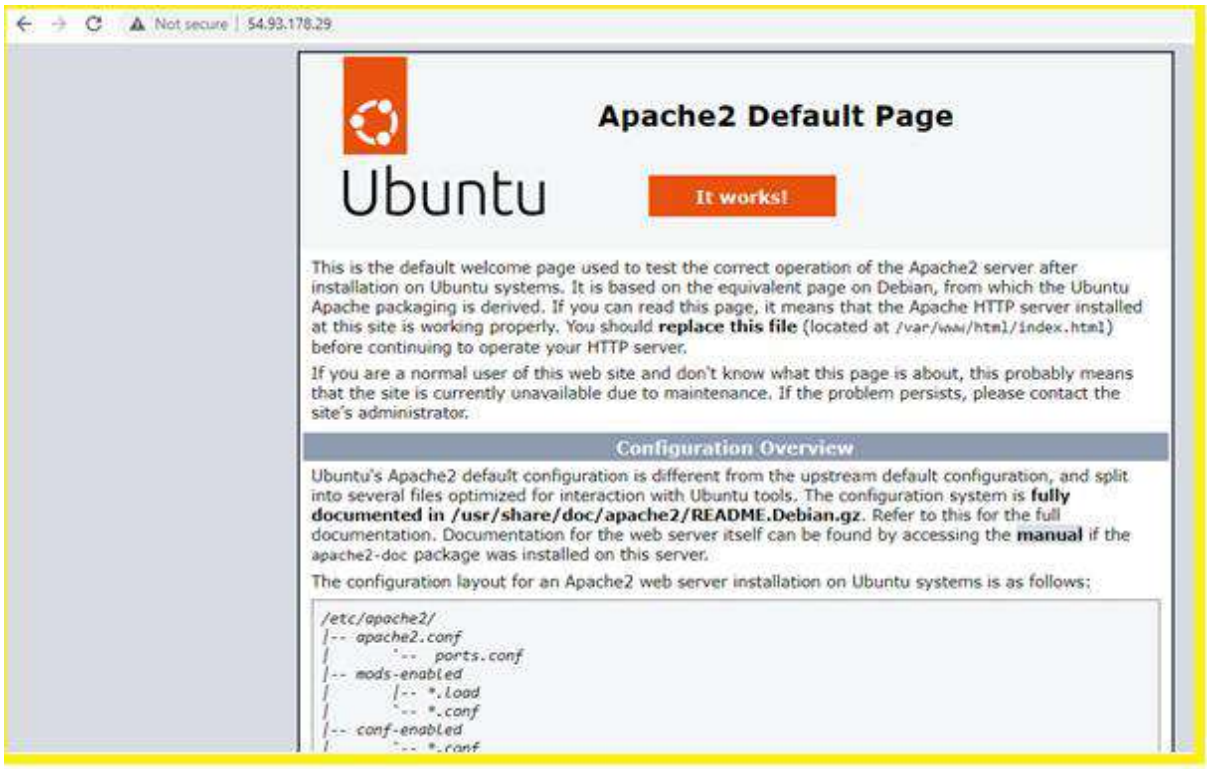

```
ubuntu@ip-172-31-37-192:~$ php --version
PHP 8.1.2 (cli) (built: Aug  8 2022 07:28:23) (NTS)
Copyright (c) The PHP Group
Zend Engine v4.1.2, Copyright (c) Zend Technologies
    with Zend OPcache v8.1.2, Copyright (c), by Zend Technologies
ubuntu@ip-172-31-37-192:~$
```

b. AMIs: Created AMIs with Apache and php

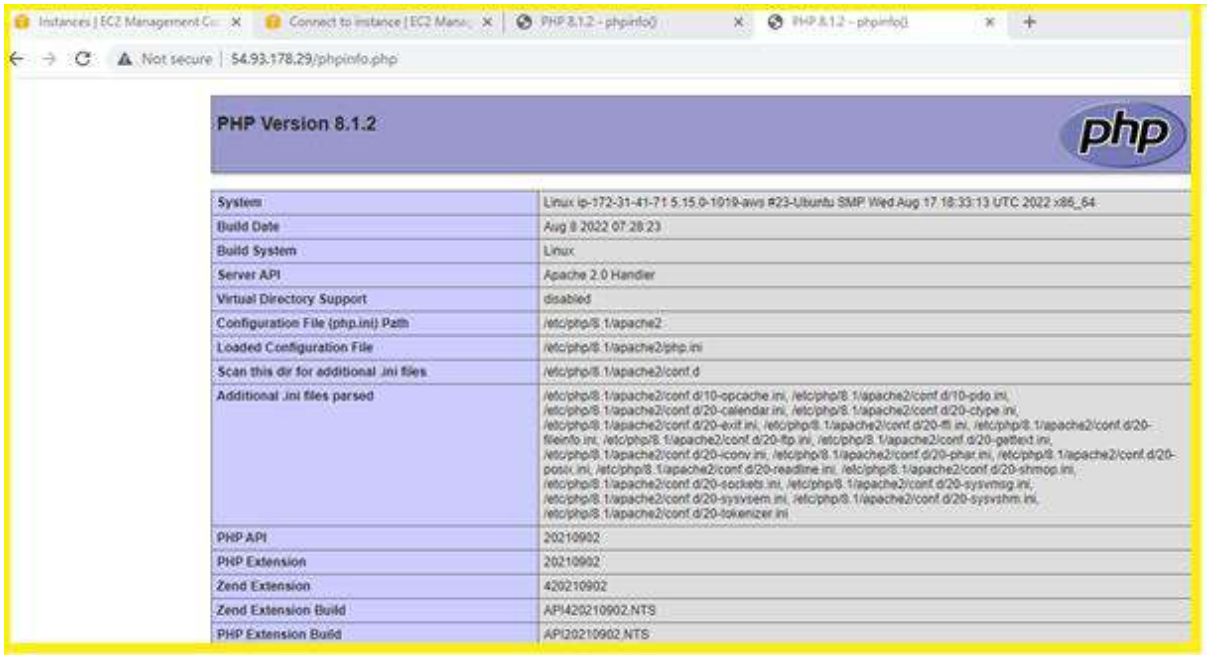

c. Created another EC2 instance from Image (AzeezMohammad-AMI-EC2)




d. AzeezMohammad-AMI-EC2 instance Apache



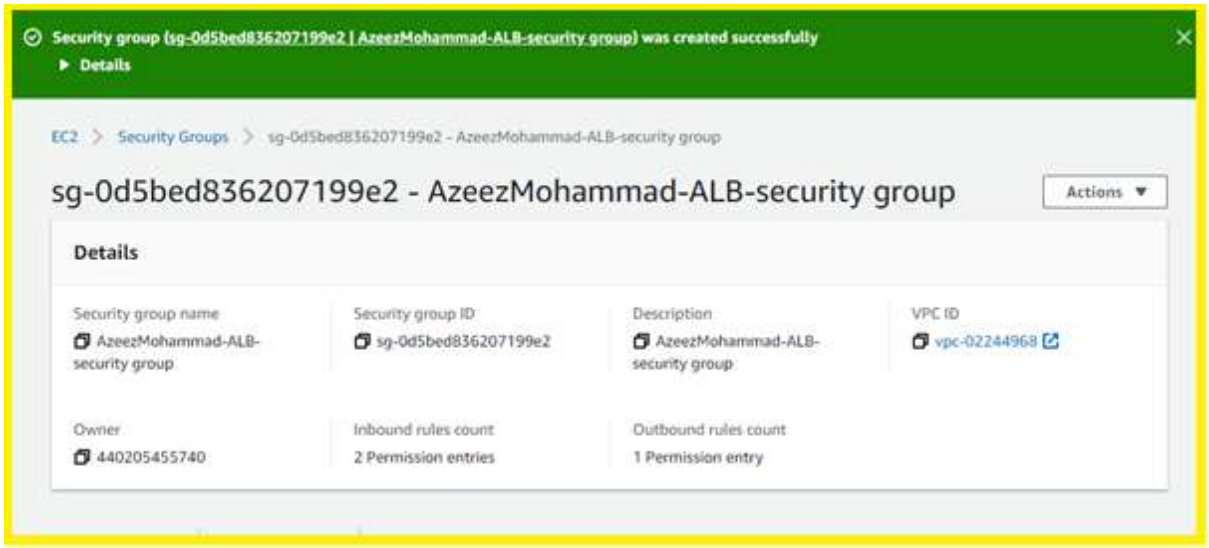
e. Two applications screenshots



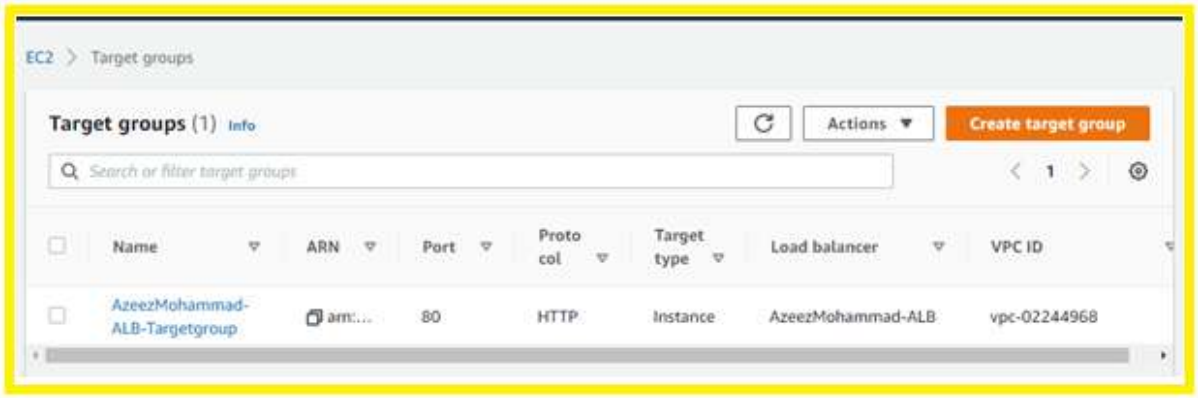

## 5. Load Balancer:

a. First Created the Security group

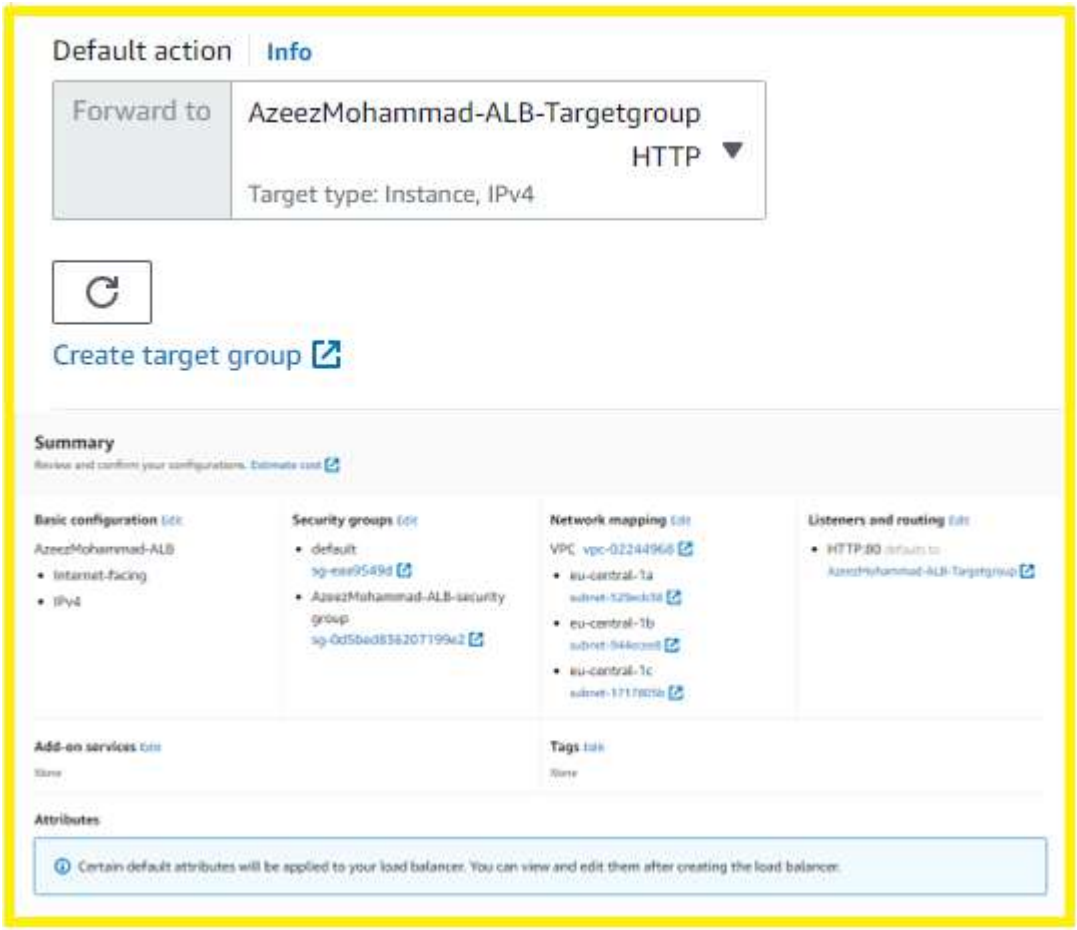
Name: AzeezMohammad-ALB-security group



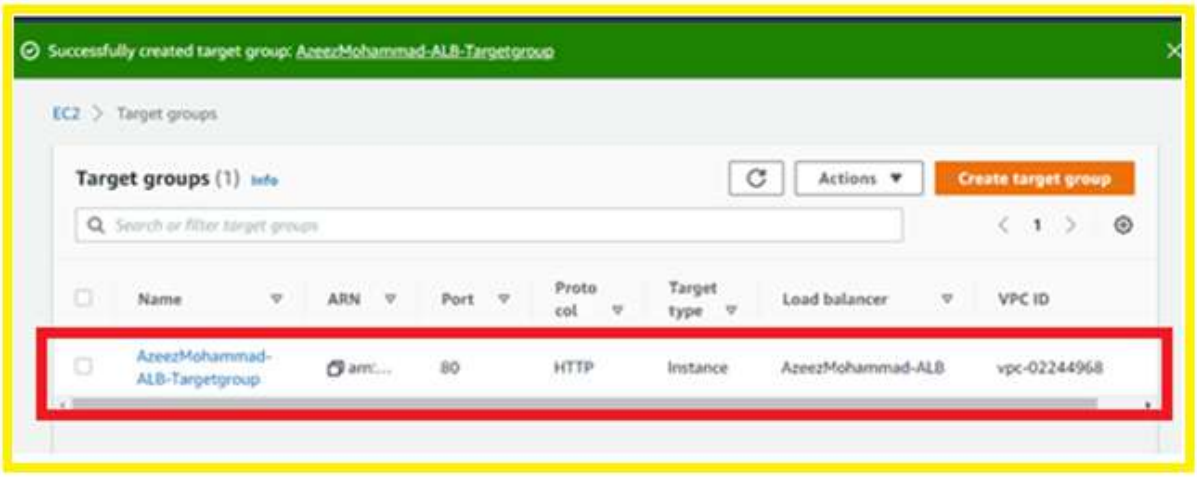
b. Then Created the Target Group:



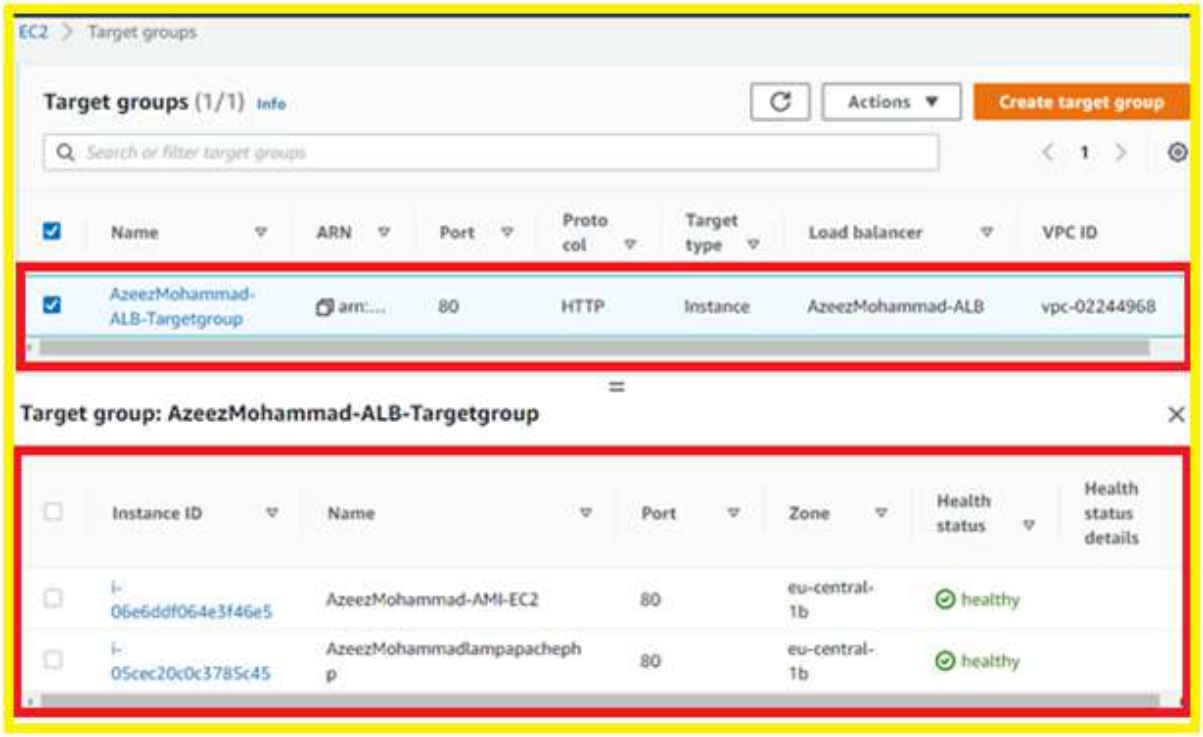

c. Added target group



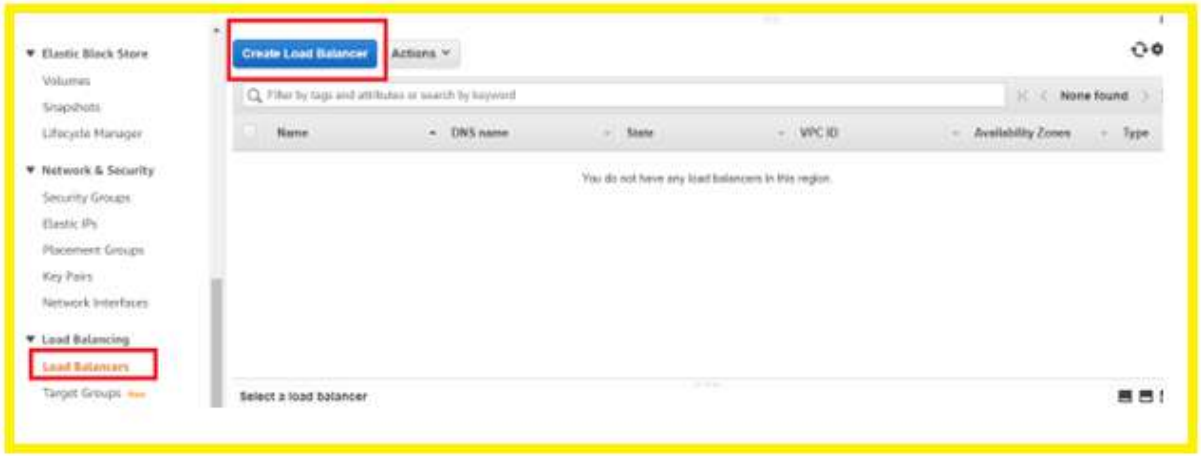
d. Associate Azeez Mohammad-ALB




e. With Health status:



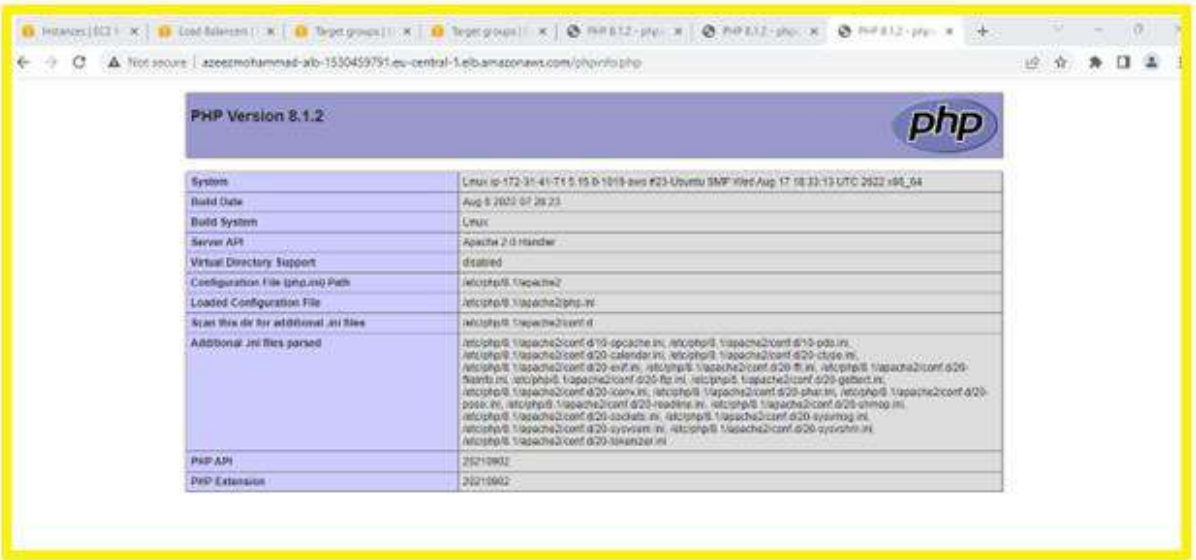
f. Go to Load balancer and Select Create Load Balancer




g. APLB:
Name: AzeezMohammad-ALB


h. DNS:

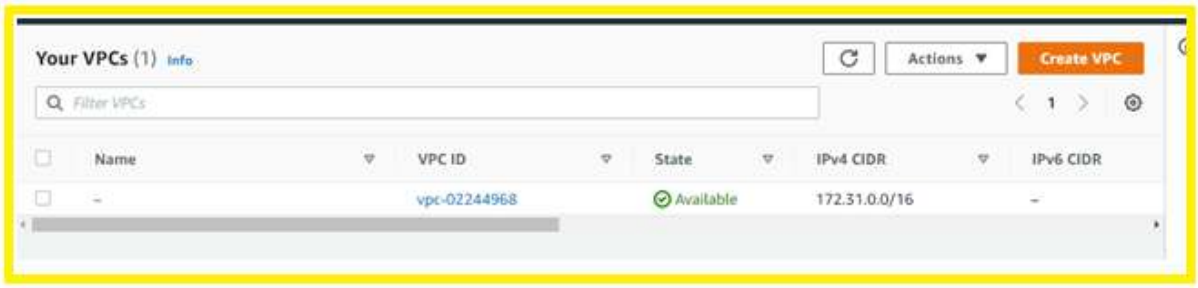
http://azeezmohammad-alb-1530459791.eu-central-1.elb.amazonaws.com/phpinfo.php



