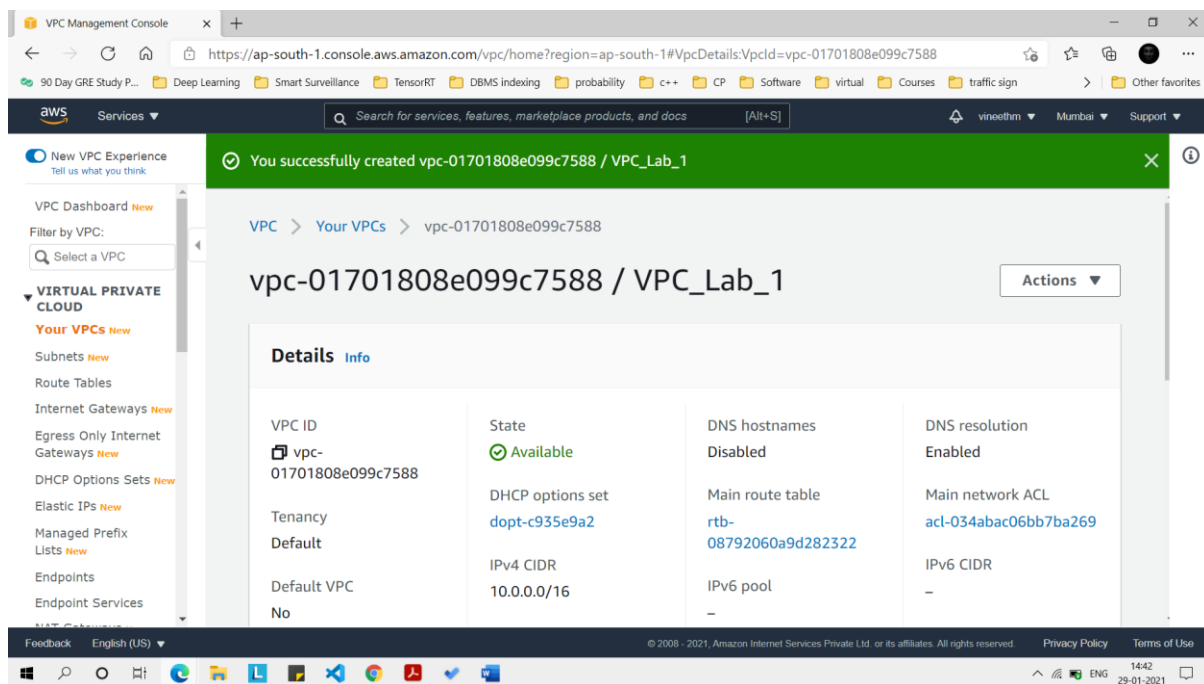


## Lab Assignment – 03

### Lab Objectives:

1. Create a VPC
2. Create Subnets
3. Configure a security group
4. Launch an EC2 instance into VPC

### Task-1: Create AWS VPC in an availability zone at one region.



## Task-2: Create one public subnet and one private subnet

The screenshot shows the AWS VPC console interface. A green notification banner at the top states: "You have successfully created 1 subnet: subnet-07ed519a25fba951e". The left sidebar contains the VPC Dashboard and a list of VPC resources including Subnets, Route Tables, Internet Gateways, Egress Only Internet Gateways, DHCP Options Sets, Elastic IPs, Managed Prefix Lists, Endpoints, and Endpoint Services. The main content area displays the "Subnets (1) Info" page. A search filter is set to "Subnet ID: subnet-07ed519a25fba951e". Below the filter, a table lists the subnet details:

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	Public Subnet 1	subnet-07ed519a25fba951e	Available	vpc-01701808e099c7...	10.0.0.0/24

Below the table, there is a "Select a subnet" section with three icons for different subnet types.

The screenshot shows the AWS VPC console interface. A green notification banner at the top states: "You have successfully created 1 subnet: subnet-0e11290faaf711e97". The left sidebar contains the VPC Dashboard and a list of VPC resources including Subnets, Route Tables, Internet Gateways, Egress Only Internet Gateways, DHCP Options Sets, Elastic IPs, Managed Prefix Lists, Endpoints, and Endpoint Services. The main content area displays the "Subnets (1) Info" page. A search filter is set to "Subnet ID: subnet-0e11290faaf711e97". Below the filter, a table lists the subnet details:

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	Private Subnet 1	subnet-0e11290faaf711e97	Available	vpc-01701808e099c7...	10.0.1.0/24

Below the table, there is a "Select a subnet" section with three icons for different subnet types.

