



Bansilal Ramnath Agarwal Charitable Trust's  
Vishwakarma Institute of Information  
Technology

**Department of  
Artificial Intelligence and Data  
Science**

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**Class:** TY

**Division:** B

**Roll No:** 372028

**Semester:** V

**Academic Year:** 2023-2024

**Subject Name & Code:** Cloud Computing & Analytics ADUA31203

**Title of Assignment:** Deploy Web application on AWS Cloud

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**ASSIGNMENT NO. 3**

### 1) Cloud Computing Definition:

Cloud computing is a technology paradigm that involves delivering various computing services, including servers, storage, databases, networking, software, and analytics, over the internet (the "cloud") to offer faster innovation, flexible resources, and cost-efficiency. Cloud computing eliminates the need for organizations and individuals to own or maintain physical hardware and software infrastructure. Instead, they can access and use these resources on a pay-as-you-go basis, scaling them up or down as needed. Cloud computing provides a wide range of services and deployment models, enabling businesses and users to leverage powerful computing capabilities without the burden of managing complex IT environments.

### 2) Cloud Service Models and Deployment Models:

Cloud computing offers several service models and deployment models to cater to various business needs. Here's an overview of each:

#### a) Cloud Service Models:

i) Infrastructure as a Service (IaaS): IaaS provides virtualized computing resources over the internet. Users can rent virtual machines, storage, and networking components, enabling them to build and manage their own software applications and infrastructure. Examples of IaaS providers include Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP).

ii) Platform as a Service (PaaS): PaaS offers a higher-level platform for developers to build, deploy, and manage applications without worrying about the underlying infrastructure. It typically includes development tools, databases, and runtime environments. Examples of PaaS providers include Heroku, Google App Engine, and Microsoft Azure App Service.

iii) Software as a Service (SaaS): SaaS delivers fully functional software applications over the internet on a subscription basis. Users can access these applications via web browsers without the need for installation or maintenance. Examples of SaaS applications include Microsoft 365, Salesforce, and Google Workspace.

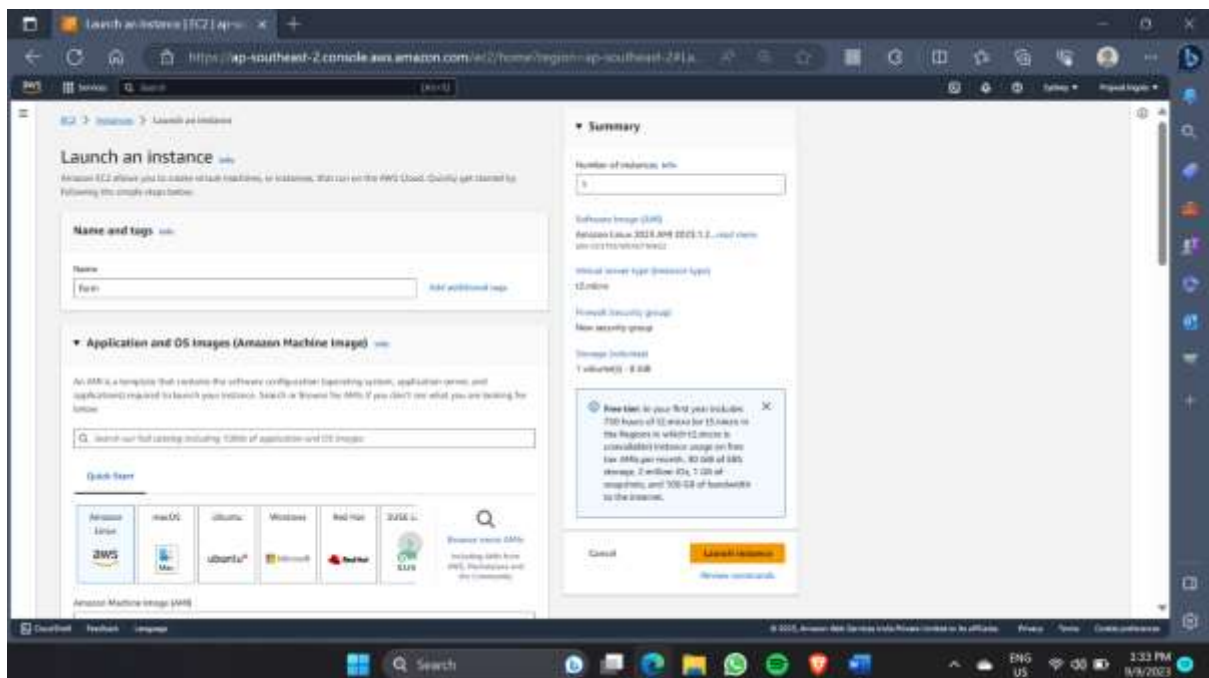
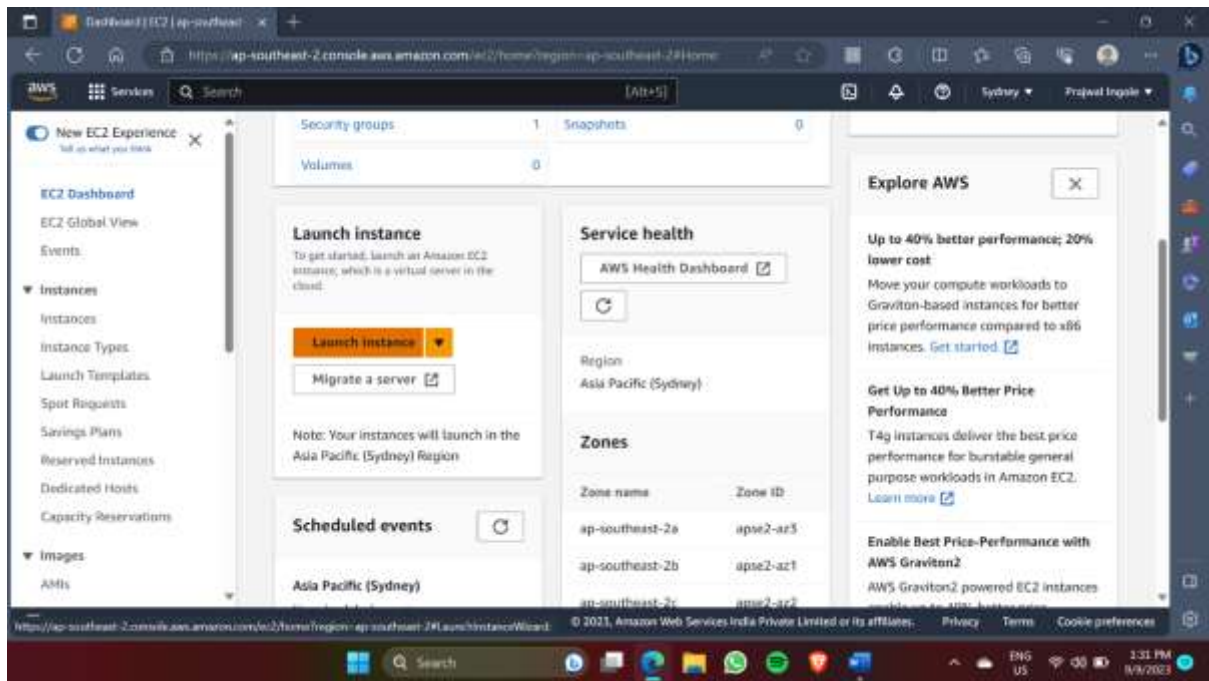
#### b) Cloud Deployment Models:

