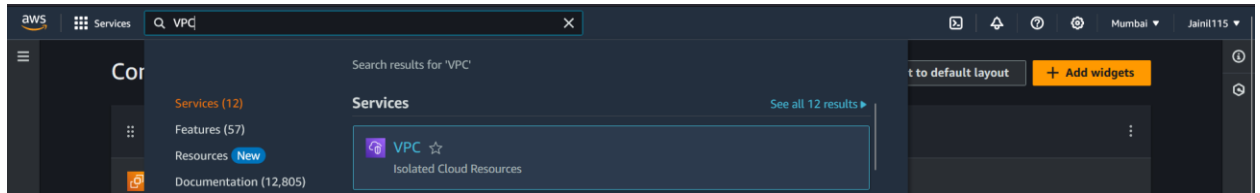


## TASK 1: Create a VPC:

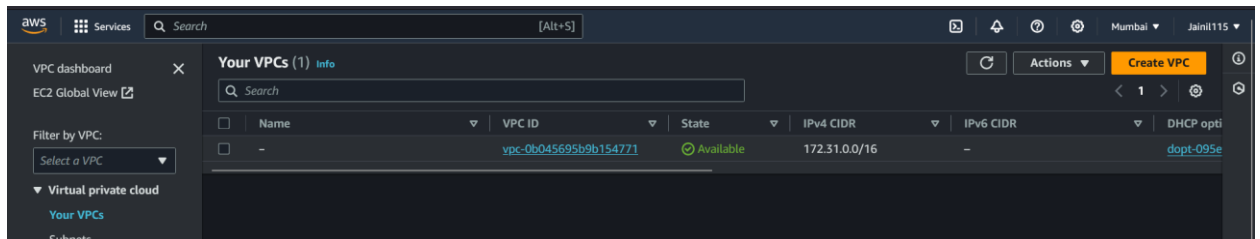
1. Include at least two subnets, each in a different Availability Zone.
2. Internet Gateway (IGW):
3. Do not create NAT gateway but understand how and why it is needed

### Steps to create VPC:

1. Search for VPC in AWS Console.



2. After that click on "Create VPC"



3. Select the following options in VPC settings:
  - i. Resource to create: VPC only.
  - ii. Name Tag: jainil
  - iii. IPv4 CIDR block: IPv4 CIDR manual input'
  - iv. IPv4 CIDR: 122.76.0.0/16
  - v. IPv6 CIDR block: No IPv6 CIDR block
  - vi. Tenancy: Default.

**VPC settings**

**Resources to create** [Info](#)  
Create only the VPC resource or the VPC and other networking resources.  
☒ VPC only ☐ VPC and more

**Name tag - optional** [Info](#)  
Creates a tag with a key of 'Name' and a value that you specify.

**IPv4 CIDR block** [Info](#)  
☒ IPv4 CIDR manual input  
☐ IPAM-allocated IPv4 CIDR block

**IPv4 CIDR**  
  
CIDR block size must be between /16 and /28.

**IPv6 CIDR block** [Info](#)  
☒ No IPv6 CIDR block  
☐ IPAM-allocated IPv6 CIDR block  
☐ Amazon-provided IPv6 CIDR block  
☐ IPv6 CIDR owned by me

**Tenancy** [Info](#)

- Click on create VPC to create the VPC. Now the VPC is created.

**VPC dashboard** [EC2 Global View](#)

Filter by VPC:

**Virtual private cloud**

- Your VPCs**
- Subnets
- Route tables
- Internet gateways
- Egress-only internet gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- Endpoints
- Endpoint services

**vpc-0e134eebed7f8dec4 / jainil** [Actions](#)

**Details** [Info](#)

VPC ID vpc-0e134eebed7f8dec4	State <span>Available</span>	DNS hostnames Disabled	DNS resolution Enabled
Tenancy Default	DHCP option set dopt-095ef722d76d780bb	Main route table rtb-0f5d408c98f85a504	Main network ACL acl-0c52a0c5600adc54e
Default VPC No	IPv4 CIDR 122.76.0.0/16	IPv6 pool -	IPv6 CIDR (Network border group) -
Network Address Usage metrics Disabled	Route 53 Resolver DNS Firewall rule groups -	Owner ID 171358186705	

[Resource map](#) [CIDRs](#) [Flow logs](#) [Tags](#) [Integrations](#)

