

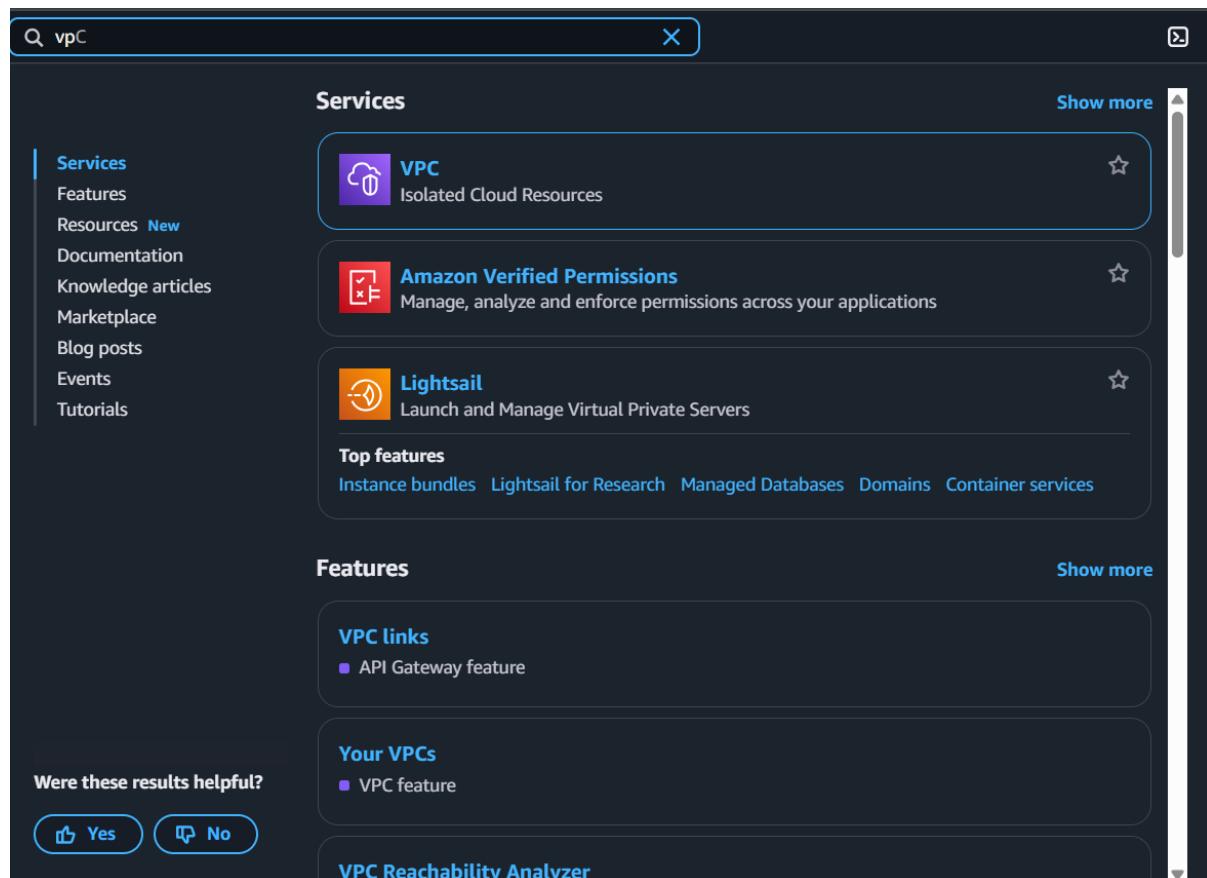
Project Title:
VPC with Public and Private Subnets in AWS

Submitted By:
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Date:
18 July 2025

Description:

This project demonstrates the creation of a secure Virtual Private Cloud (VPC) in AWS with both public and private subnets. It includes the configuration of an Internet Gateway, NAT Gateway, Route Tables, and proper subnet associations to enable secure and structured networking in the cloud environment.



