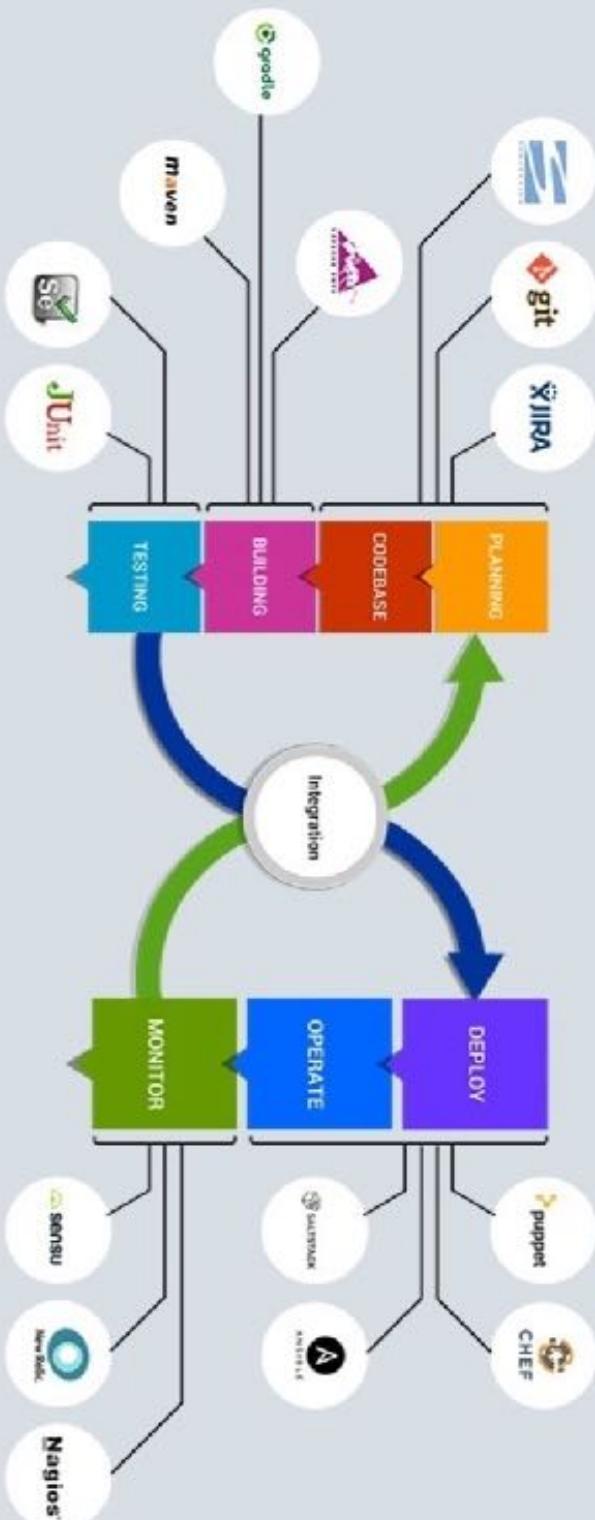


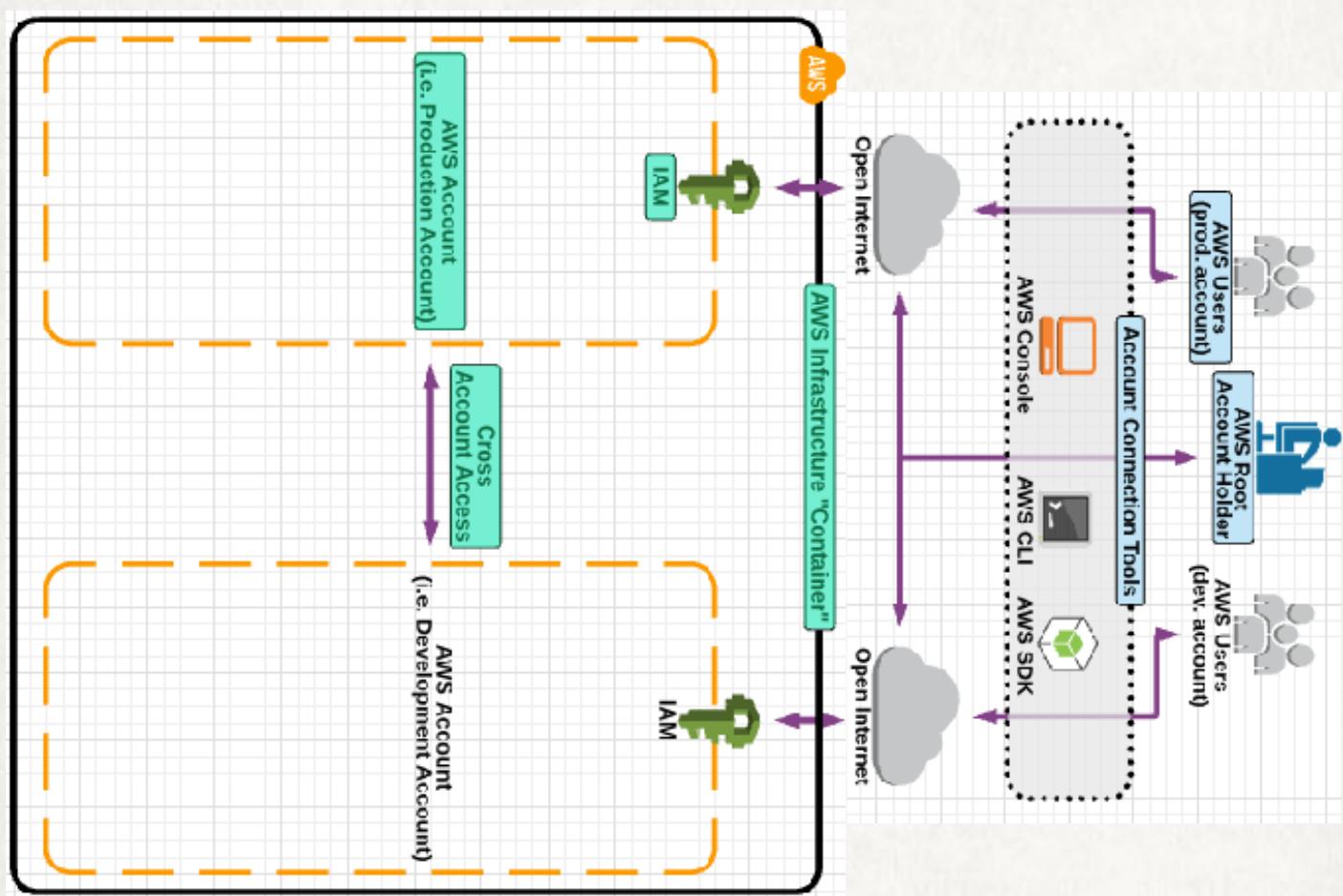
# AWS

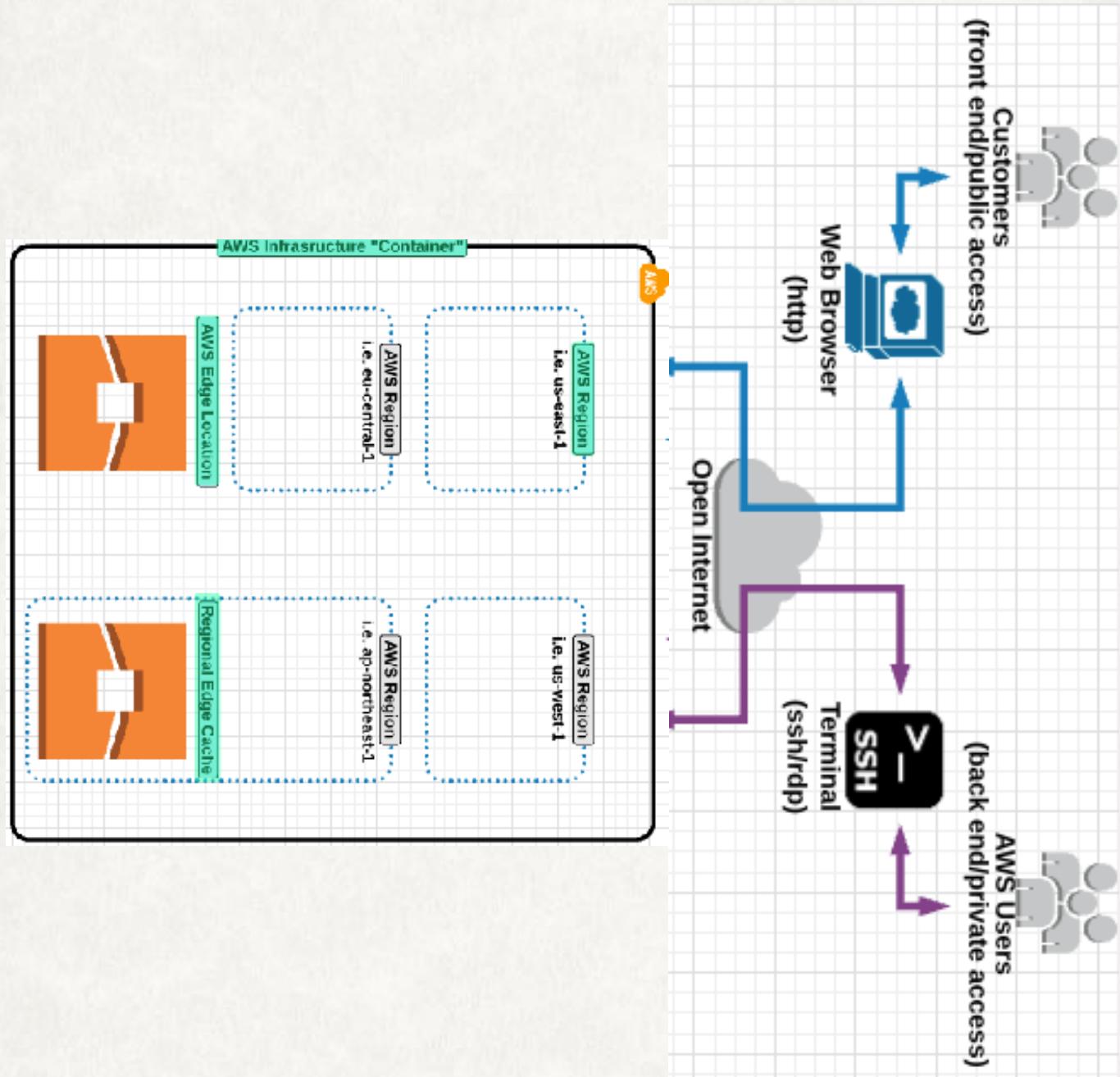
KESHAV KUMMARI

Agile | Linux | AWS | DevOps | Python

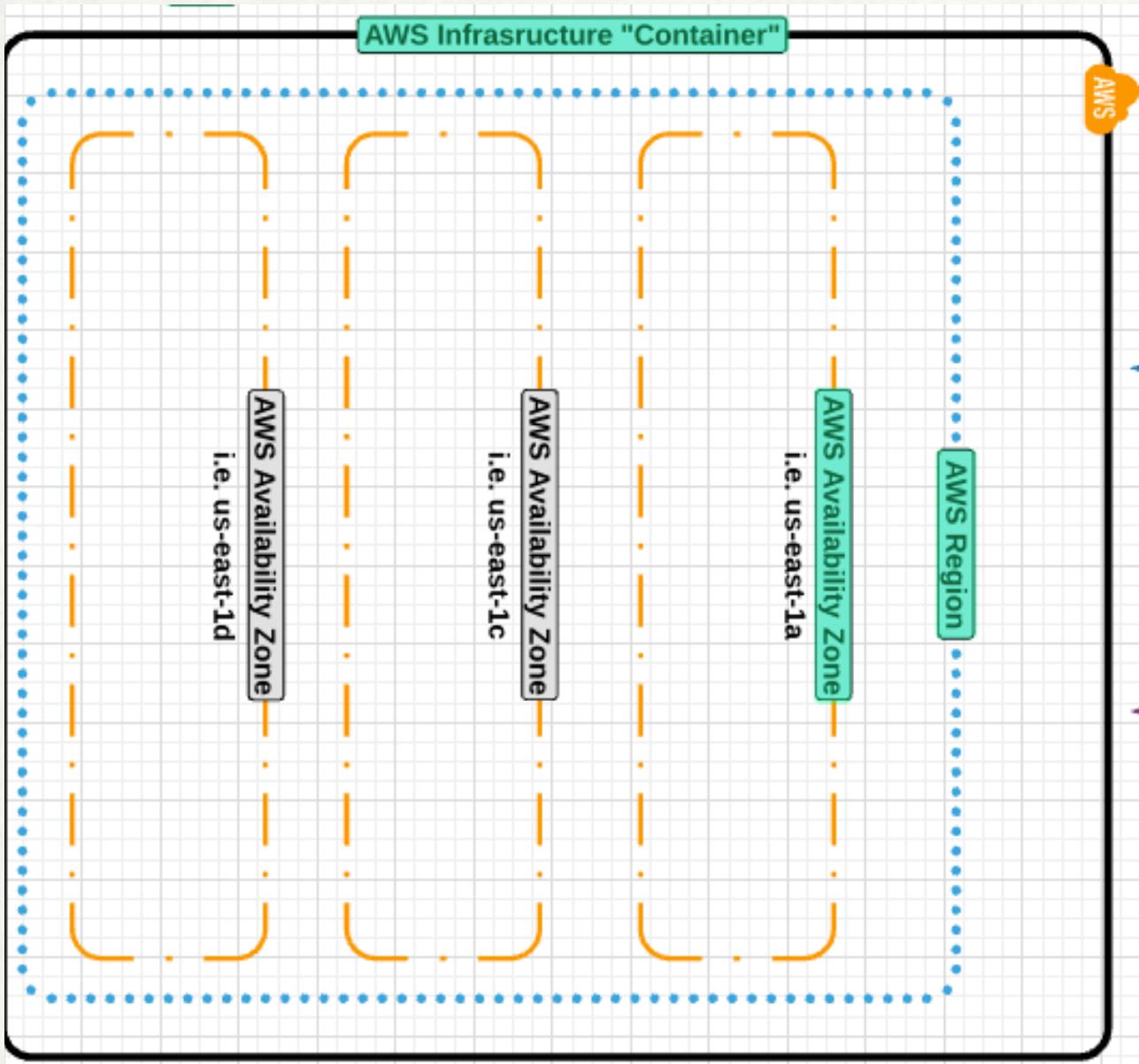
Keshav Kummari



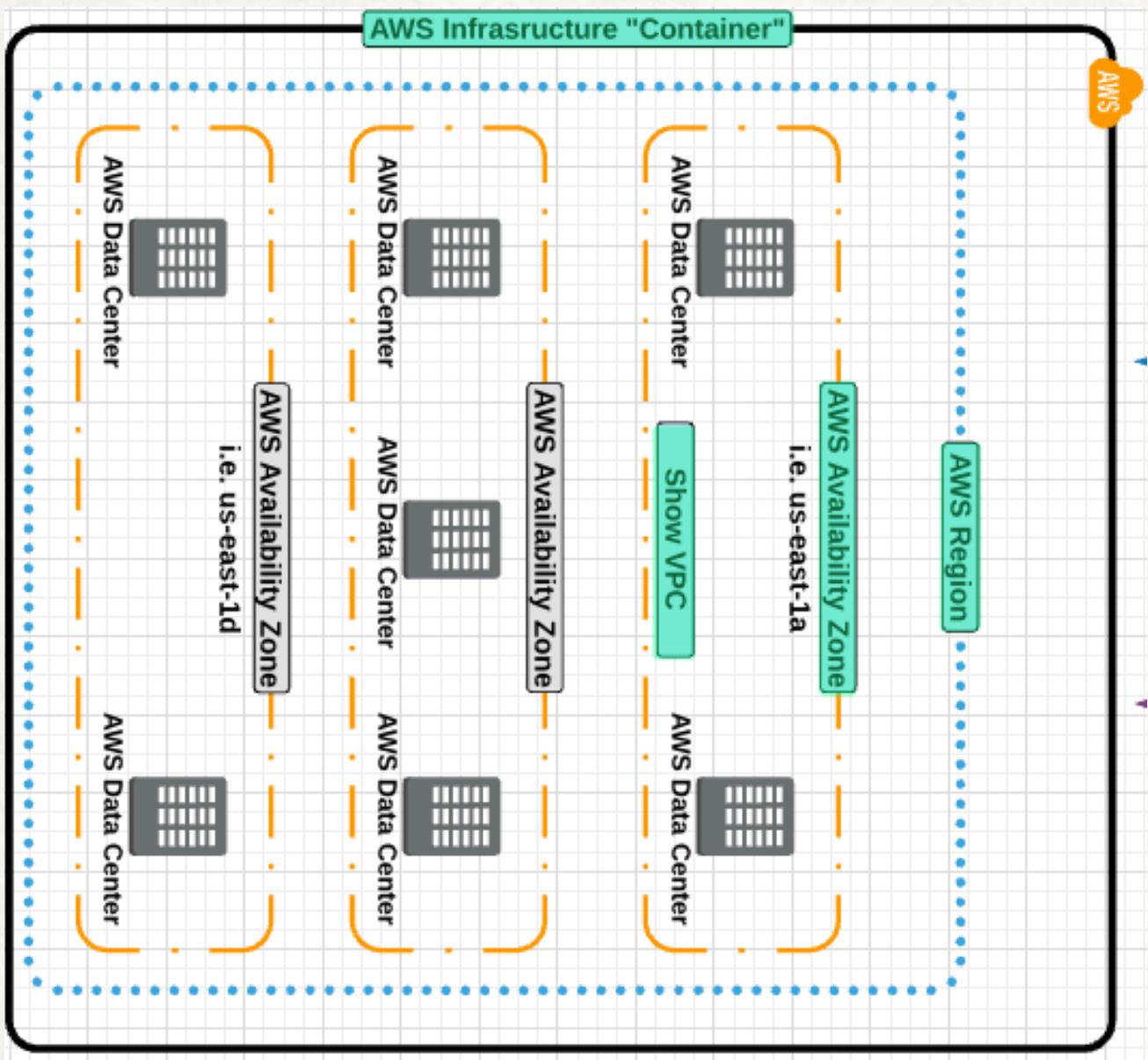




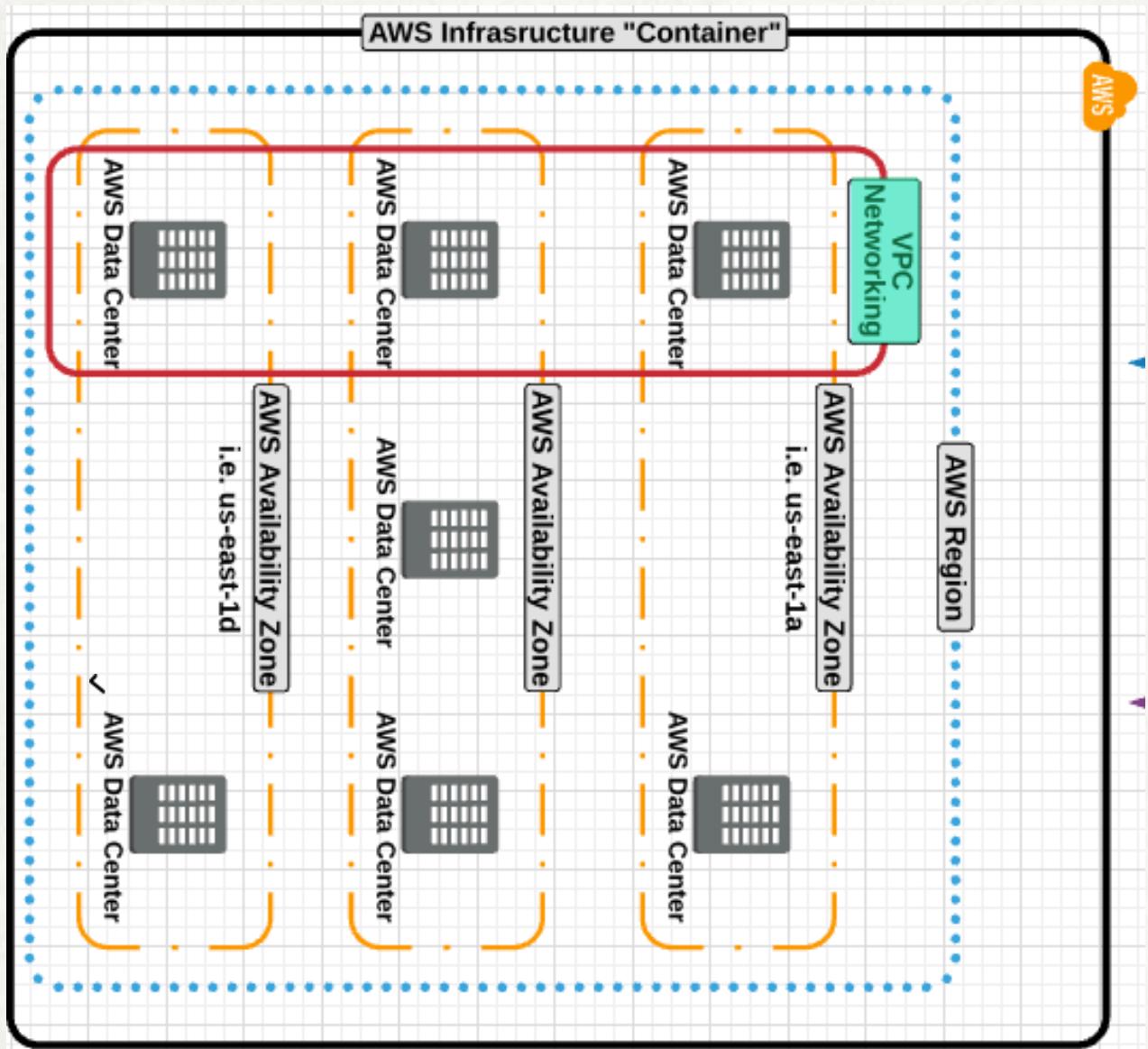
## AWS - Region & Availability Zones



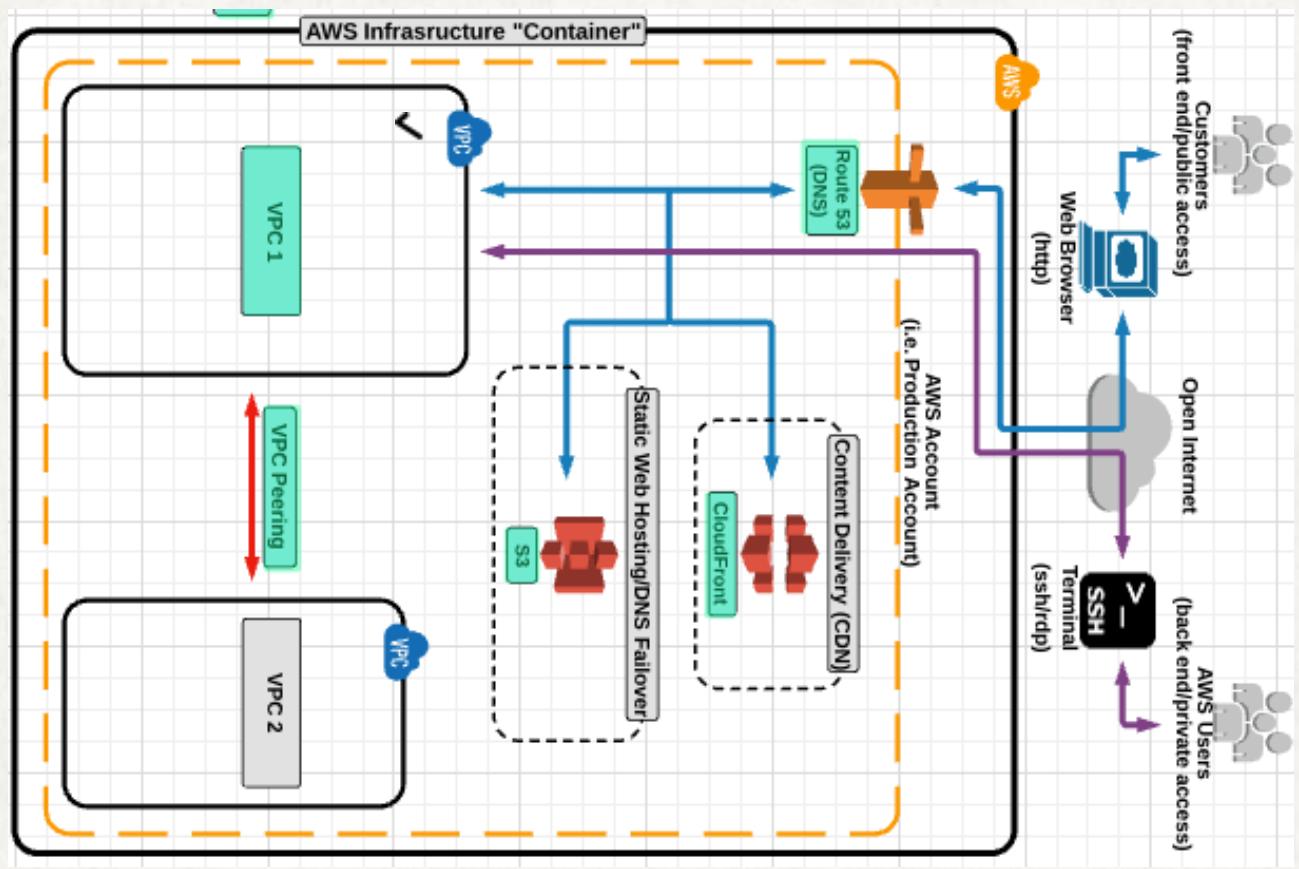
## AWS Region & AZ's



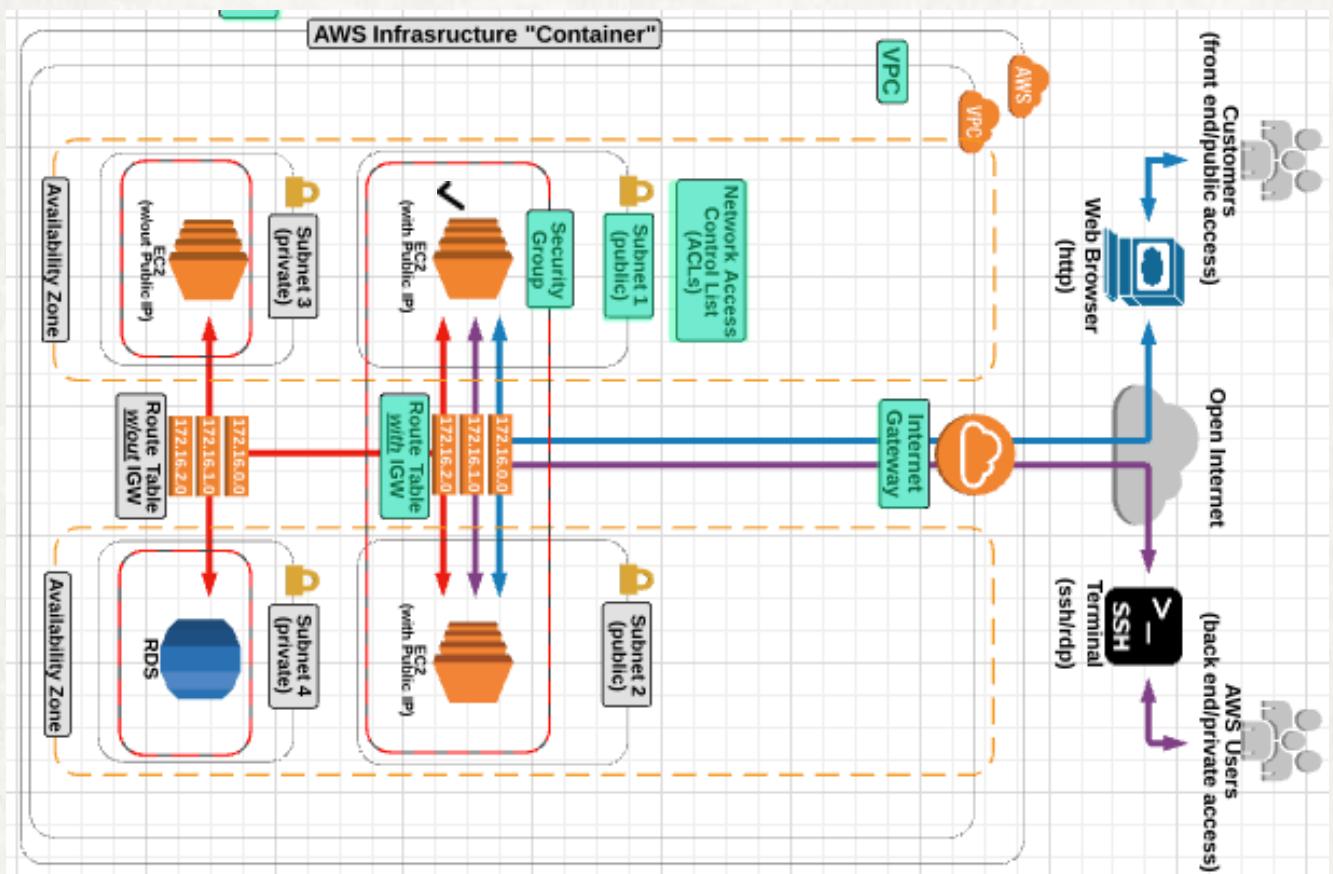
AWS

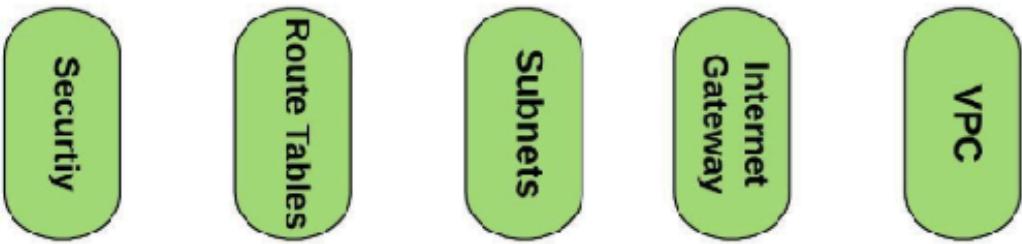


## AWS - VPC

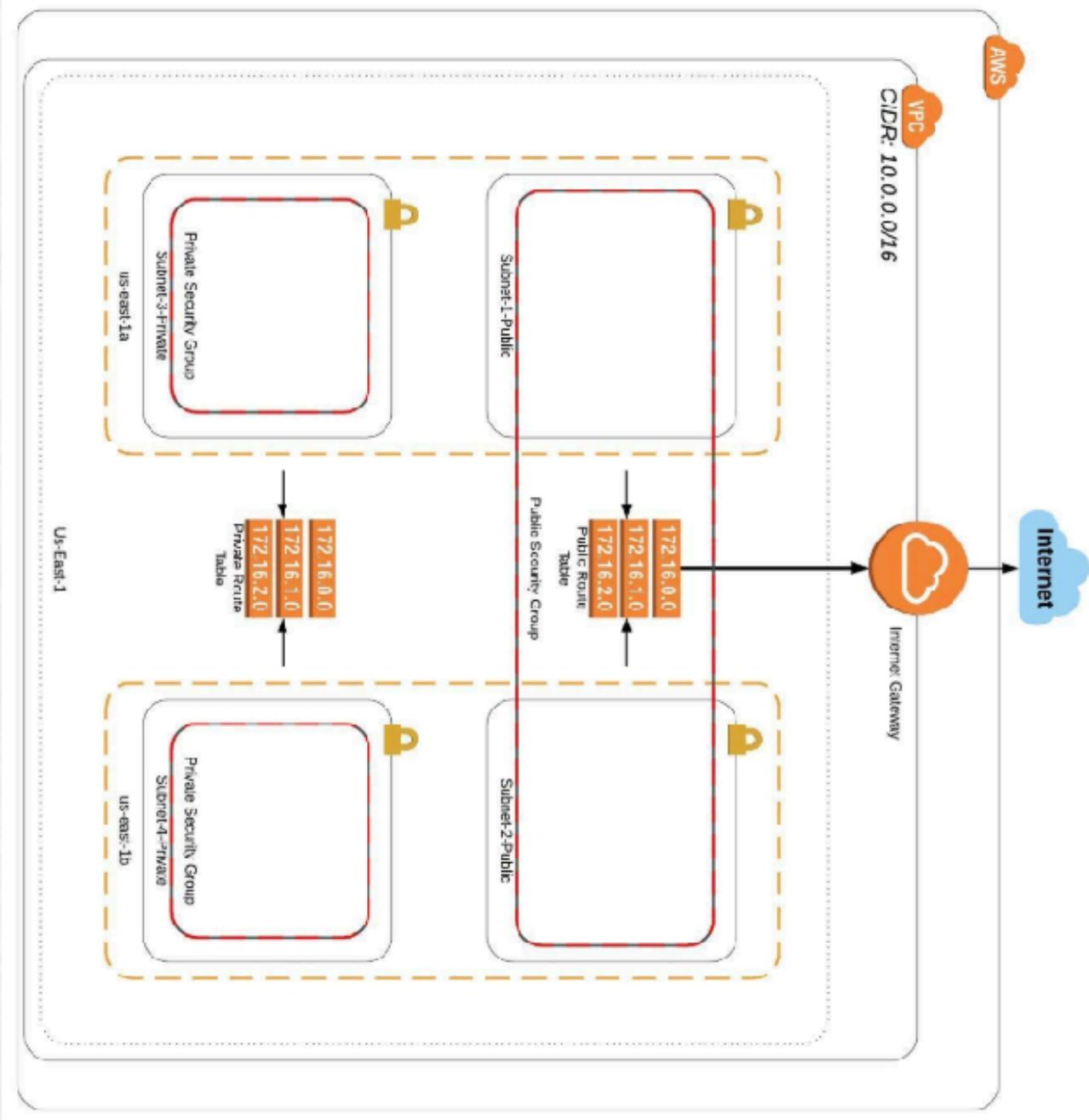


## Inside VPC

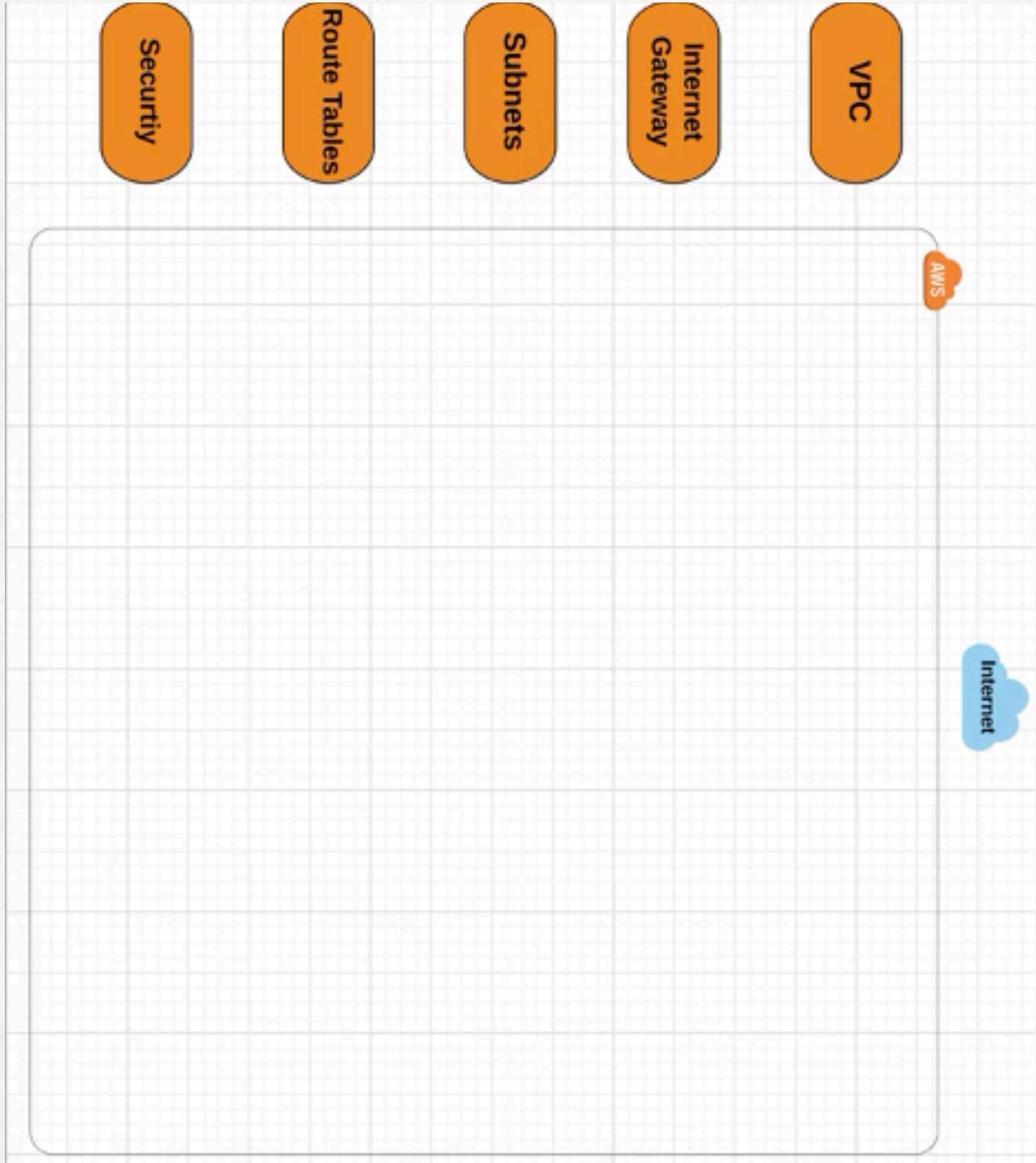




