Amazon virtual private cloud experimental and application

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Abstract

Amazon Virtual Private Cloud lets you create a secure, private network utilizing Amazon VPC. Using AWS' scalable architecture, this virtual network is almost identical to one you would find in your own data Centre. To create, access, and manage VPCs, you may make use of any of the following APIs: Using the AWS Management Console, you may manage your virtual private networks. Using the CLI, you may access all of AWS's services, including VPC. Many of the complexities of a connection, such as calculating signatures, retrying requests, and fixing issues, are handled by the AWS SDKs. As the name suggests, the Query API is designed for accessing low-level API operations through HTTPS requests. Since VPC can only be accessed via its own application, low-level tasks like generating the hash for signing the request and handling errors must be handled by your programme. A wide range of VPC concepts were addressed in this article, including the creation of a VPC, as well as subnets, routes, security groups, and gateways .

Keywords: VPC,gateway,Aws

INTRODUCTION

EC2's networking layer, Amazon VPC, may be used to create a virtual network in an AWS region. It is possible to create a subnet, set up a route table and network gateways in a virtual private cloud. As long as your virtual private networks don't overlap or share the same IP address space, you may construct many virtual private networks in the same location. In order to take use of AWS resources, you'll need to create an instance in your VPC.

When creating a VPC, use a CIDR block like 10.0.0.0/16 to construct an IPv4 address range. Amazon VPC favours CIDR over other IPv4 address ranges. Amazon won't divulge its network. Use a globally unique IPv4 address to link your AWS Cloud services with Internet endpoints to the Internet. The original IPv4 address range of a VPC cannot be modified. /16 (65,536) is OK as long as it does not overlap with any other network linked to the VPC (16 addresses).

You have the option of assigning an IPv6 address range to your VPC if you so want. Amazon has allocated your VPC an IPv6 address range of 56 (4,722,366,482,869,645,213,696). There is a GUA address space for Amazon's IPv6 addresses. These IPv6 addresses are public since Amazon welcomes GUAs on the internet. If your VPC is equipped with an Internet gateway, you may connect to the internet. Individual stack mode is supported by your virtual private server (VPS). Using IPv4 or IPv6, your VPC's resources may interact with one other. A dual-stack Amazon VPC supports both IPv4 and IPv6. The routing and security components of your VPC must be configured for each address family separately.

Each Availability Zone has a default subnet created for each AWS account as a convenience for the first time user of Amazon VPC. 172.31.0.0/16 will be the VPC's CIDR block. IPv6 is not supported in the default VPC. Two subnet switch address ranges (10.0.1.0/24) are shown in Figure2.1 in separate Availability Zones, as well as a route table with the local route setup for the VPC's 10.0.0.0/16 address space.

Subnets are the collective term for all of the virtual private network segments (VPCs) included inside a single Availability Zone. Whereas only one Availability Zone may be traversed by a subnet in any given area, a VPC can traverse numerous. Each Availability Zone may have one or more subnets. To construct a subnet, you'll need an IPv4 address range from your VPC's CIDR block. Your Amazon account specifies one or more subnets for EC2 resources, such as Amazon Relational Database Service . The CIDR range of the VPC IPv4 addresses determines the maximum subnet size. The smallest possible subnetwork is a /28. . There is no limit to the number of Availability Zone subnets you may build. The first four AWS subnets each have a set of reserved IPv4 addresses.

A preexisting subnet in your Amazon VPC may be paired with an IPv6 CIDR block.

CIDR ranges assigned from the VPC's/56CIDR block are used for each IPv6 subnet.

A subnet identifier, which is the last eight bits of the IPv6 prefix, is something you have influence over when setting up an IPv6 address range.

As previously mentioned, each subnet in a VPC has an implicit router in place. A subnet's next hop gateway is the implicit router. routing options may be controlled by the entries in a route table. Routing rules may be defined in custom route tables. Several subnets may be connected to a single route table. Your VPC's "primary" route table may also be changed. The main route table is used by all subnets that lack a specialised route table. There is a certain place you want to go to at the end of each path. For VPC gateway end points, your route tables' destinations are CIDR blocks or prefix lists. Virtual private gateways, VPC gateway endpoints, VPC peers, and elastic network interfaces may all be included in your route table. Your VPC's IPv4 and IPv6 CIDR blocks are listed in the route tables. For the specified CIDR ranges, every route table aims to be "Local". It's difficult to add a local route to the route database. As a result, your VPC's resources will always be connected. Route priority is used to decide the next hop destination when a packet is received. static and dynamic routes in one database. VPC's CIDR block route stays inside the VPC. Routes that are specified explicitly have a fixed starting point and end point. A VGW is responsible for propagating dynamic routes. You should keep in mind that Amazon VPC runs IPv6 in dual stack mode, which means that both the IPv4 and IPv6 routing evaluations are carried out independently..

Each resource in your VPC has its own individual IP address. IPv4/IPv6 compatibility is built into every service from Amazon. Amazon EC2 and Amazon VPC, among other services, need IPv4 addresses. An IPv4 CIDR block must be specified when building a VPC. For instance information and Amazon's DNS server, IPv4 is necessary. IPv4 CIDR blocks that you allocate to your VPC regardless of whether they can be routed over the Internet are known as private IPv4 address ranges. Using public IPv4 addresses, you may connect your instance to the internet or to other AWS Cloud services with public endpoints. There are several methods for allocating IPv4 addresses to the public at large. CIDR blocks of IPv6 addresses may be allocated to your VPC's resources. IPv6 addresses are available to the general public. IPv6 addresses may be obtained in a number of ways. Amazon EC2 instances can be provisioned with IPv6 addresses, which are discussed in this section.

IPV4

Your VPC comes with both private and public IPv4 addresses, which you may use. The CIDR block of your VPC is used to assign private IP addresses. Upon launch, either an automatic or manual address assignment may be made. A public pool of routable IPv4 addresses is maintained by Amazon. IPv4 Elastic IP addresses are used to assign an instance's public IPv4 addresses either automatically at launch or dynamically.

When a new EC2 instance is created, an IPv4 private address is assigned to it automatically. It is possible to provide any unused private IP within the range of the destination network address. Amazon gives a private IP address from the subnet's address pool if no IP address is supplied at the start. Once the main interface is shut down, The interface retains its private IP address. Amazon EC2 instances may have additional network interfaces and IP addresses assigned to them. (described later in this chapter). Network interfaces with private IP addresses are kept until they are removed.

Public IPv4 addresses for Amazon EC2 instances may be obtained either automatically or dynamically. In a VPC subnet, network interfaces may be configured to get public IPv4 addresses automatically or not. This option allows you to control whether or not public IPv4 addresses are automatically assigned.

IP v6

IPv6 uses a wide range of addresses for its protocol. LLAs and GUAs are important to know for the exam. LLAs are reserved IPv6 CIDR addresses with a fe80::/10 prefix. DHCPv6 and Neighbor Discovery Protocol both need an on-link address called the LLA. IPv6's address-resolution protocol, if you will.

Your VPC's LLA gives you access to the VPC's implicit router. By default, Amazon VPC uses the EUI-64 format for LLAs, therefore the 48-bit MAC address is translated into a 64-bit interface ID. FF:FE is appended to the address to demonstrate that the seventh significant bit has been flipped in Figure 2.4. The LLA will have an effect on the connection or VPC subnet linked to the elastic network interface. A GUA provides LLA packet processing to the elastic network interface.

