

# VPC Creation Assignment

## Problem Statement:

Working for an organization, you are required to provide them with a safe and secure environment for the deployment of their resources. They might require different types of connectivity. Implement the following to fulfill the requirements of the company.

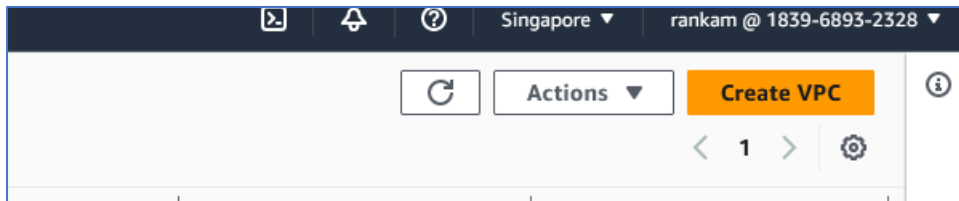
## Tasks To Be Performed:

1. Create a VPC with 120.0.0.0/16 CIDR block.
2. Create 1 public subnet and 2 private subnets and make sure you connect a NAT gateway for internet connectivity to a private subnet

## Answer:

Login to the AWS Management console

Services select **VPC** → **Create VPC**



A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances.

### 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*  
Creates a tag with a key of 'Name' and a value that you specify.

MyVPC1

IPv4 CIDR block [Info](#)

☒ IPv4 CIDR manual input ☐ IPAM-allocated IPv4 CIDR block

IPv4 CIDR

120.0.0/16

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](#)

Default

### 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 MyVPC1 X Remove tag

Add tag

You can add 49 more tags

Cancel Create VPC

1. Select VPC Only option to create VPC with customized options
2. Provide a VPC name
3. Select IPv4 CIDR manual input (Currently we are targeting for IPv4 only)
4. Select Default tenancy (Shared resources)

Click “Create VPC”

Your VPCs (2) <a href="#">Info</a>									
Find resources by attribute or tag									
	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP option set	Main route table	Main network ACL	Tenancy
<input type="checkbox"/>	-	vpc-c12495a6	Available	172.31.0.0/16	-	dopt-b60cafd1	rtb-f2437595	acl-ab5407cc	Default
<input type="checkbox"/>	MyVPC1	vpc-0ac990376a961db72	Available	120.0.0.0/16	-	dopt-b60cafd1	-	-	Default

**MyVPC1** is created successfully. Now create the subnets as per the requirement.

## Creating Subnets

In VPC service → Click on subnets → Create subnet

The screenshot shows the AWS Management Console interface for creating a new subnet. The breadcrumb navigation at the top indicates the path: VPC > Subnets > Create subnet. The main heading is 'Create subnet' with an 'Info' link. The form is divided into two main sections: 'VPC' and 'Subnet settings'.

**VPC Section:**

- VPC ID:** A dropdown menu showing 'vpc-0ac990376a961db72 (MyVPC1)'. A red arrow points to this field.
- Associated VPC CIDRs:** A list showing 'IPv4 CIDRs' with the value '120.0.0.0/16'.

**Subnet settings Section:**

Specify the CIDR blocks and Availability Zone for the subnet.

**Subnet 1 of 1**

- Subnet name:** A text input field containing 'Public'. A red arrow points to this field. Below the field, it says 'The name can be up to 256 characters long.'
- Availability Zone:** A dropdown menu showing 'Asia Pacific (Singapore) / ap-southeast-1a'. A red arrow points to this field. Below the field, it says 'Choose the zone in which your subnet will reside, or let Amazon choose one for you.'
- IPv4 CIDR block:** A text input field containing '120.0.3.0/24'. A red arrow points to this field. Below the field, it says 'The IPv4 CIDR block must be a valid IPv4 CIDR block.'

**Tags - optional**

Key	Value - optional	
Name	Public	Remove
Type	Pulbic	Remove

Buttons: 'Add new tag', 'Remove', 'Add new subnet', 'Cancel', 'Create subnet'.

1. Select the correct VPC.
2. Provide a subnet Name i.e., Public
3. Assign the IPv4 CIDR block for this subnet 120.0.3.0/24.
4. Provide Tags for easy tracking and identification.

