

# AWS VPC WITH VARIABLE-SIZE SUBNETS

## Objective

Design and deploy a **highly complex AWS VPC architecture** using Terraform, where each subnet has a different size based on the required IP capacity. This setup simulates a **production-grade environment** supporting both public-facing and private resources.

## 1. Create a New VPC

Name the VPC "asymmetric-vpc".

Use a **/16 CIDR block**.

Enable **DNS resolution** and **DNS hostnames**.

Tag all resources with:

Environment = "production"  
Owner = "network-team"  
Project = "asymmetric-vpc-build"  
CostCenter = "AWS-Networking"

## 2. Internet Gateway: Internet Gateway Creation

Name	Internet gateway ID	State	VPC ID	Owner
asym-igw	igw-0c720074afc1b4b65	Attached	vpc-0f24744540817593c   asymmetric...	177587328656
-	igw-0d5ccf09e9be62421	Attached	vpc-07c030016e4ee46ba	177587328656

### Attachement to VPC.

Attach to VPC (igw-0c720074afc1b4b65)

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.

Q vpc-0f24744540817593c

AWS Command Line Interface command

Cancel Attach internet gateway

### **3.Create SIX Subnets with Different Capacities**

#### **# AWS VPC Architecture – Documentation**

This document outlines the network architecture deployed on AWS including VPC design, CIDR strategy, Internet Gateway configuration, Route propagation, Public/Private subnet distribution and routing policies.

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#### **VPC Details**

- **\*\*Name:\*\*** Production-VPC
- **\*\*CIDR Block:\*\*** 10.0.0.0/16
- **\*\*Network Scope:\*\*** Supports multi-AZ deployment for scalable application topology.

#### **CIDR Allocation – Subnets**

Public and private subnets follow non-overlapping hierarchical CIDR blocks.

##### **Public Subnets:**

- Public Subnet A → 10.0.0.0/24
- Public Subnet B → 10.0.16.0/20
- Public Subnet C → 10.0.32.0/19

##### **Private Subnets:**

- Private Subnet A → 10.0.64.0/22
- Private Subnet B → 10.0.68.0/23
- Private Subnet C → 10.0.96.0/19

Multi-AZ architecture ensures availability zone distribution for fault tolerance.

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#### **Internet Gateway (IGW)**

- **\*\*Name:\*\*** Prod-IGW
- IGW enables public outbound & inbound access for public subnets.
- Attached directly to the VPC.

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## Route Tables

Public Route Tables (Attached to Public Subnets):

- Public-rt-A → Subnet: Public Subnet A
- Public-rt-B → Subnet: Public Subnet B
- Public-rt-C → Subnet: Public Subnet C

Route entries:

- 0.0.0.0/0 → Target: IGW

Private Route Tables (Attached to Private Subnets):

- Private-rt-A → Subnet: Private Subnet A
- Private-rt-B → Subnet: Private Subnet B
- Private-rt-C → Subnet: Private Subnet C

## Creating subnets:

**Create subnet** [Info](#)

**VPC**  
**VPC ID**  
Create subnets in this VPC.  
vpc-0f24744540817593c (asymmetric-vpc) ▼

**Associated VPC CIDRs**  
**IPv4 CIDRs**  
10.0.0.0/16

**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.  
Public Subnet A

## Select cidr range

**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 A  
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.  
United States (N. Virginia) / use1-az6 (us-east-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**  
10.0.0.0/24 256 IPs  
< > ^ v

## Give tags

10.0.0.0/24 256 IPs

▼ Tags - optional

Key	Value - optional
Environment	production
Owner	network-team
Project	asymmetric-vc-build
CostCenter	AWS-Networking
Name	Public Subnet A

Add new tag  
You can add 45 more tags.

Remove

Add new subnet

Cancel Create subnet

Create six subnets with above CIDR values;

Route tables (8) Info

Last updated 25 minutes ago

Find route tables by attribute or tag

<input type="checkbox"/>	Name	Route table ID	Explicit subnet associations	Edge associations	Main	VPC
<input type="checkbox"/>	Private rt B	rtb-0e240eca39c70b7b3	subnet-005cc0d4d982b9...	-	No	vpc-0f24744540817593c   asy...
<input type="checkbox"/>	-	rtb-0eb19a5ed7339ebe5	-	-	Yes	vpc-0f24744540817593c   asy...
<input type="checkbox"/>	Public rt C	rtb-0e01ff1b3f8fa500	subnet-09033a1bb242ee...	-	No	vpc-0f24744540817593c   asy...
<input type="checkbox"/>	Public rt A	rtb-094e6119aef471746	subnet-0bf643023f02f56...	-	No	vpc-0f24744540817593c   asy...
<input type="checkbox"/>	Private rt C	rtb-0e3ff70c8ea0a27c1	subnet-02f40c5c9e0908...	-	No	vpc-0f24744540817593c   asy...
<input type="checkbox"/>	-	rtb-044ef19c9340c3946	-	-	Yes	vpc-07c030016e4ee46ba
<input type="checkbox"/>	Public rt b	rtb-07a4be83645941eb7	subnet-0029056b321110...	-	No	vpc-0f24744540817593c   asy...
<input type="checkbox"/>	Private rt A	rtb-08198719eeede07a6	subnet-05876d69e92c8f...	-	No	vpc-0f24744540817593c   asy...

