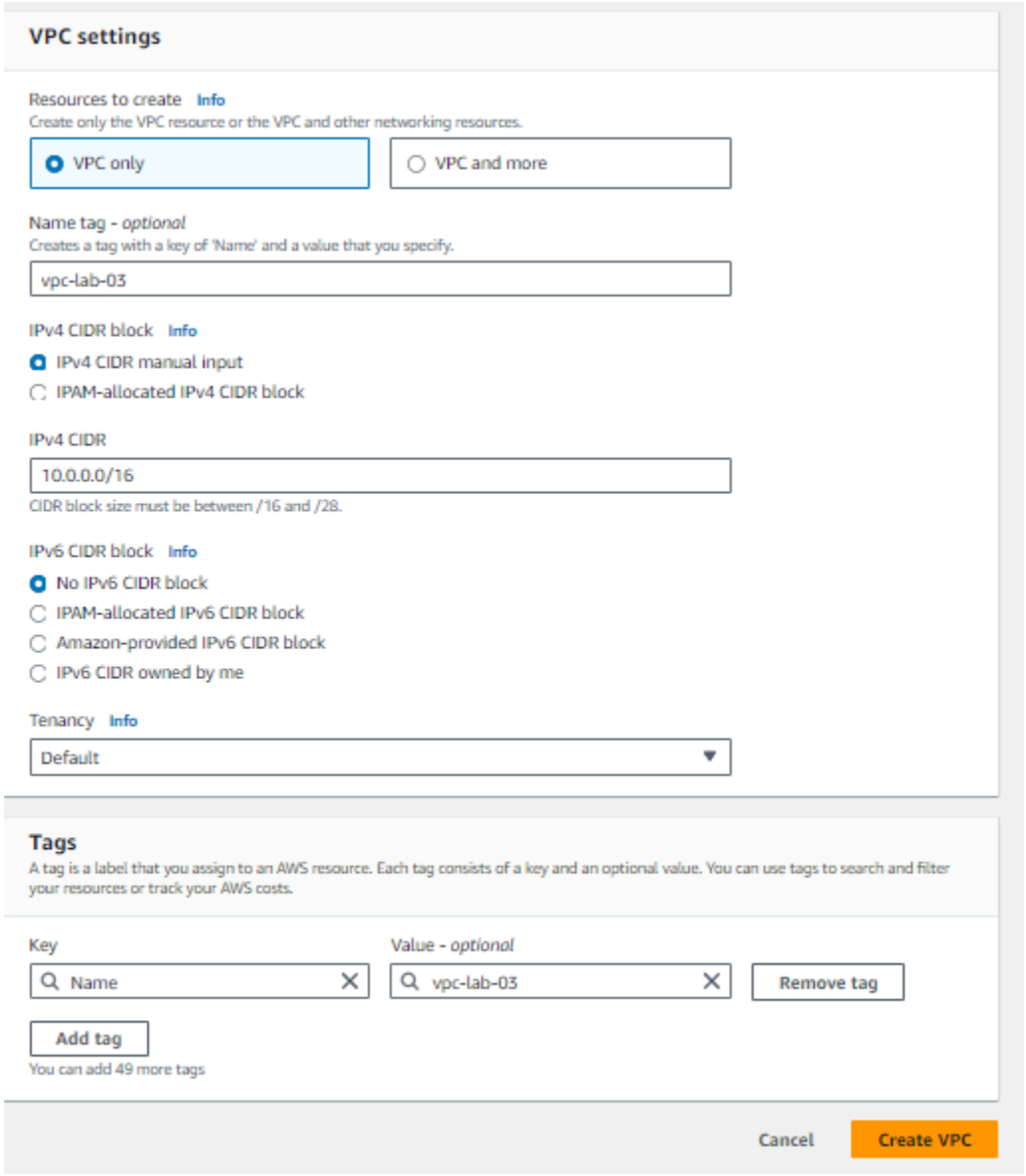
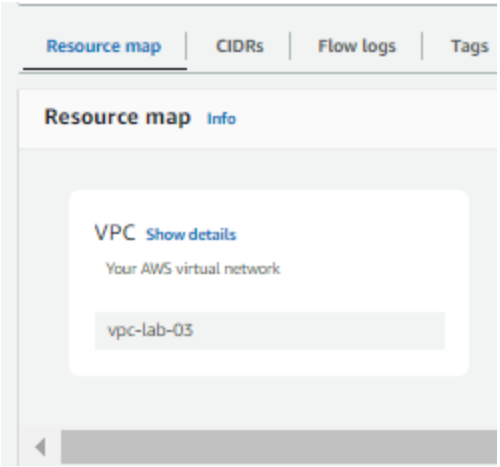
VPC LAB

VPC Configuration Lab

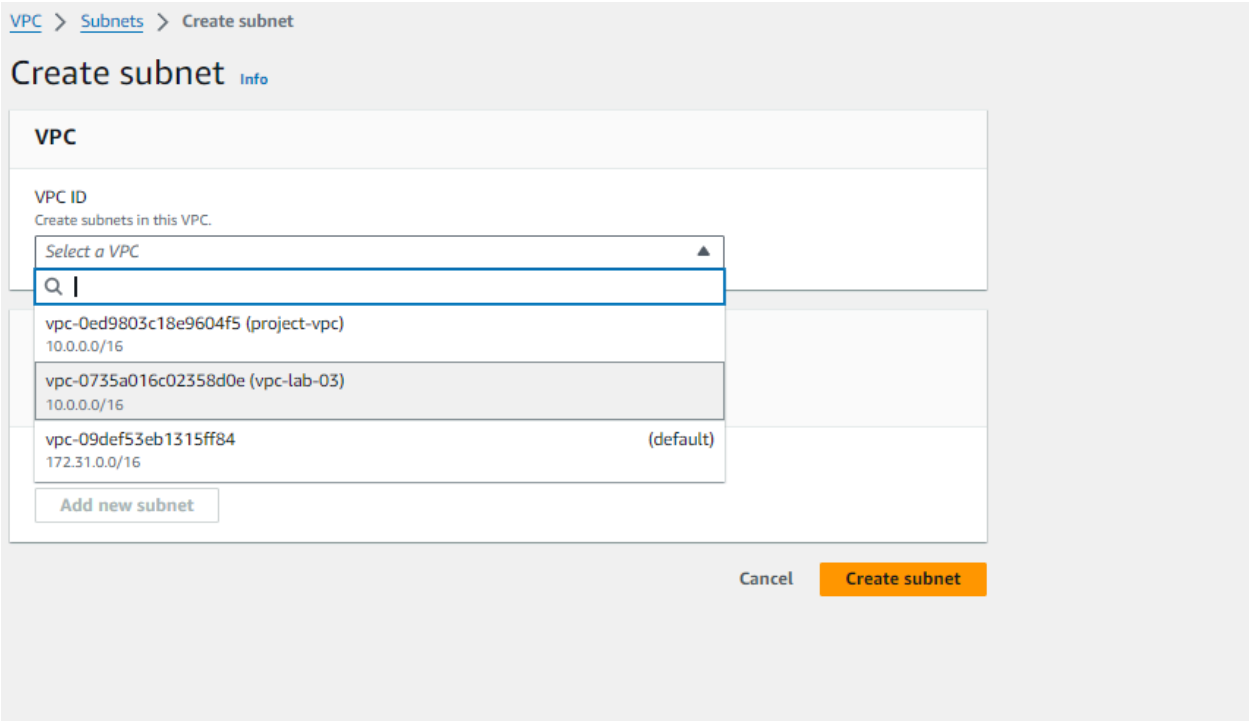
- **Objective: To understand the fundamentals of AWS networking through the configuration of a Virtual Private Cloud (VPC).**
- **Approach: Students will create a new VPC, add subnets, set up an Internet Gateway, and configure route tables. The lab might also include setting up a simple EC2 instance within this VPC to demonstrate how resources are deployed in a custom network environment.**
- **Goal: By the end of this lab, students should be able to create and configure a VPC, understand subnetting, and the role of route tables and internet gateways in AWS.**

