TEAM NUMBER: 44

AWS HACKATHON DOCUMENTATION

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SEPTEMBER 29, 2023

BRAIN O VISION

What Is AWS?

AWS (Amazon Web Services) is a cloud computing platform that offers a wide range of services to help business and individuals build and deloy applications, store and analyse data , and scale their infrastructure .it provides on – demand access to computing power,storage,databases,and other resources,eliminating the need for upfront invesments in hardware and infrastructure .AWS offers a varietyofservices,includingcompute,storage,databases.networking,machine learning , and more.it is known for its scalability ,reliability,and flexibility,making it a popular choice for business for all sizes.

STAGE 1:

VPC:

VPC (VIRTUAL PRIVATE CLOUD) is a service provided by aws that allows to create a virtual network in cloud it provides you control over your network environment including ip address, subnets, route tables, internet gateway, security settings.

Usage:

It is helps you to securely connect your resources, control network settings.

Creating a VPC (Virtual Private Cloud):

- In the VPC dashboard click on the “create VPC” Button to start the VPC creation wizard.
- Configure the VPC settings:
  - Provide a name for your VPC.

- Specify the IPv4 CIDR block for your VPC's IP address range (10.0.0.0/16).
- Optionally, you can assign an IPv6 CIDR block to your VPC.

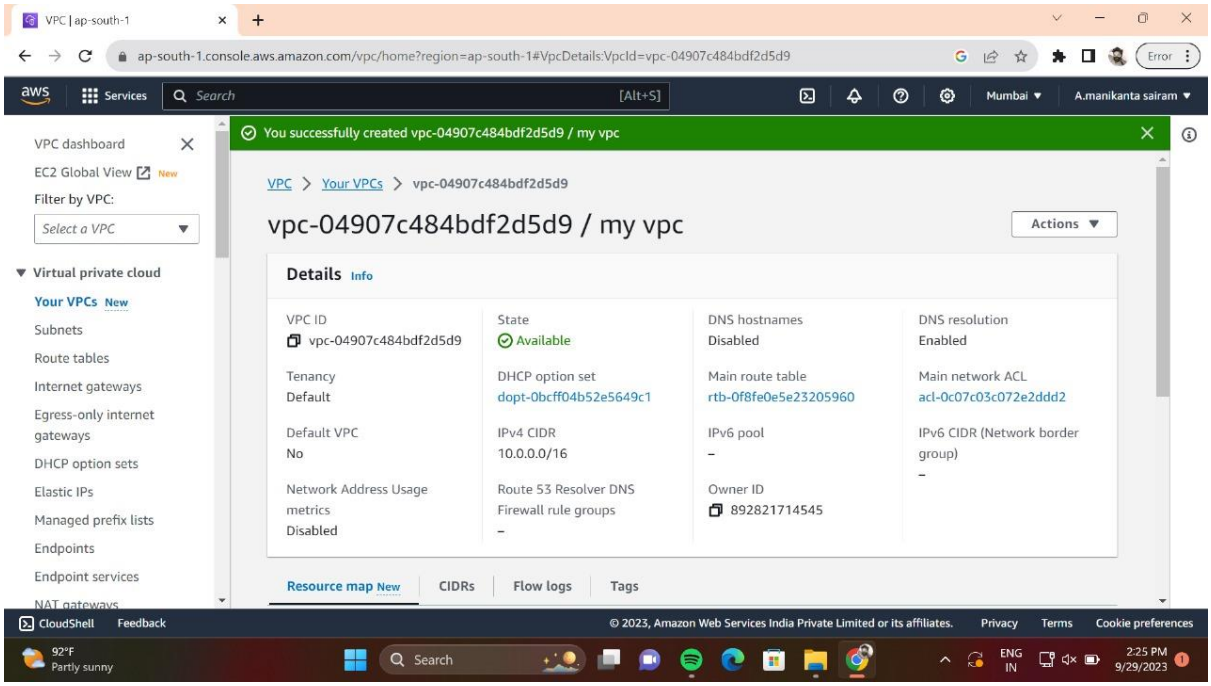
- Configure the VPC's subnets:
  - Specify the IPv4 CIDR block for your first subnet (e.g., 10.0.0.0/24).
  - Choose the availability zone where you want to create the subnet.
  - Repeat this step to create additional subnets if needed.

- Configure the VPC's route table:
  - Create a new route table or select an existing one.
  - Associate the subnets created in the previous step with the route table.

- Configure the VPC's internet gateway:
  - Create a new internet gateway or select an existing one.
  - Attach the internet gateway to your VPC.

- Configure the VPC's security groups:
  - Create new security groups or select existing ones.
  - Define the inbound and outbound rules for each security group to control network traffic.