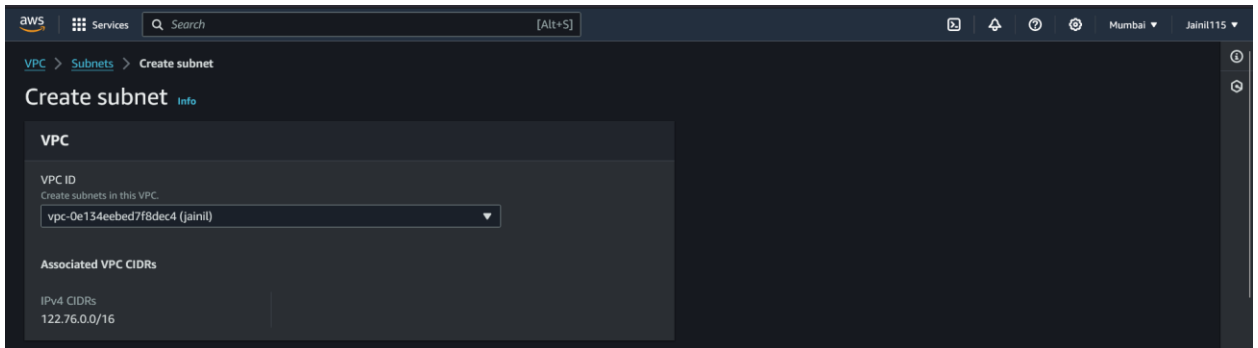
## Steps to create at least two subnets, each in a different Availability Zone:

- Go to VPC Dashboard and click on Subnets.

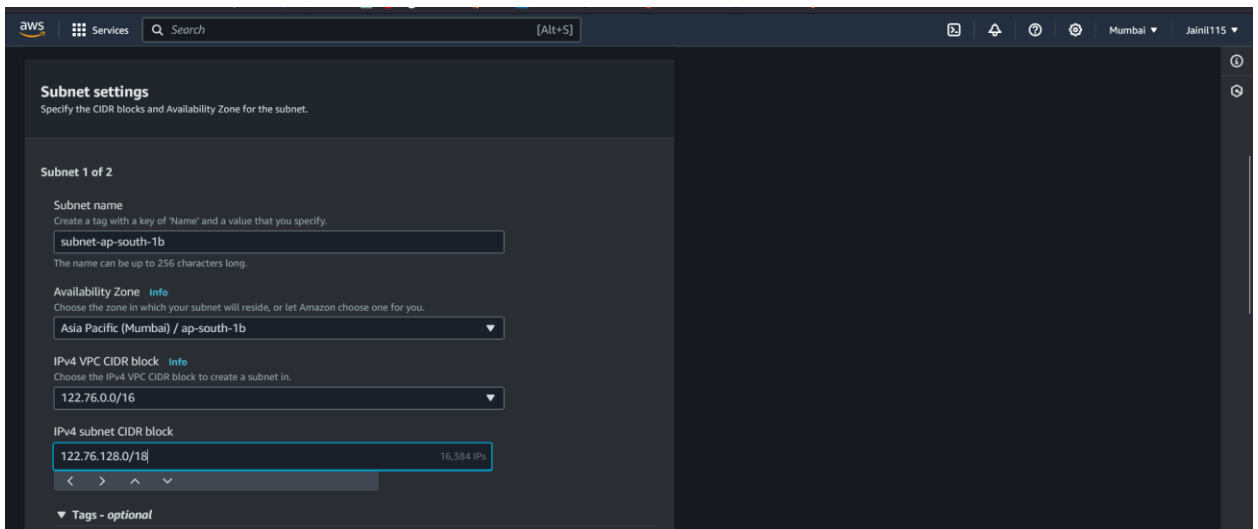
**Subnets (6)** [Info](#) [Refresh](#) [Actions](#) [Create subnet](#)

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
<input type="checkbox"/>	RDS-Pvt-subnet-2	subnet-0bf44f2493467ca04	Available	vpc-0b045695b9b154771	172.31.48.128/25	-
<input type="checkbox"/>	RDS-Pvt-subnet-3	subnet-0c375012ae3336aab	Available	vpc-0b045695b9b154771	172.31.49.0/25	-
<input type="checkbox"/>	-	subnet-075fd1037b0d200f9	Available	vpc-0b045695b9b154771	172.31.32.0/20	-
<input type="checkbox"/>	RDS-Pvt-subnet-1	subnet-0cd97c48b30f115a3	Available	vpc-0b045695b9b154771	172.31.48.0/25	-
<input type="checkbox"/>	-	subnet-0b7c23d895ea29349	Available	vpc-0b045695b9b154771	172.31.16.0/20	-
<input type="checkbox"/>	-	subnet-070ac038629d36f6d	Available	vpc-0b045695b9b154771	172.31.0.0/20	-

- Then click on create subnet. Then enter VPC Id: vpc-0e134eebed7f8dec4 (jainil)