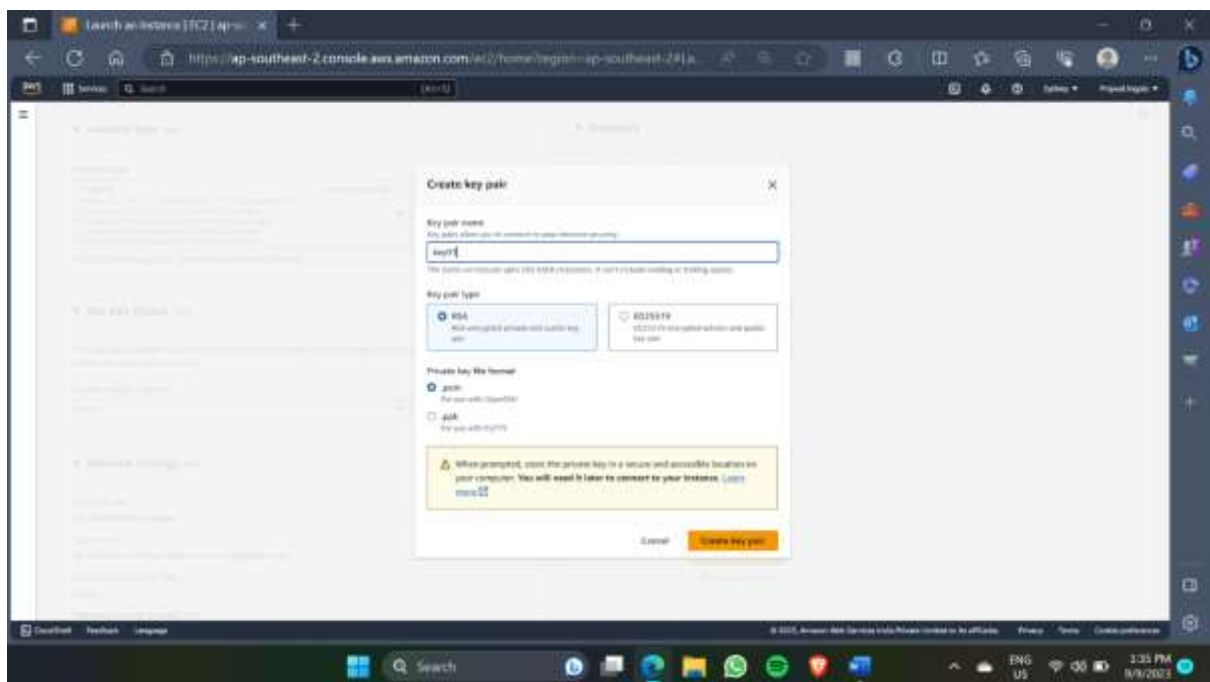
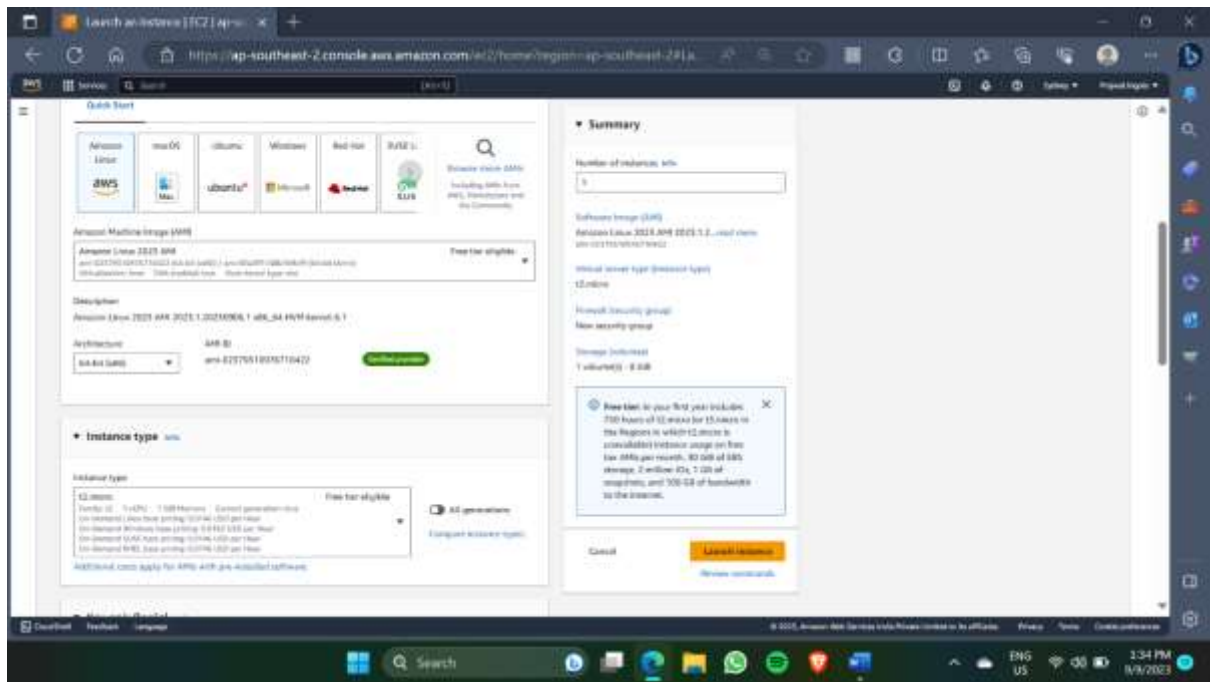
i) Public Cloud: Public cloud services are offered by third-party providers and are available to the general public over the internet. They are highly scalable and cost-effective, making them suitable for a wide range of applications. Examples of public cloud providers include AWS, Azure, GCP, and IBM Cloud.