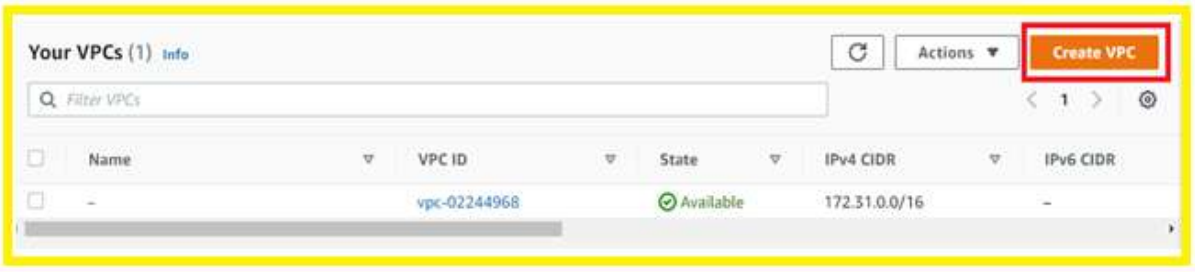
6. **VPC with 2 public subnet & 2 Private subnet having internet gateway and NAT gateway**

a) Create VPC & provide of VPC as 192.168.0.0/16

b) Before creating VPC

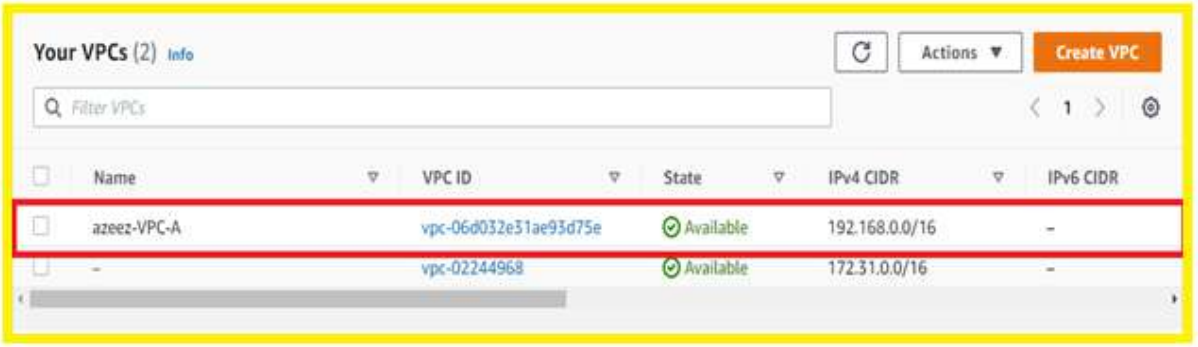



c) Select Create VPC



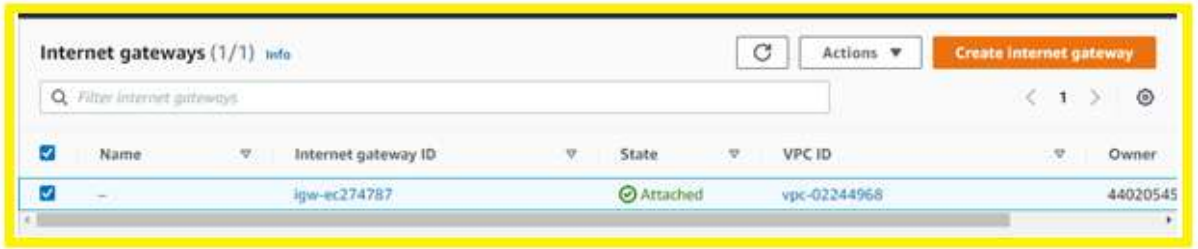

Name: azeez-VPC-A

IPv4 CIDR: 192.168.0.0/16

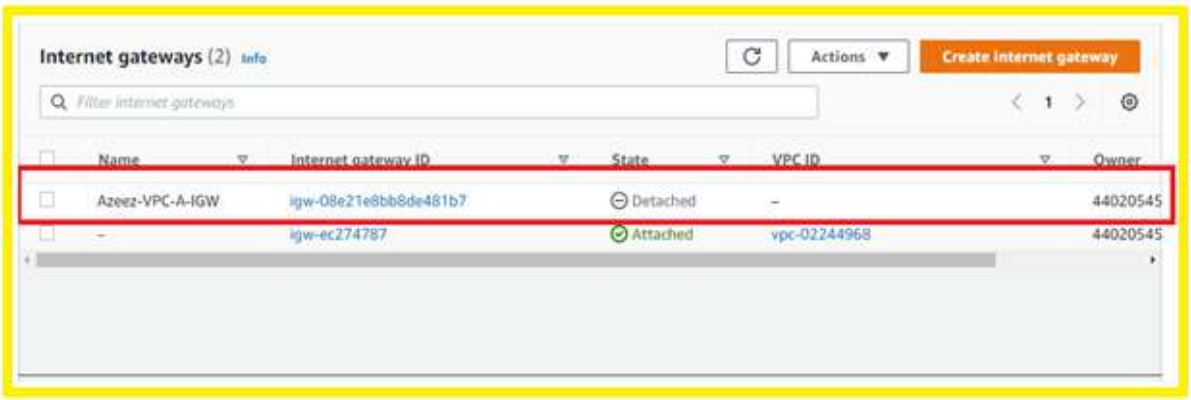



d) Create an Internet gateway and attach it to the VPC

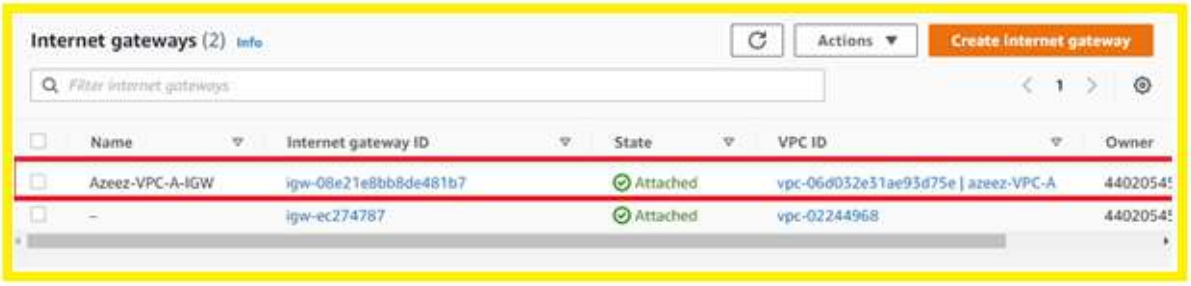
Before creating we have default internet gateway



e) After creation IGW
Name: Azeez-VPC-A-IGW



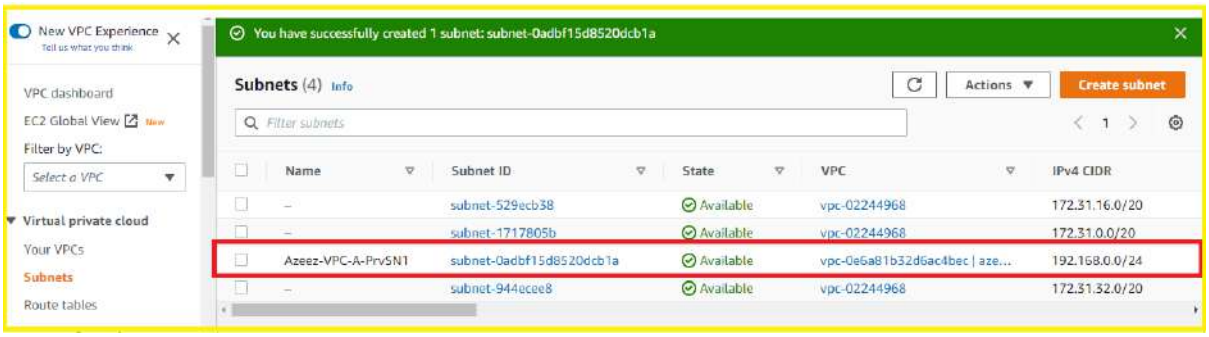

f) Assign Internet gateway to VPC:



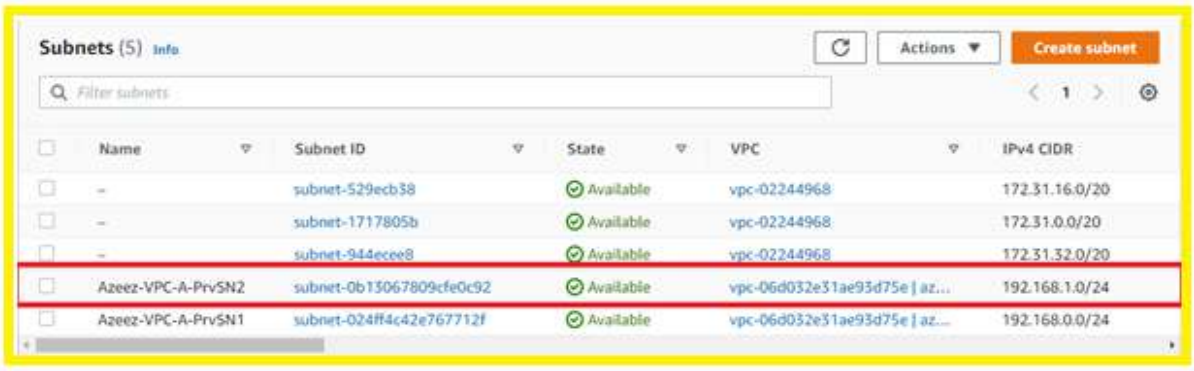

g) Create 4 subnets of which of which 2 subnets are public subnets and 2 subnets are private subnets

i). 2 private subnets
ii). 2 public subnets

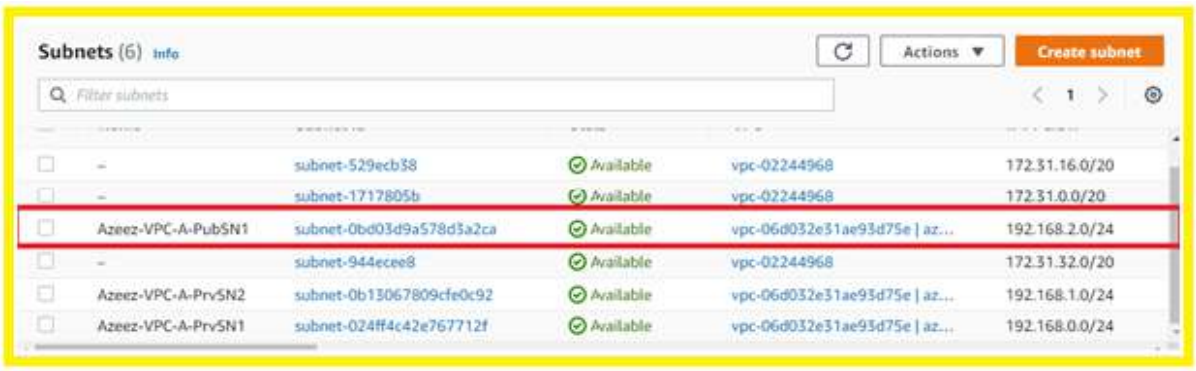
i). 2 Private Subnets
first one Private Subnet name: Azeez-VPC-A-PrvSN1
IPv4 CIDR: 192.168.0.0/24



Second one Private Subnet Name: Azeez-VPC-A-PrvSN2
IPv4 CIDR: 192.168.1.0/24

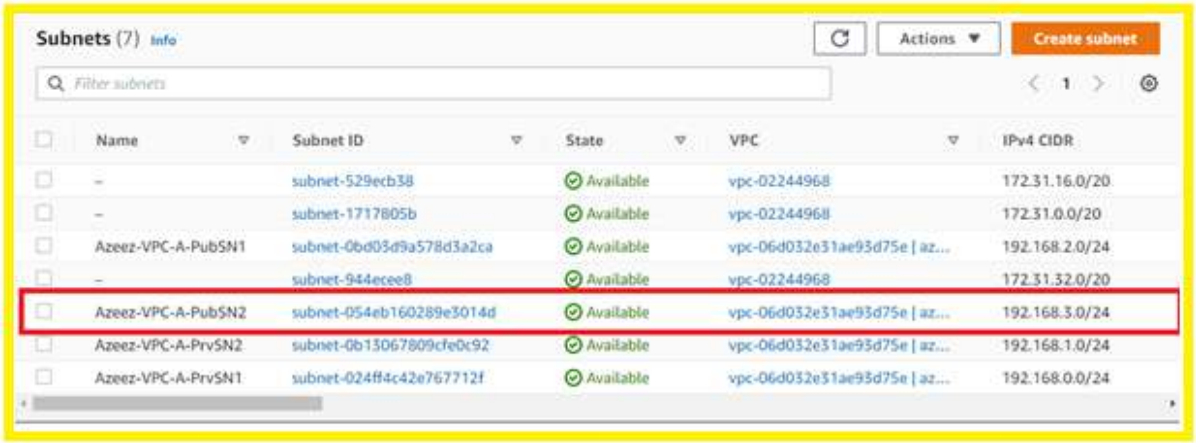



ii) 2 public subnets
first one Subnet name: Azeez-VPC-A-PubSN1
IPv4 CIDR: 192.168.2.0/24

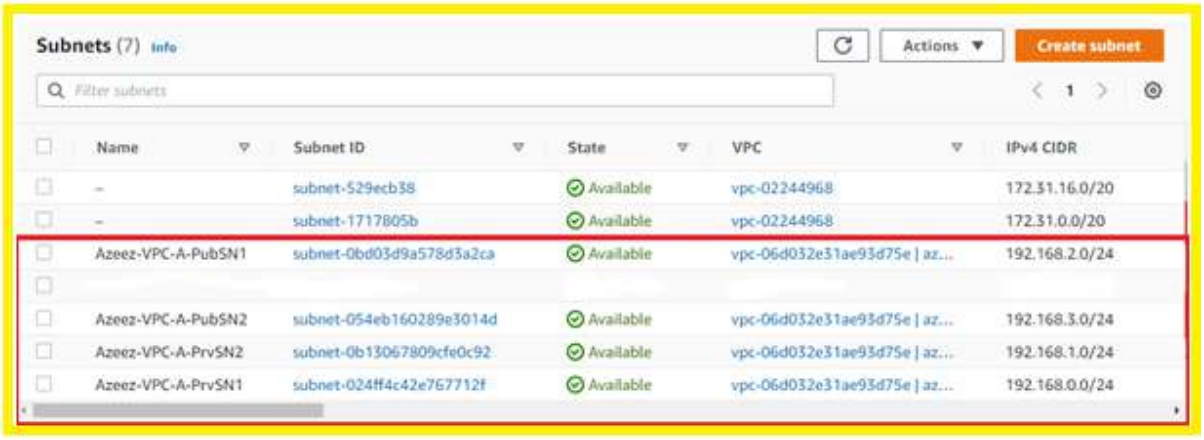



Second one Subnet name: Azeez-VPC-A-PubSN2

IPv4 CIDR: 192.168.3.0/24

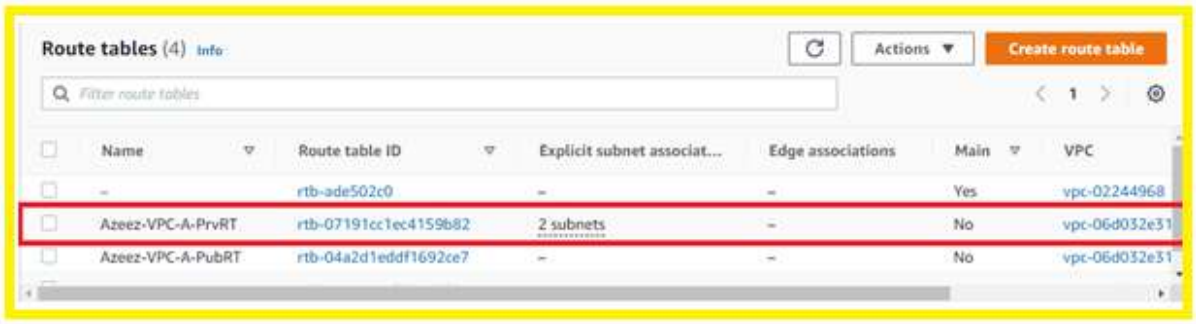


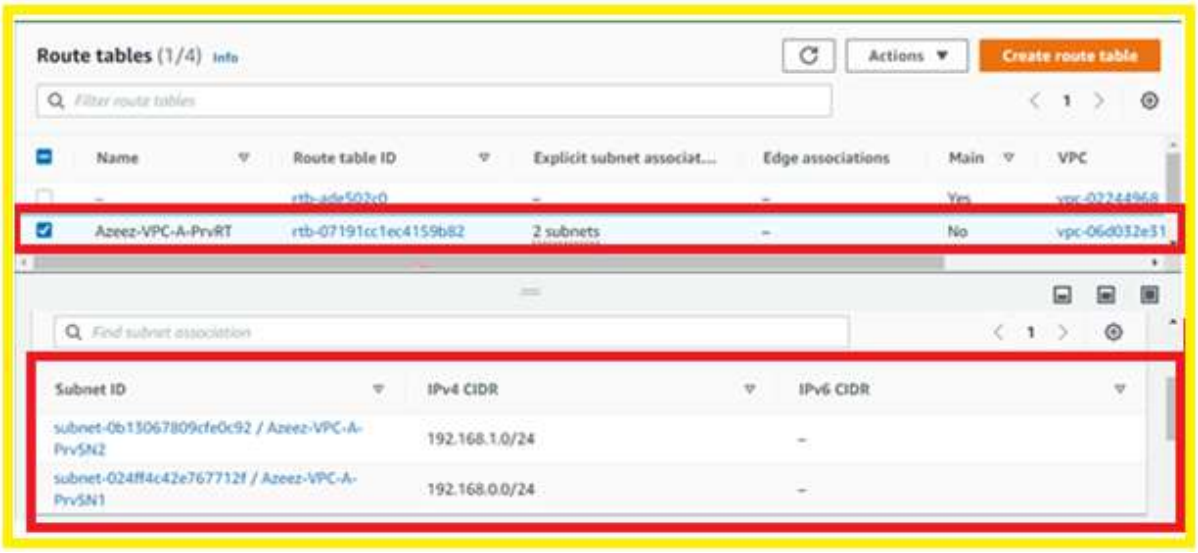
**All Subnets:**

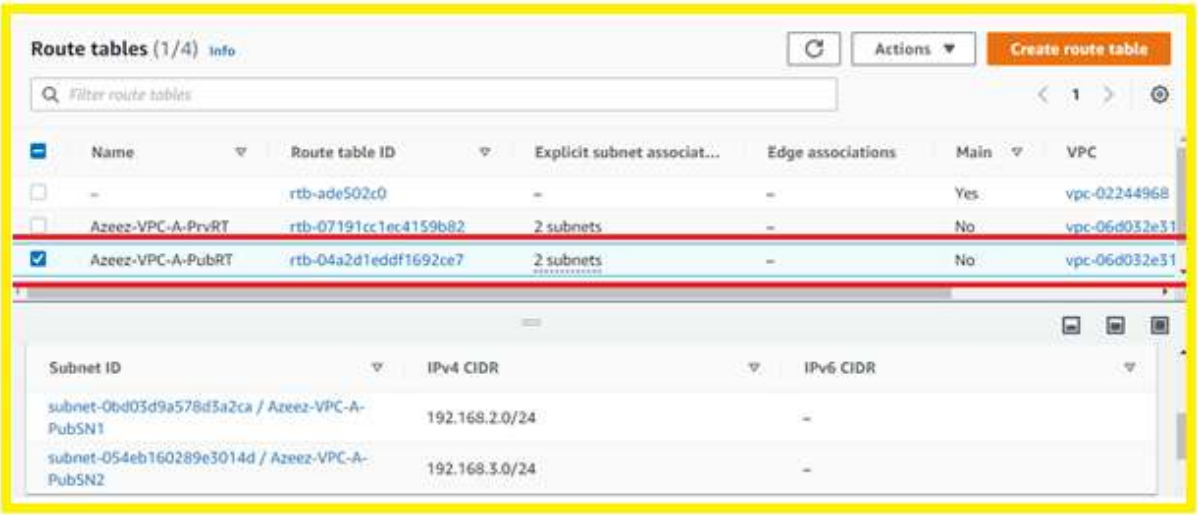



h) Create 2 Route tables 1 for Public Route table and other one as Private Route table

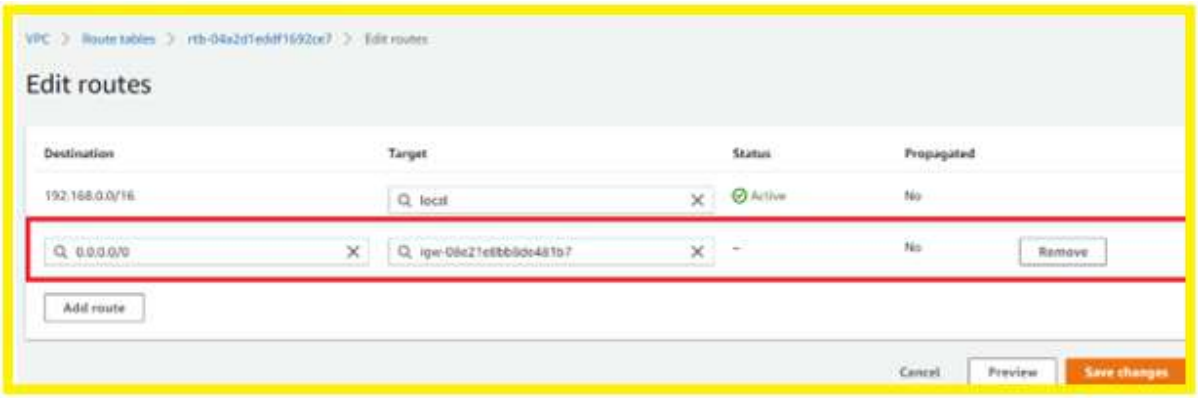

i) Associate the public subnet to public route table and private subnet to private route table



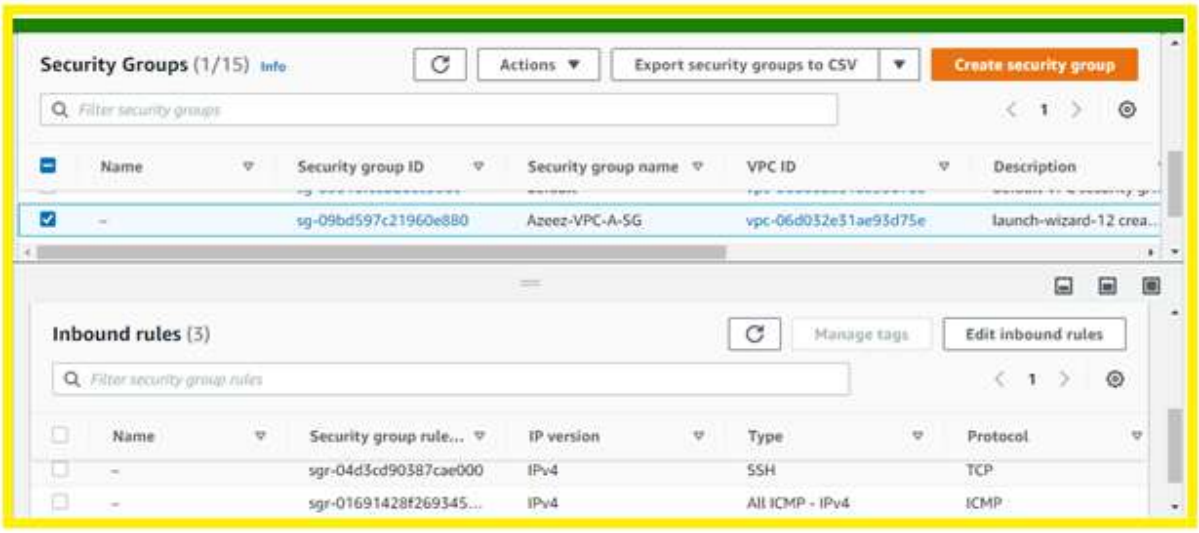



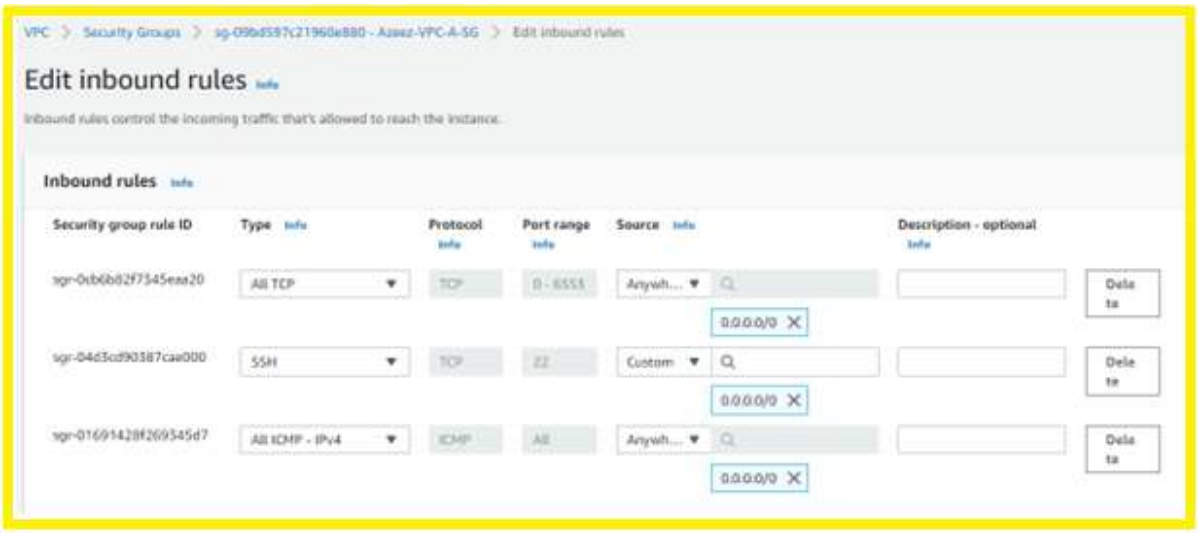



j) Connect the public route table to the internet Gateway




k) Edit inbound rules add the TCP and ICMP in Security Group

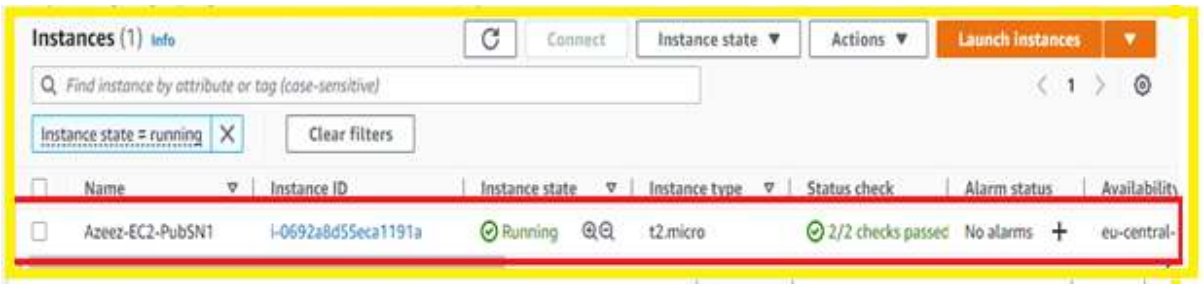


l) Create 2 EC2 instance 1 in Private SN1 and another 1 is Public SN1

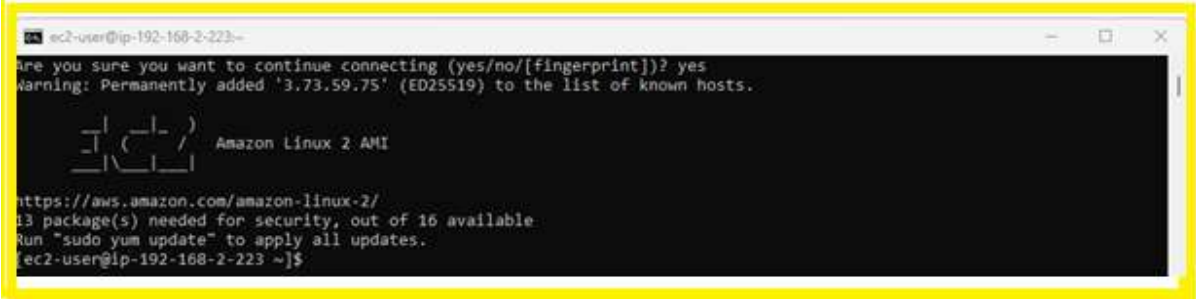
i). **Create EC2 instance in Private SN1**

