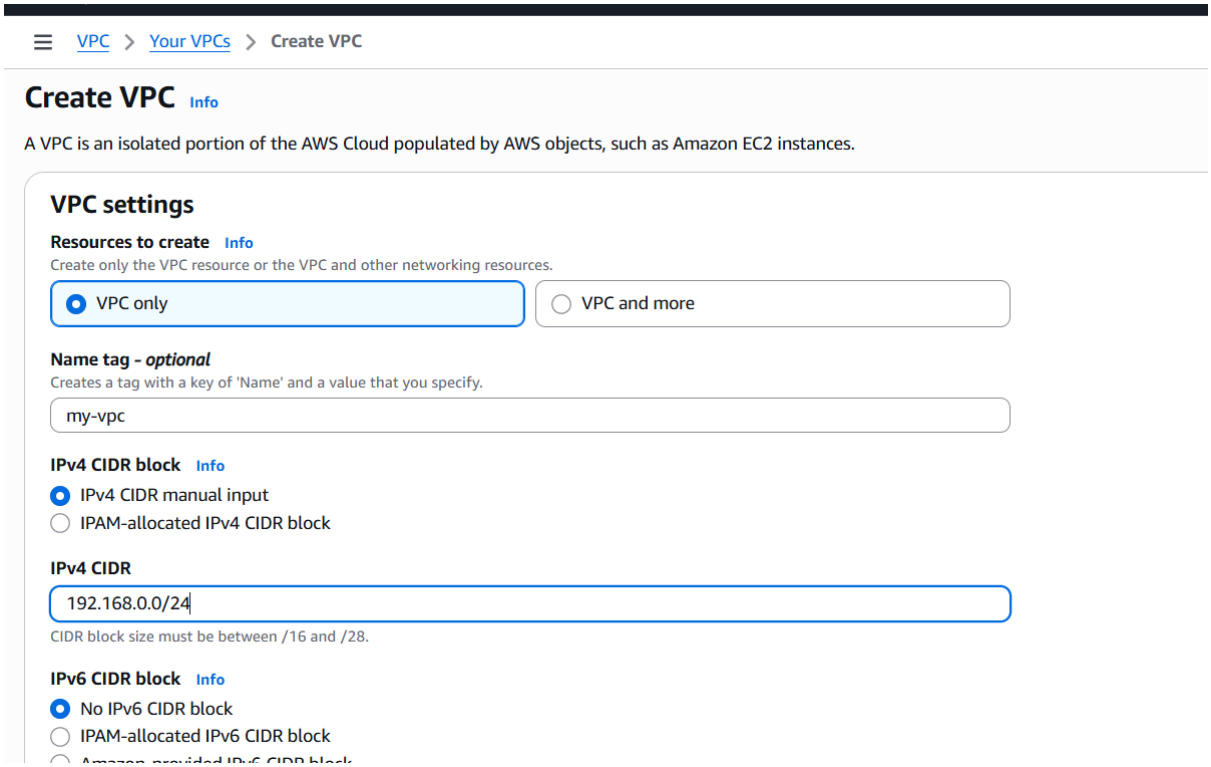
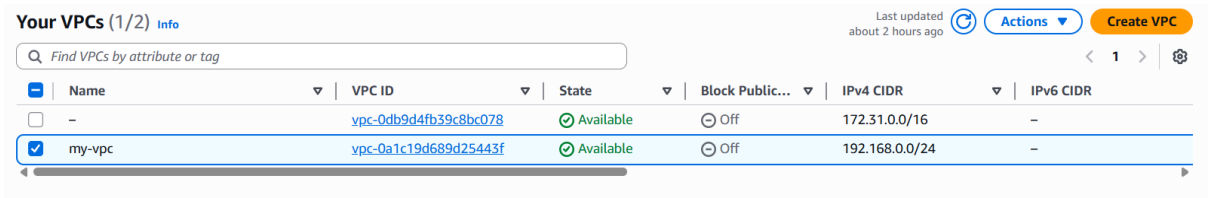
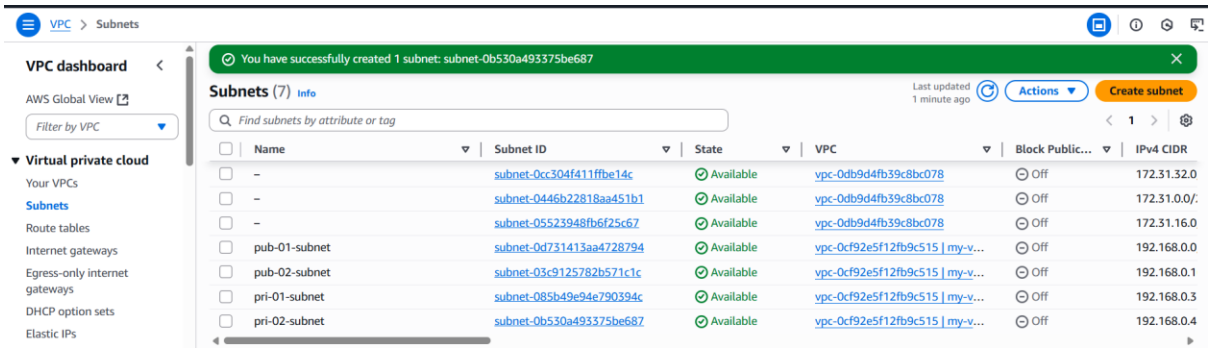
1. Create VPC with 2 private and 2 public subnets.

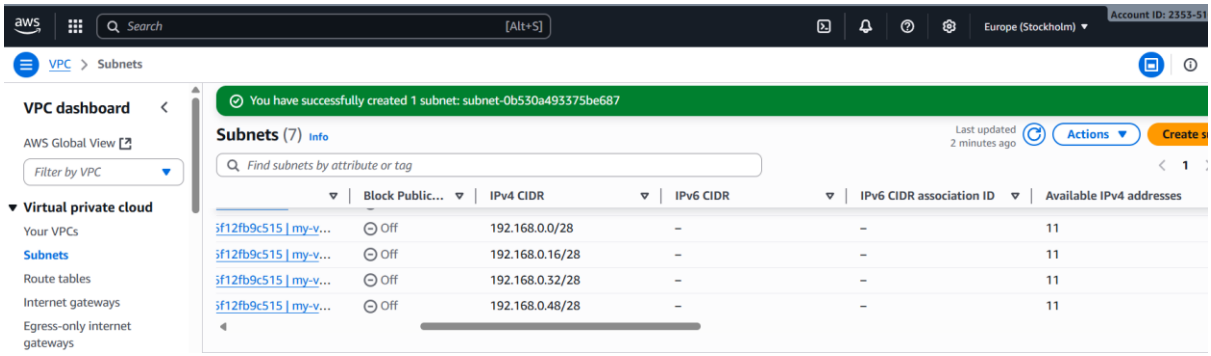
Open VPC and create one new VPC.





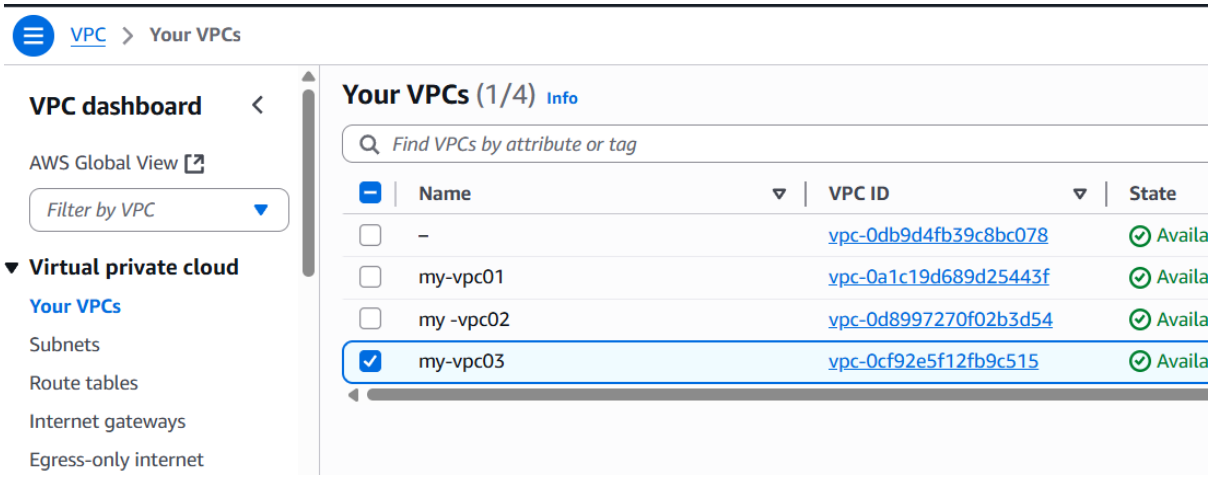
Go to subnets and create 2 public subnets and 2 private subnets.



