Assignment 1: EC2 and Instance

- Logging into AWS (with Account ID)
- Launch a Virtual Machine (VM) with EC2
- Launch an Instance
- Installing Packages, user and root user
- Installing tree
- Using tree

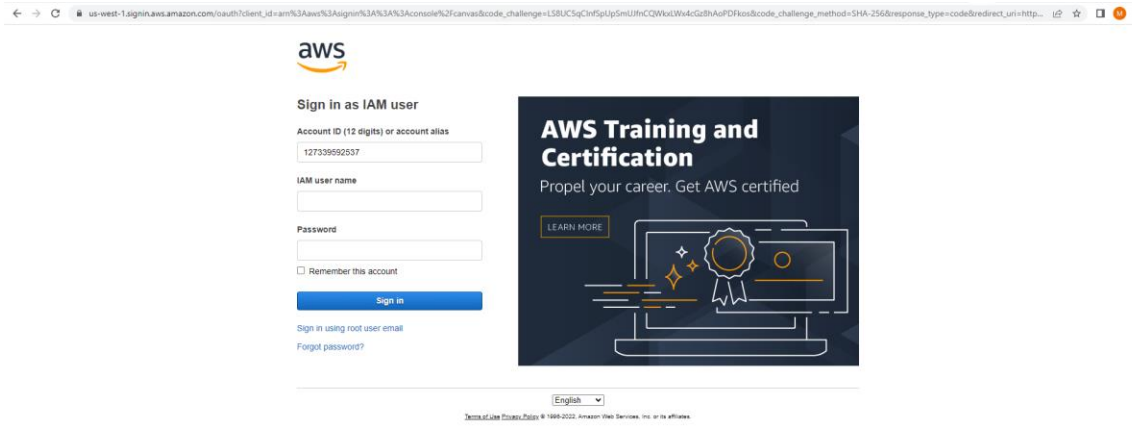
Logging into AWS (with Account ID)

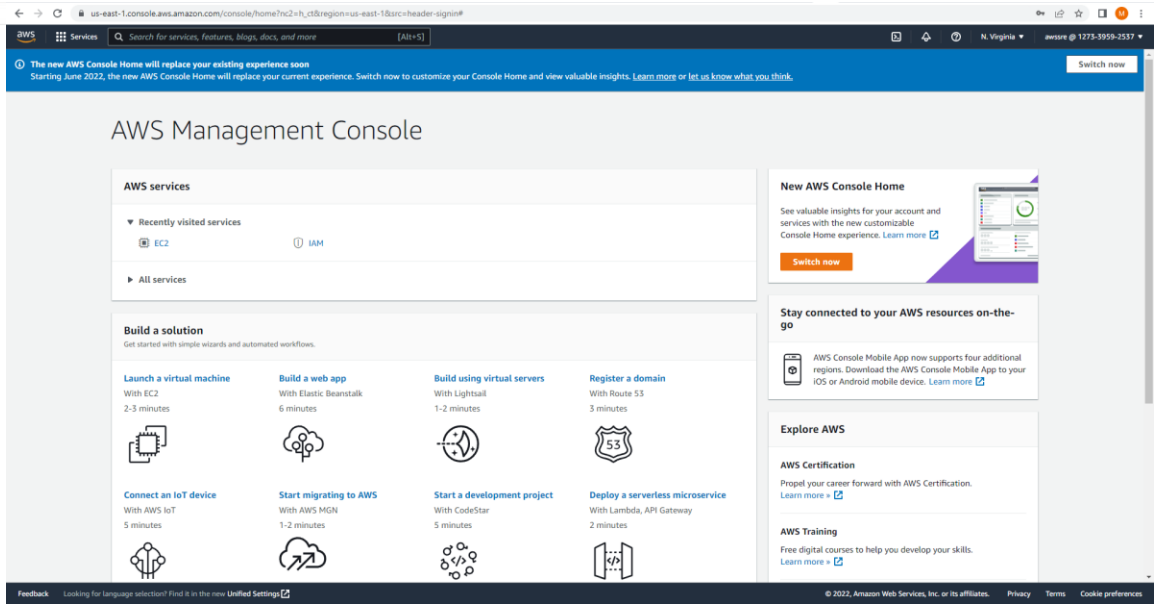
Log in link: https://console.aws.amazon.com/console/home

Important link and account ID to remember: https://127339592537.signin.aws.amazon.com/console

Account ID: 127339592537 (same as code number in the above link)

IAM Username: awssre

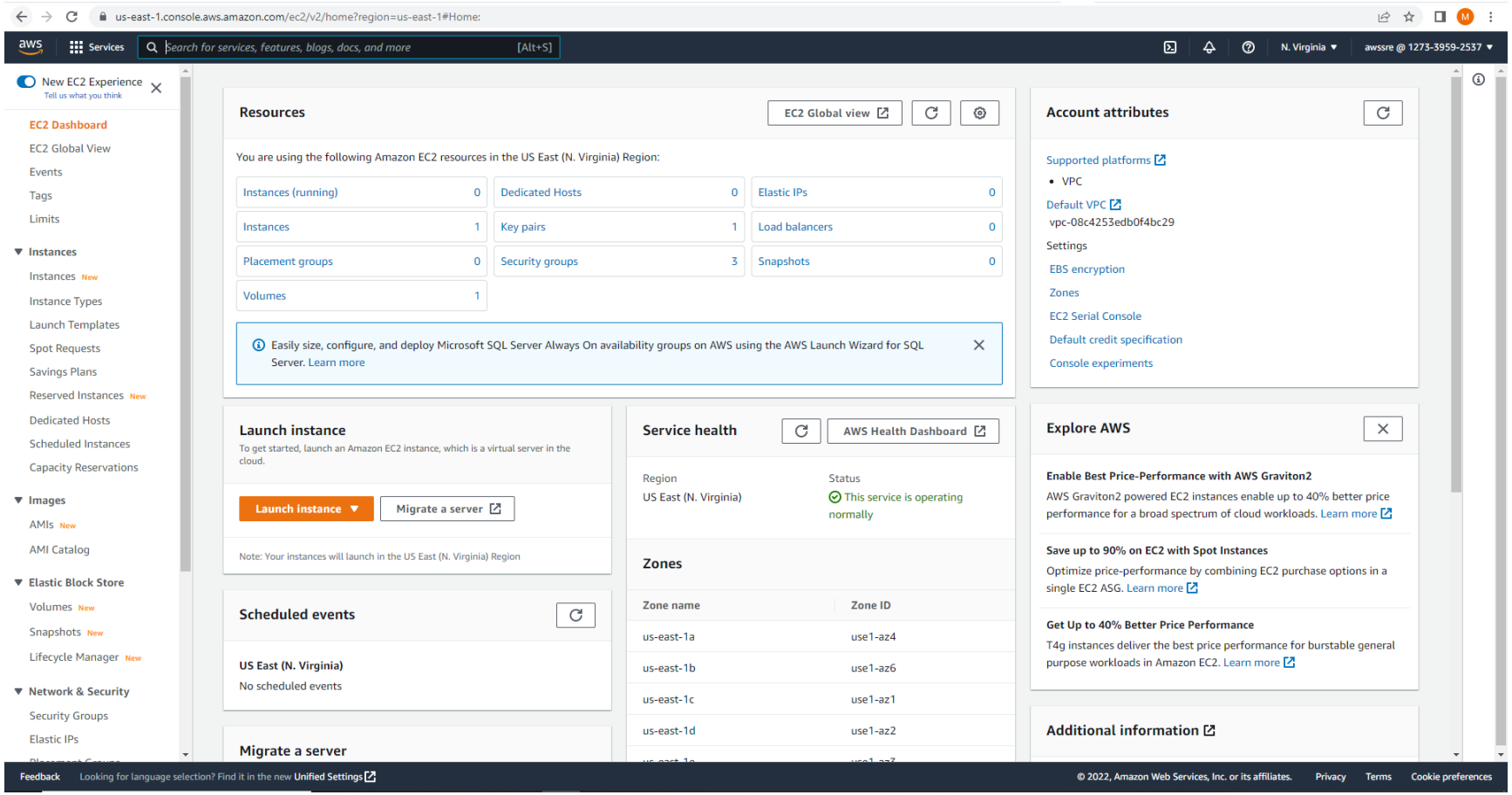




Launch a Virtual Machine (VM) with EC2

Search for “EC2” at the top of services search bar. Should arrive at this page.