Name: Azeez-EC2-PubSN1
Key pair: TestAzeez
Network Settings: azeez-VPC-A
Subnet: Azeez-VPC-A-PrvSN1
Auto-assign public IP: Enable
Security group name: Azeez-VPC-A-SG
Created EC2 instance: For PubSN1




m) Login to public subnet 1 machine try to ping and ssh (ping will get success and where ssh will fail as there is no key)

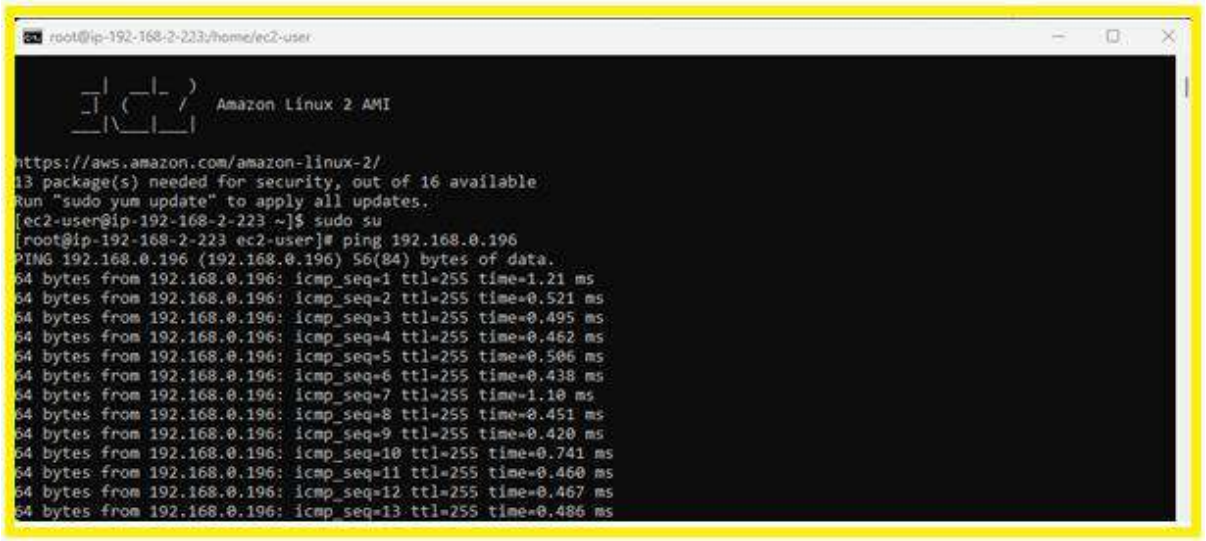
Public SN1 EC2 Console:




**ii) Create another EC2 in Private Azeez-EC2-PrvSN1**

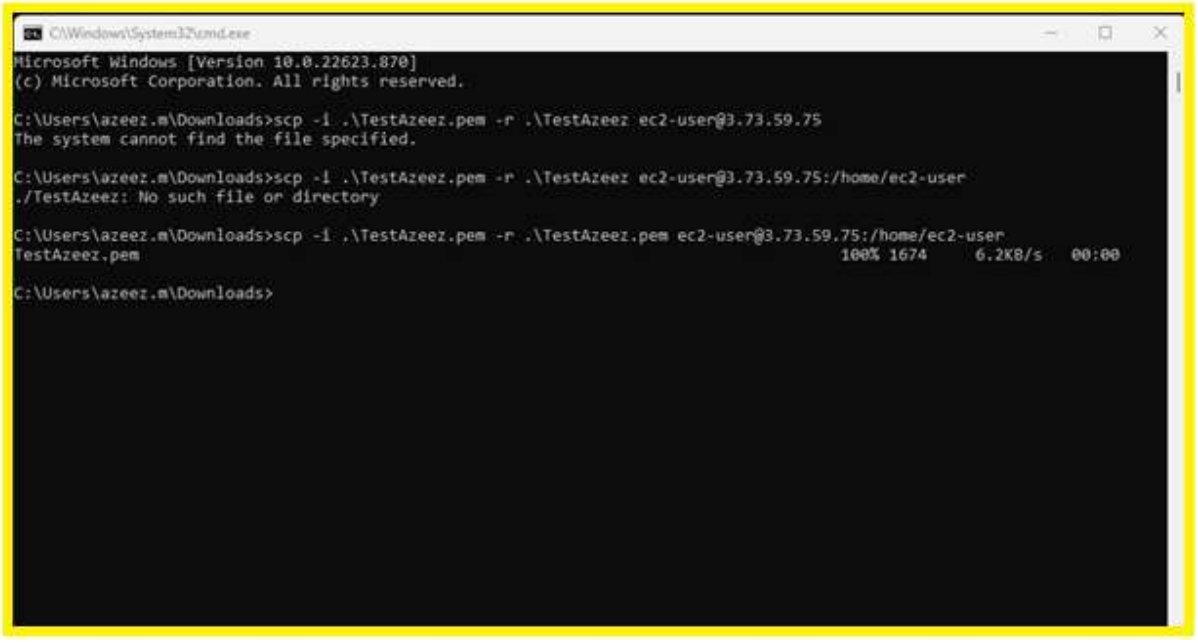
Name: Azeez-EC2-PrvSN1
Key pair: TestAzeez
Network Settings: azeez-VPC-A
Subnet: Azeez-VPC-A-PrvSN1
Auto-assign public IP: Disabled
Security group name: Azeez-VPC-A-SG

Ping from Azeez-EC2-PubSN1 to Azeez PrvSN1




n) Copy the key pair on to public subnet machine and then from public subnet machine try to connect private subnet machine with ssh

i) Copied .pem file to Public SN1 EC2 instance



ii) Connecting from Azeez-EC2-Pub SN1 to Azeez-EC2-Prv SN1

```
[root@ip-192-168-2-223 ec2-user]# pwd
/home/ec2-user
[root@ip-192-168-2-223 ec2-user]# ls
TestAzeez.pem
[root@ip-192-168-2-223 ec2-user]# chmod 700 TestAzeez.pem
[root@ip-192-168-2-223 ec2-user]# ls
TestAzeez.pem
[root@ip-192-168-2-223 ec2-user]# ssh -i TestAzeez.pem ec2-user@192.168.0.196
The authenticity of host '192.168.0.196 (192.168.0.196)' can't be established.
ECDSA key fingerprint is SHA256:1X2fkFfRvpFcrNt5pCo/9iPYxgv83WTsXZOzQT4yonY.
ECDSA key fingerprint is MD5:bb:77:50:b3:b2:45:4e:9f:d0:45:77:15:f9:60:9a:e1.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.0.196' (ECDSA) to the list of known hosts.
Permission denied (publickey,gssapi-keyex,gssapi-with-mic).
[root@ip-192-168-2-223 ec2-user]# ssh -i TestAzeez.pem ec2-user@192.168.0.196
Permission denied (publickey,gssapi-keyex,gssapi-with-mic).
[root@ip-192-168-2-223 ec2-user]# ssh -i TestAzeez.pem ec2-user@192.168.0.214
The authenticity of host '192.168.0.214 (192.168.0.214)' can't be established.
ECDSA key fingerprint is SHA256:eRjZ3L+d8ygi7sg9I2QrberHdZBPOdvNohJyNk3kn+w.
ECDSA key fingerprint is MD5:56:85:1e:8a:dd:56:1a:cf:68:e8:48:db:7b:67:c3:ad.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.0.214' (ECDSA) to the list of known hosts.

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-192-168-0-214 ~]$
```

o) In order to get internet on our private subnet machine then we have to create a NAT gateway in public subnet 1

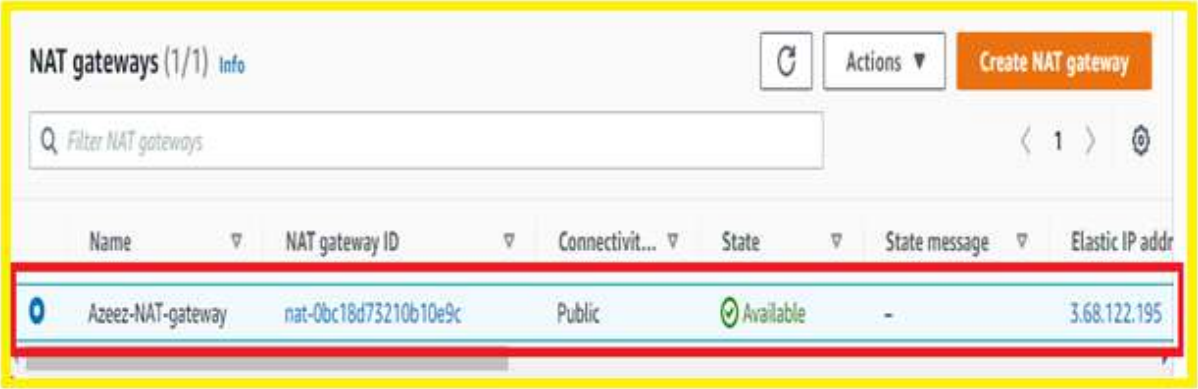
NAT gateways:

Create a NAT gateways:

Name: Azeez-NAT-gateway

Subnet: Azeez-VPC-A-PubSn1

Elastic IP allocation ID: allocated

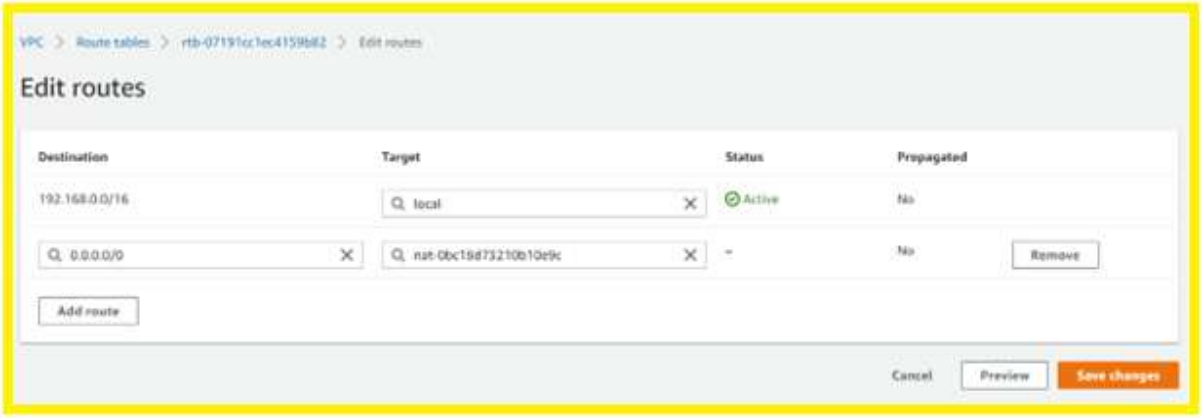


p) Edit the route table of private subnet with a route to NAT gateway

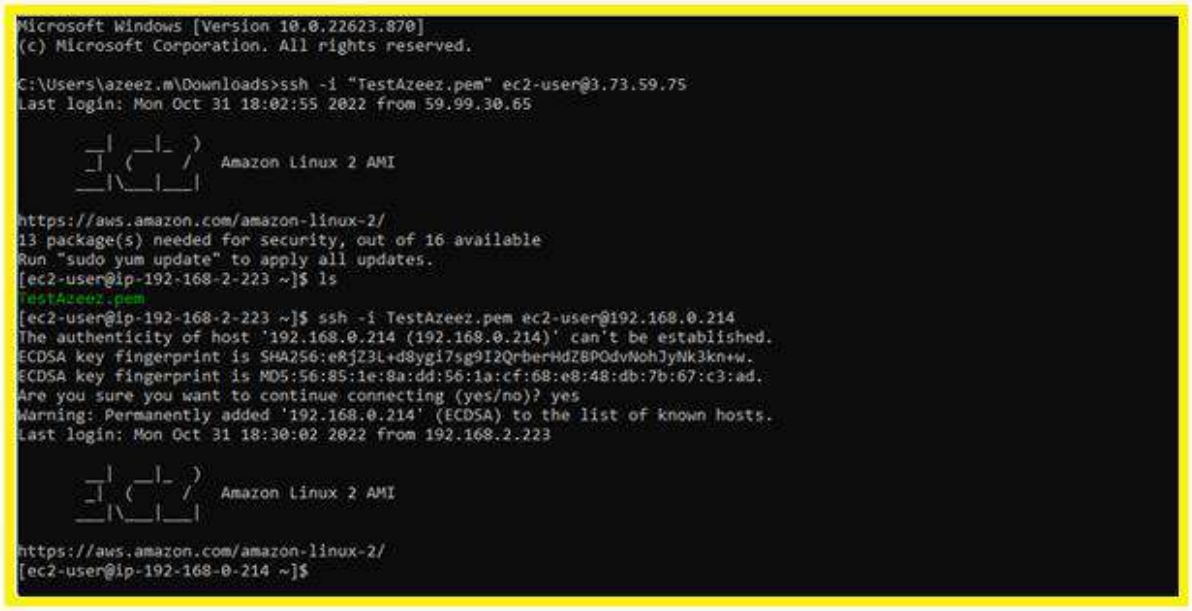
Know edit route table

Azeez-VPC-A-PrivRT

Click on Routs and Edit routes

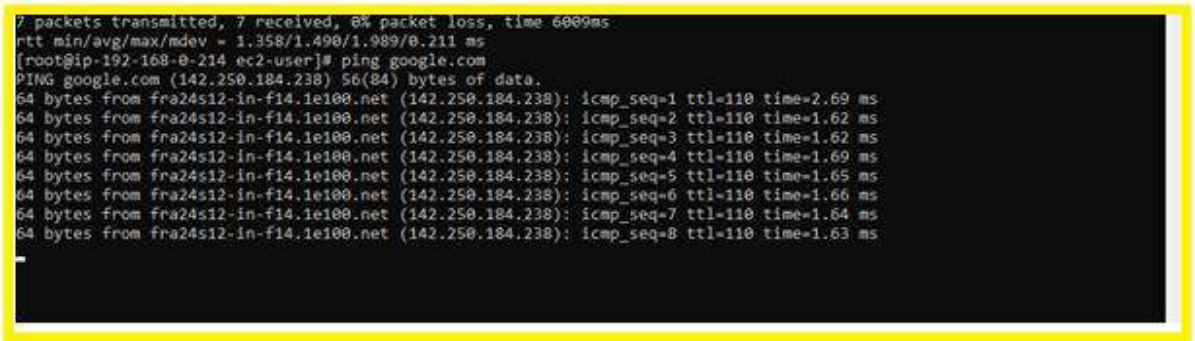



After adding NAT gateway to Public SN1 connection




q) Then login to Private subnet machine and try to ping google.com

r) I can ping goole.com from Azeez EC2-Prv SN1



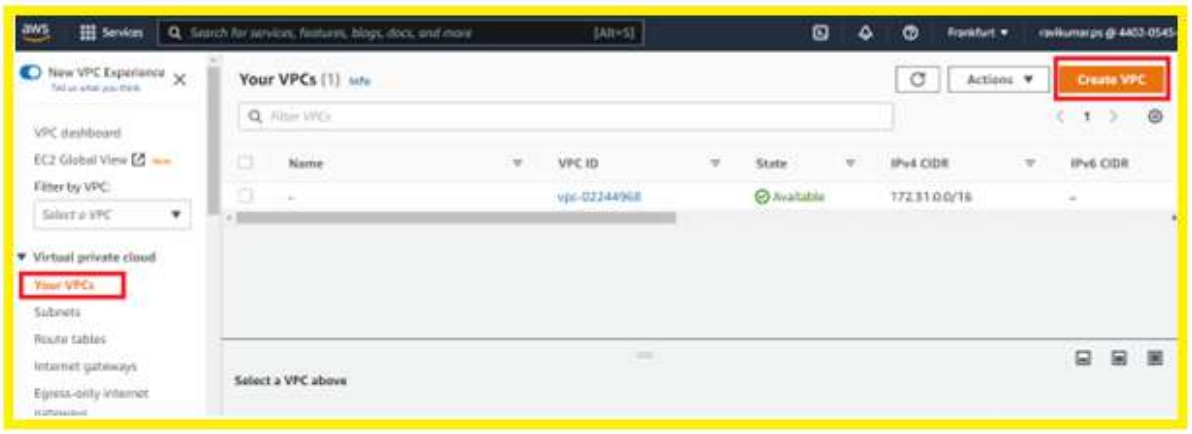
```
ssh -i <key> -r <key> username@public:/<destination>
```

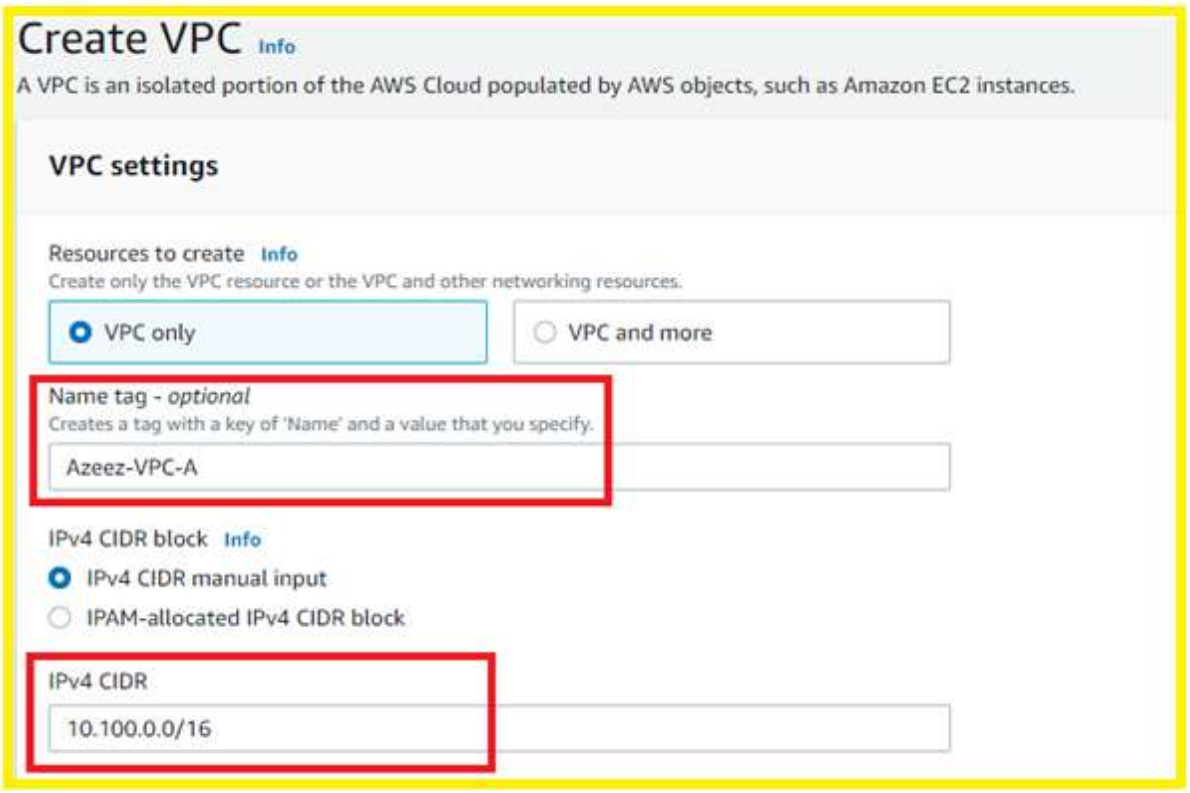
Deletion:

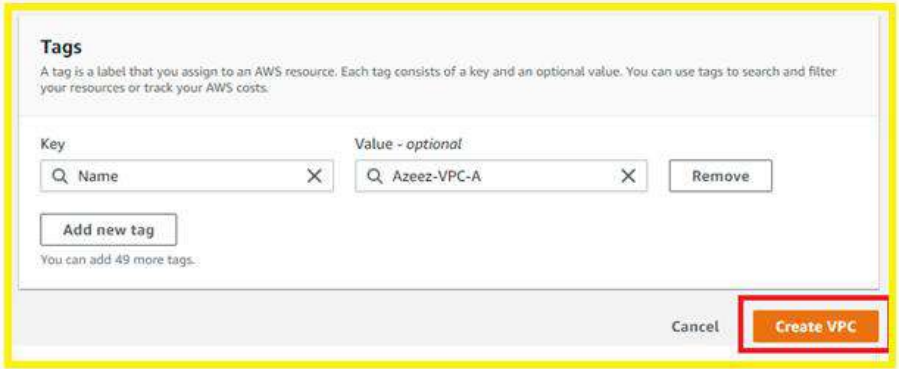
1) Route table deletion
2) Remove Subnet Associations (Public and private)
3) Delete EC2 instance
4) Delete NAT gateway
5) Internet gateways detach
6) Delete internet gateway
7) Delete subnets (Public and Private)
8) Delete Route Table
9) Delete VPC

## 7. VPC Peering

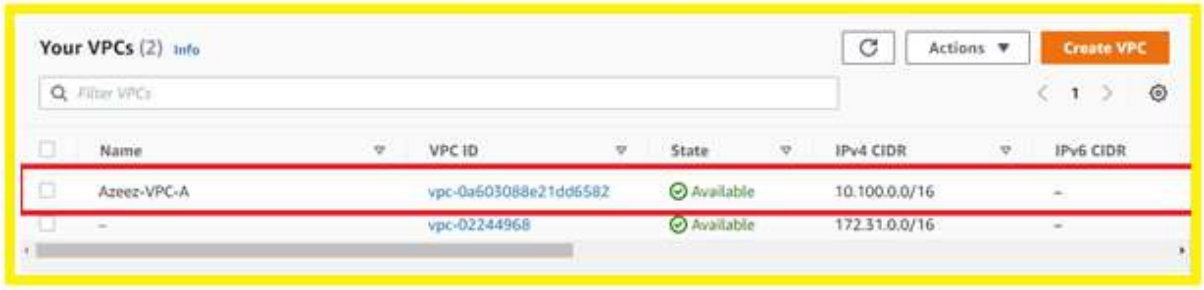
a) **Create VPC:** Go to Your VPC and select Create VPC, Name: Azeez-VPC-A, IPv4 CIDR: 10.100.0.0/16 and select create