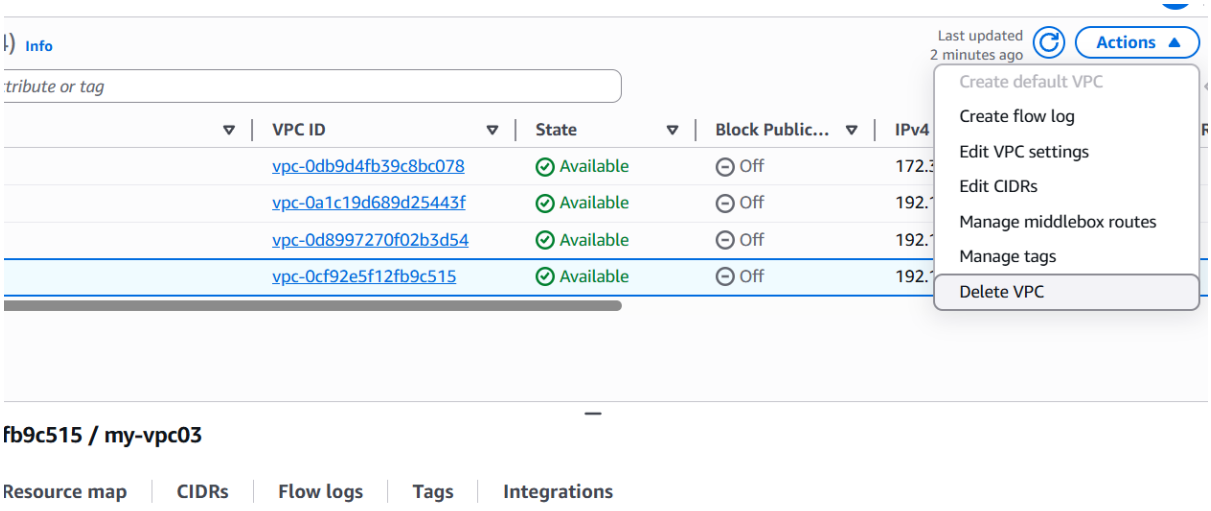


2. Enable DNS Hostname in VPC.

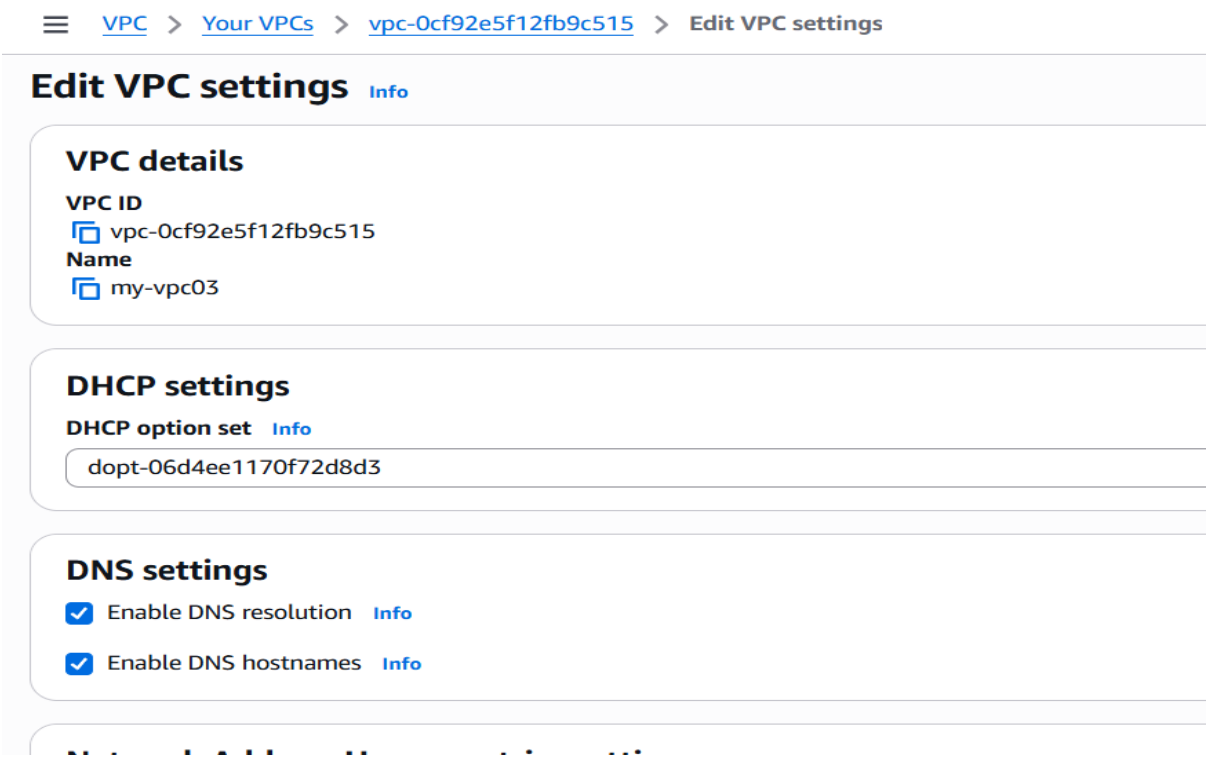
- Select the instance which we need to change DNS hostname.

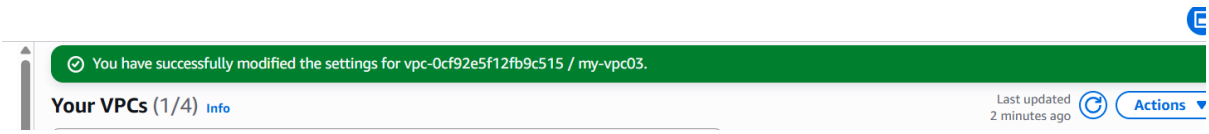


- Click on actions and select VPC change settings.



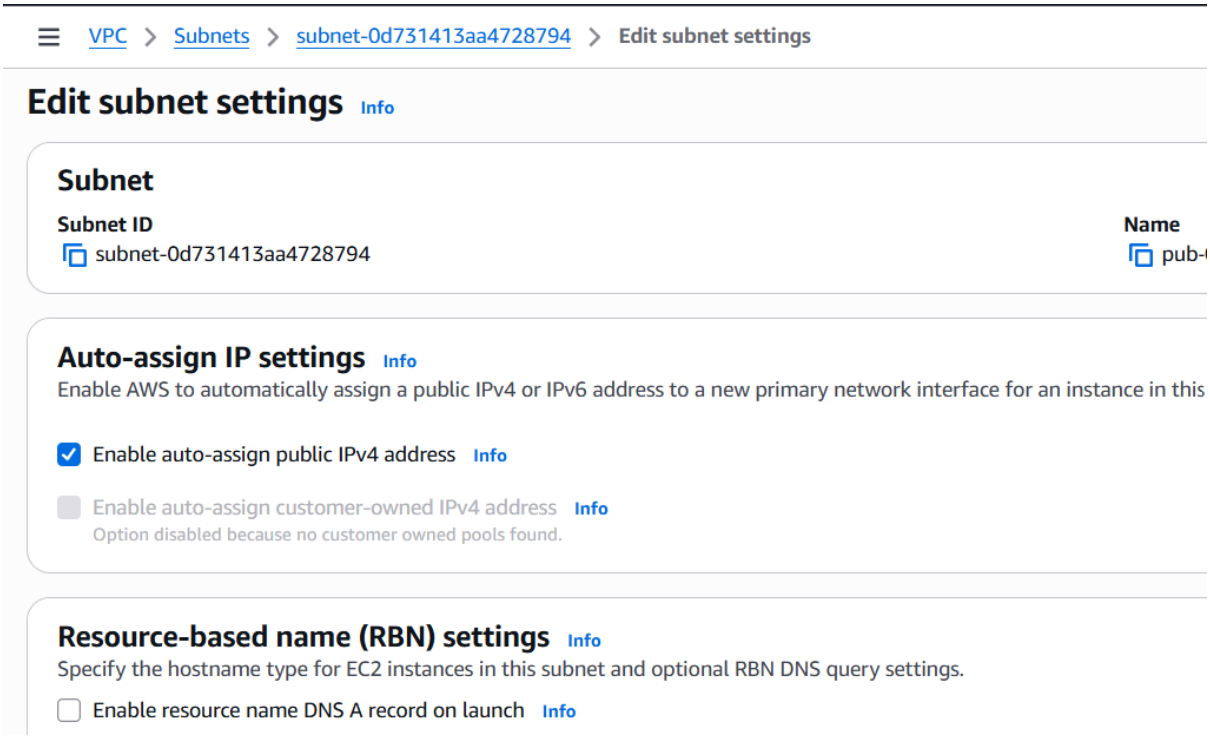
- Enable DNS hostnames and save.



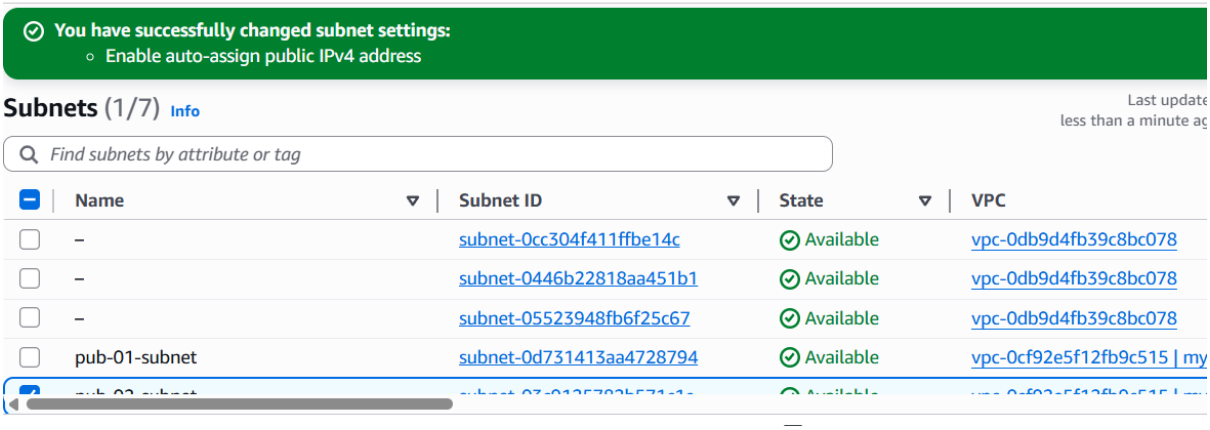


3.Enable Auto Assign Public IP in 2 public subnets.

Click on subnets. Select your first public subnet and Go to actions and click on actions and click edit subnet changes and enable it.