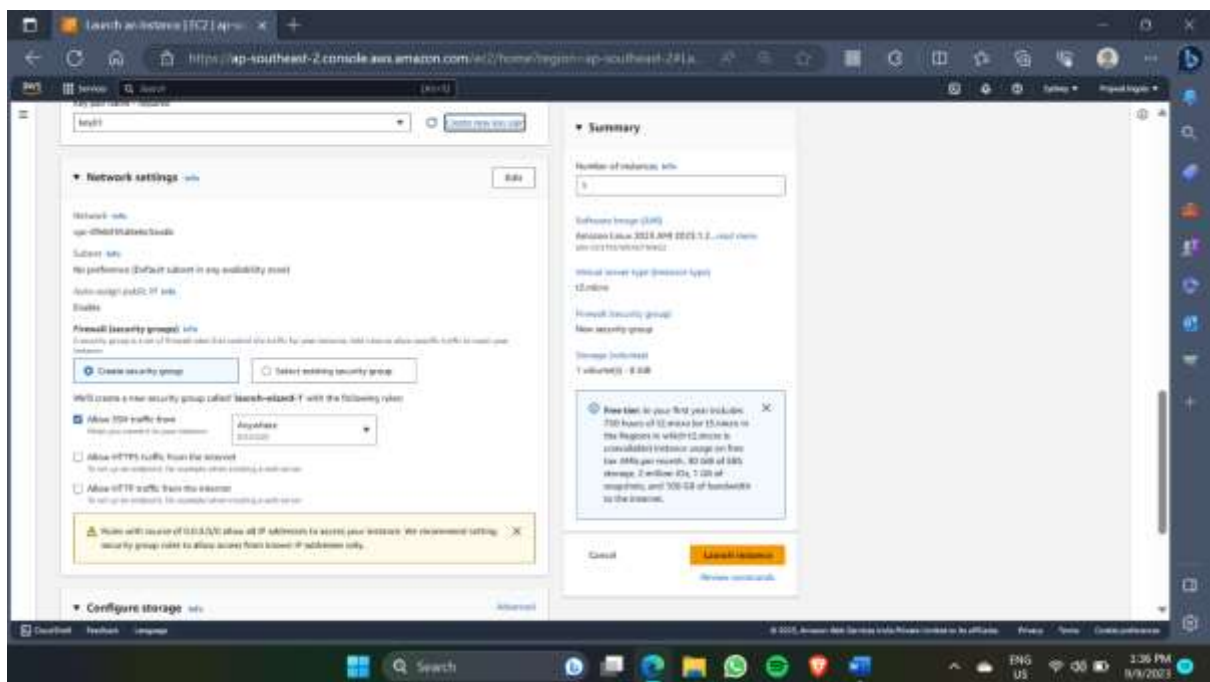
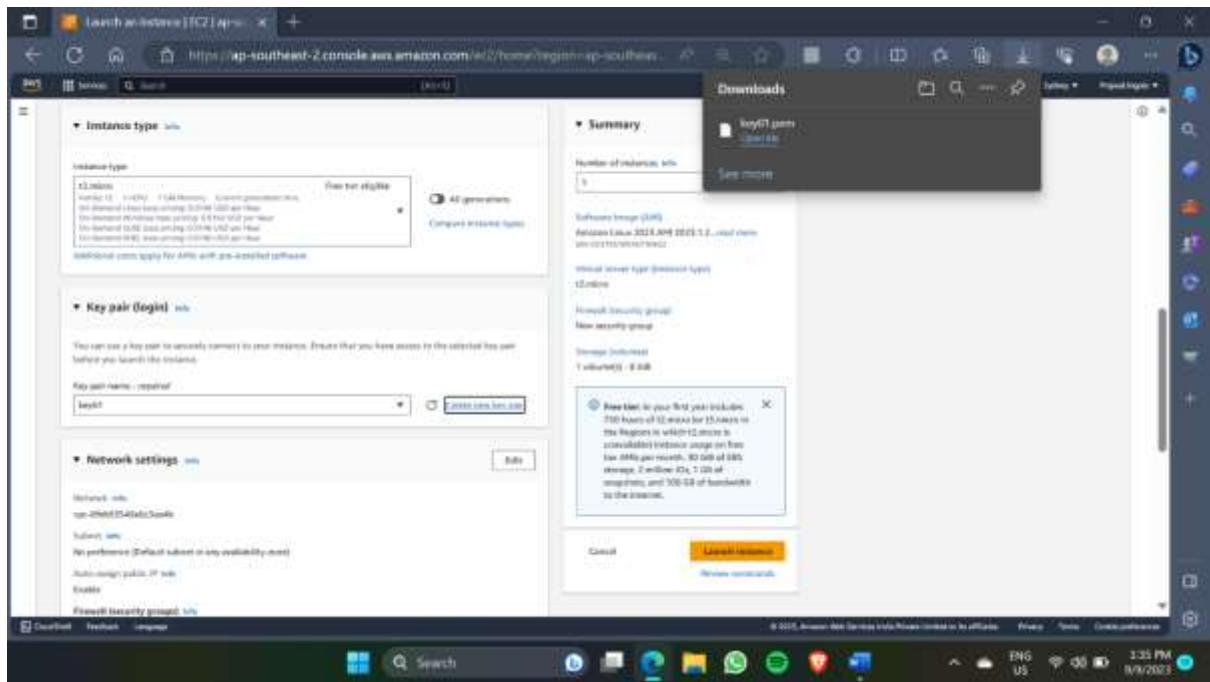
ii) Private Cloud: Private clouds are dedicated cloud environments designed for a single organization. They can be hosted on-premises or by a third-party provider and offer greater control, security, and customization. Private clouds are often used by organizations with strict data privacy and compliance requirements.

iii) Hybrid Cloud: Hybrid cloud combines elements of both public and private clouds, allowing data and applications to be shared between them. This approach provides flexibility, scalability, and the ability to balance cost-effectiveness with security and compliance needs. Organizations may use a hybrid cloud strategy to take advantage of both cloud models.

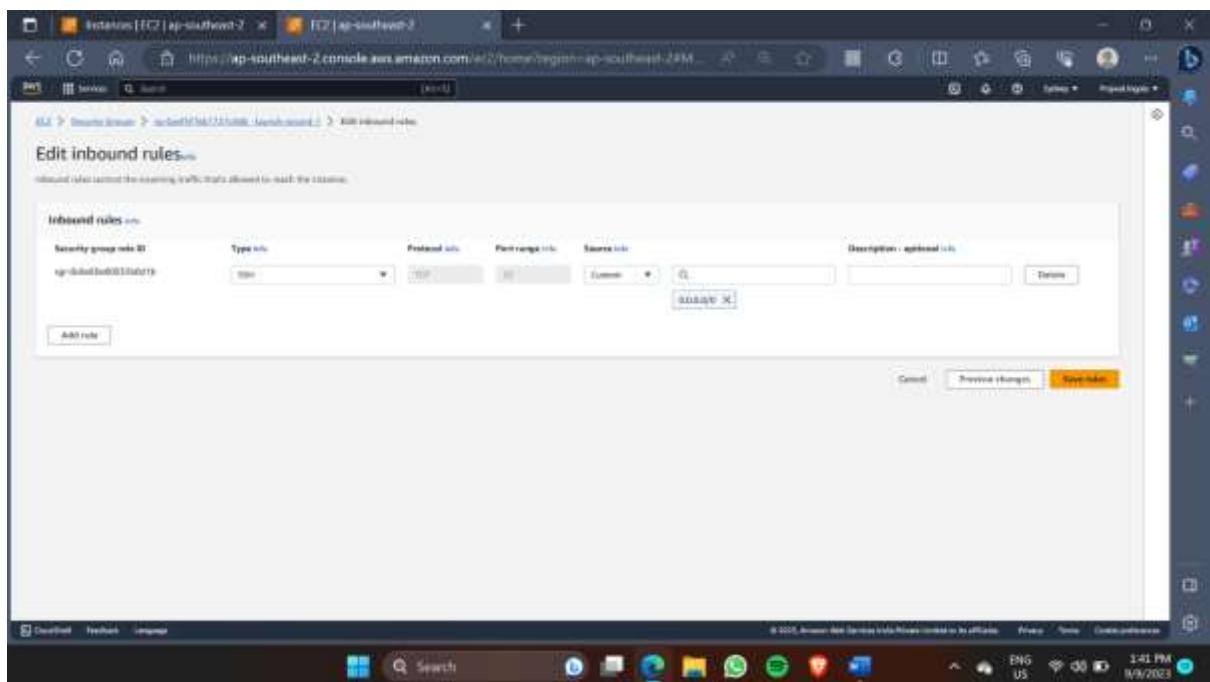
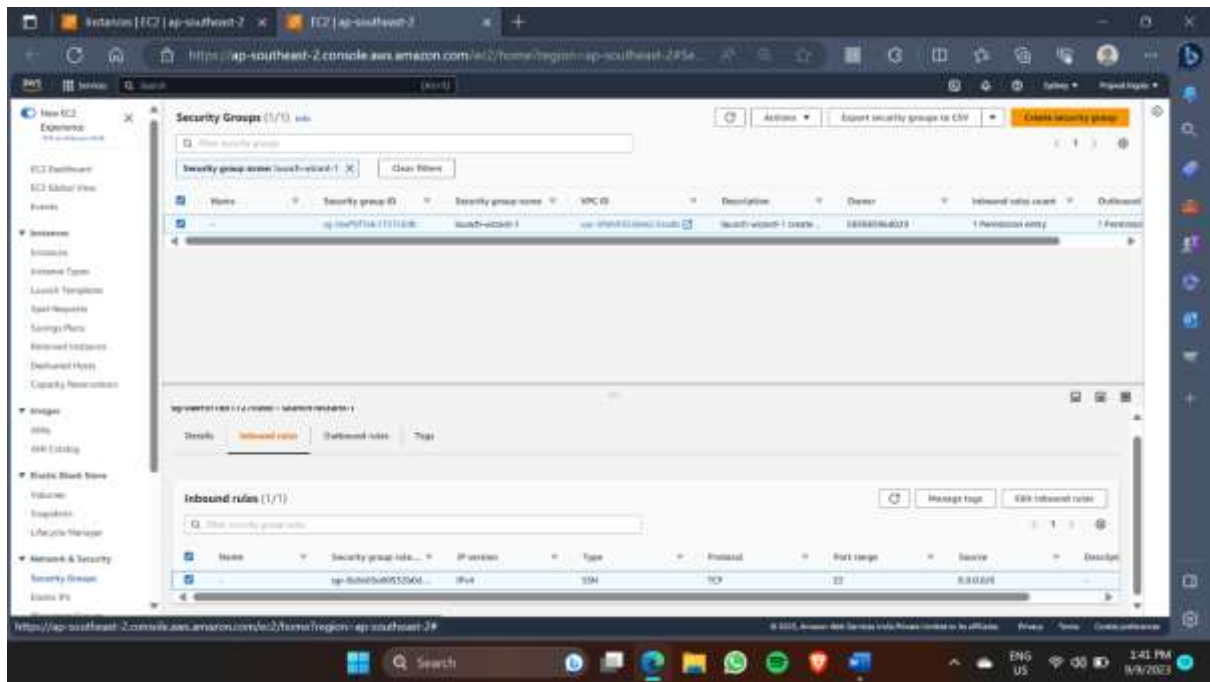
iv) Multi-Cloud: Multi-cloud refers to the use of multiple cloud providers for different services or applications. It aims to prevent vendor lock-in, enhance redundancy, and optimize cost and performance by choosing the best cloud provider for each specific use case. Organizations adopting a multi-cloud strategy may manage and orchestrate their cloud resources centrally.