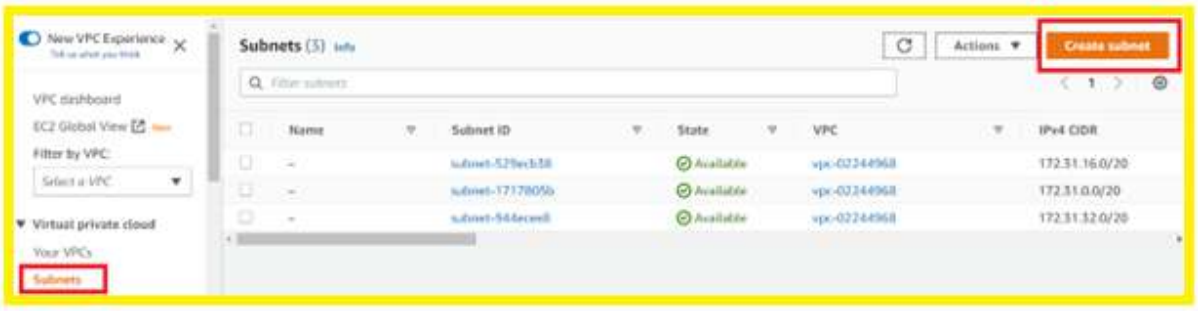



**Screen shot of VPC**



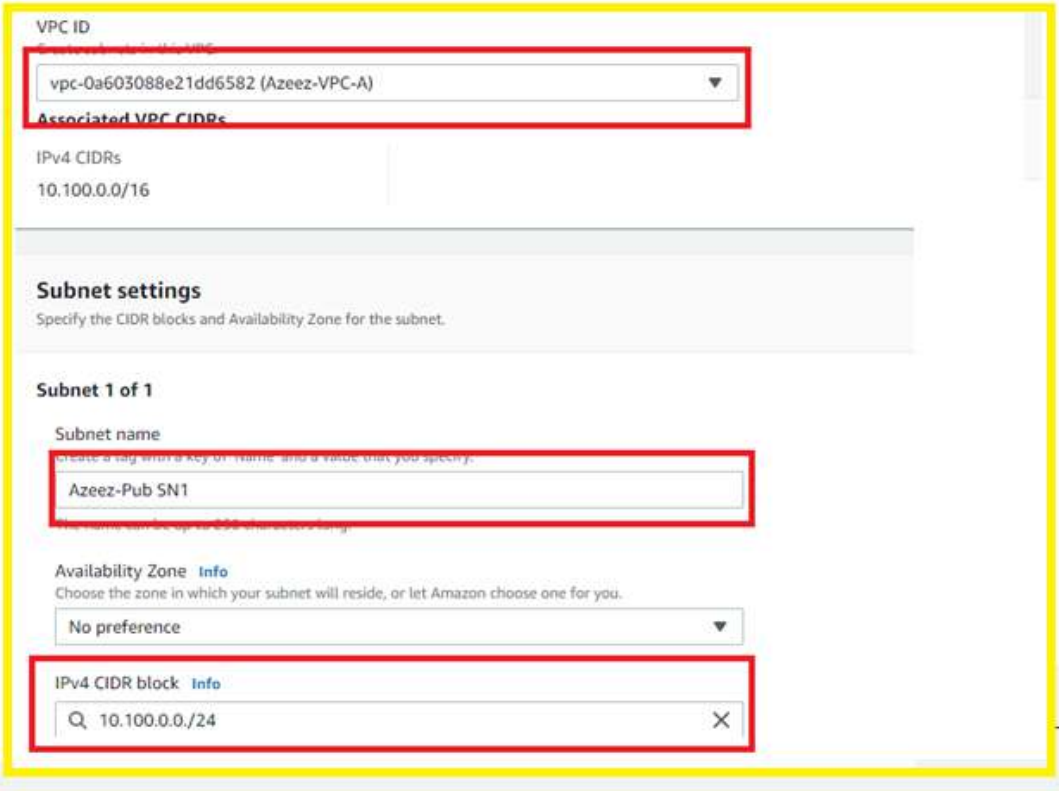

b) Create 1 Pub SN1 and 1 Prv SN1:
Go to Subnet and create Pub SN1




**VPC ID:** Azeez-VPC-A

**Subnet name:** Azeez Pub SN1

**IPv4 CIDR block:** 10.100.0.0./24

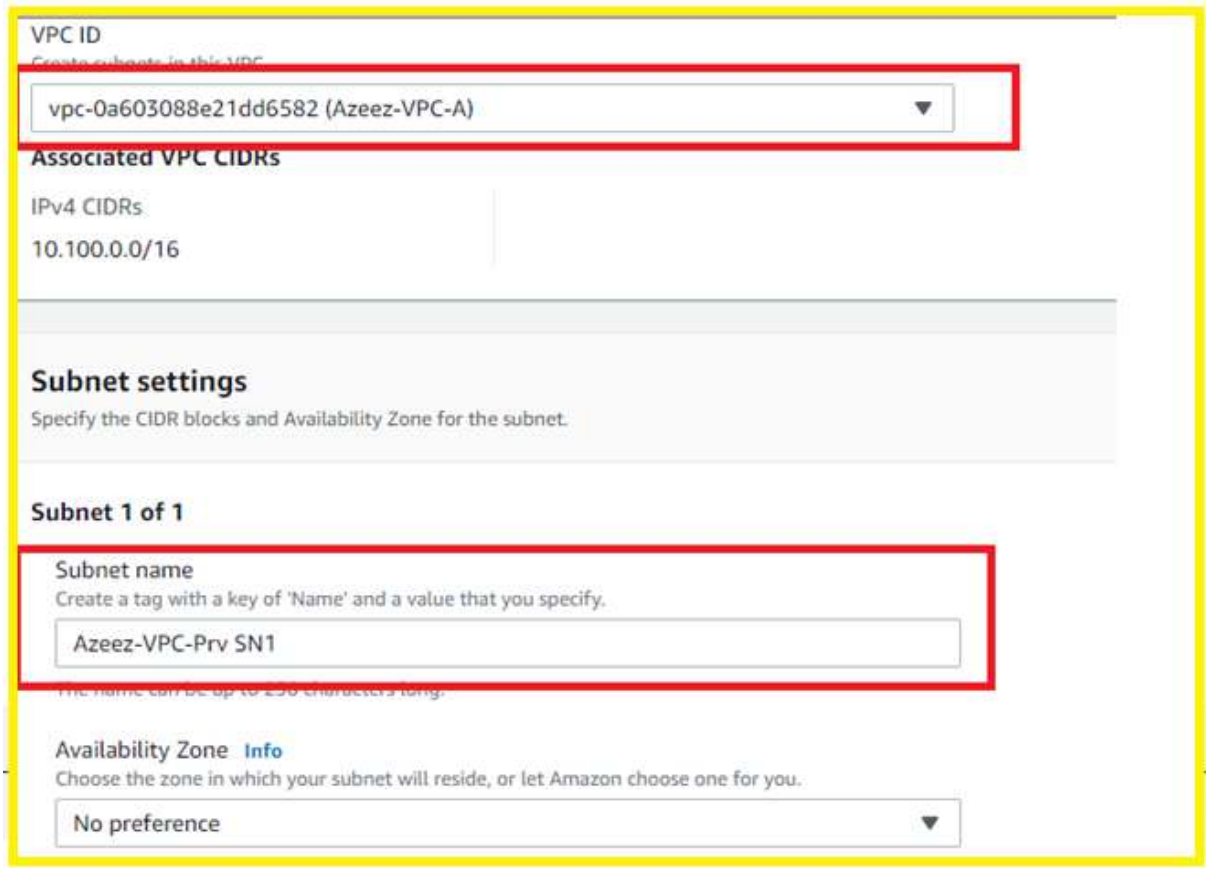


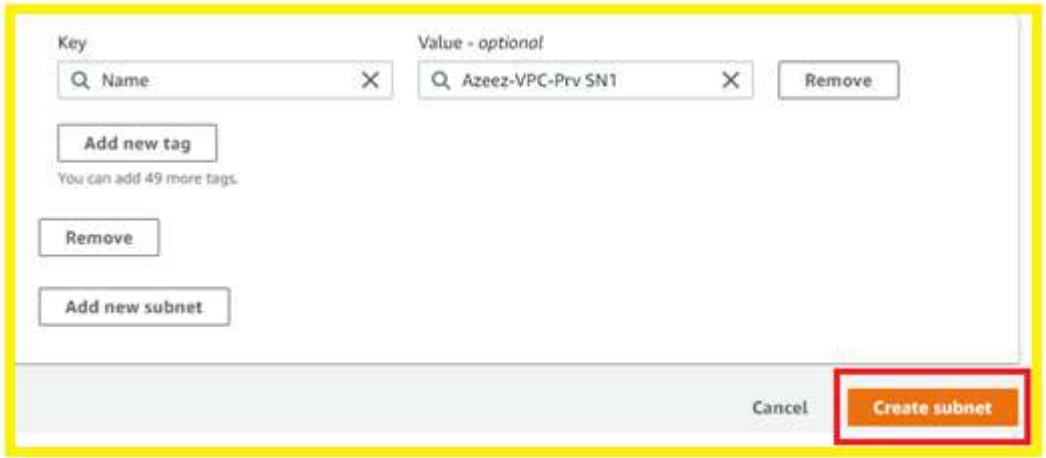
**Create Prv Sub N1:**

**VPC ID:** Azeez-VPC-A

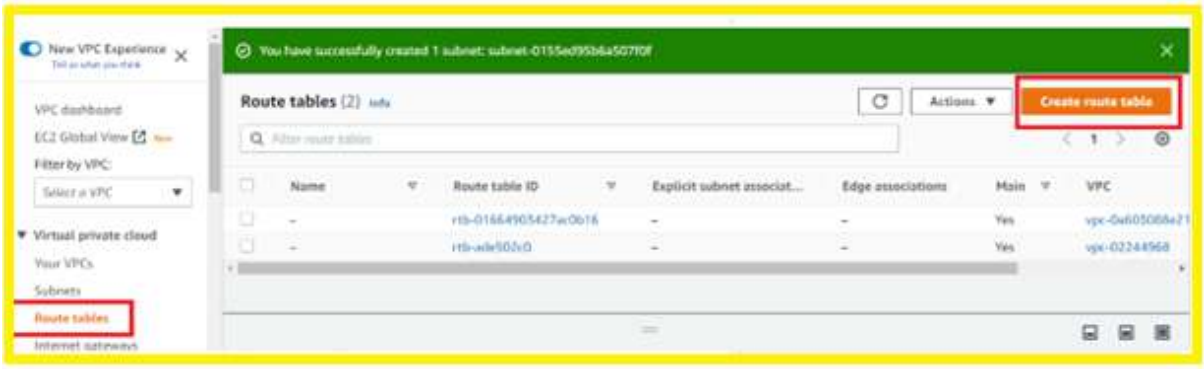
**Subnet name:** Azeez Prv SN1

**IPv4 CIDR block:** 10.100.1.0./24



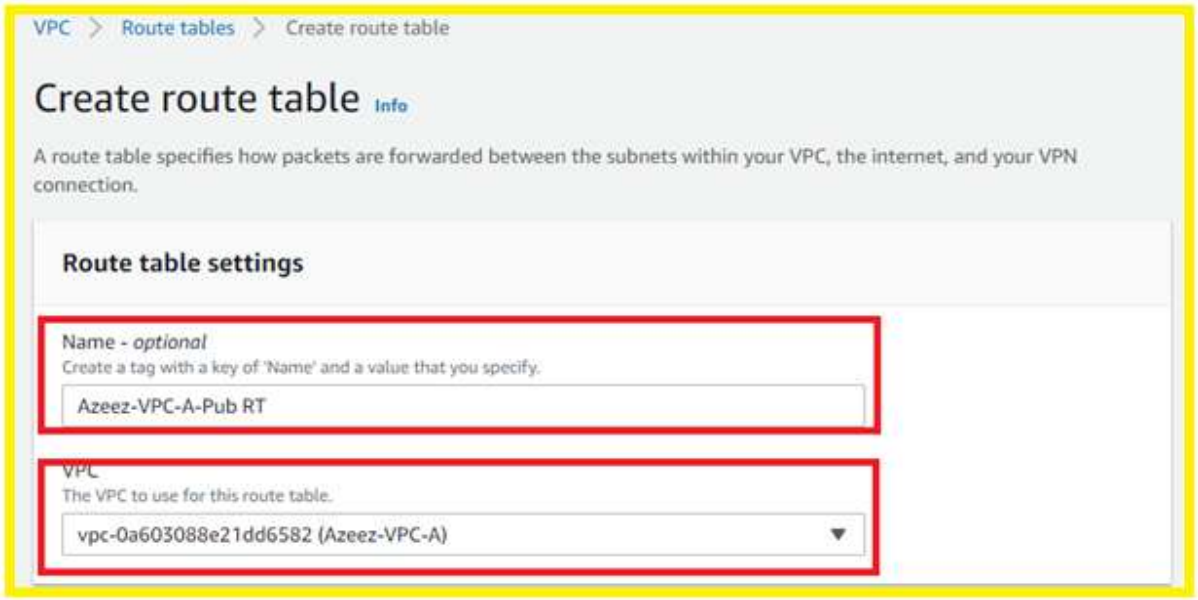
c) **Create Rout Table:** Go to Route table and Create route tables

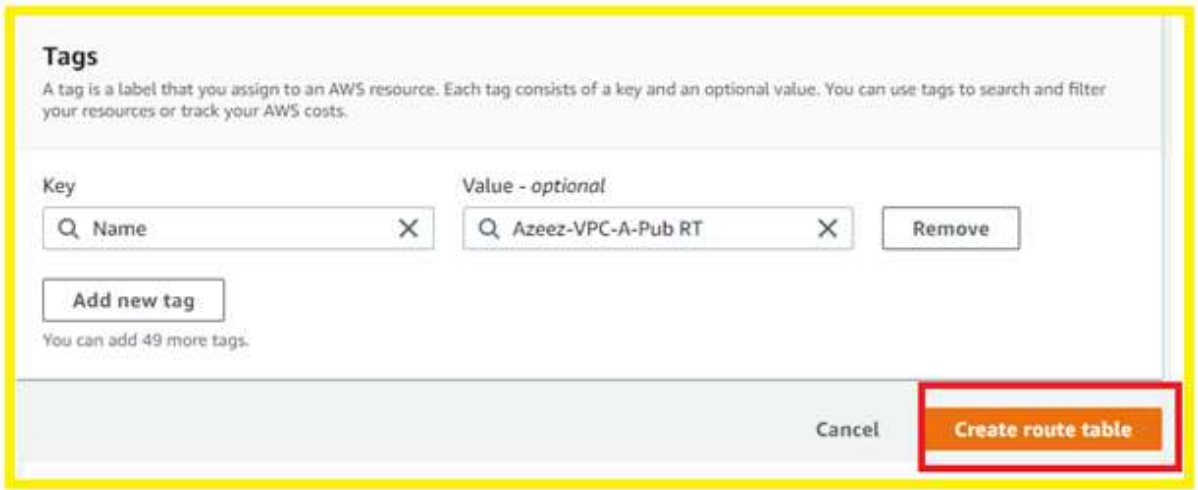



First, I am creating Public Route table

Name: Azeez-VPC-A-Pub RT

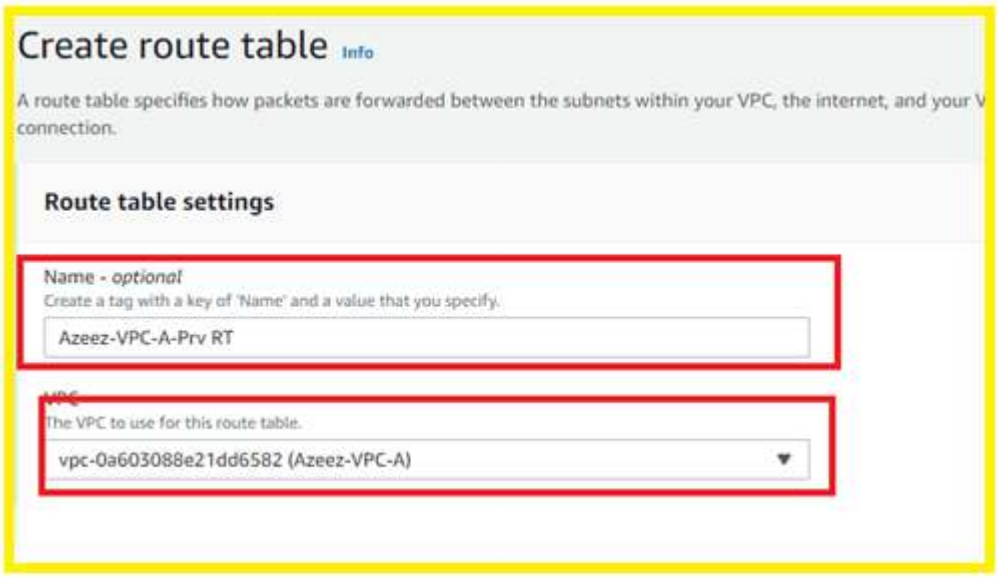
VPC: Azeez-VPC-A

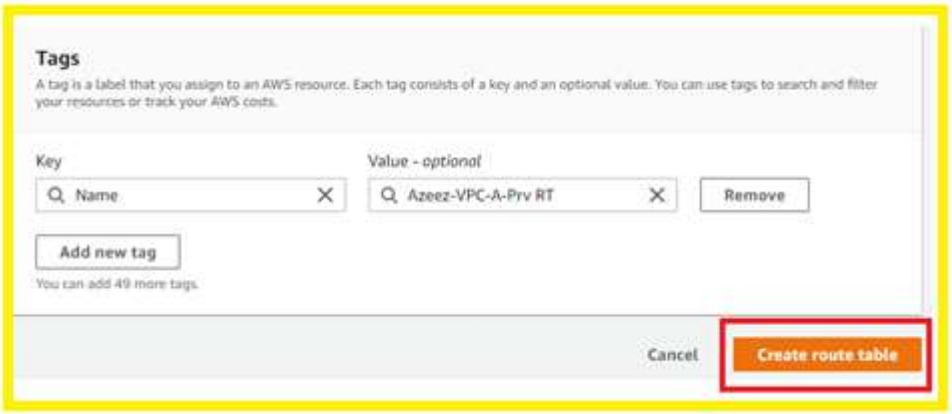


Second, I am Creating Prv Route table

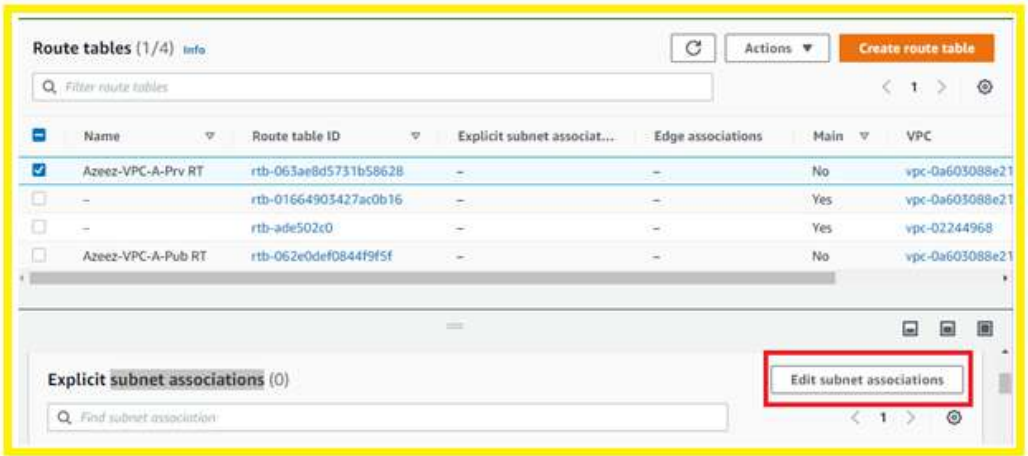
Azeez-VPC-A-Prv RT

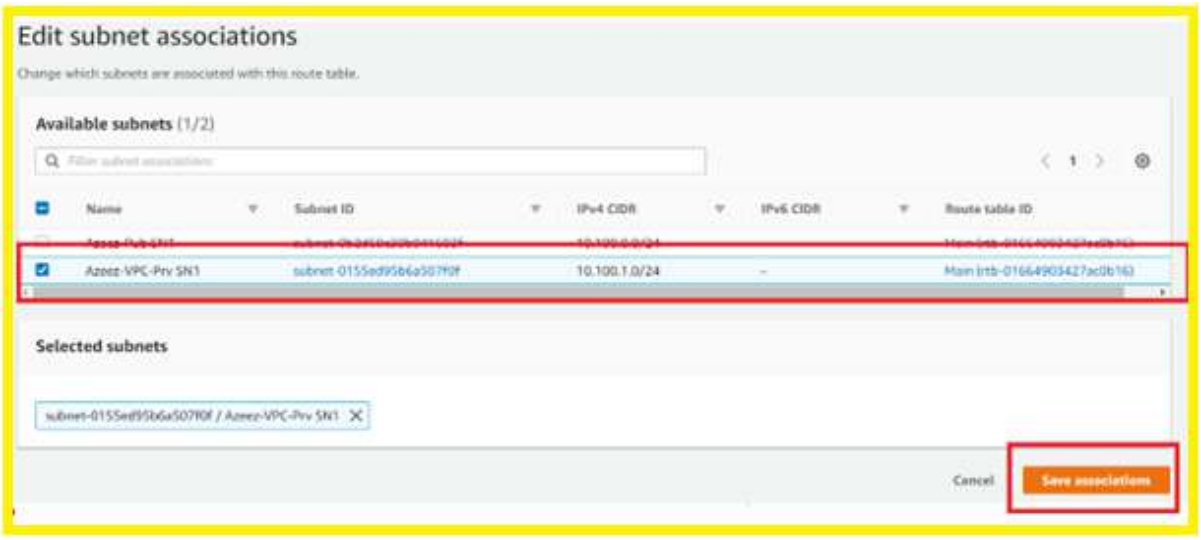



Edit subnet associations:

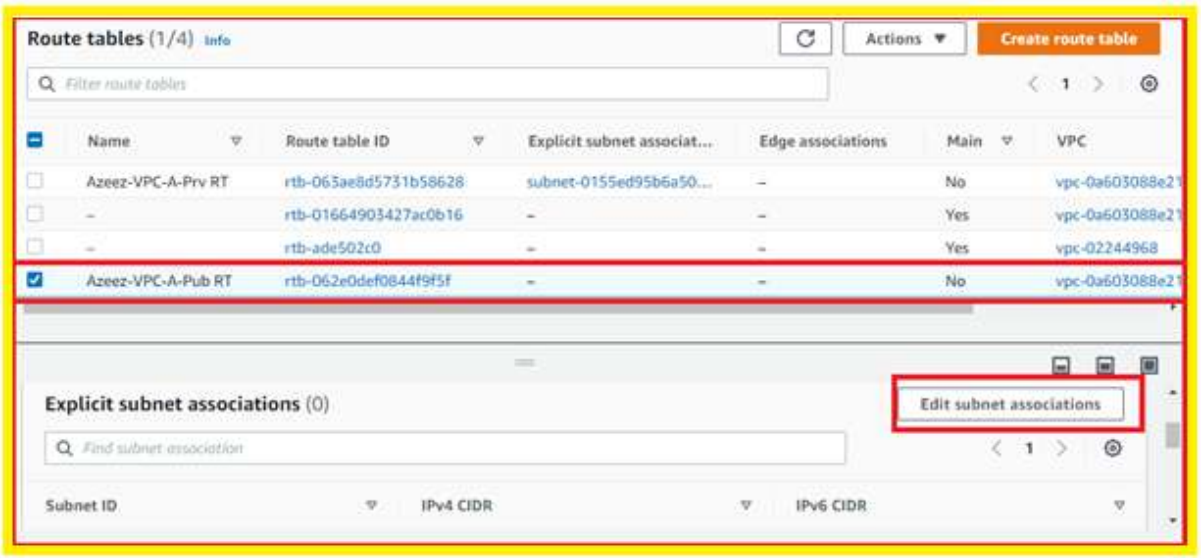
Edit the subnet Association and select the Prv SN1 and save associations

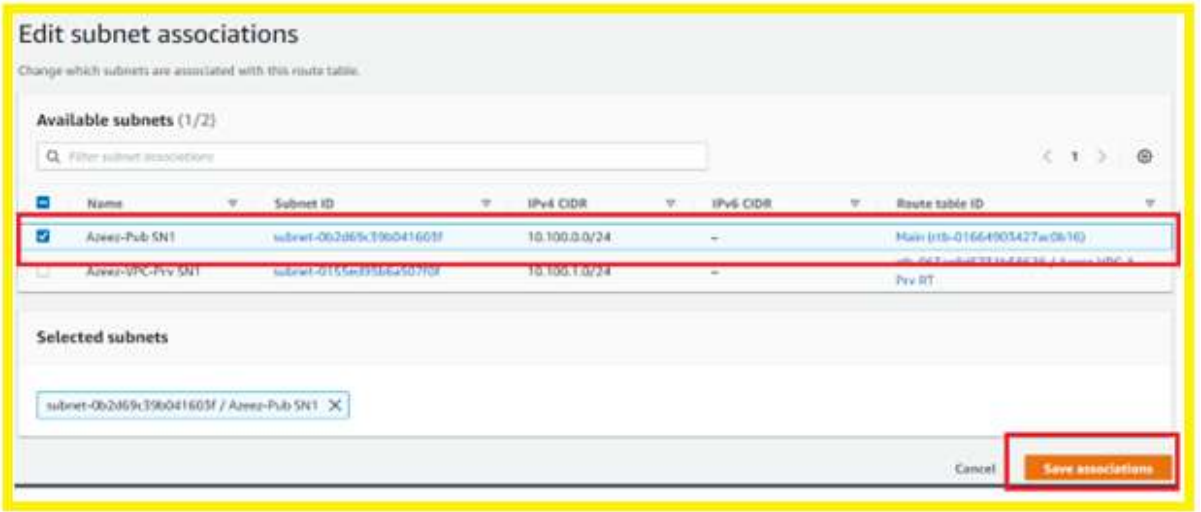




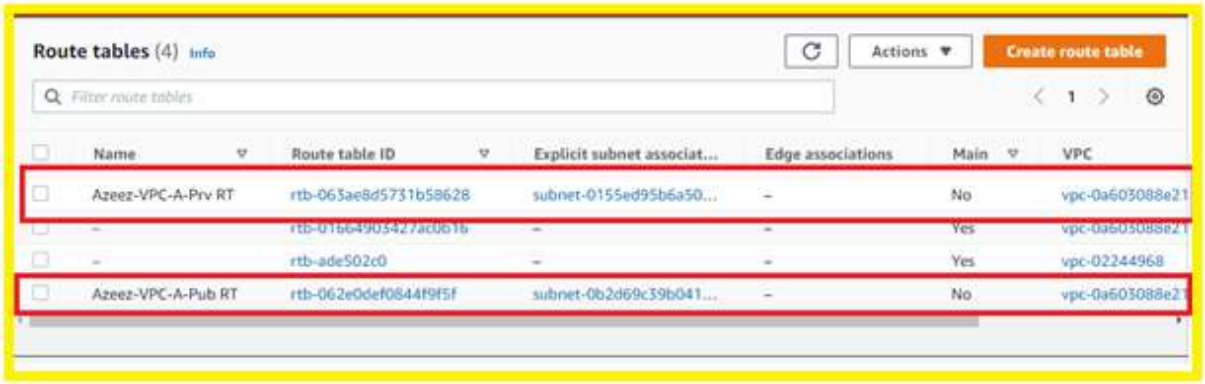

Edit subnet associations:

Edit the subnet Association and select the Pub SN1 and save associations

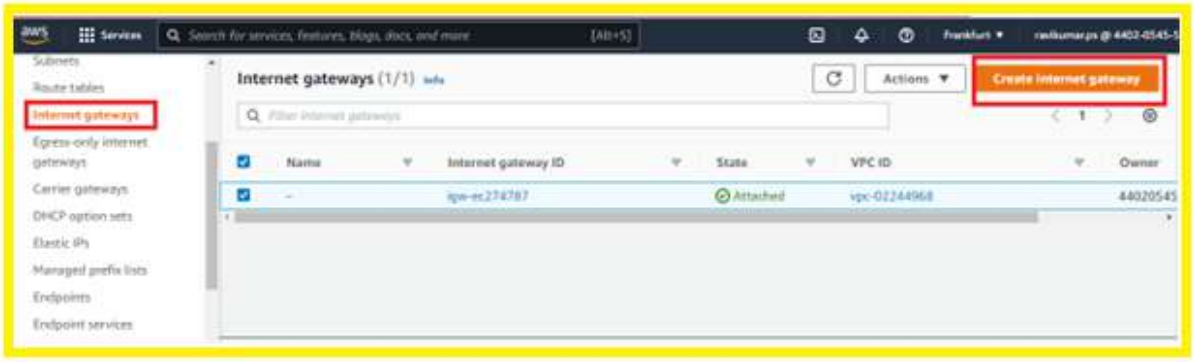


Route Table of Prv and Public

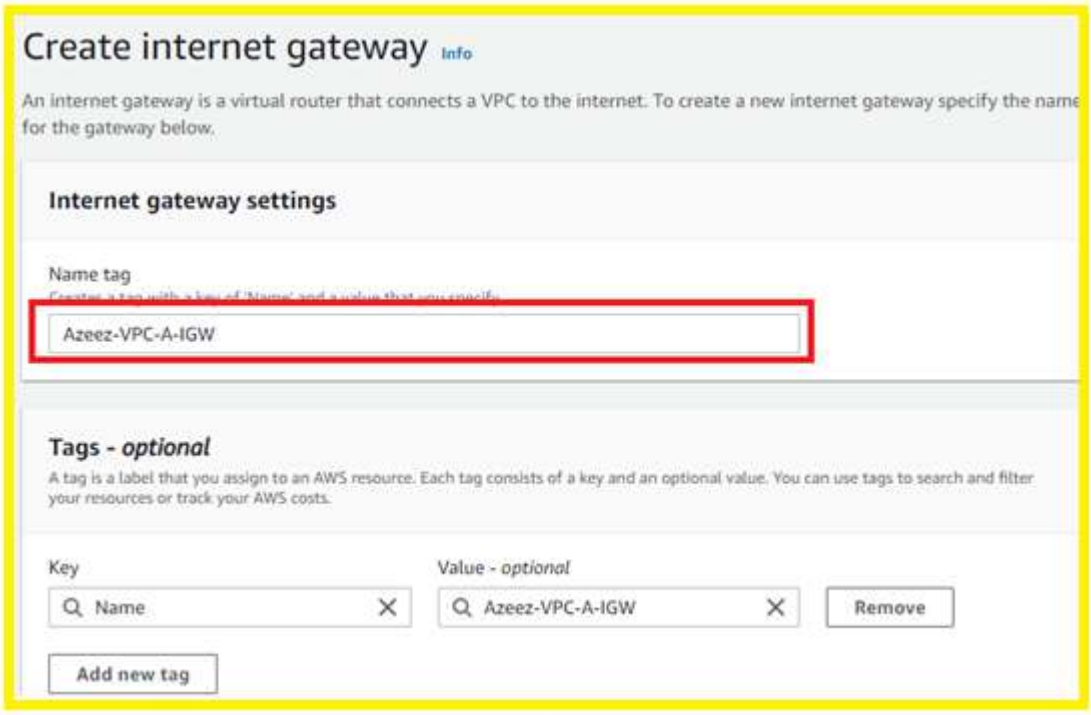


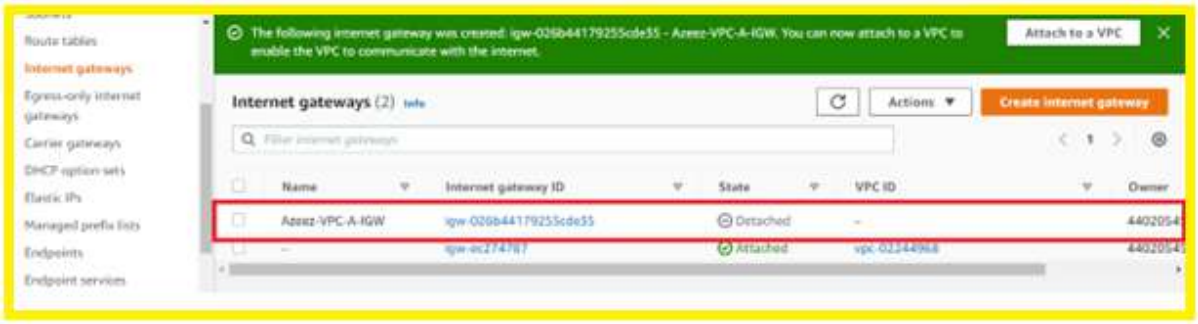

### d) Internet gateway:



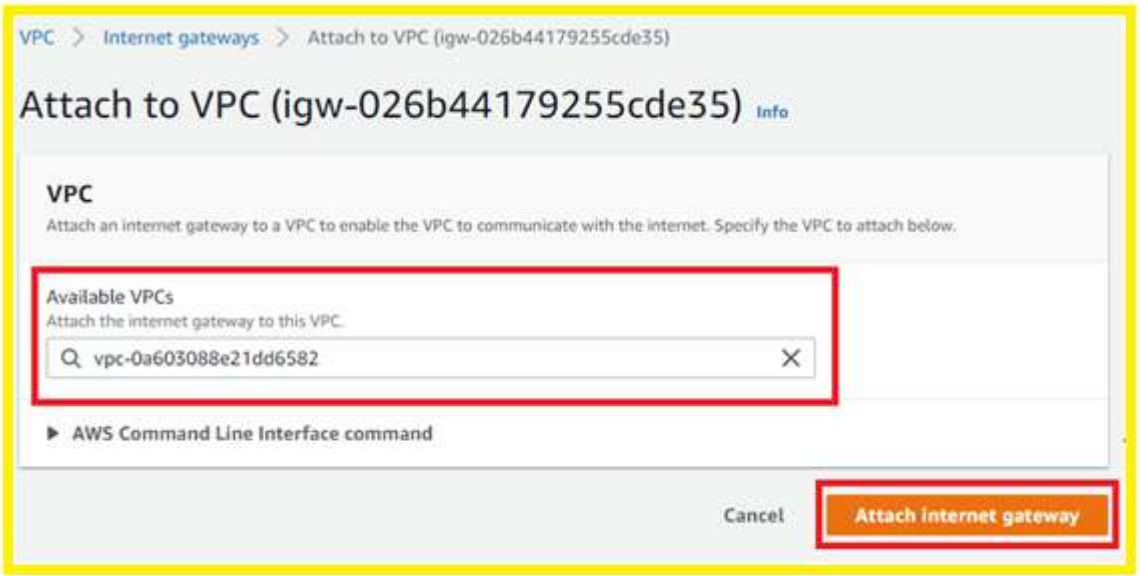

Create Internet gateway: Go to internet gateway and select create internet gateway

Name: Azeez-VPC-A-IGW

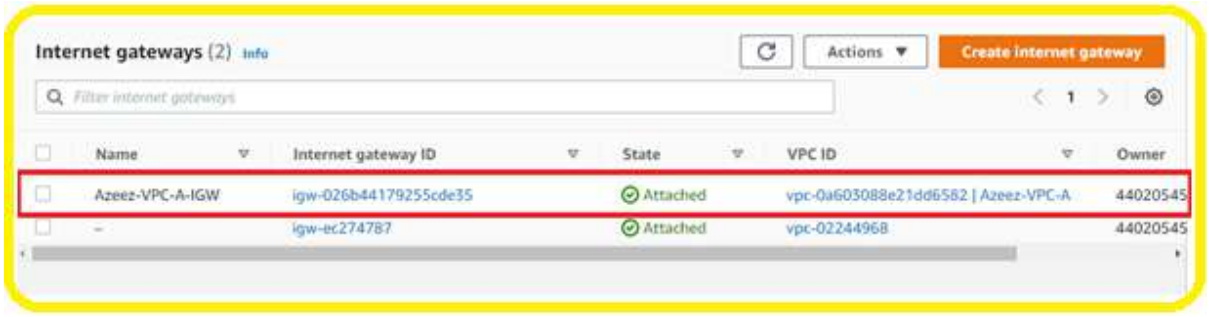


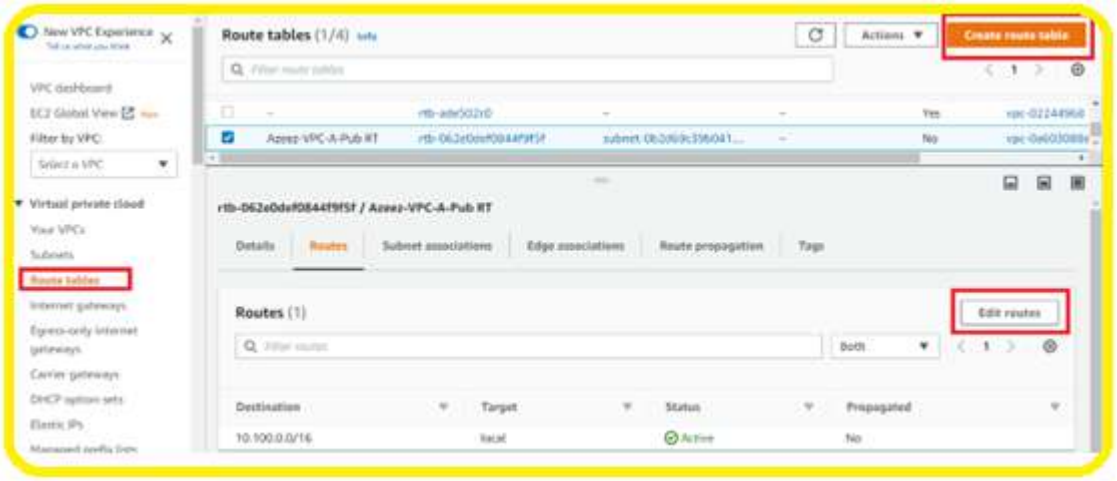

Attach to VPC: Azeez-VPC-A



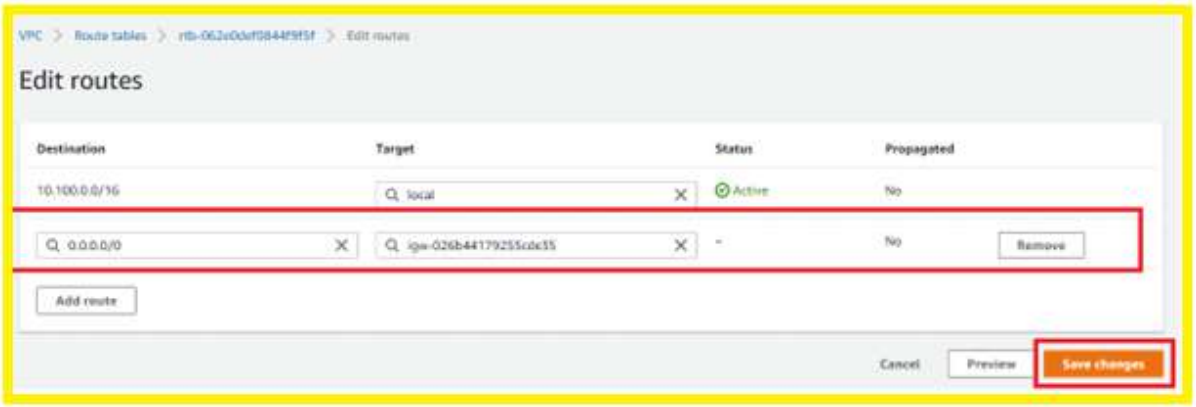
After attachment




Know edit the routes



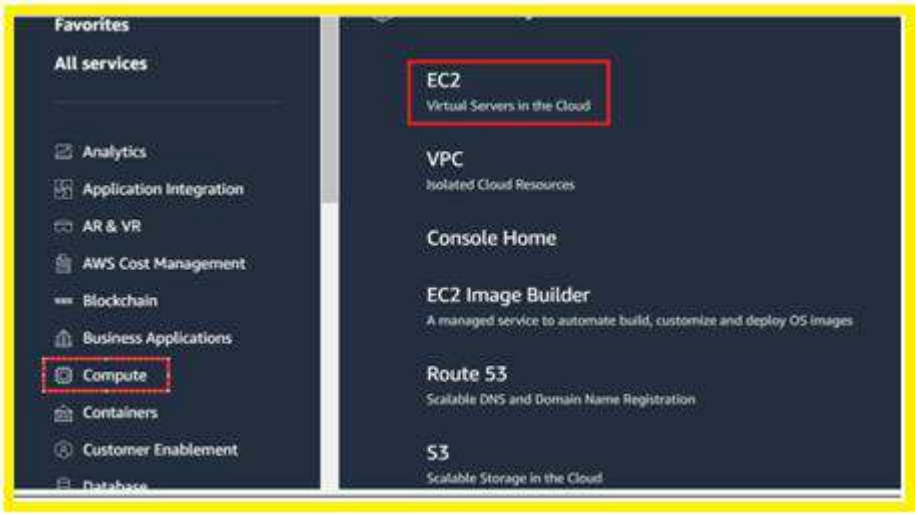

Edit the route table and add internet gateway and save changes



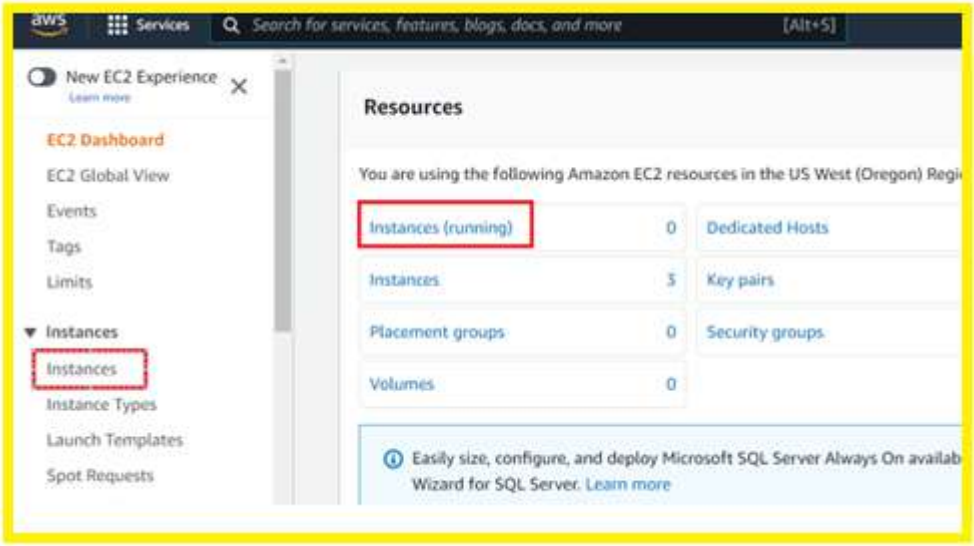
**e) Create EC2 Instance:**

**Name:** Azeez-EC2-VPC-A-Pub SN1

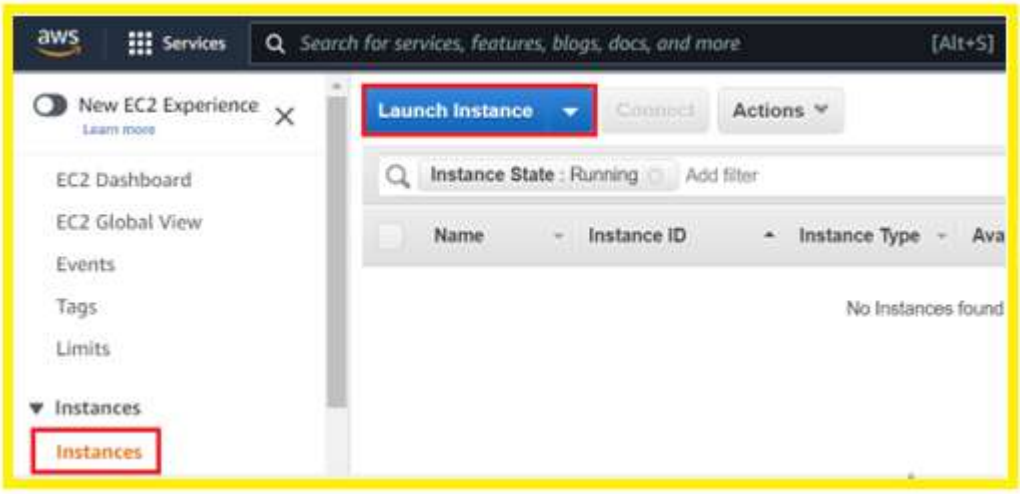
Login into the AWS console page
Once you login go to Services.
Services -> Compute -> EC2



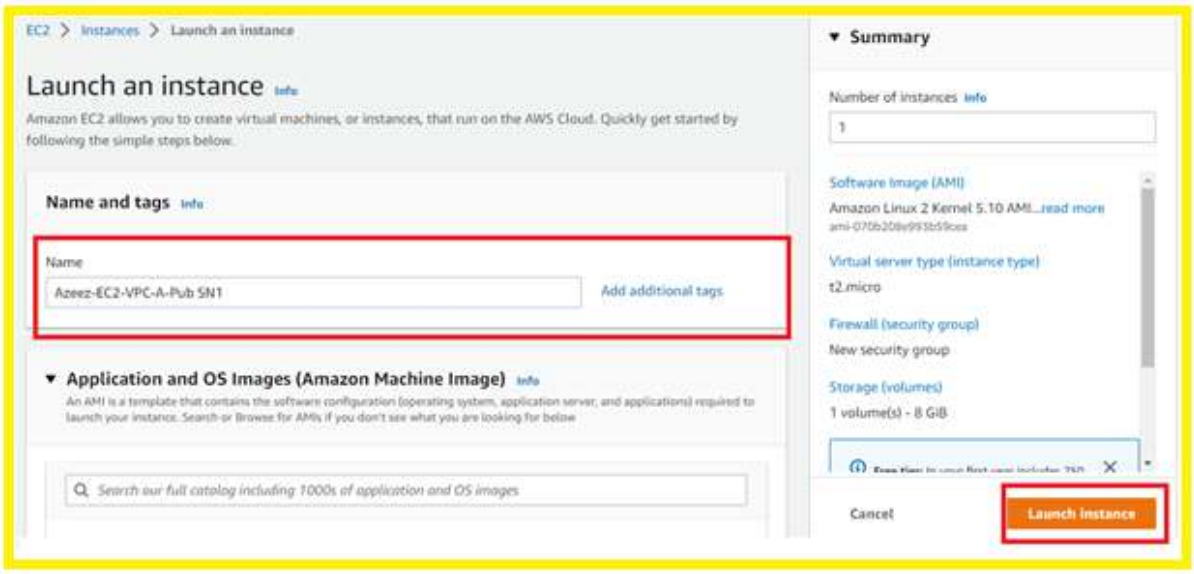

Then go to instances and click on Launch Instance:



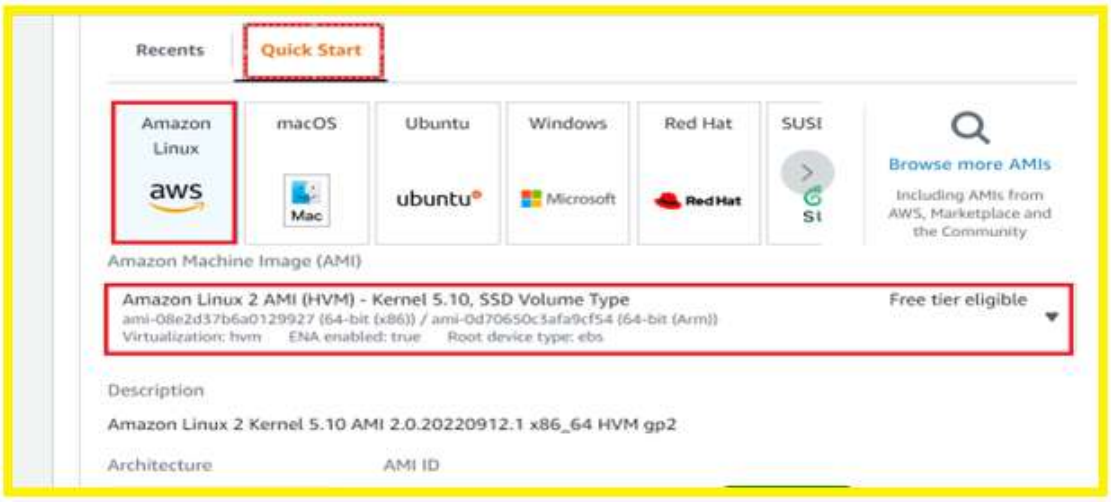
Then click on Launch instance option:



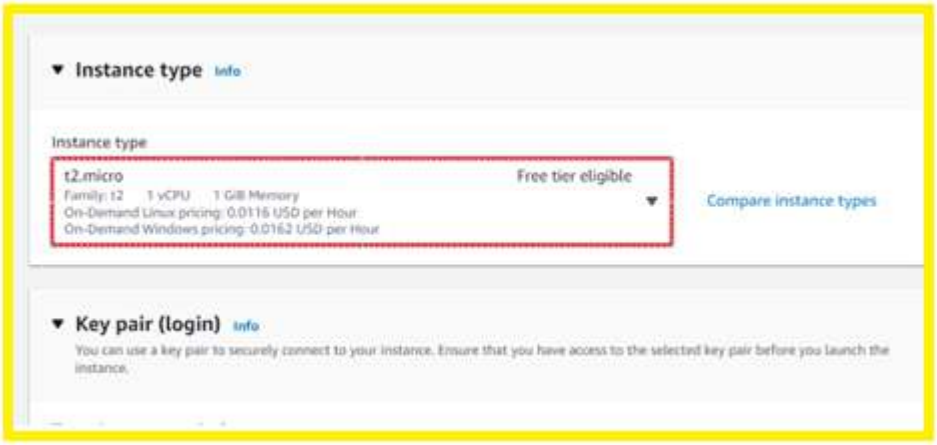

Then give the name to the instance machine:



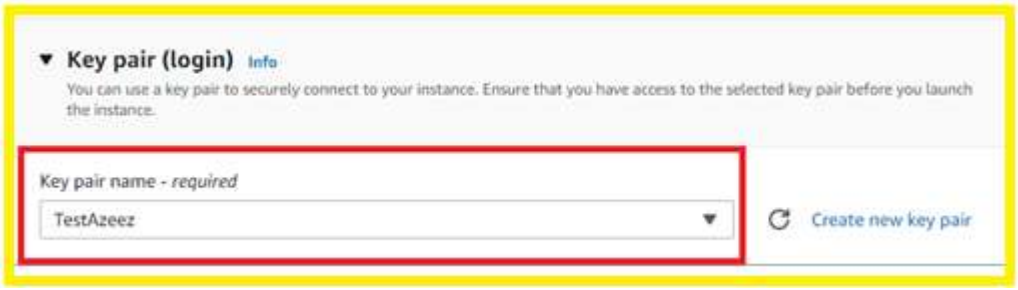

Then select OS Image and the version:



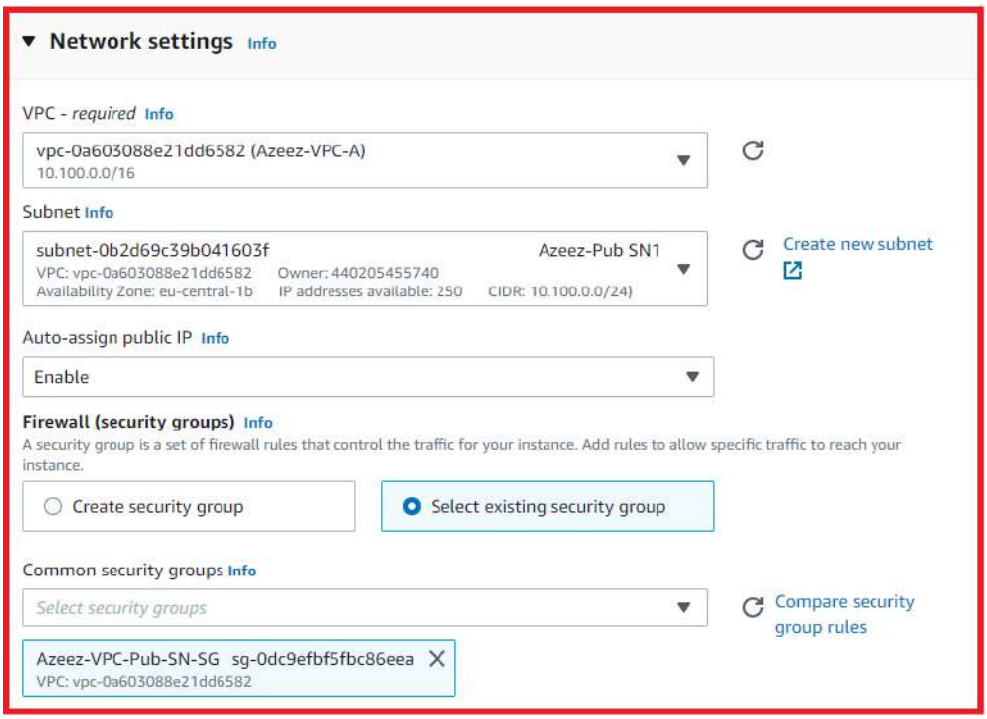
Under the Instance type: Select – t2.micro machine