1. **Create a new VPC with the following settings.**

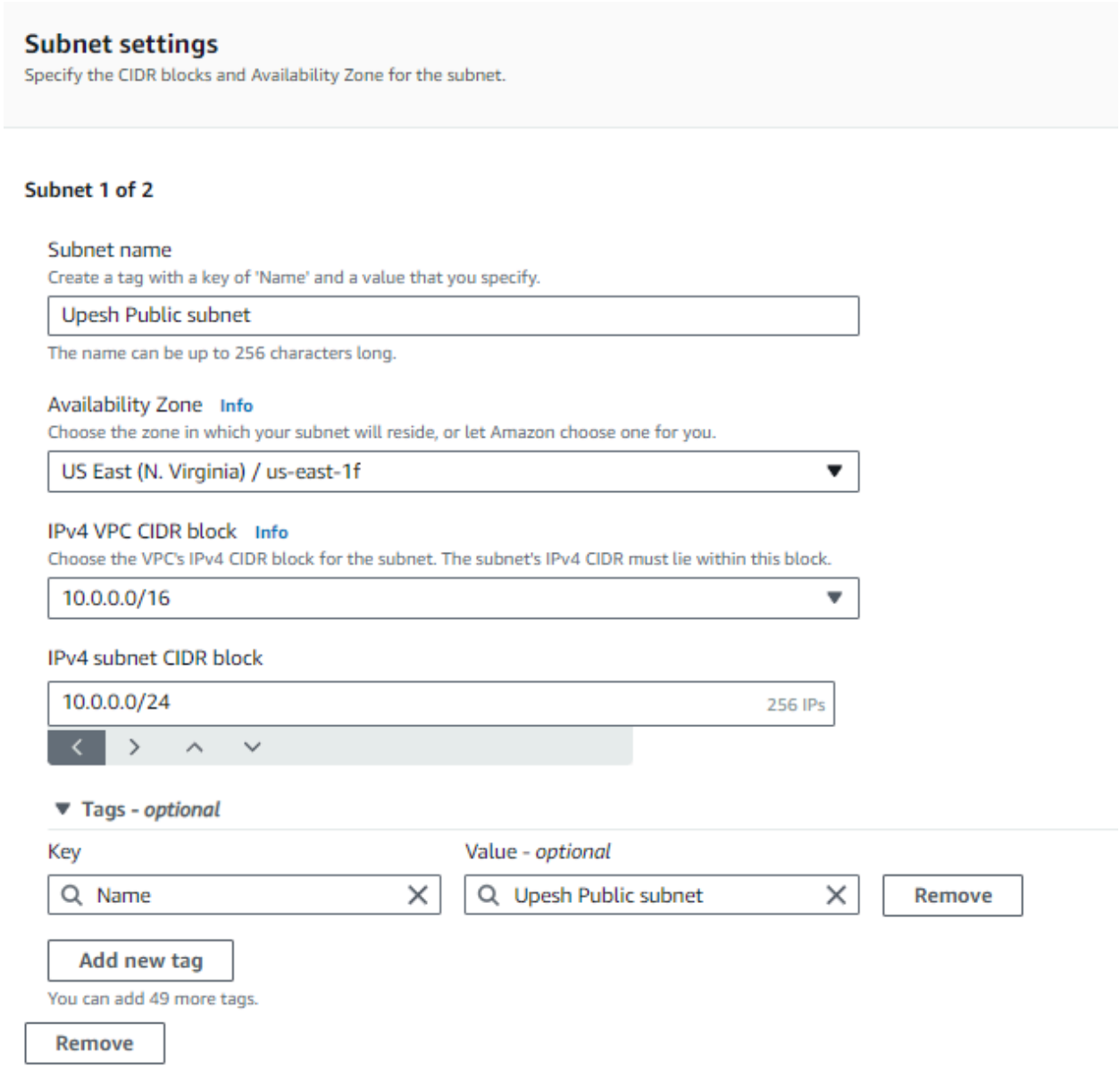




2. **Create a new subnet public and private**



3. **Subnet settings should be used as follows.**



Subnet 2 of 2

Subnet name

Create a tag with a key of 'Name' and a value that you specify.

Upesh Private 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.

US East (N. Virginia) / us-east-1e

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 IPs

▼ Tags - *optional*

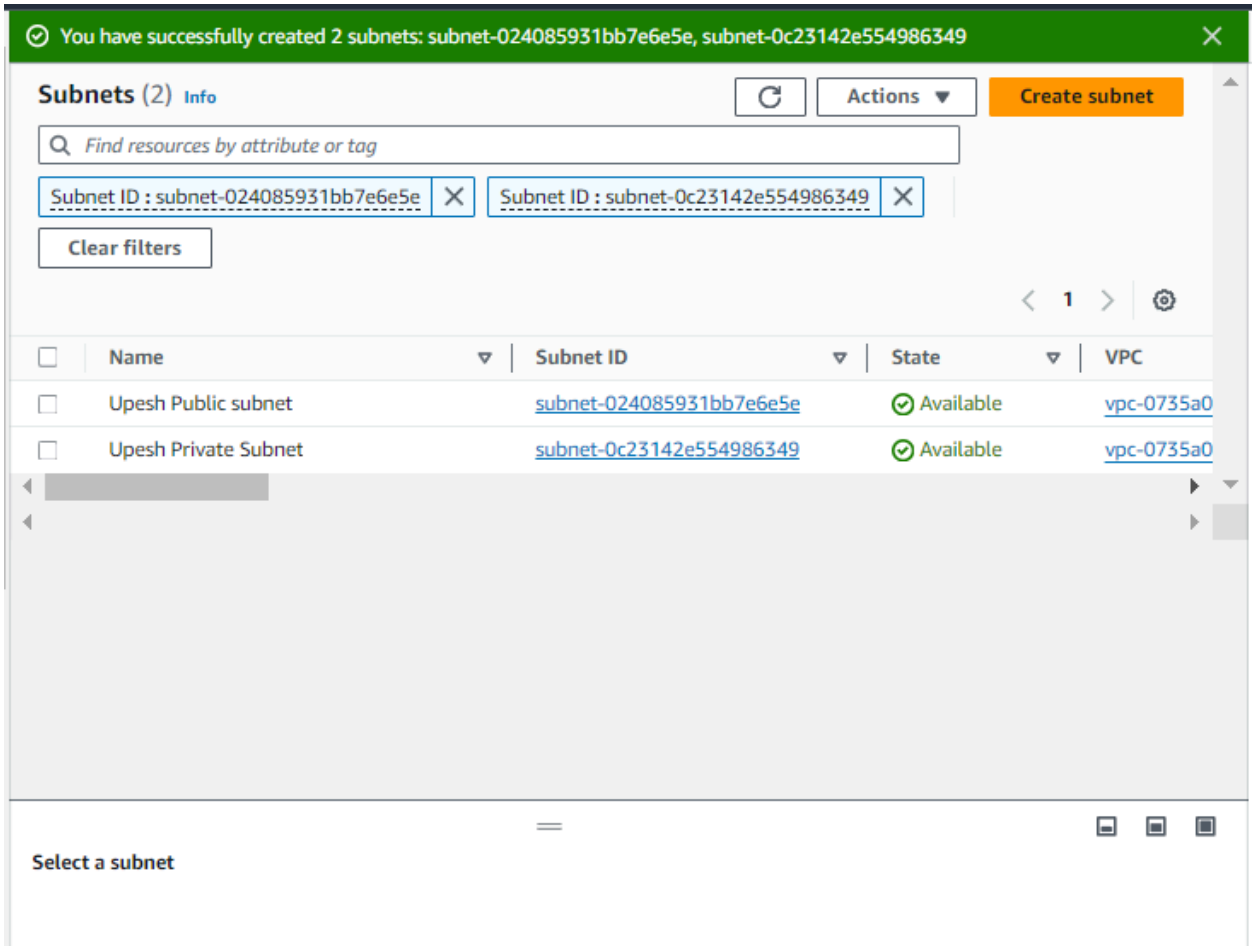
Key	Value - *optional*	
Name	Upesh Private Subnet	Remove

Add new tag

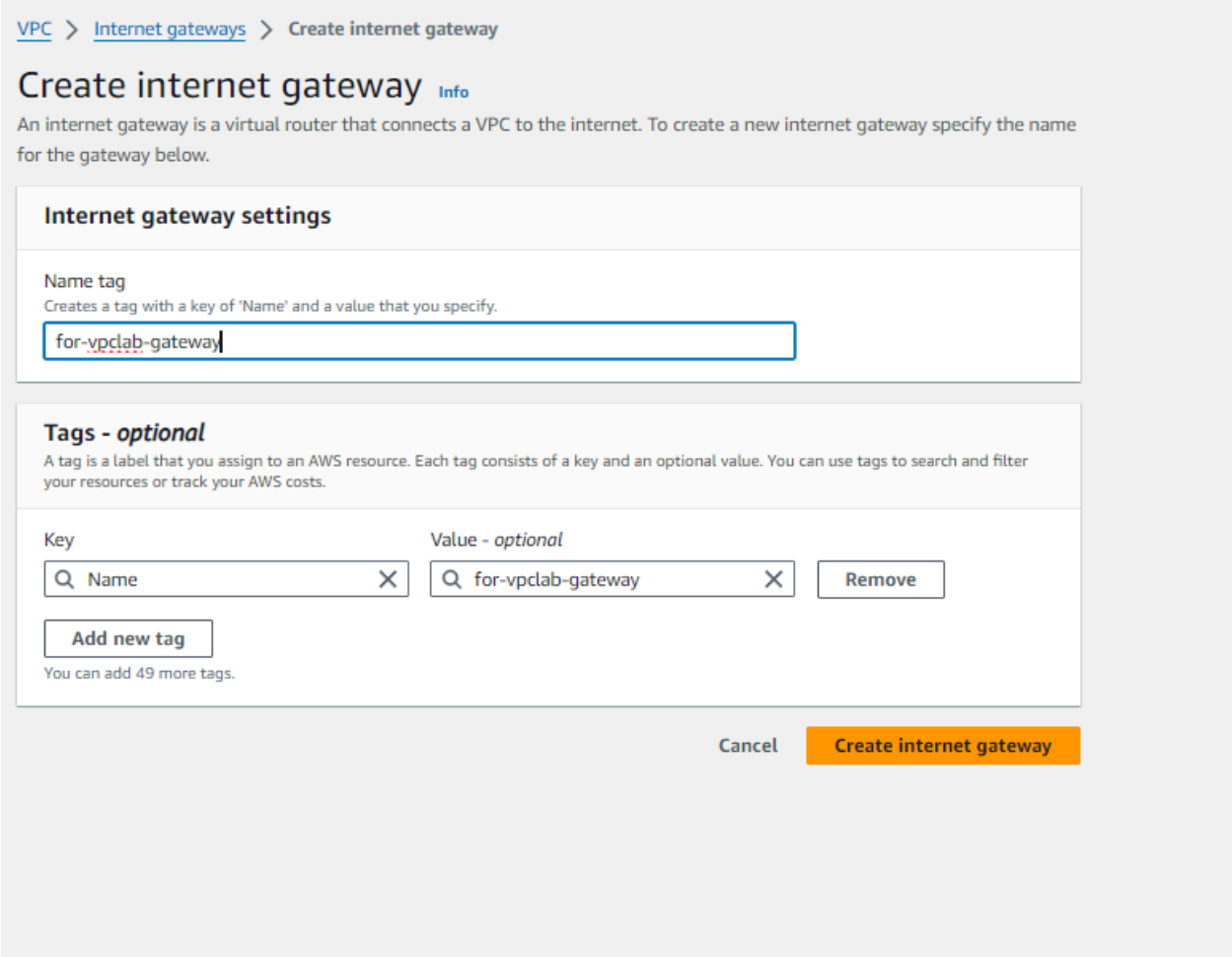
You can add 49 more tags.