- Review all the configuration details and settings for your VPC. If everything looks correct, click on the "Create VPC" button to create your VPC.

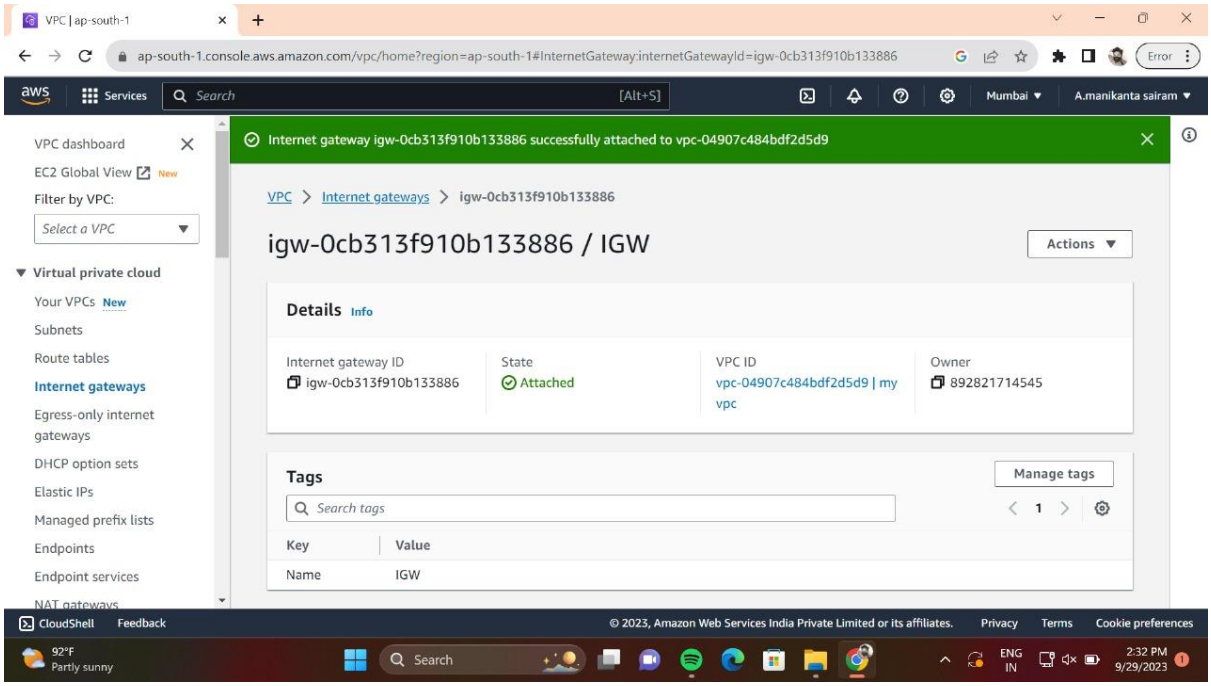


INTERNET GATEWAYS (IGW):

The internet gateway is a component in aws vpc that allows to communicate between your vpc and internet

Its servers as a gateway for internet traffic to enter or exit your vpc.

It provides a way for your instance to have public ip address and be accessible from the internet