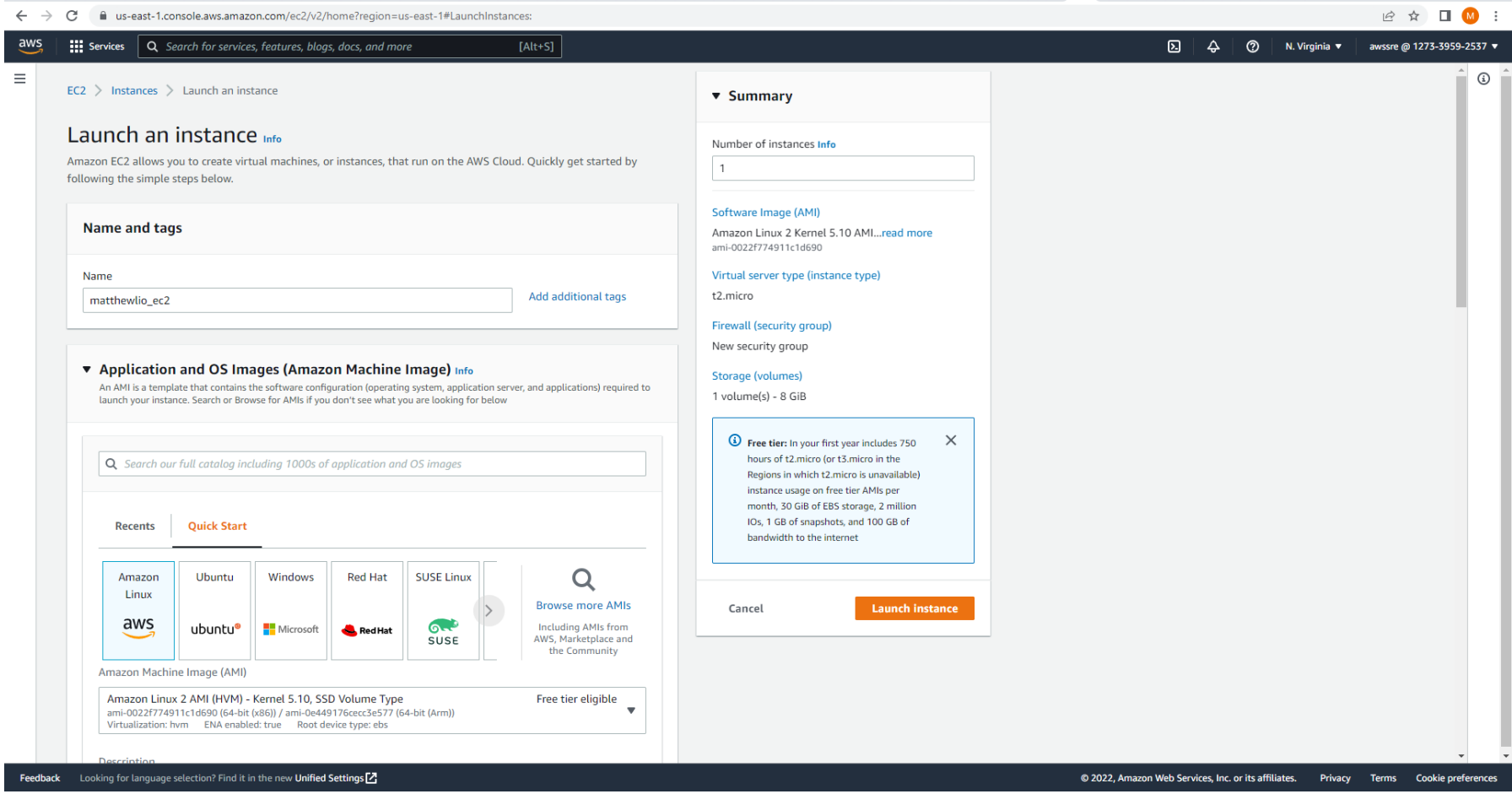
Next, create EC2 instance by clicking on Launch Instance



Launch an Instance: Settings

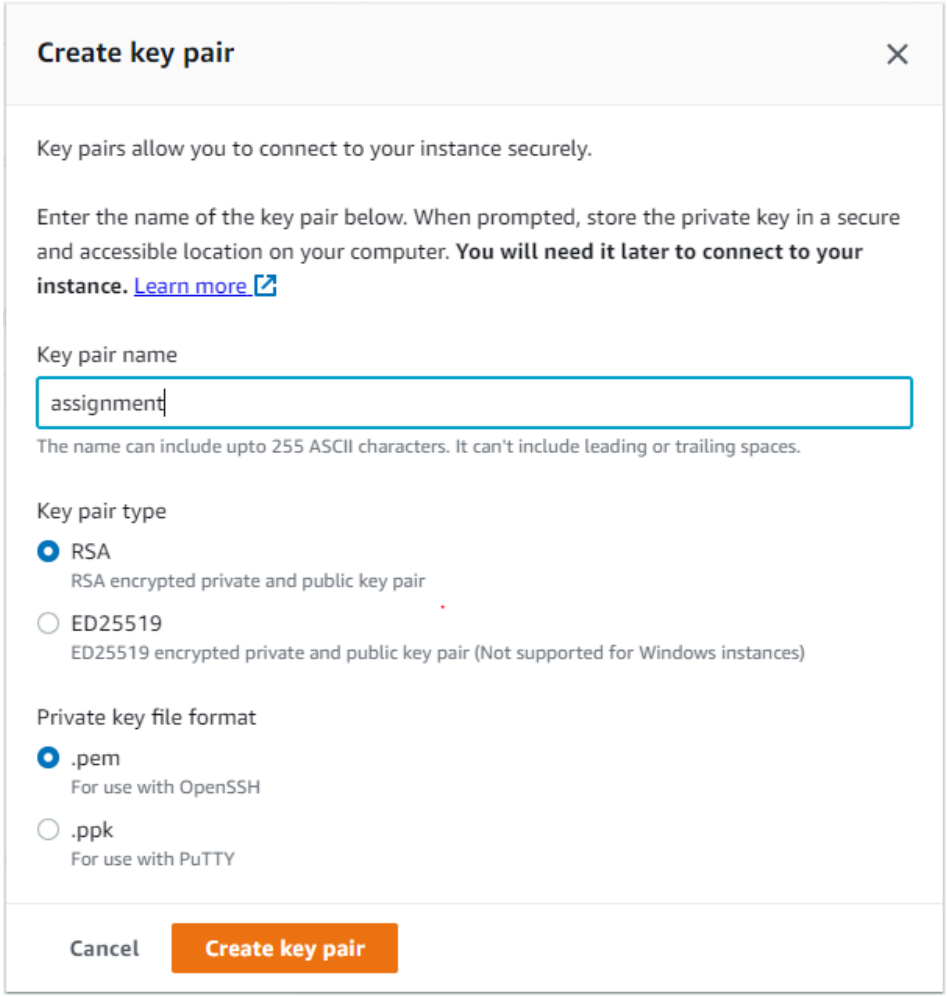
Arriving at this page, key in desired name. Name should be meaningful.

- **Application and OS Images (Amazon Machine Image):** Amazon Linux > Latest Kernel version (Free tier eligible)
- **Instance type:** t2.micro (1GB memory, Free tier eligible)
- **Key pair login**: Refer to next slide
- **Rest of the settings:** Default
- Click “Launch instance”
- Make sure it is successful
- Click on “View all instances”