Security groups

This kind of stateful virtual firewall controls the flow of data between EC2 instances and Amazon Web Services services. Each Amazon EC2 instance has its own security group. This means that if no security group is specified when the instance launches, it will be launched using the VPC's default security group.

Security groups that have not been changed are allowed to communicate with one other and with all outbound traffic, but other traffic is implicitly blocked by default. A security group's regulations may be altered, but the default security group cannot be removed. Table 2 displays the default security group settings.

Network Acl

It serves as a stateless firewall at the network subnet level. The lowest-numbered rule in an AWS network ACL is checked first to see whether traffic is allowed into or out of any subnet linked to the AWS network ACL. There is no way to change the final deny-all rule in the ACL for each network. In a VPC, each subnet has a re-configurable default access control list (ACL). The default network ACL for IPv4 allows all traffic in and out. Incoming and outgoing traffic is blocked by default when configuring a custom network ACL, unless additional rules are added to enable it. You may utilise network ACLs, which do not filter traffic across subnet borders, to provide an additional layer of security to your VPC by setting up rules identical to those in your security groups. Each subnet must have an ACL connected to the network. Adding an IPv6 CIDR block to your VPC will enable all IPv6 traffic, including inbound and outbound.

Internet gateways are Amazon VPC components that let instances in your VPC communicate with the outside world. Scalable horizontally and very redundant. Your VPC route tables include an Internet gateway as a target for traffic that may be routed to and from the Internet.

An IPv4 Elastic IP address may be used to assign a public IPv4 address to an Amazon EC2 instance either automatically or dynamically. The Internet gateway maps the instance's private IPv4 address to the instance's public IPv4 address. Using an Internet gateway, a virtual private network (VPC) converts traffic from an instance's public IPv4 address to the instance's private IPv4.

Due to Amazon's GUA bans, Amazon EC2 instances inside a VPC have public IPv6 addresses. When communicating with the Internet, the source IPv6 address remains constant. When an Amazon EC2 target instance gets traffic from the internet, it sends it to the GUA.

Perform the following steps to set up an Internet-accessible public subnet:

Connect your virtual private network to the Internet by setting up an Internet gateway (VPC).

Set up a route in a subnet route table to send non-local traffic to the Internet gateway (0.0.0.0/0 or::/0).

Allowing traffic in and out of your network is as simple as configuring the ACLs and security group rules.

To connect an EC2 instance to the Internet, perform these steps:

Elastic IP addresses or public IPv4 addresses may be assigned.

Assign a GUA for IPv6.

Either a single IP address or a range of IP addresses may be specified as the default route. This might be done for example, outside of AWS, by configuring a route that only includes your company's public IP addresses.

As shown in Figure 2.5, there is a 10.0.0.16 CIDR IP version, as well as 10.0.0.24 subnets and an EC2 instance with Elastic IP addresses. The default route or a local route should transport non-VPC traffic to the Internet gateway (igw-id). When using public IPv4 addresses, such as 198.51.100.2, data may flow in both directions.

NAT INSTANCE

For example, NAT instances are Amazon Linux AMIs that accept traffic from private subnets, convert it to private subnet IPv4 addresses, and route it to the Internet gateway for one-to-one NAT. Forwarded traffic from the Internet is returned to the right instance in the private subnet using NAT's translation table.

For private subnet instances to be able to access Internet resources through the Internet gateway, the NAT instance must be built.

The needed Internet ports, protocols, and IP addresses should be specified in an outbound rule set for the NAT instance.

Set up an Amazon Linux NAT AMI instance on a public subnet with the NAT security group linked to it.

The NAT instance's Source/Destination Check attribute should be disabled..

Create an Elastic IP address and connect it to the instance of NAT if your NAT instance was not started with a publicly accessible IPv4 address.

Direct all Internet traffic to the NAT server using the private subnet's routing table (for example, i-1a2b3c4d).

Outgoing Internet communication may be sent from private subnets, but incoming traffic from the Internet cannot be received.

VPC

AWS services may be launched into a virtual network that has been created by you using the Amazon VPC. If you maintain your own data centre network, it's very much like this, but with the extra bonus of being able to take use of AWS's scalable architecture.

Your virtual private cloud (VPC) may be created and managed using any of the following APIs:

Manage and access your virtual private clouds using the AWS Management Console (VPCs).

On Windows, Mac OS X, and Linux, the AWS CLI can be used to access a wide range of AWS services, including Amazon VPC. You may find out more about the AWS Command Line Interface by going to the website dedicated to it.

AWS SDKs manage many connection aspects, like calculating signatures, retrying requests, and problem resolution, in addition to language APIs. There is more information on AWS SDKs.

Here, you'll discover low-level API operations that may be accessed through HTTPS requests. However, even though the Query API is the quickest and easiest way to get into an Amazon VPC, it requires your application to handle low-level aspects such as signing the request and resolving errors. The Amazon VPC activities section of the Amazon EC2 API Reference provides further information.

If you want, you may pay usage-based charges for optional VPC capabilities in addition to the standard fee of creating and using an VPC. Tools and services from AWS enable you to customise your Amazon Virtual Private Cloud's connectivity, monitoring, and security. For a detailed breakdown of prices, please see the table below.

However, the stated fees for these resources, including data transmission costs, apply to other Amazon Web Services solutions as well, such as Amazon Elastic Compute Cloud (Amazon EC2)... The price of the optional hardware virtual private network (VPN) connection is depending on the number of hours the VPN connection is operational in your virtual private cloud (VPC) (the amount of time you have a VPN connection in the "available" state). You will be charged for the whole hour, even if you just utilise a portion of it. Data transmitted over VPN connections will be billed at the normal AWS Data Transfer rates.

VPC Creation

Vpc creation (number nine). Open a web browser and sign into your AWS account.

10. Now go to AWS services and choose Virtual Private Cloud (VPC).

11. Once again, choose VPC to establish a Virtual private cloud.

12. Next, choose Create VPC from the drop-down menu.

13. Enter the name of your virtual private network (VPC).

14. Assign your IP range at this point.

15. Now, choose Create VPC from the drop-down menu.

16. Congratulations, your VPC has been successfully built.

Step 1: Log in to the AWS administration interface and go to the VPC section, where you will pick Subnets and then Create Subnet.

Step 2: Provide a name for the subnetwork.

Step 3: Select the Virtual Private Cloud (VPC) that you built previously.

Availability Zone should be the same as the previous Availability Zone. Step 4:

To complete the IPv4 CIDR block, insert a valid IP address such as 10.0.0.0/16 in the box provided.

Step 6: Click on the Create button.

Creation of an internet gateway for public subnets is the seventh and last step.

In order to do this:

1. Navigate to VPC and then click on the internet gateway link in the left-hand navigation bar.

2. Next, choose Create Internet gateway from the drop-down menu.

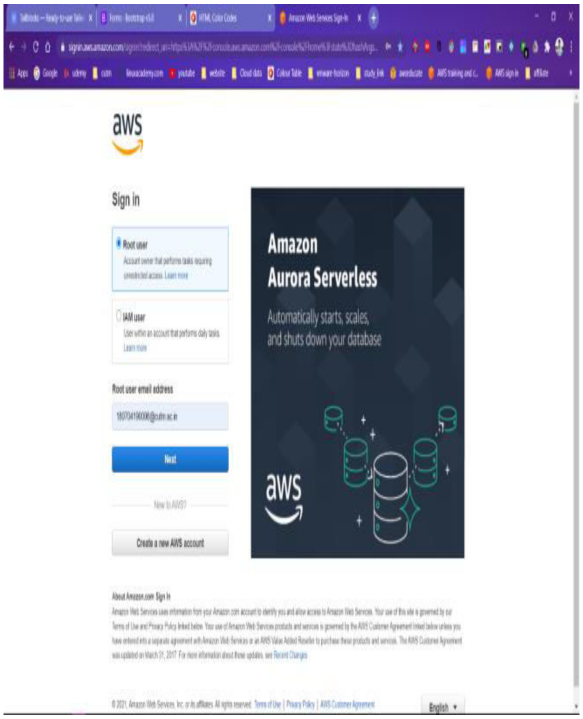
3. Provide a name for the internet gateway that will be used.