VPC | ap-south-1
ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#InternetGateway:internetGatewayId=igw-0cb313f910b133886
Services
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VPC dashboard
EC2 Global View
New
Filter by VPC:
Select a VPC
Virtual private cloud
Your VPCs
New
Subnets
Route tables
Internet gateways
Egress-only internet gateways
DHCP option sets
Elastic IPs
Managed prefix lists
Endpoints
Endpoint services
NAT gateways
Internet gateway igw-0cb313f910b133886 successfully attached to vpc-04907c484bdf2d5d9
VPC > Internet gateways > igw-0cb313f910b133886
igw-0cb313f910b133886 / IGW
Actions
Details
Info
Internet gateway ID
igw-0cb313f910b133886
State
Attached
VPC ID
vpc-04907c484bdf2d5d9 | my vpc
Owner
892821714545
Tags
Manage tags
Search tags
1
Key
Value
Name
IGW
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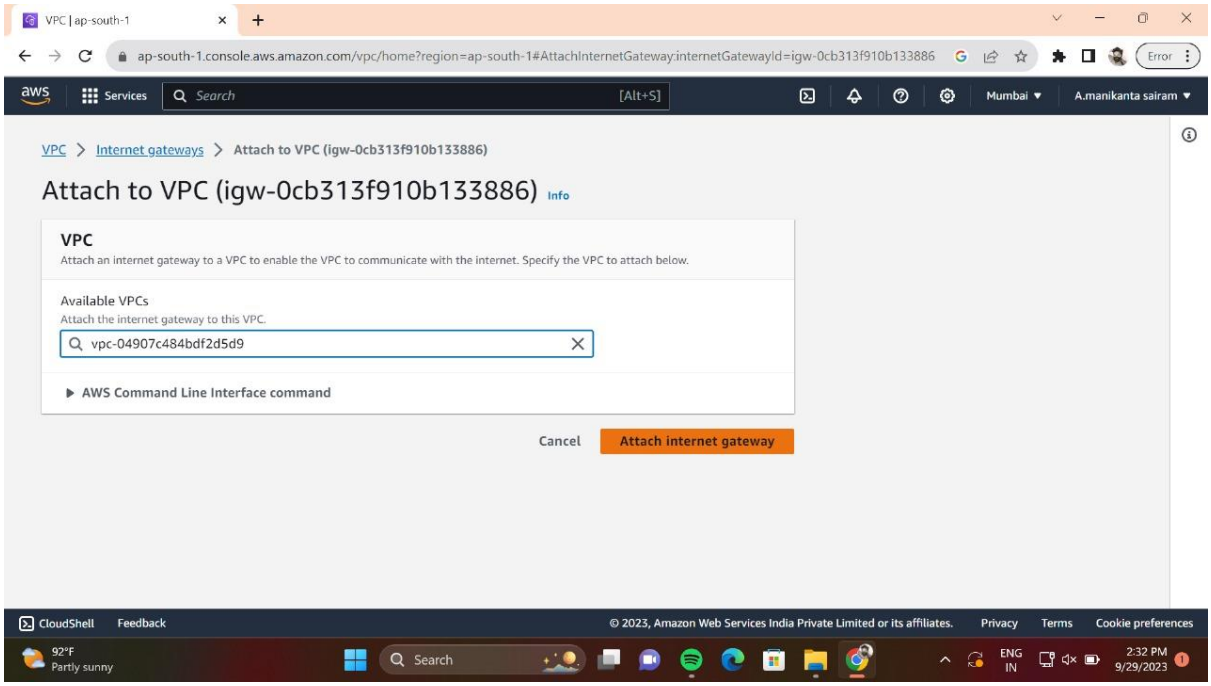
VPC | ap-south-1
ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#AttachInternetGateway:internetGatewayId=igw-0cb313f910b133886
Services
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VPC > Internet gateways > Attach to VPC (igw-0cb313f910b133886)
Attach to VPC (igw-0cb313f910b133886)
Info
VPC
Attach an internet gateway to a VPC to enable the VPC to communicate with the internet. Specify the VPC to attach below.
Available VPCs
Attach the internet gateway to this VPC.
vpc-04907c484bdf2d5d9
AWS Command Line Interface command
Cancel
Attach internet gateway
CloudShell
Feedback
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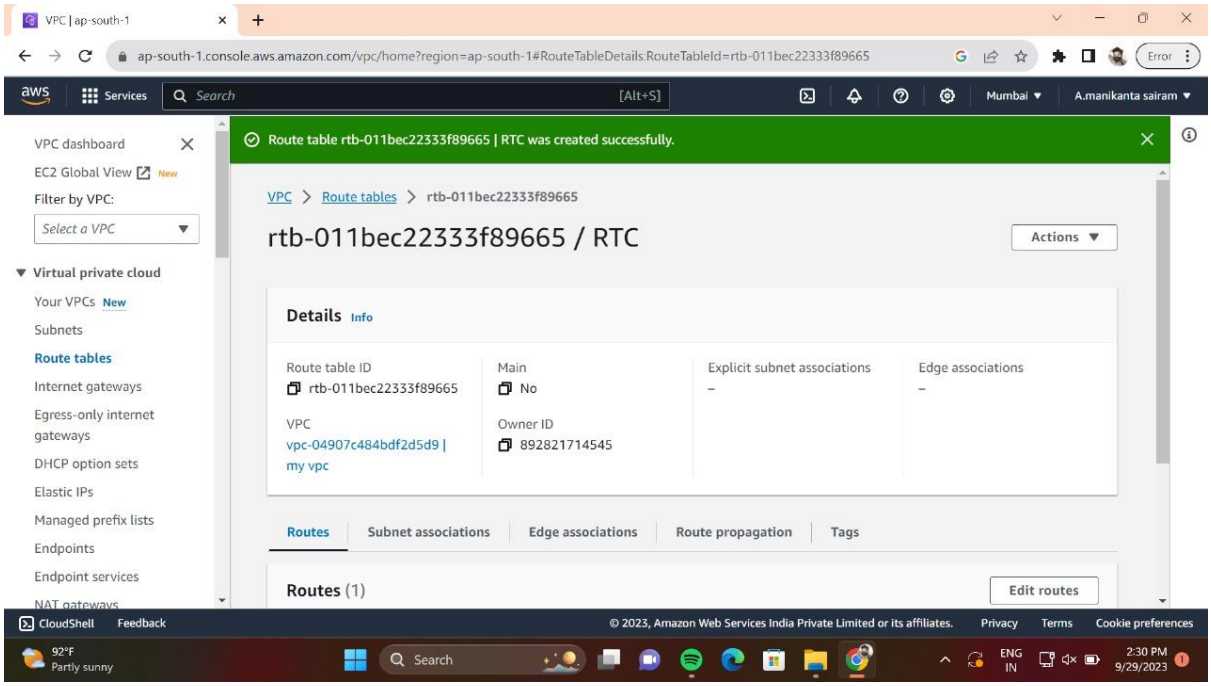
ROUTE TABLE:

It is used to determine the path that network traffic takes within the vpc.

It contains a set of rules are called routes.

ROUTE TABLES (RT):

- Go to the "Route Tables" section: Within the selected VPC, click on the "Route Tables" option in the left navigation menu. This will display the list of existing route tables in the selected VPC**.**
- Create a new route table: Click on the "Create Route Table" button to create a new route table within the selected VPC.
- Configure the route table settings:
  - Provide a name for the route table to identify it.
  - Select the VPC in which you want to create the route table.
  - Choose the desired subnet associations for the route table. Subnets can be associated with multiple route tables, and each subnet must be associated with at least one route table.
- Configure the routes:
  - Click on the "Edit routes" button to add or edit routes in the route table.
  - Add the desired routes by specifying the destination IP range and the target (e.g., an internet gateway, a virtual private gateway, or a NAT gateway)
- Save the route table: Click on the "Save" button to save the configured route table.
- Associate subnets with the route table:
  - In the "Associations" tab of the route table, click on the "Edit subnet associations" button.
  - Select the subnets you want to associate with the route table and click on the "Save" button.
  - Review the route table: Verify the route table settings, associations, and routes in the AWS Management Console.


VPC | ap-south-1
ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#RouteTableDetails:RouteTableId=rtb-011bec22333f89665
Services
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VPC dashboard
EC2 Global View
New
Filter by VPC:
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New
Subnets
Route tables
Internet gateways
Egress-only internet gateways
DHCP option sets
Elastic IPs
Managed prefix lists
Endpoints
Endpoint services
NAT gateways
Route table rtb-011bec22333f89665 | RTC was created successfully.
VPC > Route tables > rtb-011bec22333f89665
rtb-011bec22333f89665 / RTC
Actions
Details
Info
