

# Lab 02

## CLOUD COMPUTING

CS-4075

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**Section:** SE-A

**Due Date:** Oct 15, 2023



# Cloud Computing

## Lab – 02

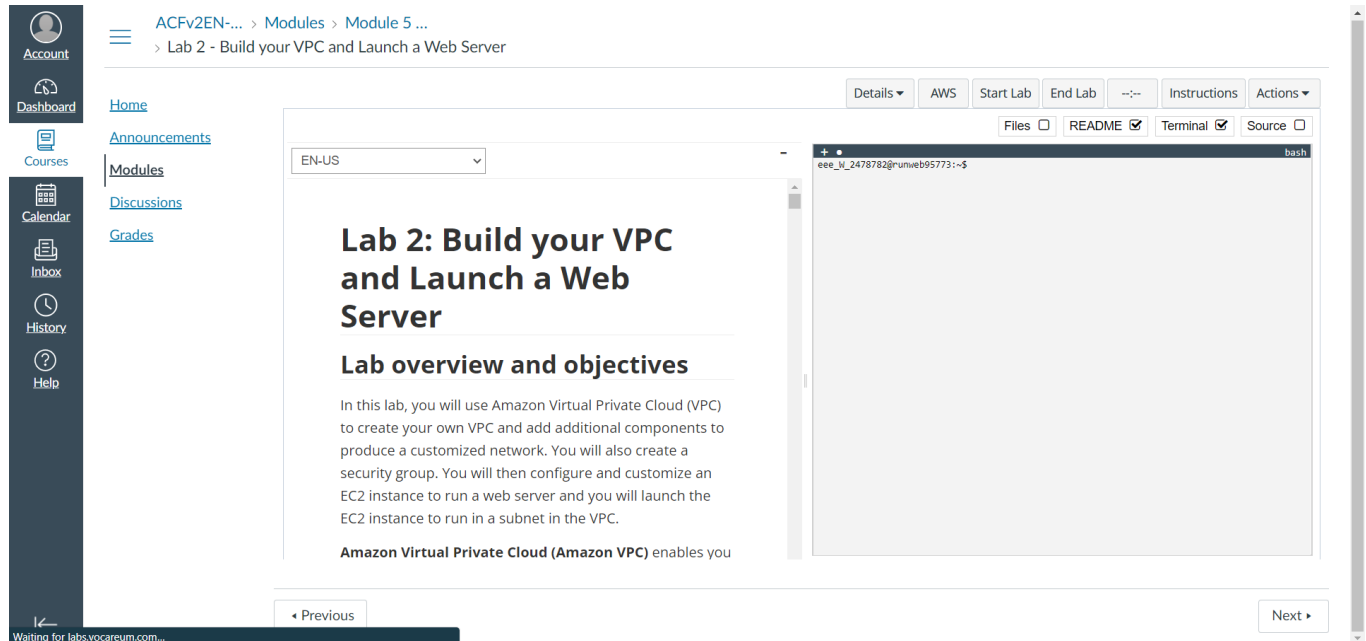


Figure 1: Access to lab resources

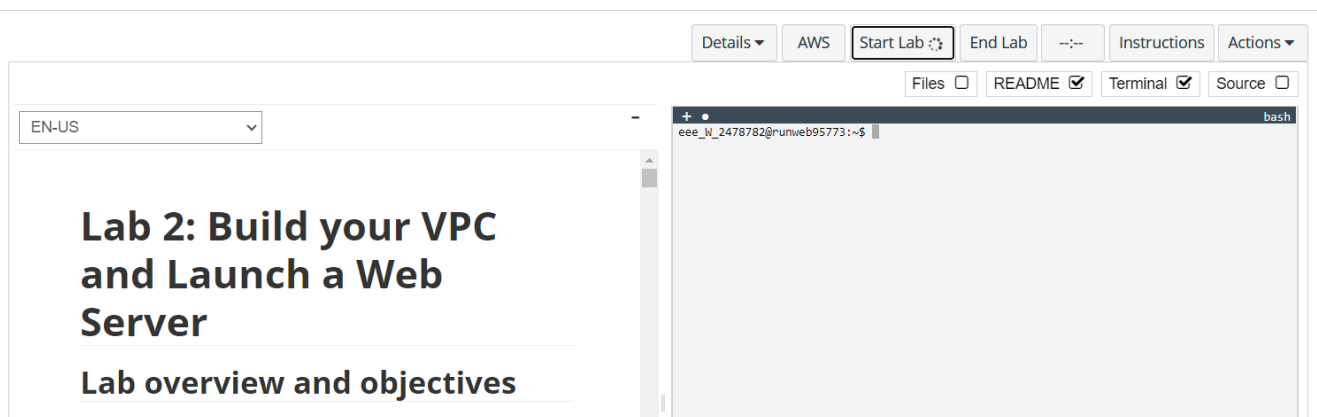


Figure 2: start the lab.

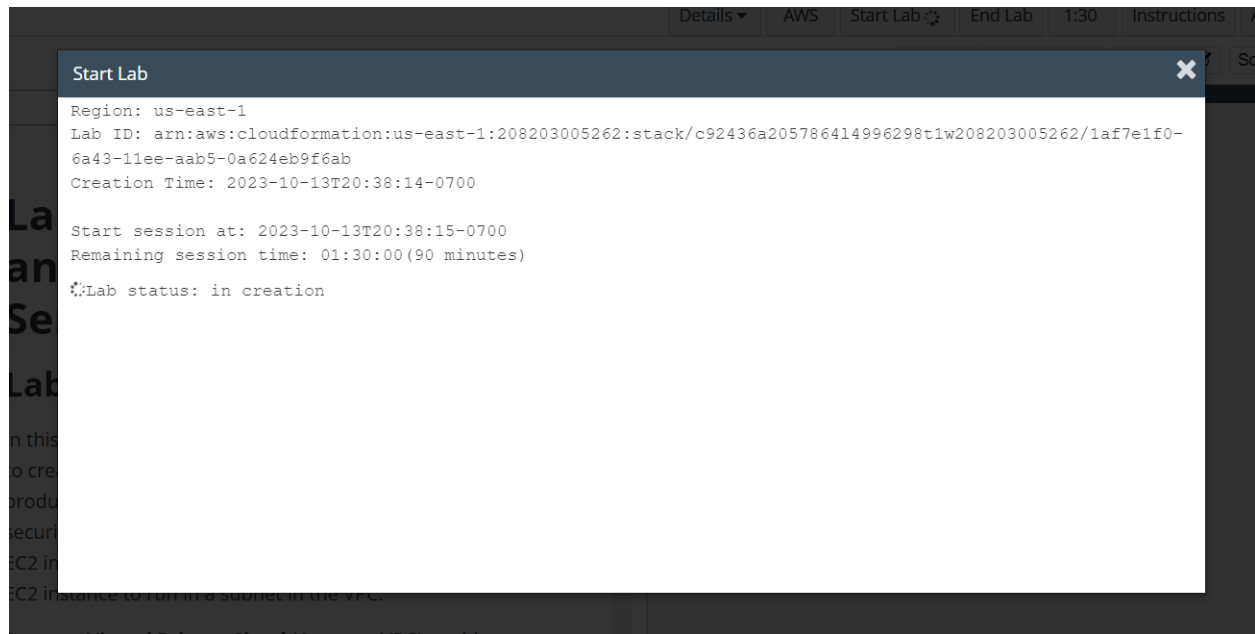


Figure 3: lab is in creation stge.