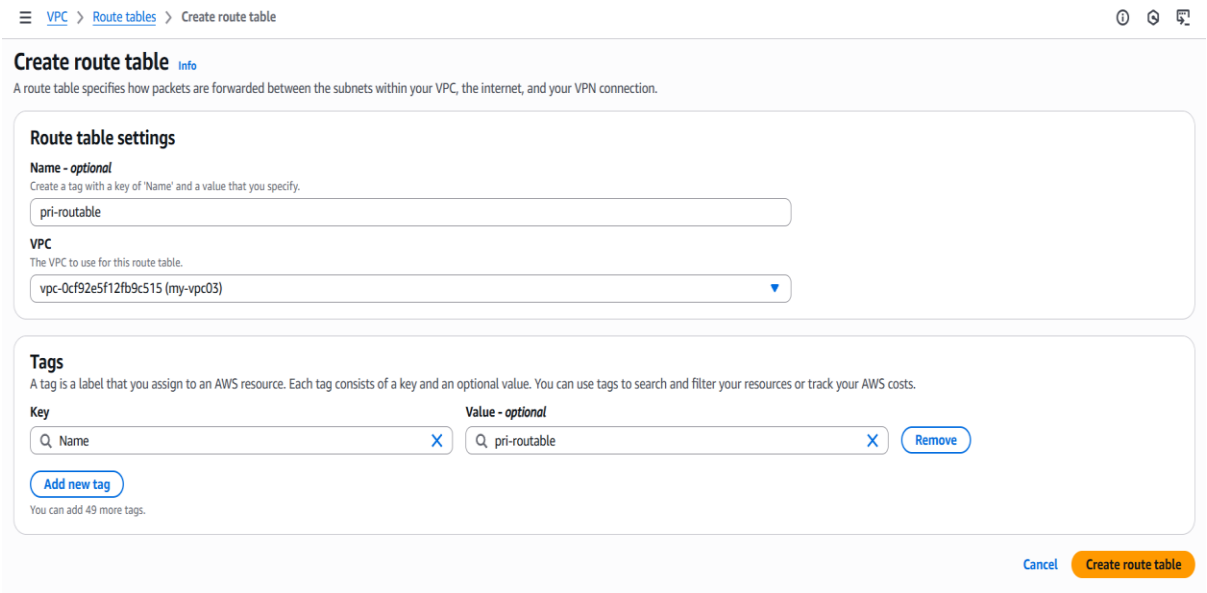


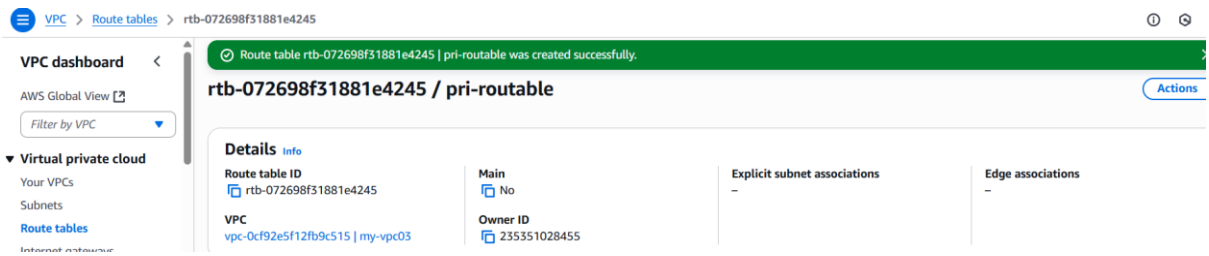
And save the changes. Select the second subnet and do the same process.



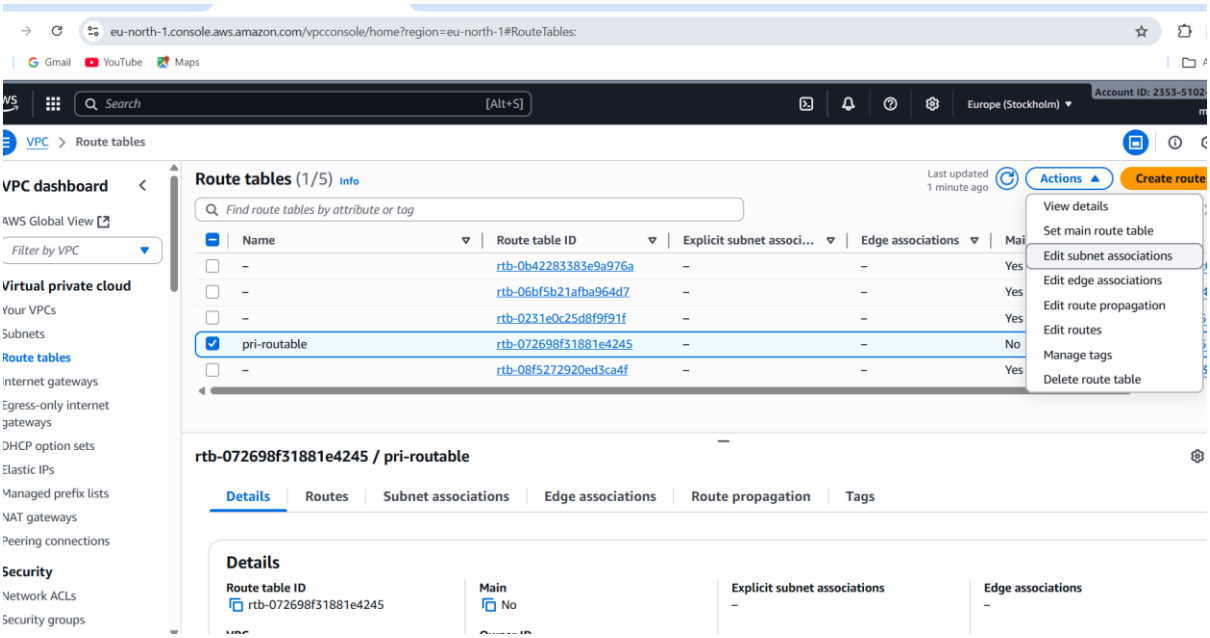
4. Add 2 private subnets in private route table.

Create a route table with the name pri-route table. And select VPC which the private subnets are present.

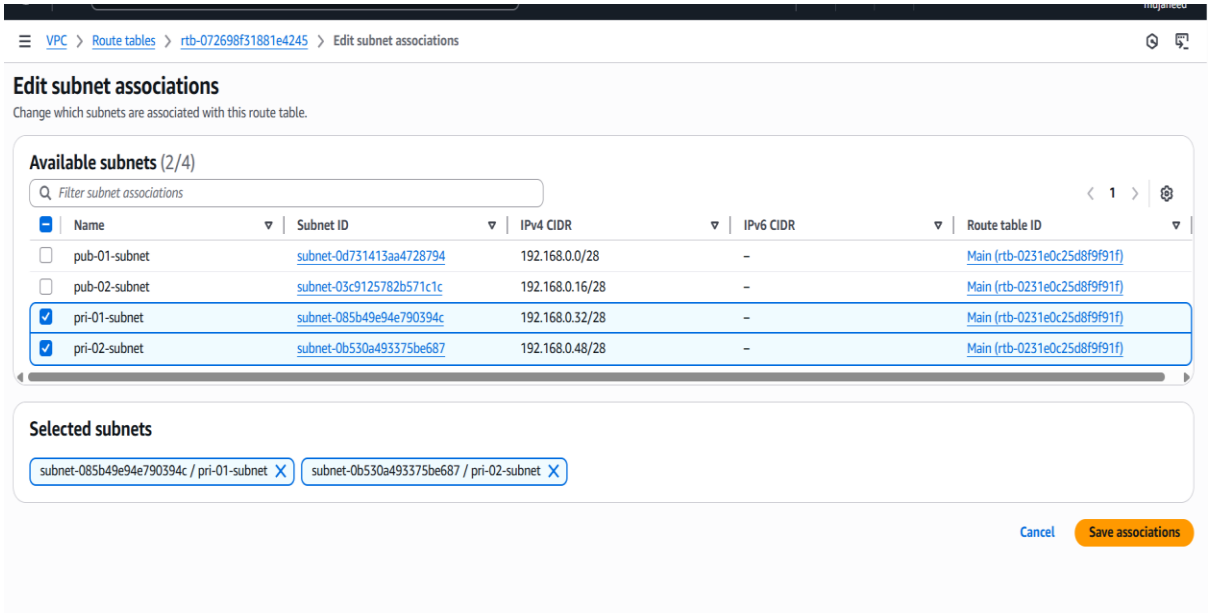


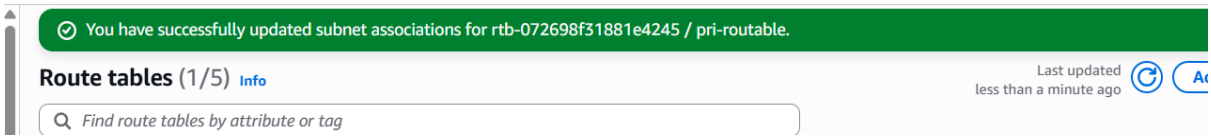


Select the private route table and go to the actions and select edit subnet associations.