Remove

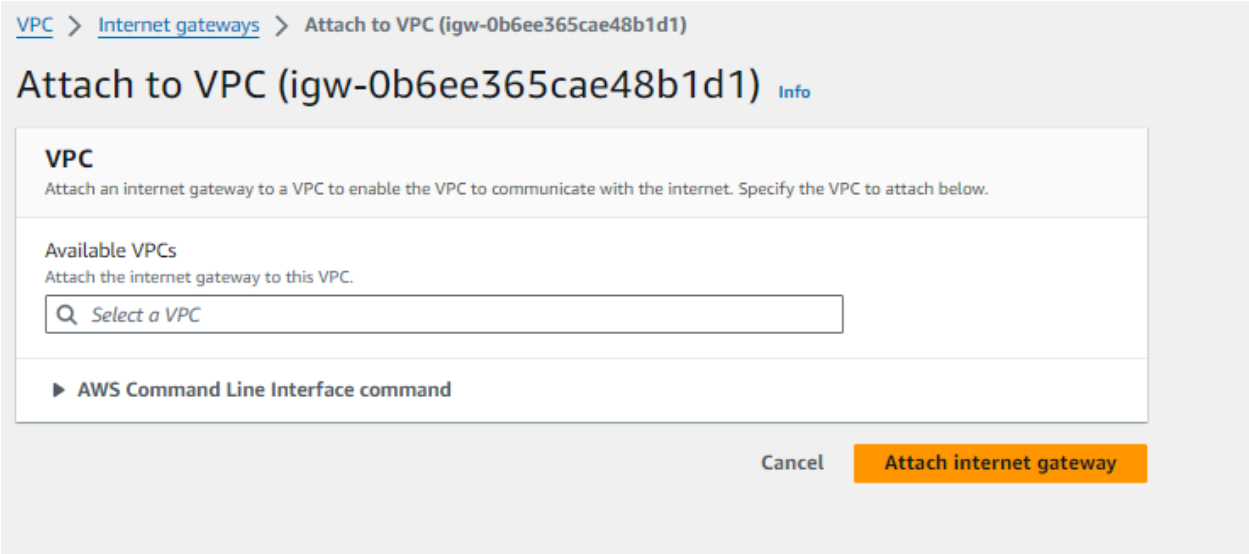
Add new subnet


You have successfully created 2 subnets: subnet-024085931bb7e6e5e, subnet-0c23142e554986349
Subnets (2) Info
Actions
Create subnet
Find resources by attribute or tag
Subnet ID : subnet-024085931bb7e6e5e
Subnet ID : subnet-0c23142e554986349
Clear filters
1
Name
Subnet ID
State
VPC
Upesh Public subnet
subnet-024085931bb7e6e5e
Available
vpc-0735a0
Upesh Private Subnet
subnet-0c23142e554986349
Available
vpc-0735a0
Select a subnet