3. Under **subnet setting** fill the following details:
  - i. Subnet name: jainil-pub-subnet-ap-south-1a
  - ii. Availability zone: ap-south-1a
  - iii. IPv4 VPC CIDR block: 122.76.0.0/16
  - iv. IPv4 subnet CIDR block: 122.76.0.0/20



4. Then click on add Subnet and Enter the following details for the subnet:
  - i. Subnet name: jainil-pvt-subnet-ap-south-1a
  - ii. Availability zone: ap-south-1a
  - iii. IPv4 VPC CIDR block: 122.76.0.0/16
  - iv. IPv4 subnet CIDR block: 122.76.16.0/20

**Subnet 2 of 3**

**Subnet name**  
Create a tag with a key of 'Name' and a value that you specify.  
jainil-pvt-subnet-ap-south-1a  
The name can be up to 256 characters long.

**Availability Zone** [Info](#)  
Choose the zone in which your subnet will reside, or let Amazon choose one for you.  
Asia Pacific (Mumbai) / ap-south-1a

**IPv4 VPC CIDR block** [Info](#)  
Choose the IPv4 VPC CIDR block to create a subnet in.  
122.76.0.0/16

**IPv4 subnet CIDR block**  
122.76.16.0/20 4,096 IPs

**Tags - optional**

Key	Value - optional	
Name	jainil-pvt-subnet-ap-south-1a	Remove

[Add new tag](#)  
You can add 49 more tags.

[Remove](#)

5. Then click on add Subnet and Enter the following details for the subnet:

- i. Subnet name: jainil-pub-subnet-ap-south-1b
- ii. Availability zone: ap-south-1b
- iii. IPv4 VPC CIDR block: 122.76.0.0/16
- iv. IPv4 subnet CIDR block: 122.76.32.0/20

**Subnet 3 of 3**

**Subnet name**  
Create a tag with a key of 'Name' and a value that you specify.  
jainil-pub-subnet-ap-south-1b  
The name can be up to 256 characters long.

**Availability Zone** [Info](#)  
Choose the zone in which your subnet will reside, or let Amazon choose one for you.  
Asia Pacific (Mumbai) / ap-south-1b

**IPv4 VPC CIDR block** [Info](#)  
Choose the IPv4 VPC CIDR block to create a subnet in.  
122.76.0.0/16

**IPv4 subnet CIDR block**  
122.76.32.0/20 4,096 IPs

**Tags - optional**

Key	Value - optional	
Name	jainil-pub-subnet-ap-south-1b	Remove

[Add new tag](#)  
You can add 49 more tags.

[Remove](#)

6. Then click on add Subnet and Enter the following details for the subnet:

- i. Subnet name: jainil-pvt-subnet-ap-south-1b
- ii. Availability zone: ap-south-1b
- iii. IPv4 VPC CIDR block: 122.76.0.0/16
- iv. IPv4 subnet CIDR block: 122.76.48.0/20

**Subnet 4 of 4**

**Subnet name**  
Create a tag with a key of 'Name' and a value that you specify.  
jainil-pvt-subnet-ap-south-1b  
The name can be up to 256 characters long.

**Availability Zone** Info  
Choose the zone in which your subnet will reside, or let Amazon choose one for you.  
Asia Pacific (Mumbai) / ap-south-1b

**IPv4 VPC CIDR block** Info  
Choose the IPv4 VPC CIDR block to create a subnet in.  
122.76.0.0/16

**IPv4 subnet CIDR block**  
122.76.48.0/20 (4,096 IPs)

**Tags - optional**

Key	Value - optional
Name	jainil-pvt-subnet-ap-south-1b

**Add new tag**  
You can add 49 more tags.

**Remove**

- Then click on Create Subnet. Now you will be able to see all the created subnets.

**Subnets (4)** Info

You have successfully created 4 subnets: subnet-046a07a98ad35e3da, subnet-006b43806989993a8, subnet-02b700038e5cee36e, subnet-0b2857f37f5c11238

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
<input type="checkbox"/>	jainil-pvt-subnet-ap-south-1b	subnet-0b2857f37f5c11238	Available	vpc-0e134eebed7f8dec4	122.76.48.0/20	-
<input type="checkbox"/>	jainil-pub-subnet-ap-south-1a	subnet-046a07a98ad35e3da	Available	vpc-0e134eebed7f8dec4	122.76.0.0/20	-
<input type="checkbox"/>	jainil-pub-subnet-ap-south-1b	subnet-02b700038e5cee36e	Available	vpc-0e134eebed7f8dec4	122.76.32.0/20	-
<input type="checkbox"/>	jainil-pvt-subnet-ap-south-1a	subnet-006b43806989993a8	Available	vpc-0e134eebed7f8dec4	122.76.16.0/20	-

## Steps to create route table:

- Click on Route table and then click on "Create route table".