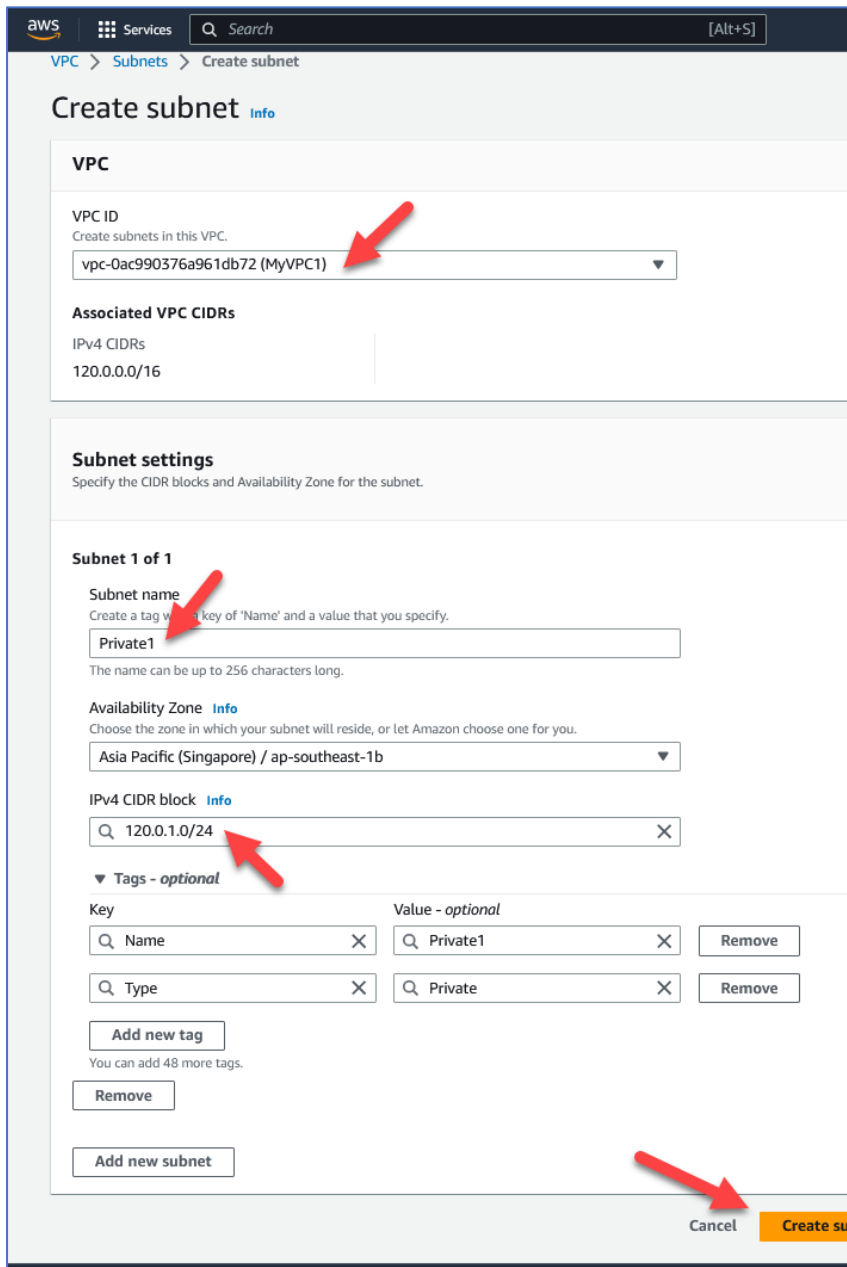
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Click “Create subnet”



The public subnet has been created successfully.



Click “Create subnet”

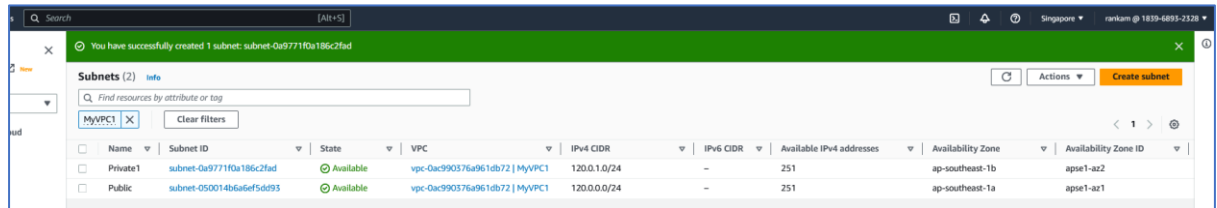
1. Select the appropriate VPC.
2. Provide a subnet name i.e., Private1.

