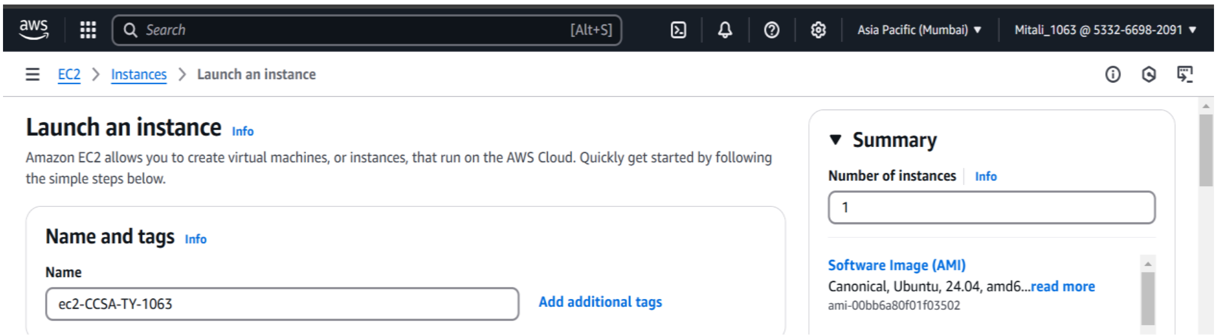
School of Computer Science, Engineering and Applications(SCSEA)
B.C.A. TY (CCSA)
Subject: Containers & Orchestration

Name of the Student: **Mitali Bhattad** **PRN: 20220801063**

Title of Practical: **Docker Container Lifecycle: Managing Ubuntu & Apache2 Images with Start, Stop, Kill, and Prune Operations**

Step1: Launch an EC2 Instance

- Name the Instance



EC2 > Instances > Launch an instance

Launch an instance

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

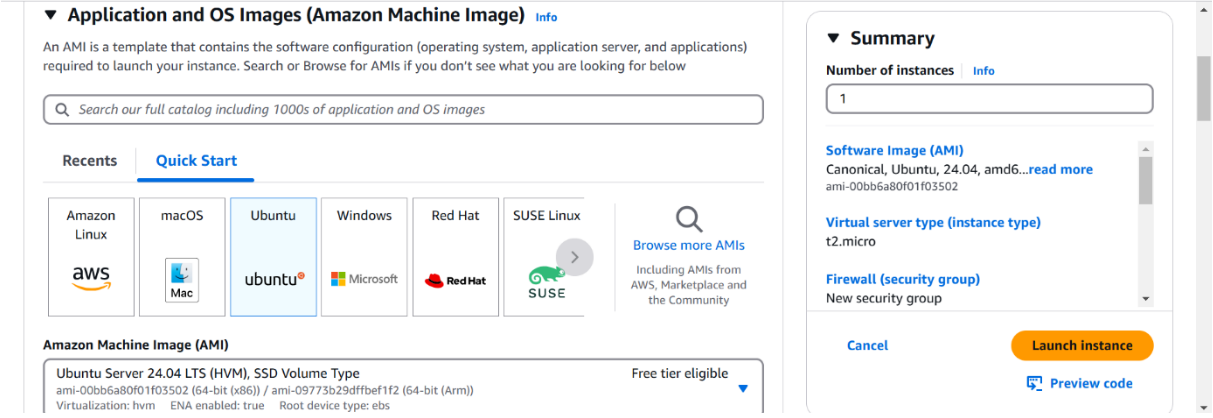
Name: ec2-CCSA-TY-1063

Summary

Number of instances: 1

Software Image (AMI): Canonical, Ubuntu, 24.04, amd6...read more
ami-00bb6a80f01f03502

- Choose AMI: Ubuntu



Application and OS Images (Amazon Machine Image)

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

Amazon Machine Image (AMI)

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type — Free tier eligible
ami-00bb6a80f01f03502 (64-bit (x86)) / ami-09773b29dffbef1f2 (64-bit (Arm))
Virtualization: hvm ENA enabled: true Root device type: ebs