**Route tables (3)** Info

You have successfully created 3 route tables: rtb-0f5d408c98f85a504, rtb-031d6910b1b7cd3da, rtb-062ab4a598b3fe0e7

<input type="checkbox"/>	Name	Route table ID	Explicit subnet associati...	Edge associations	Main	VPC
<input type="checkbox"/>	-	rtb-0f5d408c98f85a504	-	-	Yes	vpc-0e134eebed7f8d...
<input type="checkbox"/>	RDS-Pvt-rt	rtb-031d6910b1b7cd3da	3 subnets	-	No	vpc-0b045695b9b15...
<input type="checkbox"/>	-	rtb-062ab4a598b3fe0e7	-	-	Yes	vpc-0b045695b9b15...

- Then fill out the following details in Route table settings:
  - Name: jainils-route-table
  - VPC: vpc-0e134eebed7f8dec4 (jainil)

**Create route table** Info

A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

**Route table settings**

**Name - optional**  
Create a tag with a key of 'Name' and a value that you specify.  
jainils-route-table

**VPC**  
The VPC to use for this route table.  
vpc-0e134eebed7f8dec4 (jainil)

**Tags**  
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.

**Key** **Value - optional**

Q Name X Q jainils-route-table X Remove

Add new tag  
You can add 49 more tags.

Cancel Create route table

- Then click on Create route table. Now you will be able to see the route table.

**Route table rtb-003c75db0a42fd2d2 | jainils-route-table** was created successfully.

**rtb-003c75db0a42fd2d2 / jainils-route-table** Actions

**Details** Info

Route table ID rtb-003c75db0a42fd2d2	Main No	Explicit subnet associations -	Edge associations -
VPC vpc-0e134eebed7f8dec4   jainil	Owner ID 171358186705		

**Routes** **Subnet associations** **Edge associations** **Route propagation** **Tags**

**Routes (1)** Both Edit routes

Filter routes

Destination	Target	Status	Propagated
122.76.0.0/16	local	Active	No

- Click on Subnet associations to associate subnets to the route table. Then click on edit subnet associations.

aws Services Search [Alt+S] Mumbai Jainil115

VPC dashboard EC2 Global View

Filter by VPC: Select a VPC

Virtual private cloud Your VPCs Subnets **Route tables** Internet gateways Egress-only internet gateways DHCP option sets Elastic IPs Managed prefix lists Endpoints Endpoint services NAT gateways Peering connections Security Network ACLs

Route table rtb-07484803536317594 | jainil's-public-route-table was created successfully.

VPC > Route tables > rtb-07484803536317594

### rtb-07484803536317594 / jainil's-public-route-table

Actions

**Details** info

Route table ID rtb-07484803536317594	Main No	Explicit subnet associations -	Edge associations -
VPC vpc-0e134eebed7f8dec4   jainil	Owner ID 171358186705		

Routes Subnet associations Edge associations Route propagation Tags

**Explicit subnet associations (0)** Edit subnet associations

Find subnet association

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
No subnet associations You do not have any subnet associations.			

5. Then select jainil-pub-subnet-ap-south-1a and 1b. And then click on save associations.

aws Services Search [Alt+S] Mumbai Jainil115

VPC > Route tables > rtb-07484803536317594 > Edit subnet associations

### Edit subnet associations

Change which subnets are associated with this route table.

**Available subnets (2/4)**

Filter subnet associations

	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input type="checkbox"/>	jainil-pvt-subnet-ap-south-1b	subnet-0b2857f37f5c11238	122.76.48.0/20	-	Main (rtb-0f5d408c98f85a504)
<input checked="" type="checkbox"/>	jainil-pub-subnet-ap-south-1a	subnet-046a07a98ad35e3da	122.76.0.0/20	-	Main (rtb-0f5d408c98f85a504)
<input checked="" type="checkbox"/>	jainil-pub-subnet-ap-south-1b	subnet-02b700038e5cee36e	122.76.32.0/20	-	Main (rtb-0f5d408c98f85a504)
<input type="checkbox"/>	jainil-pvt-subnet-ap-south-1a	subnet-006b43806989993a8	122.76.16.0/20	-	Main (rtb-0f5d408c98f85a504)

**Selected subnets**

subnet-02b700038e5cee36e / jainil-pub-subnet-ap-south-1b X subnet-046a07a98ad35e3da / jainil-pub-subnet-ap-south-1a X