VPC



## Create a VPC



# CREATE A VPC

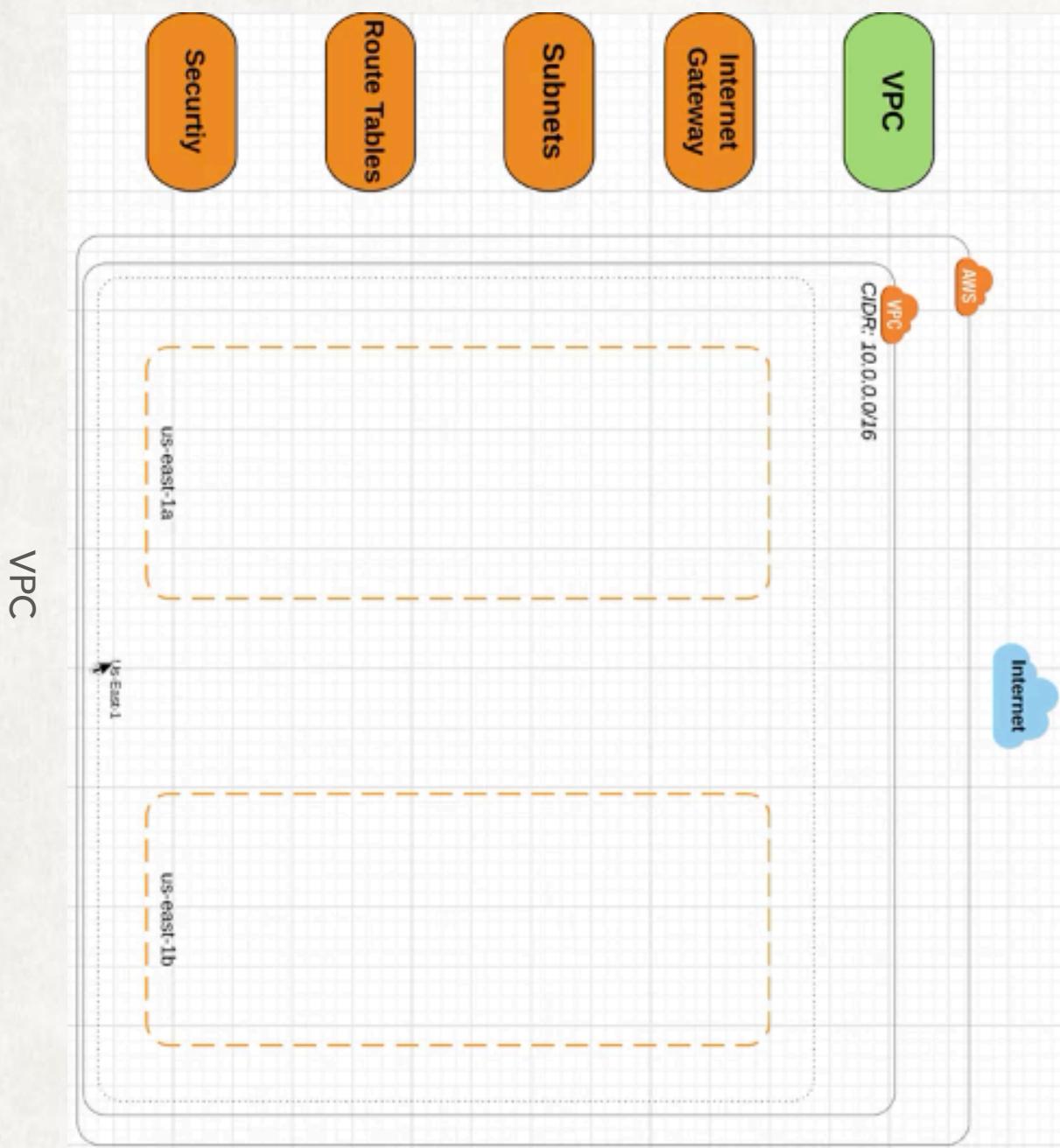
The screenshot shows the AWS VPC Dashboard. At the top right, there are three icons: a magnifying glass for search, a gear for settings, and a question mark for help. Below them is a button labeled "Create VPC". To the right of the "Create VPC" button is a dropdown menu with the option "Actions". Further down, there is a search bar with the placeholder "Search VPCs and their properties" and a close button (X). A table header row includes columns for "Name", "VPC ID", "State", "IPv4 CIDR", "IPv6 CIDR", "DHCP options set", and "Route tables". The main content area is titled "Create VPC". It contains a text box explaining what a VPC is: "A VPC is an isolated portion of the AWS cloud populated by AWS objects, such as Amazon EC2 instances. You must specify an IPv4 address range for your VPC. Specify the IPv4 address range as a Classless Inter-Domain Routing (CIDR) block; for example, 10.0.0.0/16. You cannot specify an IPv4 CIDR block larger than /16. You can optionally associate an Amazon-provided IPv6 CIDR block with the VPC." Below this explanation are several input fields:

- "Name tag": A text input field containing "Lab\_VPC".
- "IPv4 CIDR block\*": A text input field containing "10.0.0.0/16".
- "IPv6 CIDR block\*": A radio button group where the first option, "No IPv6 CIDR Block", is selected.
- "Tenancy": A dropdown menu set to "Default".

At the bottom of the dialog are two buttons: "Cancel" and "Yes, Create".

Click on Yes

# VPC IS CREATED WITH 2 SUBNETS



## VPC Dashboard

Filter by VPC:

Select a VPC

Create internet gateway

Actions ▾

Virtual Private Cloud

Filter by tags and attributes or search by keyword

Name ID State

lab\_igw igw-c51ef5be detached

Your VPCs

Subnets

Route Tables

Internet Gateways

Go to Actions

## VPC Dashboard

Filter by VPC:

Select a VPC

Create internet gateway

Actions ▾

Delete internet gateway

Attach  VPC

Detach from VPC

Add/Edit Tags

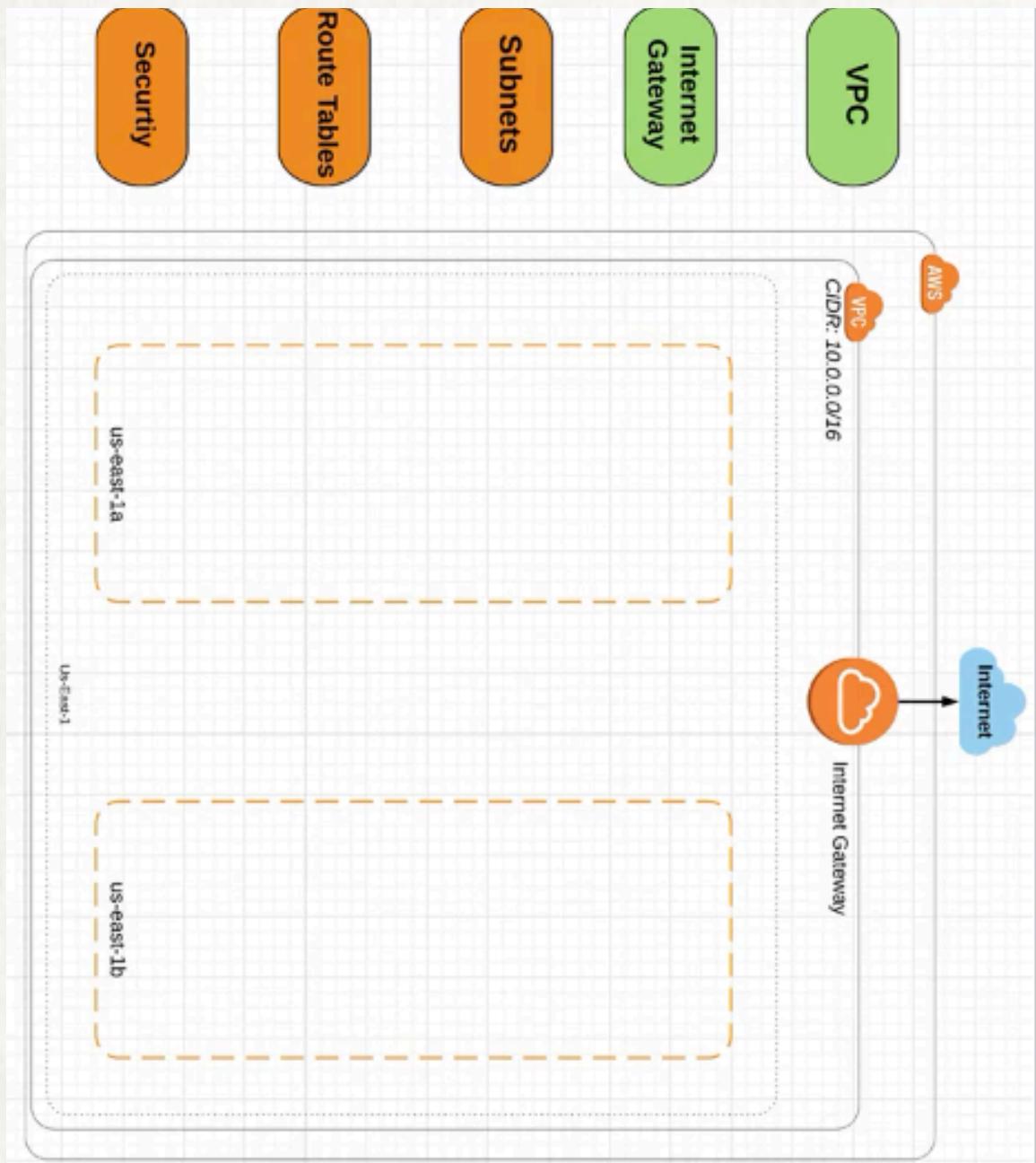
Virtual Private Cloud

lab\_igw igw-c51ef5be detached

Your VPCs

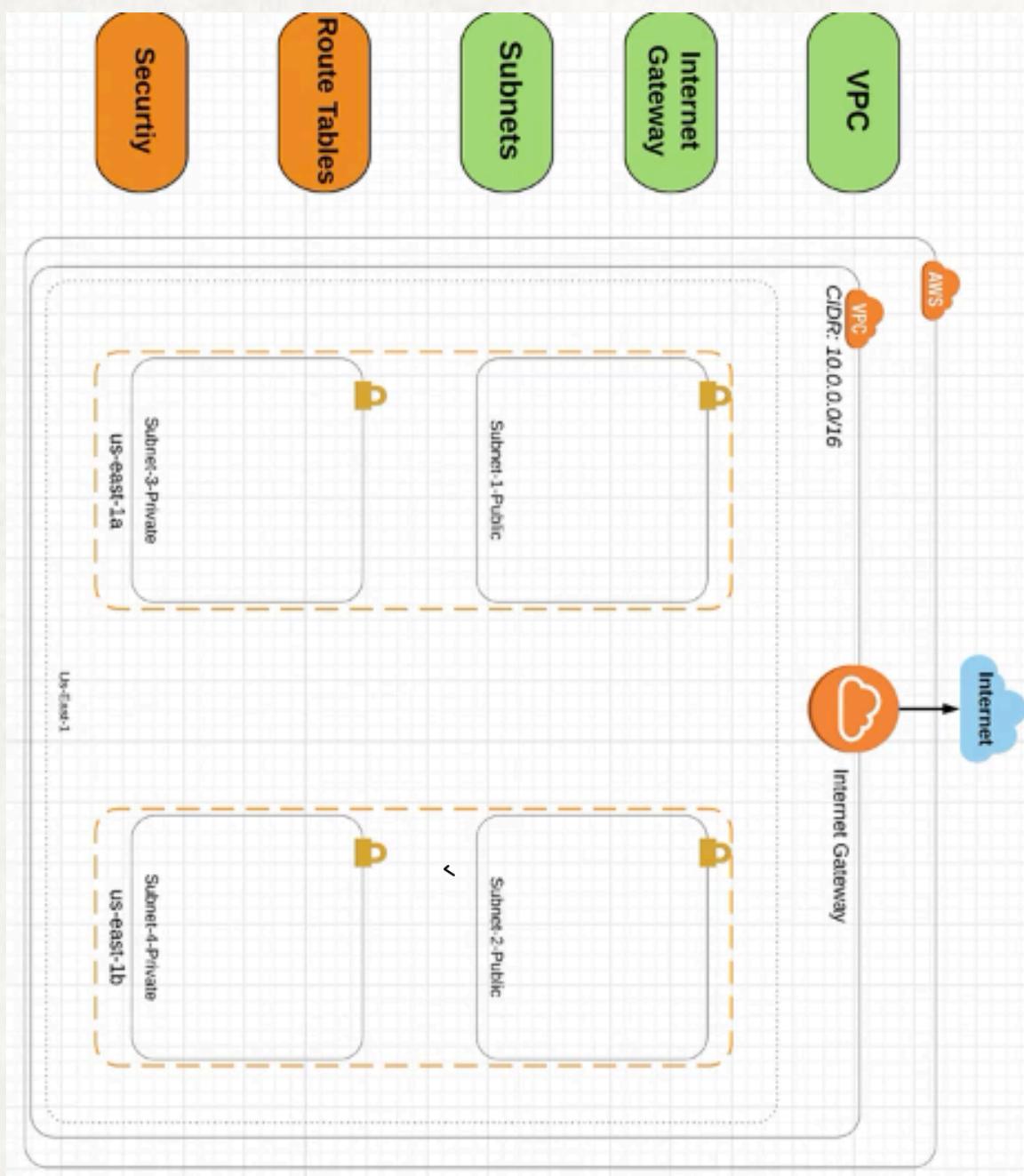
Attach to newly created VPC

# IGW HAS BEEN CREATED



IGW

# LET'S CREATE SUBNETS



4 Subnets i.e. 2 Public & 2 Private Subnets

# STEP-1 : PUBLIC SUBNET-1

VPC Dashboard

Filter by VPC:

Virtual Private Cloud

Your VPCs

Subnets

Route Tables

Internet Gateways

Egress Only Internet Gateways

DHCP Options Sets

Elastic IPs

Endpoints

Endpoint Services

NAT Gateways

Peering Connections

Security

Network ACLs

Security Groups

VPN Connections

Customer Gateways

Virtual Private Gateways

Create Subnet

Subnet Actions

Search Subnets and their pro

No Subnets

Name

Subnet ID

State

VPC

IPv4 CIDR

Available IPv4

IPv6

### Create Subnet

Use the CIDR format to specify your subnet's IP address block (e.g., 10.0.0.0/24). Note that block sizes must be between a /16 netmask and /28 netmask. Also, note that a subnet can be the same size as your VPC. An IPv6 CIDR block must be a /64 CIDR block.

Name tag	Subnet-1 -Public
VPC	vpc-e7bf8c9c   Lab_VPC
VPC CIDRs	CIDR
10.0.0.0/16	Status
	associated

Availability Zone: us-east-1a

IPv4 CIDR block: 10.0.1.0/24

Cancel

Yes, Create

Select a subnet above

Click "Yes, Create"

# STEP-2 : PUBLIC SUBNET-2

**VPC Dashboard**

Filter by VPC:

**Virtual Private Cloud**

Your VPCs

**Create Subnet**

Subnets

Route Tables

Internet Gateways

Egress Only Internet Gateways

DHCP Options Sets

Elastic IPs

Endpoints

Endpoint Services

NAT Gateways

Peering Connections

Security

Network ACLs

Security Groups

VPN Connections

Customer Gateways

Virtual Private Gateways

VPN Connections

**Subnet-322ad06e | Subnet-1-Public**

**Summary**

Route Table Network ACL Flow Logs Tags

Availability Zone: us-east-1a

Subnet ID: subnet-322ad06e | Subnet-1-Public

IPv4 CIDR: 10.0.1.0/24

IPv6 CIDR:

Status: available

VPC: vpc-e7bf8c9c | Lab\_VPC

Available IPs: 251

Auto-assign IPv6 address: no

**Create Subnet**

Use the CIDR format to specify your subnet's IP address block (e.g., 10.0.0.0/24). Note that block sizes must be between a /16 netmask and /28 netmask. Also, note that a subnet can be the same size as your VPC. An IPv6 CIDR block must be a /84 CIDR block.

Name tag	Subnet-2-Public
VPC	vpc-e7bf8c9c   Lab_VPC
CIDR	10.0.0.0/16
Status	associated
Status Reason	
Availability Zone	us-east-1b
IPv4 CIDR block	10.0.2.0/24

**Cancel** **Yes, Create**

Click on Yes, Create

# STEP-3 : PRIVATE SUBNET-3

**VPC Dashboard**

Filter by VPC:

**Virtual Private Cloud**

Your VPCs

- Subnets
- Route Tables
- Internet Gateways
- Egress Only Internet Gateways
- DHCP Options Sets
- Elastic IPs
- Endpoints
- Endpoint Services
- NAT Gateways
- Peering Connections

**Create Subnet**

Use the CIDR format to specify your subnet's IP address block (e.g., 10.0.0.0/24). Note that block sizes must be between a /16 netmask and /28 netmask. Also, note that a subnet can be the same size as your VPC. An IPv6 CIDR block must be a /64 CIDR block.

Name tag	Subnet-3-Private
VPC	vpc-e7bf8c9c   Lab_VPC
VPC CIDRs	CIDR
10.0.0.0/16	Status
	Status Reason

**Availability Zone**: us-east-1a

**IPv4 CIDR block**: 10.0.3.0/24

**Cancel** **Yes, Create**

**VPN Connections**

Customer Gateways	Virtual Private Gateways	VPN Connections
subnet-06b07c61   Subnet-2-Public	subnet-06b07c61   Subnet-2-	subnet-06b07c61   Subnet-2-Public
Summary	Route Table	Network ACL
Tags	Flow Logs	

Subnet ID: subnet-06b07c61 | Subnet-2-Public  
 Availability Zone: us-east-1b  
 IPv4 CIDR: 10.0.2.0/24  
 IPv6 CIDR:  
 State: available  
 Default subnet: no  
 Auto-assign Public IP: no  
 Available IPs: 251  
 Auto-assigned IPv6 addresses: no

Click on "Yes, Create"

# STEP-4 : PRIVATE SUBNET-4

**VPC Dashboard**

Filter by VPC:

**Virtual Private Cloud**

Your VPCs

- Subnets
- Route Tables
- Internet Gateways
- Egress Only Internet Gateways
- DHCP Options Sets
- Elastic IPs
- Endpoints
- Endpoint Services
- NAT Gateways
- Peering Connections
- Security
- Network ACLs
- Security Groups
- VPN Connections
- Customer Gateways
- Virtual Private Gateways
- VPN Connections

**Create Subnet**

Use the CIDR format to specify your subnet's IP address block (e.g., 10.0.0.0/24). Note that block sizes must be between a /16 netmask and /28 netmask. Also, note that a subnet can be the same size as your VPC. An IPv6 CIDR block must be a /64 CIDR block.

Name tag	Subnet-4-Private
VPC	vpc-e7bf8c9c   Lab_VPC
CIDR	10.0.0.0/16
Status	associated
Status Reason	
Availability Zone	us-east-1b
IPv4 CIDR block	10.0.4.0/24

**subnet-tfb2cd6a7 | Subnet-3-Private**

Summary	Route Table	Network ACL	Flow Logs	Tags
Subnet ID: subnet-tfb2cd6a7   Subnet-3-Private	Route table: rtb-63f5f41c	Network ACL: acl-052ba7f		Availability Zone: us-east-1a
IPv4 CIDR: 10.0.3.0/24	Default subnet: no	Auto-assign Public IP: no		IPv6 CIDR:
State: available	Auto-assign IPv6 address: no	Auto-assign IPv6 address: no		VPN: vpc-e7bf8c9c   Lab_VPC
Available IPs: 251				