The screenshot shows the AWS search results for the term 'vpc'. The search bar at the top contains 'vpc'. The results are categorized into 'Services' and 'Features'.

Services

- VPC** Isolated Cloud Resources
- Amazon Verified Permissions** Manage, analyze and enforce permissions across your applications
- Lightsail** Launch and Manage Virtual Private Servers

Top features

- Instance bundles
- Lightsail for Research
- Managed Databases
- Domains
- Container services

Features

- VPC links**
 - API Gateway feature
- Your VPCs**
 - VPC feature

Were these results helpful?

Yes **No**

[VPC Reachability Analyzer](#)

The screenshot shows the AWS VPC dashboard. At the top, there are buttons for 'Create VPC' and 'Launch EC2 Instances'. A note says 'Your Instances will launch in the Asia Pacific region.' Below this is a section titled 'Resources by Region' with a 'Refresh Resources' button. The resources listed are: VPCs (Mumbai 1, See all regions), NAT Gateways (Mumbai 0, See all regions), Subnets (Mumbai 3, See all regions), VPC Peering Connections (Mumbai 0, See all regions), Route Tables (Mumbai 1, See all regions), Network ACLs (Mumbai 1, See all regions), Internet Gateways (Mumbai 1, See all regions), Security Groups (Mumbai 3, See all regions), Egress-only Internet Gateways (Mumbai 0, See all regions), and Customer Gateways (Mumbai 0, See all regions). To the right, there are sections for 'Service Health' (View complete service health details), 'Settings' (Block Public Access, Zones, Console Experiments), 'Additional Information' (VPC Documentation, All VPC Resources, Forums, Report an Issue), and 'AWS Network Manager' (AWS Network Manager provides tools and features to help you manage and...). On the left, a sidebar shows 'Virtual private cloud' (Your VPCs, Subnets, Route tables, Internet gateways, Egress-only internet gateways, DHCP option sets, Elastic IPs, Managed prefix lists, NAT gateways, Peering connections), 'Security' (Network ACLs, Security groups), and 'PrivateLink and Lattice' (Getting started, Updated).

Opened the VPC dashboard from AWS Management Console to begin custom network configuration

Create VPC Info

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.