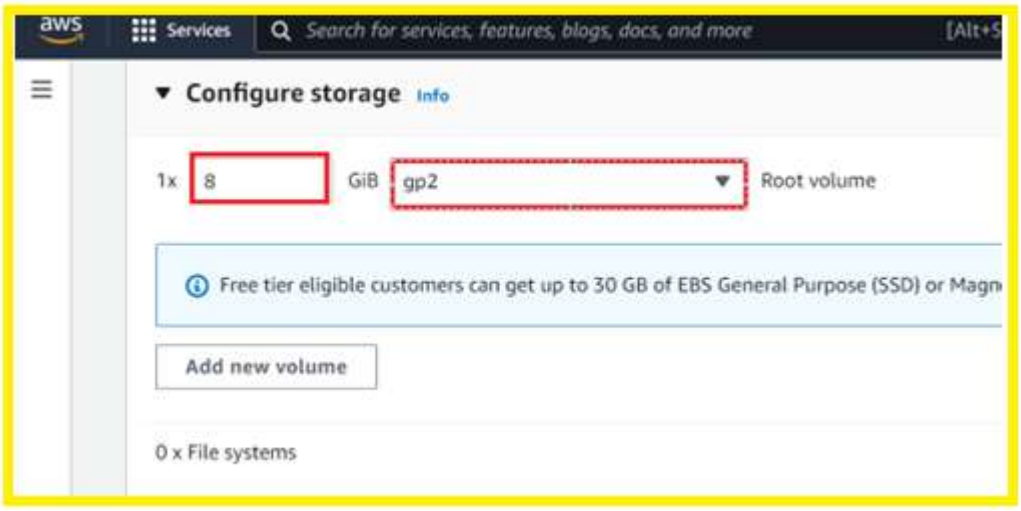

Then select the keypair, if you don't have the keypair please click on "create new keypair"



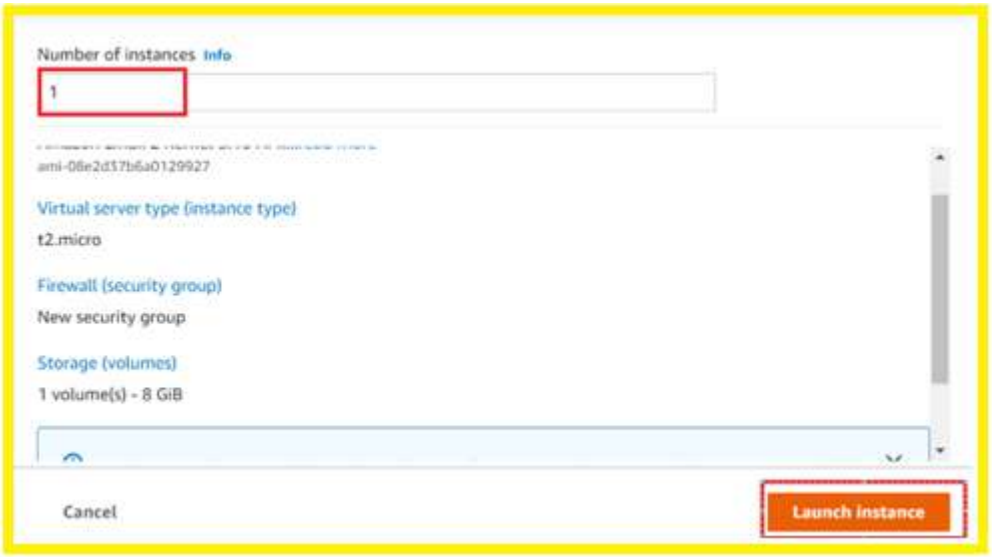

Edit the Network settings:

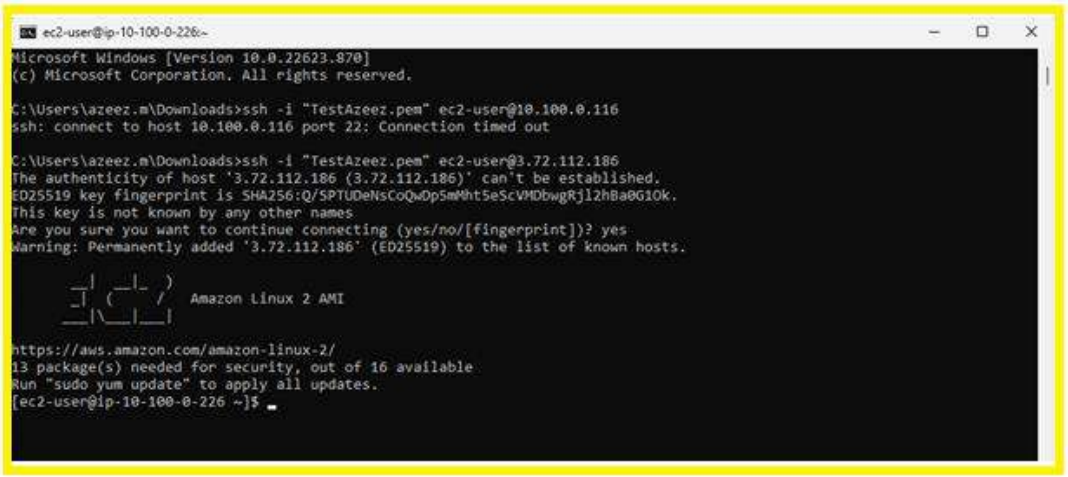


Under Configure storage, please provide your required configure storage:

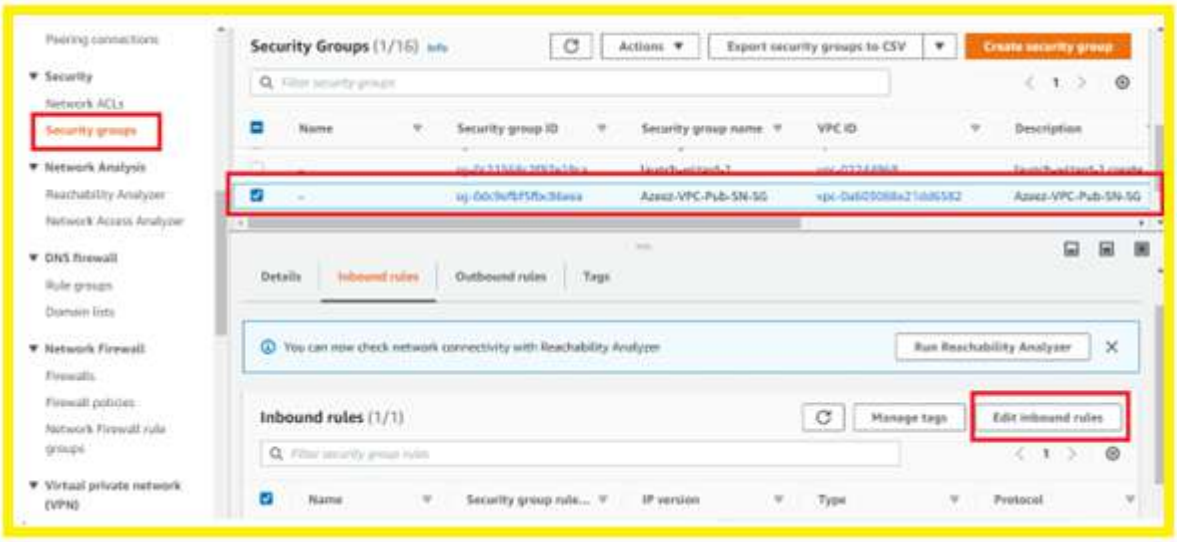


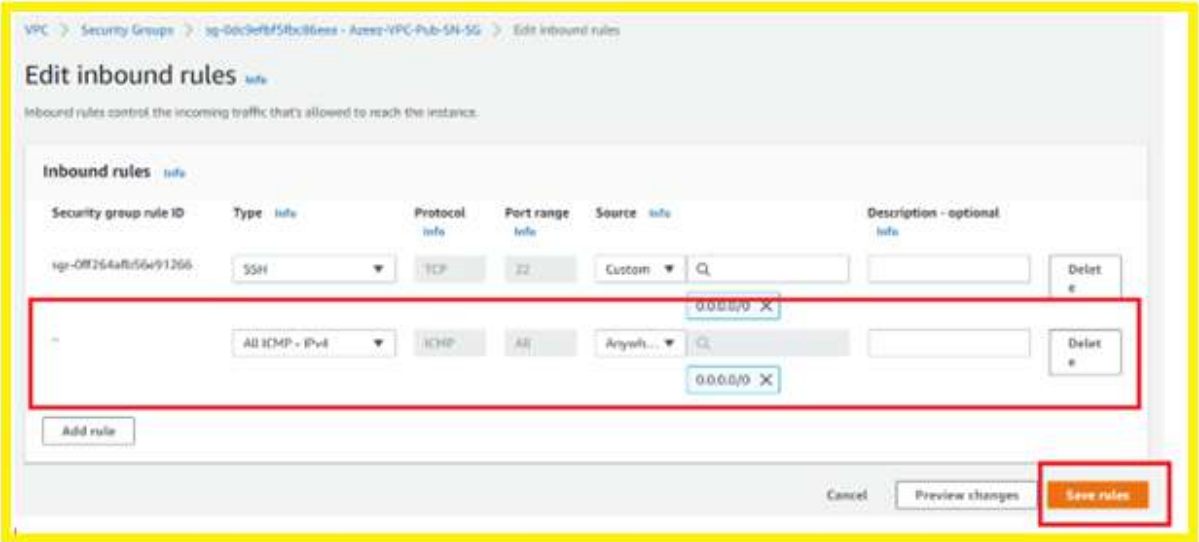

Provide the number of instances you required: 1 and launch instnace



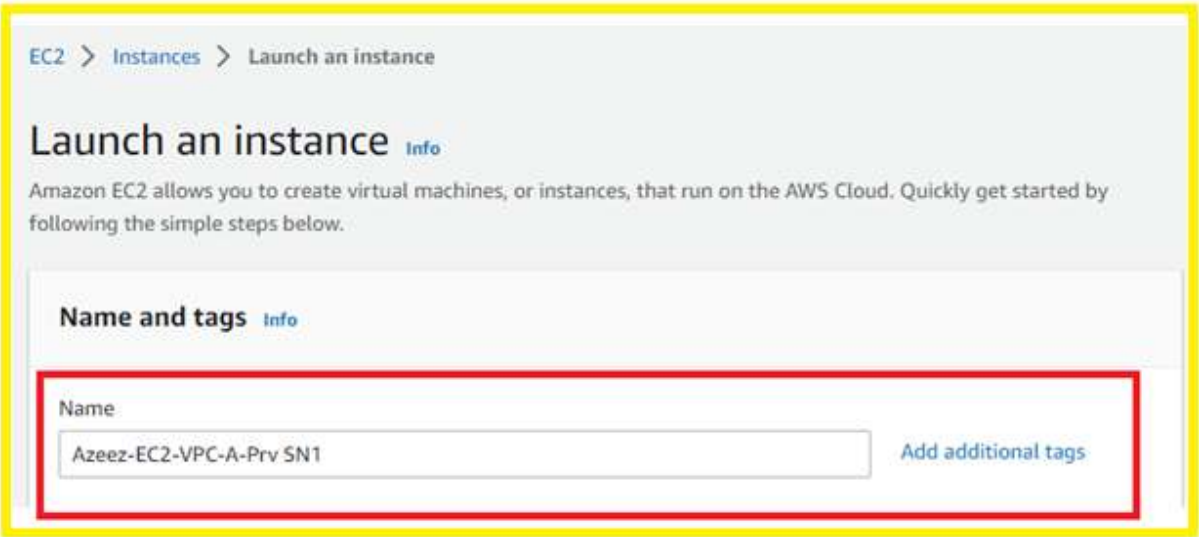



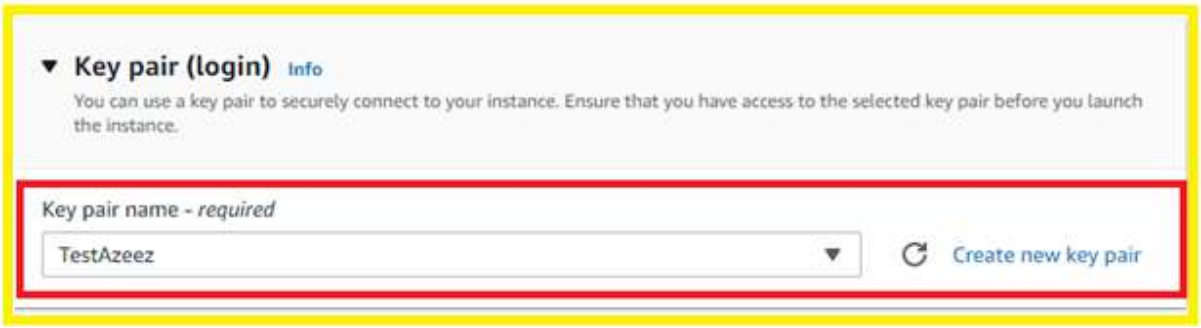
Once EC2 Instance created Edit Inbound rules in Security group:



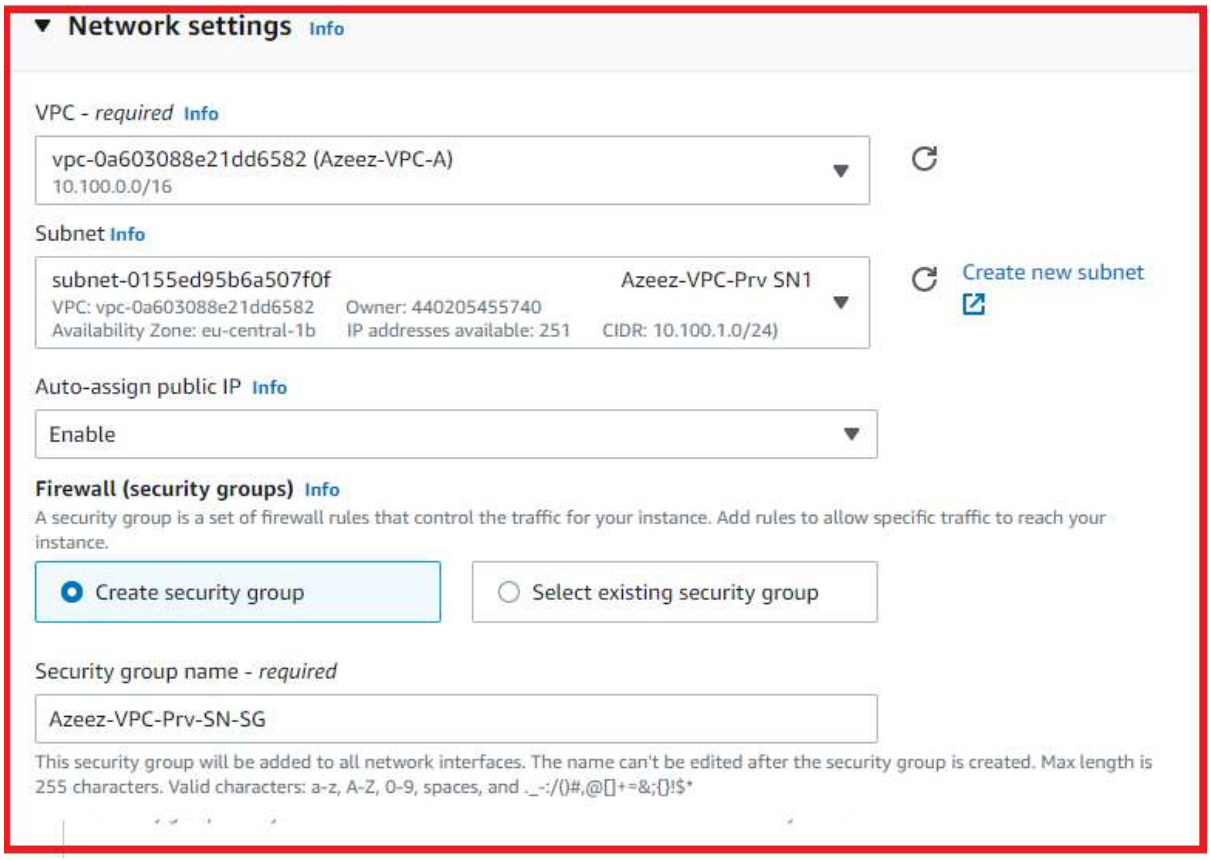




**Create another Private EC2 instance:**

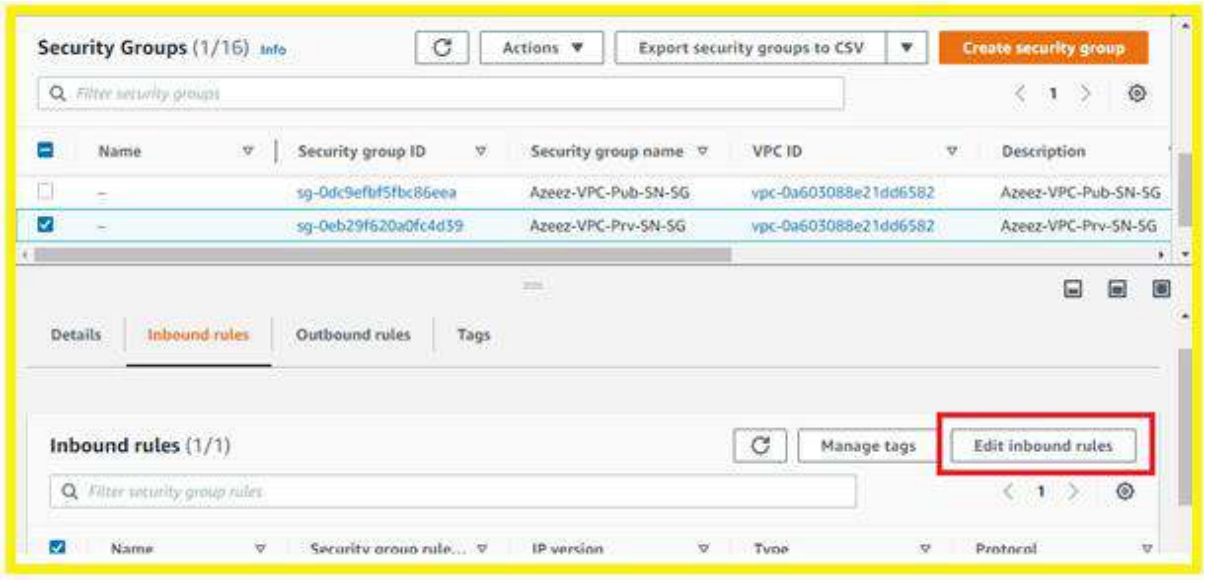


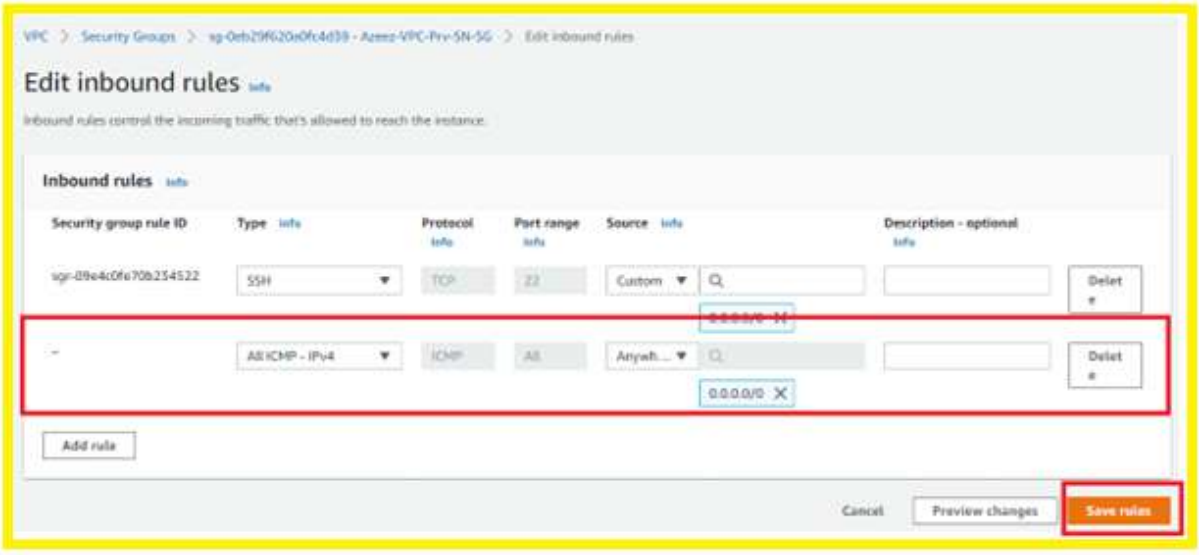



Edit the Network settings:

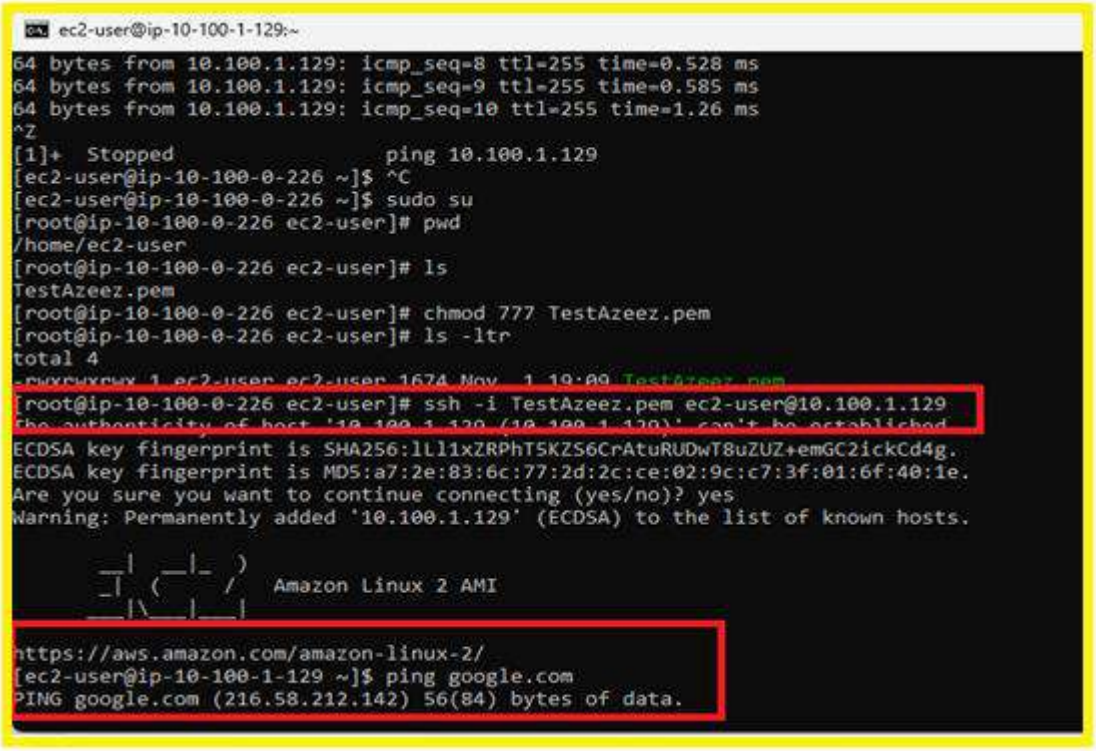


Edit Inbound rules in Security group for Azeez-VPC-Prv-Sn-SG: All ICMP-IPv4

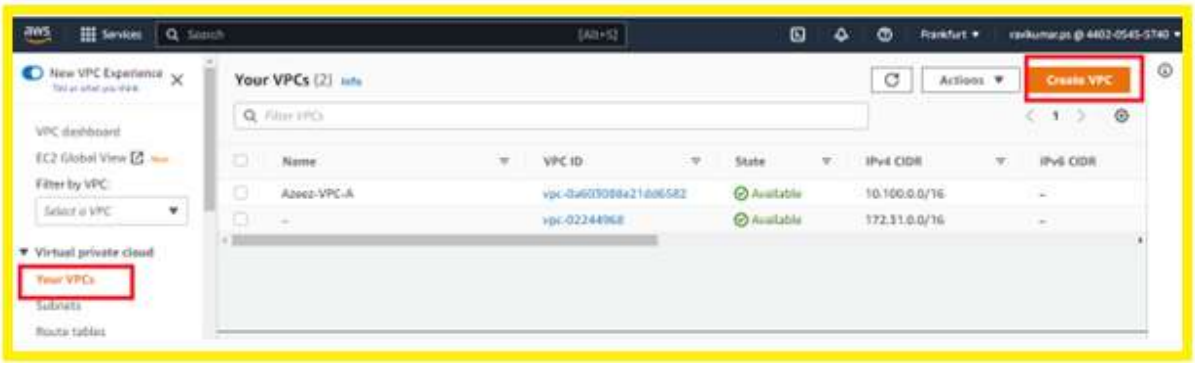



**Copy. pem  Local to Azeez-EC2-VPC-A-Pub SN1**

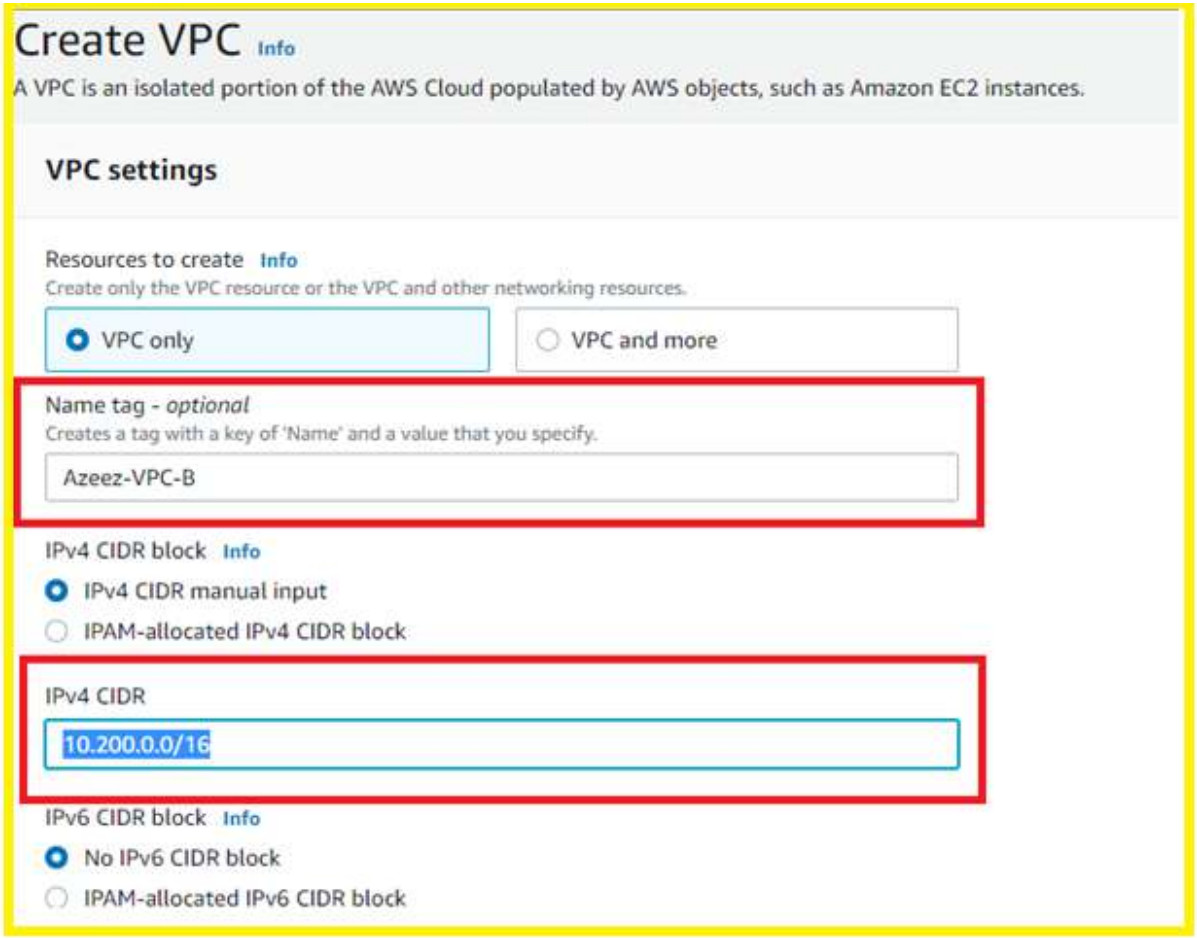

ec2-user@ip-10-100-1-129:~
64 bytes from 10.100.1.129: icmp_seq=8 ttl=255 time=0.528 ms
64 bytes from 10.100.1.129: icmp_seq=9 ttl=255 time=0.585 ms
64 bytes from 10.100.1.129: icmp_seq=10 ttl=255 time=1.26 ms
^Z
[1]+ Stopped ping 10.100.1.129
[ec2-user@ip-10-100-0-226 ~]$ ^C
[ec2-user@ip-10-100-0-226 ~]$ sudo su
[root@ip-10-100-0-226 ec2-user]# pwd
/home/ec2-user
[root@ip-10-100-0-226 ec2-user]# ls
TestAzeez.pem
[root@ip-10-100-0-226 ec2-user]# chmod 777 TestAzeez.pem
[root@ip-10-100-0-226 ec2-user]# ls -ltr
total 4
[root@ip-10-100-0-226 ec2-user]# ssh -i TestAzeez.pem ec2-user@10.100.1.129
ECDSA key fingerprint is SHA256:1Ll1xZRPhT5KZS6CrAtuRUDwT8uZUZ+emGC2ickCd4g.
ECDSA key fingerprint is MD5:a7:2e:83:6c:77:2d:2c:ce:02:9c:c7:3f:01:6f:40:1e.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.100.1.129' (ECDSA) to the list of known hosts.
Amazon Linux 2 AMI
https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-10-100-1-129 ~]$ ping google.com
PING google.com (216.58.212.142) 56(84) bytes of data.

**Create VPC B:**

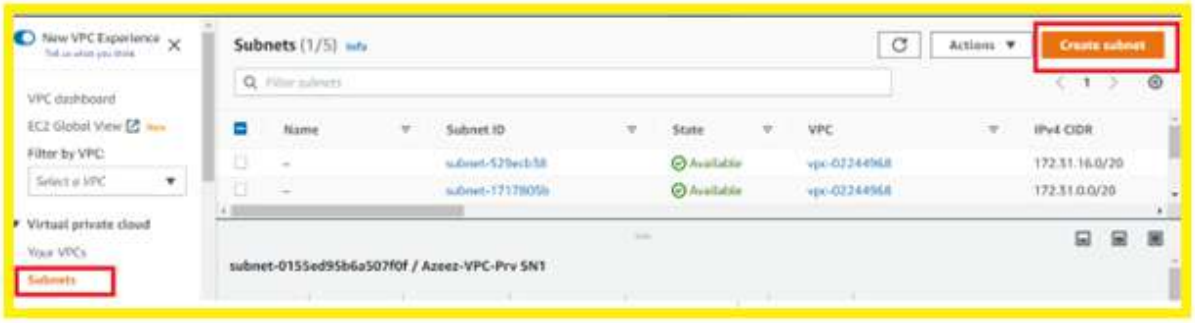



Name tag – optional: Azeez-VPC-B

IPv4 CIDR: 10.200.0.0/16

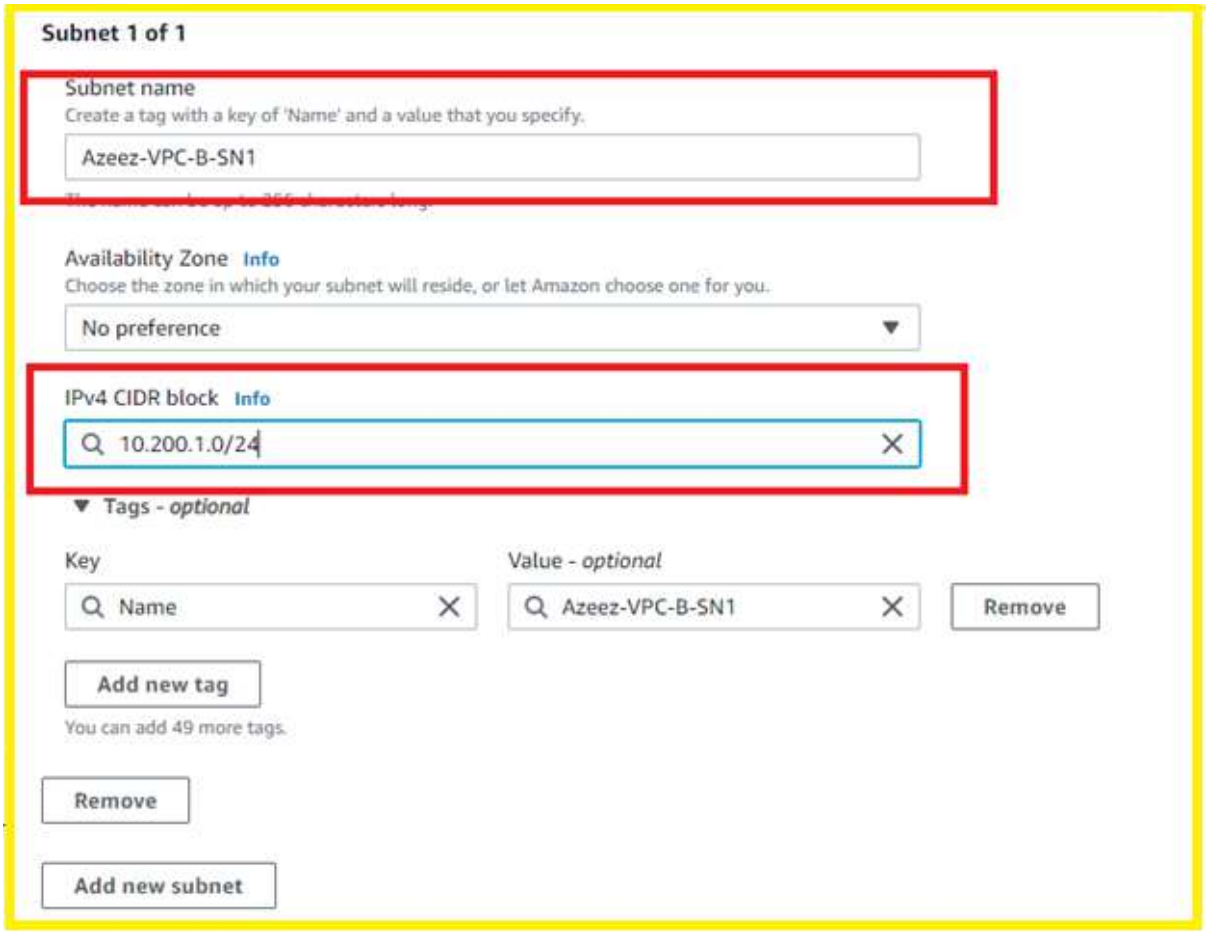


**Create subnet:** Create a subnet for Azeez-VPC-B

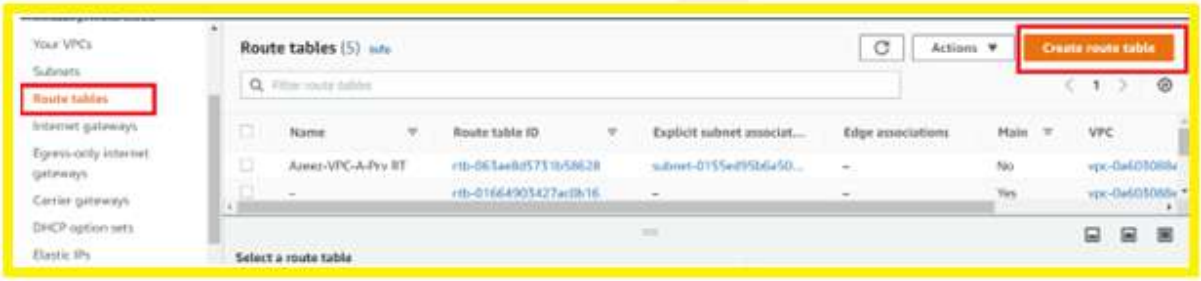


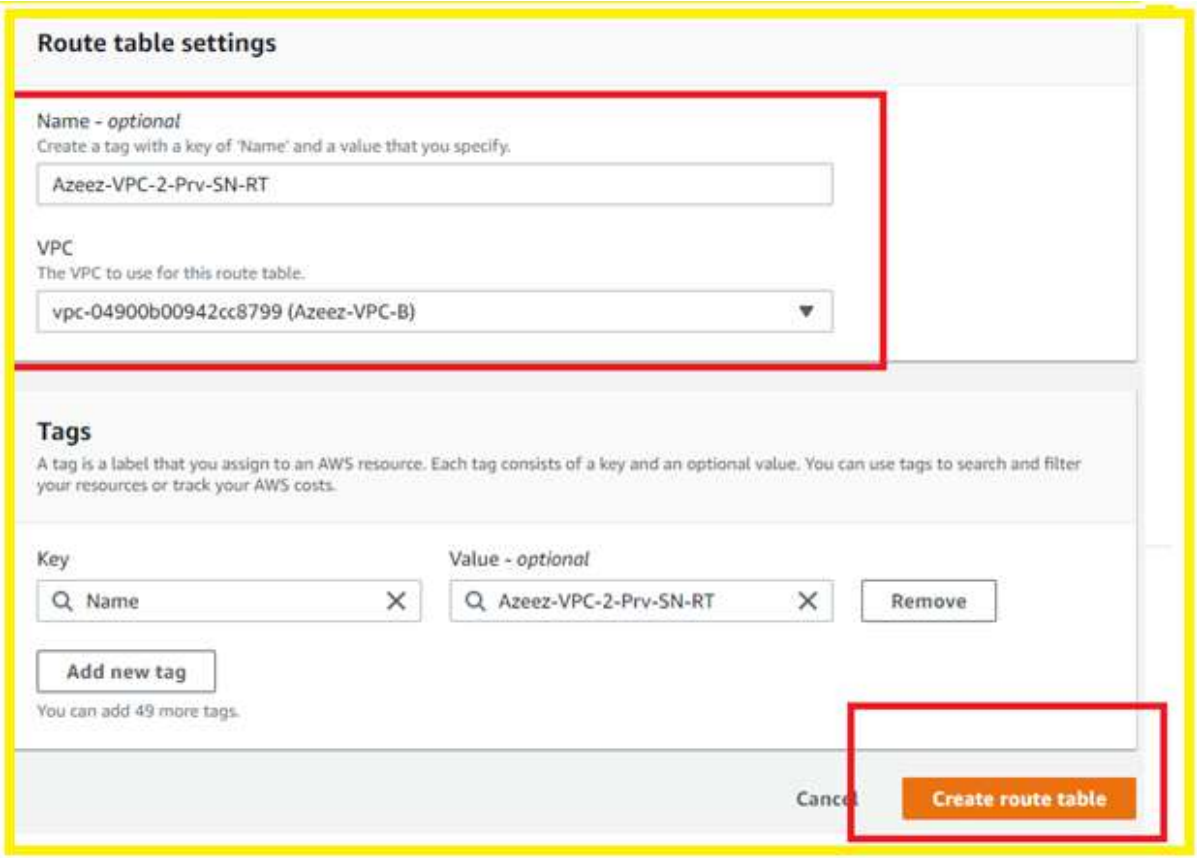

Subnet name: Azeez-VPC-B-SN1

IPv4 CIDR block: 10.200.1.0/24

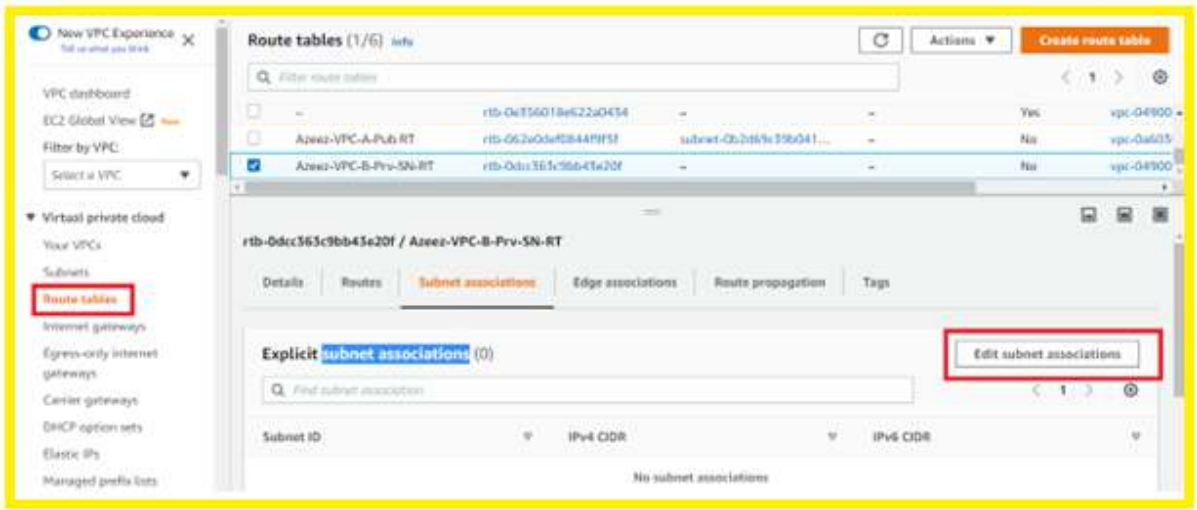


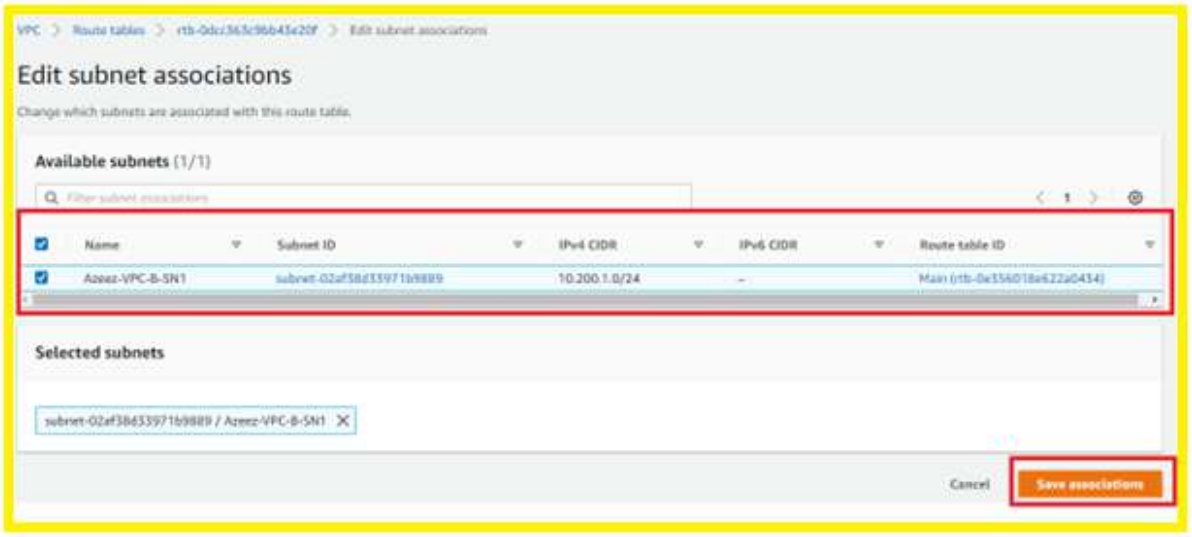
**Create Route table:** Create route table for Azeez-VPC-B