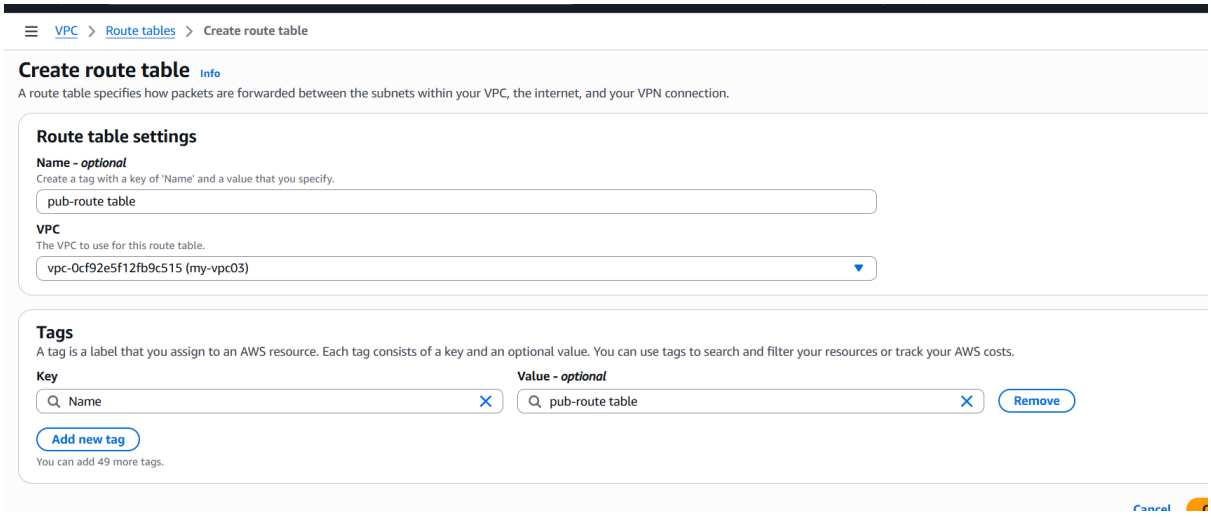
Select the 2 private subnets and save it.



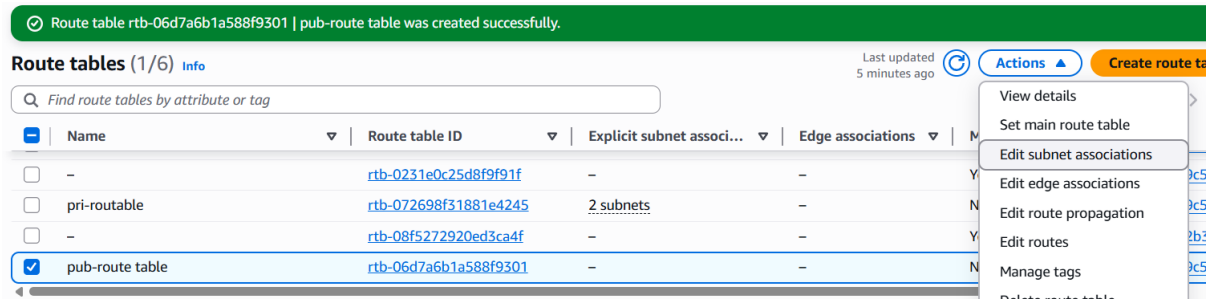


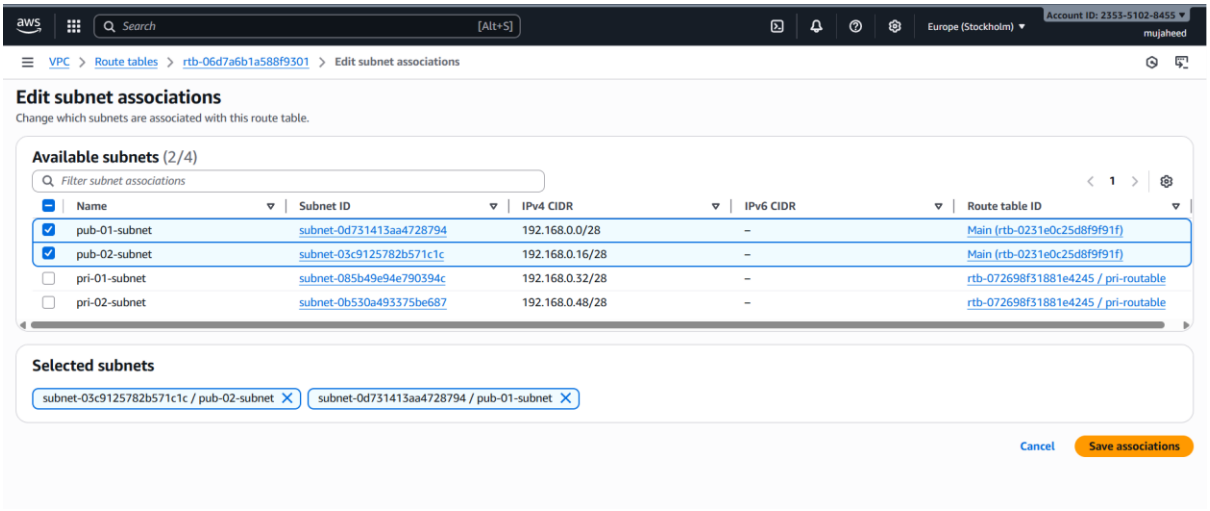
5. Add 2 public subnets in public route table.

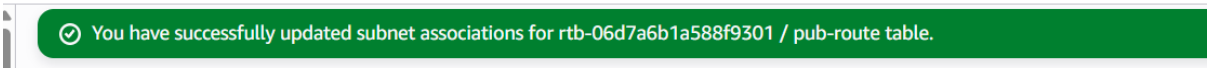
Create a route table with the name pub-route table.



Select the public route table and edit subnet associations and add two subnets.