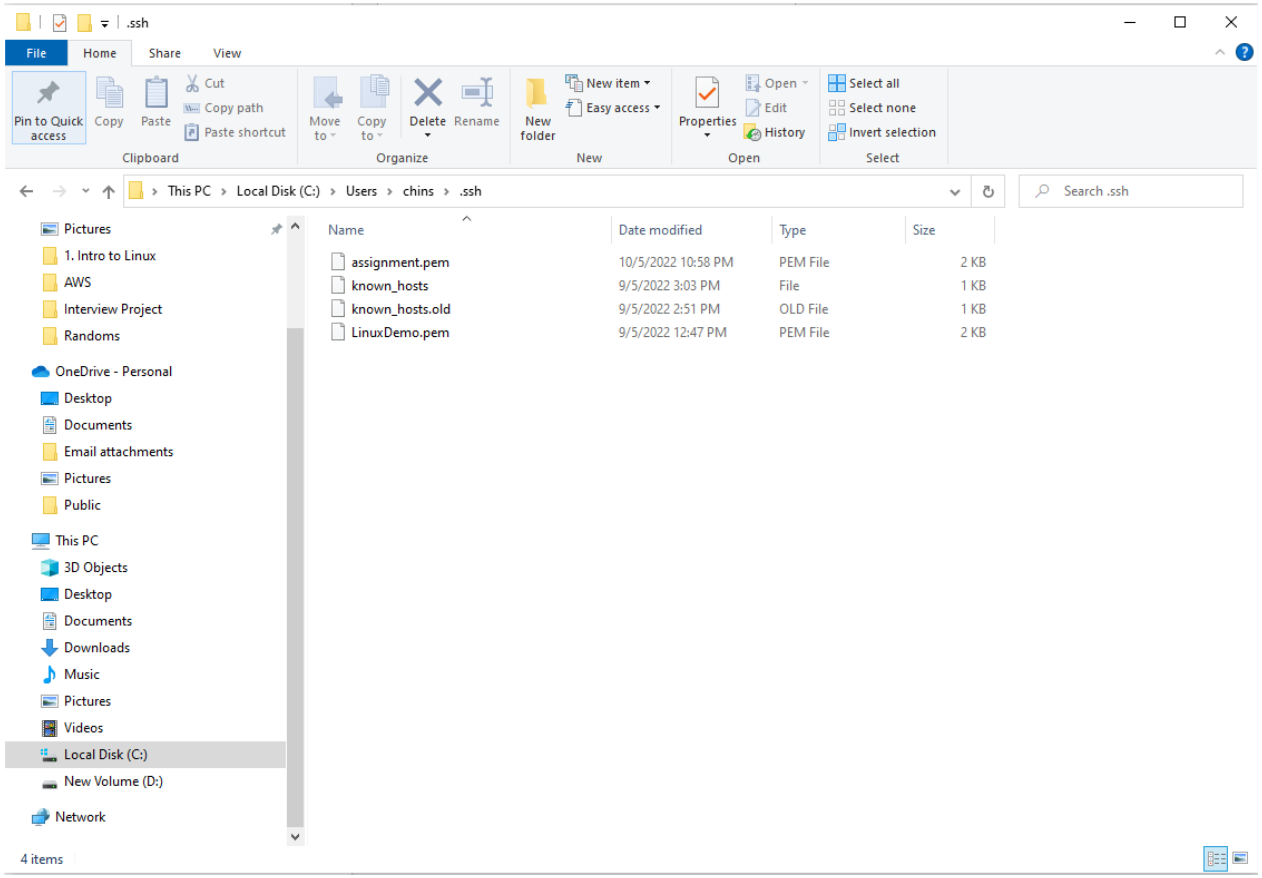


Launch an Instance: New key pair

- Key pair name: something meaningful
- For now, use .pem

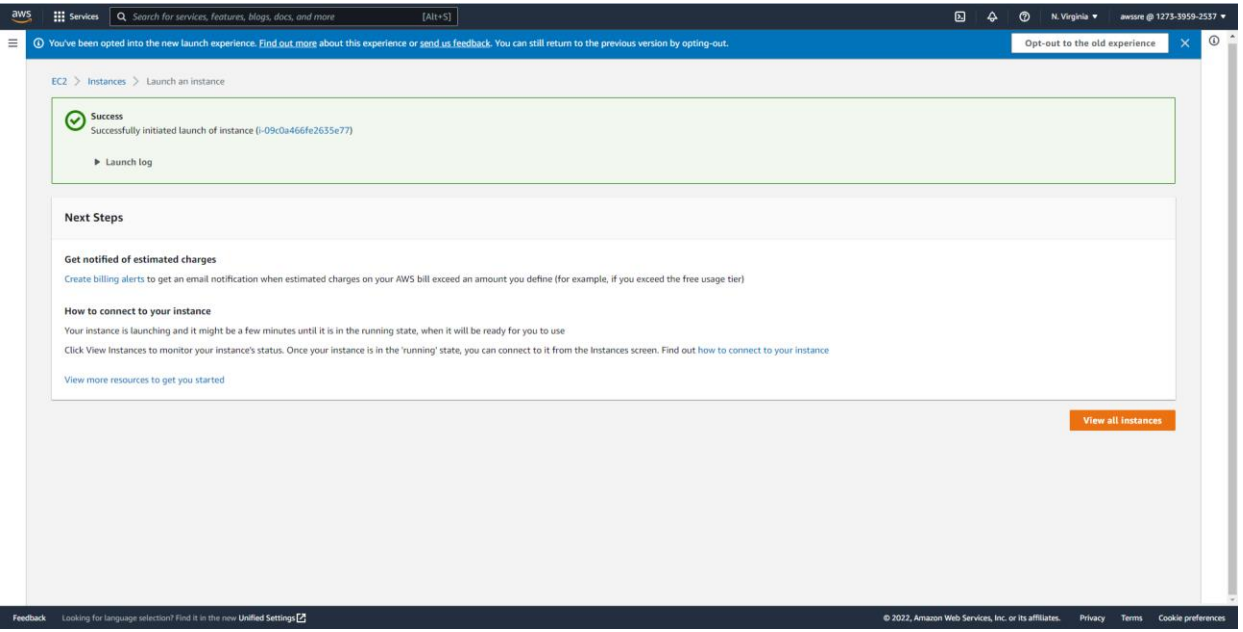


- After clicking “Create key pair”, computer will download key file
- Move key file to .ssh folder shown below (or your working folder)

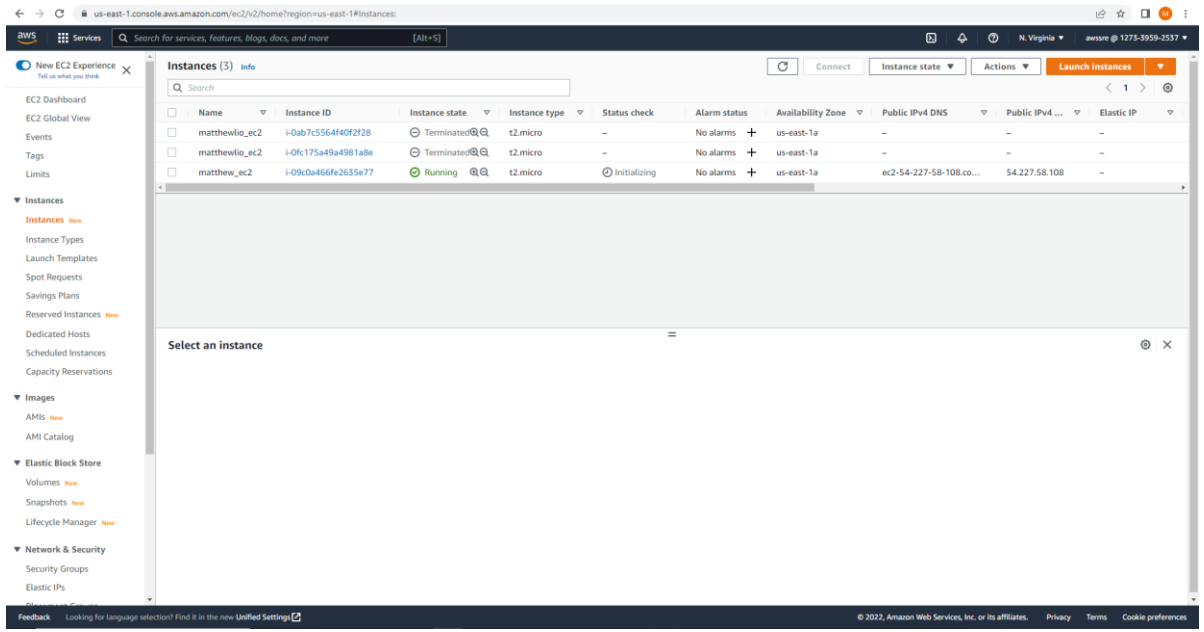


Launch an Instance: Successful

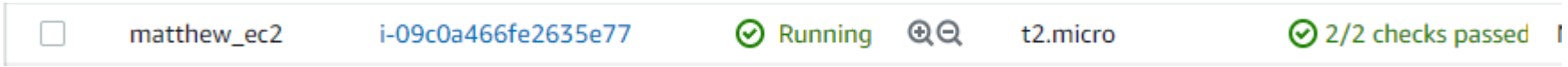
- Make sure it is successful
- Click on “View all instances”



- Instance state: Make sure it is running
- Status check: Wait while it is “Initializing”



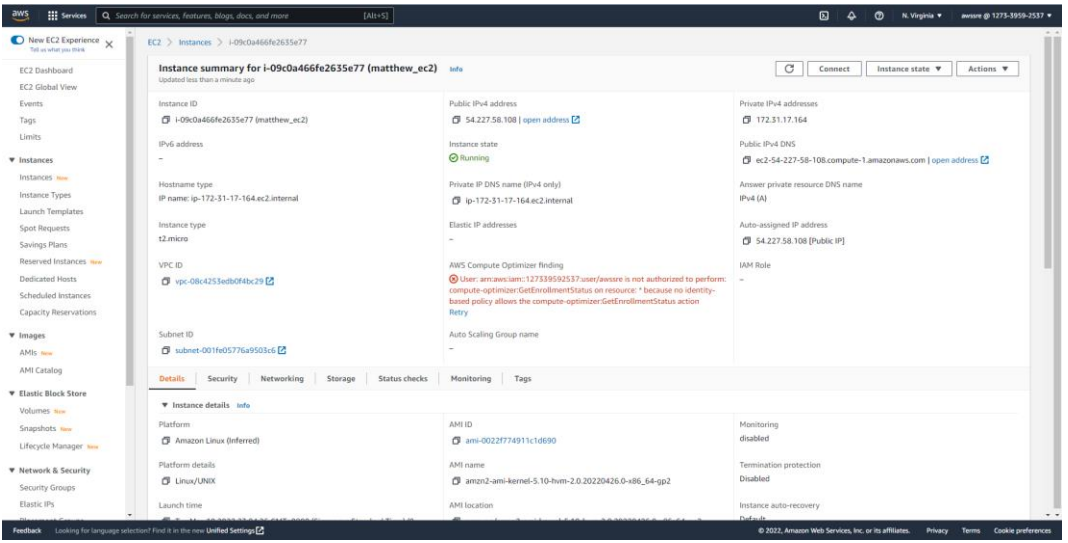
- After initializing, it should look like this