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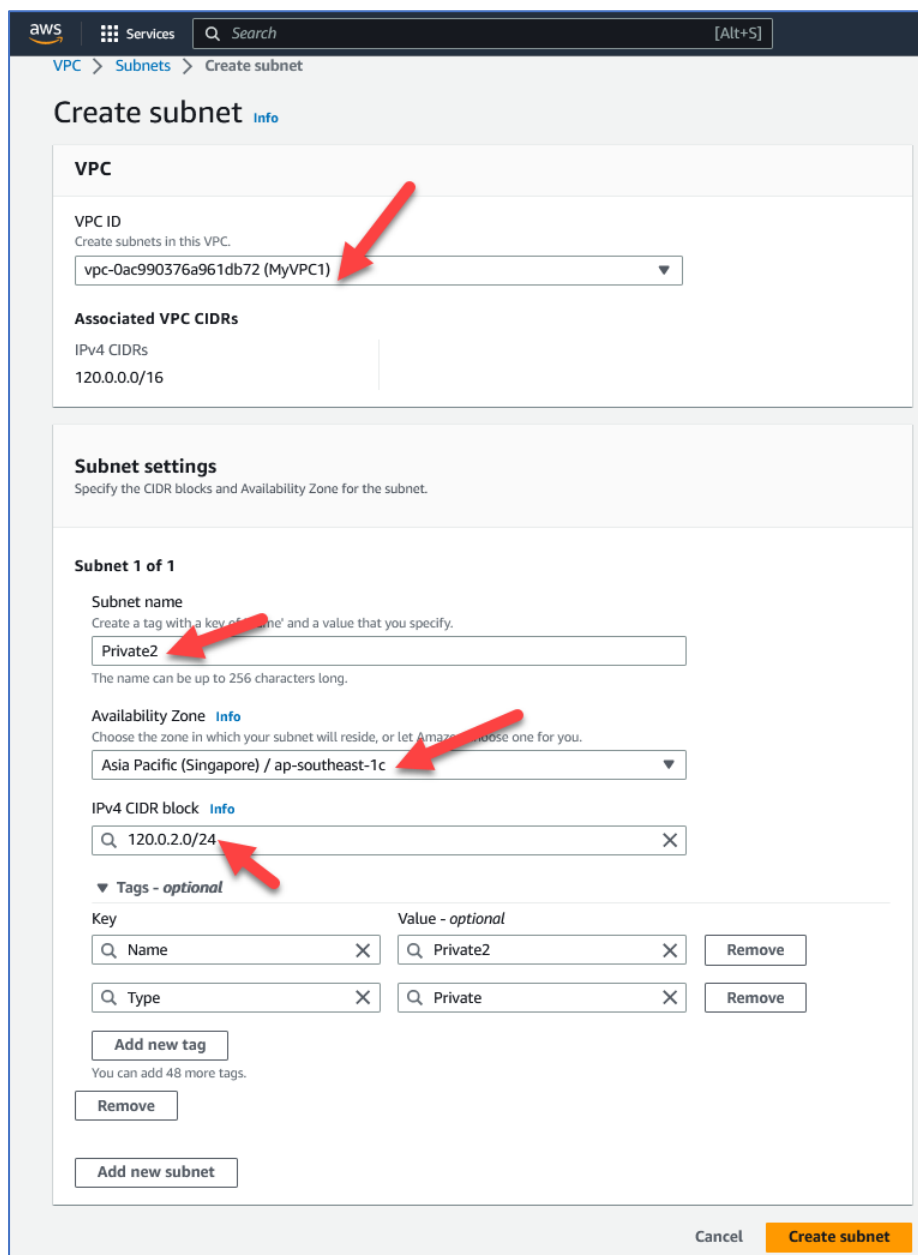
3. Select the AZ (Availability Zone) and select a different AZ than another subnet for redundancy.
4. Provide IPv4 CIDR block i.e., 120.0.1.0/24.