Route table ID
rtb-011bec22333f89665
Main
No
Explicit subnet associations
–
Edge associations
–
VPC
vpc-04907c484bdf2d5d9 | my vpc
Owner ID
892821714545
Routes
Subnet associations
Edge associations
Route propagation
Tags
Routes (1)
Edit routes
CloudShell
Feedback
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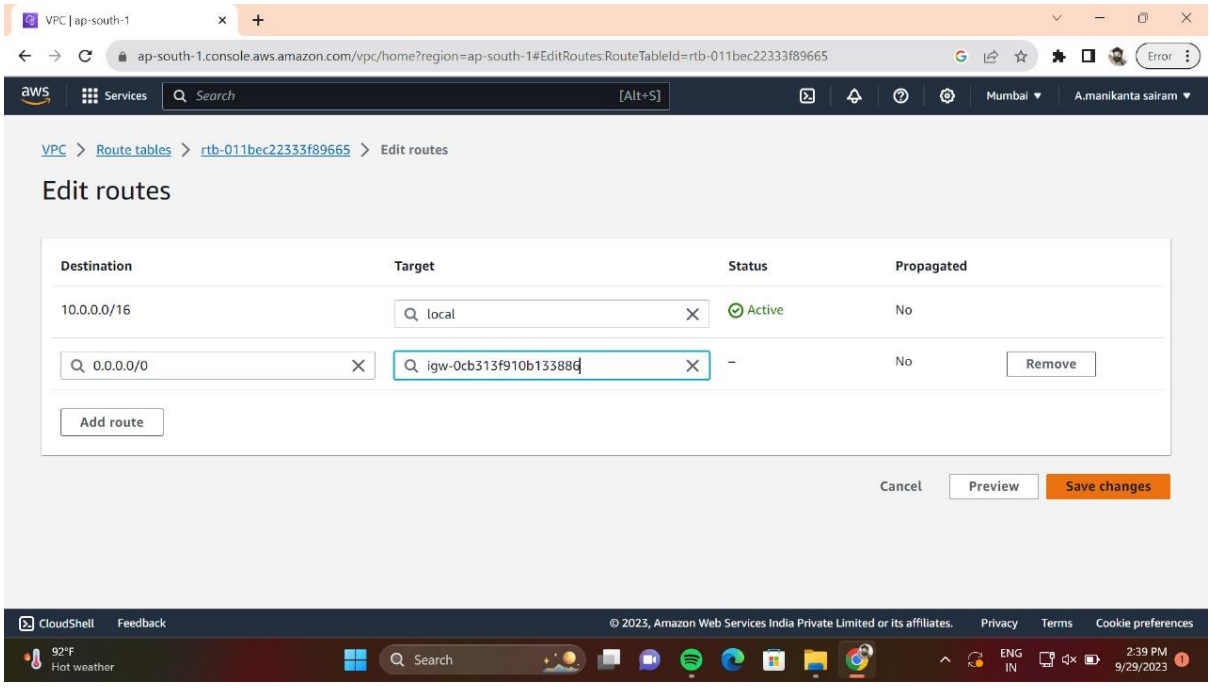
VPC | ap-south-1
ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#EditRoutes:RouteTableId=rtb-011bec22333f89665
Services
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VPC > Route tables > rtb-011bec22333f89665 > Edit routes
Edit routes
Destination
Target
Status
Propagated
10.0.0.0/16
local
Active
No
0.0.0.0/0
igw-0cb313f910b133886
–
No
Remove
Add route
Cancel
Preview
Save changes
CloudShell
Feedback
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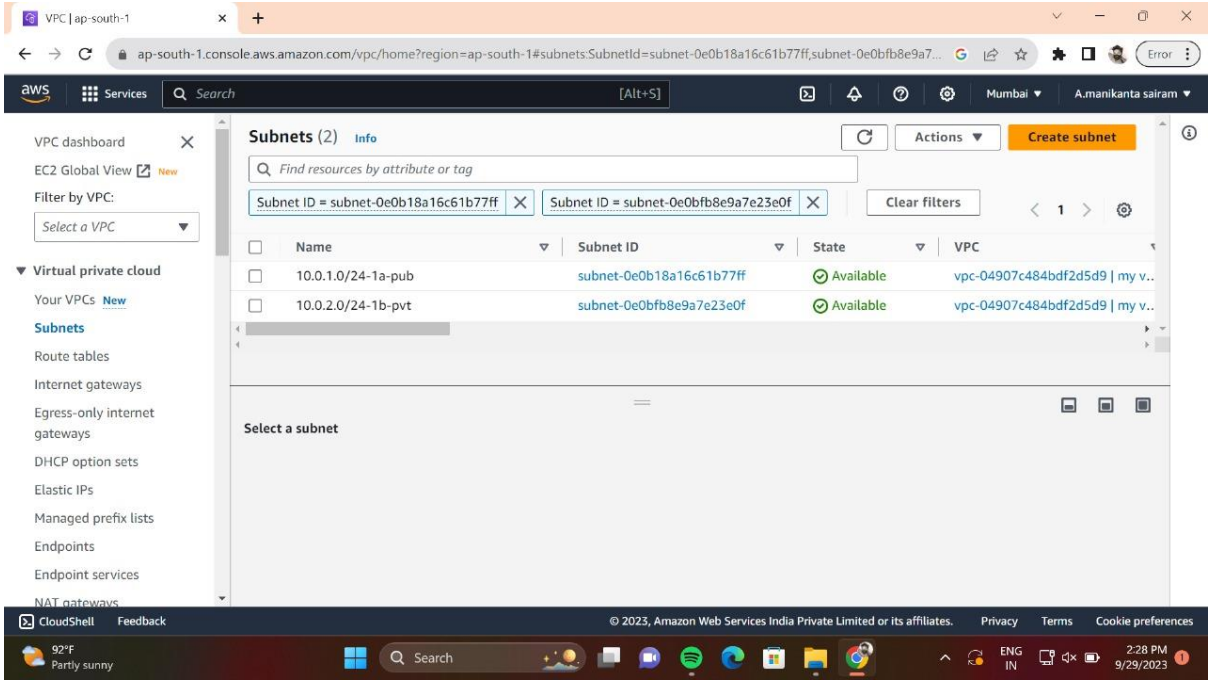
PUBLIC SUBNET:

A public subnet is a subnet that has a route to an internet gateway.

It means that instances in public ip address and can communicate with internet .

CREATION OF SUBNET:

- Click on the "Create Subnet" button to create a new subnet.
- Configure the subnet settings:
  - Select the VPC in which you want to create the subnet.
  - Provide a name and a suitable CIDR block for the subnet. Ensure that the CIDR block falls within the IP address range of the VPC and doesn't overlap with other subnets
- Select the desired availability zone for the subnet. It's recommended to create subnets in multiple availability zones for high availability and fault tolerance.
  - Configure the subnet's route table:



    - Choose an existing route table or create a new one for the subnet. To make the subnet public, associate it with a route table that has a route to an internet gateway.
    - Verify the details of the subnet, including the VPC, CIDR block, availability zone, route table, and NACL settings
- Once you have reviewed and confirmed the configuration, click on the "Create" button to create the public subnet.
- If you require multiple public subnets across different availability zones, repeat the above steps to create them.