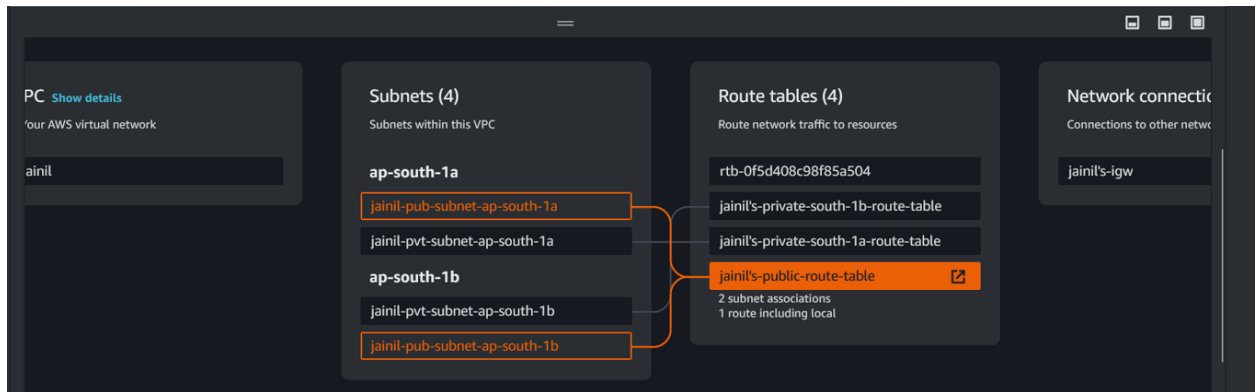
Cancel Save associations

Routes Subnet associations Edge associations Route propagation Tags

**Explicit subnet associations (2)** Edit subnet associations

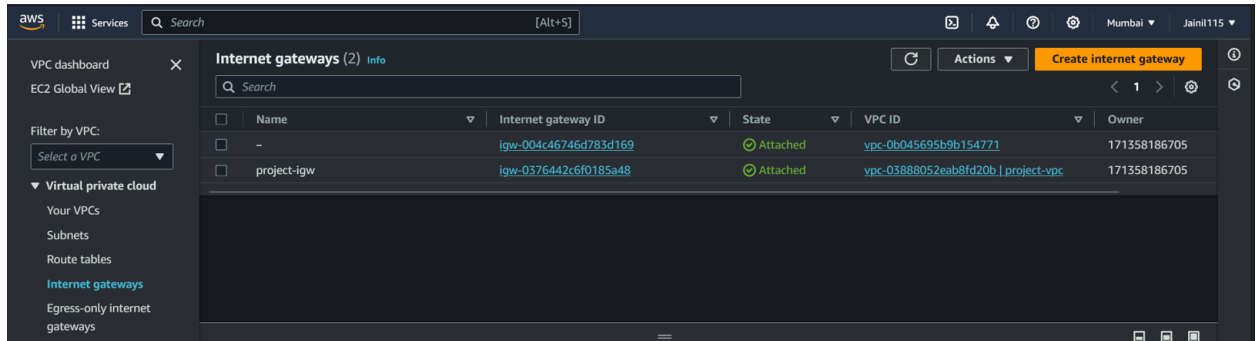
Find subnet association

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
jainil-pub-subnet-ap-south-1a	subnet-046a07a98ad35e3da	122.76.0.0/20	-
jainil-pub-subnet-ap-south-1b	subnet-02b700038e5cee36e	122.76.32.0/20	-