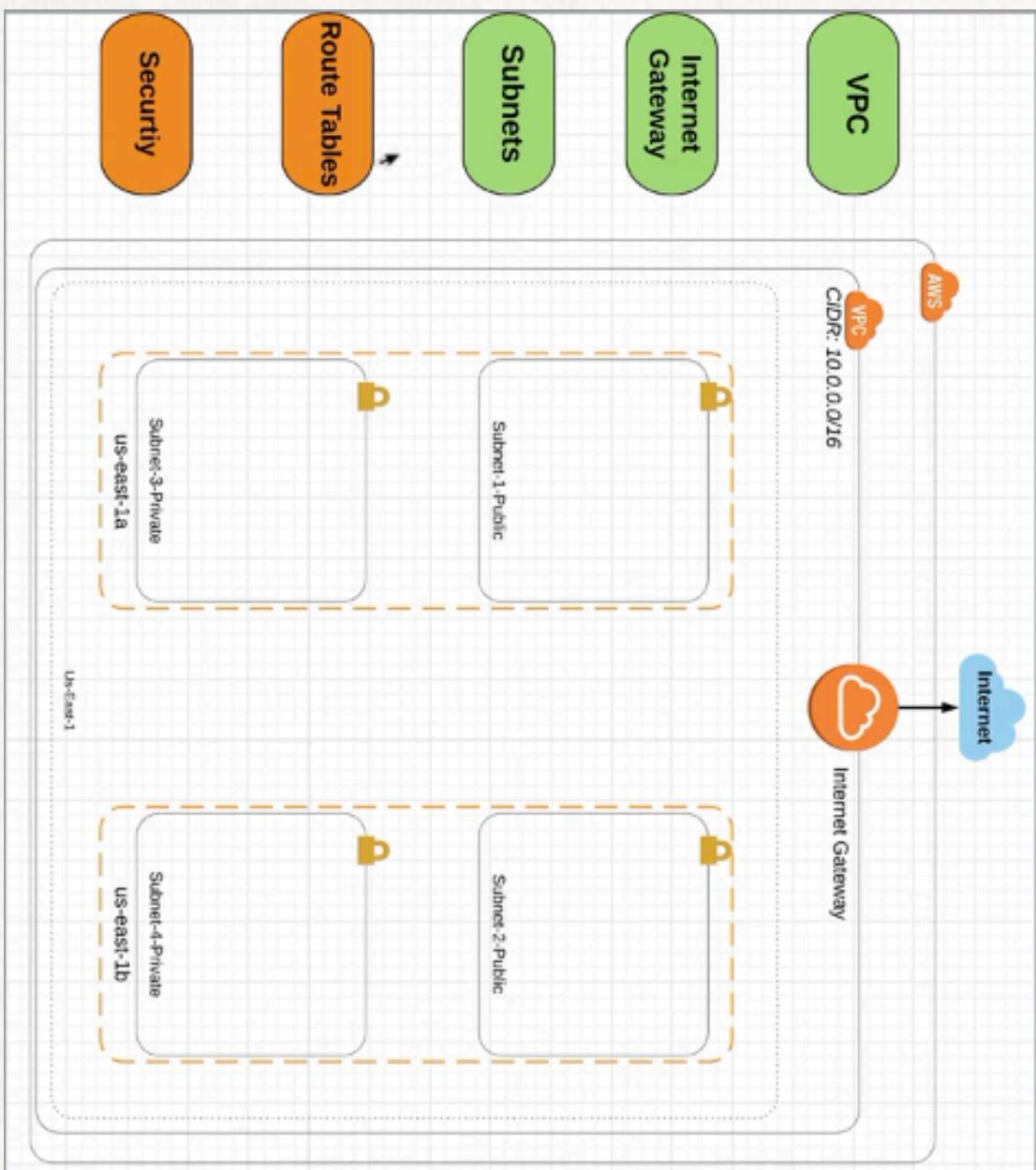
**Click on "Yes, Create"**

# 4 SUBNETS WERE CREATED SUCCESSFULLY

VPC Dashboard						
Create Subnet		Subnet Actions				
Filter by VPC:		Select a VPC				
Virtual Private Cloud		Search Subnets and their proj.				
Your VPCs		X				
Subnets		« < 1 to 4 of 4 Subnets				
Route Tables		C S				
Internet Gateways		Name				
Egress Only Internet Gateways		Subnet ID				
DHCP Options Sets		State				
Elastic IPs		VPC				
Virtual Private Cloud		IPv4 CIDR				
Your VPCs		Available IPv4				
Subnets		Subnet-4-Private	subnet-52b87435	available	vpc-e7bf8cc   Lab_VPC	10.0.4.0/24 251
Route Tables		Subnet-1-Public	subnet-322ad05e	available	vpc-e7bf8cc   Lab_VPC	10.0.1.0/24 251
Internet Gateways		Subnet-3-Private	subnet-fb2cd6a7	available	vpc-e7bf8cc   Lab_VPC	10.0.3.0/24 251
Egress Only Internet Gateways		Subnet-2-Public	subnet-06b07c61	available	vpc-e7bf8cc   Lab_VPC	10.0.2.0/24 251

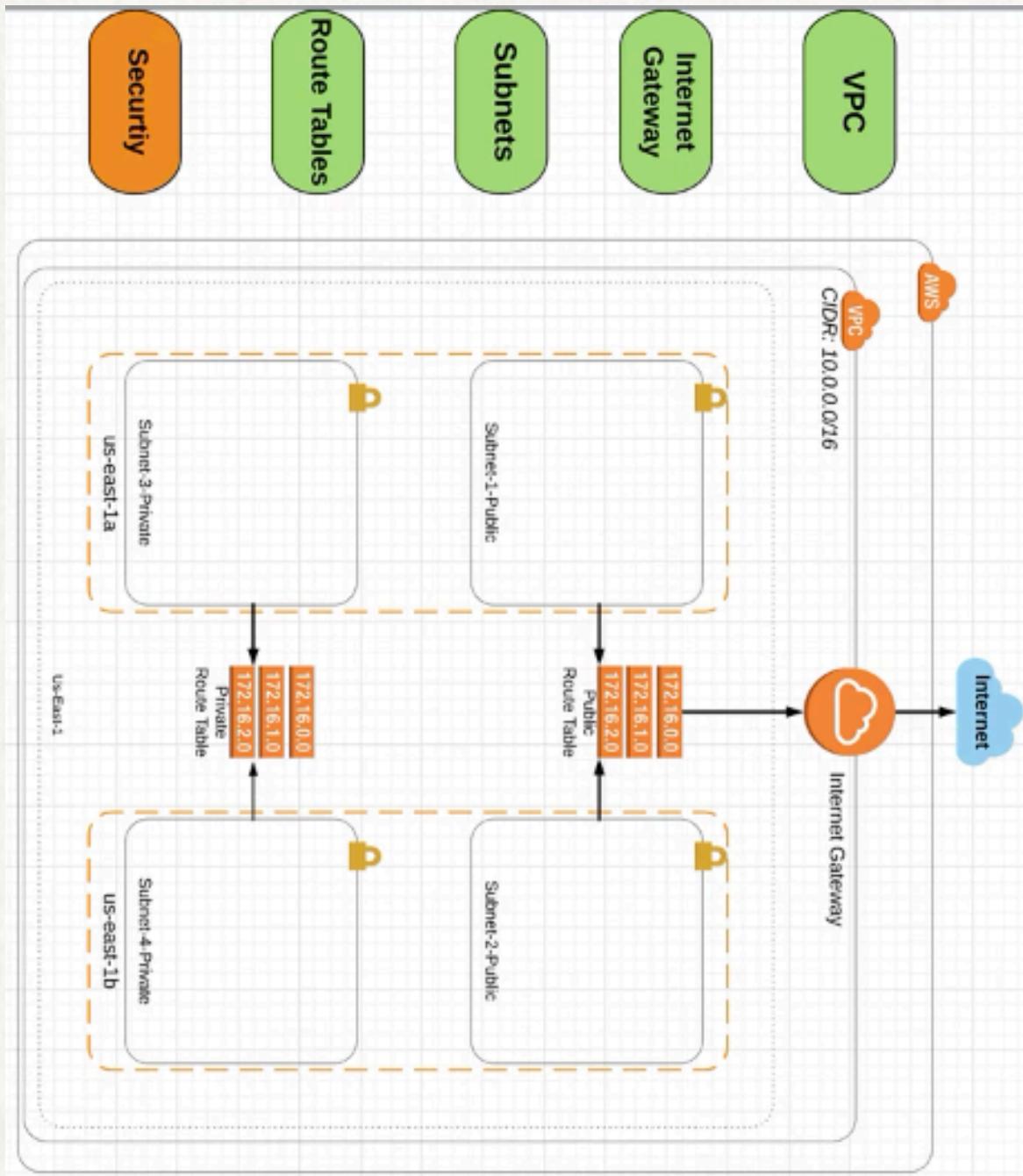
2 Public & 2 Private Subnets

# VPC, IGW & SUBNETS WERE CREATED



Continue with Route Tables

# CREATE 2 ROUTE TABLES



## 1. Public & 1. Private Route Tables

# STEP-1 PUBLIC ROUTE TABLE

The screenshot shows the AWS VPC Dashboard. In the top right corner, there are three buttons: "Create Route Table" (highlighted in blue), "Delete Route Table", and "Set As Main Table". Below these buttons is a search bar labeled "Select a VPC". A dropdown menu titled "Virtual Private Cloud" is open, showing a single item: "vpc-e7bf8c9c | Lab\_VPC". To the right of the dropdown is a "Main" button with a dropdown arrow and a "VPC" button.

The main content area is titled "Create Route Table". It contains a text box with the placeholder "A route table specifies how packets are forwarded between the subnets within your VPC, the Internet, and your VPN connection." Below this text box are two input fields:

- "Name tag": The input field contains "Public-RouteTable".
- "VPC": The input field contains "vpc-e7bf8c9c | Lab\_VPC".

At the bottom of the "Create Route Table" dialog are two buttons: "Cancel" and "Yes, Create" (highlighted in blue).

On the left side of the dashboard, there is a sidebar with several links:

- VPC Dashboard
- Create Route Table
- Delete Route Table
- Set As Main Table
- Filter by VPC:
- Select a VPC
- Virtual Private Cloud
- Your VPCs
- Subnets
- Route Tables
- Internet Gateways
- Egress Only Internet Gateways
- DHCP Options Sets
- Elastic IPs
- Endpoints

Public Route Table

# STEP-2 : PRIVATE ROUTE TABLE

The screenshot shows the AWS VPC Dashboard with the following interface elements:

- Top Bar:** Contains "VPC Dashboard", "Create Route Table" (highlighted in blue), "Delete Route Table", "Set As Main Table", and a search bar.
- Left Sidebar:** Lists navigation items: "Virtual Private Cloud", "Your VPCs", "Subnets", "Route Tables", "Internet Gateways", "Egress Only Internet Gateways", "DHCP Options Sets", "Elastic IPs", "Endpoints", "Endpoint Services", "NAT Gateways", "Peering Connections", and "Security".
- Main Content Area:**
  - A modal window titled "Create Route Table" is open, containing:
    - A descriptive text: "A route table specifies how packets are forwarded between the subnets within your VPC, the Internet, and your VPN connection."
    - Input fields: "Name tag" (set to "Private-RouteTable") and "VPC" (set to "vpc-e7bf8c9c | Lab\_VPC").
    - Buttons: "Cancel" and "Yes, Create" (highlighted in blue).
  - A table titled "Search Route Tables and their X" showing one result:

Name	Route Table ID	Explicitly Associated	Main	VPC
vpc-e7bf8c9c   Lab_VPC	rtt-00000000	None	Yes	vpc-e7bf8c9c

Private Route Table

# ROUTES TRAFFIC VIA IGW

**VPC Dashboard**

Filter by VPC:

**Create Route Table** **Delete Route Table** **Set As Main Table**

**Virtual Private Cloud**

**Your VPCs**

- PublicRouteTable rtb-7a6c2705 0 Subnets No vpc-e7e8f0c | Lab\_VPC
- PrivateRouteTable rtb-aef229d0 0 Subnets No vpc-e7e8f0c | Lab\_VPC

**Subnets**

**Route Tables**

Internet Gateways

Egress Only Internet Gateways

DHCP Options Sets

Elastic IPs

Endpoints

Endpoint Services

MAT Gateways

Pearing Connections

Security

Network ACLs

Security Groups

**VPN Connections**

Customer Gateways

Virtual Private Gateways

**rtb-7a6c2705 | PublicRouteTable**

**Summary** **Routes** **Subnet Associations** **Route Propagation** **Tags**

**Cancel** **Save**

View: All routes

Destination	Target	Status	Propagated	Remove
10.0.0.1/16	local	Active	No	
0.0.0.0/0	Igw-c61ae65be		No	

Add another route

Route IGW on IPV4

# SUBNET ASSOCIATIONS WITH PUBLIC SUBNETS

**VPC Dashboard**

Create Route Table Delete Route Table Set As Main Table

Filter by VPC:  Select a VPC

Search Route Tables and their X

Name	Route Table ID	Explicitly Associated	Main	VPC
rtb-63d141c	0 Subnets	Yes		vpc-e70f859c   Lab_VPC
rtb-a8829d6	0 Subnets	No		vpc-e70f859c   Lab_VPC
<b>rtb-7ac62705</b>	0 Subnets	No		<b>vpc-e70f859c   Lab_VPC</b>

Route Tables

- Internet Gateways
- Egress Only Internet Gateways
- DDoS Options Sets
- Elastic IPs
- Endpoints
- Endpoint Services
- NAT Gateways
- Peering Connections
- Security
- Network ACLs
- Security Groups