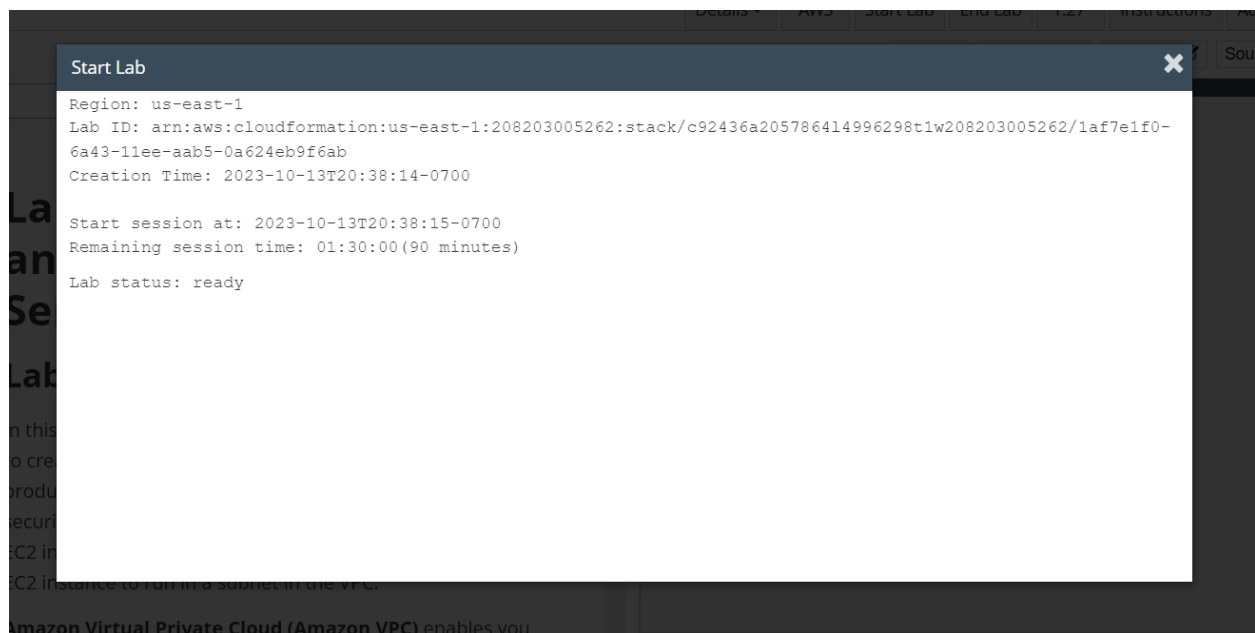


Figure 4: Lab is ready to use.

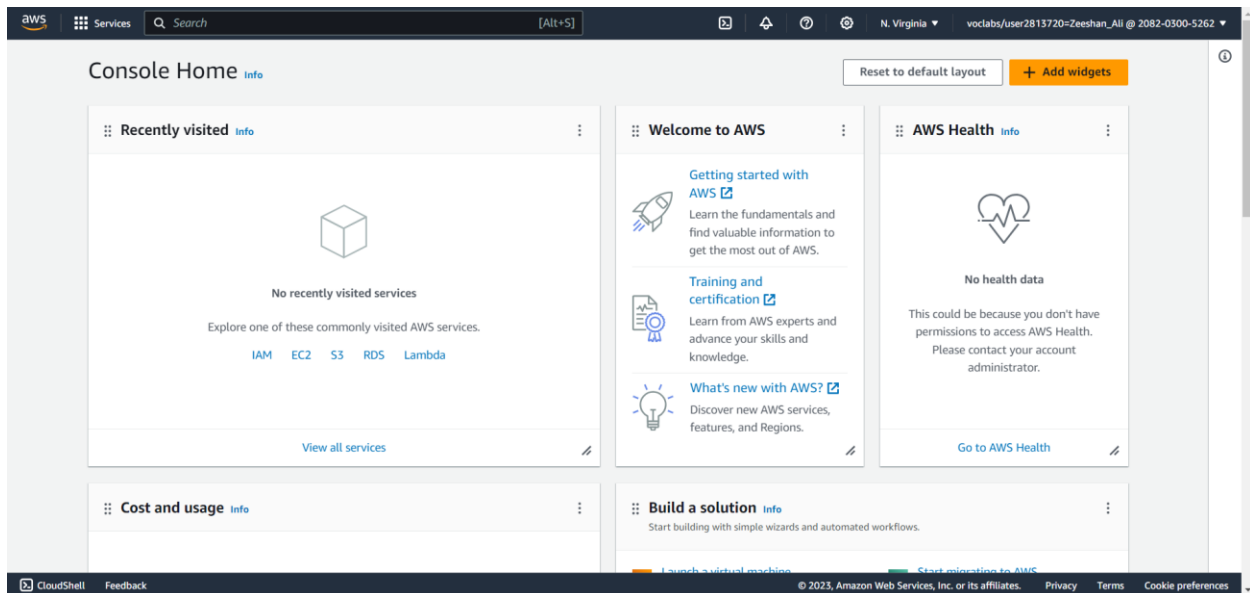


Figure 5: AWS DASHBOARD

## Task 01:

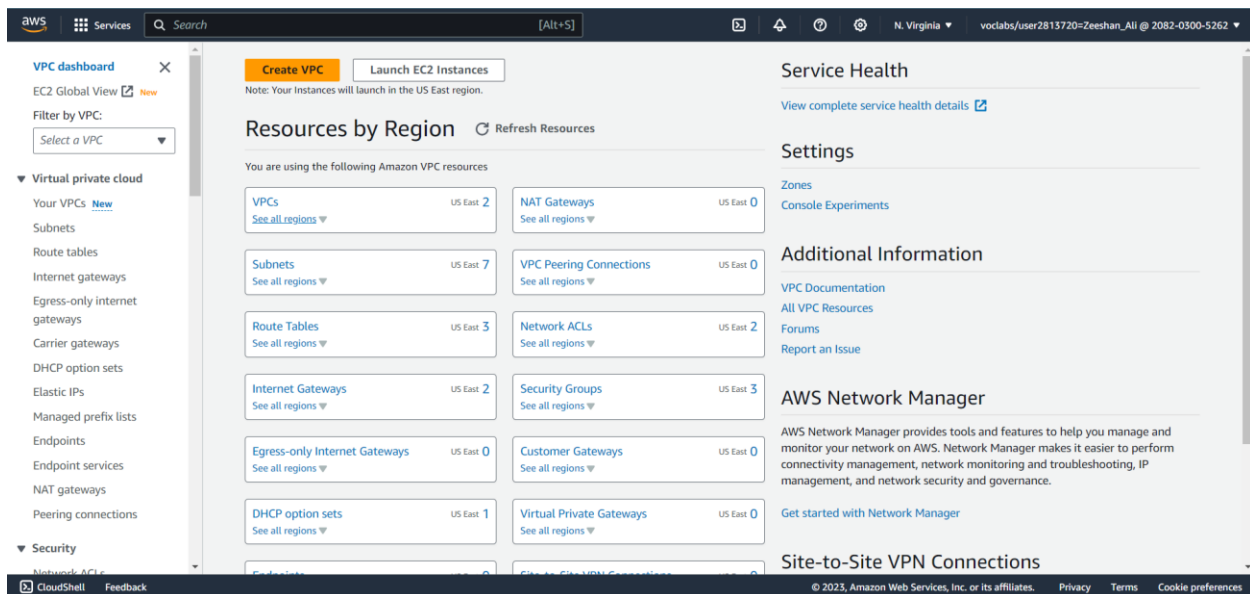


Figure 6: Select to create VPC.

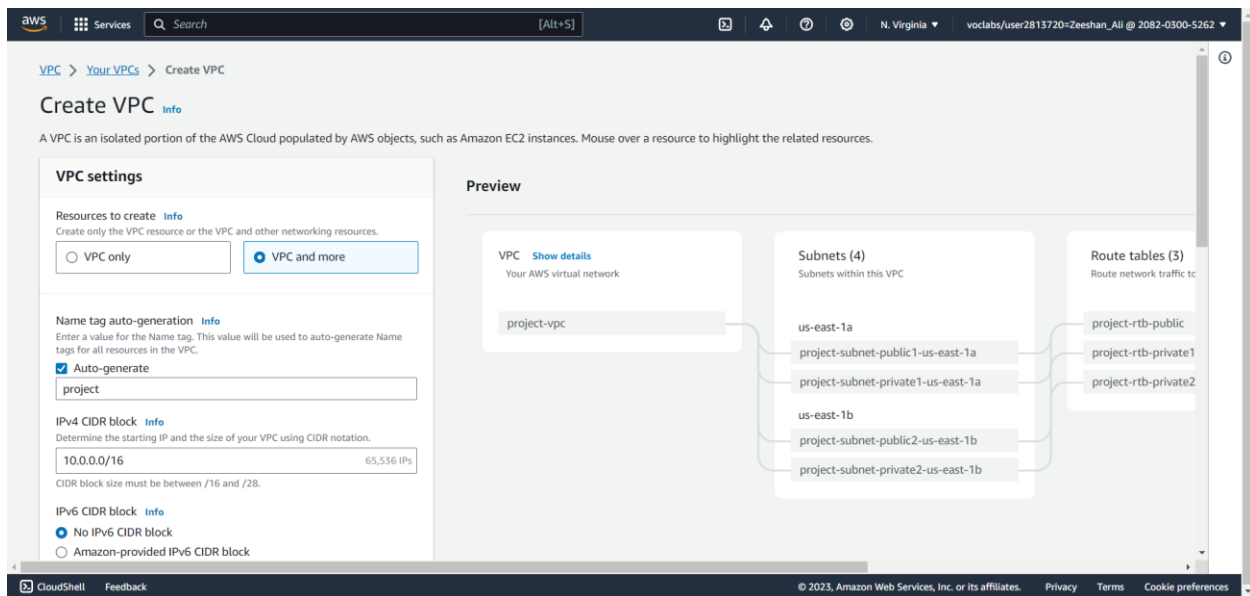


Figure 7: create VPC DASHBOARD.