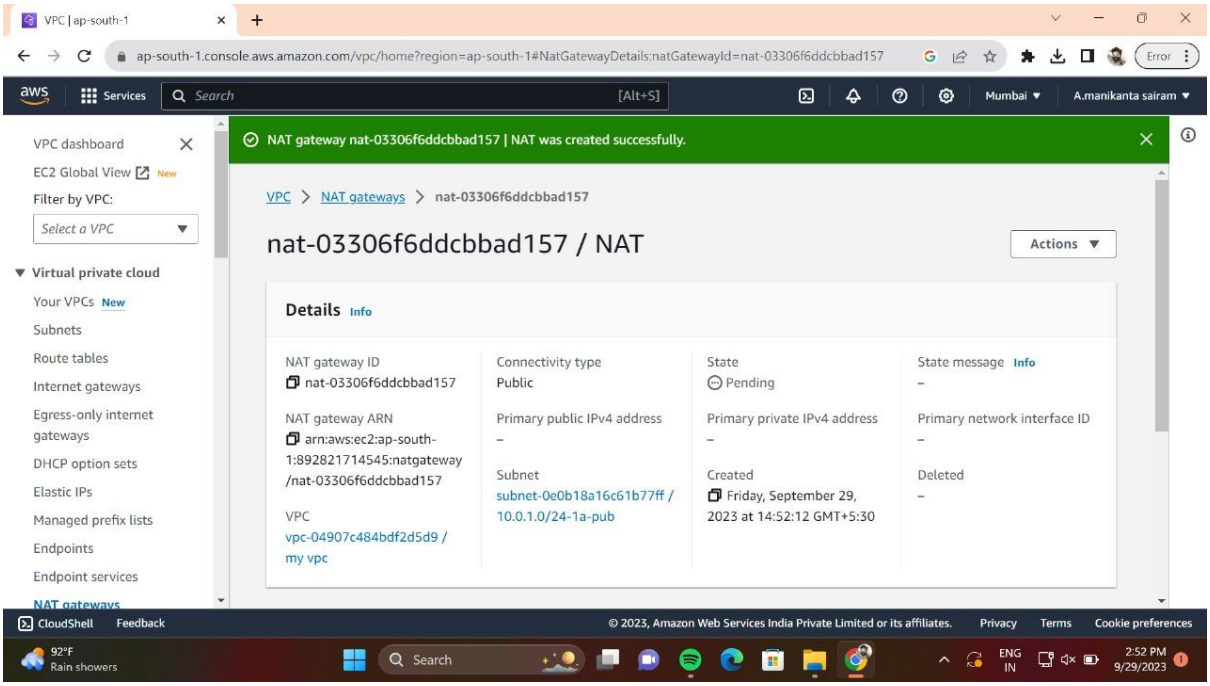
NAT GATEWAYS:

It is a network device that helps connect a private network to a public network

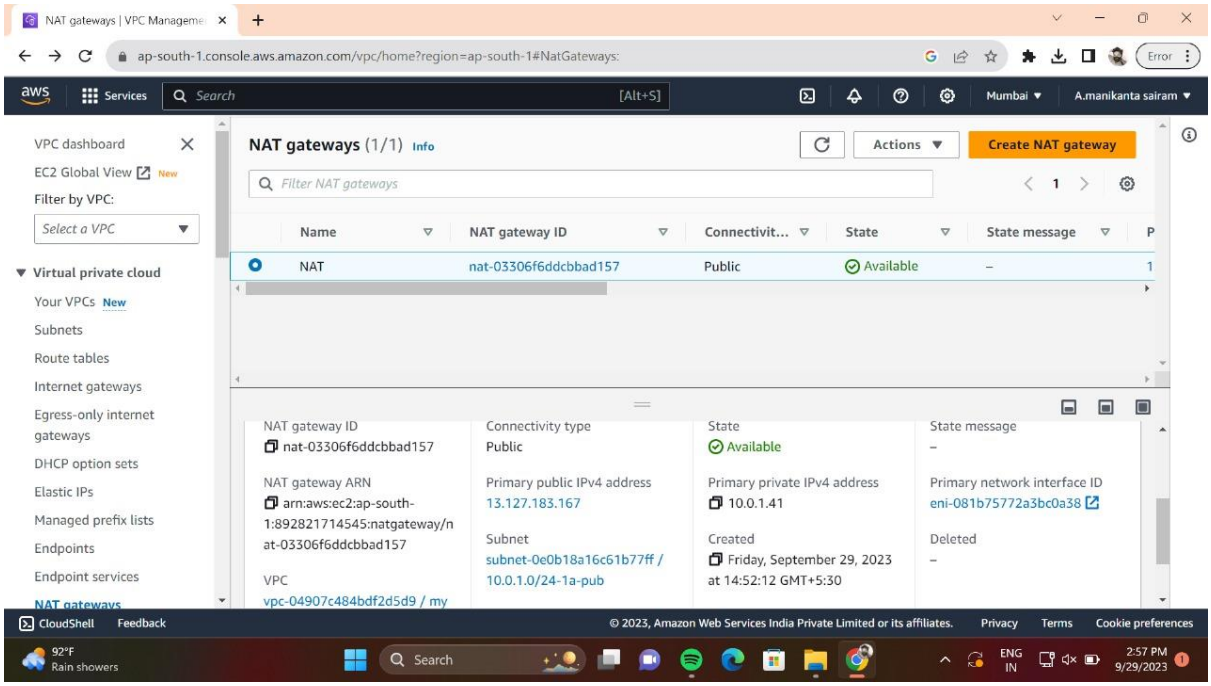
It is used to route internet traffic to internal ip address in a private network

