

Task 1

Objective: Design and configure a basic AWS network with the following requirements:

1. Create **1 VPC**
2. Create **2 Public Subnets**
3. Create **2 Private Subnets**
4. Attach an **Internet Gateway (IGW)**
5. Configure **NAT Gateway** for private subnet outbound access

Solution:

VPC Design

VPC CIDR: 10.0.0.0/16

Reason: A /16 network offers 65,536 IP addresses, making it ideal for scalable beginner AWS setups. It allows easy subdivision into multiple /24 subnets while avoiding IP exhaustion.

Subnet

According to the task I divided the VPC into 2 public and 2 private subnets = 4 Total Subnets

Each subnet uses /24 CIDR, giving 256 IPs which is a common choice

Public subnets

Public 1 10.0.1.0/24 Hosts public-facing EC2/ Load Balancer

Public 2 10.0.2.0/24 Redundancy in another availability Zone

Why /24?

- Allow enough IPs for EC2, load balancers, and NAT gateways.
- Easy to understand and commonly used in real deployments.

Private subnets

Private 1 10.0.3.0/24 Backend EC2, app servers, RDS

Private 2 10.0.4.0/24 Redundancy for backend services

Why private?

- Protect internal resources
- Prevent direct exposure from the internet

Routing Design

Public Route Table

Default: 0.0.0.0/0 (Internet Gateway IGW) for both public subnets.

Private Route Table

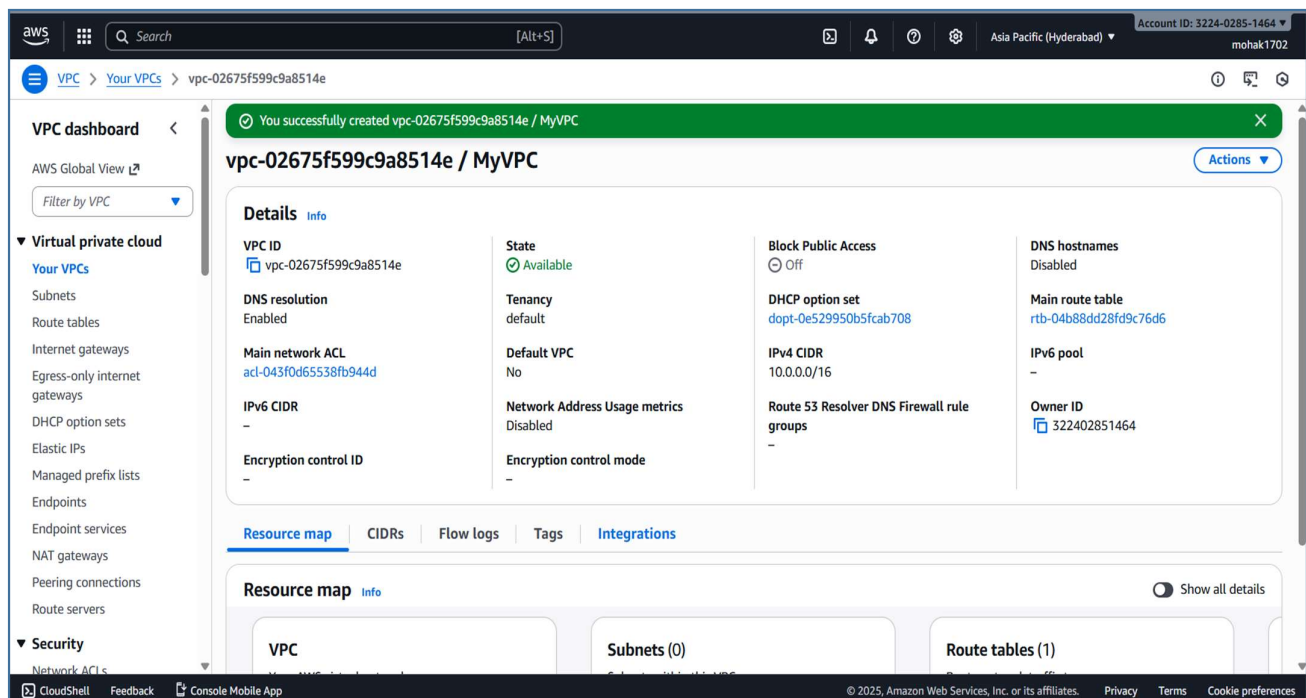
Default: 0.0.0.0/0 (NAT Gateway) for both private subnets.

Note: Public subnets are host internet facing, while private subnets are get outbound internet

ScreenShots

a) VPC Creation

Name: MyVPC



VPC Details

The screenshot shows the AWS VPC console interface. The left sidebar contains navigation links for VPC dashboard, Virtual private cloud, and Security. The main content area displays 'Your VPCs' with a table listing VPCs. Below the table, the details for 'vpc-02675f599c9a8514e / MyVPC' are shown, including VPC ID, State, Block Public Access, DNS resolution, Main network ACL, IPv6 CIDR, Tenancy, Default VPC, Network Address Usage metrics, DHCP option set, IPv4 CIDR, Route 53 Resolver DNS Firewall rule groups, DNS hostnames, Main route table, and IPv6 pool.

Name	VPC ID	State	Encryption c...	Encryption control ...	Block Public...	IPv...
MyVPC	vpc-02675f599c9a8514e	Available	-	-	Off	10.0.0.0/16
-	vpc-025eb7803f2573fae	Available	-	-	Off	172.31.0.0/20

vpc-02675f599c9a8514e / MyVPC

Details

VPC ID vpc-02675f599c9a8514e	State Available	Block Public Access Off	DNS hostnames Disabled
DNS resolution Enabled	Tenancy default	DHCP option set dopt-0e529950b5fcab708	Main route table rtb-04b88dd28fd9c76d6
Main network ACL acl-043f0d65538fb944d	Default VPC No	IPv4 CIDR 10.0.0.0/16	IPv6 pool -
IPv6 CIDR -	Network Address Usage metrics Disabled	Route 53 Resolver DNS Firewall rule groups	Owner ID 322402851464

Subnets with CIDR

The screenshot shows the AWS VPC console interface for Subnets. The left sidebar contains navigation links for VPC dashboard, Virtual private cloud, and Security. The main content area displays 'Subnets (4/7)' with a table listing subnets. Below the table, the summary for the selected subnets is shown.

Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR
private-subnet-1	subnet-07bdab65e8332daa6	Available	vpc-02675f599c9a8514e MyVPC	Off	10.0.3.0/24
public-subnet-2	subnet-0a17b56c138685f9f	Available	vpc-02675f599c9a8514e MyVPC	Off	10.0.2.0/24
-	subnet-064cc64100e55af8e	Available	vpc-025eb7803f2573fae	Off	172.31.0.0/20
-	subnet-06fce6e551d086fe3	Available	vpc-025eb7803f2573fae	Off	172.31.32.0/20
-	subnet-081bd19930f1b7223	Available	vpc-025eb7803f2573fae	Off	172.31.16.0/20
public-subnet-1	subnet-0fa5da922c1e138c6	Available	vpc-02675f599c9a8514e MyVPC	Off	10.0.1.0/24
private-subnet-2	subnet-0dba4b9f6170b2722	Available	vpc-02675f599c9a8514e MyVPC	Off	10.0.4.0/24

Subnets: subnet-07bdab65e8332daa6, subnet-0a17b56c138685f9f, subnet-0fa5da922c1e138c6, subnet-0dba4b9f6170b2722

Subnet with Availability Zone

Subnets (4/7) Info

Find subnets by attribute or tag

Name	IPv4 CIDR	IPv6 CIDR	IPv6 CIDR association ID	Available IPv4 addresses	Availability Zone	Route
public-rt	10.0.3.0/24	-	-	251	aps2-az1 (ap-south-2a)	rtb-
	10.0.2.0/24	-	-	251	aps2-az2 (ap-south-2b)	rtb-
	172.31.0.0/20	-	-	4091	aps2-az1 (ap-south-2a)	rtb-
	172.31.32.0/20	-	-	4091	aps2-az2 (ap-south-2b)	rtb-
	172.31.16.0/20	-	-	4091	aps2-az3 (ap-south-2c)	rtb-
	10.0.1.0/24	-	-	250	aps2-az1 (ap-south-2a)	rtb-
	10.0.4.0/24	-	-	251	aps2-az2 (ap-south-2b)	rtb-

Subnets: subnet-07bdab65e8332daa6, subnet-0a17b56c138685f9f, subnet-0fa5da922c1e138c6, subnet-0dba4b9f6170b2722

(c) Route tables

- One with IGW route(public subnets)
- One with NAT Gateway route(private subnets)

Route tables (2/4) Info

Find route tables by attribute or tag

Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC
-	rtb-0653d9e8e662c766c	-	-	Yes	vpc-025eb7803f2573fae
-	rtb-04b88dd28fd9c76d6	-	-	Yes	vpc-02675f599c9a8514e MyVPC
private-rt	rtb-0b201b7da32557065	2 subnets	-	No	vpc-02675f599c9a8514e MyVPC
public-rt	rtb-0ebad53ff5b4999ae	2 subnets	-	No	vpc-02675f599c9a8514e MyVPC

Route tables: rtb-0b201b7da32557065, rtb-0ebad53ff5b4999ae

(d) NAT Gateway

- NAT Gateway page

The screenshot shows the AWS Management Console for the 'ap-south-2' region. The main content area is titled 'NAT gateways (1/1) Info'. It contains a table with the following data:

Name	NAT gateway ID	Connectivity...	State	State message	Availability ...	Route table ID	P
myNatGateway	nat-003cfbcc4b63f05ce	Public	Available	-	Zonal	-	1

The left sidebar shows the 'VPC dashboard' with a search bar and a list of services: Virtual private cloud, Your VPCs, Subnets, Route tables, Internet gateways, Egress-only internet gateways, DHCP option sets, Elastic IPs, Managed prefix lists, Endpoints, Endpoint services, NAT gateways (selected), Peering connections, and Route servers. The bottom of the console shows the footer with '© 2025, Amazon Web Services, Inc. or its affiliates.' and links for Privacy, Terms, and Cookie preferences.

- Internet Gateway page (attached to VPC) (**MyIGW**)

The screenshot shows the AWS Management Console for the 'ap-south-2' region. The main content area is titled 'Internet gateways (1/2) Info'. It contains a table with the following data:

Name	Internet gateway ID	State	VPC ID	Owner
MyIGW	igw-02d19abc7a1a0bc04	Attached	ypc-02675f599c3a8514e MyVPC	322402851464
-	igw-02fc072b5cc117dec	Attached	ypc-025eb7803f2573fae	322402851464

The left sidebar shows the 'VPC dashboard' with a search bar and a list of services: Virtual private cloud, Your VPCs, Subnets, Route tables, Internet gateways (selected), Egress-only internet gateways, DHCP option sets, Elastic IPs, Managed prefix lists, Endpoints, Endpoint services, NAT gateways, Peering connections, and Route servers. The bottom of the console shows the footer with '© 2025, Amazon Web Services, Inc. or its affiliates.' and links for Privacy, Terms, and Cookie preferences.

CIDR Summary

Component	CIDR
VPC	10.0.0.0/16
Public Subnet 1	10.0.1.0/24
Public Subnet 2	10.0.2.0/24
Private Subnet 1	10.0.3.0/24
Private Subnet 2	10.0.4.0/24