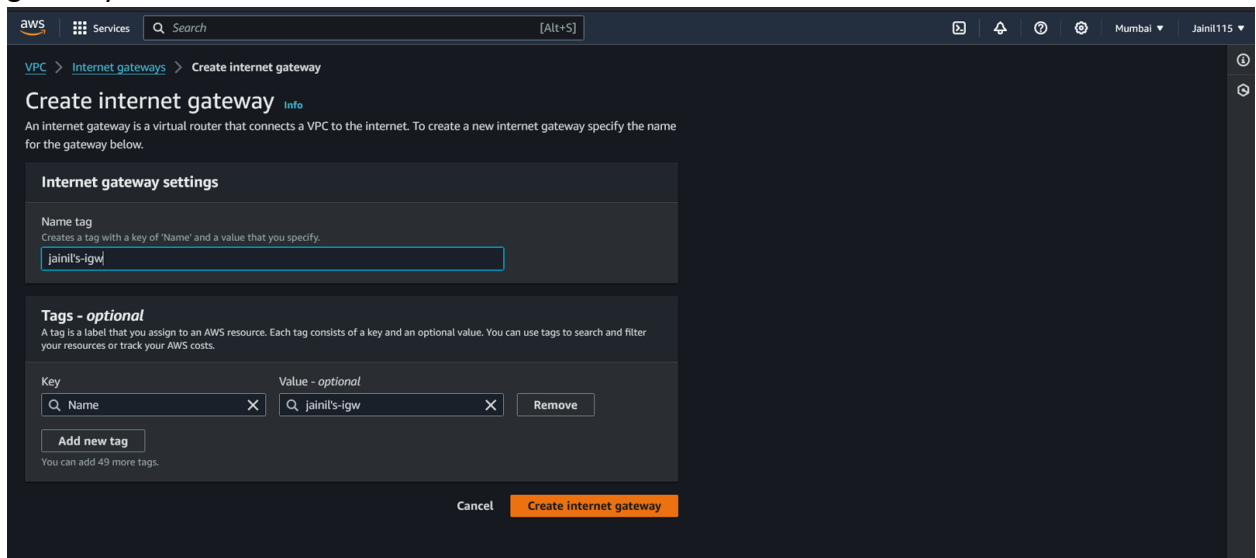


## Steps to create Internet Gateway:

1. Click on Internet Gateway in VPC Dashboard. And then Click on "Create internet gateway".

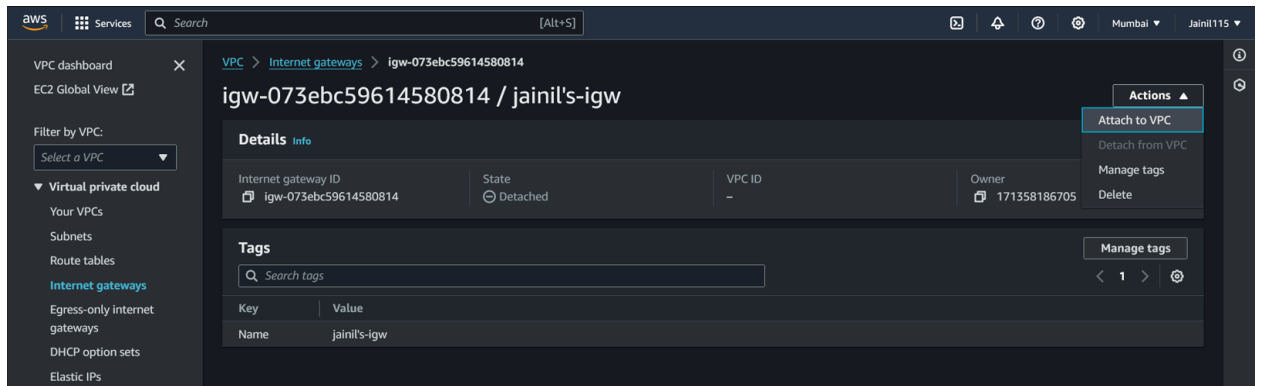


2. Then enter the name of the Internet gateway: jainil's-igw and click on Create internet gateway.