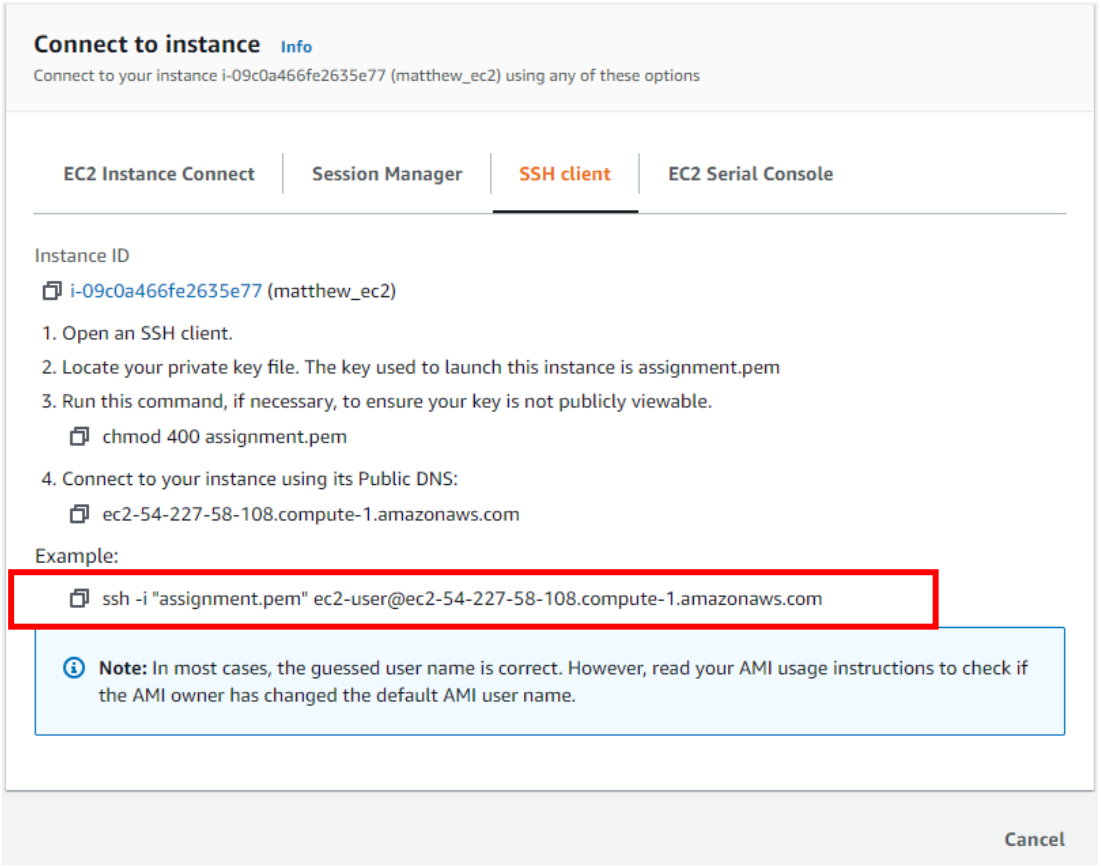
- Click on your instance

Launch an Instance: Connect

- Click on “Connect”



- Copy the “Example” string in the red box as shown



- Continuing connection on the next slide
- Open Git Bash terminal

Launch an Instance: Connect

- Using “cd” command, move to where you stored the key file that was downloaded (.ssh folder)
- Paste the “SSH Client” string that you have copied earlier into the terminal

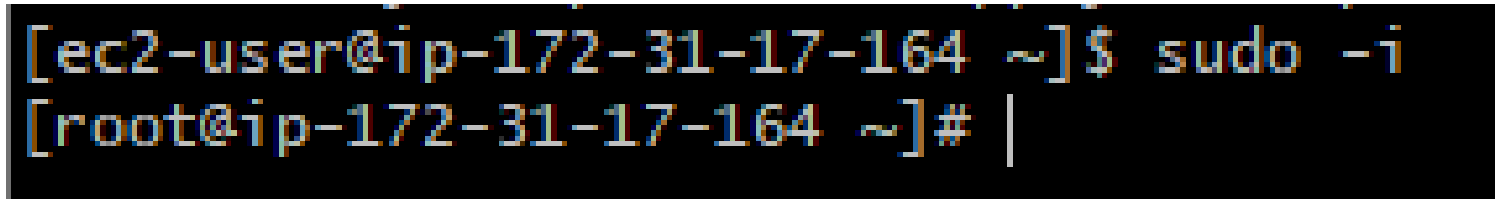
```
chins@DESKTOP-BJ2N99B MINGW64 ~/.ssh
$ ssh -i "assignment.pem" ec2-user@ec2-54-227-58-108.compute-1.amazonaws.com
The authenticity of host 'ec2-54-227-58-108.compute-1.amazonaws.com (54.227.58.108)' can't be established.
ED25519 key fingerprint is SHA256:NvapzW7nqnFWV++6jTE8/Ji6Zjmk+Ep//6SyYdcrIyo.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? |
```

- Type “yes” to continue connecting
- If unsuccessful: type **chmod 400 xxx.pem**
- Below shows how it should look like if it is successful. Note the red box when it is successful.

```
chins@DESKTOP-BJ2N99B MINGW64 ~/.ssh
$ ssh -i "assignment.pem" ec2-user@ec2-54-227-58-108.compute-1.amazonaws.com

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
2 package(s) needed for security, out of 2 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-17-164 ~]$ |
```

Installing Packages, user and root user

- To install packages in Linux, type: yum install package
- Package: package name
- But you can only install packages as root user. Type: sudo –I
- Take note the differences below between normal user and root user (ec2-user and root, $ and #)



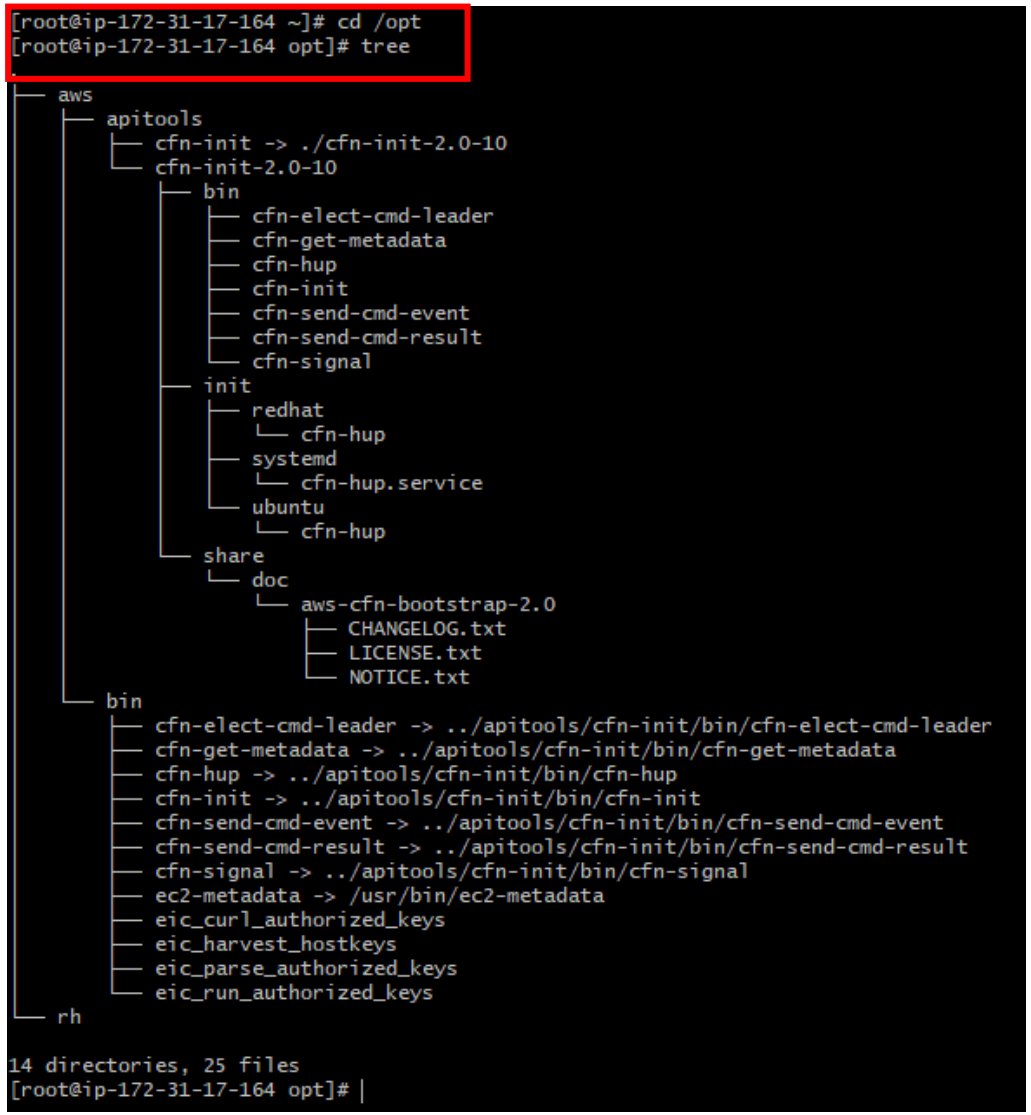
Installing tree

- Yum install tree

```
[ec2-user@ip-172-31-17-164 ~]$ sudo -i
[root@ip-172-31-17-164 ~]# sudo -i
[root@ip-172-31-17-164 ~]# yum install tree
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core                                                  | 3.7 kB  00:00:00
Resolving Dependencies
--> Running transaction check
---> Package tree.x86_64 0:1.6.0-10.amzn2.0.1 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================
 Package            Arch                Version                    Repository                Size
================================================================================
Installing:
 tree               x86_64              1.6.0-10.amzn2.0.1         amzn2-core                47 k

Transaction Summary
================================================================================
Install  1 Package

Total download size: 47 k
Installed size: 83 k
Is this ok [y/d/N]: y
Downloading packages:
tree-1.6.0-10.amzn2.0.1.x86_64.rpm                          |  47 kB  00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : tree-1.6.0-10.amzn2.0.1.x86_64                                1/1
  Verifying  : tree-1.6.0-10.amzn2.0.1.x86_64                                1/1

Installed:
  tree.x86_64 0:1.6.0-10.amzn2.0.1

Complete!
[root@ip-172-31-17-164 ~]#
```