Summary

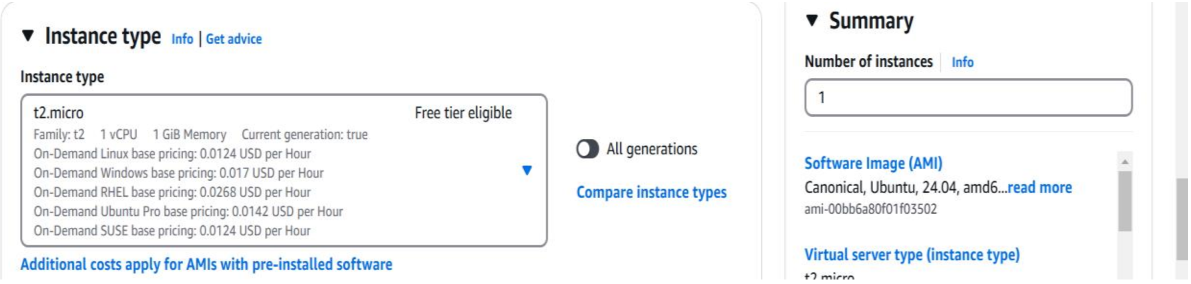
Number of instances: 1

Software Image (AMI): Canonical, Ubuntu, 24.04, amd6...read more
ami-00bb6a80f01f03502

Virtual server type (instance type): t2.micro

Firewall (security group): New security group

- Select the instance type: t2 micro



Instance type

Instance type

t2.micro — Free tier eligible
Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Linux base pricing: 0.0124 USD per Hour
On-Demand Windows base pricing: 0.017 USD per Hour
On-Demand RHEL base pricing: 0.0268 USD per Hour
On-Demand Ubuntu Pro base pricing: 0.0142 USD per Hour
On-Demand SUSE base pricing: 0.0124 USD per Hour

Additional costs apply for AMIs with pre-installed software

Summary

Number of instances: 1

Software Image (AMI): Canonical, Ubuntu, 24.04, amd6...read more
ami-00bb6a80f01f03502

Virtual server type (instance type)

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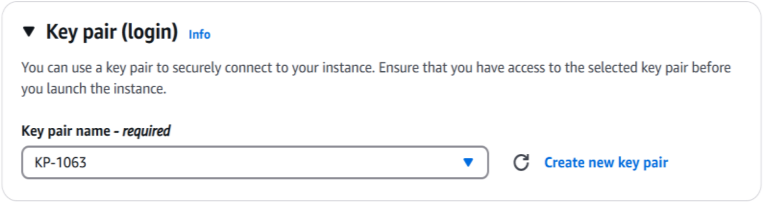
- Create a Key pair

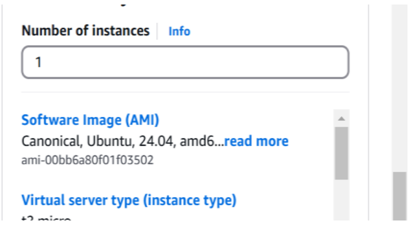


▼ Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

KP-1063 ▼



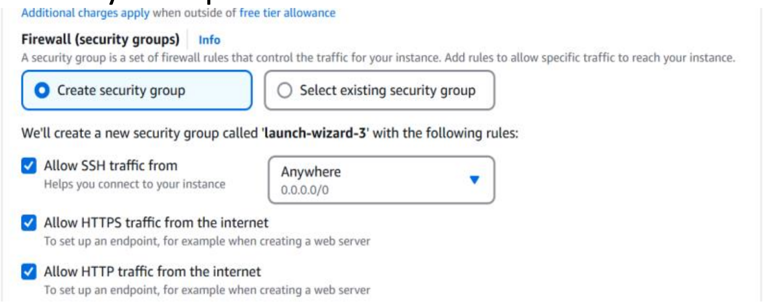
Number of instances Info

1

Software Image (AMI)
Canonical, Ubuntu, 24.04, amd6...read more
ami-00bb6a80f01f03502

Virtual server type (instance type)

- Security Group: Allow all the traffic



Additional charges apply when outside of free tier allowance

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.

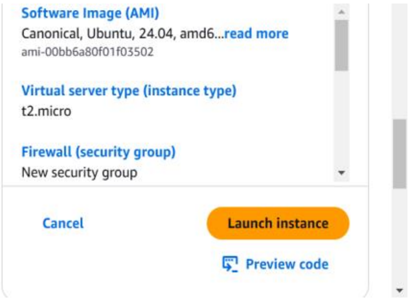
● Create security group ○ Select existing security group

We'll create a new security group called '**launch-wizard-3**' with the following rules:

☑ Allow SSH traffic from
Helps you connect to your instance
Anywhere
0.0.0.0/0

☑ Allow HTTPS traffic from the internet
To set up an endpoint, for example when creating a web server

☑ Allow HTTP traffic from the internet
To set up an endpoint, for example when creating a web server