**rtb-7ac62705 | Public-RouteTable**

Summary Routes **Subnet Associations** Route Propagation Tags

VPN Connections Customer Gateways Virtual Private Gateways VPN Connections

**Associate** **Subnet** IPv4 CIDR IPv6 CIDR Current Route Table

Associate	Subnet	IPv4 CIDR	IPv6 CIDR	Current Route Table
<input checked="" type="checkbox"/>	subnet-322ad06e   Subnet-1-Public	10.0.1.0/24	-	Main
<input checked="" type="checkbox"/>	subnet-0d07cc61   Subnet-2-Public	10.0.2.0/24	-	Main
<input type="checkbox"/>	subnet-fb5cd6a7   Subnet-3-Private	10.0.3.0/24	-	Main
<input type="checkbox"/>	subnet-52bb7455   Subnet-4-Private	10.0.4.0/24	-	Main

Click on Public Subnet 1 & 2

# NO NEED TO ROUTE WITH PRIVATE SUBNETS

VPC Dashboard

Filter by VPC:

[Create Route Table](#) [Delete Route Table](#) [Set As Main Table](#)

Name	Route Table ID	Explicitly Associated	Main	VPC
rtb-63f5141c	0 Subnets	Yes	vpc-e7fbff9c   Lab_VPC	
Private-RouteTable	rtb-afc829d0	0 Subnets	No	vpc-e7fbff9c   Lab_VPC
Public-RouteTable	rtb-7ae62705	2 Subnets	No	vpc-e7fbff9c   Lab_VPC

Virtual Private Cloud

Your VPCs

Subnets

Route Tables

Internet Gateways

Egress Only Internet Gateways

DHCP Options Sets

Elastic IPs

Endpoints

Endpoint Services

NAT Gateways

Peering Connections

Security

Network ACLs

Security Groups

VPN Connections

Customer Gateways

Virtual Private Gateways

VPN Connections

[Edit](#)

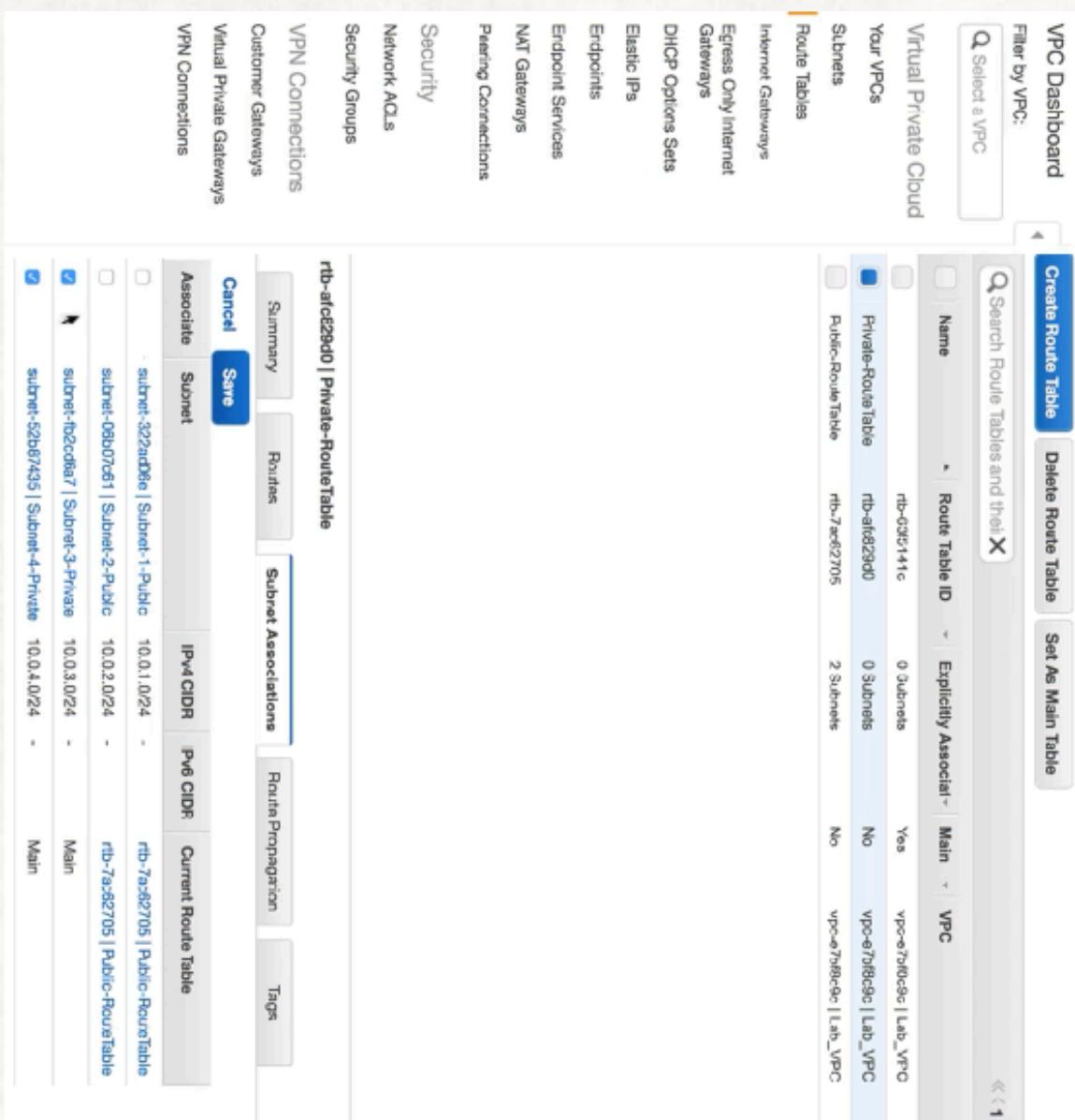
Summary Routes Subnet Associations Route Propagation Tags