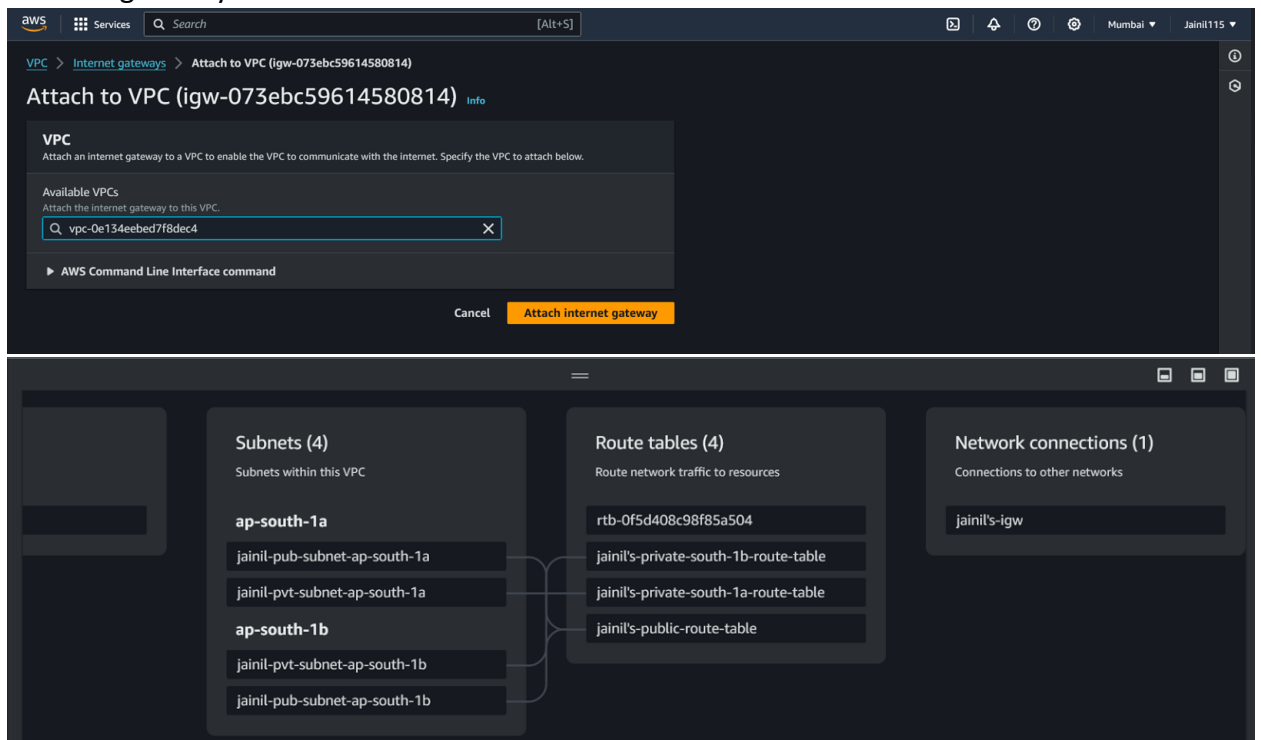


3. Then you will be able to see jainil's-igw Internet gateway. Now click on actions and click on Attach VPC.

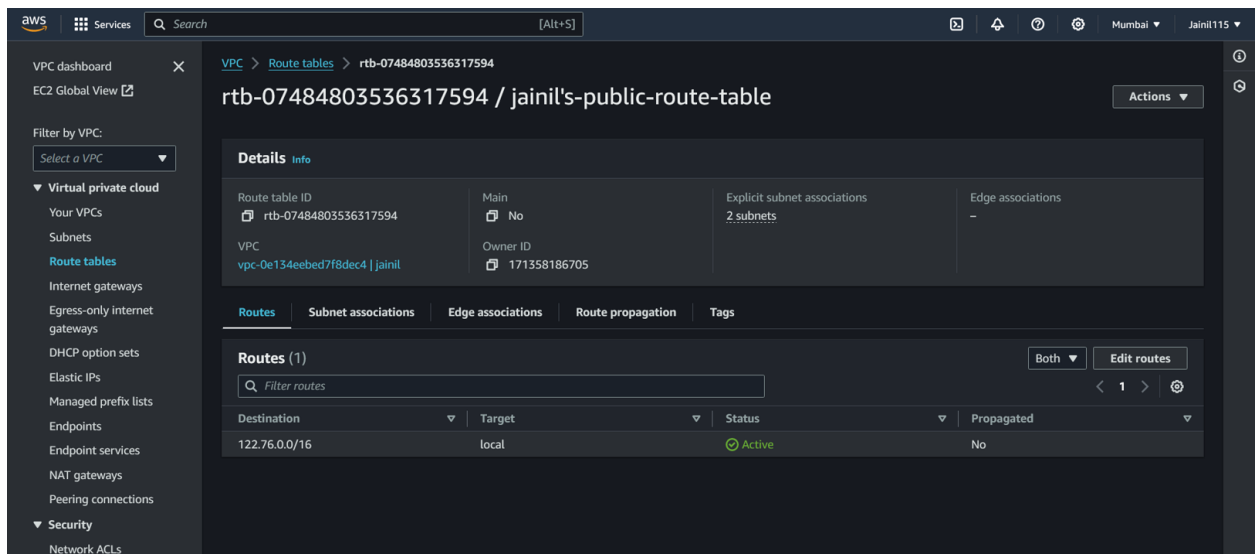




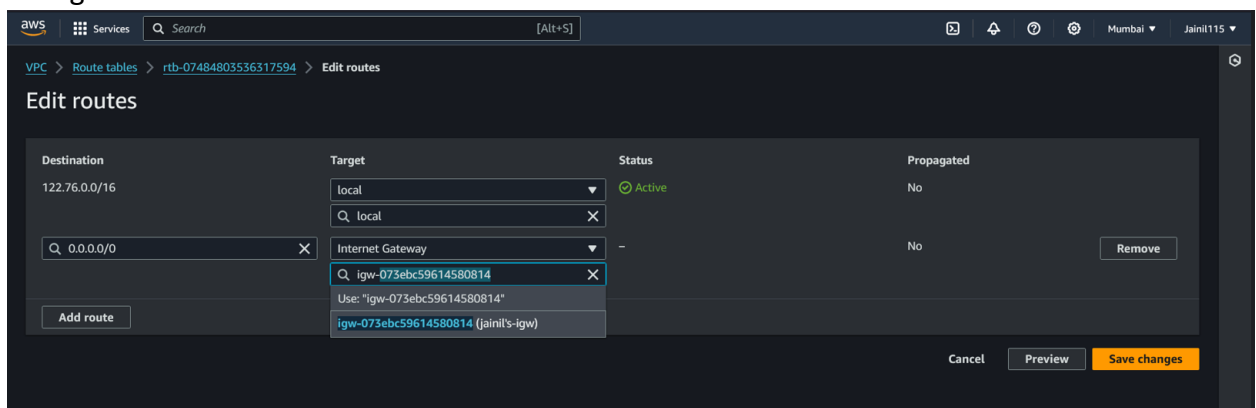
- Now select the vpc-0e134eebed7f8dec4 (jainil) in Available VPC. Then click on Attach internet gateway.