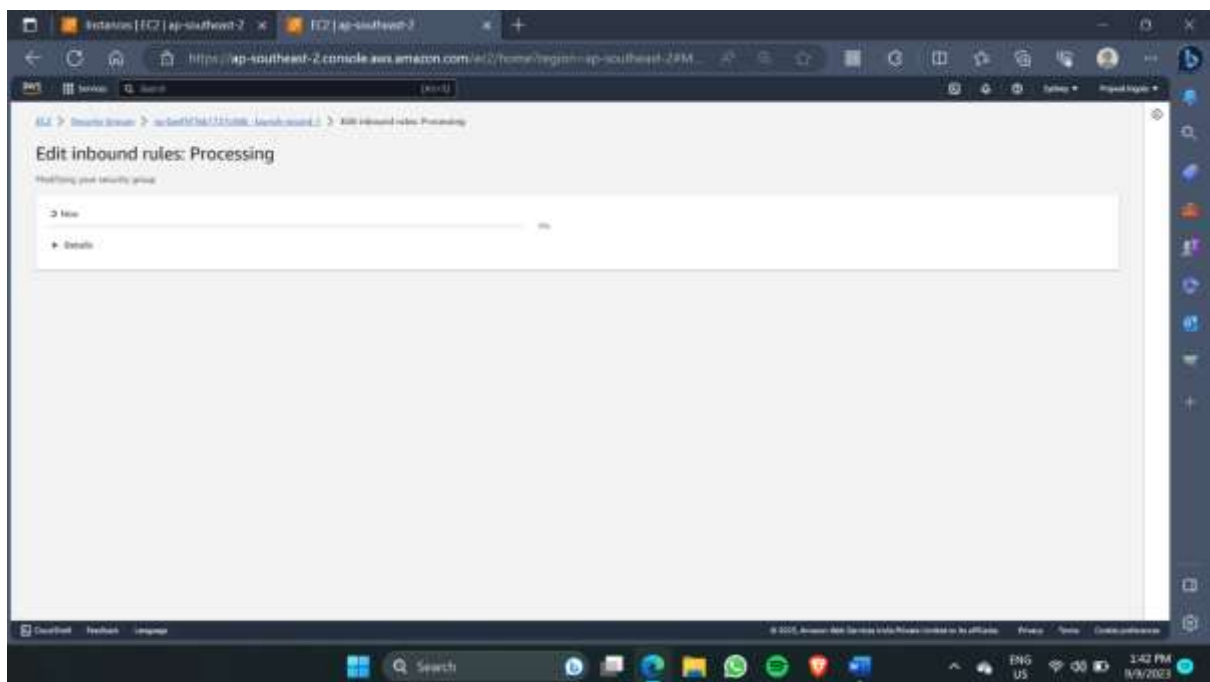
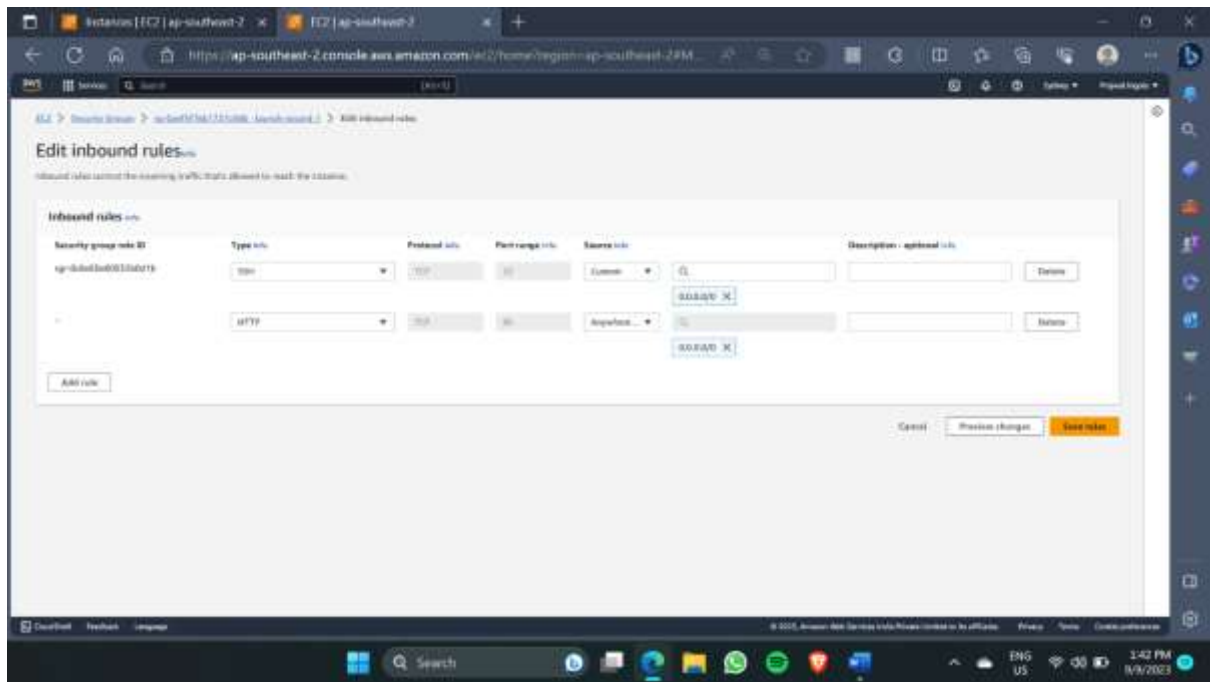