### 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 auto-generation** [Info](#)

Enter a value for the Name tag. This value will be used to auto-generate Name tags for all resources in the VPC.

☒ Auto-generate

**IPv4 CIDR block** [Info](#)

Determine the starting IP and the size of your VPC using CIDR notation.

65,536 IPs

CIDR block size must be between /16 and /28.

**IPv6 CIDR block** [Info](#)

☒ No IPv6 CIDR block
 ☐ Amazon-provided IPv6 CIDR block

**Tenancy** [Info](#)

Figure 8: Enter the details to create VPC.

### Number of Availability Zones (AZs) [Info](#)

Choose the number of AZs in which to provision subnets. We recommend at least two AZs for high availability.

1	2	3
---	---	---

#### ▼ Customize AZs

First availability zone

us-east-1a ▼

### Number of public subnets [Info](#)

The number of public subnets to add to your VPC. Use public subnets for web applications that need to be publicly accessible over the internet.

0	1
---	---

### Number of private subnets [Info](#)

The number of private subnets to add to your VPC. Use private subnets to secure backend resources that don't need public access.

0	1	2
---	---	---

#### ▼ Customize subnets CIDR blocks

Public subnet CIDR block in us-east-1a

10.0.0.0/24 256 IPs

Private subnet CIDR block in us-east-1a

10.0.1.0/24 256 IPs

Figure 9: Enter and select the details to create VPC.

### NAT gateways (\$) [Info](#)

Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway

None	In 1 AZ	1 per AZ
------	---------	----------

### VPC endpoints [Info](#)

Endpoints can help reduce NAT gateway charges and improve security by accessing S3 directly from the VPC. By default, full access policy is used. You can customize this policy at any time.

None	S3 Gateway
------	------------

### DNS options [Info](#)

- ☒ Enable DNS hostnames
- ☒ Enable DNS resolution

Figure 10: Selecting the details to create VPC.

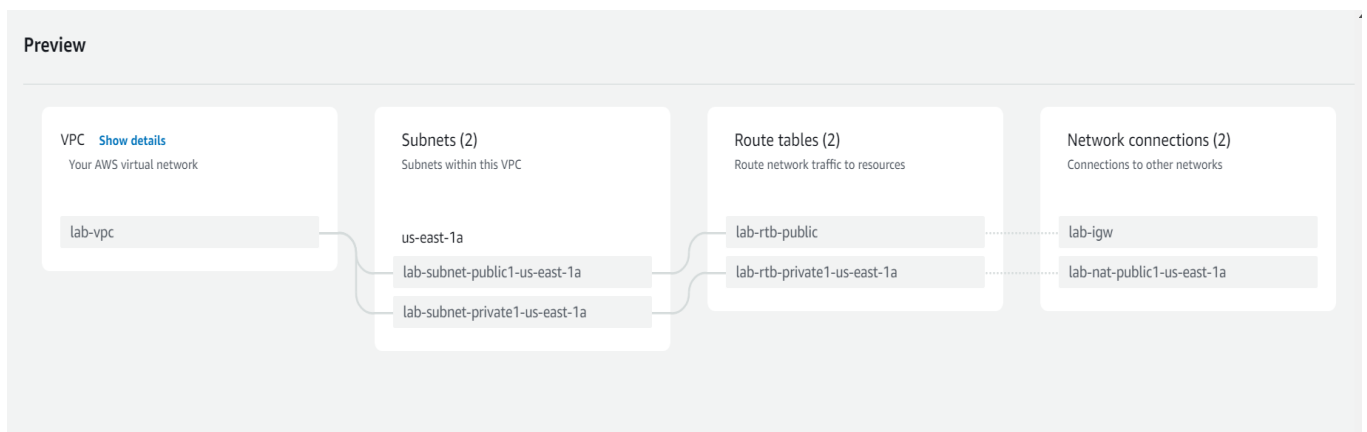


Figure 11: Preview the details before creating the VPC.

## Create VPC workflow

✔ Success

### ▼ Details

- ✔ Create VPC: [vpc-0158a1313a6caa43b](#) 
- ✔ Enable DNS hostnames
- ✔ Enable DNS resolution
- ✔ Verifying VPC creation: [vpc-0158a1313a6caa43b](#) 
- ✔ Create subnet: [subnet-0576a0aa6a0e853da](#) 
- ✔ Create subnet: [subnet-0cb9de6af8696b650](#) 
- ✔ Create internet gateway: [igw-0b7cf97cbeeca2e7b](#) 
- ✔ Attach internet gateway to the VPC
- ✔ Create route table: [rtb-04b02cfd80f7aa324](#) 
- ✔ Create route
- ✔ Associate route table
- ✔ Allocate elastic IP: [eipalloc-09a32c66b69979850](#) 
- ✔ Create NAT gateway: [nat-068439c6ae5d152a2](#) 
- ✔ Wait for NAT Gateways to activate
- ✔ Create route table: [rtb-0a1e5bb8677fedee1](#) 
- ✔ Create route
- ✔ Associate route table
- ✔ Verifying route table creation

Figure 12: VPC is created Successfully.



## Task 02:

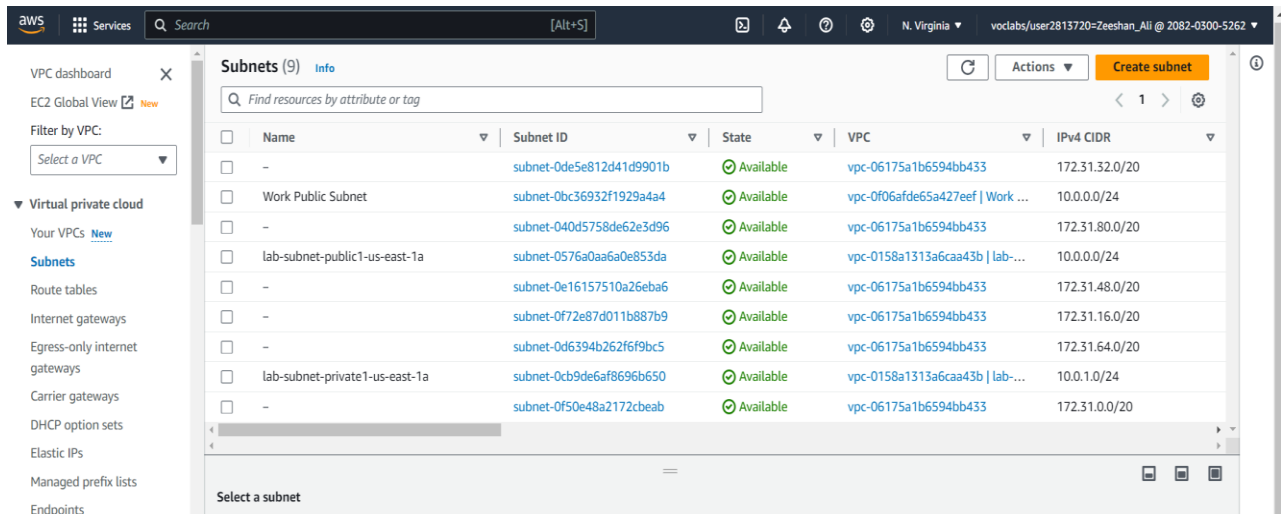


Figure 13: Exploring Subnets DASHBOARD.