## 4. Route Table Creation and Subnet Association:

### # Route Tables, Subnet Associations, and Routes

#### 1. Route Table Name: Public rt A

- \*\*Subnet Association:\*\* Public Subnet A
- \*\*Routes:\*\*
  - 0.0.0.0/0 → Internet Gateway (asymmetric-igw)

#### 2. Route Table Name: Public rt B

- \*\*Subnet Association:\*\* Public Subnet B
- \*\*Routes:\*\*
  - 0.0.0.0/0 → Internet Gateway (asymmetric-igw)

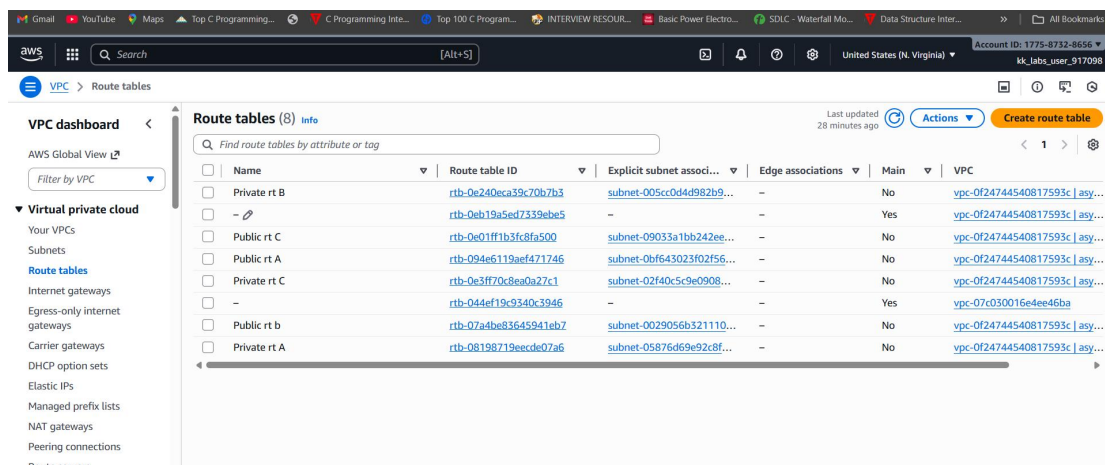
#### 3. Route Table Name: Public rt C

- \*\*Subnet Association:\*\* Public Subnet C
- \*\*Routes:\*\*
  - 0.0.0.0/0 → Internet Gateway (asymmetric-igw)

## Private Route Tables:

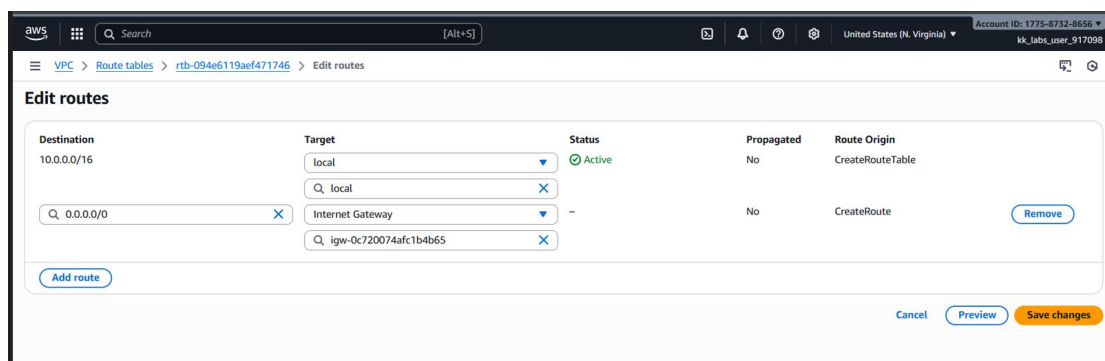
- \*\*Route Table Name:\*\* Private rt A**
  - \*\*Subnet Association:\*\* Private Subnet A**
  - \*\*Routes:\*\***
    - Local VPC route only (no internet route)
- \*\*Route Table Name:\*\* Private rt B**
  - \*\*Subnet Association:\*\* Private Subnet B**
  - \*\*Routes:\*\***
    - Local VPC route only (no internet route)
- \*\*Route Table Name:\*\* Private rt C**
  - \*\*Subnet Association:\*\* Private Subnet C**
  - \*\*Routes:\*\***
    - Local VPC route only (no internet route)

Following are the route tables created.