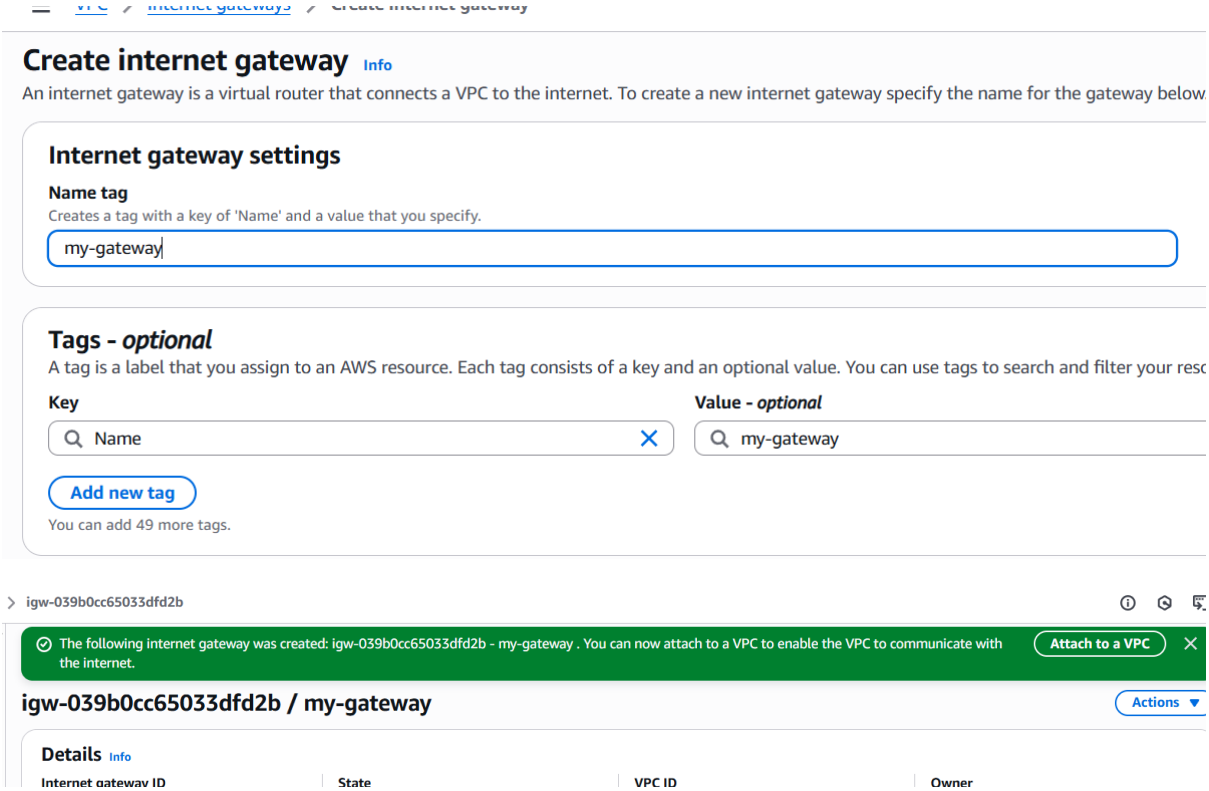




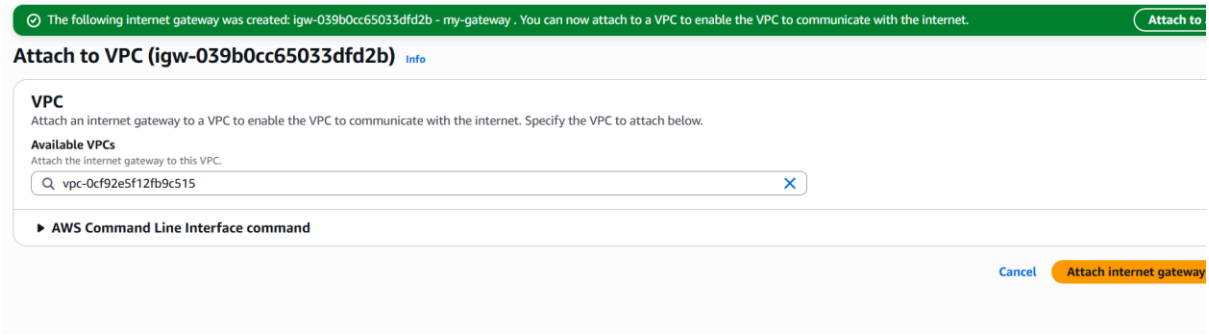


6. Public route table will have the routes to internet and local.

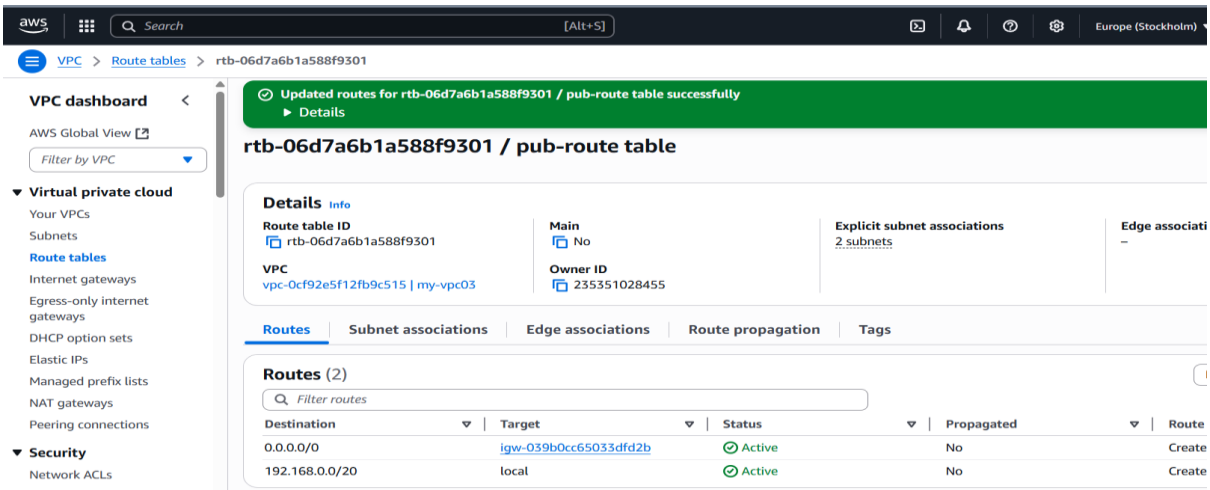
Create a internet gateway with the name my-gateway.



Attach to vpc which have the public subnets.

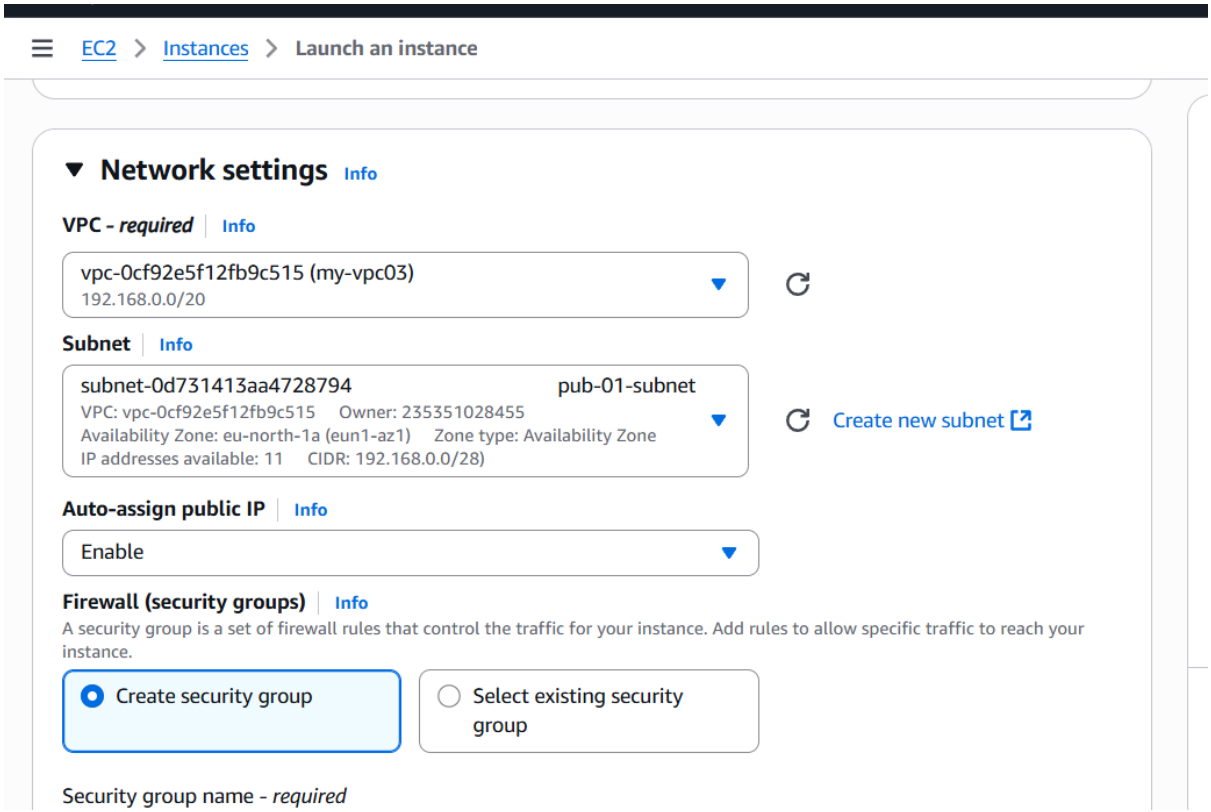


Edit the routes of add gate way to public routetable.

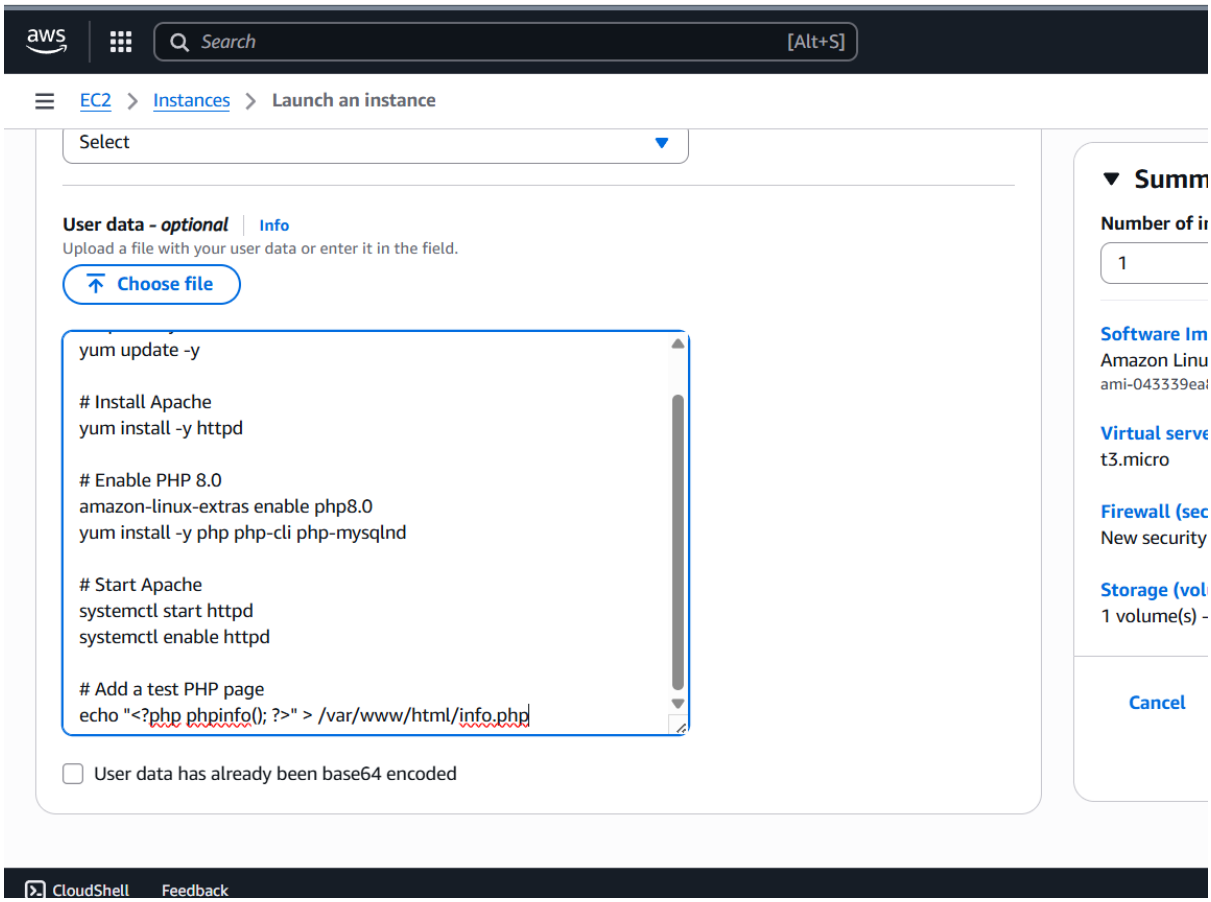


7. Create EC2 in public subnet with t2.micro and install PHP.

Create a instance with the name php-server and select amazon liux image and select your VPC and select your publicsubnet and launch the instance.



Write the installation code of php in the user data and launch the instance.