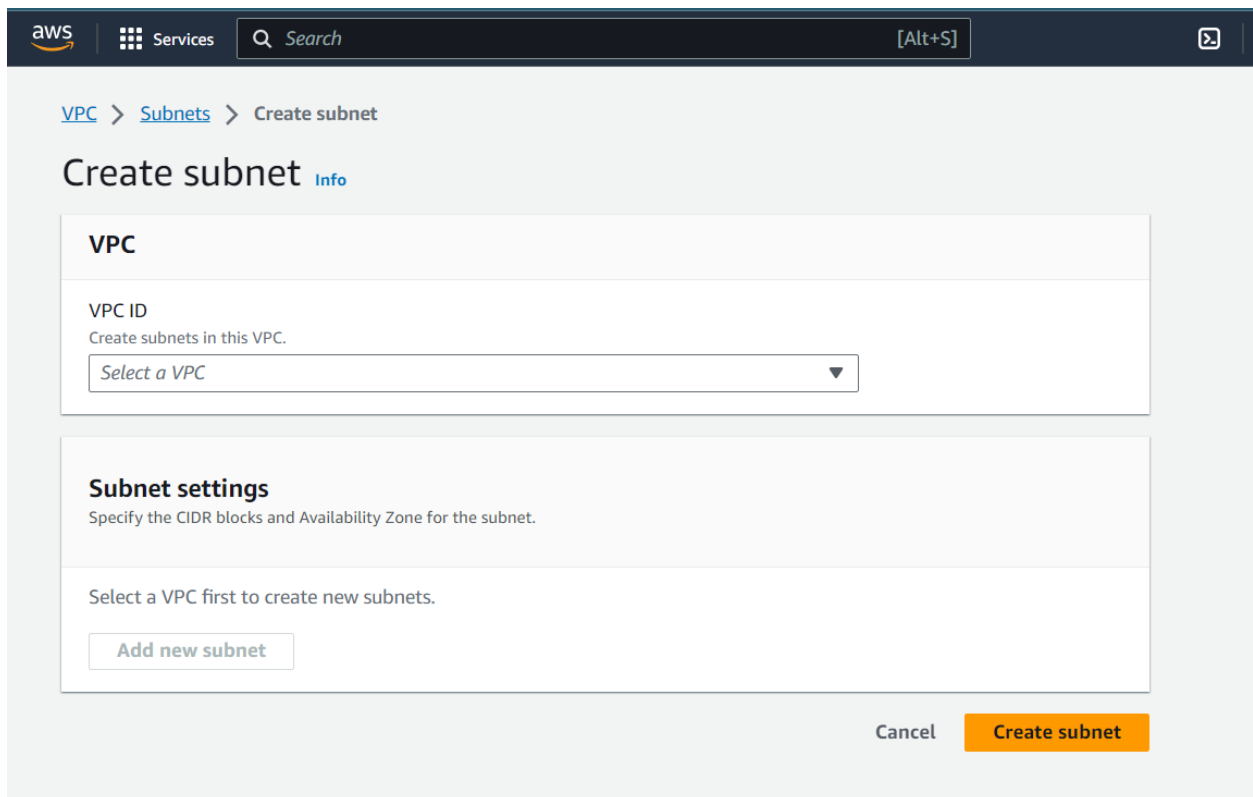


Figure 14: Create subnets interface.

## Create subnet [Info](#)

### VPC

#### VPC ID

Create subnets in this VPC.

vpc-0158a1313a6caa43b (lab-vpc) ▼

#### Associated VPC CIDRs

##### IPv4 CIDRs

10.0.0.0/16

Figure 15: selecting VPC name.

## 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.

lab-subnet-public2

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.

US East (N. Virginia) / us-east-1b ▼

#### IPv4 VPC CIDR block [Info](#)

Choose the IPv4 VPC CIDR block to create a subnet in.

10.0.0.0/16 ▼

#### IPv4 subnet CIDR block

10.0.2.0/24

256 IPs

< > ^ v

#### ▼ Tags - optional

Key

Q Name

X

Value - optional

Q lab-subnet-public2

X

Remove

Figure 16: Add public subnet.

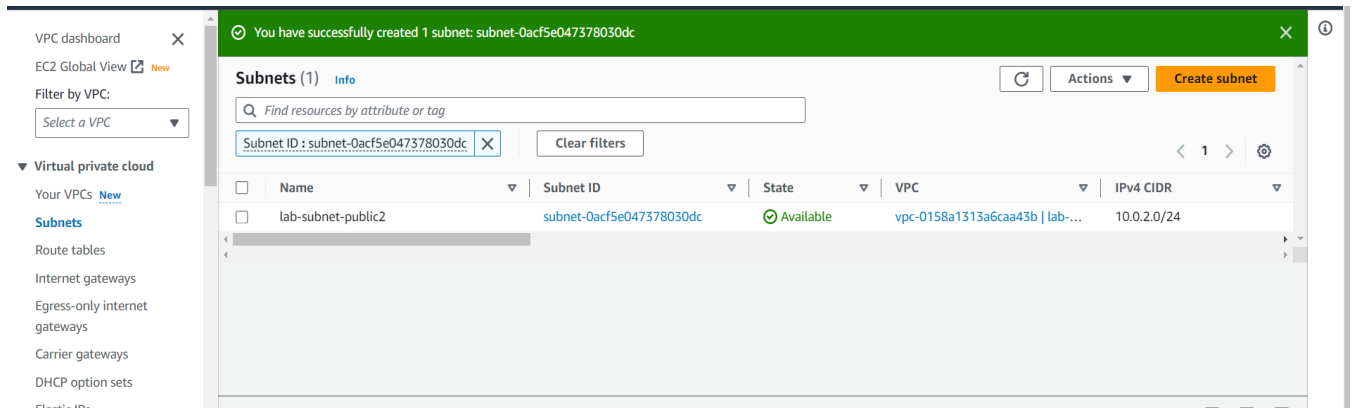


Figure 17: Public subnet added successfully.

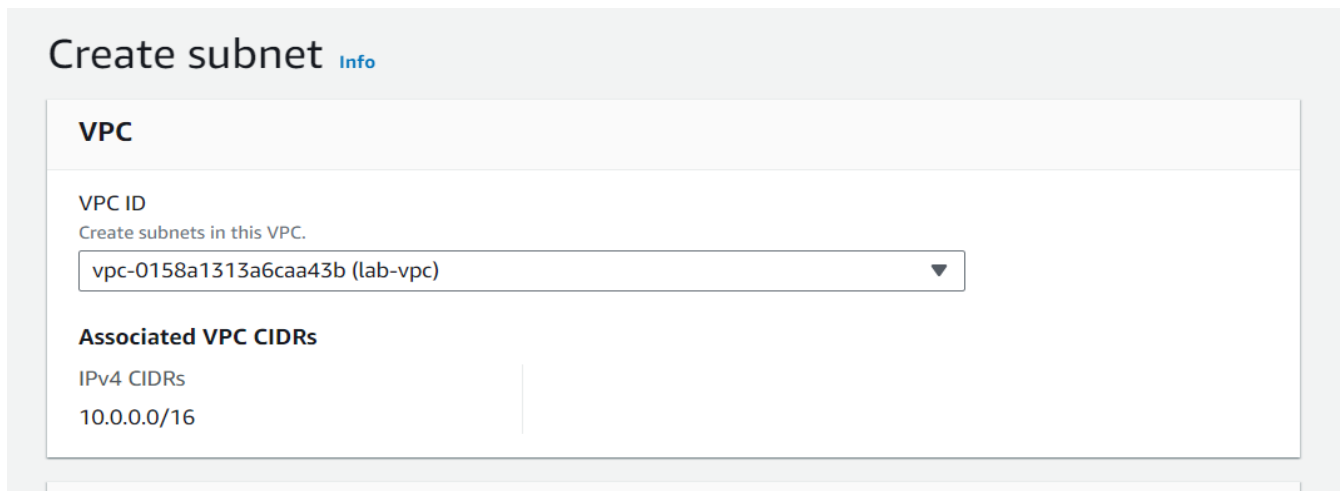


Figure 18: selecting VPC name.

## 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 IPv4 VPC CIDR block to create a subnet in.

#### IPv4 subnet CIDR block

256 IPs

< > ^ v

#### Tags - optional

##### Key

X

##### Value - optional

X

Remove

Figure 18: Add private subnet.

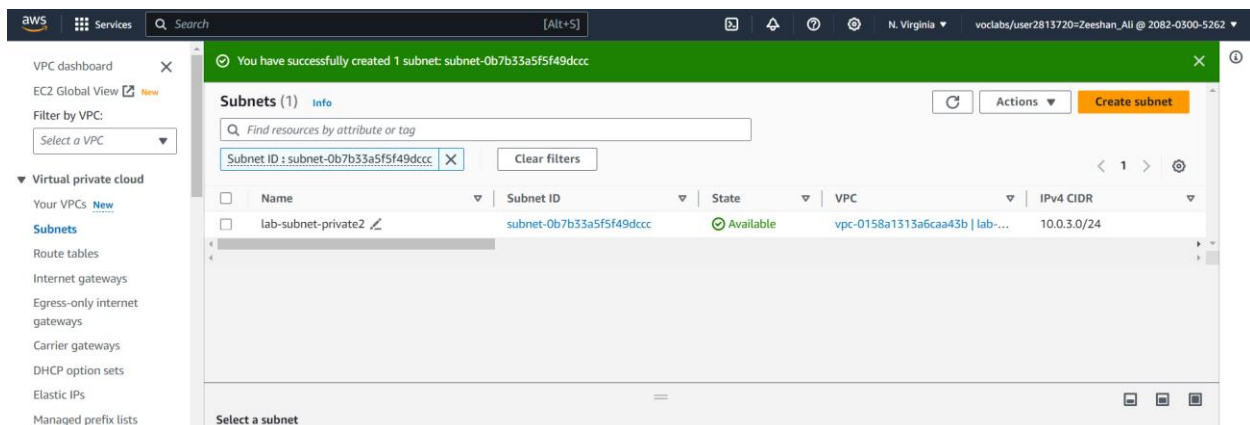


Figure 19: Private subnet added successfully.