secure-vpc

IPv4 CIDR block Info

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

IPv4 CIDR

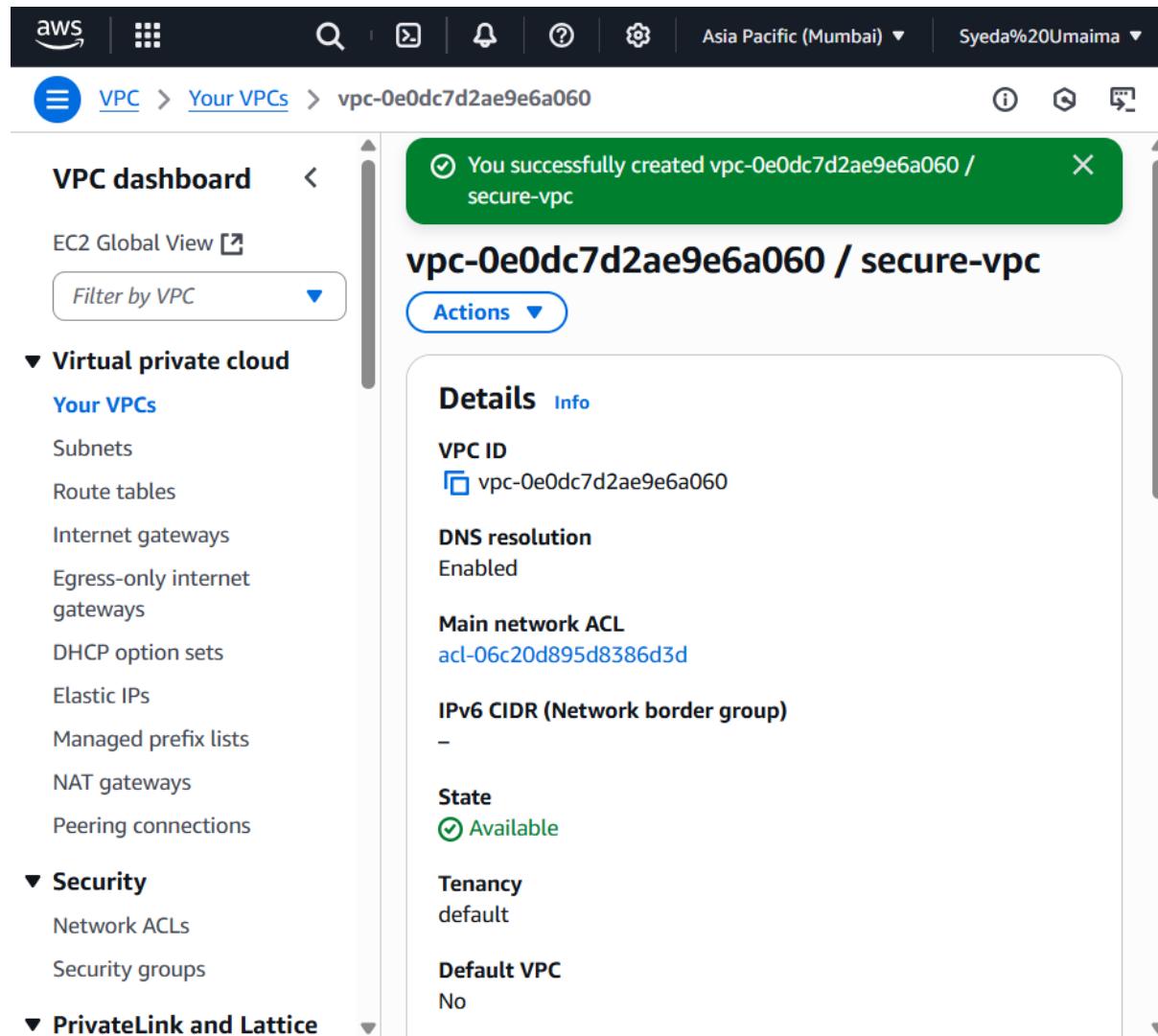
10.0.0.0/16

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

Created a custom VPC named secure-vpc with IPv4 CIDR 10.0.0.0/16 for secure networking structure.



The screenshot shows the AWS VPC dashboard. In the top navigation bar, the region is set to 'Asia Pacific (Mumbai)' and the user is 'Syeda%20Umaima'. The left sidebar has a 'Virtual private cloud' section with 'Your VPCs' selected, showing options like Subnets, Route tables, Internet gateways, Egress-only internet gateways, DHCP option sets, Elastic IPs, Managed prefix lists, NAT gateways, and Peering connections. Below this is a 'Security' section with Network ACLs and Security groups, and a 'PrivateLink and Lattice' section. The main content area shows a success message: 'You successfully created **vpc-0e0dc7d2ae9e6a060** / secure-vpc'. The VPC details are listed: VPC ID (vpc-0e0dc7d2ae9e6a060), DNS resolution (Enabled), Main network ACL (acl-06c20d895d8386d3d), IPv6 CIDR (Network border group) (empty), State (Available), Tenancy (default), and Default VPC (No). The 'Actions' button is visible at the top of the details section.

The VPC secure-vpc was created successfully and is now ready for subnet configuration.

Create subnet Info

VPC

VPC ID

Create subnets in this VPC.

Select a VPC



Subnet settings

Specify the CIDR blocks and Availability Zone for the subnet.

Select a VPC first to create new subnets.

[Add new subnet](#)

Navigated to the Subnet section to begin creating a public subnet in the custom VPC.\

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.

public-subnet

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

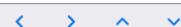
Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.

10.0.0.0/16

IPv4 subnet CIDR block

10.0.1.0/24

256 IP



► Tags - optional

[Remove](#)

[Add new subnet](#)

Created a public subnet named public-subnet in secure-vpc with CIDR 10.0.1.0/24.