4. Finally, key and value are optional, but you may provide them if you like.

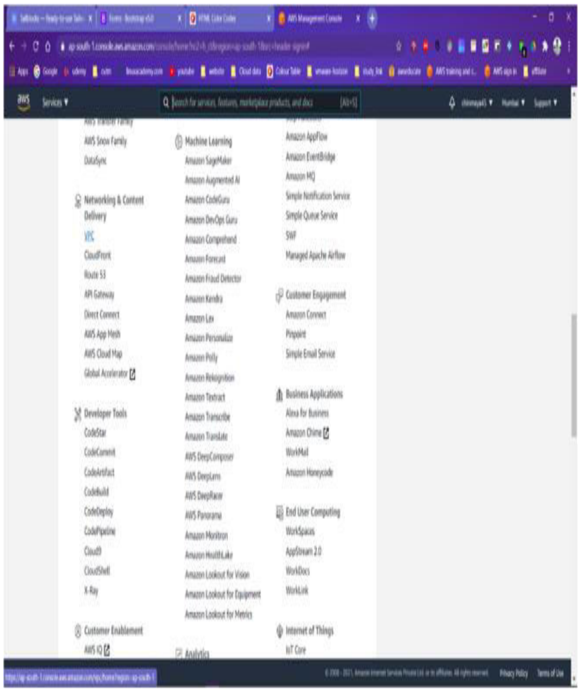
5. Then click on the Create button.

VPC

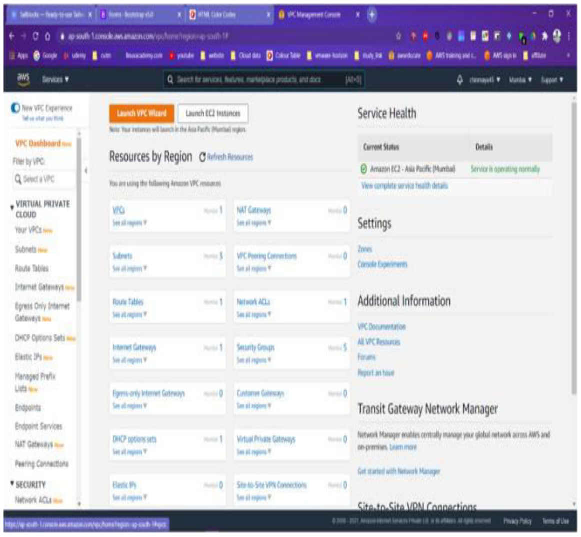
Open a web browser and sign into your AWS account.



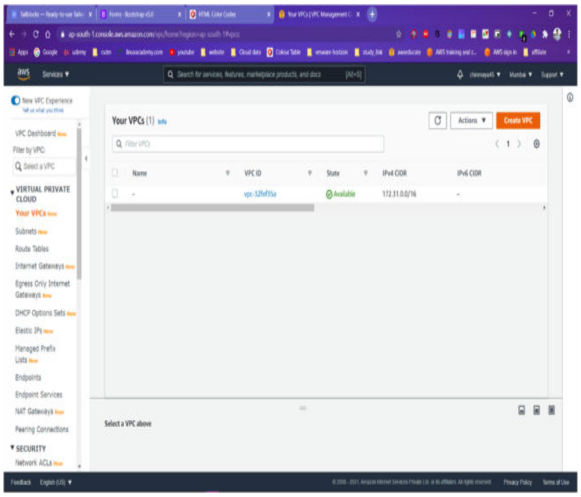
2. Now go to AWS services and choose Virtual Private Cloud (VPC).



3.Again, click on VPC to begin the process of creating a Virtual private cloud.



4. Now, choose Create VPC from the drop-down menu.

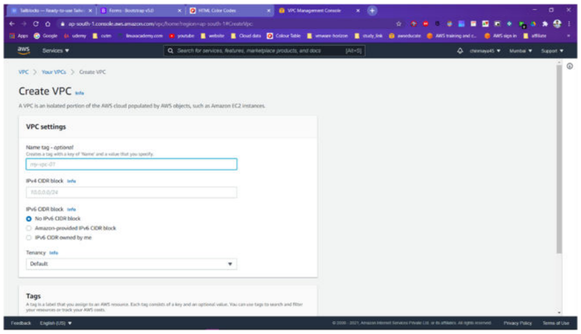


Your VPCs (1) Info

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR
-	vpc-52fef35a	Available	172.31.0.0/16	-

Select a VPC above

5. Enter the name of your virtual private cloud (VPC).



VPC > Your VPCs > Create VPC

Create VPC Info

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

VPC settings

Name tag - optional
Creates a tag with a key of 'Name' and a value that you specify.
my-vpc-01

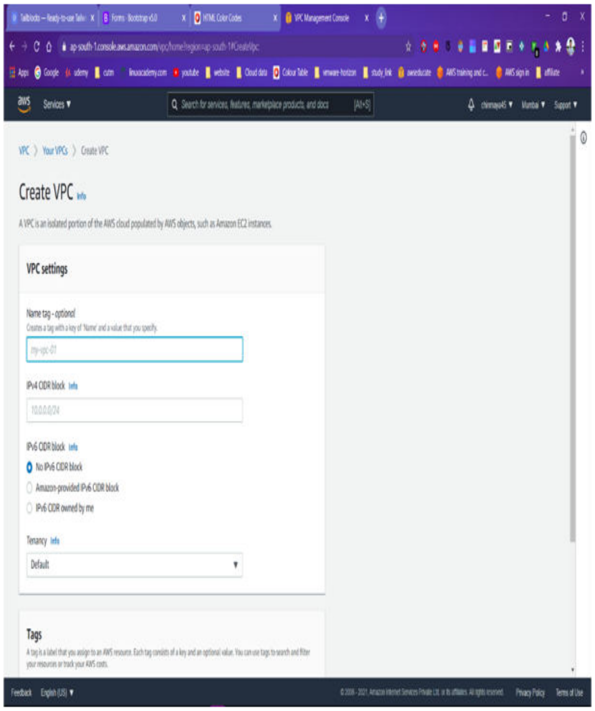
IPv4 CIDR block Info
10.0.0.0/24

IPv6 CIDR block Info
● No 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.