VPC dashboard

EC2 Global View New

Filter by VPC: Select a VPC

Virtual private cloud

Your VPCs New

Subnets

Route tables

Internet gateways

Egress-only internet gateways

Carrier gateways

DHCP option sets

Elastic IPs

Managed prefix lists

Endpoints

Endpoint services

NAT gateways

You have successfully created 1 subnet: subnet-0b7b33a5f5f49dccc

Subnets (11) Info

Find resources by attribute or tag

Name	Subnet ID	State	VPC	IPv4 CIDR
-	subnet-0de5e812d41d9901b	Available	vpc-06175a1b6594bb433	172.31.32.0/20
Work Public Subnet	subnet-0bc36932f1929a4a4	Available	vpc-0f06afde65a427eef   Work ...	10.0.0.0/24
-	subnet-040d5758de62e3d96	Available	vpc-06175a1b6594bb433	172.31.80.0/20
lab-subnet-public1-us-east-1a	subnet-0576a0aa6a0e853da	Available	vpc-0158a1313a6caa43b   lab-...	10.0.0.0/24
-	subnet-0e16157510a26eba6	Available	vpc-06175a1b6594bb433	172.31.48.0/20
-	subnet-0f72e87d011b887b9	Available	vpc-06175a1b6594bb433	172.31.16.0/20
-	subnet-0d6394b262f6f9bc5	Available	vpc-06175a1b6594bb433	172.31.64.0/20
lab-subnet-private1-us-east-1a	subnet-0cb9de6af8696b650	Available	vpc-0158a1313a6caa43b   lab-...	10.0.1.0/24
-	subnet-0f50e48a2172cbeab	Available	vpc-06175a1b6594bb433	172.31.0.0/20
lab-subnet-public2	subnet-0ac5e047378030dc	Available	vpc-0158a1313a6caa43b   lab-...	10.0.2.0/24
lab-subnet-private2	subnet-0b7b33a5f5f49dccc	Available	vpc-0158a1313a6caa43b   lab-...	10.0.3.0/24

Figure 20: All listed subnets are in the VPC.

aws Services Search [Alt+S]

N. Virginia voclabs/user2813720=Zeeshan\_Ali @ 2082-0300-5262

VPC dashboard

EC2 Global View New

Filter by VPC: Select a VPC

Virtual private cloud

Your VPCs New

Subnets

Route tables

Internet gateways

Egress-only internet gateways

Carrier gateways

DHCP option sets

Elastic IPs

Managed prefix lists

Endpoints

Route tables (6) Info

Find resources by attribute or tag

Name	Route table ID	Explicit subnet associati...	Edge associations	Main	VPC
-	rtb-00c0aba6ce7efd8b3	-	-	Yes	vpc-0f06afde65a427eef
-	rtb-0c912659283b4e7ca	-	-	Yes	vpc-06175a1b6594bb4...
lab-rtb-public	rtb-04b02cf80f7aa324	subnet-0576a0aa6a0e85...	-	No	vpc-0158a1313a6caa43
Work Public Route Table	rtb-065eeca9cd65cc53	subnet-0bc36932f1929a...	-	No	vpc-0f06afde65a427eef
lab-rtb-private1-us-east-1a	rtb-0a1e5bb8677fedee1	subnet-0cb9de6af8696b...	-	No	vpc-0158a1313a6caa43
-	rtb-031f2d9c6b4e85ce8	-	-	Yes	vpc-0158a1313a6caa43

Select a route table

Figure 21: Route Table Dashboard.

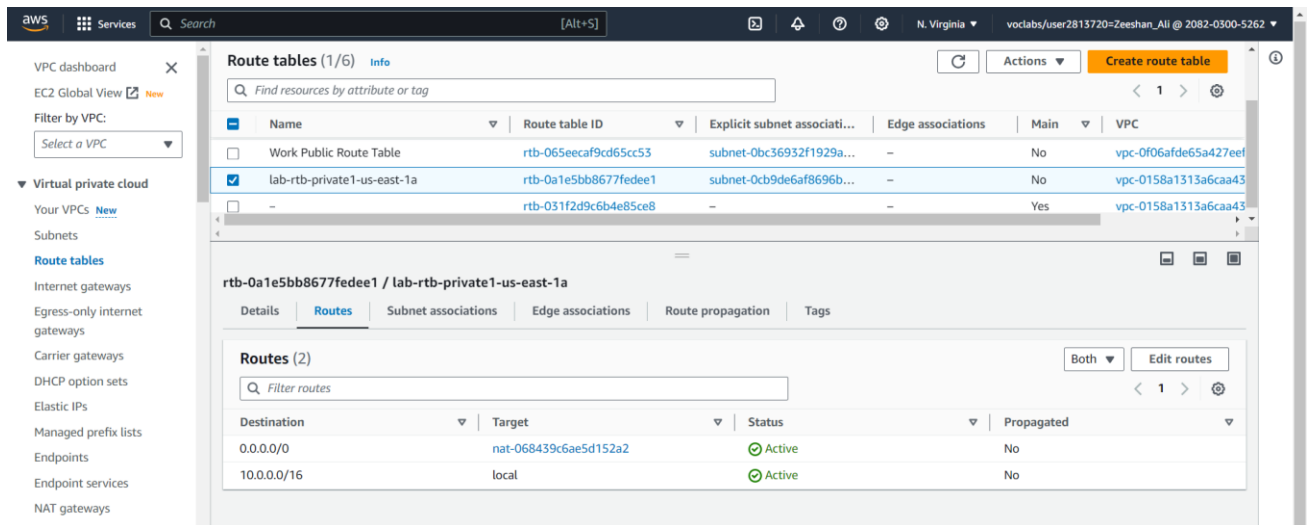


Figure 22: View the routes details of the private subnet.

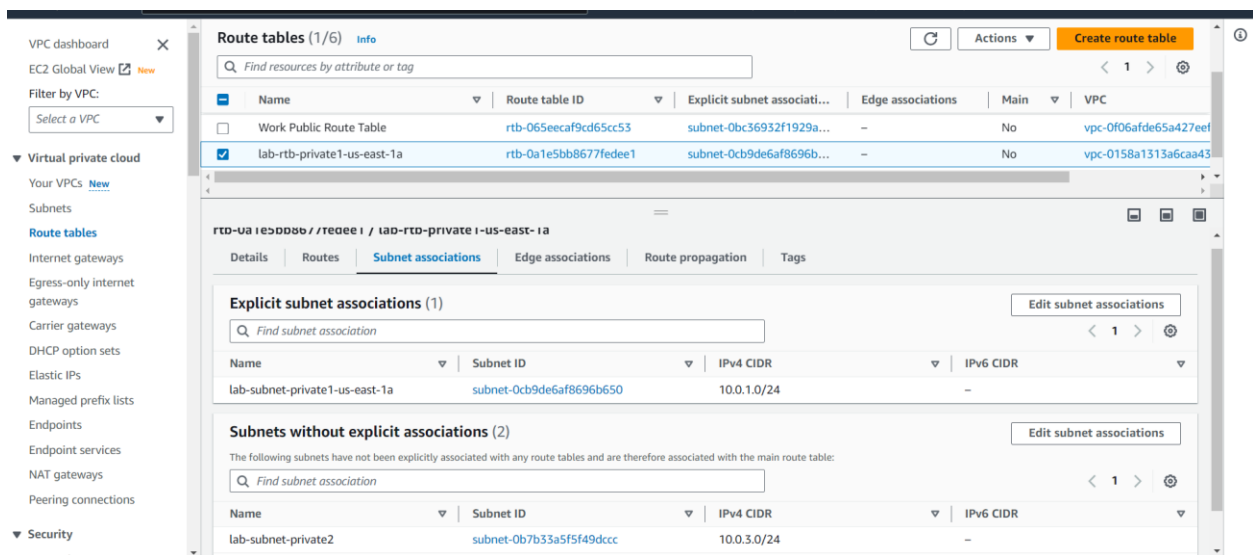


Figure 23: View the subnet association details of the private subnet.