View: All rules

Destination	Target	Status	Propagated
10.0.0.0/16	local	Active	No

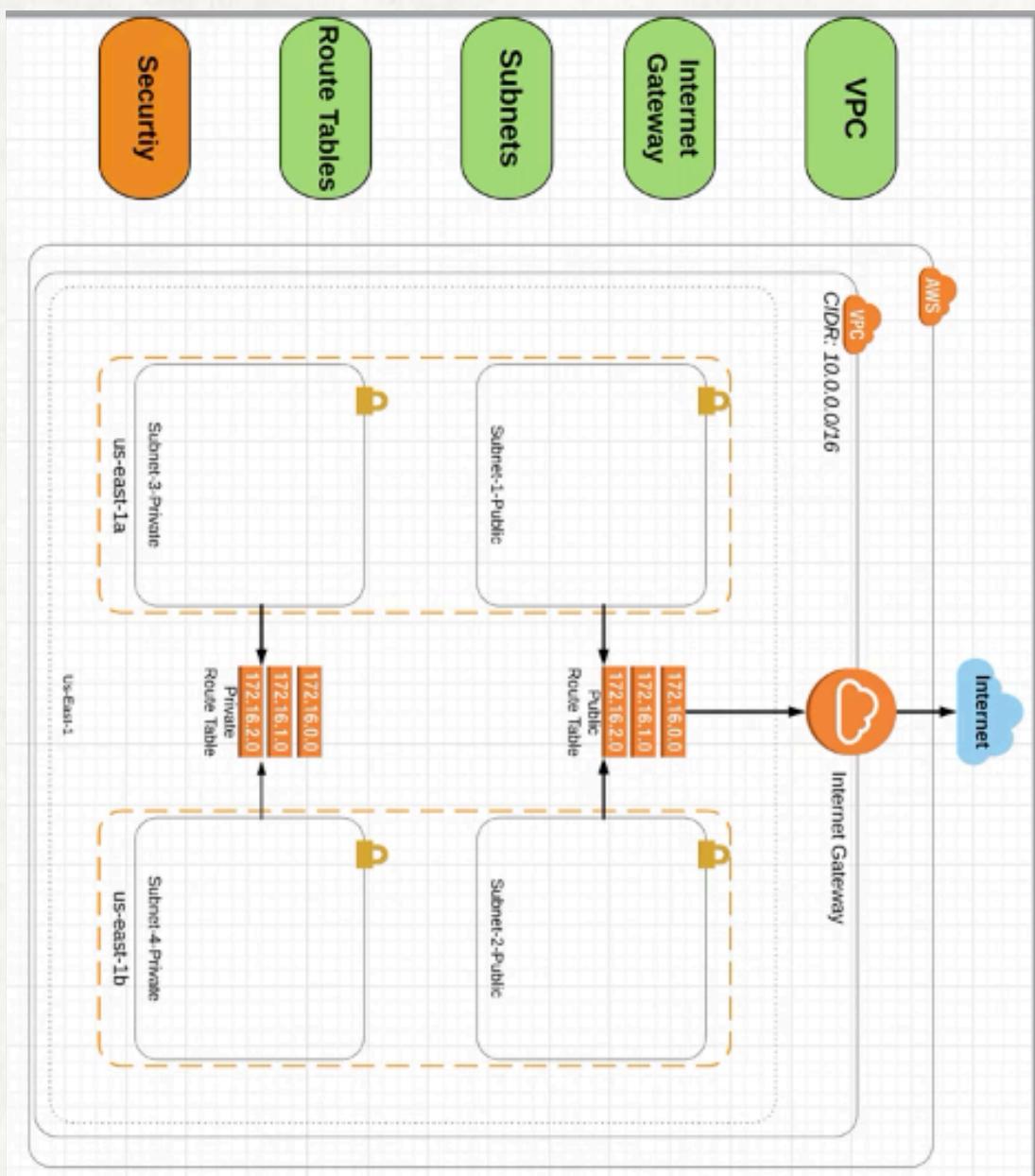
**Click on Subnet Associations**

## ADD SUBNET ASSOCIATIONS WITH PRIVATE SUBNETS



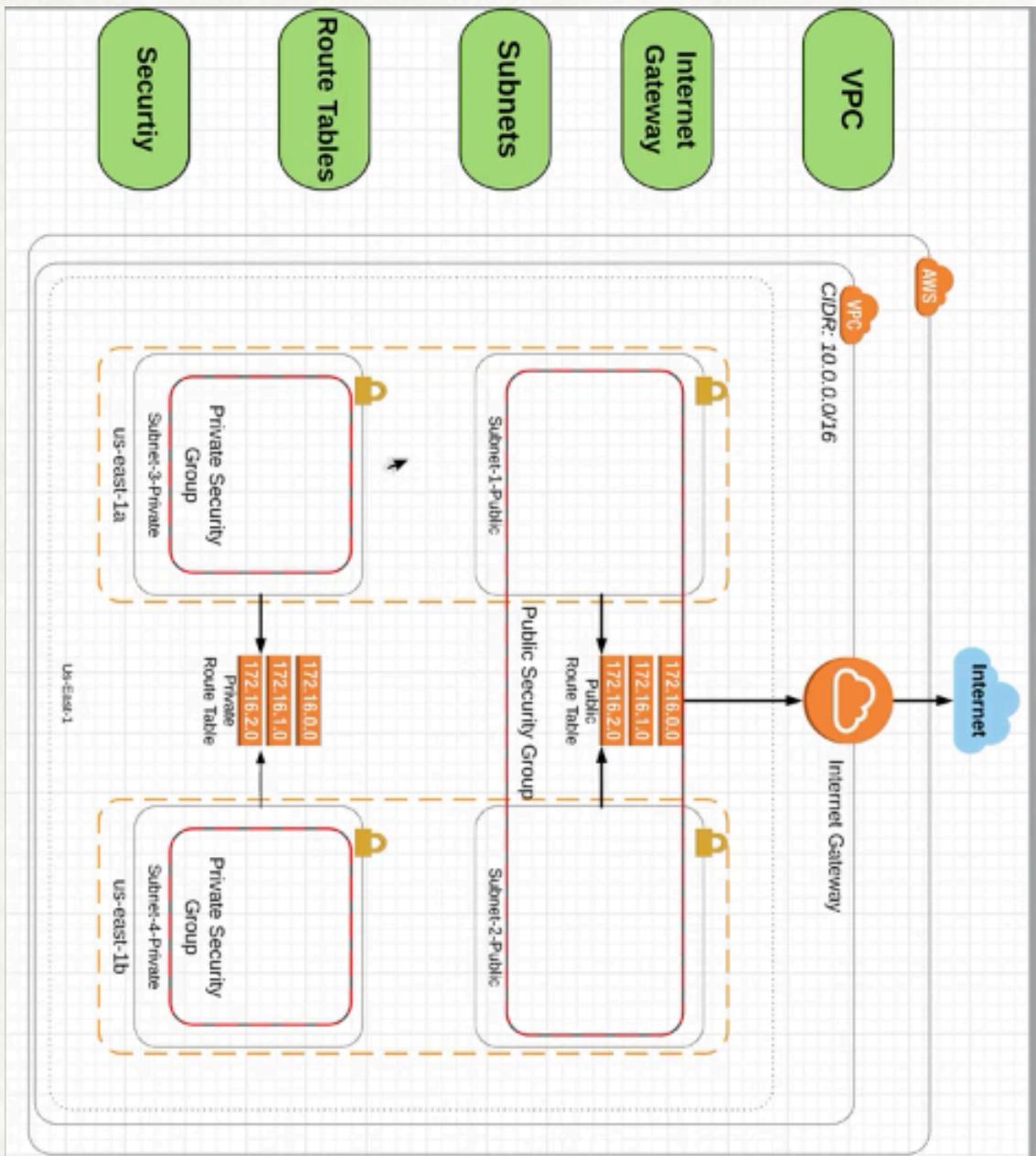
**Click on Save**

# ROUTE TABLES & SUBNETS WERE CREATED SUCCESSFULLY



Route Tables are created

# SECURITY - STATEFUL & STATELESS



Security Groups

# CREATE SECURITY GROUP ON PUBLIC SUBNET

The screenshot shows the AWS VPC Dashboard with the 'Create Security Group' button highlighted. The 'Name tag' field contains 'Lab\_SG'. The 'Group name' field contains 'Lab\_SG'. The 'Description' field contains 'Lab\_SG'. The 'VPC' dropdown is set to 'vpc-2d211c56 | Lab\_VPC'. The 'Create' button is also highlighted.

VPC Dashboard

Create Security Group

Security Group Actions

Filter by VPC:

Select a VPC

Virtual Private Cloud

Name tag

Group ID

Group Name

VPC

Description

Create Security Group

X

Name tag: Lab\_SG

Group name: Lab\_SG

Description: Lab\_SG

VPC: vpc-2d211c56 | Lab\_VPC

Cancel

Next, Create

Subnets

Route Tables

Internet Gateways

Egress Only Internet Gateways

DHCP Options Sets

Elastic IPs

Endpoints

Endpoint Services

NAT Gateways

Peering Connections

Security

Network ACLs

Security Groups

sg-752e0d3d

Stat-full Security Group

# ENABLE THE HTTP PORT PART OF SECURITY GROUP

The screenshot shows the AWS VPC Dashboard with the following details:

**VPC Dashboard**

**Virtual Private Cloud**

**Your VPCs**

- Lab\_SG (sg-2a701562)
- sg-753ea43d (default)

**Create Security Group**

**Security Group Actions**

**Filter by VPC:** Select a VPC

**Filter All security groups**

**Search Security Groups and t X**

**<< 1 to 2 of 2 Security**

Name tag	Group ID	Group Name	VPC	Description
Lab_SG	sg-2a701562	Lab_SG	vpc-2d211c56   Lab_VPC	Lab_SG

**Virtual Private Cloud**

**Route Tables**

**Internet Gateways**

**Egress Only Internet Gateways**

**DHCP Options Sets**

**Elastic IPs**

**Endpoints**

**Endpoint Services**

**NAT Gateways**

**Peering Connections**

**Security**

**Network ACLs**

**Security Groups**

**VPN Connections**

**Customer Gateways**

**Virtual Private Gateways**

**VPN Connections**

**Inbound Rules**

**Summary**

**Cancel**

**Save**

**Type**: HTTP (80)

**Protocol**: TCP (6)

**Port Range**: 80

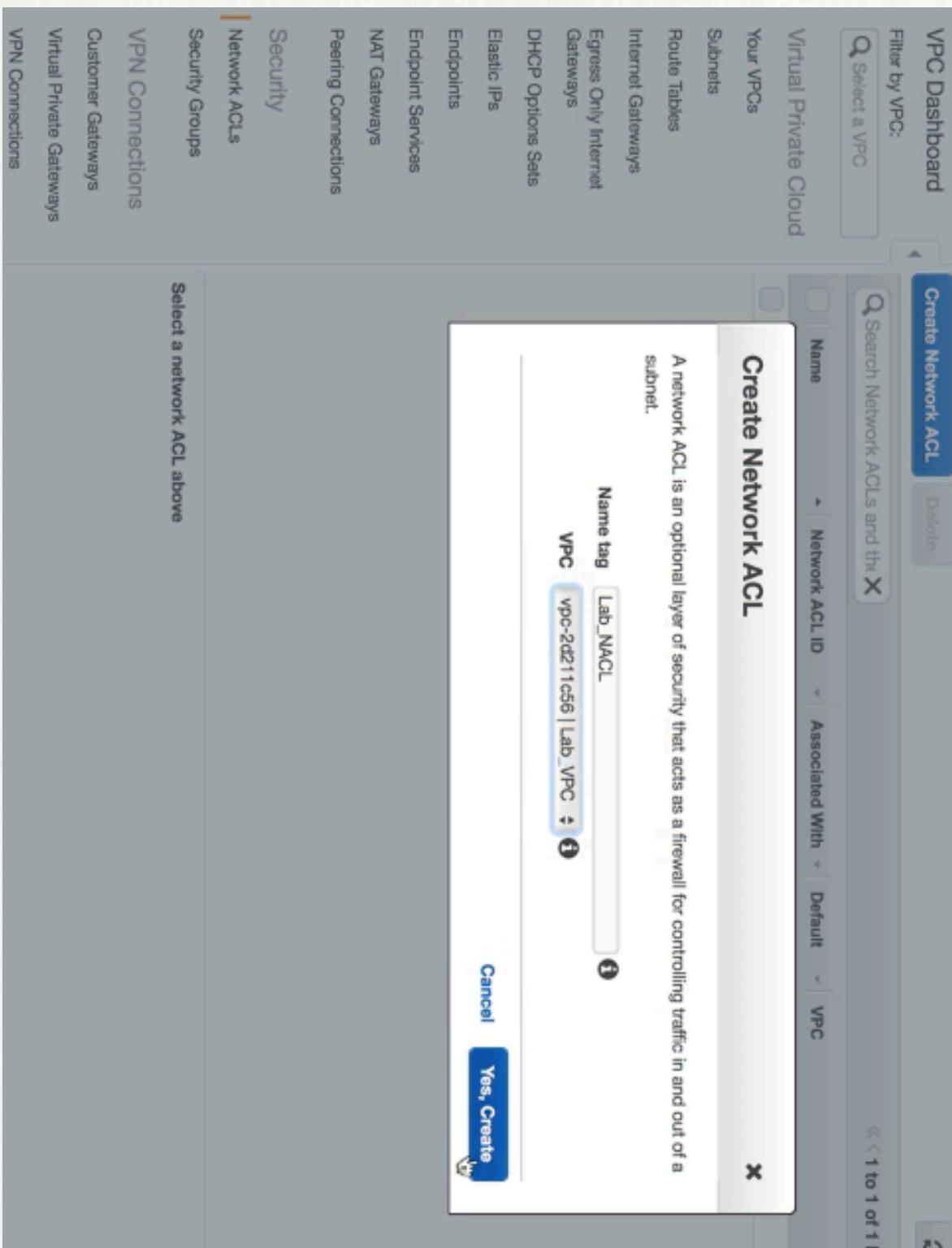
**Source**: 0.0.0.0/0

**Description**: Web Traffic

**Add another rule**

**Click on Save**

# LET'S CREATE NAACL



NACL

# ALL HTTP PORT ON NACL

VPC Dashboard

Create Network ACL

Delete

Filter by VPC:

Select a VPC

Virtual Private Cloud

Your VPCs

Subnets

Route Tables

Internet Gateways

Egress Only Internet Gateways

DHCP Options Sets

Basic IPs

Endpoints

Endpoint Services

NAT Gateways

Peering Connections

Security

Network ACLs

Security Groups

VPN Connections

Customer Gateways

Virtual Private Gateways

VPN Connections

**Edit**

View: All rules 4

Rule #	Type	Protocol	Port Range	Source	Allow / Deny
100	HTTP (80)	TC>(8)	80	0.0.0.0/0	ALLOW
*	All Traffic	All	All	0.0.0.0/0	DENY

aci-6c059777 | Lab\_NACL

Summary Inbound Rules Outbound Rules Subnet Associations Tags

Allows inbound traffic. Because network ACLs are stateless, you must create inbound and outbound rules.

Under Inbound Rules

# ALLOW PORT HTTP IN NACL

**VPC Dashboard**

Filter by VPC:

**Virtual Private Cloud**

**Your VPCs**

- Lab\_NACL
- 83-7575e70f

Name	Network ACL ID	Associated With	Default	VPC
83-7575e70f	4 Subnets	Yes	No	vpc-20211056   Lab_VPC
Lab_NACL	83-60D59117	0 Subnets	No	vpc-20211056   Lab_VPC

**Subnets**

**Route Tables**

**Internet Gateways**

Egress Only Internet Gateways

**DHCP Options Sets**

**Elastic IPs**

**Endpoints**

**Endpoint Services**

**NAT Gateways**

**Peering Connections**

**Security**

**Network ACLs**

**Security Groups**

**VPN Connections**

**Customer Gateways**

**Virtual Private Gateways**

**VPN Connections**

**Create Network ACL** **Delete**

**act-6d059717 | Lab\_NACL**

**Summary** **Inbound Rules** **Outbound Rules** **Subnet Associations** **Tags**

Allows outbound traffic. Because network ACLs are stateless, you must create inbound and outbound rules.

**Edit** **Save Successful**

**View:** All rules

Rule #	Type	Protocol	Port Range	Destination	Allow / Deny
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	ALLOW
*	All Traffic	All	All	0.0.0.0/0	DENY

Under Outbound Rules

# PUBLIC SUBNET ASSOCIATIONS WITH NAACL'S

Virtual Private Cloud						
Your VPCs						
Name	Network ACL ID	Associated With	Default	VPC		
Lab_NACL	aci-1515ba7ff	4 Subnets	Yes	vpc-20211c5b   Lab_VPC		
Subnets	aci-4d05971f	0 Subnets	No	vpc-20211c5b   Lab_VPC		
Route Tables						
Internet Gateways						
Egress Only Internet Gateways						
NAT Gateways						
DHCP Options Sets						
Elastic IPs						
Endpoints						
Endpoint Services						
NAT Gateways						
Peering Connections						
Security Groups						
Network ACLs						
aci-4d05971f   Lab_NACL						
VPN Connections						
Customer Gateways						
Virtual Private Gateways						
VPN Connections						
Customer Gateways						
Virtual Private Gateways						
Security Groups						
Network ACLs						
aci-4d05971f   Lab_NACL						
aci-7575e7f4   Current Network ACL						
Associate	Subnet	IPv4 CIDR	IPv6 CIDR			
<input checked="" type="checkbox"/>	subnet-bc67abdb   Subnet-1-Public	10.0.1.0/24	-	aci-7575e7f4		
<input checked="" type="checkbox"/>	subnet-10498f6e   Subnet-2-Public	10.0.2.0/24	-	aci-7575e7f4		
<input type="checkbox"/>	subnet-fc62e0b9   Subnet-3-Private	10.0.3.0/24	-	aci-7575e7f4		
<input type="checkbox"/>	subnet-445c996a   Subnet-4-Private	10.0.4.0/24	-	aci-7575e7f4		

## Public Subnets with NACL's