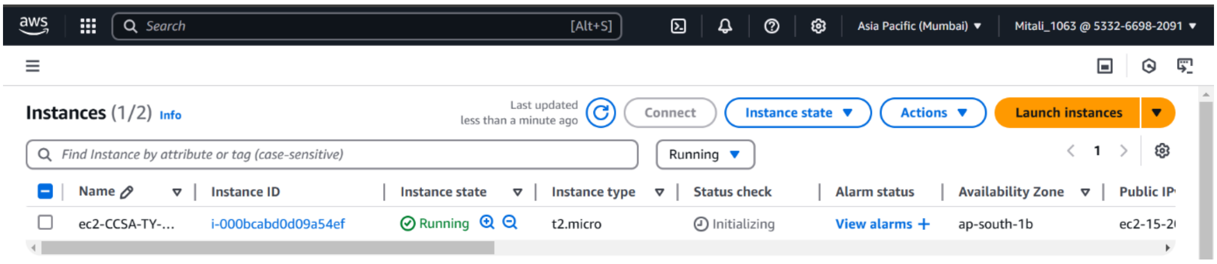


Software Image (AMI)
Canonical, Ubuntu, 24.04, amd6...read more
ami-00bb6a80f01f03502

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

- Launch the instance



aws
Search [Alt+S]
Asia Pacific (Mumbai) ▼
Mitali_1063 @ 5332-6698-2091 ▼
Last updated less than a minute ago
Connect
Instance state ▼
Actions ▼
Launch instances ▼
Find Instance by attribute or tag (case-sensitive)
Running ▼

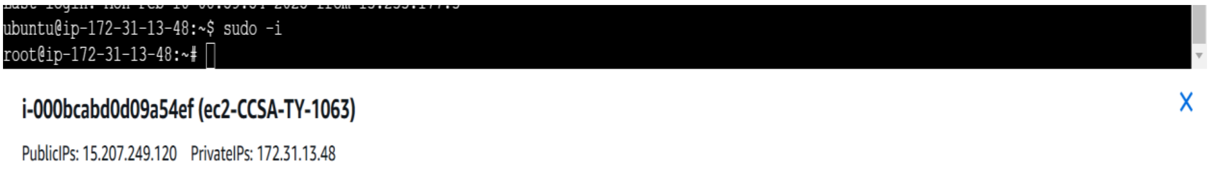
Instances (1/2) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
ec2-CCSA-TY-...	i-000bcabd0d09a54ef	Running	t2.micro	Initializing	View alarms +	ap-south-1b	ec2-15-2

Step 2: Connect the EC2 Instance and run the following commands:

1. Switch to root user

- sudo -i

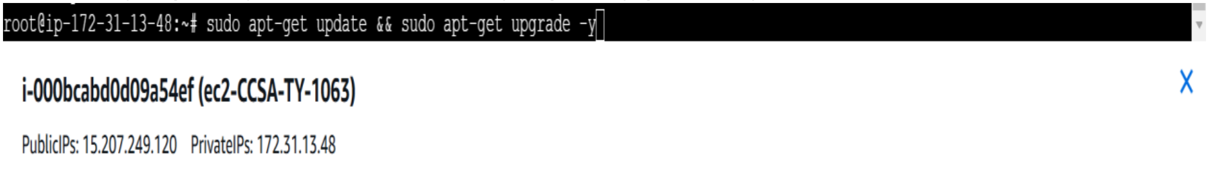


```
ubuntu@ip-172-31-13-48:~$ sudo -i
root@ip-172-31-13-48:~#
```

i-000bcabd0d09a54ef (ec2-CCSA-TY-1063)

PublicIPs: 15.207.249.120 PrivateIPs: 172.31.13.48

2. Update and upgrade system packages
- sudo apt-get update && sudo apt-get upgrade -y

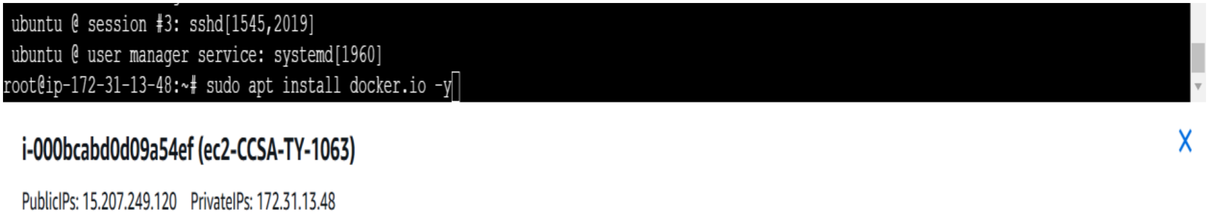


```
root@ip-172-31-13-48:~# sudo apt-get update && sudo apt-get upgrade -y
```

i-000bcabd0d09a54ef (ec2-CCSA-TY-1063)