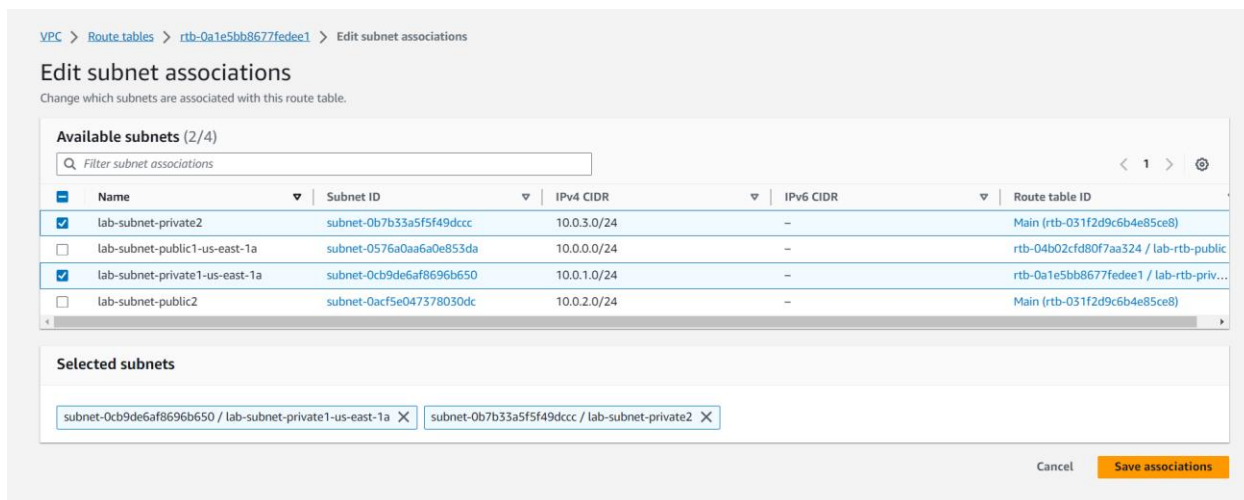


Figure 24: selecting the private-subnet-2 and then save it.

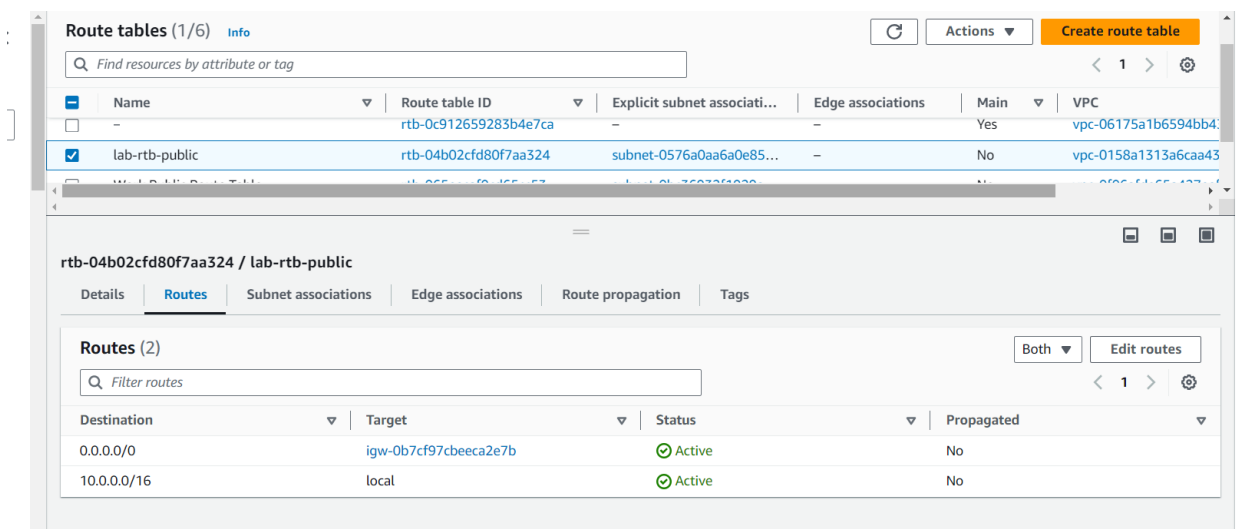


Figure 25: View the routes details of the public subnet.

Route tables (1/6) [Info](#) Refresh Actions Create route table

Find resources by attribute or tag

Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC
-	rtb-0c912659283b4e7ca	-	-	Yes	vpc-06175a1b6594bb4
<input checked="" type="checkbox"/> lab-rtb-public	rtb-04b02cfd80f7aa324	subnet-0576a0aa6a0e85...	-	No	vpc-0158a1313a6caa43

rtb-04b02cfd80f7aa324 / lab-rtb-public

Details | Routes | **Subnet associations** | Edge associations | Route propagation | Tags

**Explicit subnet associations (1)** Edit subnet associations

Find subnet association

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
lab-subnet-public1-us-east-1a	subnet-0576a0aa6a0e853da	10.0.0.0/24	-

**Subnets without explicit associations (1)** Edit subnet associations

The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:

Find subnet association

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
lab-subnet-public2	subnet-0acf5e047378030dc	10.0.2.0/24	-

Figure 26: View the subnet association details of the public subnet.

VPC > Route tables > rtb-04b02cfd80f7aa324 > Edit subnet associations

### Edit subnet associations

Change which subnets are associated with this route table.

**Available subnets (2/4)** Filter subnet associations 1 Settings

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input type="checkbox"/> lab-subnet-private2	subnet-0b7b33a5f5f49dccc	10.0.3.0/24	-	rtb-0a1e5bb8677fedee1 / lab-rtb-priv...
<input checked="" type="checkbox"/> lab-subnet-public1-us-east-1a	subnet-0576a0aa6a0e853da	10.0.0.0/24	-	rtb-04b02cfd80f7aa324 / lab-rtb-public
<input type="checkbox"/> lab-subnet-private1-us-east-1a	subnet-0cb9defaf8696b650	10.0.1.0/24	-	rtb-0a1e5bb8677fedee1 / lab-rtb-priv...
<input checked="" type="checkbox"/> lab-subnet-public2	subnet-0acf5e047378030dc	10.0.2.0/24	-	Main (rtb-031f2d9c6b4e85ce8)

**Selected subnets**

subnet-0576a0aa6a0e853da / lab-subnet-public1-us-east-1a ✕ subnet-0acf5e047378030dc / lab-subnet-public2 ✕

Cancel Save associations

Figure 27: selecting the public-subnet-2 and then save it.



## Task 03:

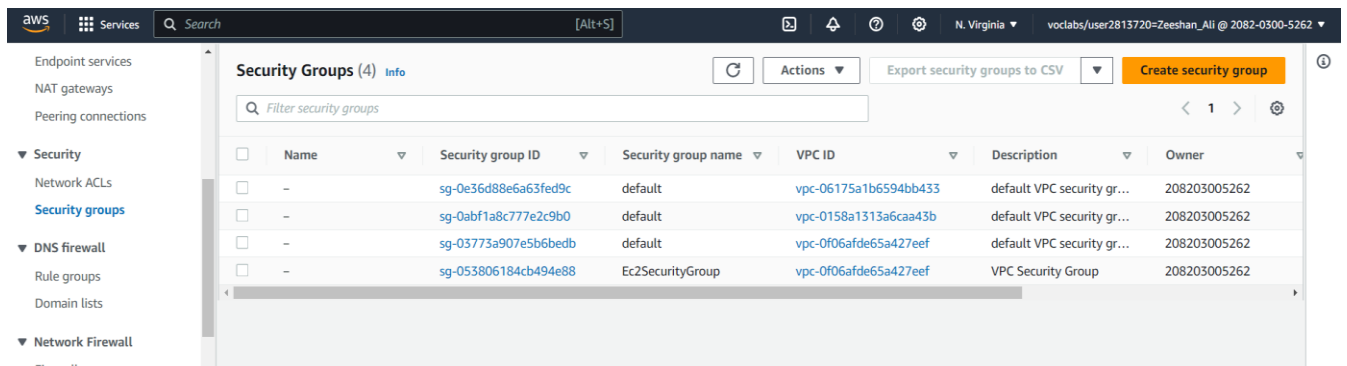


Figure 28: Security Groups Dashboard.

### 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 [Info](#)

Name cannot be edited after creation.

Description [Info](#)

VPC [Info](#)

Figure 29: Enter the details to create Security Groups.

### Inbound rules [Info](#)

Type <a href="#">Info</a>	Protocol <a href="#">Info</a>	Port range <a href="#">Info</a>	Source <a href="#">Info</a>	Description - optional <a href="#">Info</a>
HTTP	TCP	80	Anyw... 0.0.0.0/0	Permit web requests

[Add rule](#) [Delete](#)

**Warning:** Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Figure 30: Adding inbound rules.

**Outbound rules** Info

**Type** Info: All traffic  
**Protocol** Info: All  
**Port range** Info: All  
**Destination** Info: Custom  
**Description - optional** Info:

**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.

No tags associated with the resource.