Subnets (1) Info								
Last updated less than a minute ago Actions Create subnet								
<input type="checkbox"/>	Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR		
<input type="checkbox"/>	public-subnet	subnet-0f885c248dbb3000d	Available	vpc-0e0dc7d2ae9e6a060 secu...	<input type="radio"/> Off	10.0.1.0/24		

Successfully created the public subnet within the secure custom VPC.

[VPC](#) > [Subnets](#) > [Create subnet](#)

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.

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.

IPv4 VPC CIDR block [Info](#)

Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.

IPv4 subnet CIDR block

256 IPs

Tags - optional

Key

Value - optional

[Remove](#)

[Add new tag](#)

Created a private subnet named private-subnet in ap-south-1b with CIDR 10.0.2.0/24.

Subnets (1) Info								
Last updated less than a minute ago Actions Create subnet								
<input type="checkbox"/>	Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR		
<input type="checkbox"/>	private-subnet	subnet-0b6eda7f837f44284	Available	vpc-0e0dc7d2ae9e6a060 secu...	<input type="radio"/> Off	10.0.2.0/24		

Select a subnet

Successfully created the private subnet under the custom VPC.

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.

secure-igw

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

Name

Value - optional

secure-igw

X

Remove

Add new tag

You can add 49 more tags.

Cancel

> igw-06903115499e9a4db

ⓘ The following internet gateway was created: igw-06903115499e9a4db - secure-igw. You can now attach to a VPC to enable the VPC to communicate with the internet.

igw-06903115499e9a4db / secure-igw

Created an internet gateway named secure-igw to enable internet access for public resources.

Attach to VPC (igw-06903115499e9a4db) 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-0e0dc7d2ae9e6a060

X

Use: "vpc-0e0dc7d2ae9e6a060"

vpc-0e0dc7d2ae9e6a060 - secure-vpc

igw-06903115499e9a4db

ⓘ Internet gateway igw-06903115499e9a4db successfully attached to vpc-0e0dc7d2ae9e6a060

igw-06903115499e9a4db / secure-igw

Actions ▾

Attached secure-igw to the custom VPC secure-vpc to allow outbound internet connectivity.

Create & Configure Route Tables

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.

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 cost.

Key

Value - *optional*

[Add new tag](#)

You can add 49 more tags.

✓ Route table rtb-0a10cf4694196456d | public-rt was created successfully.

rtb-0a10cf4694196456d / public-rt

Details Info

Route table ID

Main

Explicit subnet associations

Edge associations

VPC

Owner ID

[Routes](#)[Subnet associations](#)[Edge associations](#)[Route propagation](#)[Tags](#)

Routes (1)

[Both](#)

Created a route table public-rt for routing public traffic in secure-vpc.

Updated routes for rtb-0a10cf4694196456d / public-rt successfully

► Details

rtb-0a10cf4694196456d / public-rt

Added a route in public-rt to send all outbound traffic to the internet via secure-igw.

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (1/2)					
	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input checked="" type="checkbox"/>	public-subnet	subnet-0f885c248dbb3000d	10.0.1.0/24	-	Main (rtb-013a0e6d5251)
<input type="checkbox"/>	private-subnet	subnet-0b6eda7f837f44284	10.0.2.0/24	-	Main (rtb-013a0e6d5251)

Selected subnets

subnet-0f885c248dbb3000d / public-subnet X

Cancel S

✓ You have successfully updated subnet associations for rtb-0a10cf4694196456d / public-rt.

Route tables (1/3) Info

Find route tables by attribute or tag

Last updated less than a minute ago C Actions A Create S

Associated public-subnet with public-rt to enable internet access.

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.

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
<input type="text" value="Name"/>	<input type="text" value="private-rt"/> X Remove

Add new tag

You can add 49 more tags.

Route table rtb-092a720f0609aae68 | private-rt was created successfully.

rtb-092a720f0609aae68 / private-rt

Actions

Created private-rt for handling private subnet routing in secure-vpc.