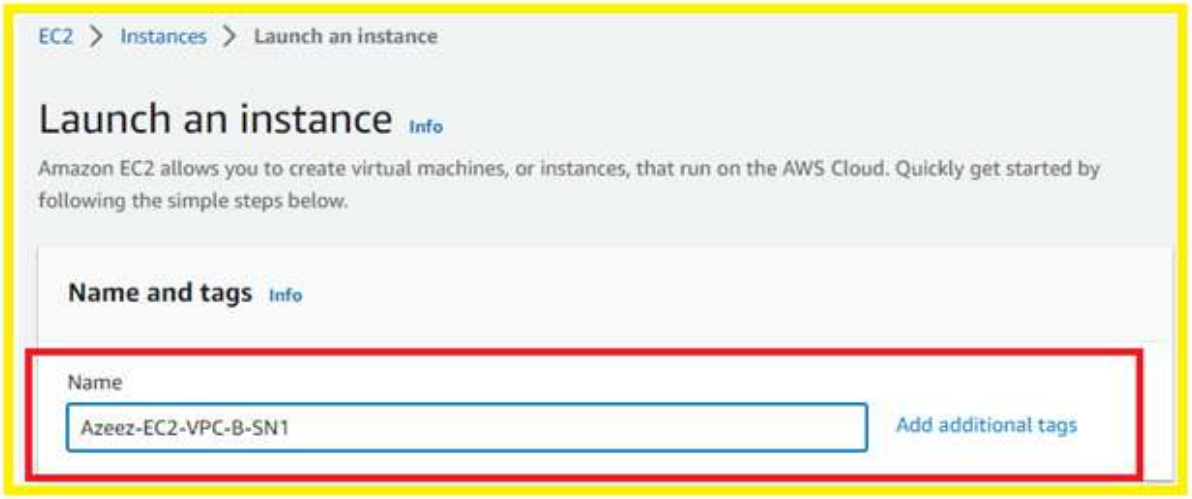




**Edit subnet associations:** Edit subnet association in Azeez-VPC-B-Prv SN-RT

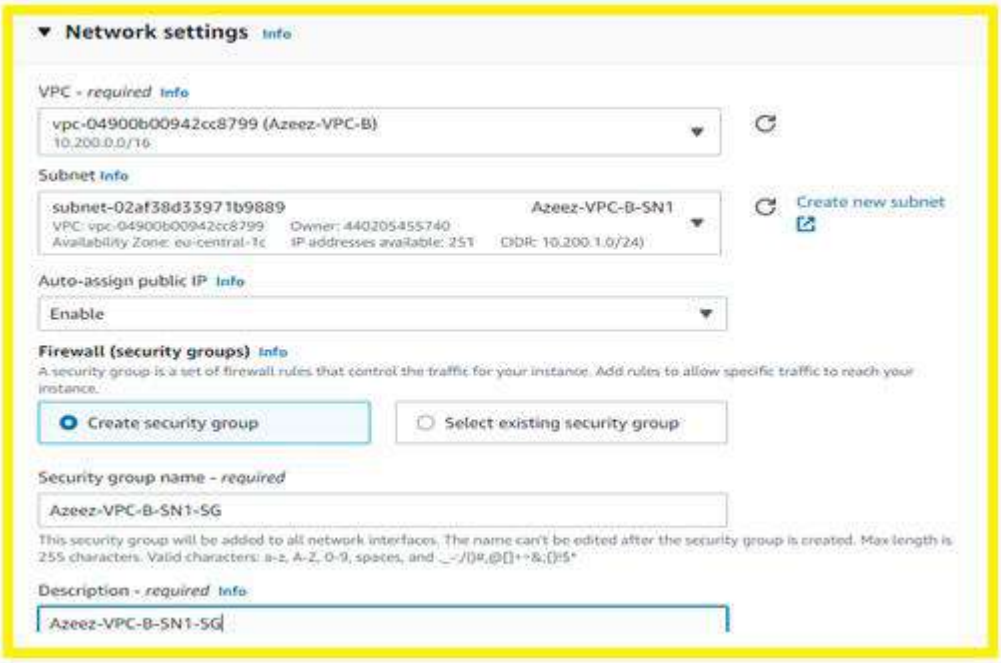




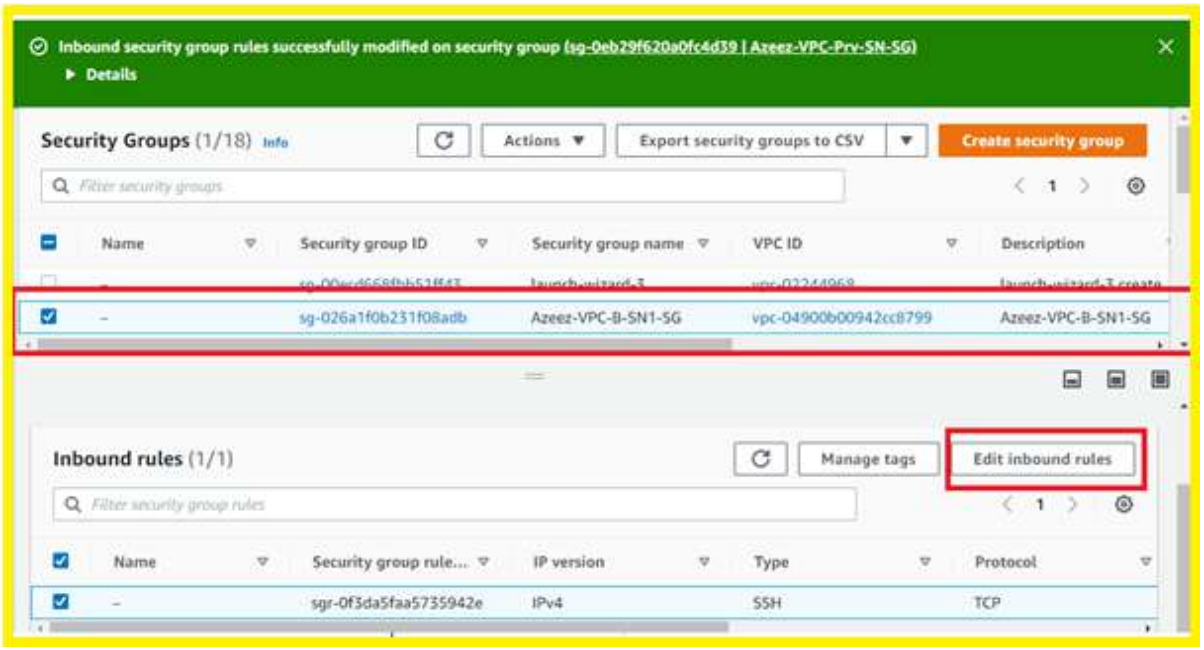

**Create EC2 instance:** Create EC2 instance in Azeez-VPC-B-Prv SN1

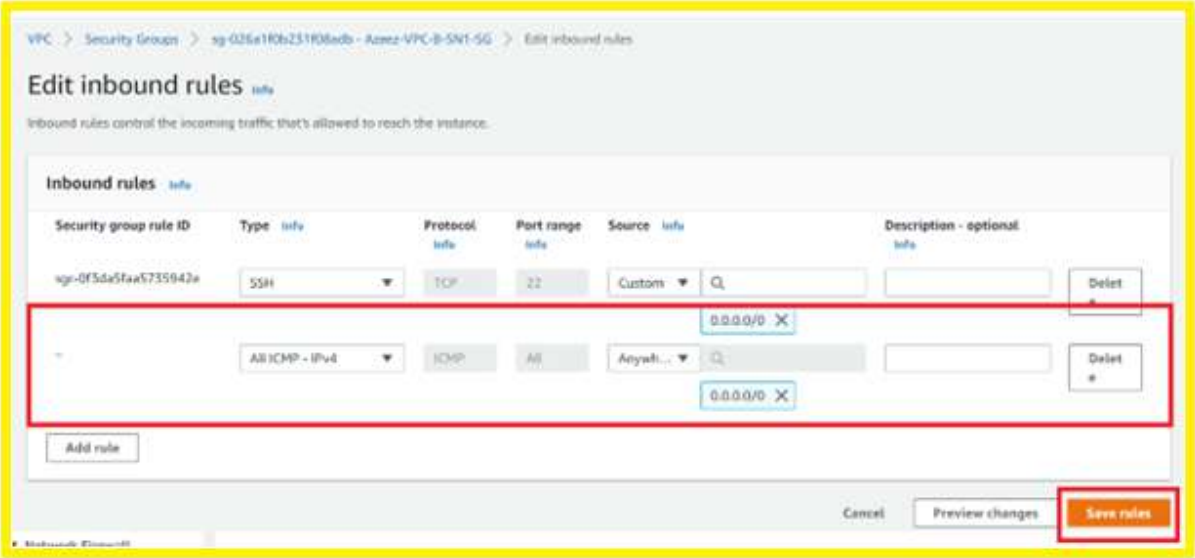



**Edit Network settings:** Edit network settings and create Security group then Launch instance.



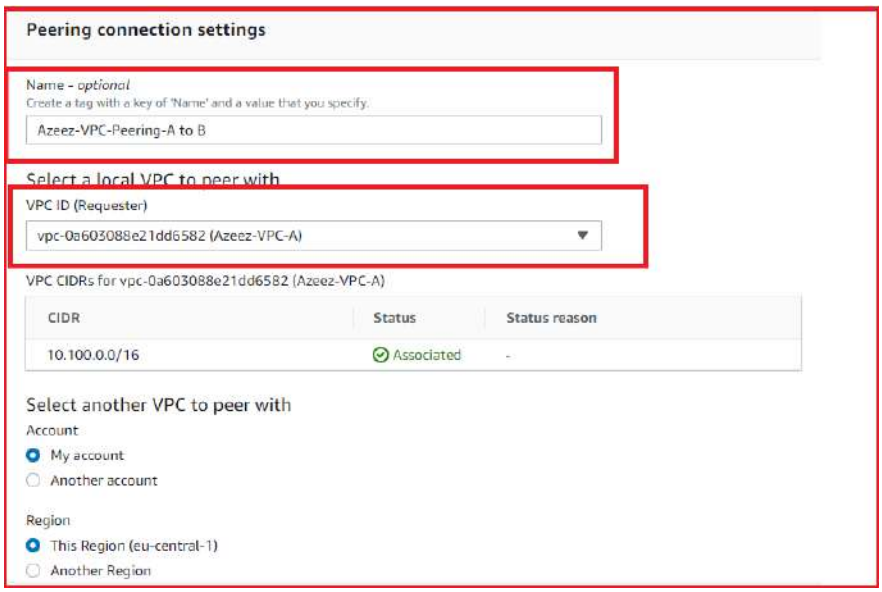

## Edit Security Group:

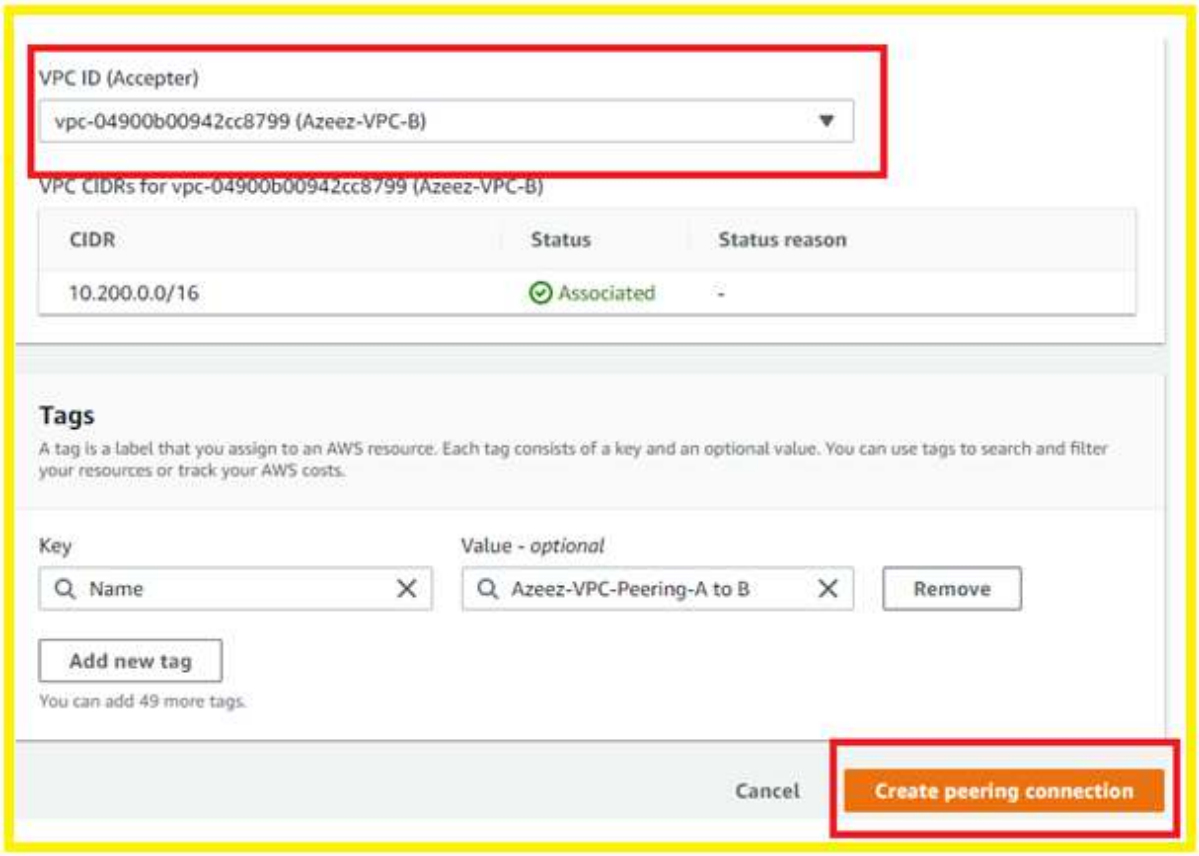




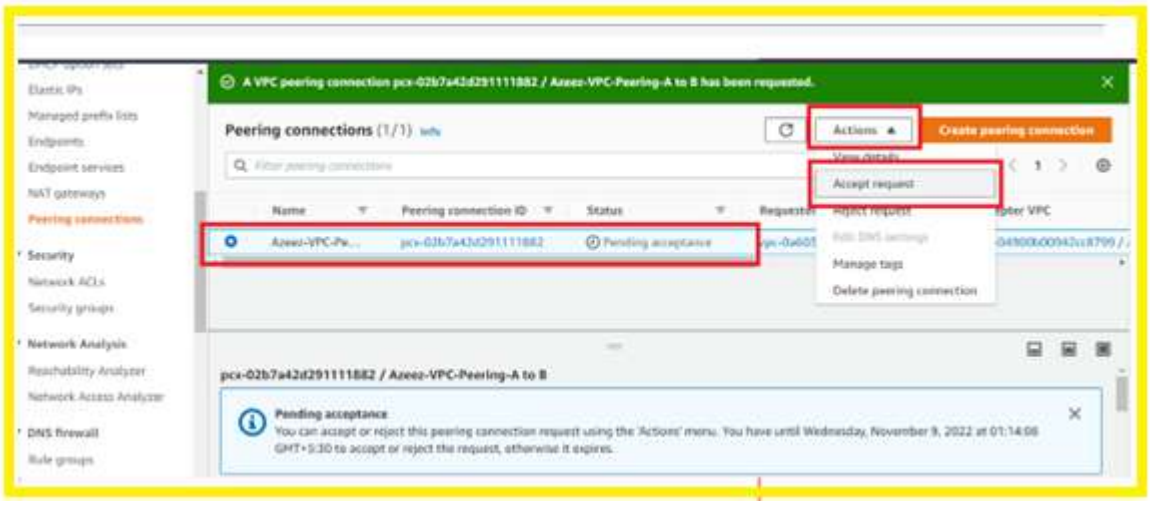

**Save rule**

**VPC Peering:** Go to peering and select Create peering connection. Connect Azeez-VPC-A to Azeez-VPC-B. Create peering connection



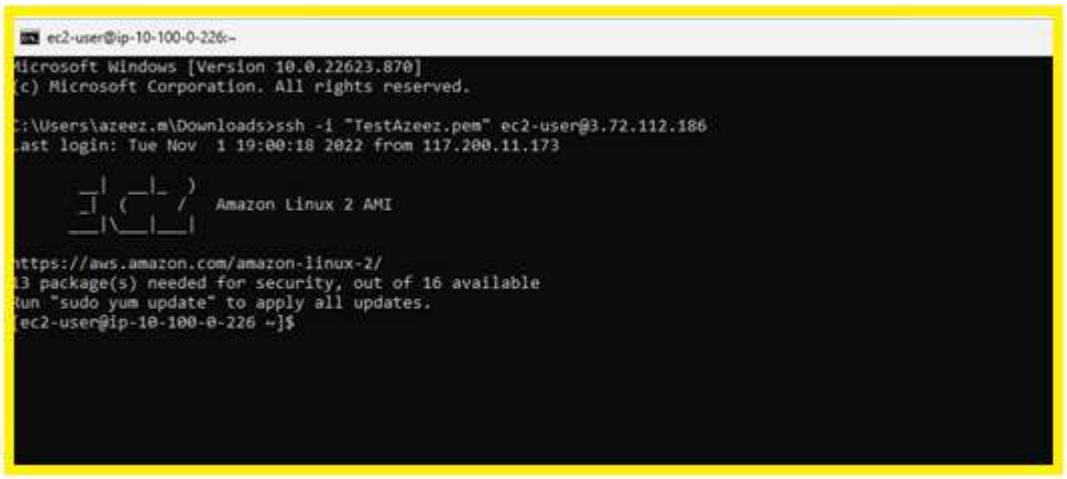

Then select Peering machine and go to action and accept the request



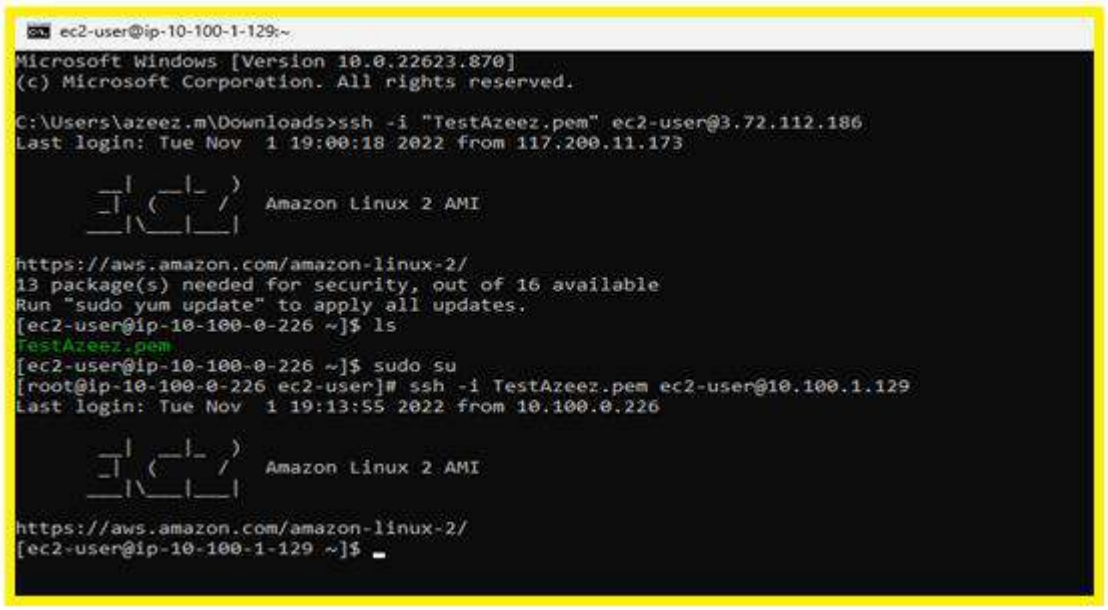

**Know connect:**

EC2-VPC-A-PubSN1 to EC2-VPC-A PrvSN1 to EC2-VPC-B-SN1

Connected local to EC2-VPC-A-PubSN1

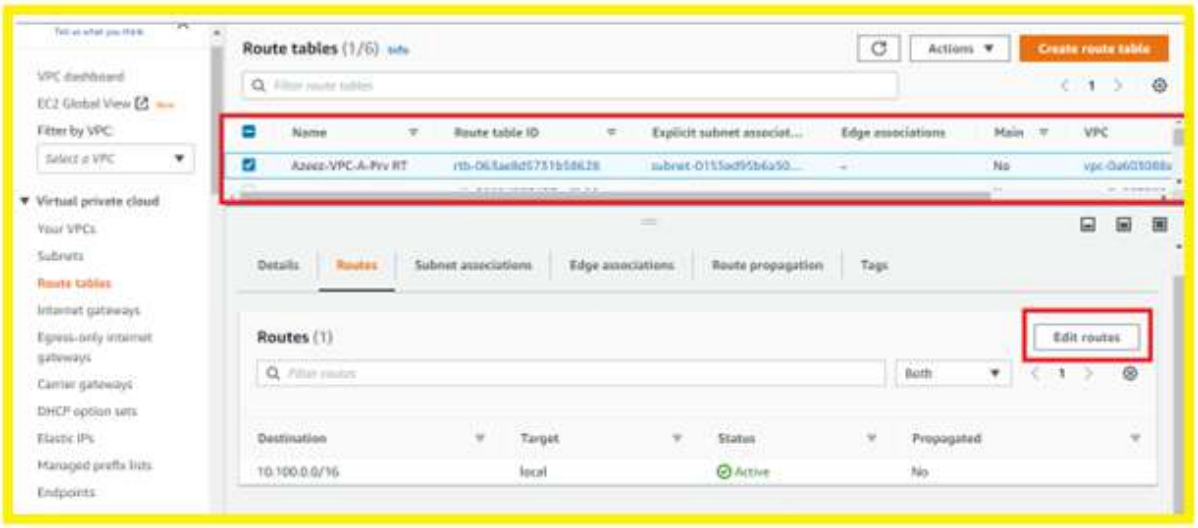


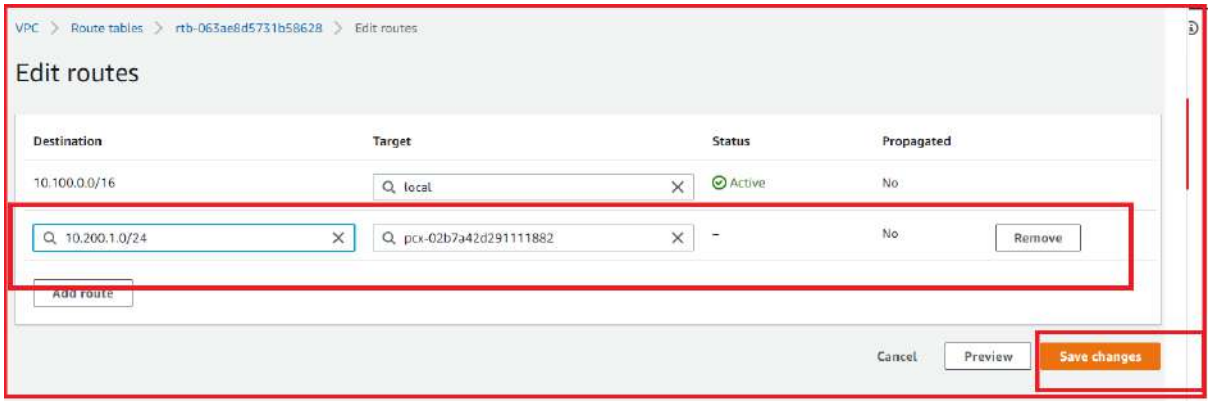

Next EC2-VPC-A-PubSN1 to EC2-VPC-A PrvSN1



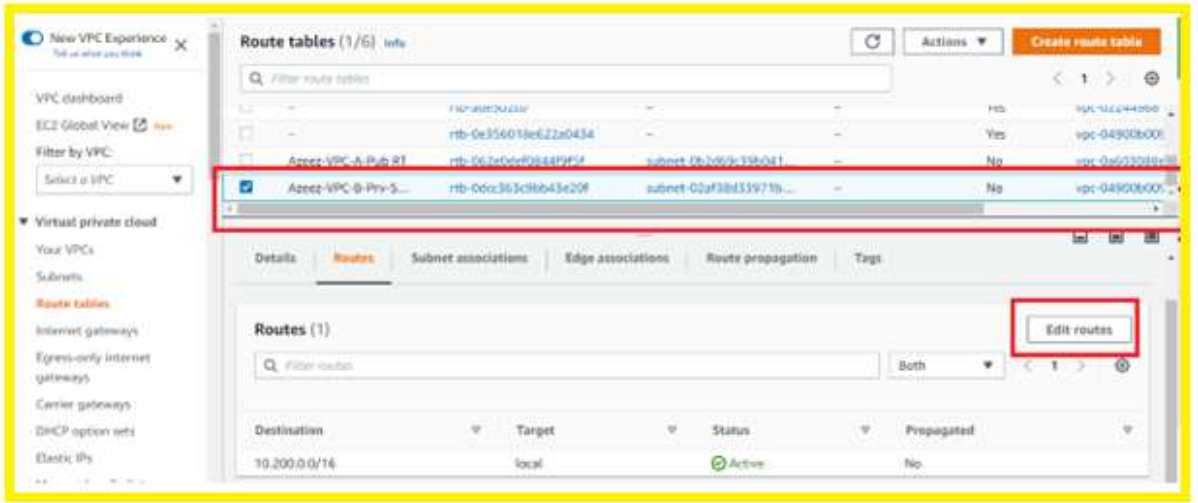

Next ping EC2-VPC-A PrvSN1 to Azeez-EC2-VPC-B-SN1

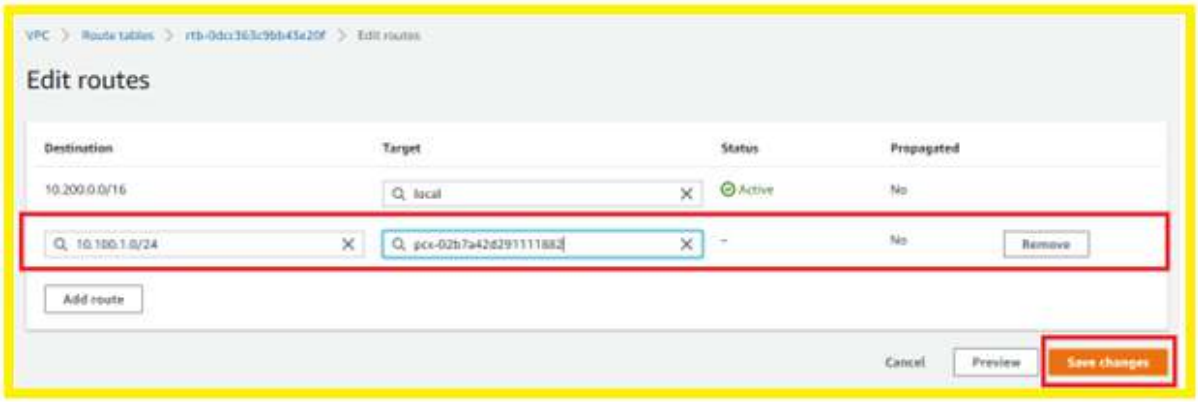
Without edit the route table we cant ping so Know we have to Both Route tables has to update



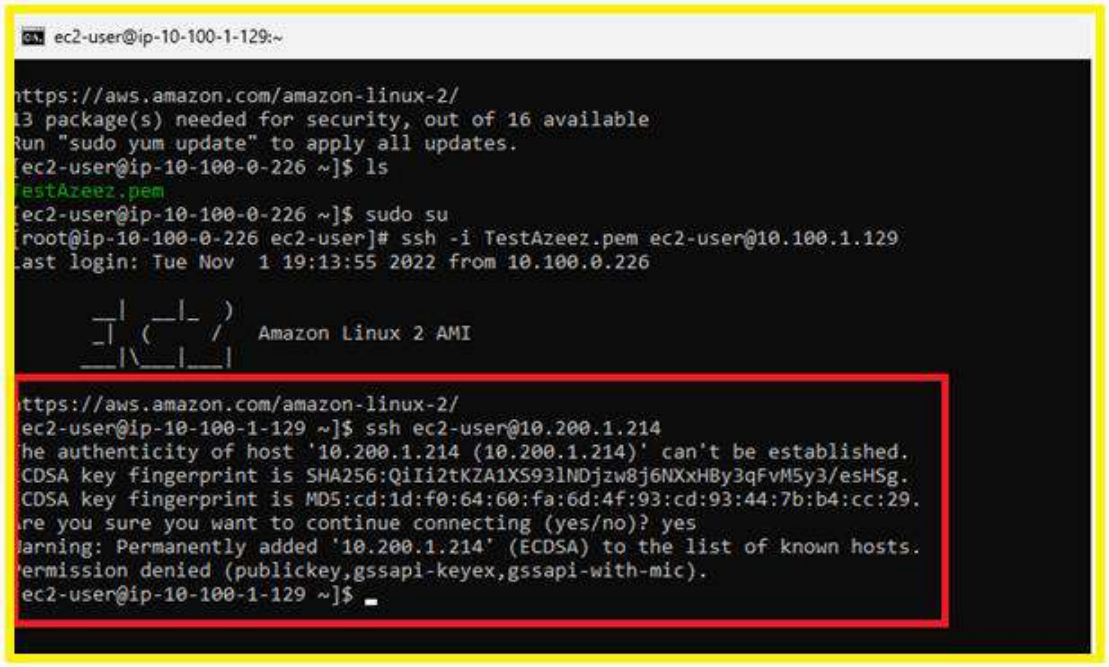

## Next edit Azeez-VPC-B-Prv-SN





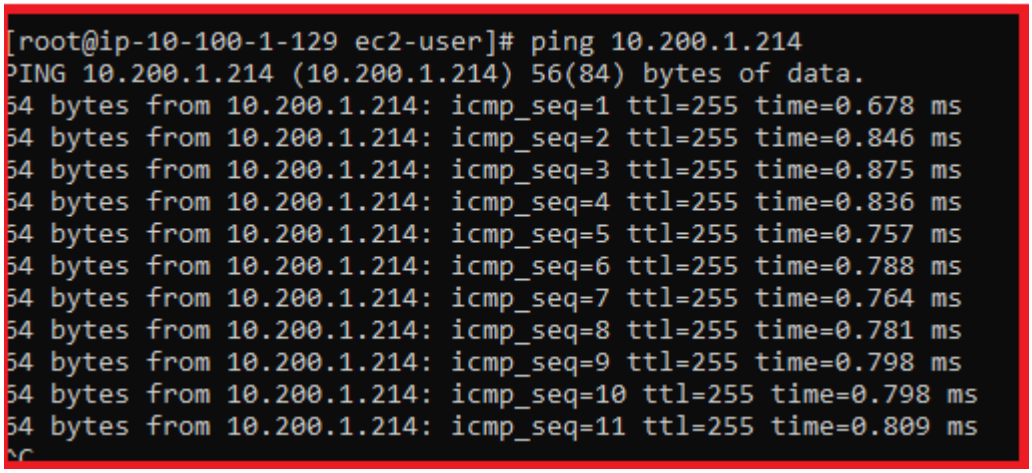

**Know we have to do ssh**

EC2-VPC-A PrvSN1 to Azeez-EC2-VPC-B-SN1




**Know we have to do ping**

**Unable to ping**



**Know we have copy .pem file Azeez-EC2-VPC-A-Pub SN1 to Azeez-EC2-VPC-A-Prv SN1**


**Know connect Azeez-EC2-VPC-A-Prv SN1 to Azeez-EC@-VPC-B-SN1**