## Task-3: Create Internet Gateway and attach it to VPC

The screenshot shows the AWS VPC Management Console interface. A green notification banner at the top states: "The following internet gateway was created: igw-0a47e3af3fa89b6bd. You can now attach to a VPC to enable the VPC to communicate with the internet." Below this, the breadcrumb navigation shows "VPC > Internet gateways > igw-0a47e3af3fa89b6bd". The main heading is "igw-0a47e3af3fa89b6bd / IGW\_Lab\_01". The "Details" section shows the following information:

Internet gateway ID	State	VPC ID	Owner
igw-0a47e3af3fa89b6bd	Detached	-	277391238495

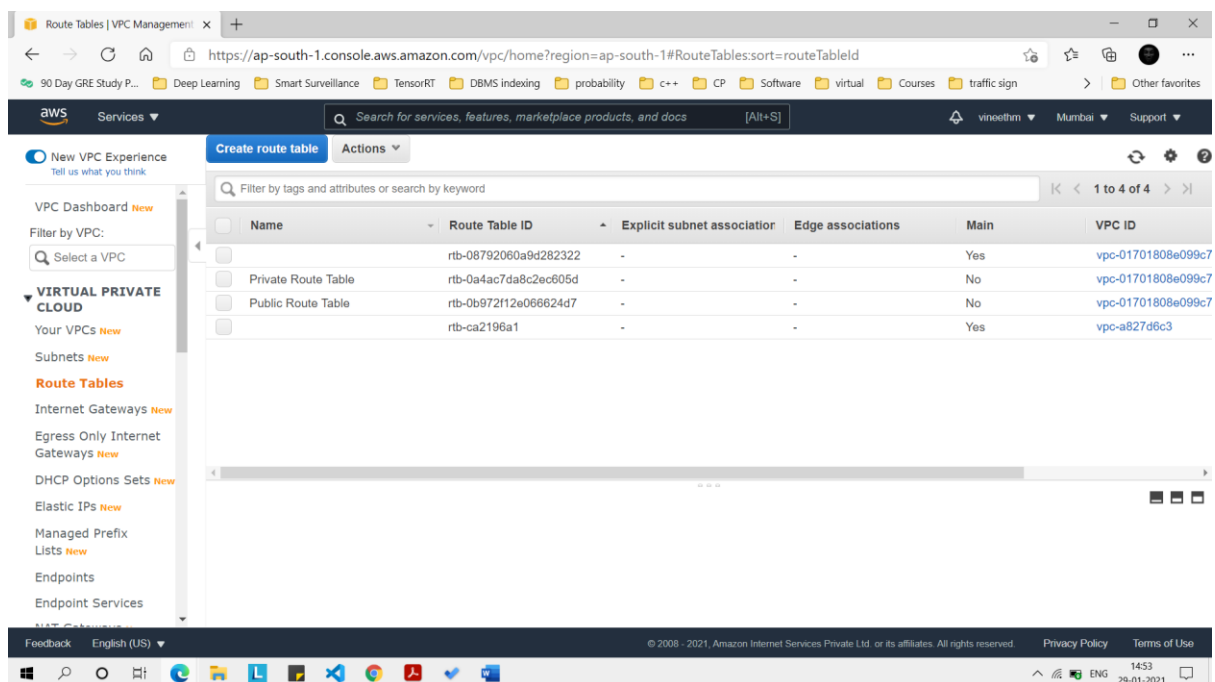
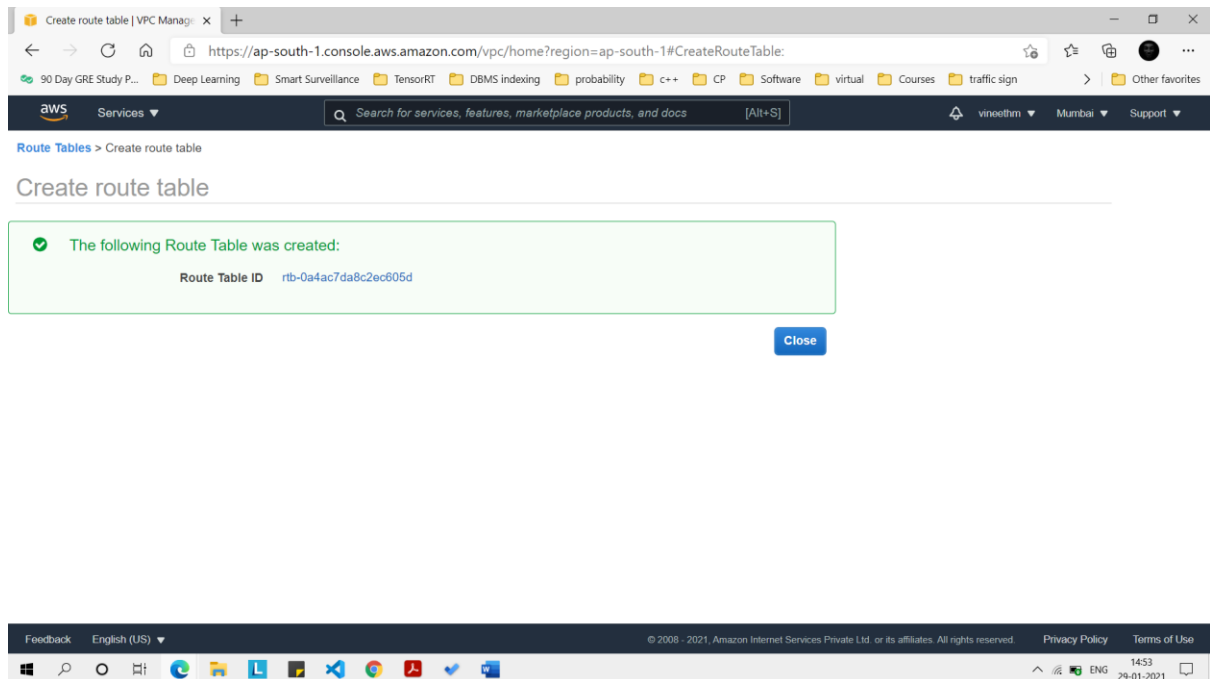
The "Tags" section is empty, and there is a "Manage tags" button. The left sidebar shows the "VIRTUAL PRIVATE CLOUD" section with various options like "Your VPCs", "Subnets", "Route Tables", "Internet Gateways", etc.