CREATION OF NAT GATEWAY:

- Click on the "Create NAT Gateway" button to create a new NAT gateway.
- Configure the NAT gateway settings:
    - Select the subnet in which you want to create the NAT gateway. The subnet must be a public subnet, meaning it should have a route to an internet gateway.
    - Choose an existing Elastic IP address or allocate a new one to associate with the NAT gateway. The Elastic IP address serves as a public IP address for the NAT gateway.
- Verify the configuration details for the NAT gateway, including the selected subnet and Elastic IP address
- Click on the "Create NAT Gateway" button to create the NAT gateway. The creation process may take a few moments.



- Update route tables: After the NAT gateway is created, you need to update the route tables to direct the outbound traffic from private subnets to the NAT gateway.
  - Go to the "Route Tables" section in the VPC Dashboard.
  - Select the route table associated with the private subnets that need access to the internet via the NAT gateway.
  - Add a new route with a destination of "0.0.0.0/0" (or the desired IP range) and set the target as the newly created NAT gateway.
- Test the connectivity by launching an instance in a private subnet and ensuring it can access the internet through the NAT gateway.



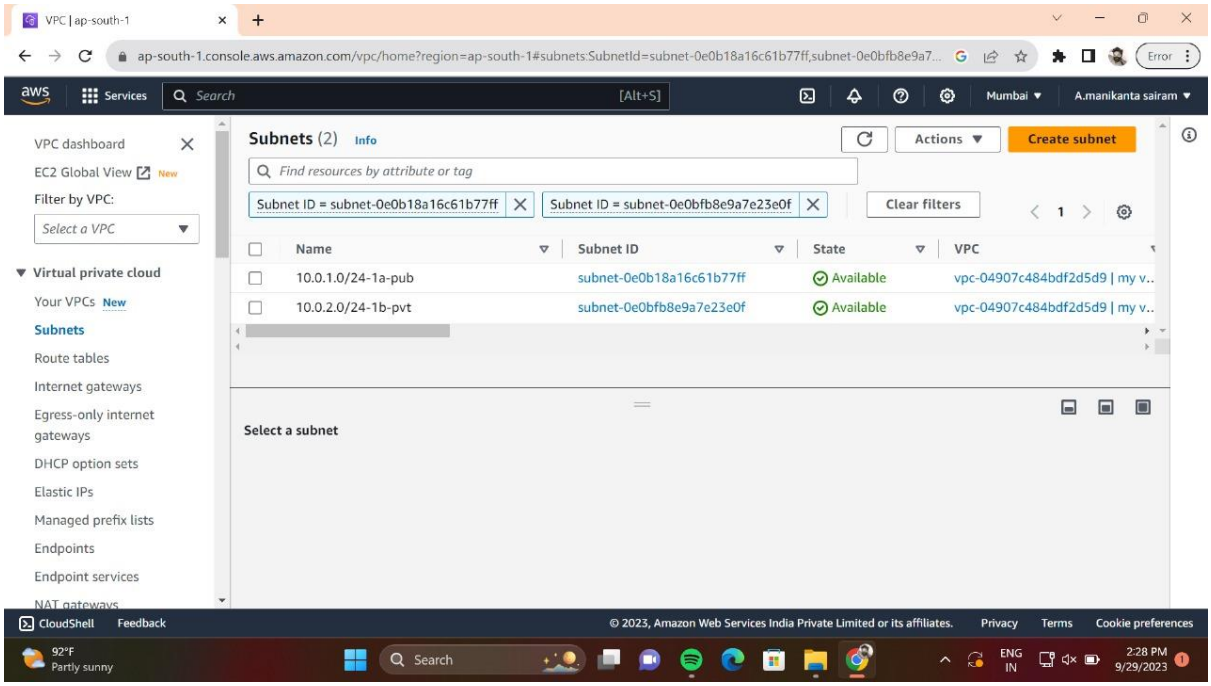
PRIVATE GATEWAY:

It is a network device that allows communicate between different network within a private network.