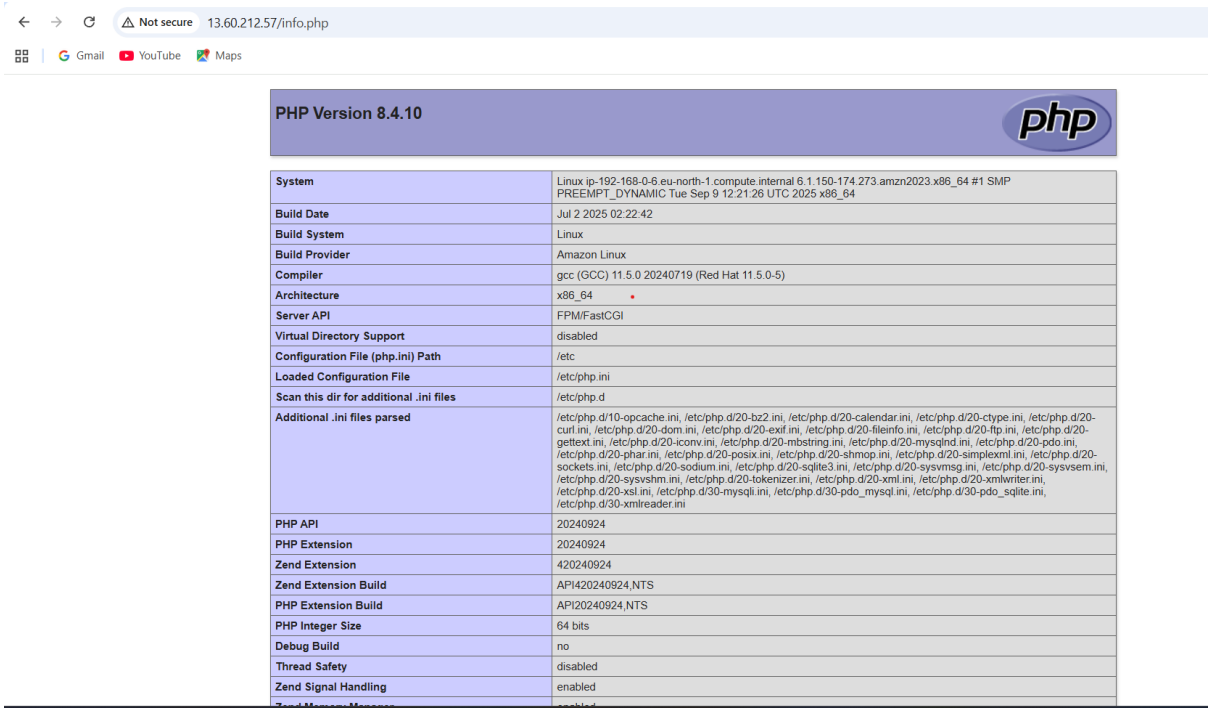


We can check whether the installation is done or not.

```
MUJJU SK@DESKTOP-LU541U4 MINGW64 ~/Downloads
$ ssh -i AWS.pem ec2-user@13.60.212.57
The authenticity of host '13.60.212.57 (13.60.212.57)' can't be established.
ED25519 key fingerprint is SHA256:qObd9gAQLy7v7pLy8G1g6CY6nvuRdqO2yX8RTnUOBfM.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '13.60.212.57' (ED25519) to the list of known hosts.
       #_
   ~\_  ####_        Amazon Linux 2023
  ~~  \_#####\
  ~~     \###|
  ~~       \#/ ___   https://aws.amazon.com/linux/amazon-linux-2023
   ~~       V~' '->
    ~~~         /
      ~~._.   _/
         _/ _/
       _/m/'
[ec2-user@ip-192-168-0-6 ~]$ sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
    Drop-In: /usr/lib/systemd/system/httpd.service.d
             └─php-fpm.conf
     Active: active (running) since Sun 2025-09-21 05:27:41 UTC; 31min ago
       Docs: man:httpd.service(8)
   Main PID: 8243 (httpd)
```

```
[ec2-user@ip-192-168-0-6 ~]$ ls -l /var/www/html/
total 4
-rw-r--r--. 1 root root 20 Sep 21 05:27 info.php
[ec2-user@ip-192-168-0-6 ~]$ curl http://localhost/info.php
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "DTD/xhtm
<html xmlns="http://www.w3.org/1999/xhtml"><head>
<style type="text/css">
body {background-color: #fff; color: #222; font-family: sans-serif;}
pre {margin: 0; font-family: monospace;}
a {color: inherit;}
a:hover {text-decoration: none;}
table {border-collapse: collapse; border: 0; width: 934px; box-shadow: 1
.center {text-align: center;}
.center table {margin: 1em auto; text-align: left;}
.center th {text-align: center !important;}
td, th {border: 1px solid #666; font-size: 75%; vertical-align: baseline
th {position: sticky; top: 0; background: inherit;}
h1 {font-size: 150%;}
h2 {font-size: 125%;}
h2 > a {text-decoration: none;}
```

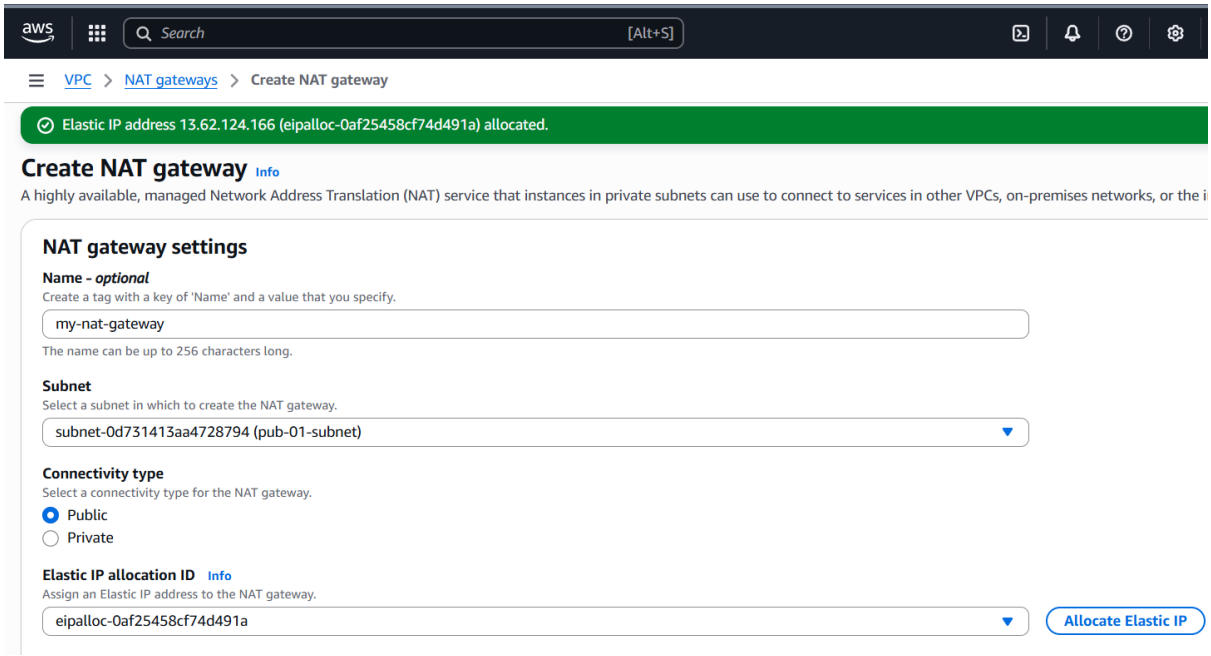
Open browser and check with the http://ipadress/info.php



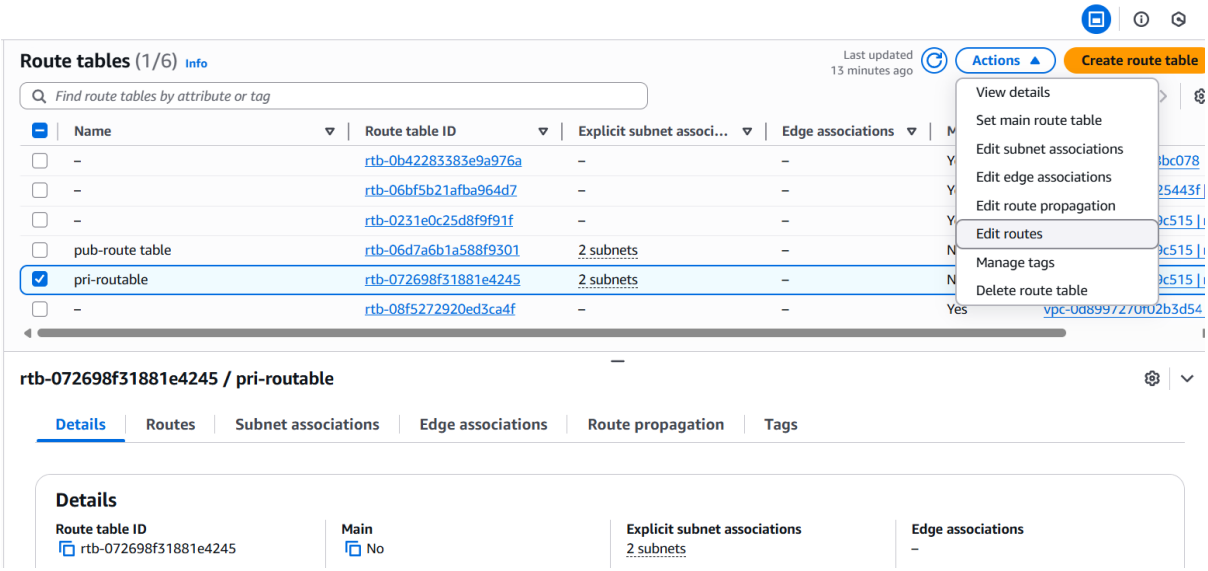
System	Linux ip-192-168-0-6.eu-north-1.compute.internal 6.1.150-174.273.amzn2023.x86_64 #1 SMP PREEMPT_DYNAMIC Tue Sep 9 12:21:26 UTC 2025 x86_64
Build Date	Jul 2 2025 02:22:42
Build System	Linux
Build Provider	Amazon Linux
Compiler	gcc (GCC) 11.5.0 20240719 (Red Hat 11.5.0-5)
Architecture	x86_64
Server API	FPM/FastCGI
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc
Loaded Configuration File	/etc/php.ini
Scan this dir for additional .ini files	/etc/php.d
Additional .ini files parsed	/etc/php.d/10-opcache.ini, /etc/php.d/20-bz2.ini, /etc/php.d/20-calendar.ini, /etc/php.d/20-ctype.ini, /etc/php.d/20-curl.ini, /etc/php.d/20-dom.ini, /etc/php.d/20-exif.ini, /etc/php.d/20-fileinfo.ini, /etc/php.d/20-ftp.ini, /etc/php.d/20-gettext.ini, /etc/php.d/20-iconv.ini, /etc/php.d/20-mbstring.ini, /etc/php.d/20-mysqlnd.ini, /etc/php.d/20-pdo.ini, /etc/php.d/20-phar.ini, /etc/php.d/20-posix.ini, /etc/php.d/20-shmop.ini, /etc/php.d/20-simplexml.ini, /etc/php.d/20-sockets.ini, /etc/php.d/20-sodium.ini, /etc/php.d/20-sqlite3.ini, /etc/php.d/20-sysvmsg.ini, /etc/php.d/20-sysvsem.ini, /etc/php.d/20-sysvshm.ini, /etc/php.d/20-tokenizer.ini, /etc/php.d/20-xml.ini, /etc/php.d/20-xmlwriter.ini, /etc/php.d/20-xsl.ini, /etc/php.d/30-mysqli.ini, /etc/php.d/30-pdo_mysql.ini, /etc/php.d/30-pdo_sqlite.ini, /etc/php.d/30-xmlreader.ini
PHP API	20240924
PHP Extension	20240924
Zend Extension	420240924
Zend Extension Build	API420240924,NTS
PHP Extension Build	API20240924,NTS
PHP Integer Size	64 bits
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled

8. Configure NAT gateway in public subnet and connect to private instance.

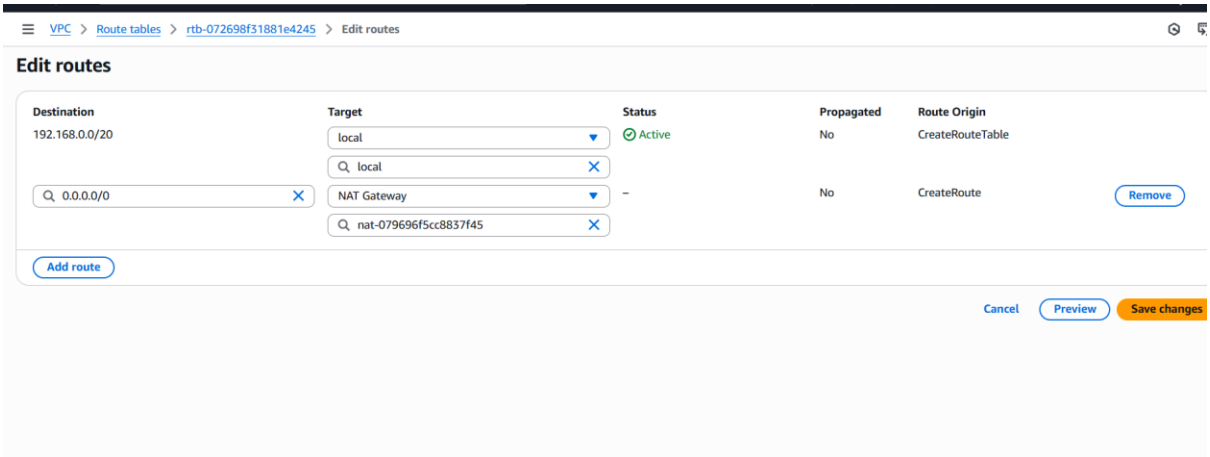
Create a NAT gateway



Go to the route table and select the private route table and edit the routes.

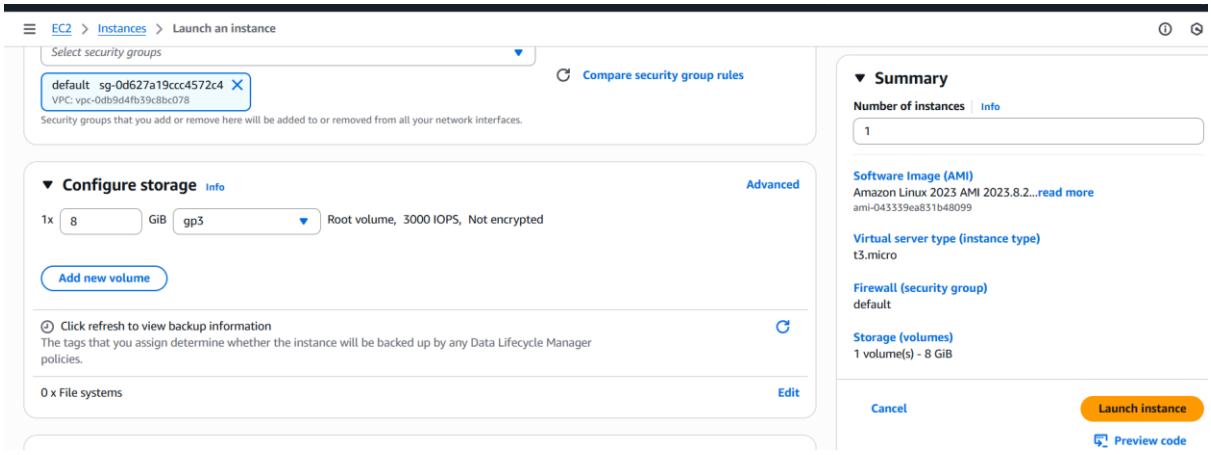


Select your created NAT gateway



9. Install Apache Tomcat in private EC2 and deploy a sample app.

Create a private instance with your VPC and placed in your private subnet. And create another instance named as bastion host with your VPC and placed in your public subnet.



Login in ssh with the public ip address.

```
MUJJU SK@DESKTOP-LU541U4 MINGW64 ~/Downloads
$ ssh -i AWS.pem ec2-user@13.60.210.225
The authenticity of host '13.60.210.225 (13.60.210.225)' can't be established.
ED25519 key fingerprint is SHA256:3m/aL7g732zVqNcEkdY7j012Zhd2V+1aFUquGP+18PQ.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '13.60.210.225' (ED25519) to the list of known hosts.
       #_
   ~\_  ####_        Amazon Linux 2023
  ~~  \_#####\
  ~~     \###|
  ~~       \#/ ___   https://aws.amazon.com/linux/amazon-linux-2023
   ~~       V~' '->
    ~~~         /
      ~~._.   _/
         _/ _/
       _/m/'
[ec2-user@ip-192-168-0-11 ~]$
```

By using public ip login that.add sudo yum update -y

```
[root@ip-10-0-14-43 ~]# sudo yum update -y
Amazon Linux 2023 Kernel Livepatch repository
Dependencies resolved.
Nothing to do.
Complete!
[root@ip-10-0-14-43 ~]#
```

Yum install java.

```
[root@ip-10-0-14-43 ~]# yum install java
Last metadata expiration check: 0:02:01 ago on Thu Sep 25 13:56:30 2025.
Dependencies resolved.
================================================================================
 Package                          Architecture     Version                  R
================================================================================
Installing:
 java-24-amazon-corretto          x86_64           1:24.0.2+12-1.amzn2023.1 a
Installing dependencies:
 alsa-lib                         x86_64           1.2.7.2-1.amzn2023.0.2   a
 cairo                            x86_64           1.18.0-4.amzn2023.0.3    a
 dejavu-sans-fonts                noarch           2.37-16.amzn2023.0.2     a
 dejavu-sans-mono-fonts           noarch           2.37-16.amzn2023.0.2     a
 dejavu-serif-fonts               noarch           2.37-16.amzn2023.0.2     a
 fontconfig                       x86_64           2.13.94-2.amzn2023.0.2   a
 fonts-filesystem                 noarch           1:2.0.5-12.amzn2023.0.2  a
 freetype                         x86_64           2.13.2-5.amzn2023.0.1    a
 giflib                           x86_64           5.2.1-9.amzn2023.0.1     a
 google-noto-fonts-common         noarch           20240401-1.amzn2023.0.2  a
 google-noto-sans-vf-fonts        noarch           20240401-1.amzn2023.0.2  a
```

Install tomcat:

- sudo yum update -y
- sudo amazon-linux-extras install java-openjdk11 -y

- wgethttps://dlcdn.apache.org/tomcat/tomcat9/v9.0.95/bin/apache-tomcat-9.0.95.tar.gz
- tar -xvzf apache-tomcat-9.0.95.tar.gz
- mv apache-tomcat-9.0.95 /opt/tomcat
- sh /opt/tomcat/bin/startup.sh

```
[root@ip-10-0-14-43 opt]# ls
apache-tomcat-9.0.109  aws  tomcat  tomcat9
[root@ip-10-0-14-43 opt]# cd /opt/tomcat9
-bash: cd: /opt/tomcat9: Not a directory
[root@ip-10-0-14-43 opt]#
[root@ip-10-0-14-43 opt]#
[root@ip-10-0-14-43 opt]# cd apache-tomcat-9.0.109/
[root@ip-10-0-14-43 apache-tomcat-9.0.109]# ls
BUILDING.txt     LICENSE  README.md      RUNNING.txt  conf  logs  webapps
CONTRIBUTING.md  NOTICE   RELEASE-NOTES  bin          lib   temp  work
[root@ip-10-0-14-43 apache-tomcat-9.0.109]# cd bin/
[root@ip-10-0-14-43 bin]# ls
bootstrap.jar       ciphers.sh                  daemon.sh     setclasspath.bat  startup.sh            version.bat
catalina-tasks.xml  commons-daemon-native.tar.gz  digest.bat    setclasspath.sh   tomcat-juli.jar       version.sh
catalina.bat        commons-daemon.jar          digest.sh     shutdown.bat      tomcat-native.tar.gz
catalina.sh         configtest.bat              makebase.bat  shutdown.sh       tool-wrapper.bat
ciphers.bat         configtest.sh               makebase.sh   startup.bat       tool-wrapper.sh
[root@ip-10-0-14-43 bin]# ./startup.sh
Using CATALINA_BASE:   /opt/apache-tomcat-9.0.109
Using CATALINA_HOME:   /opt/apache-tomcat-9.0.109
Using CATALINA_TMPDIR: /opt/apache-tomcat-9.0.109/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /opt/apache-tomcat-9.0.109/bin/bootstrap.jar:/opt/apache-tomcat-9.0.109/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
```