4. **You can now create an internet gateway.**

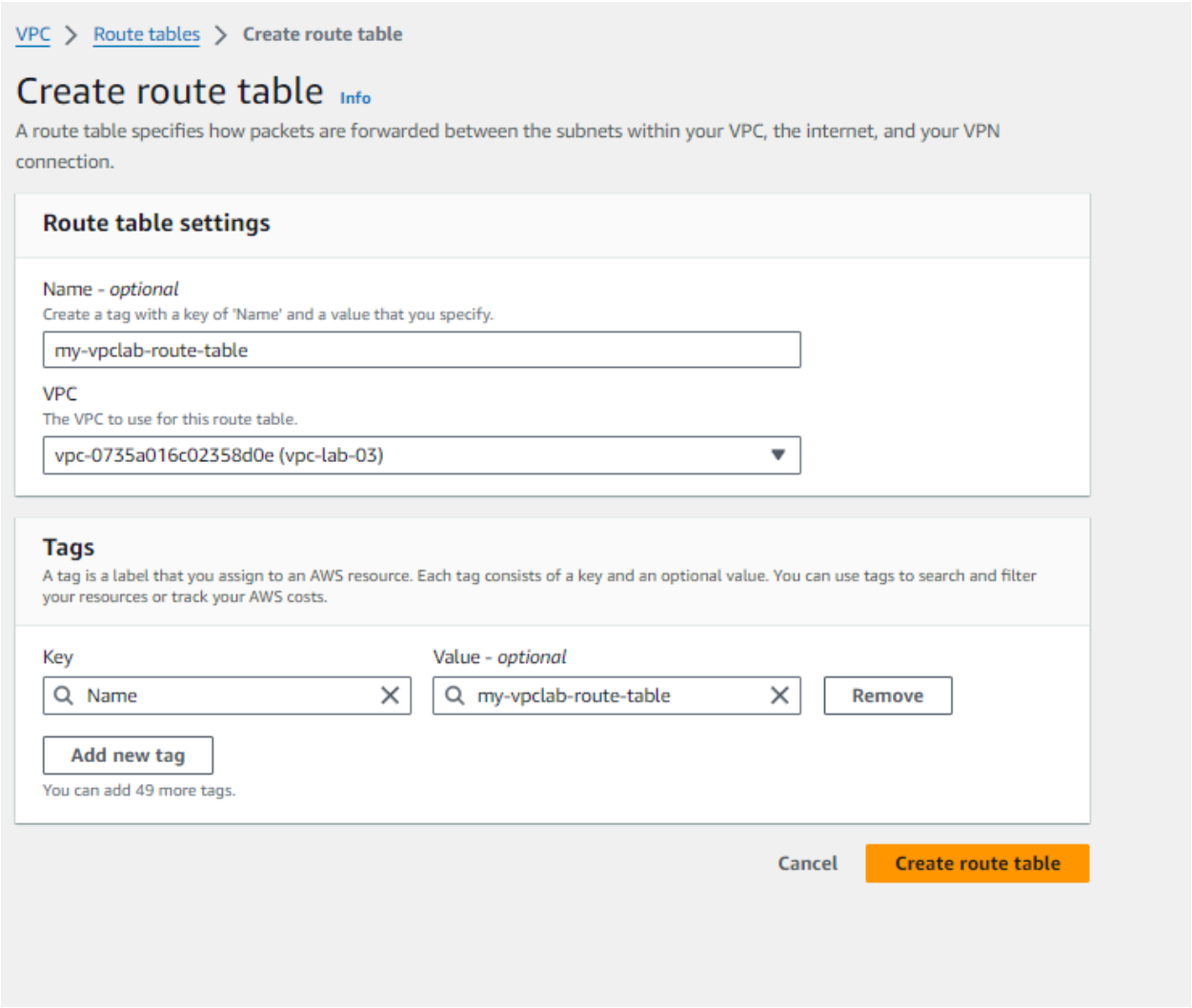


4. Attach that internet gateway to VPC.

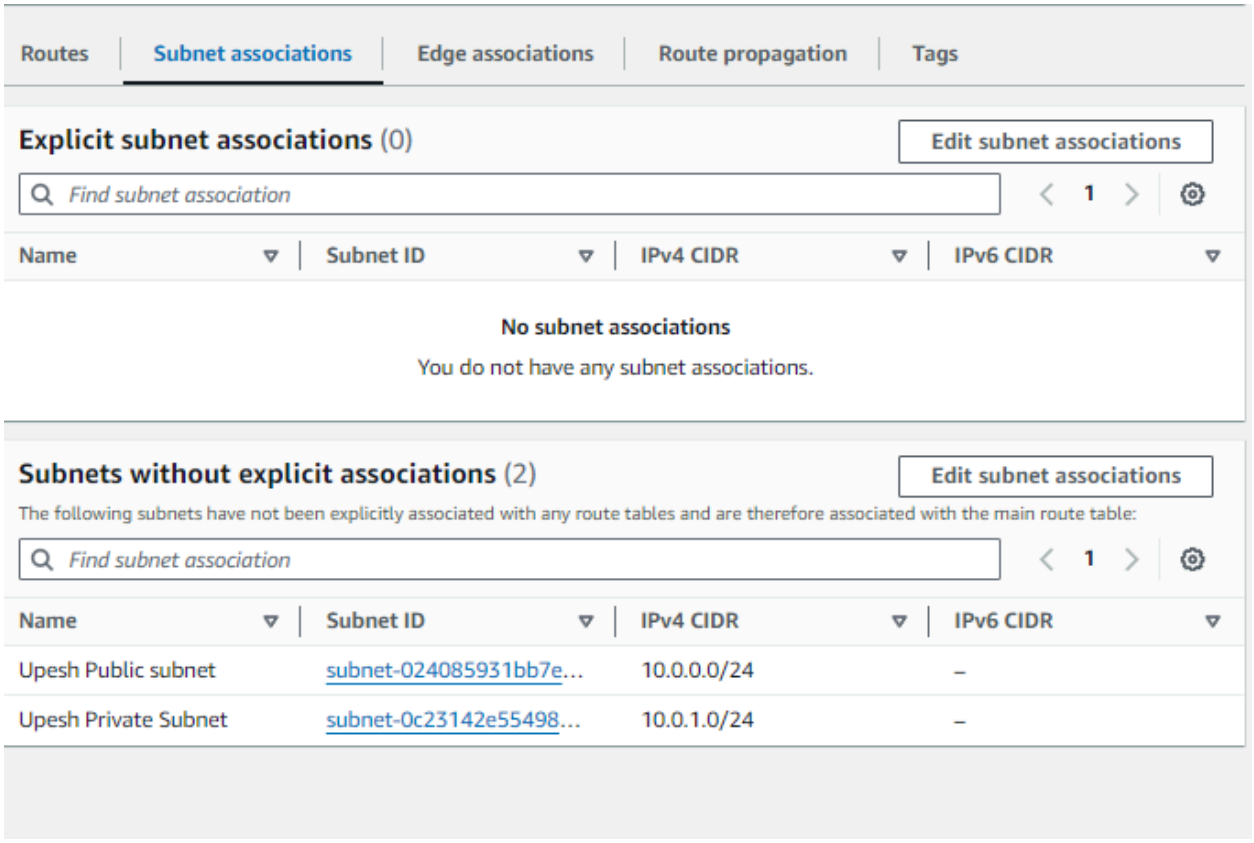


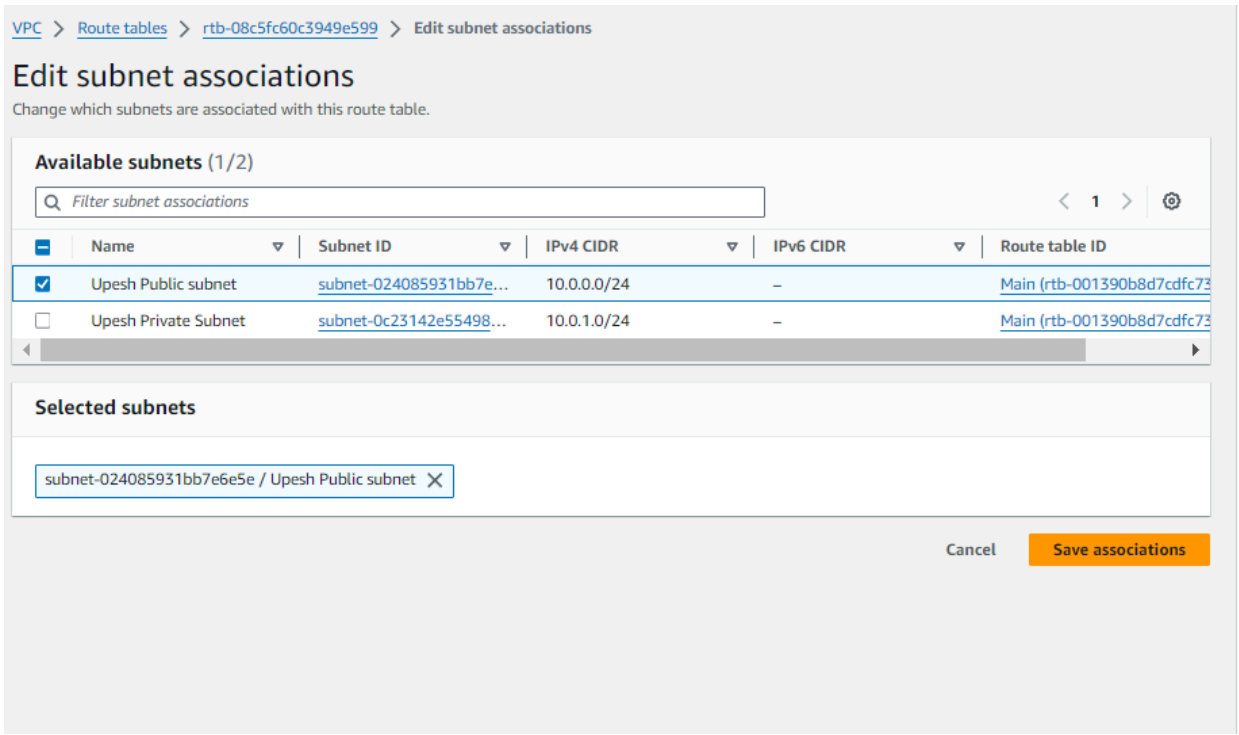

igw-0b6ee365cae48b1d1 / for-vpclab-gateway
Actions
Details Info
Internet gateway ID
igw-0b6ee365cae48b1d1
State
Attached
VPC ID
vpc-0735a016c02358d0e | vpc-lab-03
Owner
979147213970
Tags
Manage tags
Search tags
1
Key
Value
Name
for-vpclab-gateway

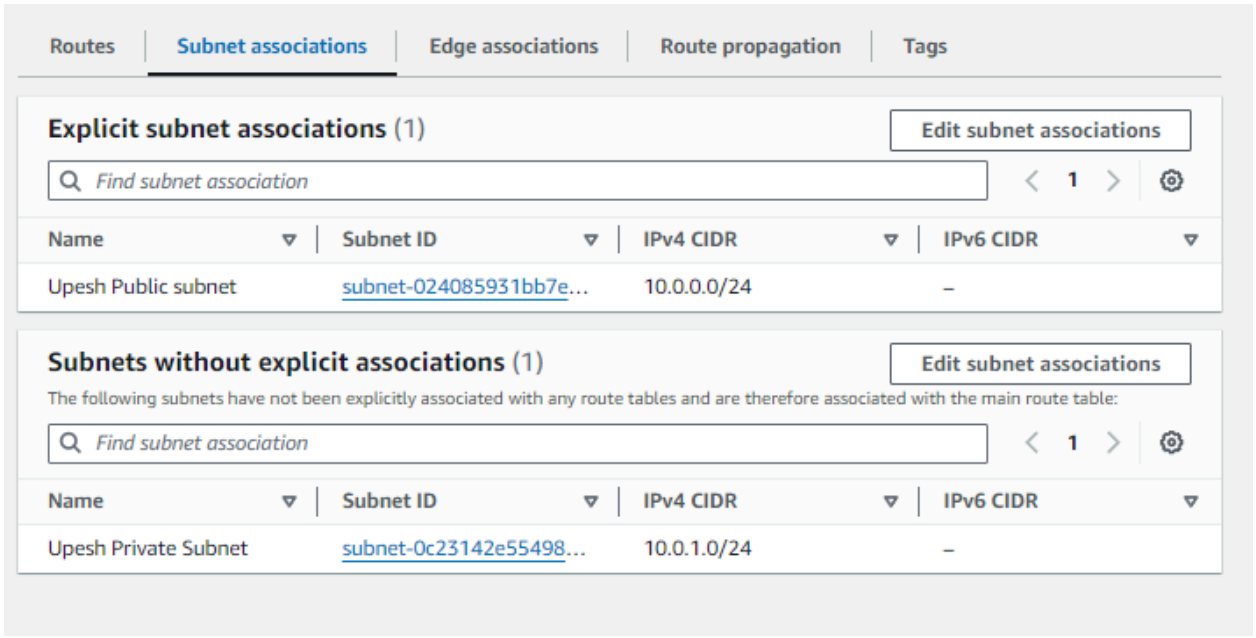
5. **Create the new route table now**

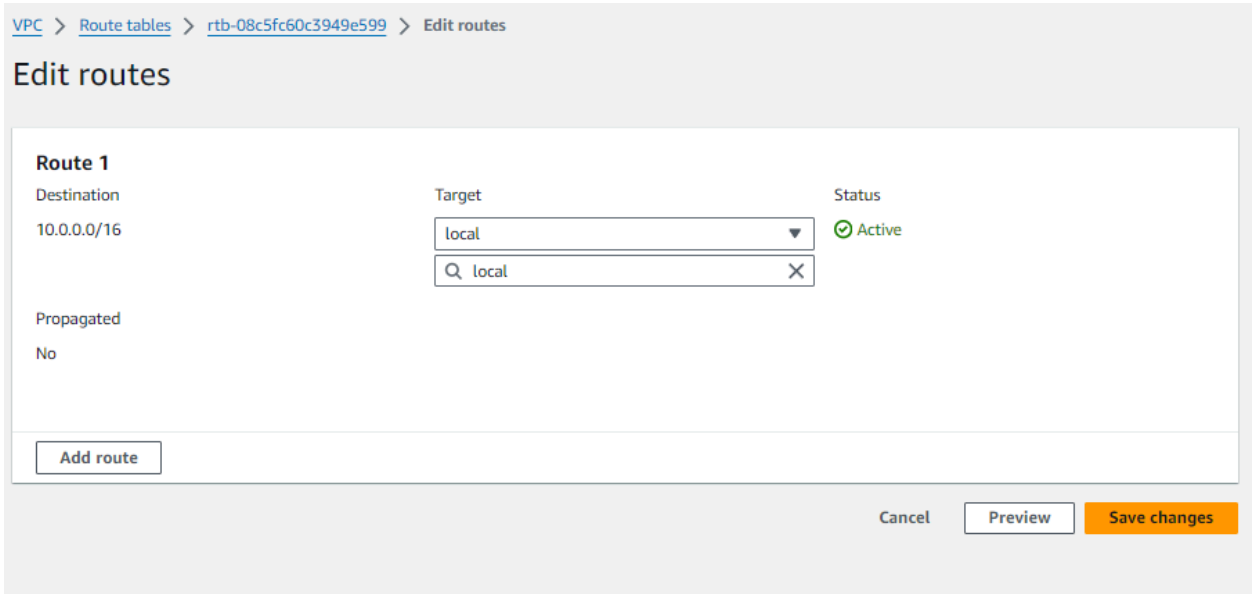


6. **Use public subnet for explicit associations**

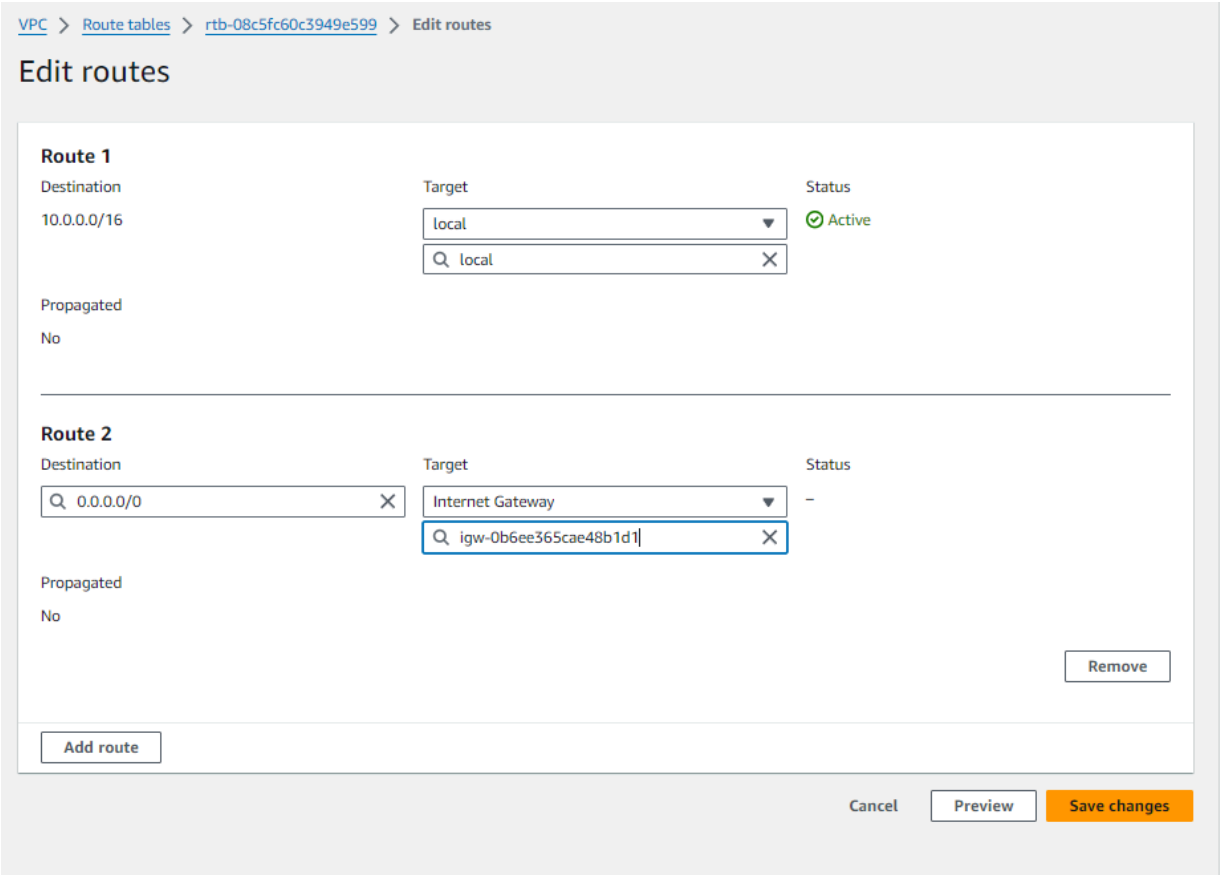





Routes
Subnet associations
Edge associations
Route propagation
Tags
Explicit subnet associations (1)
Edit subnet associations
Find subnet association
1
Name
Subnet ID
IPv4 CIDR
IPv6 CIDR
Upesh Public subnet
subnet-024085931bb7e...
10.0.0.0/24
–
Subnets without explicit associations (1)
Edit subnet associations
The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:
Find subnet association
1
Name
Subnet ID
IPv4 CIDR
IPv6 CIDR
Upesh Private Subnet
subnet-0c23142e55498...
10.0.1.0/24
–