You can add up to 50 more tags

Figure 31: select create security group for creation.

**Security group (sg-0353e0b3b994ef51e | Web Security Group) was created successfully**

**Details**

VPC > Security Groups > sg-0353e0b3b994ef51e - Web Security Group

**sg-0353e0b3b994ef51e - Web Security Group**

**Details**

Security group name Web Security Group	Security group ID sg-0353e0b3b994ef51e	Description Enable HTTP access	VPC ID vpc-0158a1313a6caa43b
Owner 208203005262	Inbound rules count 1 Permission entry	Outbound rules count 1 Permission entry	

**Inbound rules** | Outbound rules | Tags

**Inbound rules (1/1)**

<input checked="" type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol	Port range	Source
<input checked="" type="checkbox"/>	-	sg-0fae93fd729f786f	IPv4	HTTP	TCP	80	0.0.0.0/0

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Figure 32: Security Group Created Successfully.

## Task 04:

**Resources**

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	1	Auto Scaling Groups	API Error	Dedicated Hosts	0
Elastic IPs	2	Instances	1	Key pairs	1
Load balancers	API Error	Placement groups	0	Security groups	5
Snapshots	0	Volumes	1		

**Launch instance**

To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.

[Launch instance](#) [Migrate a server](#)

Note: Your instances will launch in the US East (N. Virginia) Region

**Scheduled events**

**US East (N. Virginia)**  
No scheduled events

**Service health**

[AWS Health Dashboard](#)

Region  
US East (N. Virginia)

**Zones**

Zone name	Zone ID
us-east-1a	use1-az1
us-east-1b	use1-az2
us-east-1c	use1-az4

Figure 33: Launch EC2 Instance.

## Launch an instance [Info](#)

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

### Name and tags [Info](#)

Name

[Add additional tags](#)

### ▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Recents

[Quick Start](#)








<p>Amazon Linux</p> 	<p>macOS</p> 	<p>Ubuntu</p> 	<p>Windows</p> 	<p>Red Hat</p> 	<p>SUSE Linux</p> 	<p> <a href="#">Browse more AMIs</a></p> <p>Including AMIs from AWS, Marketplace and the Community</p>
---	--	---	--	--	---	---

Figure 34: Assigning name and selecting required details.

Amazon Machine Image (AMI)

Amazon Linux 2023 AMI

ami-041feb57c611358bd (64-bit (x86)) / ami-0fa3d3dafc154a053 (64-bit (Arm))

Virtualization: hvm    ENA enabled: true    Root device type: ebs

Free tier eligible

Description

Amazon Linux 2023 AMI 2023.2.20231011.0 x86\_64 HVM kernel-6.1

Architecture

64-bit (x86)

AMI ID

ami-041feb57c611358bd

Verified provider

▼ Instance type [Info](#)

Instance type

t2.micro

Free tier eligible

Family: t2    1 vCPU    1 GiB Memory    Current generation: true

On-Demand Windows base pricing: 0.0162 USD per Hour

On-Demand SUSE base pricing: 0.0116 USD per Hour

On-Demand RHEL base pricing: 0.0716 USD per Hour

On-Demand Linux base pricing: 0.0116 USD per Hour

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

Figure 35: selecting required details.

User data - optional [Info](#)

Upload a file with your user data or enter it in the field.

Choose file

```
#!/bin/bash
# Install Apache Web Server and PHP
dnf install -y httpd wget php mariadb105-server
# Download Lab files
wget https://aws-tc-largeobjects.s3.us-west-2.amazonaws.com/CUR-TF-100-ACCLFO-2/2-lab2-vpc/s3/lab-app.zip
unzip lab-app.zip -d /var/www/html/
# Turn on web server
chkconfig httpd on
service httpd start
```

☐ User data has already been base64 encoded

Virtual server type (instance type)

t2.micro

Firewall (security group)

Web Security Group

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots,

Cancel

Launch instance

Review commands

Figure 36: Add Script in the user data box & then launch instance.

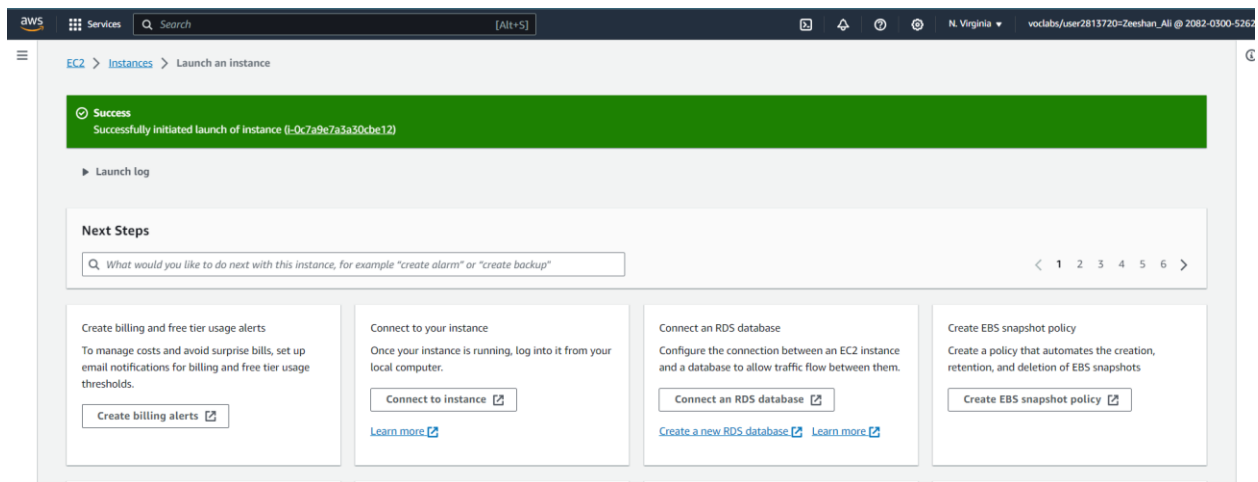


Figure 37: Successfully launch the instances with specific details.

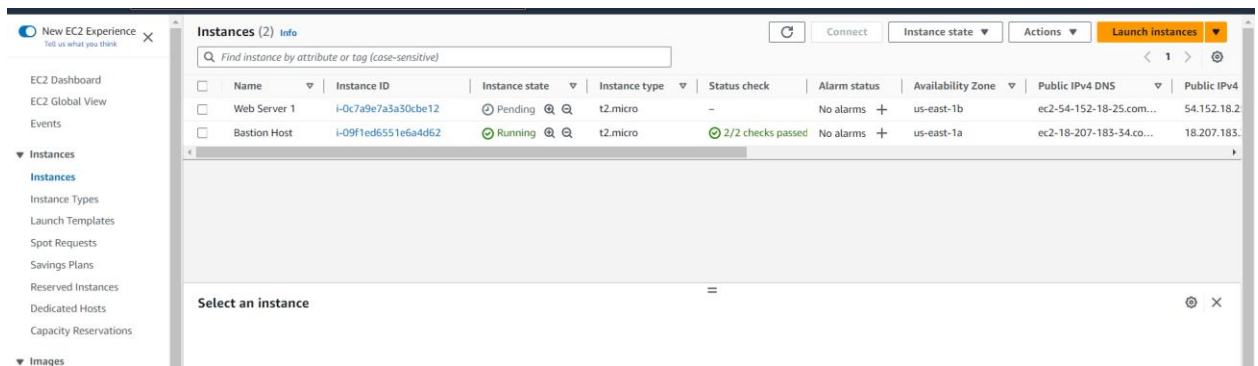


Figure 38: The instance is in pending stage.

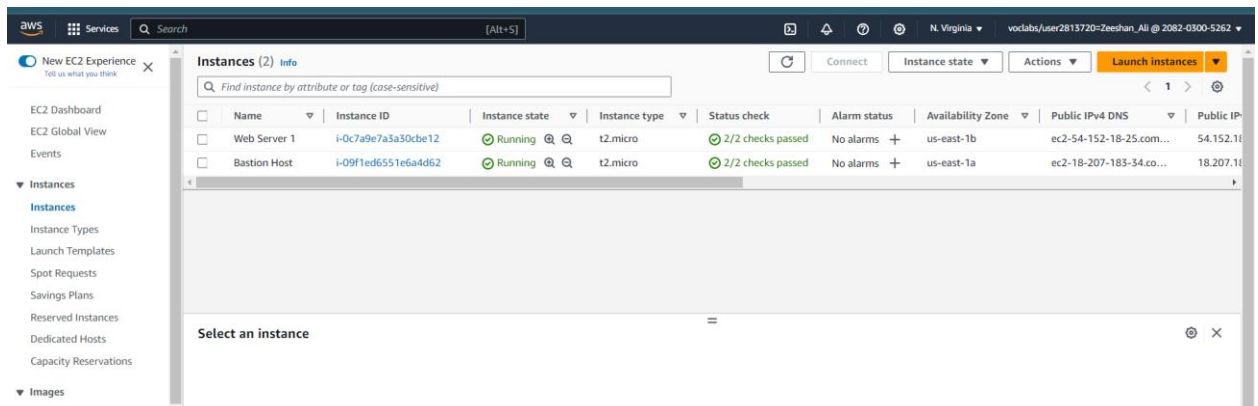


Figure 39: The instance is in running stage.