Using tree package

- Tree package from Google:
- It outputs the directory paths and files in each sub-category and a summary of a total number of sub-directories and files.
- Below, we print out the /opt directory: cd /opt, then tree
- Red box shows the commands used



Assignment 2: Uninstalling packages

- Uninstalling tree package with erase

Uninstalling tree package with erase

- Uninstalling tree package: yum erase tree –y
- -y: to automatically “yes” the command

```
[root@ip-172-31-17-164 opt]# yum erase tree -y
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
Resolving Dependencies
--> Running transaction check
---> Package tree.x86_64 0:1.6.0-10.amzn2.0.1 will be erased
--> Finished Dependency Resolution
amzn2-core/2/x86_64                                                     | 3.7 kB  00:00:00

Dependencies Resolved

================================================================================================
 Package            Arch                Version                       Repository          Size
================================================================================================
Removing:
 tree               x86_64              1.6.0-10.amzn2.0.1            @amzn2-core         83 k

Transaction Summary
================================================================================================
Remove  1 Package

Installed size: 83 k
Downloading packages:
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Erasing    : tree-1.6.0-10.amzn2.0.1.x86_64                                              1/1
  Verifying  : tree-1.6.0-10.amzn2.0.1.x86_64                                              1/1

Removed:
  tree.x86_64 0:1.6.0-10.amzn2.0.1

Complete!
[root@ip-172-31-17-164 opt]#
```

- No more tree package to use

```
[root@ip-172-31-17-164 opt]# tree
-bash: /bin/tree: No such file or directory
[root@ip-172-31-17-164 opt]#
```

Assignment 3: Creating and printing new files

- Making directories with mkdir command
- Creating new files with echo command
- Printing content in files with cat command
- Echo and cat together

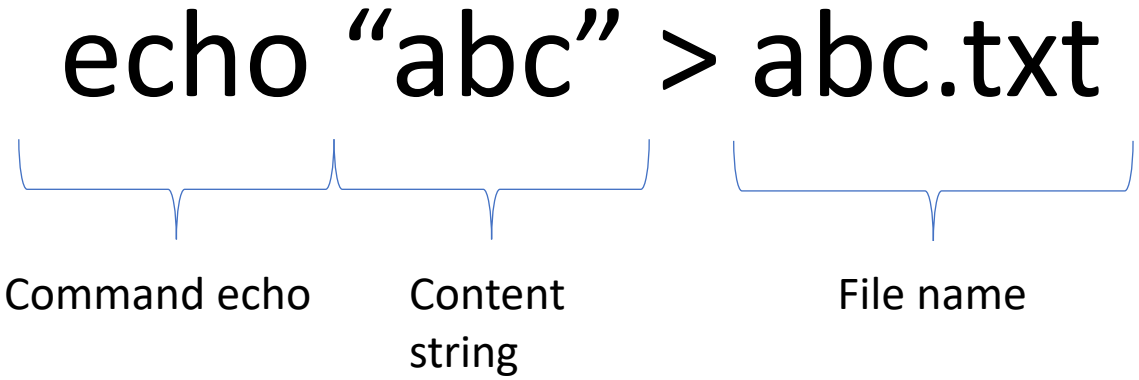
Making directories with mkdir command

- Here, we create new folder called “demolinux” in the /opt directory, using the mkdir command
- With ls command, we can see that the folder has been created
- We then enter (using cd command) into “demolinux” folder

```
[root@ip-172-31-17-164 opt]# mkdir demolinux
[root@ip-172-31-17-164 opt]# ls
aws  demolinux  rh
[root@ip-172-31-17-164 opt]# cd demolinux
[root@ip-172-31-17-164 demolinux]#
```

Creating new files with echo command

- With echo command, we create a new text file called abc.txt
- The content of the file is just a simple string “abc”




```
[root@ip-172-31-17-164 opt]# cd demolinux
[root@ip-172-31-17-164 demolinux]# ls
[root@ip-172-31-17-164 demolinux]# echo "abc" > abc.txt
[root@ip-172-31-17-164 demolinux]# ls
abc.txt
[root@ip-172-31-17-164 demolinux]#
```

Printing content in files with cat command

cat abc.txt

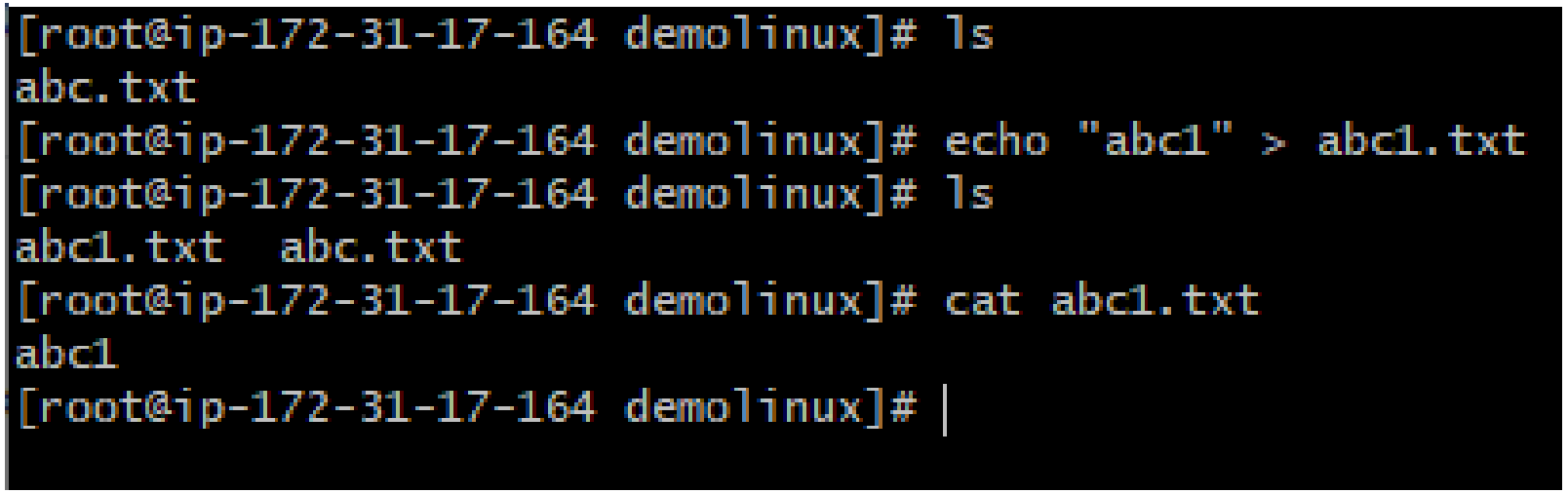
Command cat File name

- Printing content of abc.txt file that we created earlier
- Content shown in red box

```
[root@ip-172-31-17-164 opt]# cd demolinux
[root@ip-172-31-17-164 demolinux]# ls
[root@ip-172-31-17-164 demolinux]# echo "abc" > abc.txt
[root@ip-172-31-17-164 demolinux]# ls
abc.txt
[root@ip-172-31-17-164 demolinux]# cat abc.txt
abc
[root@ip-172-31-17-164 demolinux]#
```

Echo and cat together

- Using both echo and cat commands, create “abc1.txt” file and print content



Assignment 4: Extra basic ls commands

- Ls –ltr command
- Ls –ltra command

Ls –ltr command

- WHEN IN DOUBT: use manual page command: man ls
- -l : List all files in the long listing format view
- -t : sort by modification time, newest first
- -r: reverse order while sorting

```
[root@ip-172-31-17-164 demolinux]# ls
abc1.txt  abc.txt
[root@ip-172-31-17-164 demolinux]# ls -ltr
total 8
-rw-r--r-- 1 root root 4 May 10 16:22 abc.txt
-rw-r--r-- 1 root root 5 May 10 16:42 abc1.txt
[root@ip-172-31-17-164 demolinux]#
```