VPC
Route tables
rtb-08c5fc60c3949e599
Edit routes
Edit routes
Route 1
Destination
Target
Status
10.0.0.0/16
local
Active
local
Propagated
No
Add route
Cancel
Preview
Save changes

7. **Use new route to be accessible through the internet**



8. **EC2 Instance**

EC2 > Instances > Launch an 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

MyVpcLabInstance

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

Search our full catalog including 1000s of application and OS images

Recents | Quick Start

Amazon Linux | macOS | Ubuntu | Windows | Red Hat | SUSE Linu

Browse more AMIs

Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

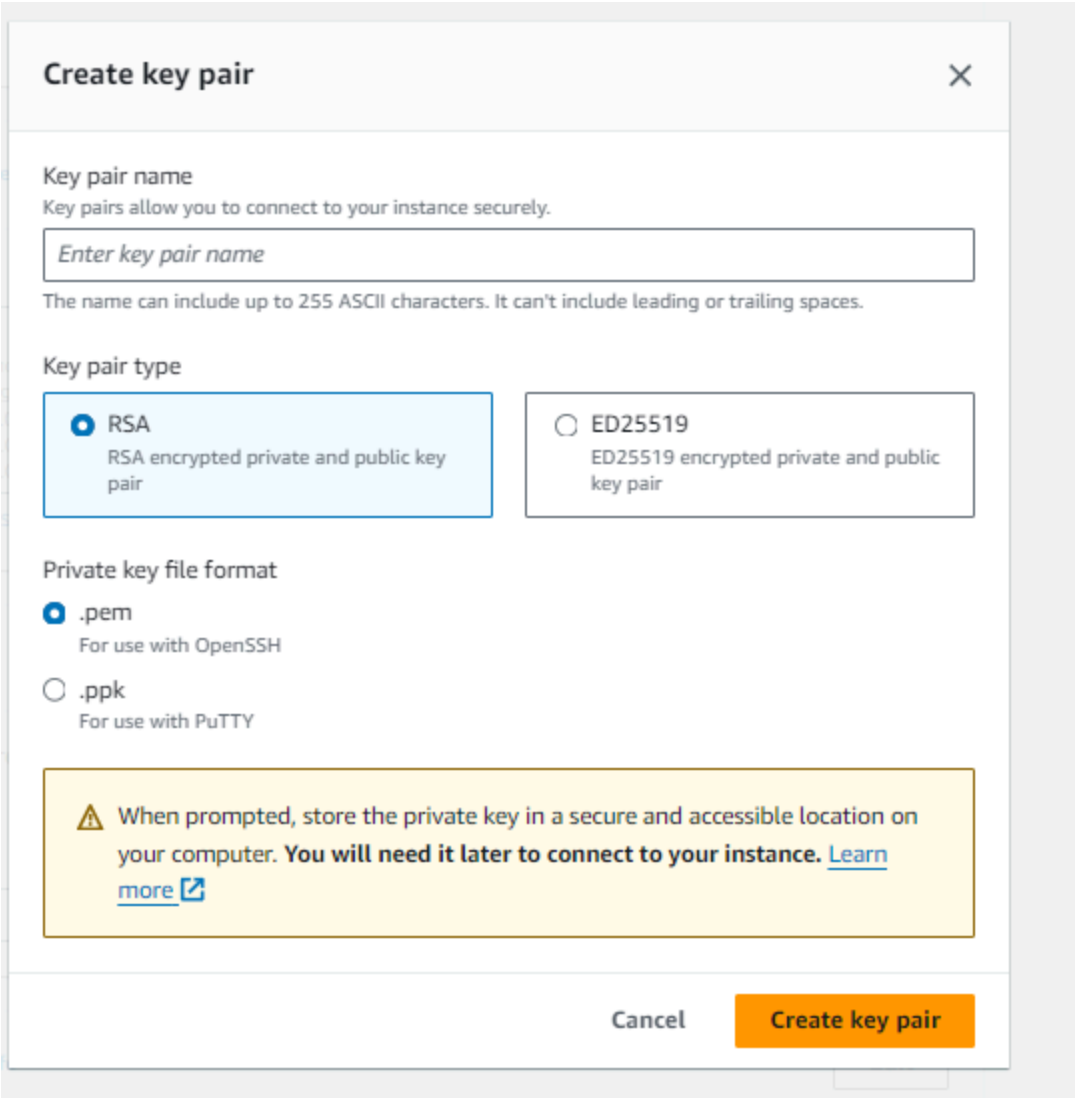
Amazon Linux 2023 AMI — Free tier eligible

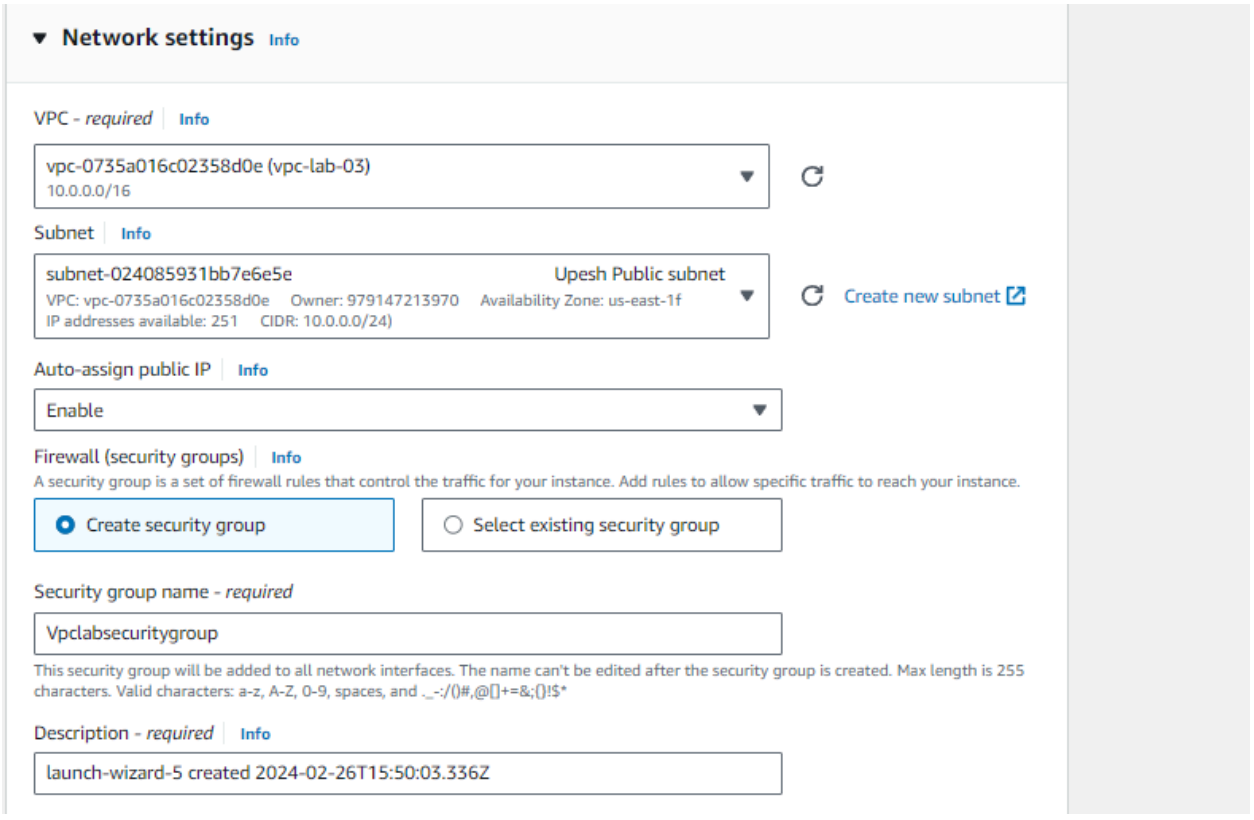
ami-0440d3b780d96b29d (64-bit (x86), uefi-preferred) / ami-0f93c02efd1974b8b (64-bit (Arm), uefi)

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

Description

Amazon Linux 2023 AMI 2023.3.20240219.0 x86_64 HVM kernel-6.1


Create key pair
Key pair name
Key pairs allow you to connect to your instance securely.
Enter key pair name
The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.
Key pair type
RSA
RSA encrypted private and public key pair
ED25519
ED25519 encrypted private and public key pair
Private key file format
.pem
For use with OpenSSH
.ppk
For use with PuTTY
When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance. Learn more
Cancel
Create key pair


Network settings Info
VPC - required Info
vpc-0735a016c02358d0e (vpc-lab-03)
10.0.0.0/16
Subnet Info
subnet-024085931bb7e6e5e
Upesh Public subnet
VPC: vpc-0735a016c02358d0e Owner: 979147213970 Availability Zone: us-east-1f
IP addresses available: 251 CIDR: 10.0.0.0/24)
Create new subnet
Auto-assign public IP Info
Enable
Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.
Create security group
Select existing security group
Security group name - required
Vpclabsecuritygroup
This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and ._-:/()#,@[]+=&;{}!$*
Description - required Info
launch-wizard-5 created 2024-02-26T15:50:03.336Z