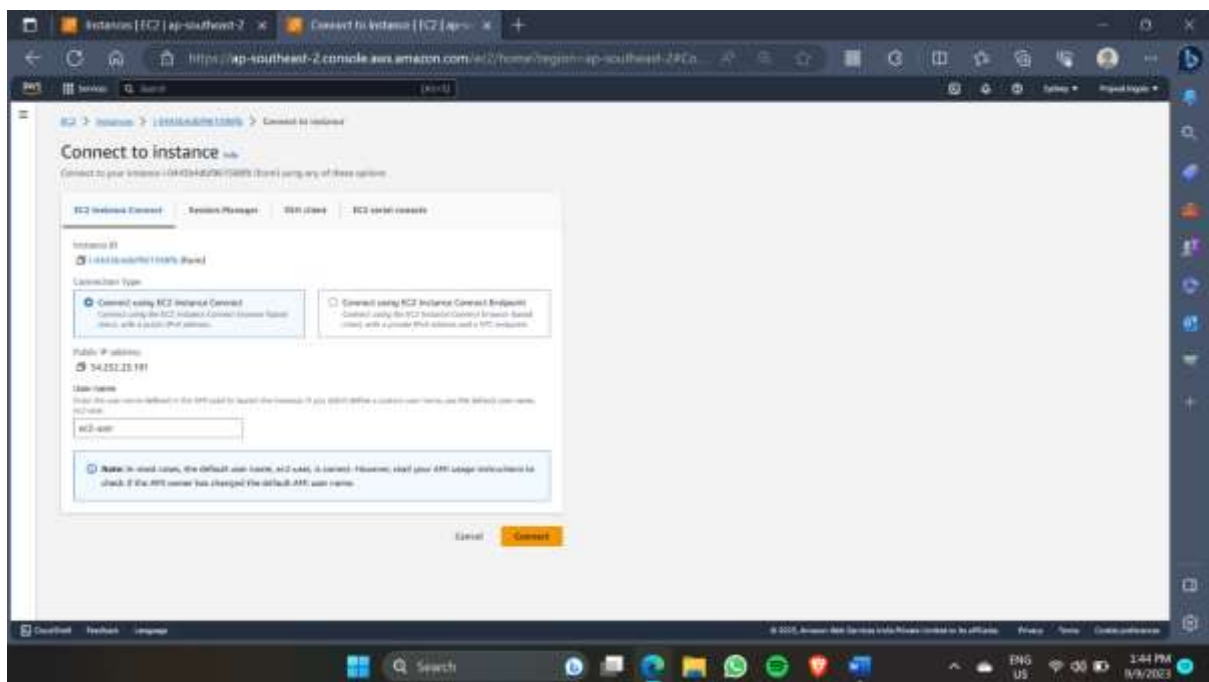
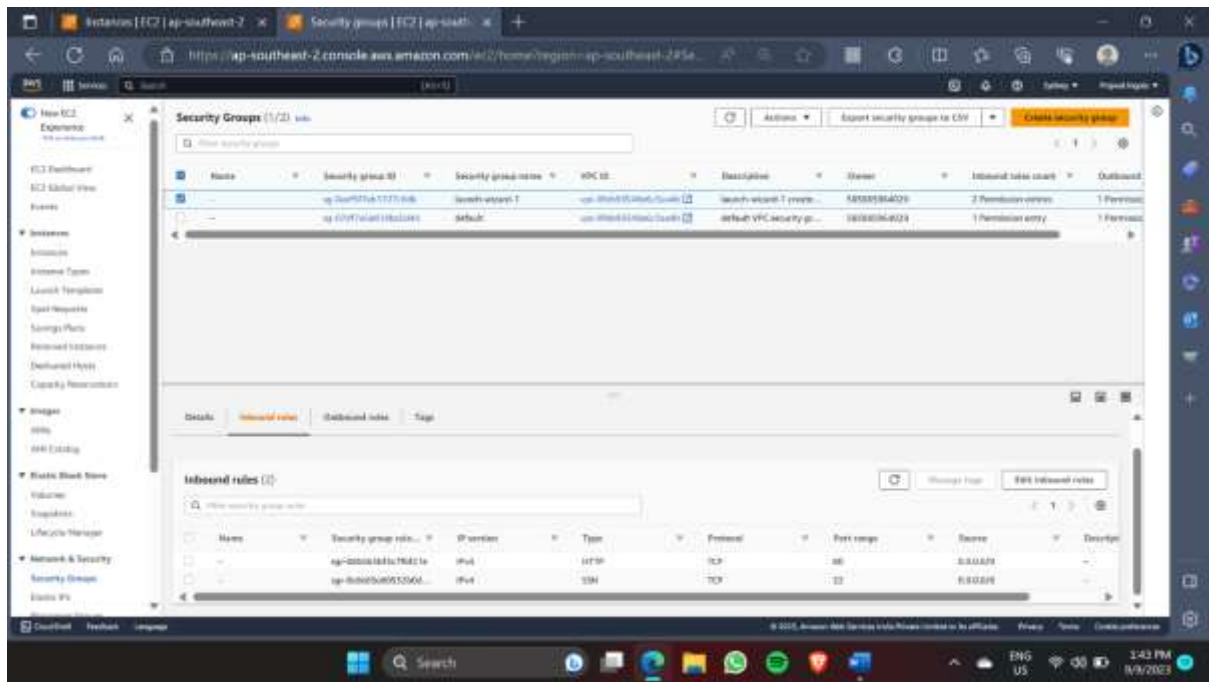