Ls –ltra command

- WHEN IN DOUBT: use manual page command: man ls
- -l : List all files in the long listing format view
- -t : sort by modification time, newest first
- -r: reverse order while sorting
- -a: all files, including parent directory and current directory (“..” is parent directory, “.” is current directory)

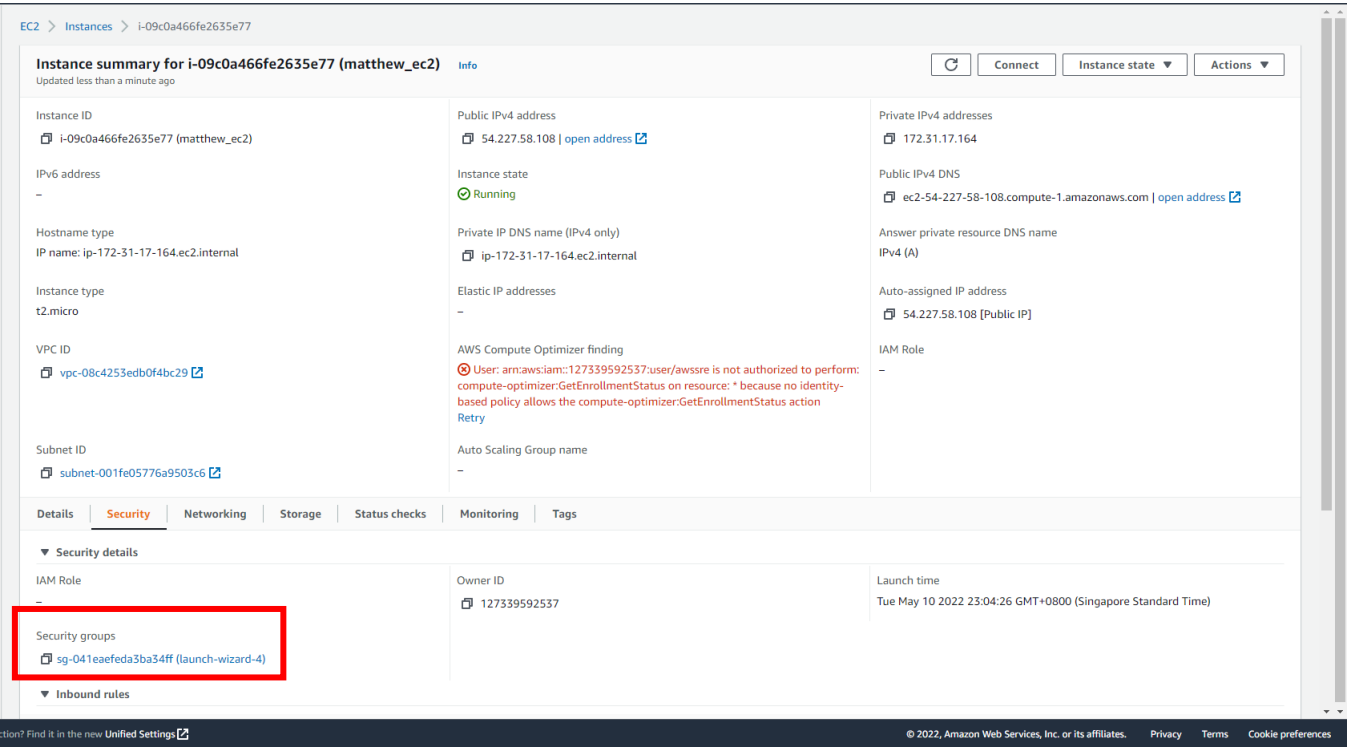
```
[root@ip-172-31-17-164 demolinux]# ls
abc1.txt  abc.txt
[root@ip-172-31-17-164 demolinux]# ls -ltr
total 8
-rw-r--r-- 1 root root 4 May 10 16:22 abc.txt
-rw-r--r-- 1 root root 5 May 10 16:42 abc1.txt
[root@ip-172-31-17-164 demolinux]# ls -ltra
total 8
drwxr-xr-x 5 root root 44 May 10 16:08 ..
-rw-r--r-- 1 root root  4 May 10 16:22 abc.txt
-rw-r--r-- 1 root root  5 May 10 16:42 abc1.txt
drwxr-xr-x 2 root root 37 May 10 16:42 .
[root@ip-172-31-17-164 demolinux]#
```

Assignment 5: Display a HTTP Web Page

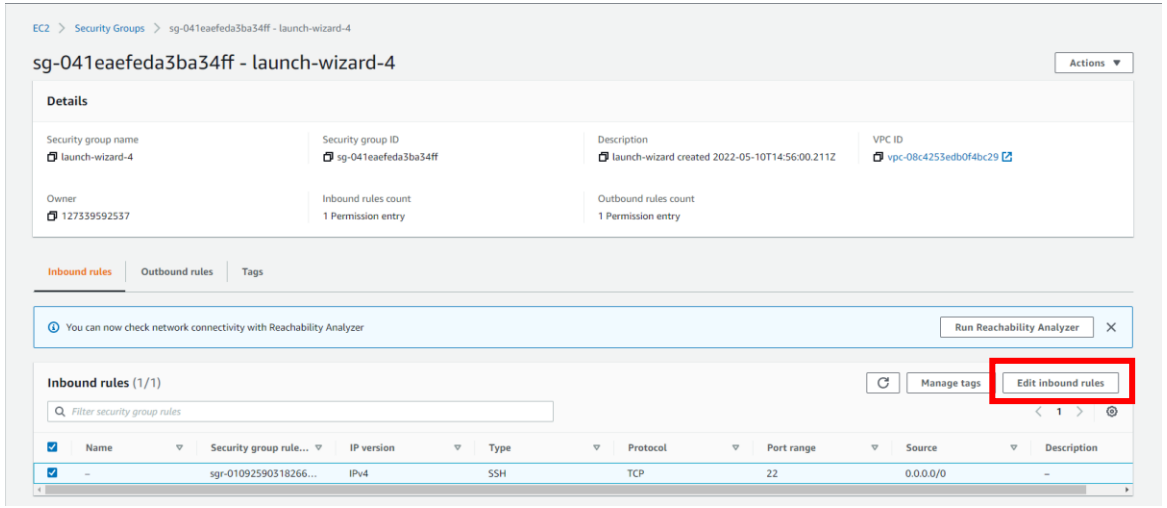
- Allow HTTP traffic (existing instance)
- Allow HTTP traffic (when creating new instance)
- Installing httpd package
- Creating HTTP file
- Starting httpd service (and using chkconfig)
- Public IP Address
- HTML Webpage

Allow HTTP traffic (existing instance)

- Go to instance page. View under Security tab
- Under Security groups, click available security group (in red box)



- Click Edit inbound rules

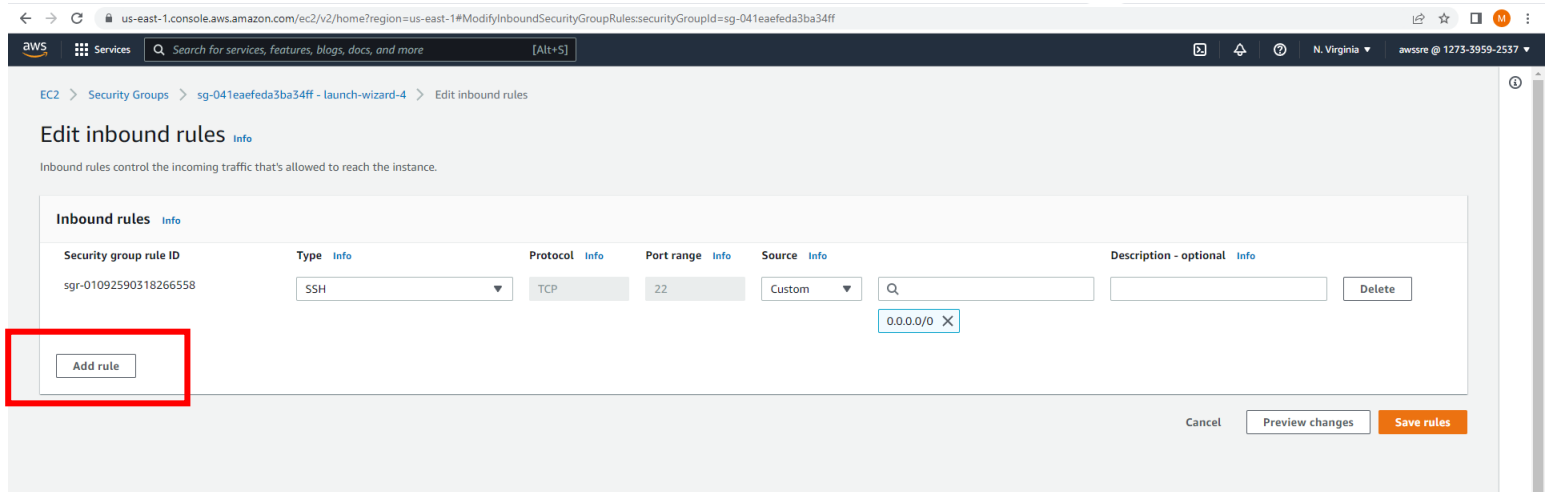


Allow HTTP traffic (existing instance)