Deploy a sample war:

wget https://tomcat.apache.org/tomcat-9.0 doc/appdev/sample/sample.war -O sample.war

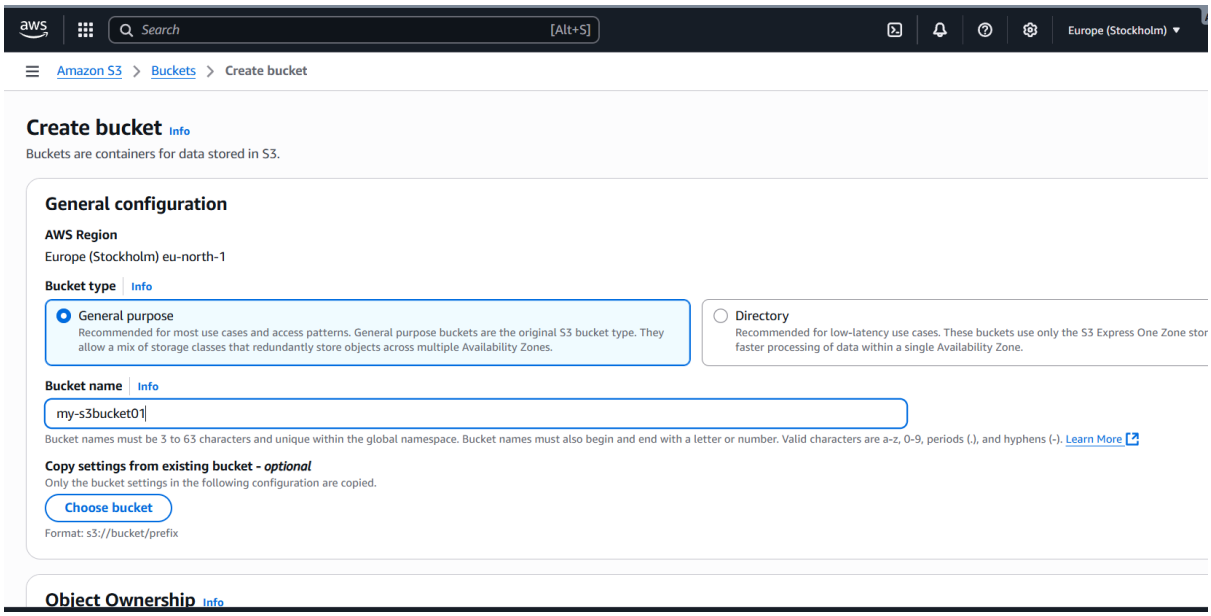
```
root@ip-192-168-3-99 tmp]# sudo systemctl daemon-reload
udo systemctl start tomcat
udo systemctl status tomcat
 tomcat.service - Apache Tomcat Web Application Container
     Loaded: loaded (/etc/systemd/system/tomcat.service; enabled; preset: disabled)
     Active: active (running) since Thu 2025-09-25 09:27:15 UTC; 113ms ago
    Process: 30512 ExecStart=/opt/tomcat/bin/catalina.sh start (code=exited, status=0/SUCCESS)
   Main PID: 30520 (java)
      Tasks: 12 (limit: 1111)
     Memory: 17.4M
        CPU: 66ms
     CGroup: /system.slice/tomcat.service
             └─30520 /usr/lib/jvm/java-24-amazon-corretto.x86_64//bin/java -Djava.util.logging.config.file=/opt/tomca

ep 25 09:27:15 ip-192-168-3-99.ec2.internal systemd[1]: Starting tomcat.service - Apache Tomcat Web Application Cont
ep 25 09:27:15 ip-192-168-3-99.ec2.internal catalina.sh[30512]: Existing PID file found during start.
ep 25 09:27:15 ip-192-168-3-99.ec2.internal catalina.sh[30512]: Removing/clearing stale PID file.
ep 25 09:27:15 ip-192-168-3-99.ec2.internal catalina.sh[30512]: Tomcat started.
ep 25 09:27:15 ip-192-168-3-99.ec2.internal systemd[1]: Started tomcat.service - Apache Tomcat Web Application Conta
ines 1-16/16 (END)
```

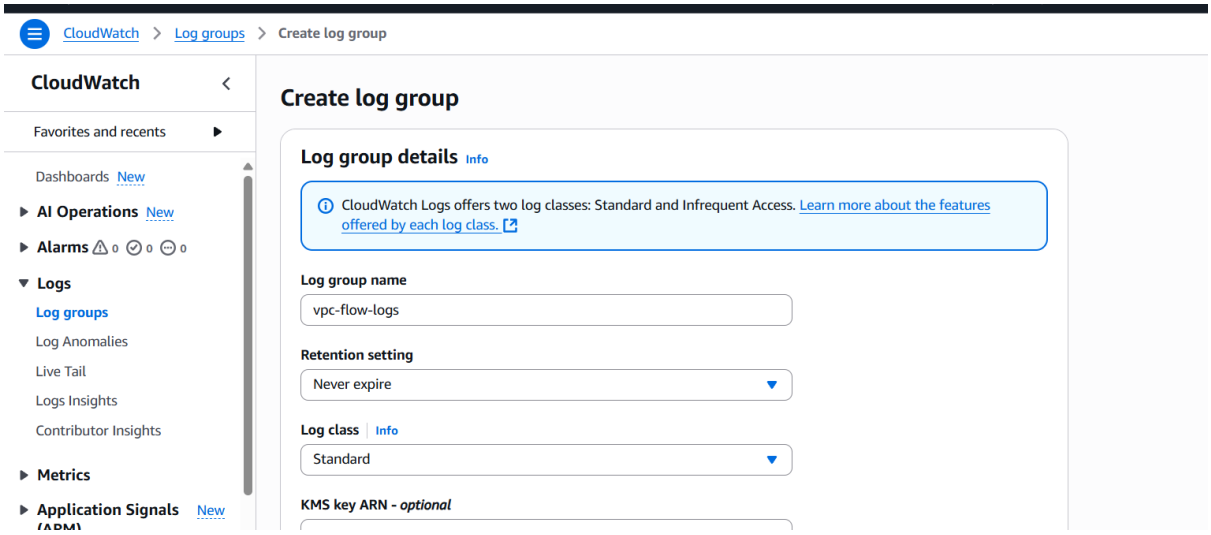
Access from Public EC2 using: http://<Private-EC2-PrivateIP>:8080/sample (curl or browser if using bastion)

10. Configure VPC flow logs and store the logs in S3 and CloudWatch.

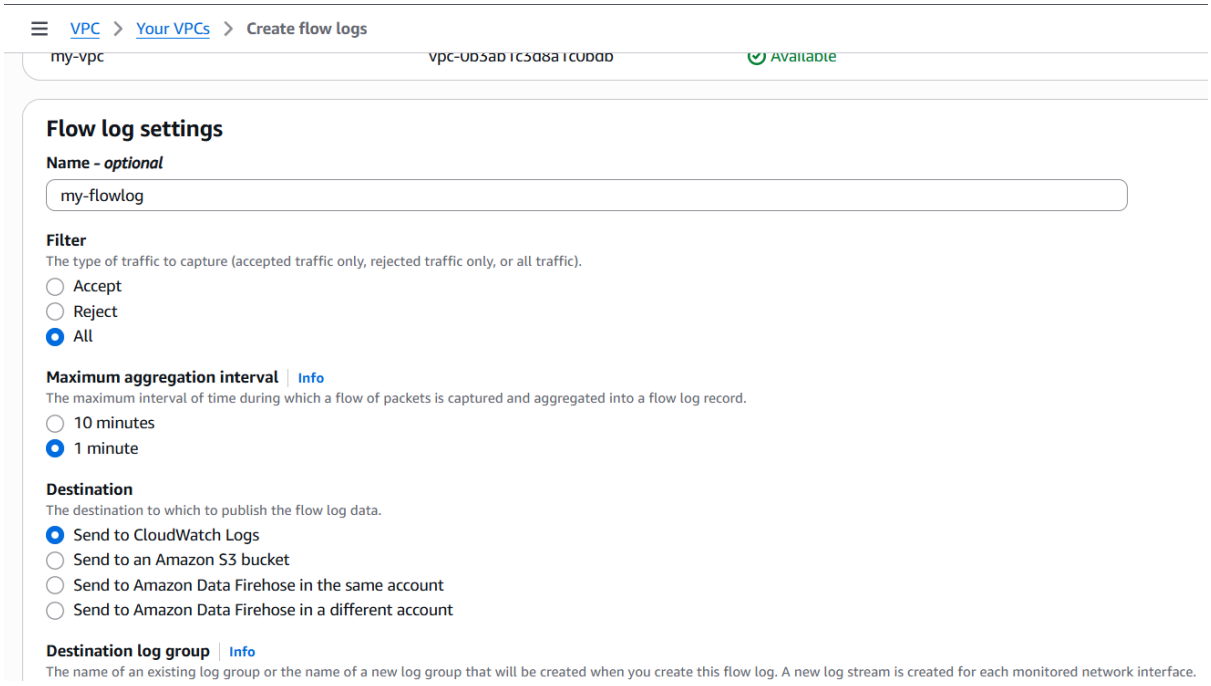
Create a bucket by navigating to S3 bucket.



Go to cloud watch and select log groups and create a log group.



Go to vpc and select your vpc int that vpc select flow logs and create flowlog.



Go to cloudwatch and log groups vpc-flow-logs if you didn't see any streams delete an instance it will give the logs.