6. At this point, you may allocate your IP image



VPC > Your VPCs > Create VPC

Create VPC Info

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

VPC settings

Name tag - optional
Creates a tag with a key of 'Name' and a value that you specify.
my-vpc-01

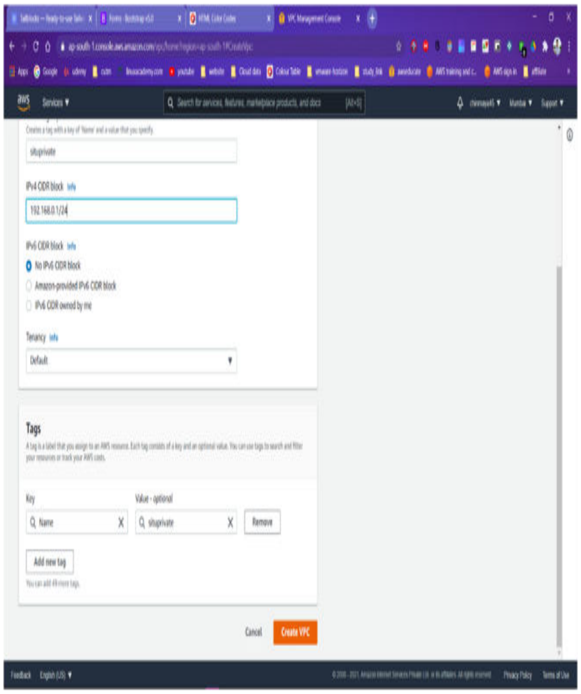
IPv4 CIDR block Info
10.0.0.0/24

IPv6 CIDR block Info
● No 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.

7. Now, choose Create VPC from the drop-down menu.



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

IPv4 CIDR block Info
192.168.0.1/24

IPv6 CIDR block Info
● No IPv6 CIDR block
○ Amazon-provided IPv6 CIDR block
○ IPv6 CIDR owned by me

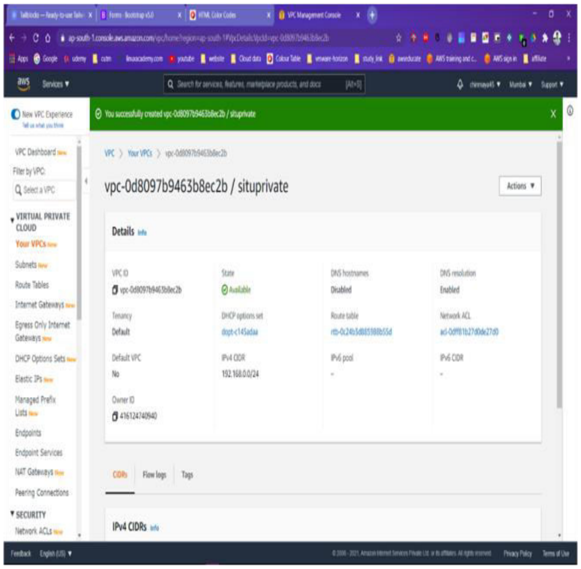
Tenancy Info
Default

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: Name
Value - optional: situprivate

Add new tag
You can add 49 more tags.

8. Congratulations, your VPC has been successfully built.



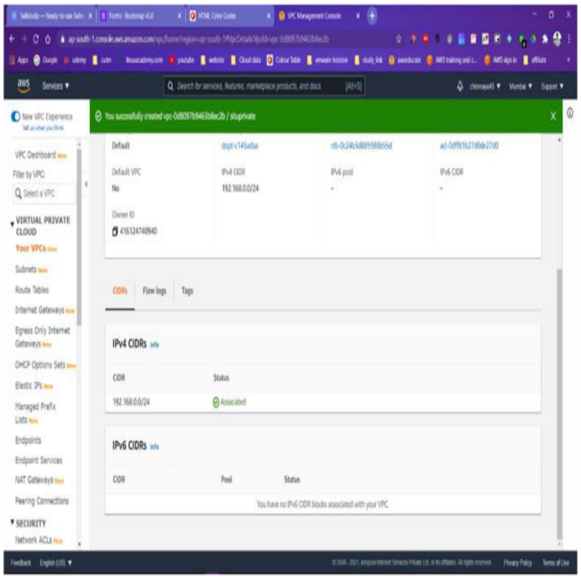
You successfully created vpc-0d8097b9463b8ec2b / situprivate

VPC > Your VPCs > vpc-0d8097b9463b8ec2b

vpc-0d8097b9463b8ec2b / situprivate

Details

VPC ID vpc-0d8097b9463b8ec2b	State Available	DNS hostnames Disabled	DNS resolution Enabled
Tenancy Default	DHCP options set dopt-c145adaa	Route table rtb-0c24b5d885988b55d	Network ACL acl-0dff81b27d0de27d0
Default VPC No	IPv4 CIDR 192.168.0.0/24	IPv6 pool -	IPv6 CIDR -
Owner ID 416124740940			



You successfully created vpc-0d8097b9463b8ec2b / situprivate

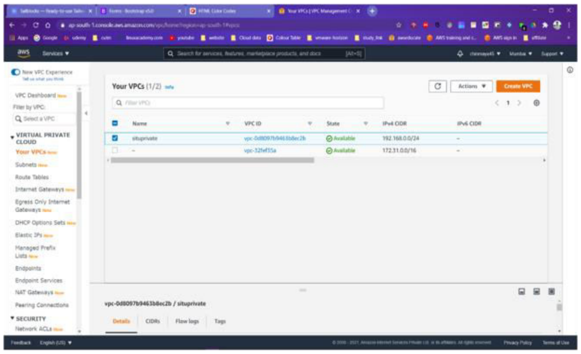
IPv4 CIDRs

CIDR	Status
192.168.0.0/24	Associated

IPv6 CIDRs

CIDR	Pool	Status

You have no IPv6 CIDR blocks associated with your VPC.



Your VPCs (1/2)

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR
situprivate	vpc-0d8097b9463b8ec2b	Available	192.168.0.0/24	-
-	vpc-32fef55a	Available	172.31.0.0/16	-

vpc-0d8097b9463b8ec2b / situprivate

Create public and private subnet using route table.

Step 1: Log in to the AWS administration interface and go to the VPC section, where you will pick Subnets and then Create Subnet.

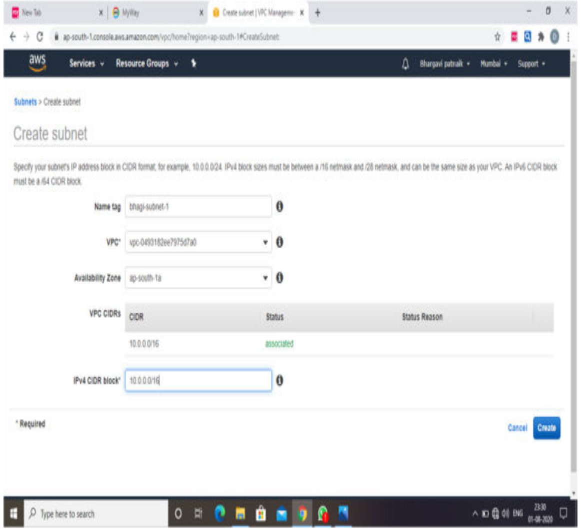
Step 2: Provide a name for the subnetwork.

Step 3: Select the Virtual Private Cloud (VPC) that you built previously.

step 4:Availability Zone should be the same as the previous Availability Zone. Step 4:

step 5:To complete the IPv4 CIDR block, insert a valid IP address such as 10.0.0.0/16 in the box provided.

Step 6: Click on the Create button.



Subnets > Create subnet

Create subnet

Specify your subnet's IP address block in CIDR format, for example, 10.0.0.0/24. IPv4 block sizes must be between a /16 netmask and /28 netmask, and can be the same size as your VPC. An IPv6 CIDR block must be a /64 CIDR block.

Name tag: bhagi-subnet-1

VPC*: vpc-0493182ee7975d7a0

Availability Zone: ap-south-1a

VPC CIDRs

CIDR	Status	Status Reason
10.0.0.0/16	associated	

IPv4 CIDR block*: 10.0.0.0/16

* Required

step 7:Creation of an internet gateway for public subnets is the seventh and last step.