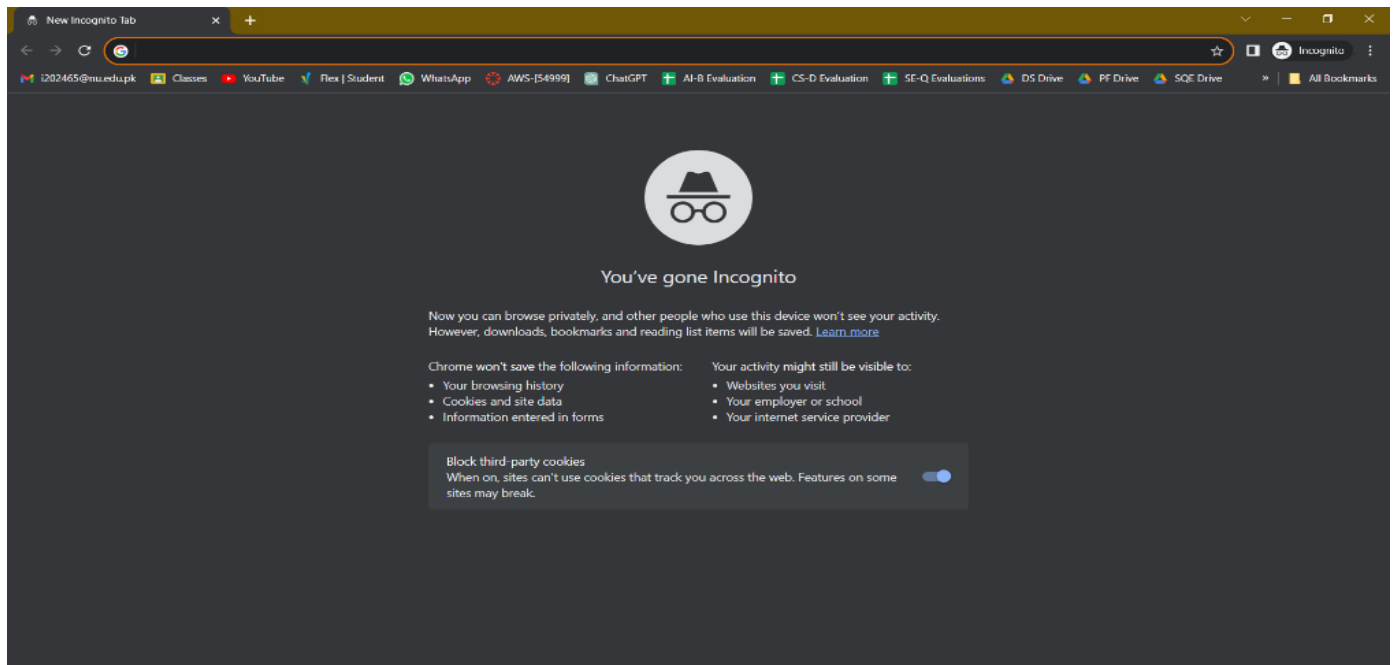



Figure 40: New private incognito tab

 Load Test RDS

Meta-Data	Value
InstanceId	i-0c7a9e7a3a30cbe12
Availability Zone	us-east-1b

Current CPU Load: **100%**

Figure 41: EC2-Instances public IP to verify webserver details.

## Lab Ended:

Build your VPC and Launch a Web Server

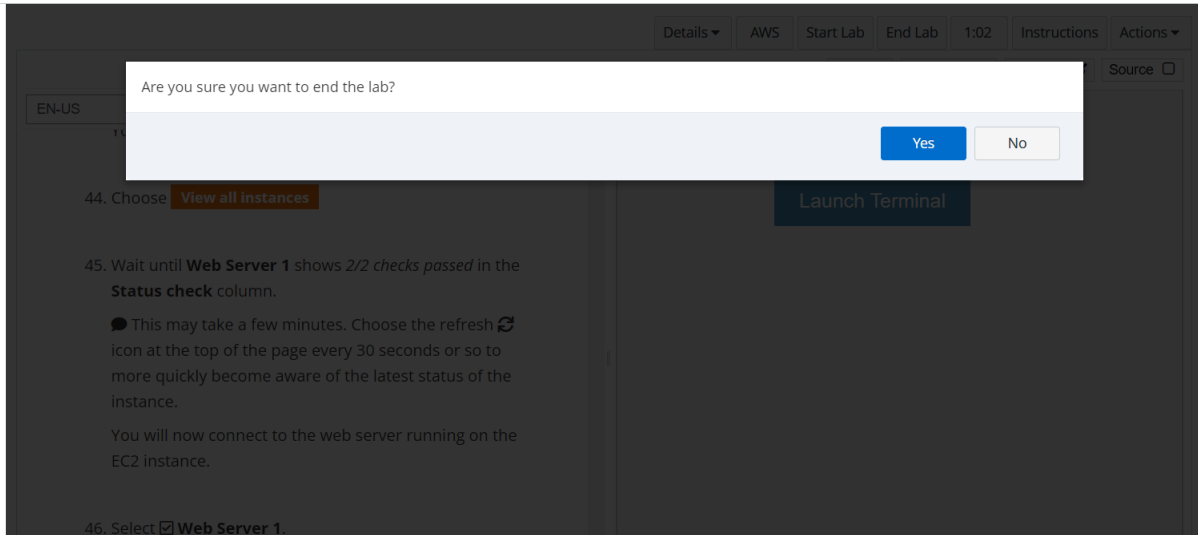


Figure 42: pop-up mesg to end the lab.

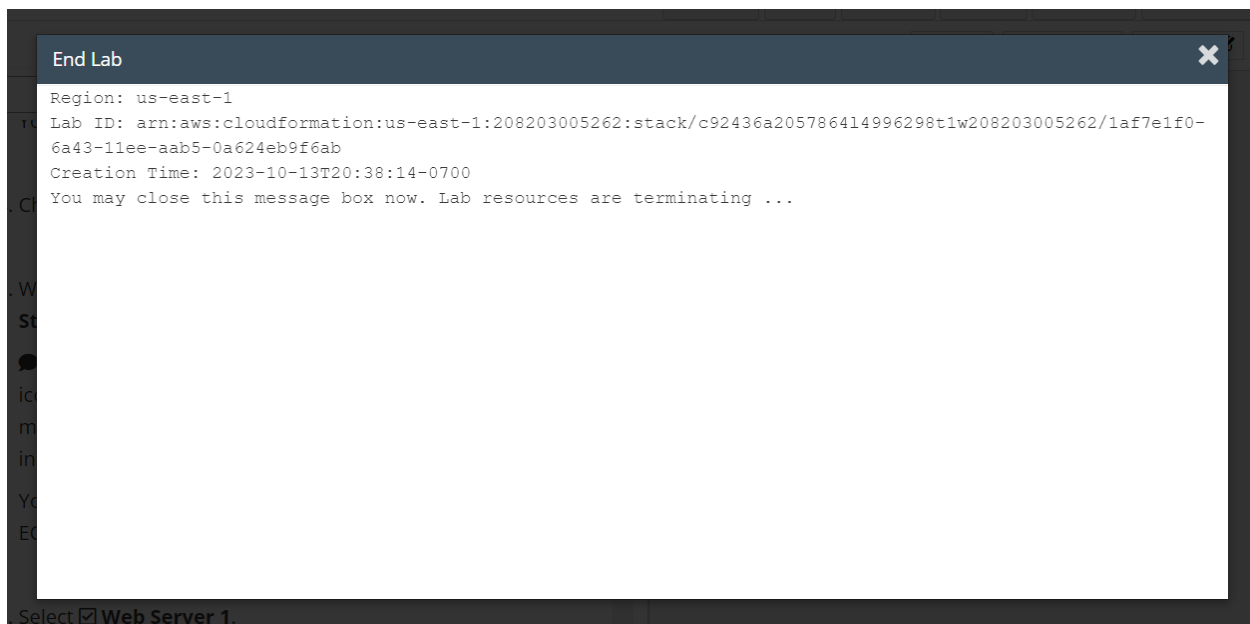


Figure 43: All resources are terminating.