The screenshot shows the "Internet gateways (2)" page in the AWS VPC Management Console. A green notification banner at the top states: "Internet gateway igw-0a47e3af3fa89b6bd successfully attached to vpc-01701808e099c7588". Below this, the "Internet gateways (2)" section shows a table with the following data:

Name	Internet gateway ID	State	VPC ID
IGW_Lab_01	igw-0a47e3af3fa89b6bd	Attached	vpc-01701808e099c7588   V...
-	igw-1a149772	Attached	vpc-a827d6c3

Below the table, there is a prompt: "Select an internet gateway above". The left sidebar shows the "VIRTUAL PRIVATE CLOUD" section with various options like "Your VPCs", "Subnets", "Route Tables", "Internet Gateways", etc.

## Task-4: Create route tables for public and private subnet



## Task-5: configure route tables.

### Public route table → IGW

The screenshot shows the AWS Management Console for the 'Route Tables' section. The 'Public Route Table' is selected, and the 'Routes' tab is active. The table below shows the routes configured for this route table.

Destination	Target	Status	Propagated
10.0.0.0/16	local	active	No
0.0.0.0/0	igw-0a47e3af3fa89b6bd	active	No

### Private route table → NAT gateway

The screenshot shows the 'Edit subnet associations' page for a Private Route Table. The 'Associated subnets' section shows the following subnets:

Subnet ID	IPv4 CIDR	IPv6 CIDR	Current Route Table
subnet-07ed519a25fba951e   Public Subnet 1	10.0.0.0/24	-	rtb-0b972f12e066624d7
subnet-0e11290faaf711e97   Private Subnet 1	10.0.1.0/24	-	Main

At the bottom of the page, there are 'Cancel' and 'Save' buttons.