In order to do this:

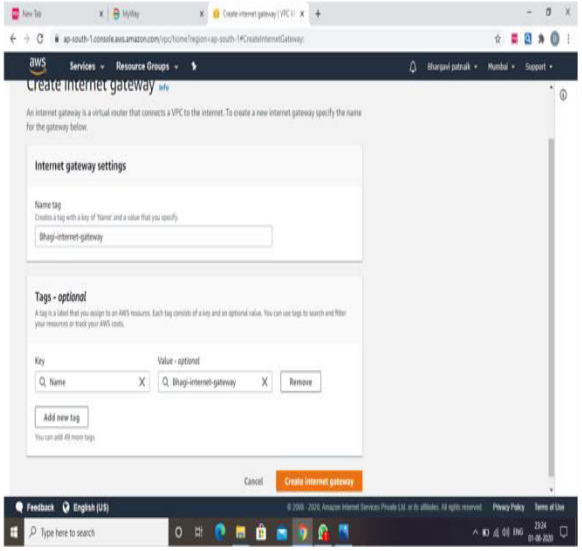
1. Navigate to VPC and then click on the internet gateway link in the left-hand navigation bar.

2. Next, choose Create Internet gateway from the drop-down menu.

3. Provide a name for the internet gateway that will be used.

4. Finally, key and value are optional, but you may provide them if you like.

5. Then click on the Create button.



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

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 a key of 'Name' and a value that you specify.
Bhagi-internet-gateway

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
Name	Bhagi-internet-gateway

You can add 49 more tags.

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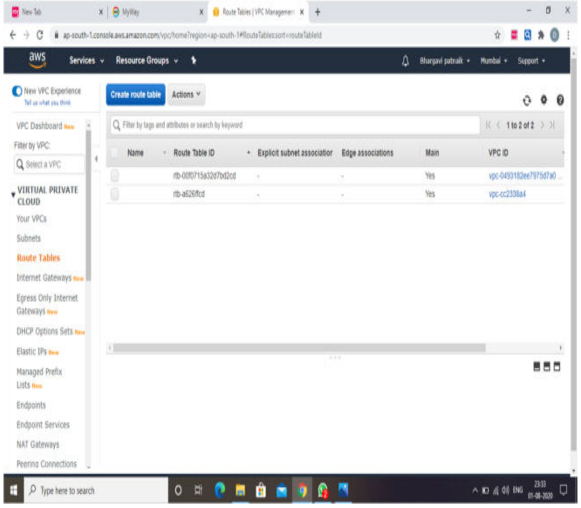
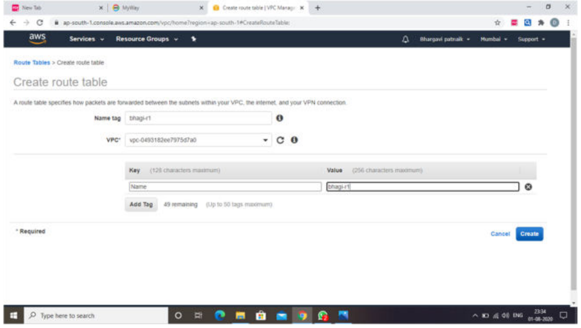
Step 8: create a route table, go to VPC notification bar select route table and click on create route table give the details and create it.



ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#RouteTables:sort=routeTableId

Filter by tags and attributes or search by keyword — 1 to 2 of 2

Name	Route Table ID	Explicit subnet association	Edge associations	Main	VPC ID
	rtb-00f0715a32d7bd2cd	-	-	Yes	vpc-0493182ee7975d7a0 ...
	rtb-a626ffcd	-	-	Yes	vpc-cc2338a4



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

Route Tables > Create route table

Create route table

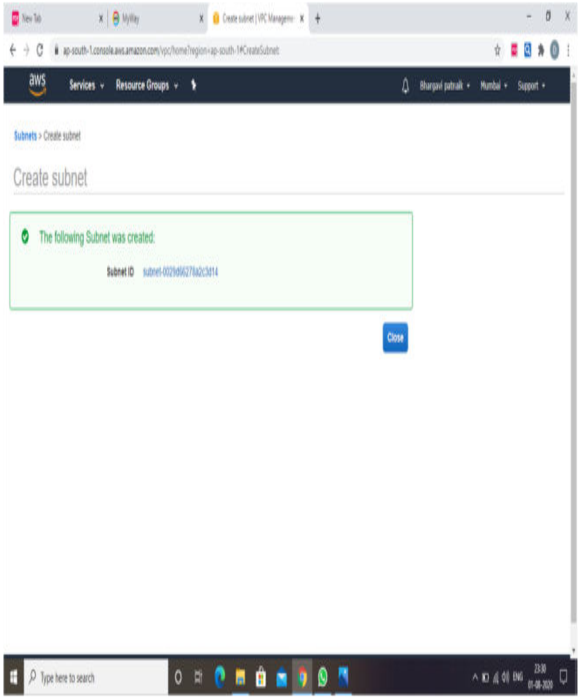
A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

Name tag: bhagi-r1
VPC*: vpc-0493182ee7975d7a0

Key (128 characters maximum)	Value (256 characters maximum)
Name	bhagi-r1

49 remaining (Up to 50 tags maximum)

* Required



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

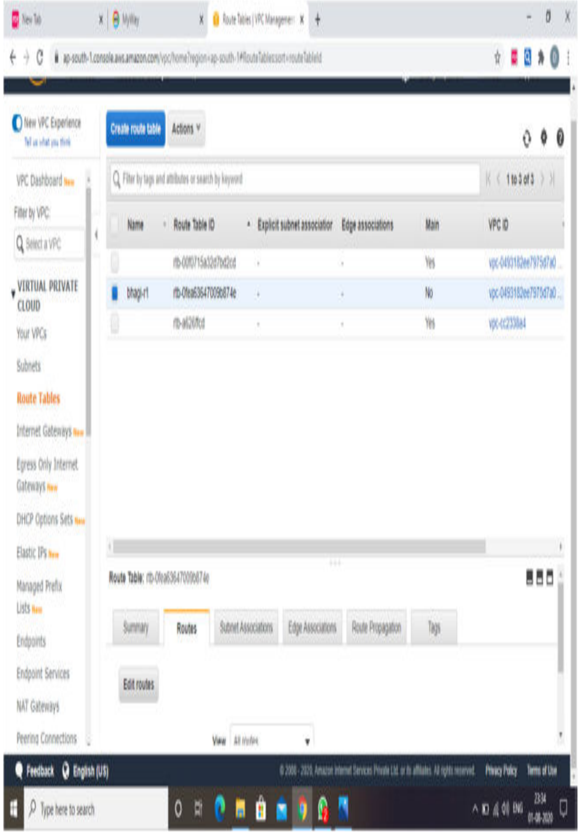
Subnets > Create subnet

Create subnet

The following Subnet was created:

Subnet ID subnet-0029d66278a2c3d14

Step 9: Select Edit Routes from the drop-down menu and connect it to the internet gateway.



ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#RouteTables:sort=routeTableId

Filter by tags and attributes or search by keyword — 1 to 3 of 3

Name	Route Table ID	Explicit subnet association	Edge associations	Main	VPC ID
	rtb-00f0715a32d7bd2cd	-	-	Yes	vpc-0493182ee7975d7a0 ...
bhagi-r1	rtb-0fea63647009b874e	-	-	No	vpc-0493182ee7975d7a0 ...
	rtb-a626ffcd	-	-	Yes	vpc-cc2338a4

Route Table: rtb-0fea63647009b874e

View: All routes

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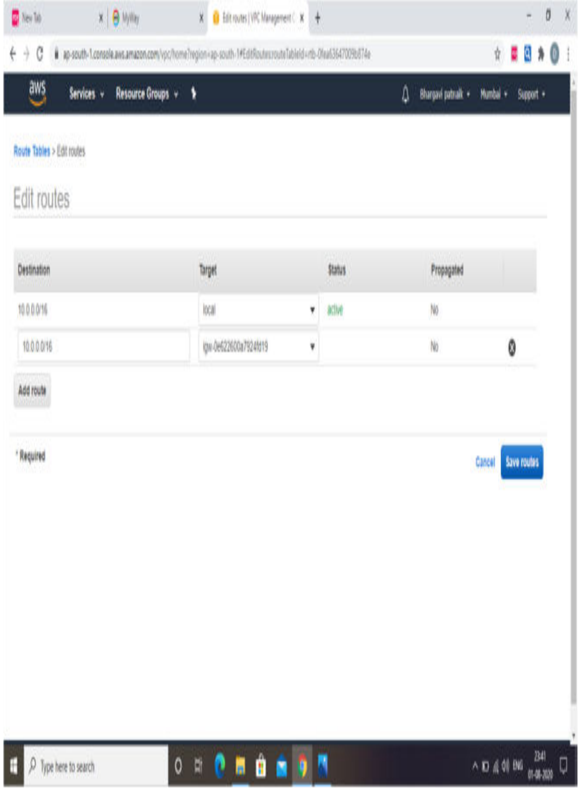
Step 10: Select "Save Routes" from the drop-down menu



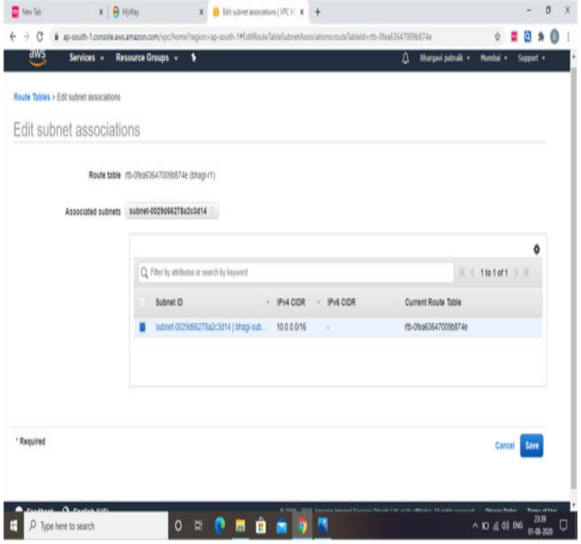
Route Tables > Edit routes

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	active	No
10.0.0.0/16	igw-0e622600a7924fd19		No

* Required

Step 11: Associate the route table with the subnet by selecting route table, then clicking on subnet associations, then clicking on modify associations, after which selecting the subnet and saving the configuration.



Route Tables > Edit subnet associations

Edit subnet associations

Route table rtb-0fea63647009b874e (bhagi-r1)

Associated subnets subnet-0029d66278a2c3d14

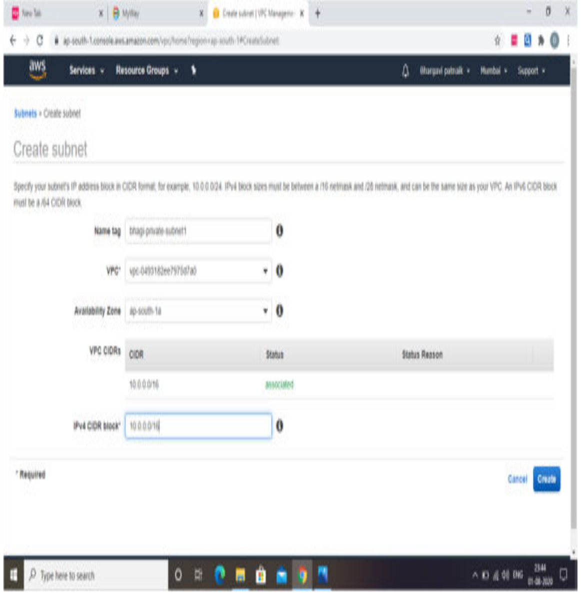
Subnet ID	IPv4 CIDR	IPv6 CIDR	Current Route Table
subnet-0029d66278a2c3d14 | bhagi-sub...	10.0.0.0/16	-	rtb-0fea63647009b874e

* Required

We can now construct our public subnet in the same way.

For private subnet

Step 1: Create a private subnet in the same manner as described earlier.



Subnets > Create subnet

Create subnet

Specify your subnet's IP address block in CIDR format, for example, 10.0.0.0/24. IPv4 block sizes must be between a /16 netmask and /28 netmask, and can be the same size as your VPC. An IPv6 CIDR block must be a /64 CIDR block.

Name tag: bhagi-private-subnet1

VPC*: vpc-0493182ee7975d7a0

Availability Zone: ap-south-1a

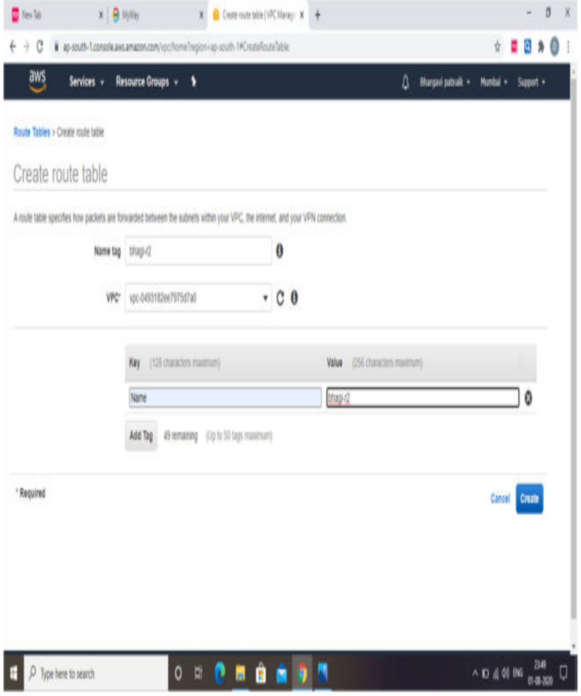
VPC CIDRs

CIDR	Status	Status Reason
10.0.0.0/16	associated	

IPv4 CIDR block*: 10.0.0.0/16

* Required

Step 2: Create a second route table in the same manner.



Route Tables > Create route table

Create route table

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

Name tag: bhagi-r2

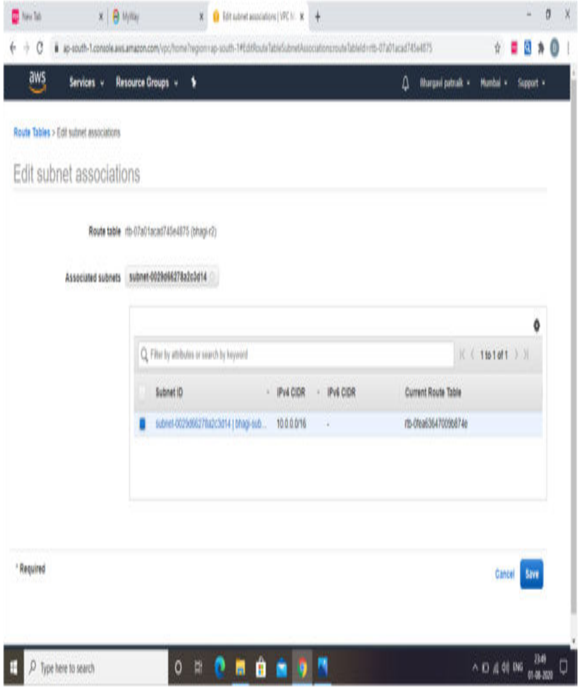
VPC*: vpc-0493182ee7975d7a0

Key (128 characters maximum)	Value (256 characters maximum)
Name	bhagi-r2

49 remaining (Up to 50 tags maximum)

* Required

Step 3: Assign the route table to the appropriate subnet.