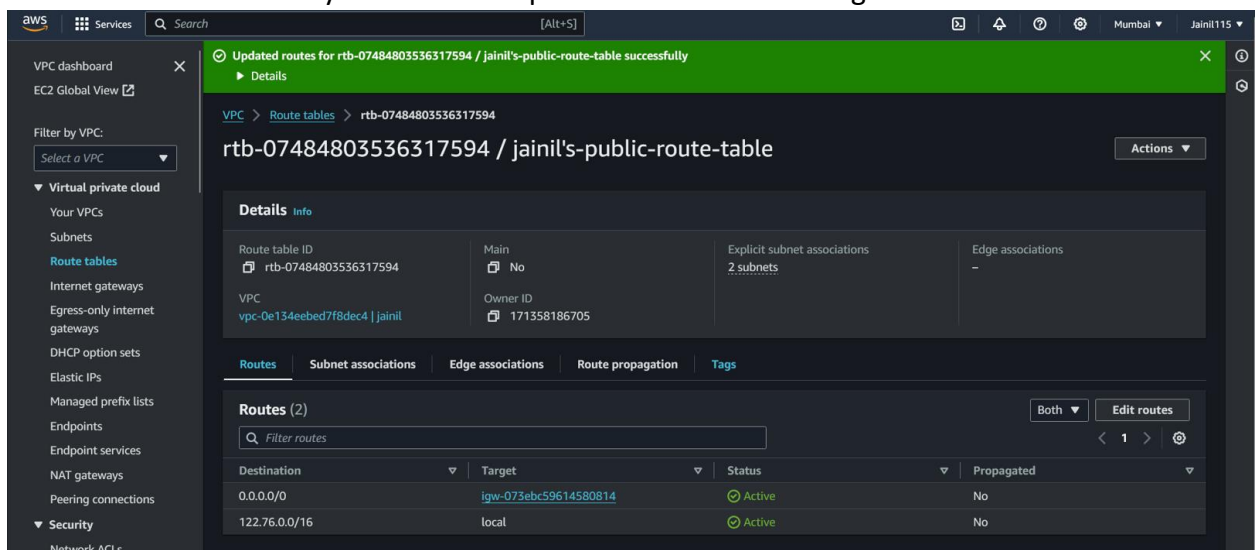
- Now then go to jainil's-public-route-table. Go to Routes tab and click on edit routes.



- Then click on add route and select target internet gateway and select igw-073ebc59614580814 (jainil's-igw). Set destination to 0.0.0.0/0. Then click on save changes.



- Now to Internet Gateway is attached to public subnets in both regions.





## Do not create NAT gateway but understand how and why it is needed?

A NAT (Network Address Translation) gateway is needed primarily for two reasons: to enable multiple devices within a private network to access the internet using a single public IP address, and to enhance security by hiding the internal network structure from external sources. Here's a breakdown:

1. **IP Address Conservation:** In many cases, organizations have more devices in their internal networks than available public IP addresses. NAT allows multiple devices within a private network to share a single public IP address, extending the usability of IPv4 addresses.
2. **Internet Access:** NAT gateways act as intermediaries between devices in a private network and the internet. When a device from the internal network initiates a connection to a website or server on the internet, the NAT gateway translates the device's private IP address to its public IP address. This enables communication with servers on the internet, as the public IP address is routable on the internet.
3. **Security:** NAT also provides a layer of security by hiding the internal network structure from external sources. Since devices within the private network are assigned private IP addresses that are not routable on the internet, they are not directly accessible from outside the network. The NAT gateway acts as a barrier, only allowing outbound connections initiated from within the private network to reach the internet.
4. **Logging and Monitoring:** NAT gateways can also be configured to log network traffic, which can be useful for monitoring and analyzing network activity. This helps in troubleshooting network issues, identifying potential security threats, and optimizing network performance.