## Task-6: Launch 2 different windows EC2 instances in each created subnet

Launch instance wizard | EC2 M... x +

https://ap-south-1.console.aws.amazon.com/ec2/v2/home?region=ap-south-1#LaunchInstanceWizard:

90 Day GRE Study P... Deep Learning Smart Surveillance TensorRT DBMS indexing probability c++ CP Software virtual Courses traffic sign Other favorites

aws Services Search for services, features, marketplace products, and docs [Alt+S] vineethm Mumbai Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of Instances  Launch into Auto Scaling Group

Purchasing option ☐ Request Spot instances

Network  Create new VPC

Subnet  Create new subnet  
251 IP Addresses available

Auto-assign Public IP

Placement group ☐ Add instance to placement group

Capacity Reservation

Domain join directory  Create new directory

IAM role  Create new IAM role

Cancel Previous Review and Launch Next: Add Storage

Feedback English (US) © 2008 - 2021, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved. Privacy Policy Terms of Use

1506 29-01-2021

Launch instance wizard | EC2 M... x +

https://ap-south-1.console.aws.amazon.com/ec2/v2/home?region=ap-south-1#LaunchInstanceWizard:

90 Day GRE Study P... Deep Learning Smart Surveillance TensorRT DBMS indexing probability c++ CP Software virtual Courses traffic sign Other favorites

aws Services Search for services, features, marketplace products, and docs [Alt+S] vineethm Mumbai Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group ☐ Select an existing security group

Security group name:

Description:

Type	Protocol	Port Range	Source	Description
RDP	TCP	3389	Anywhere 0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop
HTTP	TCP	80	Anywhere 0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop
HTTPS	TCP	443	Anywhere 0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop

Add Rule

Warning

Cancel Previous Review and Launch

Feedback English (US) © 2008 - 2021, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved. Privacy Policy Terms of Use

1508 29-01-2021

Launch instance wizard | EC2 Management Console

https://ap-south-1.console.aws.amazon.com/ec2/v2/home?region=ap-south-1#LaunchInstanceWizard:

90 Day GRE Study P... Deep Learning Smart Surveillance TensorRT DBMS indexing probability c++ CP Software virtual Courses traffic sign Other favorites

aws Services Search for services, features, marketplace products, and docs [Alt+S]

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of Instances  [Launch into Auto Scaling Group](#)

Purchasing option ☐ Request Spot instances

Network  [Create new VPC](#)

Subnet  [Create new subnet](#)  
251 IP Addresses available

Auto-assign Public IP

Placement group ☐ Add instance to placement group

Capacity Reservation

Domain join directory  [Create new directory](#)

IAM role  [Create new IAM role](#)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Storage](#)

Feedback English (US) © 2008 - 2021, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved. Privacy Policy Terms of Use

Instances | EC2 Management Console

(7) EB03 Lab | ECSE304L

https://ap-south-1.console.aws.amazon.com/ec2/v2/home?region=ap-south-1#Instances:sort=desc:instanceState

90 Day GRE Study P... Deep Learning Smart Surveillance TensorRT DBMS indexing probability c++ CP Software virtual Courses traffic sign Other favorites

aws Services Search for services, features, marketplace products, and docs [Alt+S]

New EC2 Experience [Learn more](#)

EC2 Dashboard Events Tags Limits INSTANCES **Instances** Instance Types Launch Templates Spot Requests Savings Plans Reserved Instances Dedicated Hosts Capacity Reservations IMAGES AMIs ELASTIC BLOCK STORE Volumes

[Launch Instance](#) [Connect](#) [Actions](#)

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv6
Public Server	i-03e4d769922b9a9b8	t2.micro	ap-south-1a	running	2/2 checks ...	None	13.126.212.228	
Private Server	i-0fa26f9bf3c2a9e31	t2.micro	ap-south-1a	running	2/2 checks ...	None		