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (1/2)

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route
public-subnet	subnet-0f885c248dbb3000d	10.0.1.0/24	-	rtb-0a
<input checked="" type="checkbox"/> private-subnet	subnet-0b6eda7f837f44284	10.0.2.0/24	-	Main (

Selected subnets

subnet-0b6eda7f837f44284 / private-subnet X

You have successfully updated subnet associations for rtb-092a720f0609aae68 / private-rt.

Route tables (1/4) Info

Last updated less than a minute ago

Actions Create route table

Associated private-subnet with private-rt to isolate it from direct internet access.

Create & Attach NAT Gateway

Elastic IP address 13.204.121.68 (eipalloc-0594cb72ee88e9ca8) allocated.

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

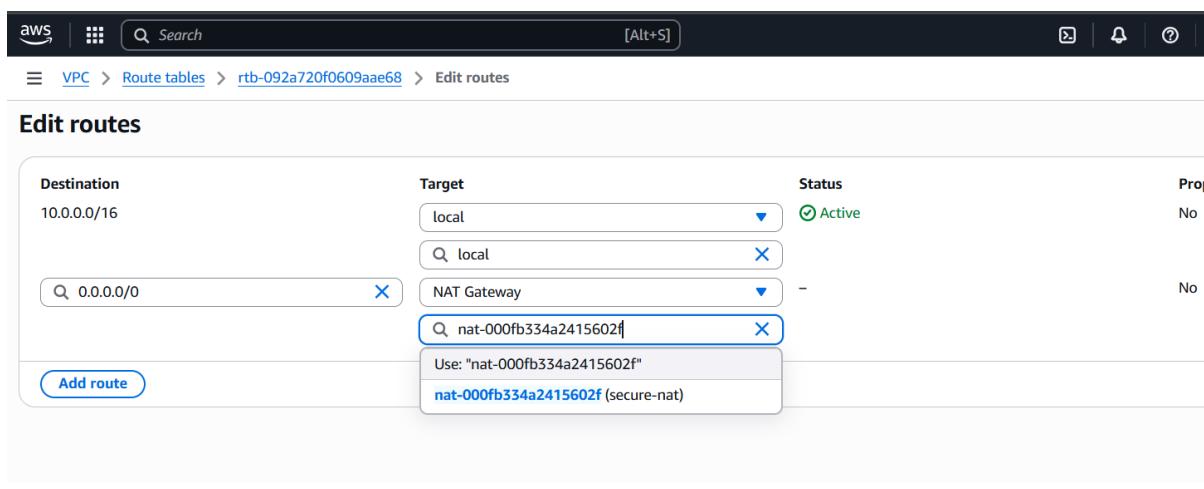
Elastic IP allocation ID Info
Assign an Elastic IP address to the NAT gateway.

Allocate Elastic IP

Additional settings Info

NAT gateways (1) Info					
Find NAT gateways by attribute or tag					
Name	NAT gateway ID	Connectivity...	State	State message	
secure-nat	nat-000fb334a2415602f	Public	Available	-	

Created secure-nat in public-subnet with Elastic IP to allow private subnet outbound internet access.



The screenshot shows the 'Edit routes' section for a specific route table. A new route is being added to forward traffic from the 0.0.0.0/0 source to the target 'nat-000fb334a2415602f' (secure-nat). The route is marked as 'Active' and 'No Propagated'.

Destination: 10.0.0.0/16

Target: local (removed), NAT Gateway (selected), nat-000fb334a2415602f (secure-nat)

Status: Active, No Propagated

Route Table: rtb-092a720f0609aae68 / private-rt

Message: Updated routes for rtb-092a720f0609aae68 / private-rt successfully

Added route in private-rt to route internet-bound traffic via secure-nat.

This project involved designing a secure AWS Virtual Private Cloud (VPC) with both public and private subnets.

An Internet Gateway was configured for the public subnet, and a NAT Gateway for the private subnet's internet access.

Custom route tables ensured controlled traffic flow across the architecture.

This setup provides a secure foundation for deploying applications with both internet-facing and internal components.