Route Tables > Edit subnet associations

Edit subnet associations

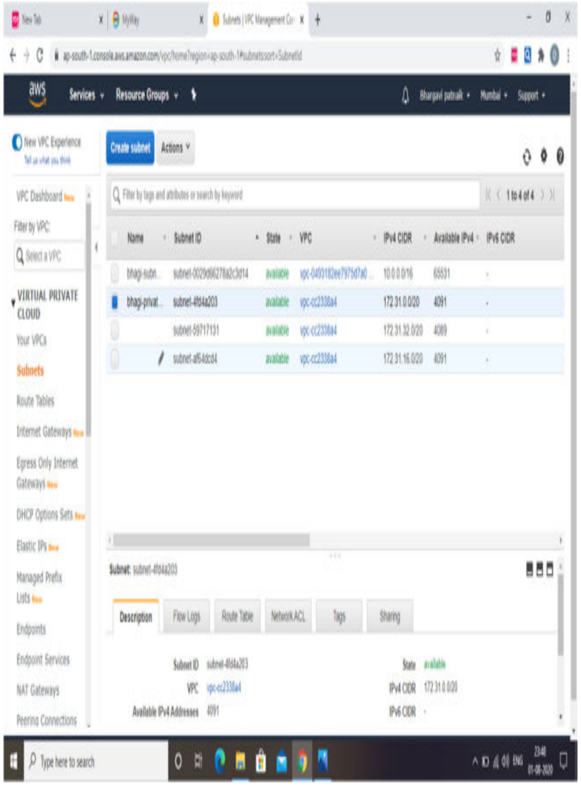
Route table rtb-07a01acad745e4075 (bhagi-r2)

Associated subnets subnet-0029d66278a2c3d14

Subnet ID	IPv4 CIDR	IPv6 CIDR	Current Route Table
subnet-0029d66278a2c3d14 | bhagi-sub...	10.0.0.0/16	-	rtb-0fea63647009b874e

* Required

Finally



Name	Subnet ID	State	VPC	IPv4 CIDR	Available IPv4	IPv6 CIDR
bhagi-subn...	subnet-0029d66278a2c3d14	available	vpc-0493182ee7975d7a0 ...	10.0.0.0/16	65531	-
bhagi-privat...	subnet-4fd4a203	available	vpc-cc2338a4	172.31.0.0/20	4091	-
	subnet-59717131	available	vpc-cc2338a4	172.31.32.0/20	4089	-
	subnet-af64dcd4	available	vpc-cc2338a4	172.31.16.0/20	4091	-

Subnet: subnet-4fd4a203

Subnet ID subnet-4fd4a203
VPC vpc-cc2338a4
Available IPv4 Addresses 4091
State available
IPv4 CIDR 172.31.0.0/20
IPv6 CIDR -

Configure security group and NACL

Step 1: Log in to the AWS administration interface and then pick VPC from the services menu.

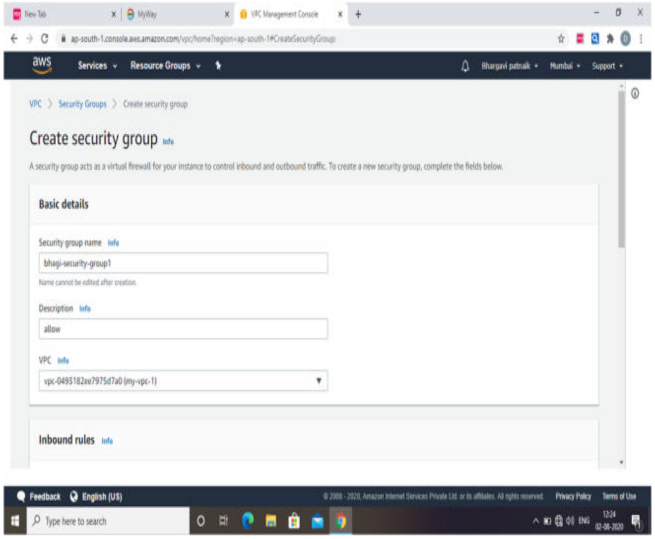
Step 2: Open VPC and then choose Security Groups from the menu bar.

Creating a Security Group is the third step.

Step 4: Give the security group a name and then offer a brief explanation of what it does.

Step 5: Using the VPC Choose the ID of your virtual private cloud (VPC).

Step 6: You may either add or delete a tag.If you want you can give key and value, and add a tag or remove a tag.



VPC > Security Groups > Create security group

Create security group Info

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security group, complete the fields below.

Basic details

Security group name: bhagi-security-group1
Name cannot be edited after creation.

Description: allow

VPC: vpc-0493182ee7975d7a0 (my-vpc-1)

Inbound rules

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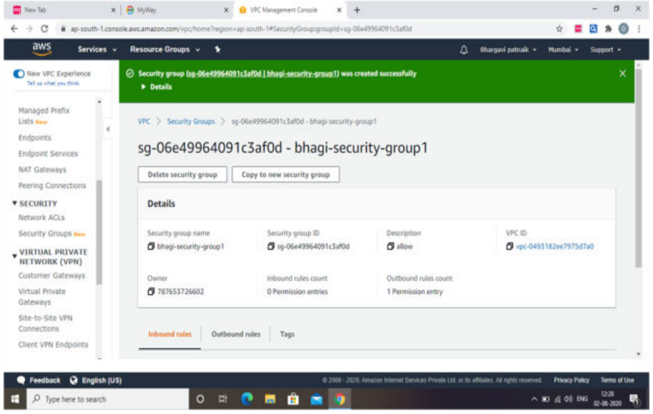


Security group (sg-06e49964091c3af0d | bhagi-security-group1) was created successfully

VPC > Security Groups > sg-06e49964091c3af0d - bhagi-security-group1

sg-06e49964091c3af0d - bhagi-security-group1

Details

Security group name	Security group ID	Description	VPC ID
bhagi-security-group1	sg-06e49964091c3af0d	allow	vpc-0493182ee7975d7a0
Owner	Inbound rules count	Outbound rules count	
787653726602	0 Permission entries	1 Permission entry	

Step 1: Log into the Amazon Management Console and pick Virtual Private Cloud (VPC).

step 2: Using the navigation pane, choose Network ACLs as the second step.

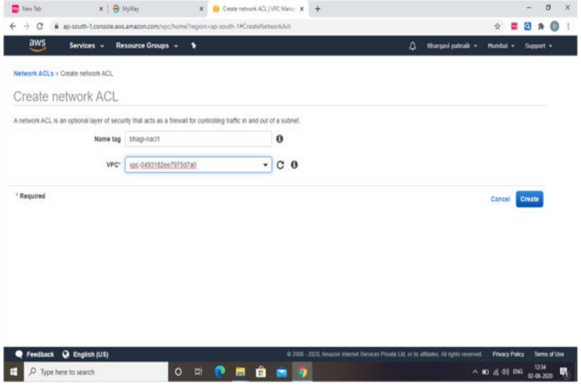
Step 3: Select Create Network ACL from the drop-down menu.

step 4: The Create Network ACL dialogue box allows you to give your network ACL a name if you choose, and pick the ID of your VPC from the VPC list in Step 4.