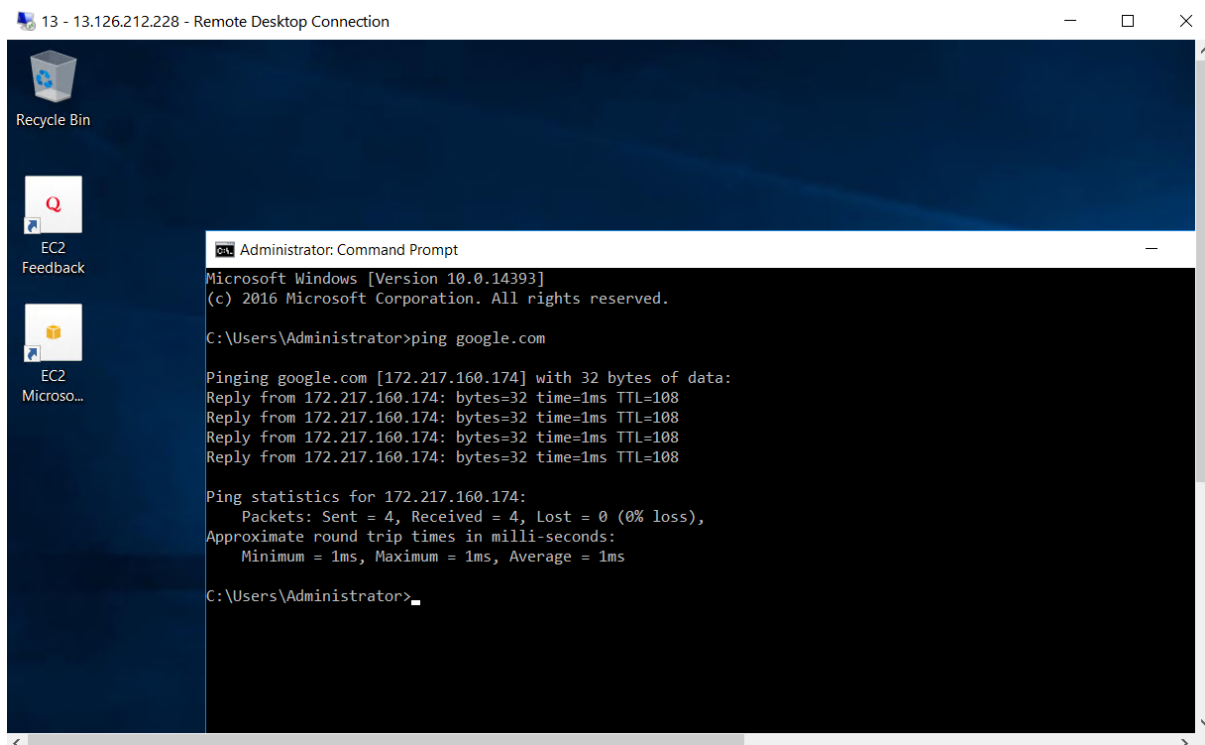
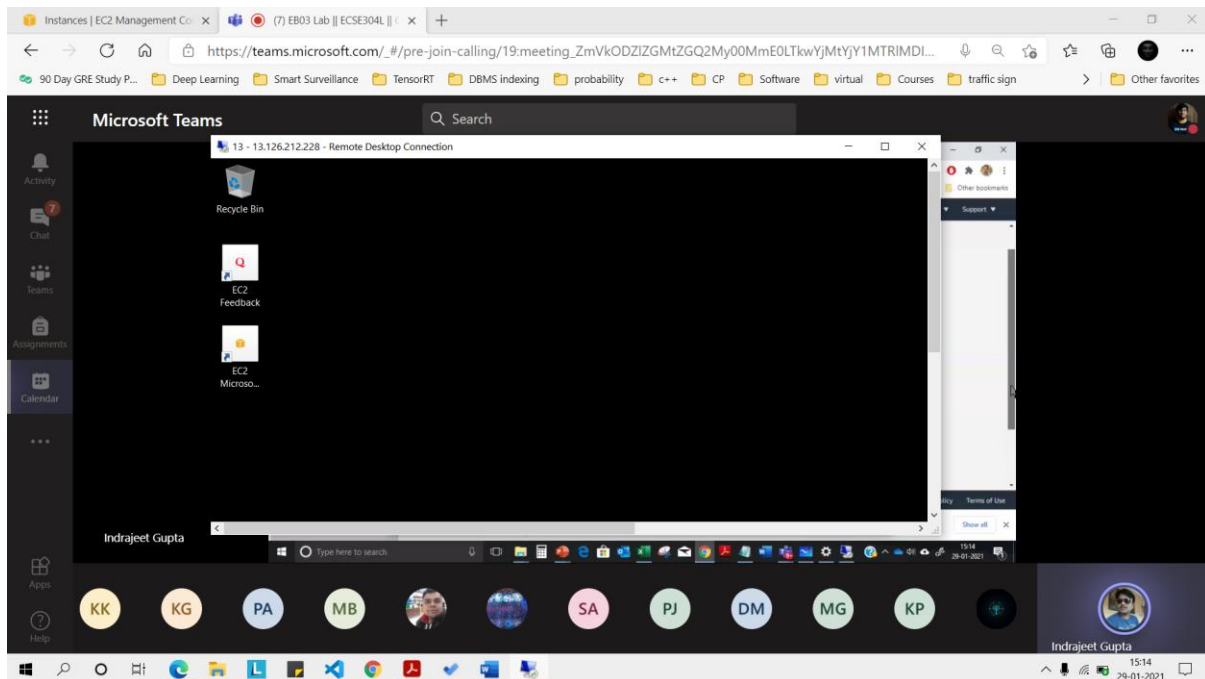
Instance: **i-03e4d769922b9a9b8 (Public Server)** Public IP: 13.126.212.228