Inbound Security Group Rules

Security group rule 1 (TCP, 22, 0.0.0.0/0) — Remove

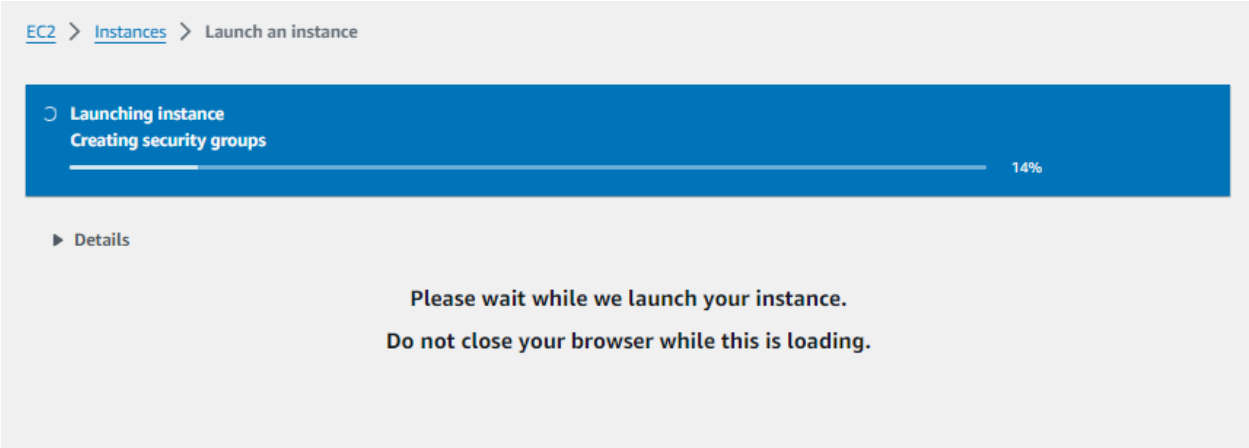
Type Info	Protocol Info	Port range Info
ssh	TCP	22

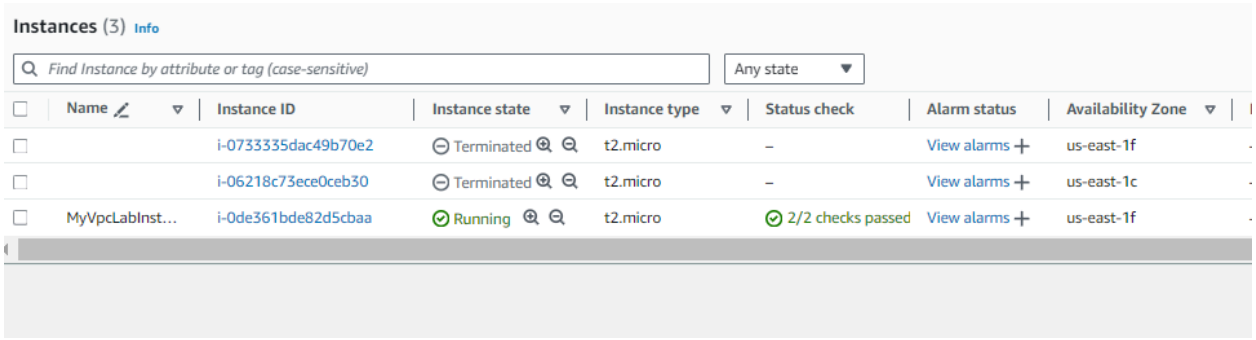
Source type Info	Source Info	Description - *optional* Info
Anywhere	*Add CIDR, prefix list or security g*	*e.g. SSH for admin desktop*
	0.0.0.0/0	

Security group rule 2 (TCP, 80, 0.0.0.0/0) — Remove

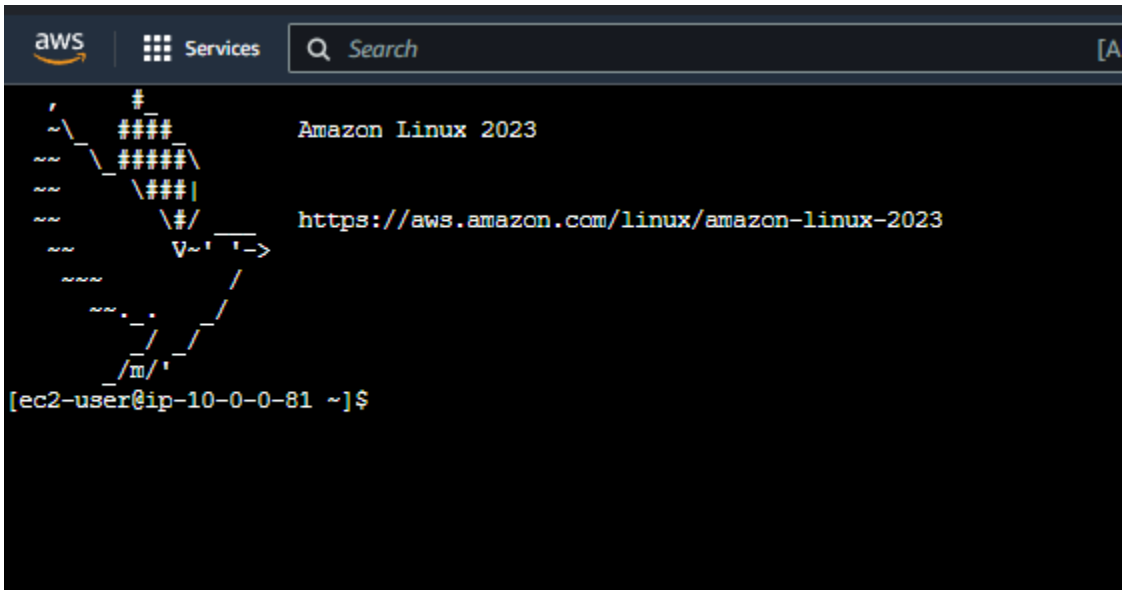
Type Info	Protocol Info	Port range Info
HTTP	TCP	80

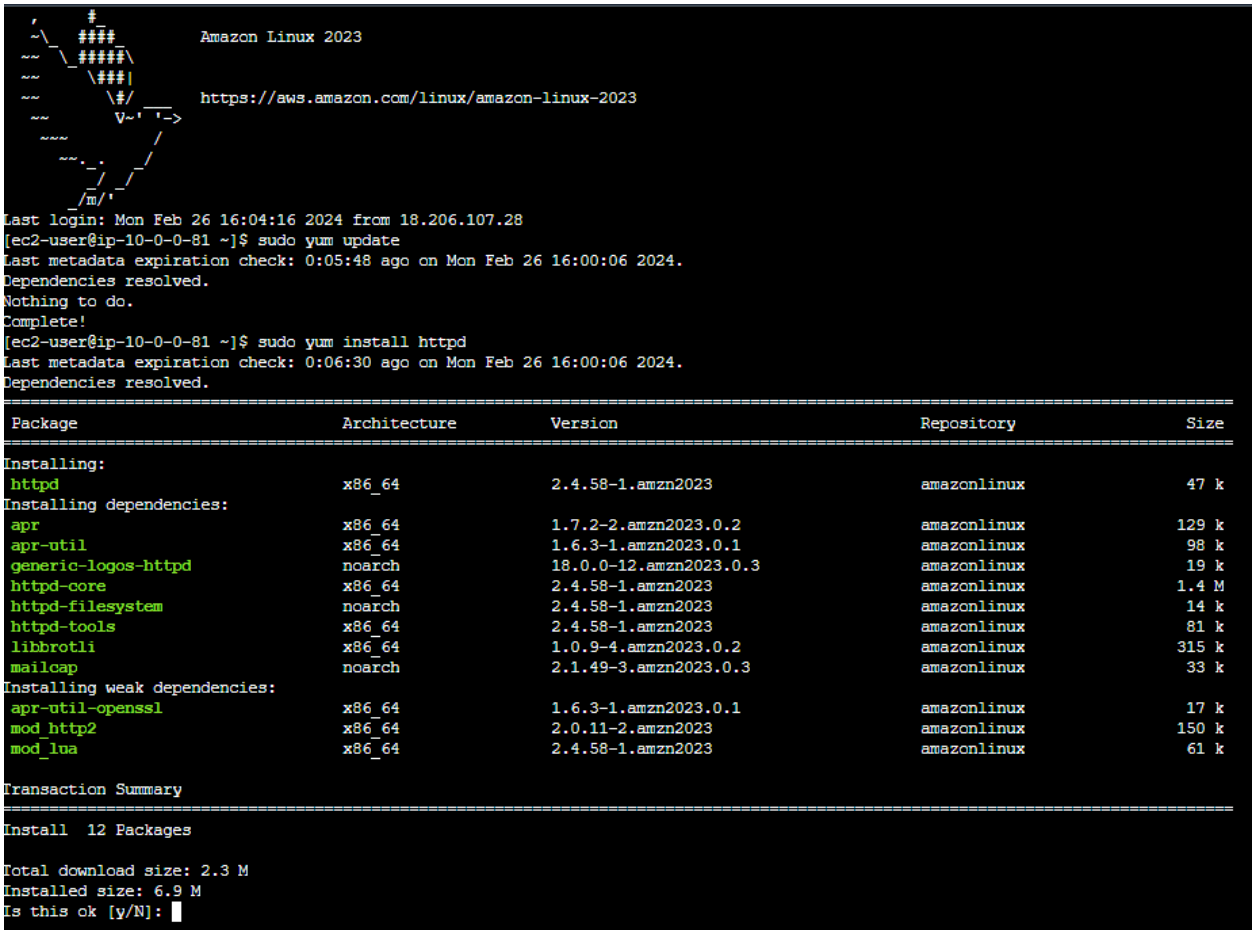
Source type Info	Source Info	Description - *optional* Info
Anywhere	*Add CIDR, prefix list or security g*	*e.g. SSH for admin desktop*
	0.0.0.0/0	