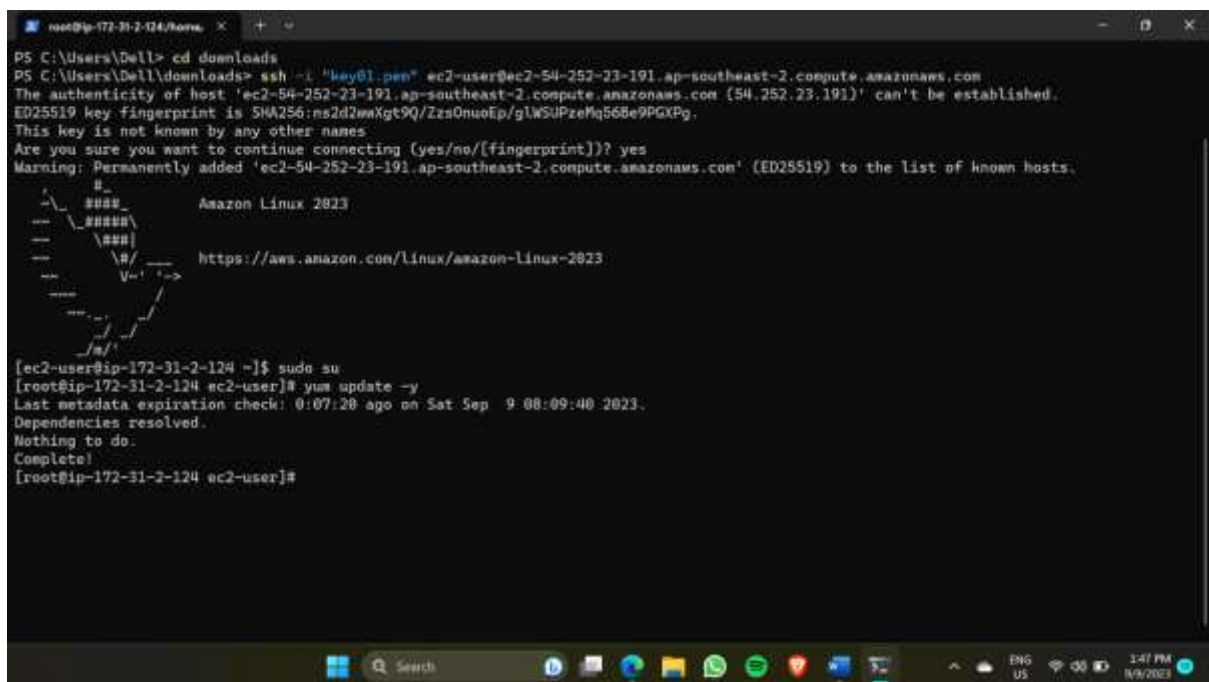
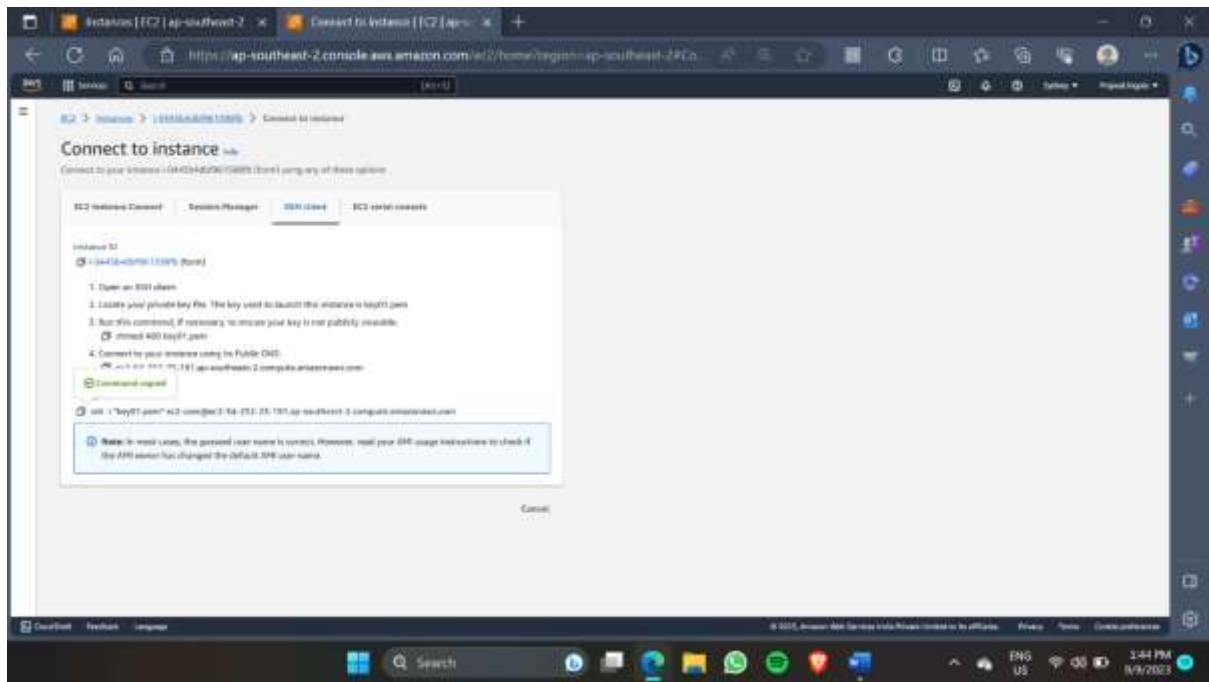












```
root@ip-172-31-2-124/home ~$ sudo su
[ec2-user@ip-172-31-2-124 ~]$ yum update -y
Last metadata expiration check: 0:07:28 ago on Sat Sep 9 08:09:40 2023.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-2-124 ~]$ yum install -y httpd
Last metadata expiration check: 0:08:10 ago on Sat Sep 9 08:09:40 2023.
Dependencies resolved.
===== Package Arch Version Repository Size
Installing:
httpd x86_64 2.4.56-1.amzn2023 amazonlinux 48 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 2.4.56-1.amzn2023 amazonlinux 1.4 M
httpdfilesystem noarch 2.4.56-1.amzn2023 amazonlinux 15 k
httpd-tools x86_64 2.4.56-1.amzn2023 amazonlinux 82 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 2.4.56-1.amzn2023 amazonlinux 62 k

Transaction Summary
=====Install 12 Packages
```

```
Transaction Summary
=====Install 12 Packages

Total download size: 2.3 M
Installed size: 6.9 M
Downloading Packages:
(1/12): httpd-2.4.56-1.amzn2023 987 kB/s | 48 kB 00:00
(2/12): apr-1.7.2-2.amzn2023.0. 8.3 MB/s | 129 kB 00:00
(3/12): libbrotli-1.0.9-4.amzn2 3.8 MB/s | 315 kB 00:00
(4/12): mod_lua-2.4.56-1.amzn20 4.1 MB/s | 62 kB 00:00
(5/12): httpd-core-2.4.56-1.amz 13 MB/s | 1.4 MB 00:00
(6/12): apr-util-1.6.3-1.amzn20 3.8 MB/s | 98 kB 00:00
(7/12): mod_http2-2.0.11-2.amzn 5.6 MB/s | 150 kB 00:00
(8/12): httpd-tools-2.4.56-1.am 4.9 MB/s | 82 kB 00:00
(9/12): apr-util-openssl-1.6.3- 989 kB/s | 17 kB 00:00
(10/12): mailcap-2.1.49-3.amzn2 1.1 MB/s | 33 kB 00:00
(11/12): generic-logos-httpd-18 1.2 MB/s | 19 kB 00:00
(12/12): httpd-filesystem-2.4.5 734 kB/s | 15 kB 00:00
-----Total 11 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. 2/12
Installing : apr-util-1.6.3-1.amzn2023.0.1.x86_ 3/12
Installing : mailcap-2.1.49-3.amzn2023.0.3.noar 4/12
Installing : httpd-tools-2.4.56-1.amzn2023.x86_ 5/12
Installing : generic-logos-httpd-18.0.0-12.amzn 6/12
```

```
root@ip-172-31-2-124:/home/ - Total 11 MB/s | 2.3 MB 00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing : 1/12
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.noar 4/12
Installing : httpd-tools-2.4.56-1.amzn2023.x86_64 5/12
Installing : generic-logos-httpd-18.0.0-12.amzn2023.x86_64 6/12
Running scriptlet: httpd-filesystem-2.4.56-1.amzn2023.x86_64 7/12