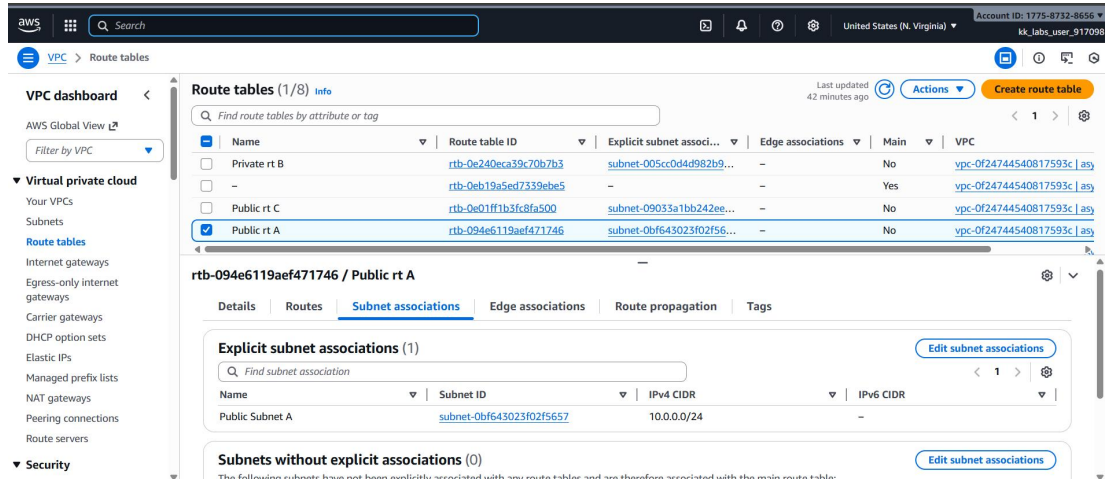
## Add Routes to all the route tables

Select 0.0.0.0/0 as destination, target as internet gateway and select Internet gateway created. Do for all the route tables.



## 5.Edit Subnet Associations

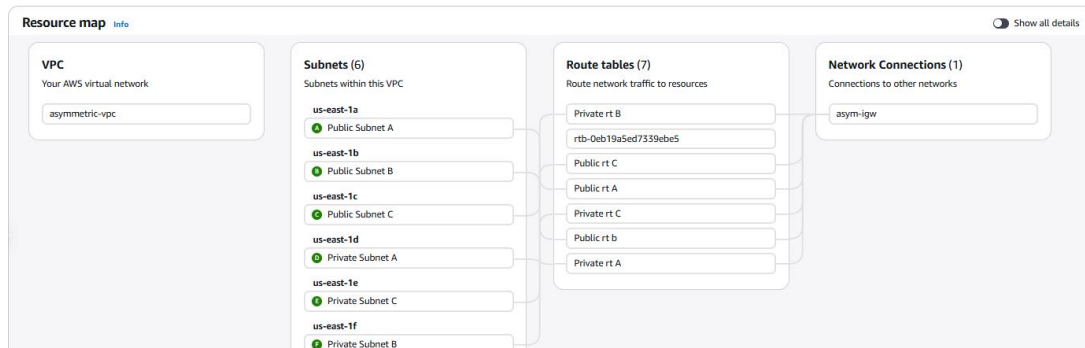
Select the route table -----> scroll down----->goto subnet associations----->edit subnet association-----> select the subnet you want to associate with the route table. Associate all the respective Route tables with the respective subnets accordingly.



The screenshot displays the AWS Management Console interface for editing subnet associations. The 'Route tables' page is shown, with 'Public rt A' selected. The 'Subnet associations' tab is active, showing a table with one explicit association: 'Public Subnet A' (subnet-0bf643023f02f5657) with an IPv4 CIDR of 10.0.0.0/24. The interface includes a search bar, a table of route tables, and a detailed view of the selected route table's subnet associations.

## 6.ResourceMap of VPC:

Following is the ResourceMap of the VPC created.



## 7. Conclusion:

This asymmetric VPC architecture sets the stage for:

- Multi-tier application deployments
- Landing zone onboarding
- NAT / Transit Gateway expansion
- Cloud security posture alignment
- Hybrid network peering

Future Enhancements May Include:

- NAT Gateway for private outbound internet
- VPC Endpoints for S3 / DynamoDB
- Transit Gateway for multi-VPC communication

The network is primed for elastic scaling, security compliance, and production workload enablement.