[Description](#) [Status Checks](#) [Monitoring](#) [Tags](#)

Instance ID	i-03e4d769922b9a9b8	Public DNS (IPv4)	-
Instance state	running	IPv4 Public IP	13.126.212.228
Instance type	t2.micro	IPv6 IPs	-
Finding	Opt-in to AWS Compute Optimizer for recommendations. <a href="#">Learn more</a>	Elastic IPs	-
Private DNS	ip-10-0-0-158.ap-south-1.compute.internal	Availability zone	ap-south-1a

Feedback English (US) © 2008 - 2021, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved. Privacy Policy Terms of Use

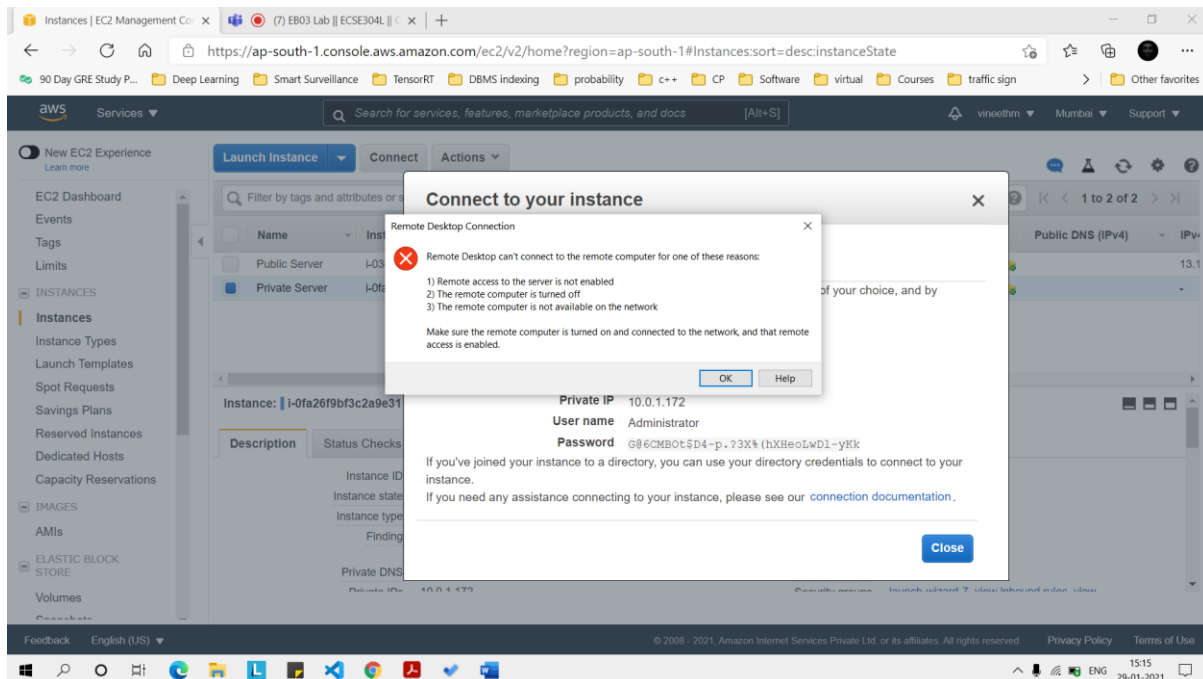
## Task-7: Check the internet availability of the running EC2 instances.