Installing : httpd-filesystem-2.4.56-1.amzn2023.x86_64 7/12
Installing : httpd-core-2.4.56-1.amzn2023.x86_64 8/12
Installing : mod_lua-2.4.56-1.amzn2023.x86_64 9/12
Installing : mod_http2-2.0.11-2.amzn2023.x86_64 10/12
Installing : libbrotli-1.0.9-4.amzn2023.0.2.x86_64 11/12
Installing : httpd-2.4.56-1.amzn2023.x86_64 12/12
Running scriptlet: httpd-2.4.56-1.amzn2023.x86_64 12/12
Verifying : httpd-2.4.56-1.amzn2023.x86_64 1/12
Verifying : httpd-core-2.4.56-1.amzn2023.x86_64 2/12
Verifying : libbrotli-1.0.9-4.amzn2023.0.2.x86_64 3/12
Verifying : apr-1.7.2-2.amzn2023.0.2.x86_64 4/12
Verifying : mod_lua-2.4.56-1.amzn2023.x86_64 5/12
Verifying : apr-util-1.6.3-1.amzn2023.0.1.x86_64 6/12
Verifying : mod_http2-2.0.11-2.amzn2023.x86_64 7/12
Verifying : httpd-tools-2.4.56-1.amzn2023.x86_64 8/12
Verifying : apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64 9/12
Verifying : mailcap-2.1.49-3.amzn2023.0.3.noar 10/12
Verifying : httpd-filesystem-2.4.56-1.amzn2023.x86_64 11/12
```

```
Installing : httpd-2.4.56-1.amzn2023.x86_64 12/12
Running scriptlet: httpd-2.4.56-1.amzn2023.x86_64 12/12
Verifying : httpd-2.4.56-1.amzn2023.x86_64 1/12
Verifying : httpd-core-2.4.56-1.amzn2023.x86_64 2/12
Verifying : libbrotli-1.0.9-4.amzn2023.0.2.x86_64 3/12
Verifying : apr-1.7.2-2.amzn2023.0.2.x86_64 4/12
Verifying : mod_lua-2.4.56-1.amzn2023.x86_64 5/12
Verifying : apr-util-1.6.3-1.amzn2023.0.1.x86_64 6/12
Verifying : mod_http2-2.0.11-2.amzn2023.x86_64 7/12
Verifying : httpd-tools-2.4.56-1.amzn2023.x86_64 8/12
Verifying : apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64 9/12
Verifying : mailcap-2.1.49-3.amzn2023.0.3.noar 10/12
Verifying : httpd-filesystem-2.4.56-1.amzn2023.x86_64 11/12
Verifying : generic-logos-httpd-18.0.0-12.amzn2023.x86_64 12/12

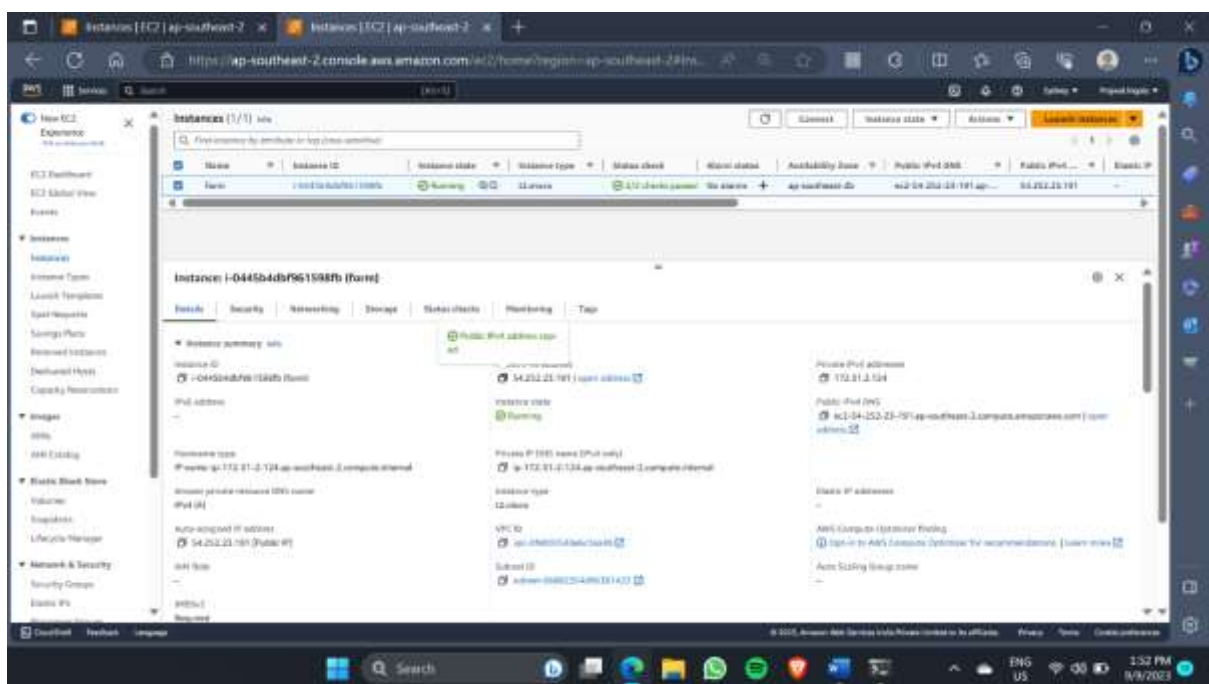
Installed:
apr-1.7.2-2.amzn2023.0.2.x86_64
apr-util-1.6.3-1.amzn2023.0.1.x86_64
apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64
generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch
httpd-2.4.56-1.amzn2023.x86_64
httpd-core-2.4.56-1.amzn2023.x86_64
httpd-filesystem-2.4.56-1.amzn2023.noarch
httpd-tools-2.4.56-1.amzn2023.x86_64
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-2.4.56-1.amzn2023.x86_64

Complete!
[root@ip-172-31-2-124 ~]#
```