BEFORE

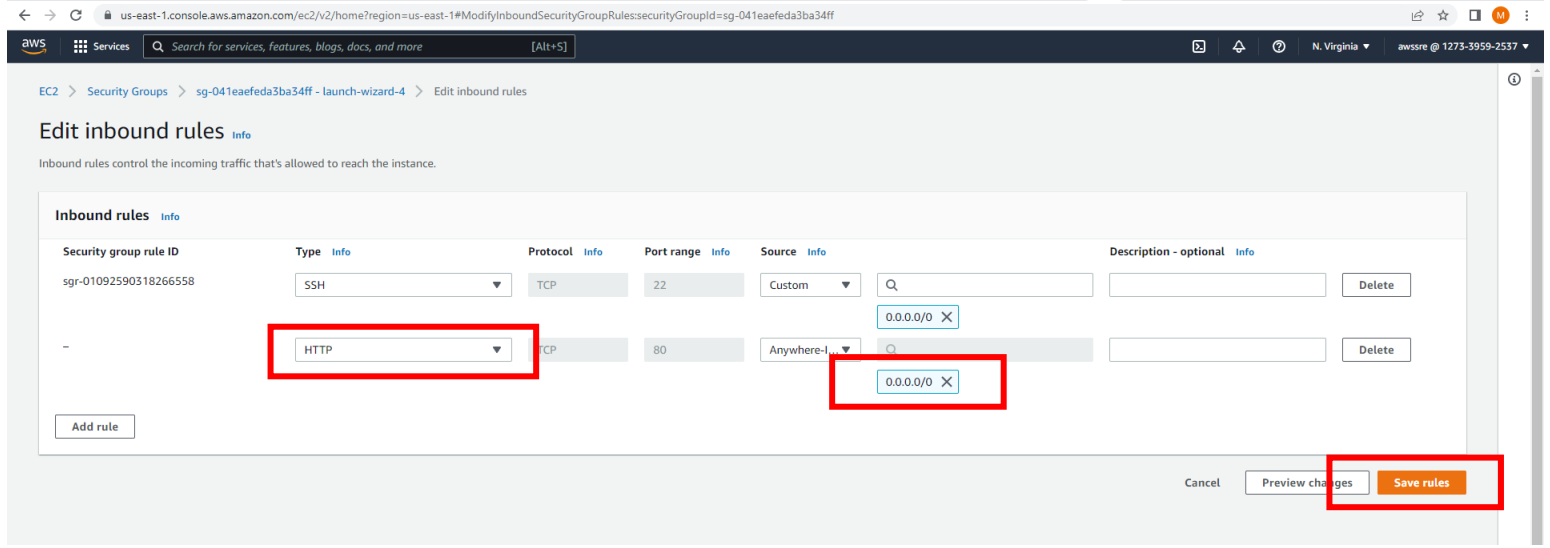
Editing inbound rules

- Add rule



AFTER

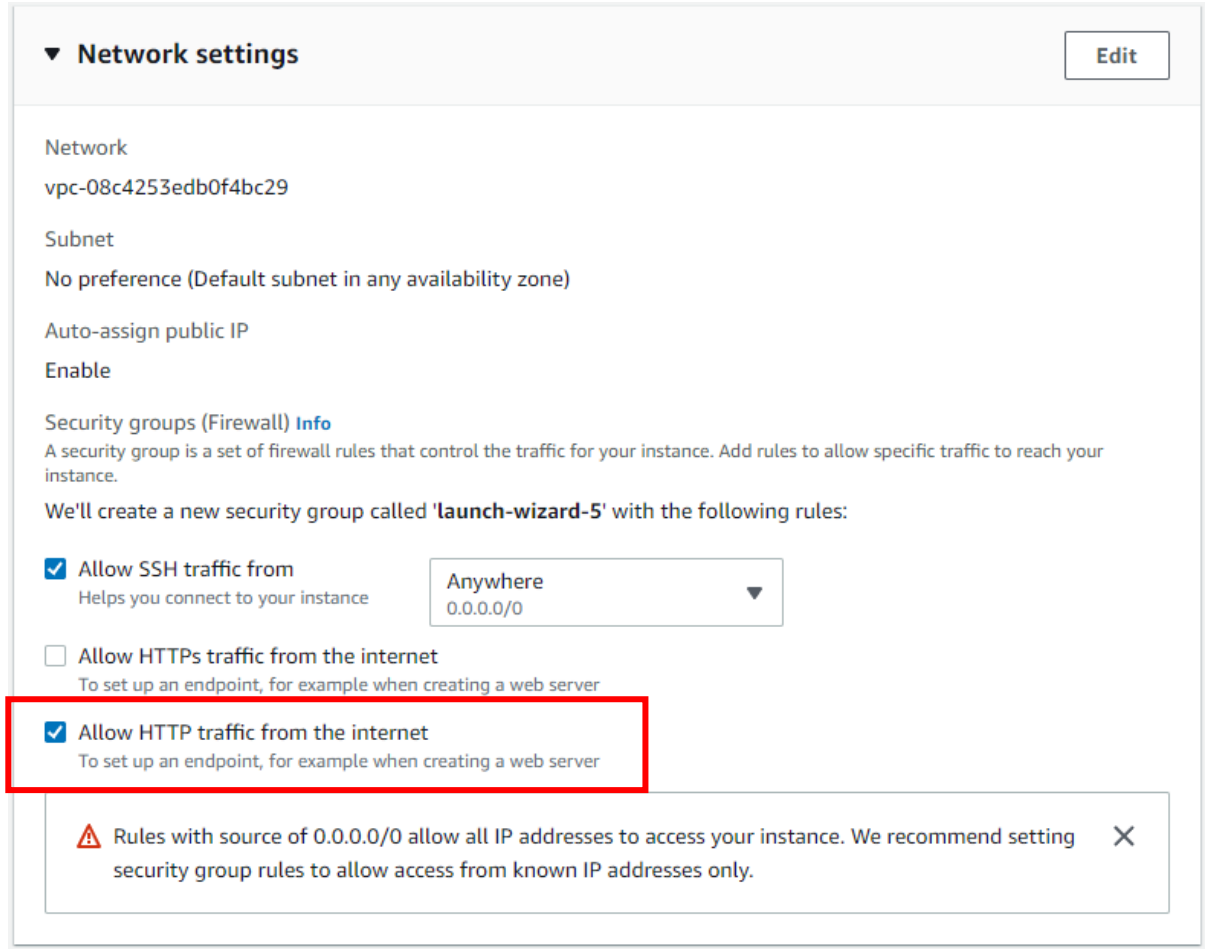
- Type: HTTP
- 0.0.0.0/0
- Save rules



Allow HTTP traffic (when creating new instance)

Allowing HTTP traffic when creating new instance

- Check the appropriate box



Installing httpd package

- As root user, install httpd package
- sudo yum install –y httpd

```
[root@ip-172-31-17-164 demolinux]# sudo yum install -y httpd
```