8. Public IP works correctly.

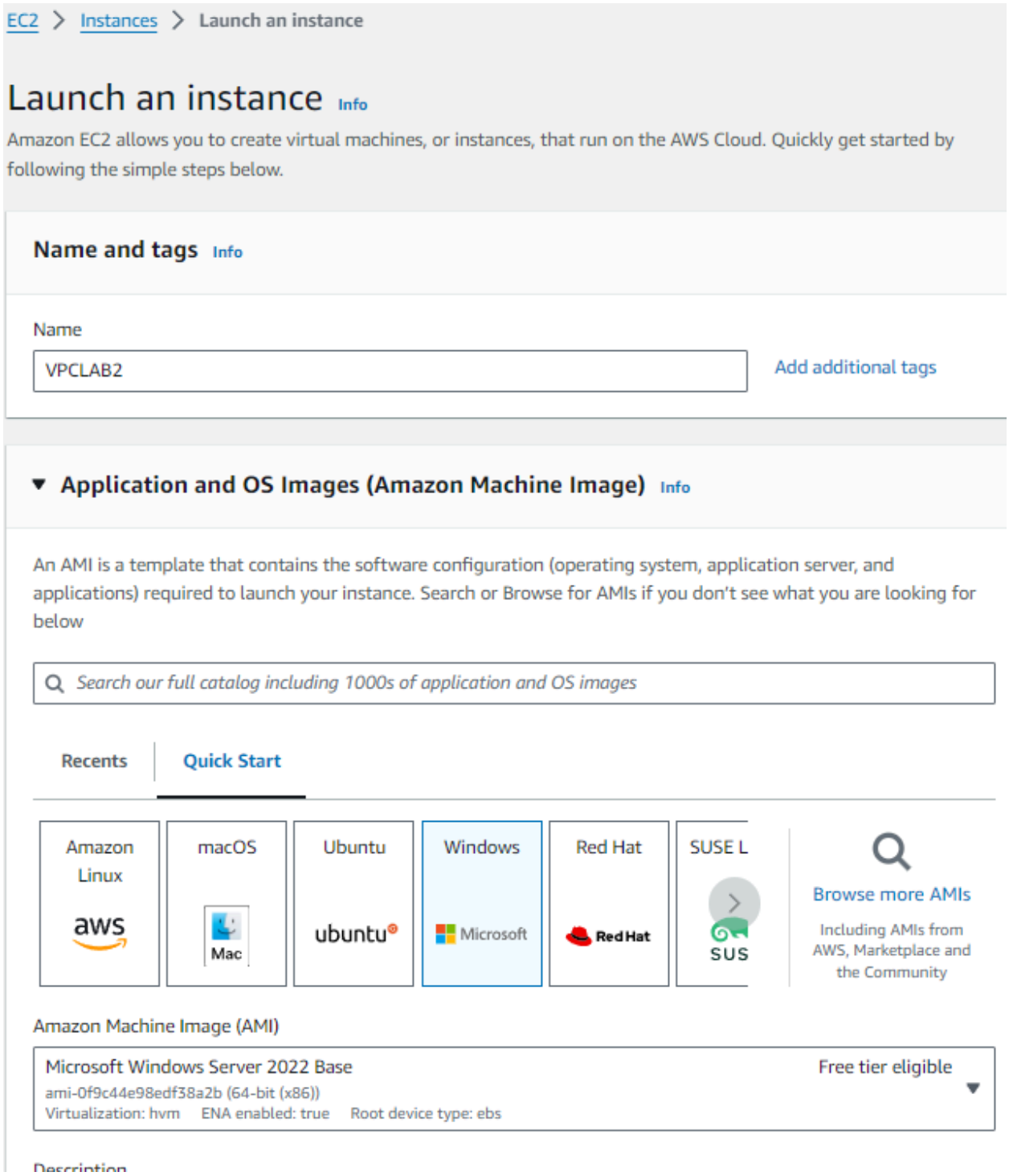



Amazon Linux 2023
https://aws.amazon.com/linux/amazon-linux-2023
Last login: Mon Feb 26 16:04:16 2024 from 18.206.107.28
[ec2-user@ip-10-0-0-81 ~]$ sudo yum update
Last metadata expiration check: 0:05:48 ago on Mon Feb 26 16:00:06 2024.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-10-0-0-81 ~]$ sudo yum install httpd
Last metadata expiration check: 0:06:30 ago on Mon Feb 26 16:00:06 2024.
Dependencies resolved.
Package Architecture Version Repository Size
Installing:
httpd x86_64 2.4.58-1.amzn2023 amazonlinux 47 k
Installing dependencies:
apr x86_64 1.7.2-2.amzn2023.0.2 amazonlinux 129 k
apr-util x86_64 1.6.3-1.amzn2023.0.1 amazonlinux 98 k
generic-logos-httpd noarch 18.0.0-12.amzn2023.0.3 amazonlinux 19 k
httpd-core x86_64 2.4.58-1.amzn2023 amazonlinux 1.4 M
httpd-filesystem noarch 2.4.58-1.amzn2023 amazonlinux 14 k
httpd-tools x86_64 2.4.58-1.amzn2023 amazonlinux 81 k
libbrotli x86_64 1.0.9-4.amzn2023.0.2 amazonlinux 315 k
mailcap noarch 2.1.49-3.amzn2023.0.3 amazonlinux 33 k
Installing weak dependencies:
apr-util-openssl x86_64 1.6.3-1.amzn2023.0.1 amazonlinux 17 k
mod_http2 x86_64 2.0.11-2.amzn2023 amazonlinux 150 k
mod_lua x86_64 2.4.58-1.amzn2023 amazonlinux 61 k
Transaction Summary
Install 12 Packages
Total download size: 2.3 M
Installed size: 6.9 M
Is this ok [y/N]:

```
Total                                                                                                  9.8 MB/s | 2.3 MB     00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :                                                                                                       1/1
  Installing       : apr-1.7.2-2.amzn2023.0.2.x86_64                                                                       1/12
  Installing       : apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64                                                          2/12
  Installing       : apr-util-1.6.3-1.amzn2023.0.1.x86_64                                                                  3/12
  Installing       : mailcap-2.1.49-3.amzn2023.0.3.noarch                                                                  4/12
  Installing       : httpd-tools-2.4.58-1.amzn2023.x86_64                                                                  5/12
  Running scriptlet: httpd-filesystem-2.4.58-1.amzn2023.noarch                                                             6/12
  Installing       : httpd-filesystem-2.4.58-1.amzn2023.noarch                                                             6/12
  Installing       : httpd-core-2.4.58-1.amzn2023.x86_64                                                                   7/12
  Installing       : mod_lua-2.4.58-1.amzn2023.x86_64                                                                      8/12
  Installing       : mod_http2-2.0.11-2.amzn2023.x86_64                                                                    9/12
  Installing       : generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch                                                    10/12
  Installing       : libbrotli-1.0.9-4.amzn2023.0.2.x86_64                                                                11/12
  Installing       : httpd-2.4.58-1.amzn2023.x86_64                                                                       12/12
  Running scriptlet: httpd-2.4.58-1.amzn2023.x86_64                                                                       12/12
  Verifying        : httpd-core-2.4.58-1.amzn2023.x86_64                                                                   1/12
  Verifying        : apr-util-1.6.3-1.amzn2023.0.1.x86_64                                                                  2/12
  Verifying        : mod_lua-2.4.58-1.amzn2023.x86_64                                                                      3/12
  Verifying        : apr-1.7.2-2.amzn2023.0.2.x86_64                                                                       4/12
  Verifying        : httpd-tools-2.4.58-1.amzn2023.x86_64                                                                  5/12
  Verifying        : libbrotli-1.0.9-4.amzn2023.0.2.x86_64                                                                 6/12
  Verifying        : mod_http2-2.0.11-2.amzn2023.x86_64                                                                    7/12
  Verifying        : httpd-2.4.58-1.amzn2023.x86_64                                                                        8/12
  Verifying        : apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64                                                          9/12
  Verifying        : generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch                                                    10/12
  Verifying        : mailcap-2.1.49-3.amzn2023.0.3.noarch                                                                 11/12
  Verifying        : httpd-filesystem-2.4.58-1.amzn2023.noarch                                                            12/12

Installed:
  apr-1.7.2-2.amzn2023.0.2.x86_64                       apr-util-1.6.3-1.amzn2023.0.1.x86_64
  apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64          generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch
  httpd-2.4.58-1.amzn2023.x86_64                        httpd-core-2.4.58-1.amzn2023.x86_64
  httpd-filesystem-2.4.58-1.amzn2023.noarch             httpd-tools-2.4.58-1.amzn2023.x86_64
  libbrotli-1.0.9-4.amzn2023.0.2.x86_64                 mailcap-2.1.49-3.amzn2023.0.3.noarch
  mod_http2-2.0.11-2.amzn2023.x86_64                    mod_lua-2.4.58-1.amzn2023.x86_64

Complete!
[ec2-user@ip-10-0-0-81 ~]$
```

```
mplete!
c2-user@ip-10-0-0-81 ~]$ sudo service httpd start
edirecting to /bin/systemctl start httpd.service
c2-user@ip-10-0-0-81 ~]$ sudo service httpd status
edirecting to /bin/systemctl status httpd.service
 httpd.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
     Active: active (running) since Mon 2024-02-26 16:08:36 UTC; 41s ago
       Docs: man:httpd.service(8)
   Main PID: 26381 (httpd)
     Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec:   0 B/sec"
      Tasks: 177 (limit: 1114)
     Memory: 13.3M
        CPU: 90ms
     CGroup: /system.slice/httpd.service
             ├─26381 /usr/sbin/httpd -DFOREGROUND
             ├─26382 /usr/sbin/httpd -DFOREGROUND
             ├─26383 /usr/sbin/httpd -DFOREGROUND
             ├─26384 /usr/sbin/httpd -DFOREGROUND
             └─26385 /usr/sbin/httpd -DFOREGROUND

eb 26 16:08:36 ip-10-0-0-81.ec2.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
eb 26 16:08:36 ip-10-0-0-81.ec2.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
eb 26 16:08:36 ip-10-0-0-81.ec2.internal httpd[26381]: Server configured, listening on: port 80
c2-user@ip-10-0-0-81 ~]$
```

8. Create a new instance using WIndows tier architecture for using RDP.



Network settings Info

VPC - *required* Info

vpc-0735a016c02358d0e (vpc-lab-03)
10.0.0.0/16

Subnet Info

subnet-024085931bb7e6e5e Upesh Public subnet
VPC: vpc-0735a016c02358d0e Owner: 979147213970
Availability Zone: us-east-1f IP addresses available: 250 CIDR: 10.0.0.0/24)