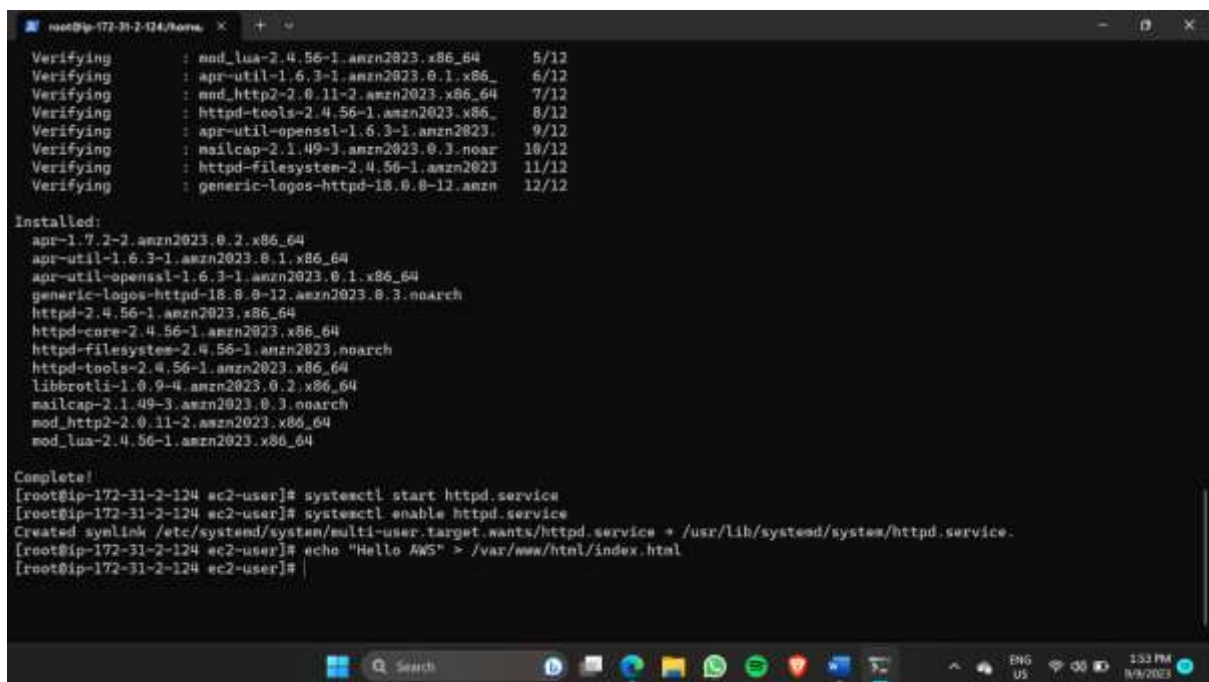
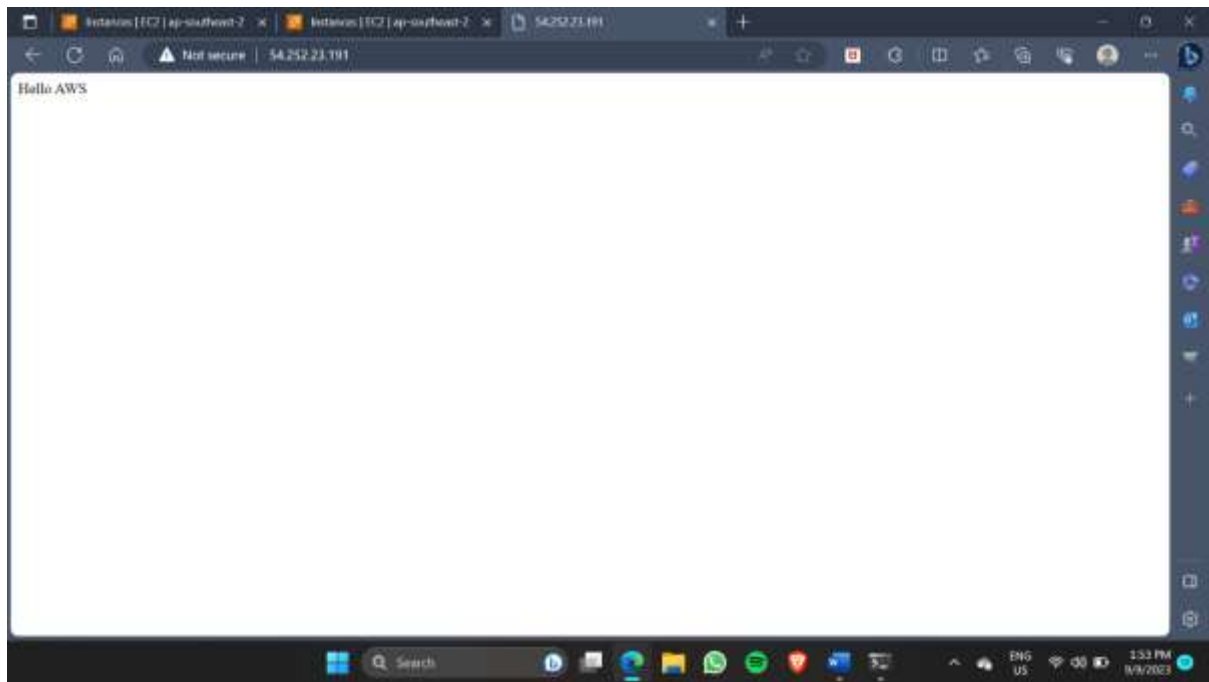
```
root@ip-172-31-2-124:/home/
Verifying : libbrotli-1.0.9-4.amzn2023.0.2.x86_64 3/12
Verifying : apr-1.7.2-2.amzn2023.0.2.x86_64 4/12
Verifying : mod_lua-2.4.56-1.amzn2023.x86_64 5/12
Verifying : apr-util-1.6.3-1.amzn2023.0.1.x86_64 6/12
Verifying : mod_http2-2.0.11-2.amzn2023.x86_64 7/12
Verifying : httpd-tools-2.4.56-1.amzn2023.x86_64 8/12
Verifying : apr-util-openssl-1.6.3-1.amzn2023. 9/12
Verifying : mailcap-2.1.49-3.amzn2023.0.3.noar 10/12
Verifying : httpd filesystem-2.4.56-1.amzn2023 11/12
Verifying : generic-logos-httpd-18.0.0-12.amzn 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-2.4.56-1.amzn2023.x86_64
httpd-core-2.4.56-1.amzn2023.x86_64
httpd-filesystem-2.4.56-1.amzn2023.noarch
httpd-tools-2.4.56-1.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-2.4.56-1.amzn2023.x86_64

Complete!
[root@ip-172-31-2-124 ec2-user]# systemctl start httpd.service
[root@ip-172-31-2-124 ec2-user]# systemctl enable httpd.service
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service + /usr/lib/systemd/system/httpd.service.
[root@ip-172-31-2-124 ec2-user]#
```











```
root@ip-172-31-10-205:~#  
Last login: Wed Sep 13 09:14:50 2023 from 103.97.164.116  
[ec2-user@ip-172-31-10-205 ~]$ sudo su  
[root@ip-172-31-10-205 ec2-user]# cp -r /home/ec2-user/data/* /var/www/html/index.html  
cp: target '/var/www/html/index.html' is not a directory  
[root@ip-172-31-10-205 ec2-user]# cd var  
bash: cd: var: No such file or directory  
[root@ip-172-31-10-205 ec2-user]# ls  
data  
[root@ip-172-31-10-205 ec2-user]# cd ..  
[root@ip-172-31-10-205 home]# ls  
ec2-user  
[root@ip-172-31-10-205 home]# cd ..  
[root@ip-172-31-10-205 /]# ls  
bin dev home lib64 media opt root sbin sys usr  
boot etc lib local mnt proc run srv var  
[root@ip-172-31-10-205 /]# cd var  
[root@ip-172-31-10-205 var]# cd www  
[root@ip-172-31-10-205 www]# cd html  
[root@ip-172-31-10-205 html]# ls  
index.html  
[root@ip-172-31-10-205 html]# sudo cp -r /home/ec2-user/data/* /var/www/html  
[root@ip-172-31-10-205 html]# ls  
index.html jqueryform.html styles.css  
[root@ip-172-31-10-205 html]# cp jqueryform.html index.html  
cp: overwrite 'index.html'? y  
[root@ip-172-31-10-205 html]# |
```

```
Windows PowerShell  
[root@ip-172-31-10-205 ec2-user]# cp -r /home/ec2-user/data/* /var/www/html/index.html  
cp: target '/var/www/html/index.html' is not a directory  
[root@ip-172-31-10-205 ec2-user]# cd var  
bash: cd: var: No such file or directory  
[root@ip-172-31-10-205 ec2-user]# ls  
data  
[root@ip-172-31-10-205 ec2-user]# cd ..  
[root@ip-172-31-10-205 home]# ls  
ec2-user  
[root@ip-172-31-10-205 home]# cd ..  
[root@ip-172-31-10-205 /]# ls  
bin dev home lib64 media opt root sbin sys usr  
boot etc lib local mnt proc run srv var  
[root@ip-172-31-10-205 /]# cd var  
[root@ip-172-31-10-205 var]# cd www  
[root@ip-172-31-10-205 www]# cd html  
[root@ip-172-31-10-205 html]# ls  
index.html  
[root@ip-172-31-10-205 html]# sudo cp -r /home/ec2-user/data/* /var/www/html  
[root@ip-172-31-10-205 html]# ls  
index.html jqueryform.html styles.css  
[root@ip-172-31-10-205 html]# cp jqueryform.html index.html  
cp: overwrite 'index.html'? y  
[root@ip-172-31-10-205 html]# exit  
exit  
[ec2-user@ip-172-31-10-205 ~]$ exit  
logout  
Connection to ec2-13-211-229-172.ap-southeast-2.compute.amazonaws.com closed.  
PS C:\Users\Dell\downloads>
```