Click **“Create subnet”**



Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR	Available IPv4 addresses	Availability Zone	Availability Zone ID
Private1	subnet-0a9771f0a186c2fad	Available	vpc-0ac990376a961db72   MyVPC1	120.0.1.0/24	-	251	ap-southeast-1b	apse1-az2
Public	subnet-050014b6a6ef5d993	Available	vpc-0ac990376a961db72   MyVPC1	120.0.0.0/24	-	251	ap-southeast-1a	apse1-az1

Private1 subnet created successfully.



**Create subnet** Info

**VPC**

VPC ID  
Create subnets in this VPC.  
vpc-0ac990376a961db72 (MyVPC1)

**Associated VPC CIDRs**

IPv4 CIDRs  
120.0.0.0/16

**Subnet settings**  
Specify the CIDR blocks and Availability Zone for the subnet.

**Subnet 1 of 1**

**Subnet name**  
Create a tag with a key of 'Name' and a value that you specify.  
Private2

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

**IPv4 CIDR block** Info  
120.0.2.0/24

**Tags - optional**

Key	Value - optional	
Name	Private2	Remove
Type	Private	Remove

**Add new tag**  
You can add 48 more tags.

**Remove**

**Add new subnet**

Cancel **Create subnet**

Click Create subnet

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1. Select appropriate VPC,
2. Provide a subnet name i.e., Private2.
3. Select the AZ (Availability Zone) and select a different AZ than another subnet for redundancy.
4. Provide IPv4 CIDR block i.e., 120.0.2.0/24.

Click “Create subnet”

You have successfully created 1 subnet: subnet-0063f7f30839d7dda

Subnets (3) Info

Find resources by attribute or tag

MyVPC1 X Clear filters

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR	Available IPv4 addresses	Availability Zone	Availability Zone ID	Network border
<input type="checkbox"/>	Private1	subnet-0a9771f0a186c2fad	Available	vpc-0ac990376a961db72   MyVPC1	120.0.1.0/24	–	251	ap-southeast-1b	apse1-az2	ap-southeast
<input type="checkbox"/>	Public	subnet-050014b6a6ef5dd93	Available	vpc-0ac990376a961db72   MyVPC1	120.0.0.0/24	–	251	ap-southeast-1a	apse1-az1	ap-southeast
<input type="checkbox"/>	Private2	subnet-0063f7f30839d7dda	Available	vpc-0ac990376a961db72   MyVPC1	120.0.2.0/24	–	251	ap-southeast-1c	apse1-az3	ap-southeast

## Create Internet Gateway

VPC > Internet gateways > Create internet gateway

### Create internet gateway Info

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

#### Internet gateway settings

**Name tag**  
Creates a tag with the key of 'Name' and a value that you specify.

igw1

#### Tags - optional

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	
<input type="text" value="Name"/>	<input type="text" value="igw1"/>	<input type="button" value="Remove"/>
<input type="text" value="Purpose"/>	<input type="text" value="For Public Subnet"/>	<input type="button" value="Remove"/>

You can add 48 more tags.

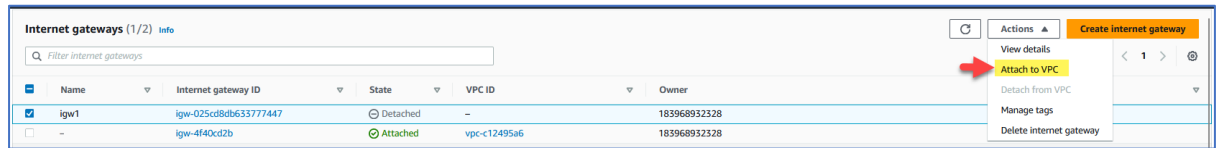
Click on “Create Internet Gateway”

- a. Provide a Internet Gateway a Name “igw1”
- b. Provide Tags for later identification