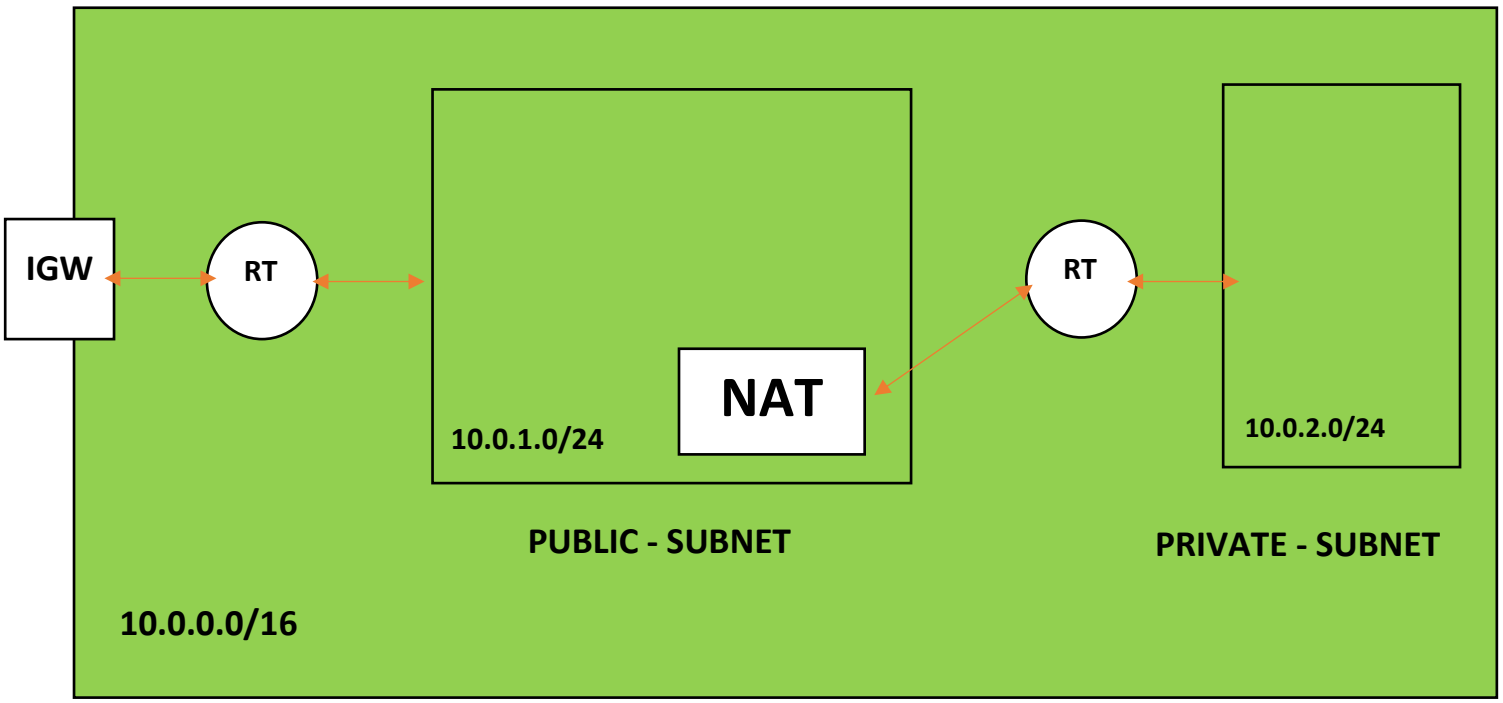
It helps connect devices and enable data transfer between them securely.

- Click on the "Create Subnet" button to create a new subnet.
- Configure the subnet settings:
  - Select the VPC in which you want to create the subnet.
  - Provide a name and a suitable CIDR block for the subnet. Ensure that the CIDR block falls within the IP address range of the VPC and doesn't overlap with other subnets

- Select the desired availability zone for the subnet. It's recommended to create subnets in multiple availability zones for high availability and fault tolerance.
    - Configure the subnet's route table:
    - Choose an existing route table or create a new one for the subnet. To make the subnet public, associate it with a route table that has a route to an internet gateway.



CONCLUSION:



MY – VPC (M)