- Installation in progress…

```
[root@ip-172-31-17-164 demolinux]# sudo yum install -y httpd
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core                                                | 3.7 kB  00:00:00
Resolving Dependencies
--> Running transaction check
---> Package httpd.x86_64 0:2.4.53-1.amzn2 will be installed
--> Processing Dependency: httpd-tools = 2.4.53-1.amzn2 for package: httpd-2.4.53-1.amzn2.x86_64
--> Processing Dependency: httpd-filesystem = 2.4.53-1.amzn2 for package: httpd-2.4.53-1.amzn2.x86_64
--> Processing Dependency: system-logos-httpd for package: httpd-2.4.53-1.amzn2.x86_64
--> Processing Dependency: mod_http2 for package: httpd-2.4.53-1.amzn2.x86_64
--> Processing Dependency: httpd-filesystem for package: httpd-2.4.53-1.amzn2.x86_64
--> Processing Dependency: /etc/mime.types for package: httpd-2.4.53-1.amzn2.x86_64
--> Processing Dependency: libaprutil-1.so.0()(64bit) for package: httpd-2.4.53-1.amzn2.x86_64
--> Processing Dependency: libapr-1.so.0()(64bit) for package: httpd-2.4.53-1.amzn2.x86_64
--> Running transaction check
---> Package apr.x86_64 0:1.7.0-9.amzn2 will be installed
---> Package apr-util.x86_64 0:1.6.1-5.amzn2.0.2 will be installed
--> Processing Dependency: apr-util-bdb(x86-64) = 1.6.1-5.amzn2.0.2 for package: apr-util-1.6.1-5.amzn2.0.2.x86_6
4
---> Package generic-logos-httpd.noarch 0:18.0.0-4.amzn2 will be installed
---> Package httpd-filesystem.noarch 0:2.4.53-1.amzn2 will be installed
---> Package httpd-tools.x86_64 0:2.4.53-1.amzn2 will be installed
---> Package mailcap.noarch 0:2.1.41-2.amzn2 will be installed
---> Package mod_http2.x86_64 0:1.15.19-1.amzn2.0.1 will be installed
--> Running transaction check
---> Package apr-util-bdb.x86_64 0:1.6.1-5.amzn2.0.2 will be installed
--> Finished Dependency Resolution

Dependencies Resolved
```

```
Dependencies Resolved

================================================================================
 Package                 Arch          Version                  Repository    Size
================================================================================
Installing:
 httpd                   x86_64        2.4.53-1.amzn2           amzn2-core   1.3 M
Installing for dependencies:
 apr                     x86_64        1.7.0-9.amzn2            amzn2-core   122 k
 apr-util                x86_64        1.6.1-5.amzn2.0.2        amzn2-core    99 k
 apr-util-bdb            x86_64        1.6.1-5.amzn2.0.2        amzn2-core    19 k
 generic-logos-httpd     noarch        18.0.0-4.amzn2           amzn2-core    19 k
 httpd-filesystem        noarch        2.4.53-1.amzn2           amzn2-core    24 k
 httpd-tools             x86_64        2.4.53-1.amzn2           amzn2-core    88 k
 mailcap                 noarch        2.1.41-2.amzn2           amzn2-core    31 k
 mod_http2               x86_64        1.15.19-1.amzn2.0.1      amzn2-core   149 k

Transaction Summary
================================================================================
Install  1 Package (+8 Dependent packages)

Total download size: 1.9 M
Installed size: 5.2 M
Downloading packages:
(1/9): apr-1.7.0-9.amzn2.x86_64.rpm                        | 122 kB  00:00:00
(2/9): apr-util-1.6.1-5.amzn2.0.2.x86_64.rpm               |  99 kB  00:00:00
(3/9): apr-util-bdb-1.6.1-5.amzn2.0.2.x86_64.rpm           |  19 kB  00:00:00
(4/9): generic-logos-httpd-18.0.0-4.amzn2.noarch.rpm       |  19 kB  00:00:00
(5/9): httpd-filesystem-2.4.53-1.amzn2.noarch.rpm          |  24 kB  00:00:00
(6/9): httpd-2.4.53-1.amzn2.x86_64.rpm                     | 1.3 MB  00:00:00
(7/9): httpd-tools-2.4.53-1.amzn2.x86_64.rpm               |  88 kB  00:00:00
(8/9): mailcap-2.1.41-2.amzn2.noarch.rpm                   |  31 kB  00:00:00
(9/9): mod_http2-1.15.19-1.amzn2.0.1.x86_64.rpm            | 149 kB  00:00:00
--------------------------------------------------------------------------------
Total                                       8.3 MB/s | 1.9 MB  00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : apr-1.7.0-9.amzn2.x86_64                                     1/9
  Installing : apr-util-bdb-1.6.1-5.amzn2.0.2.x86_64                        2/9
  Installing : apr-util-1.6.1-5.amzn2.0.2.x86_64                            3/9
  Installing : httpd-tools-2.4.53-1.amzn2.x86_64                            4/9
  Installing : generic-logos-httpd-18.0.0-4.amzn2.noarch                    5/9
  Installing : mailcap-2.1.41-2.amzn2.noarch                                6/9
  Installing : httpd-filesystem-2.4.53-1.amzn2.noarch                       7/9
  Installing : mod_http2-1.15.19-1.amzn2.0.1.x86_64                         8/9
  Installing : httpd-2.4.53-1.amzn2.x86_64                                  9/9
  Verifying  : apr-util-1.6.1-5.amzn2.0.2.x86_64                            1/9
  Verifying  : apr-util-bdb-1.6.1-5.amzn2.0.2.x86_64                        2/9
  Verifying  : mod_http2-1.15.19-1.amzn2.0.1.x86_64                         3/9
  Verifying  : httpd-filesystem-2.4.53-1.amzn2.noarch                       4/9
  Verifying  : httpd-tools-2.4.53-1.amzn2.x86_64                            5/9
  Verifying  : mailcap-2.1.41-2.amzn2.noarch                                6/9
  Verifying  : generic-logos-httpd-18.0.0-4.amzn2.noarch                    7/9
  Verifying  : httpd-2.4.53-1.amzn2.x86_64                                  8/9
  Verifying  : apr-1.7.0-9.amzn2.x86_64                                     9/9

Installed:
  httpd.x86_64 0:2.4.53-1.amzn2

Dependency Installed:
  apr.x86_64 0:1.7.0-9.amzn2                 apr-util.x86_64 0:1.6.1-5.amzn2.0.2
  apr-util-bdb.x86_64 0:1.6.1-5.amzn2.0.2    generic-logos-httpd.noarch 0:18.0.0-4.amzn2
  httpd-filesystem.noarch 0:2.4.53-1.amzn2   httpd-tools.x86_64 0:2.4.53-1.amzn2
  mailcap.noarch 0:2.1.41-2.amzn2            mod_http2.x86_64 0:1.15.19-1.amzn2.0.1

Complete!
[root@ip-172-31-17-164 demolinux]#
```

- Installation complete!

Creating HTTP file

Creating HTML file using echo command

- echo “<html><body><h1>Welcome! </br> Design & Developed by Matt</h1></body></html>” > /var/www/html/index.html
- HTML file: /var/www/html/index.html

```
[root@ip-172-31-31-168 ~]# echo "<html><body><h1>Welcome! </br> Design & Developed by Matt</h1></body></html>" >
/var/www/html/index.html
[root@ip-172-31-31-168 ~]# cat /var/www/html/index.html
<html><body><h1>Welcome! </br> Design & Developed by Matt</h1></body></html>
[root@ip-172-31-31-168 ~]#
```

Starting httpd service (and using chkconfig)

Necessary commands for starting httpd service

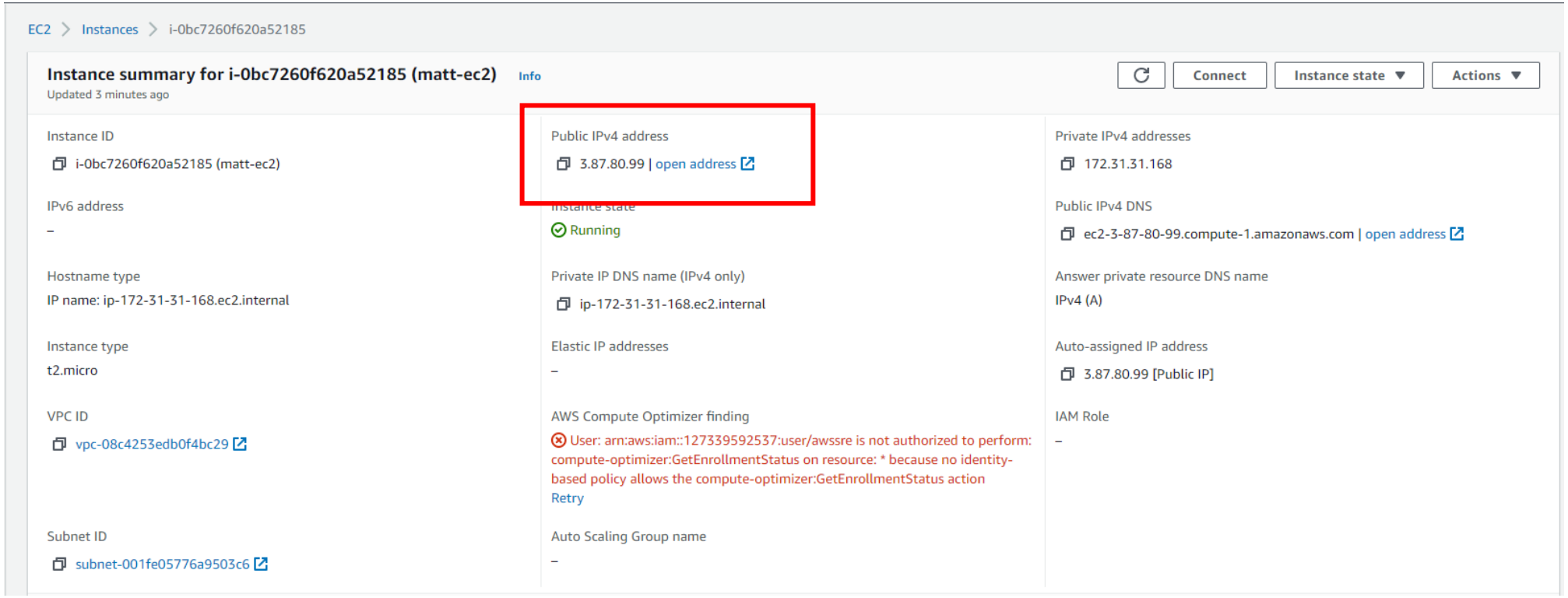
- sudo service httpd start
- sudo chkconfig httpd on

```
[root@ip-172-31-31-168 ~]# sudo service httpd start
Redirecting to /bin/systemctl start httpd.service
[root@ip-172-31-31-168 ~]# sudo chkconfig httpd on
Note: Forwarding request to 'systemctl enable httpd.service'.
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.s
ervice.
[root@ip-172-31-31-168 ~]#
```

Public IP Address

To view our HTTP webpage, we first need to obtain our public IP address

- On AWS Console, go to our instance page
- Our public IP address is shown in the red box
- Copy this IP address
- Open a new tab, and paste the IP address in the address bar



HTML Webpage