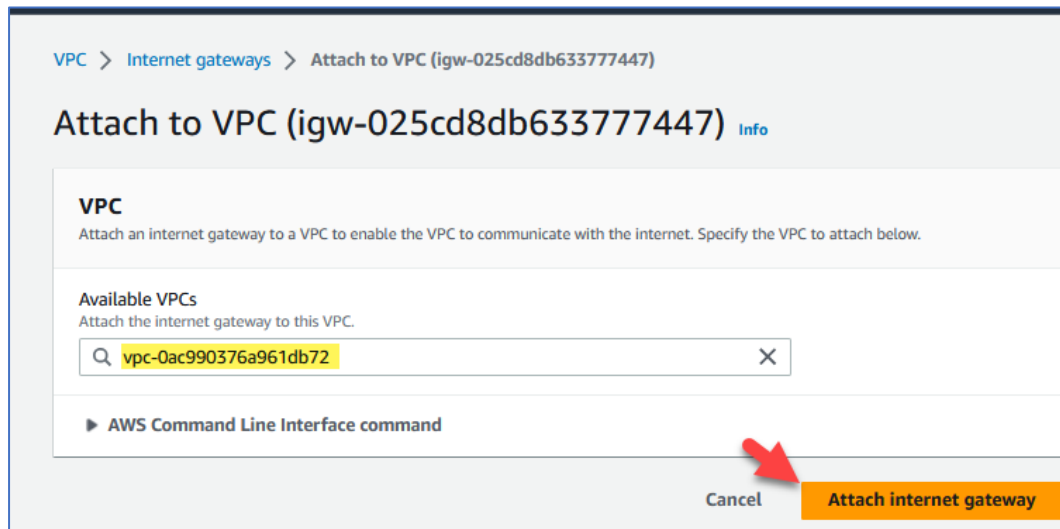
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Click “Create internet Gateway”

IGW is created successfully.



Select the “igw1” which is newly created, **Actions** → **Attach to VPC**



Select “MyVPC1” which is a newly created then click on “**Attach internet gateway**”

## Enable Internet Route to Public Subnet

We require multiple route tables to add routes to them. Since we have a single route table I am going to create another route table for the private subnet.

1. De-associate private subnets from existing subnets (to avoid having IGW and route table)
2. Associate private subnets to the “rtb-private” subnet to have different routes.

In **VPC service** → **route tables** → **Create route table**

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**Route table settings**

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

**VPC**  
The VPC to use for this route table.

**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**

You can add 49 more tags.

Click “Create route table”

You have successfully updated subnet associations for rtb-0eba45140ea7d237a / rtb-private.

**Route tables (2)**

Name	Route table ID	Explicit subnet associations	Edge associations	Main	VPC	Owner ID
Public	rtb-0505573e101fd18f	subnet-0a3a5bbd27bf54034 / Public	-	Yes	vpc-0ac990376a961db72   MyVPC1	183968932328
rtb-private	rtb-0eba45140ea7d237a	2 subnets	-	No	vpc-0ac990376a961db72   MyVPC1	183968932328

Edit Public route table and add internet route

**Edit routes**

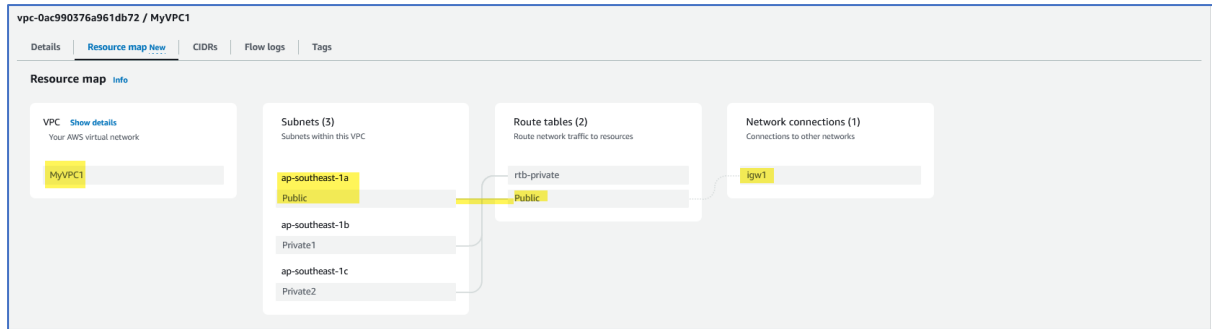
Destination	Target	Status	Propagated
120.0.0.0/16	local	Active	No
0.0.0.0/0	igw-025c8db633777447	-	No

Now Public subnet have internet access.