Create new subnet

Auto-assign public IP Info

Enable

Firewall (security groups) Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

- ○ Create security group
- ◉ Select existing security group

Common security groups Info

Select security groups

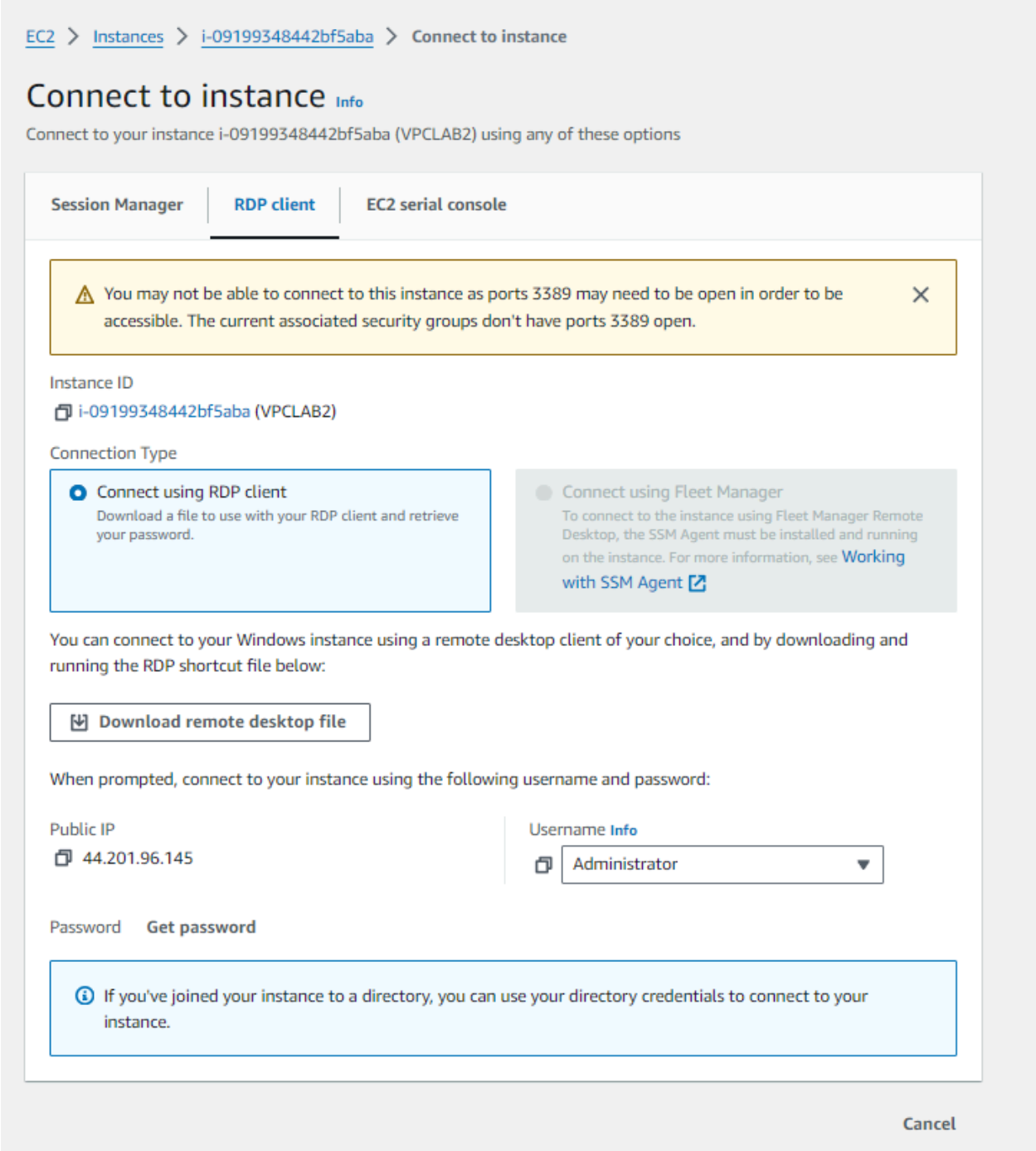
Vpclabsecuritygroup sg-0aba152998b461555
VPC: vpc-0735a016c02358d0e

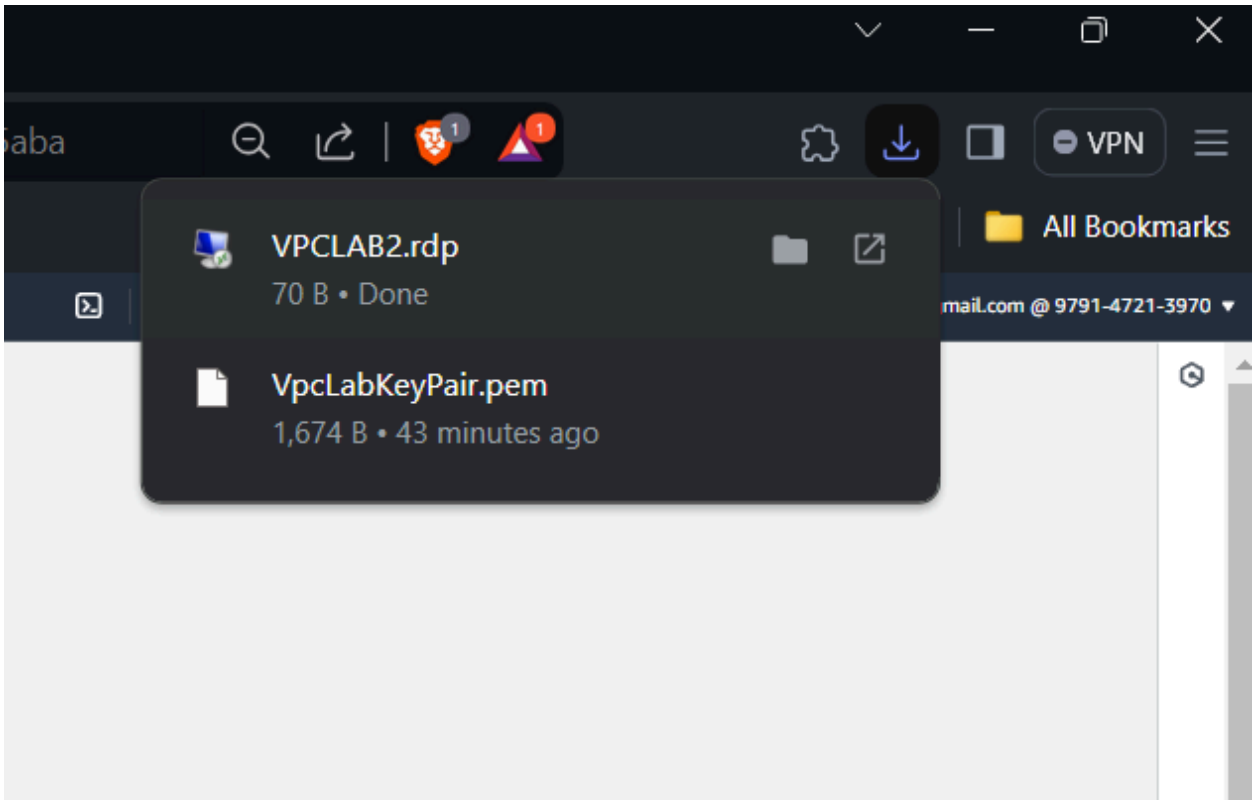
Compare security group rules

Security groups that you add or remove here will be added to or removed from all your network interfaces.

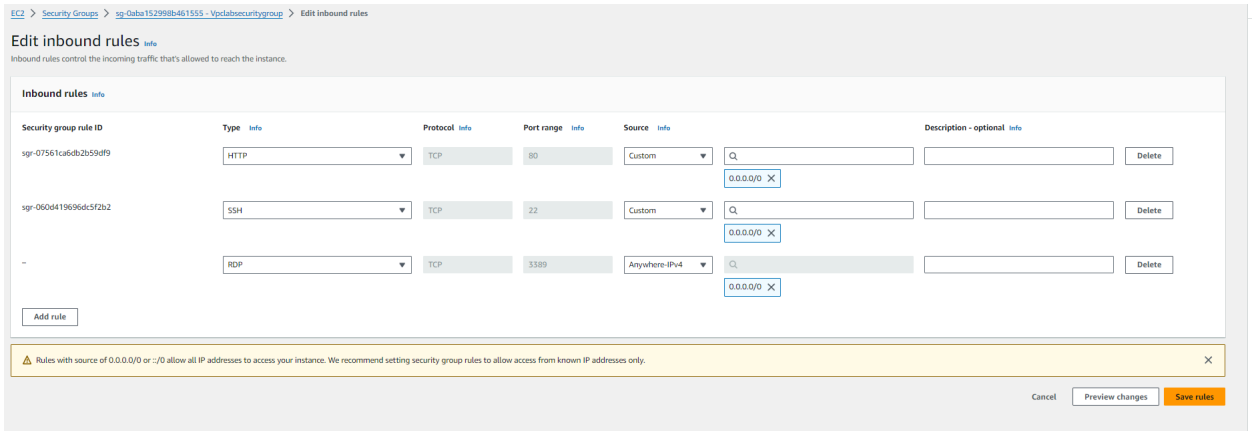
▶ Advanced network configuration

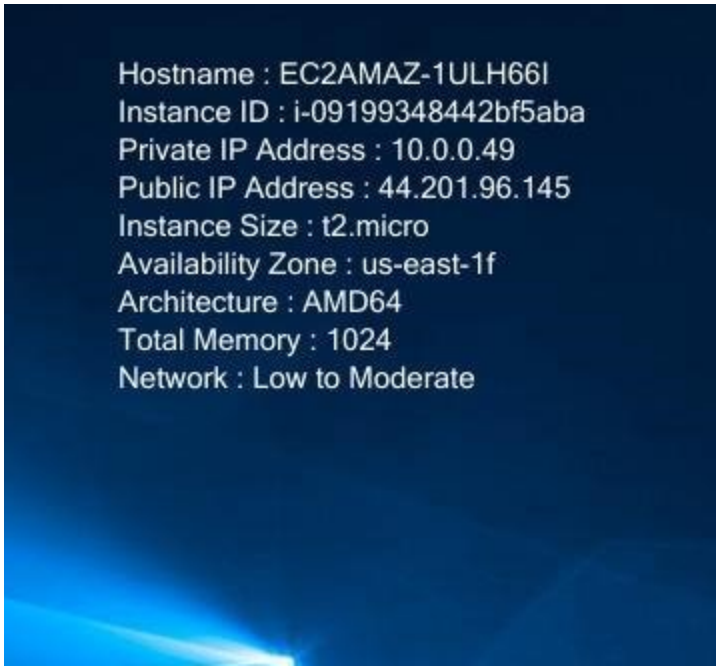
9. Use get password to decrypt password from key pair and and download the rdp file. You can access the server from that RDP file.





10 . Change the inbound rules to adjust the RDP to be accessible from everywhere.




Hostname : EC2AMAZ-1ULH66I
Instance ID : i-09199348442bf5aba
Private IP Address : 10.0.0.49
Public IP Address : 44.201.96.145
Instance Size : t2.micro
Availability Zone : us-east-1f
Architecture : AMD64
Total Memory : 1024
Network : Low to Moderate