Step 5: Select Yes, Create from the drop-down menu.

Step 6: Select Subnet Associations to link the subnets to the network Access Control List (ACL).

Step 7: Make changes to the Inbound Rules.


New Tab
MyWay
Create network ACL | VPC Mana
ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#CreateNetworkAcl:
aws
Services
Resource Groups
Bhargavi patnaik
Mumbai
Support
Network ACLs > Create network ACL
Cancel
Create
Feedback
English (US)
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Privacy Policy
Terms of Use
Type here to search
12:34
02-08-2020

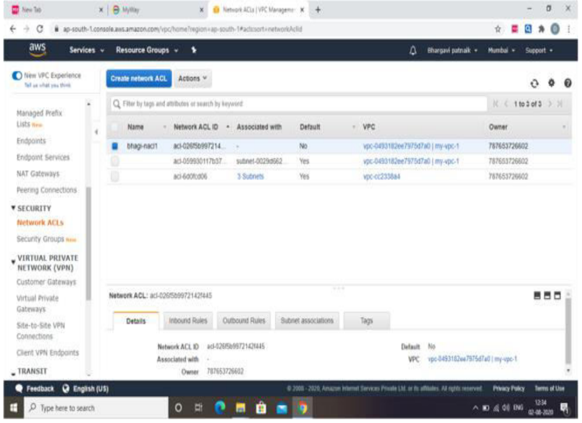
Create network ACL

A network ACL is an optional layer of security that acts as a firewall for controlling traffic in and out of a subnet.

Name tag: bhagi-nacl1

VPC*: vpc-0493182ee7975d7a0

* Required



Name	Network ACL ID	Associated with	Default	VPC	Owner
bhagi-nacl1	acl-026f5b997214...	-	No	vpc-0493182ee7975d7a0 | my-vpc-1	787653726602
	acl-059930117b37...	subnet-0029d662...	Yes	vpc-0493182ee7975d7a0 | my-vpc-1	787653726602
	acl-6d0fcd06	3 Subnets	Yes	vpc-cc2338a4	787653726602

Network ACL: acl-026f5b99721421445

Network ACL ID: acl-026f5b99721421445

Associated with: -

Owner: 787653726602

Default: No

VPC: vpc-0493182ee7975d7a0 | my-vpc-1

Algorithm

Vpc creation

9. Go to a browser and login to AWS account.

10. Now go to AWS services and click on VPC.

11. Again Click on VPC to create a Virtual private cloud.

12. Now click on create VPC.

13. Write your VPC name.

14. Now assign your ip range.

15. Now click on create VPC.

16. Now your VPC created successfully.

Create public and private subnet using route table.

Step 1: Log in to the AWS administration interface and go to the VPC section. Select Subnets and then Create Subnet from the drop-down menu.

Step 2: Provide a name for the subnetwork.

Step 3: Select the Virtual Private Cloud (VPC) that you built previously.

step 4:Availability Zone should be the same as the previous Availability Zone.

step 5:To complete the IPv4 CIDR block, insert a valid IP address such as 10.0.0.0/16 in the box provided.

Step 6: Click on the Create button.

step 7:Creation of an internet gateway for public subnets is the seventh and last step.

For this:

1. Go to VPC then left side navigation bar click on internet gateway.

2. Then click on Create Internet gateway.

3. Give the name for the internet gateway.

4. And key, values are optional if you want you can give.

5. then click on create.

For private subnet

Step 1: Create a private subnet in the manner described above.

Step 2: Create a second route table in the same manner.

In Step 3, you'll link the route table to the subnet.

Step 8: Build a route table by going to the VPC notification bar, selecting route table, and clicking on create route table. Fill in the necessary information and click create route table.

Step 9: Select Edit Routes from the drop-down menu and connect it to the internet gateway.

Step 10: Select "Save Routes" from the drop-down menu.

Step 11: Associate the route table with the subnet by selecting route table, then clicking on subnet associations, then clicking on modify associations, after which selecting the subnet and saving the configuration.

Like this we can create our public subnet.

For private subnet

Step 1: We can now construct our public subnet in the same manner.

Step 2: Create a second route table in the same manner.

In Step 3, you'll link the route table to the subnet.

Configure security group and NACL

Step 1: Log in to the AWS administration interface and then pick VPC from the services menu.

Step 2: Open VPC and then choose Security Groups from the menu bar.

Creating a Security Group is the third step.

Step 4: Give the security group a name and then offer a brief explanation of what it does.

Step 5: Using the VPC Choose the ID of your virtual private cloud (VPC).

Step 6: You may either add or delete a tag.If you want you can give key and value, and add a tag or remove a tag.

Step 1: Log into the Amazon Management Console and pick Virtual Private Cloud (VPC).

Using the navigation pane, choose Network ACLs as the second step.

Step 3: Select Create Network ACL from the drop-down menu.

The Create Network ACL dialogue box allows you to give your network ACL a name if you choose, and pick the ID of your VPC from the VPC list in Step 4.

Step 5: Select Yes, Create from the drop-down menu.

Step 6: Select Subnet Associations to link the subnets to the network Access Control List (ACL).

Step 7: Make changes to the Inbound Rules.

Conclusion

When connecting your distant networks with Amazon VPC, AWS offers a range of efficient and secure connection solutions to help you get the most out of AWS. To help clients combine their distant networks or multiple Amazon VPC networks, this whitepaper provides a list of connecting choices and patterns. With the knowledge offered here, you'll be able to decide the best way to link your company's infrastructure, no matter where it is physically situated or hosted.

Future scope

Amazon VPC (Amazon Virtual Private Cloud) allows you to deploy AWS services inside a specific virtual network by using the Amazon Virtual Private Cloud. This virtual network, which makes use of AWS' scalable architecture, simulates a typical network that you might deploy in your own data centre.

REFERENCES

[1] Carbon Disclosure Project Study 2011,Cloud Computing –The IT Solution for the 21st Century.

[2] Virtual private cloud-as-a service: Extend Enterprise Security policies to public cloud, CISCO white paper.

[3] http://fortycloud.com/public-cloud-security-revisited-the-need-for-vpc

[4] Virtual Private Cloud: Service Provider Opportunities, 2012 Schireson Associates,CISCO white paper.

[5] http://searchcloudcomputing.techtarget.com

[6] http://blog.appcore.com/blog/bid/174815/Virtual-Private-Cloud-The-Benefits-it-Holds-for-Your-Business.

[7] ttp://en.wikipedia.org/wiki/Virtual_private_cloud.

[8] EliomarCampos, Rubens Matos, Paulo ;Maciel, Igor Costa, "Performance Evaluation of Virtual Machines Instantiation in a Private Cloud", IEEE World Congress on Services, pp:319 – 326, 2015.

[9] Takahiro Miyamoto, Michiaki Hayashi, Kosuke Nishimura, "Sustainable Network Resource Management System for Virtual Private Clouds", 2nd IEEE International Conference on Cloud Computing Technology and Science, pp: 512-520, 2010.

[10] Hiroaki Hata, Yuka Kamizuru, Akira Honda, "Dynamic IP-VPN architecture for Cloud Computing", IEEE Information and Telecommunication Technologies (APSITT), 8th Asia-Pacific Symposium on, pp:1-5, 2010.

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