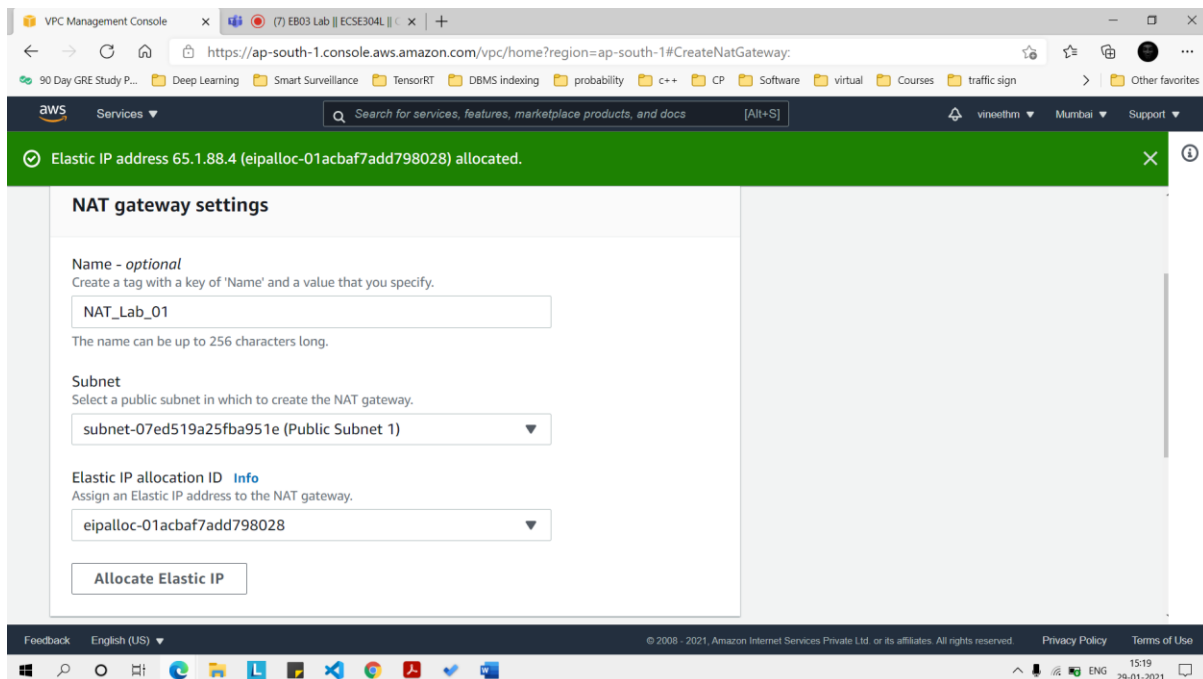
We get the below error when connecting to the instance in the private subnet because there is no route in the private route table.



To resolve this issue, we need to create the NAT Gateway and add it in the private route table.



## Task-8: Create NAT Gateway



VPC Management Console

https://ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#NatGatewayDetails:natGatewayId=nat-02d0082aa9b2d1a77

Services Search for services, features, marketplace products, and docs [Alt+S]

New VPC Experience Tell us what you think

Route Tables  
Internet Gateways New  
Egress Only Internet Gateways New  
DHCP Options Sets New  
Elastic IPs New  
Managed Prefix Lists New  
Endpoints  
Endpoint Services  
NAT Gateways New  
Peering Connections

▼ SECURITY  
Network ACLs New  
Security Groups New

▼ REACHABILITY  
Reachability Analyzer

NAT gateway nat-02d0082aa9b2d1a77 | NAT\_Lab\_01 was created successfully.

VPC > NAT gateways > nat-02d0082aa9b2d1a77

## nat-02d0082aa9b2d1a77 / NAT\_Lab\_01

Delete

Details Info

NAT gateway ID nat-02d0082aa9b2d1a77	State Pending	State message Info -	Elastic IP address -
Private IP address -	Network interface ID -	VPC vpc-01701808e099c7588 / VPC_Lab_1	Subnet subnet-07ed519a25fba951e / Public Subnet 1
Created 2021/01/29 15:19	Deleted -		

Waiting for ap-south-1.console.aws.amazon.com...

© 2008 - 2021, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved. Privacy Policy Terms of Use

15:19 29-01-2021

NAT gateways | VPC Management Console

https://ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#NatGateways:

Services Search for services, features, marketplace products, and docs [Alt+S]

New VPC Experience Tell us what you think

VPC Dashboard New

Filter by VPC:  
Select a VPC

▼ VIRTUAL PRIVATE CLOUD  
Your VPCs New  
Subnets New  
Route Tables  
Internet Gateways New  
Egress Only Internet Gateways New  
DHCP Options Sets New  
Elastic IPs New  
Managed Prefix Lists New  
Endpoints  
Endpoint Services

## NAT gateways (1/1) Info

Filter NAT gateways

Create NAT gateway

Name	NAT gateway ID	State	State mes...	Elastic IP a...
NAT_Lab_01	nat-02d0082aa9b2d1...	Available	-	65.1.88.4

nat-02d0082aa9b2d1a77 / NAT\_Lab\_01

Feedback English (US)