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## Create NAT Gateway

VPC Service → NAT gateways → Create NAT gateways →

✓ Elastic IP address 18.138.220.170 (eipalloc-02c0b603b10dc5040) allocated.

VPC > NAT gateways > Create NAT gateway

### Create NAT gateway Info

A highly available, managed Network Address Translation (NAT) service that instances in private subnets can use to connect to services in other VPCs, on-premises networks, or the internet.

**NAT gateway settings**

**Name - optional**  
Create a tag with a key of 'Name' and a value that you specify.  
  
The name can be up to 256 characters long.

**Subnet**  
Select a subnet in which to create the NAT gateway.

**Connectivity type**  
Select a connectivity type for the NAT gateway.  
☒ Public  
☐ Private

**Elastic IP allocation ID Info**  
Assign an Elastic IP address to the NAT gateway.

▶ **Additional settings** Info

**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	
<input type="text" value="Name"/>	<input type="text" value="my-nat-gateway1"/>	<input type="button" value="Remove"/>
<input type="text" value="Purpose"/>	<input type="text" value="Private subnets"/>	<input type="button" value="Remove"/>

You can add 48 more tags.

- Provide a NAT gateway name i.e., my-nat-gateway1.
- Select the subnets.
- Connectivity type Public
- Assign Elastic IP

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Click “Create NAT Gateway”

NAT gateways (1/1) info

Filter NAT gateways

Name	NAT gateway ID	Connectivity type	State	Status	Primary public IPv4 address	Primary private IPv4 address	Primary network interface ID	VPC	Subnet
my-nat-gateway1	nat-04aa37aa9f0b4667d	Public	Available	-	18.138.220.170	120.0.1.53	eni-0ab5ae5af2a2c0f83	vpc-0ac990376a961db72 / MyVPC1	subnet-0a9771f0a186c2fad / ...

nat-04aa37aa9f0b4667d / my-nat-gateway1

Details Secondary IP4 addresses Monitoring Tags

**Details**

NAT gateway ID  
nat-04aa37aa9f0b4667d

NAT gateway ARN  
arn:aws:ec2:ap-southeast-1:183968932328:natgateway/nat-04aa37aa9f0b4667d

VPC  
vpc-0ac990376a961db72 / MyVPC1

Connectivity type  
Public

Primary public IPv4 address  
18.138.220.170

Subnet  
subnet-0a9771f0a186c2fad / Private1

State  
Available

Primary private IPv4 address  
120.0.1.53

Created  
Tuesday, August 1, 2023 at 15:56:53 GMT+5:30

State message  
-

Primary network interface ID  
eni-0ab5ae5af2a2c0f83

Deleted  
-

NAT Gateway is created successfully.

VPC Service → Route tables → Select Private route table → Edit route table

VPC > Route tables > rtb-0eba45140ea7d237a > Edit routes

Edit routes

Destination	Target	Status	Propagated
120.0.0.0/16	local	Active	No
0.0.0.0/0	nat-04aa37aa9f0b4667d	-	No

Add route

Cancel Preview **Save changes**

Add another route

Destination: 0.0.0.0/0

Target: NAT-GATEWAY

Click “Save Changes”

Updated routes for rtb-0eba45140ea7d237a / rtb-private successfully

Details

VPC > Route tables > rtb-0eba45140ea7d237a

rtb-0eba45140ea7d237a / rtb-private

You can now check network connectivity with Reachability Analyzer

Run Reachability Analyzer

**Details**

Route table ID  
rtb-0eba45140ea7d237a

VPC  
vpc-0ac990376a961db72 / MyVPC1

Main  
No

Owner ID  
183968932328

Explicit subnet associations  
2 subnets

Edge associations  
-

**Routes**

Subnet associations Edge associations Route propagation Tags

Routes (2)

Filter routes

Both

Destination	Target	Status	Propagated
0.0.0.0/0	nat-04aa37aa9f0b4667d	Active	No
120.0.0.0/16	local	Active	No

Edit routes

Activity Completed.