© 2008 - 2021, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved. Privacy Policy Terms of Use

15:22 29-01-2021

## Task-9: Attach the NAT Gateway to the private route table

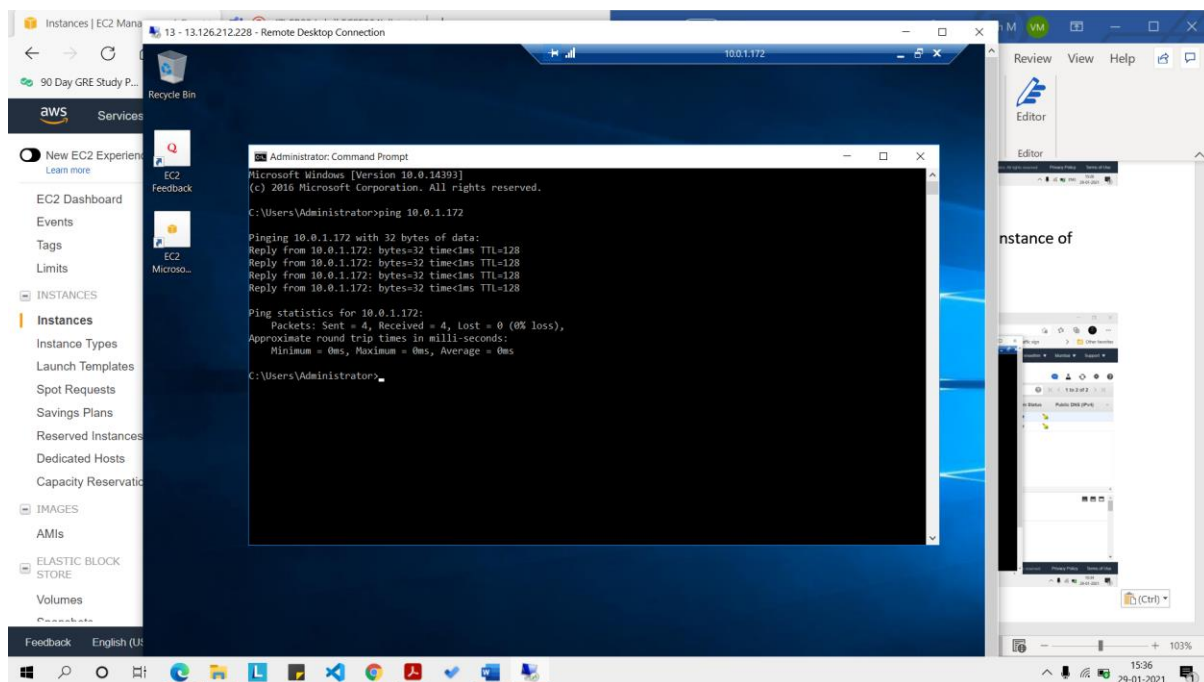
The screenshot shows the AWS Management Console interface for editing routes. The URL in the browser is `https://ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#EditRoutes:routeTableId=rtb-0a4ac7da8c2ec605d`. The page title is "Edit routes". Below the title is a table with the following data:

Destination	Target	Status	Propagated
10.0.0.0/16	local	active	No
0.0.0.0/0	nat-02d0082aa9b2d1a77		No

At the bottom of the table, there is an "Add route" button. Below the table, there is a "Required" section with a "Cancel" button and a "Save routes" button.

## Task-10: Via RDP of the public server, we connected to instance of private subnet.

The screenshot shows the AWS Management Console interface for the "Instances" page. The URL in the browser is `https://ap-south-1.console.aws.amazon.com/ec2/v2/home?region=ap-south-1#Instances:sort=tag:Name`. The page title is "Instances". On the left, there is a sidebar with navigation options: "New EC2 Experience", "EC2 Dashboard", "Events", "Tags", "Limits", "INSTANCES", "Instances", "Instance Types", "Launch Templates", "Spot Requests", "Savings Plans", "Reserved Instances", "Dedicated Hosts", "Capacity Reservations", "IMAGES", "AMIs", "ELASTIC BLOCK STORE", "Volumes", and "Pricing". The "Instances" section is selected. The main content area shows a list of instances. A remote desktop connection window is open, showing a Windows desktop environment. The console shows the "Instances" list with a status of "Public DNS (IPv4)".



We can notice the ping command to the private instance results in a success.

We cannot access this instance from outside as it is a part of the private subnet. The public instance can access it because they are a part of the same VPC.