PublicIPs: 15.207.249.120 PrivateIPs: 172.31.13.48

3. Install Docker sudo apt install
- docker.io -y

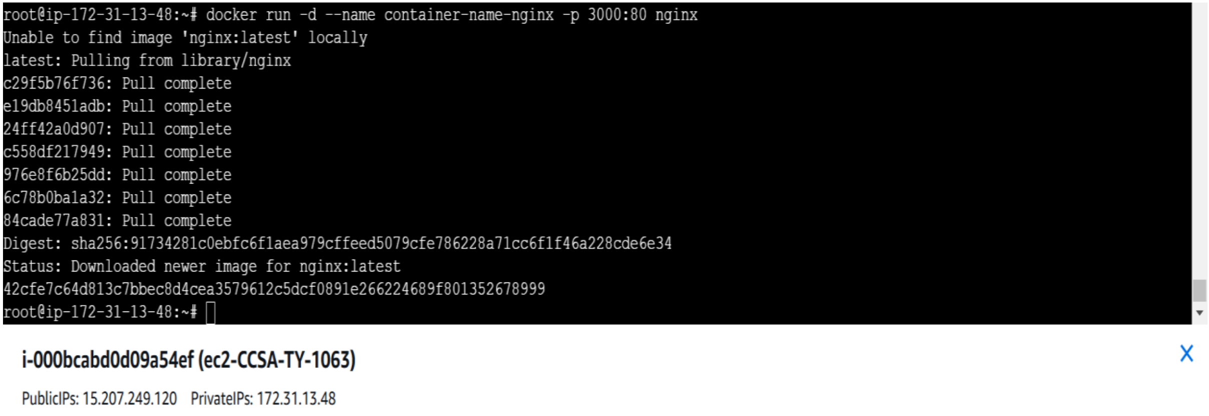


```
 ubuntu @ session #3: sshd[1545,2019]
 ubuntu @ user manager service: systemd[1960]
root@ip-172-31-13-48:~# sudo apt install docker.io -y
```

i-000bcabd0d09a54ef (ec2-CCSA-TY-1063)

PublicIPs: 15.207.249.120 PrivateIPs: 172.31.13.48

4. Run an Nginx container
- docker run -d --name container-nginx -p 3000:80 nginx



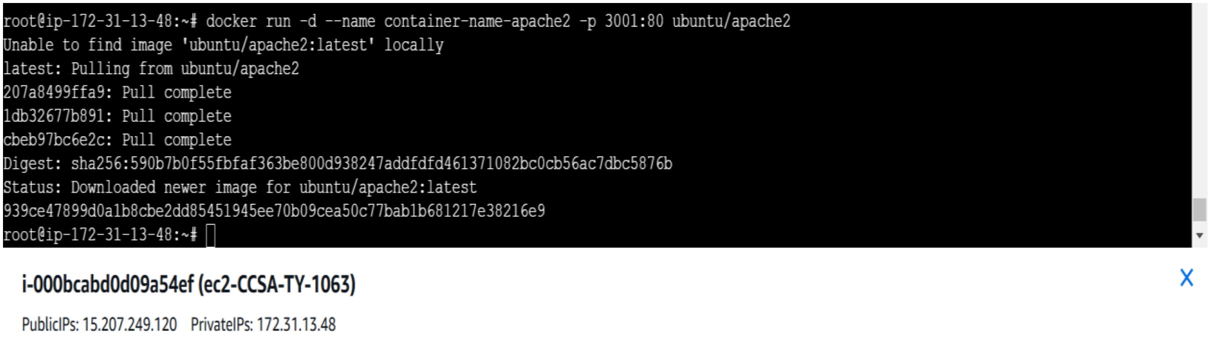
```
root@ip-172-31-13-48:~# docker run -d --name container-name-nginx -p 3000:80 nginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
c29f5b76f736: Pull complete
e19db8451adb: Pull complete
24ff42a0d907: Pull complete
c558df217949: Pull complete
976e8f6b25dd: Pull complete
6c78b0ba1a32: Pull complete
84cade77a831: Pull complete
Digest: sha256:91734281c0ebfc6f1aea979cffeed5079cfe786228a71cc6f1f46a228cde6e34
Status: Downloaded newer image for nginx:latest
42cfe7c64d813c7bbec8d4cea3579612c5dcf0891e266224689f801352678999
root@ip-172-31-13-48:~#
```

i-000bcabd0d09a54ef (ec2-CCSA-TY-1063)

PublicIPs: 15.207.249.120 PrivateIPs: 172.31.13.48

5. Run an Apache2 container

- docker run -d --name container-apache2 -p 3001:80 ubuntu/apache2



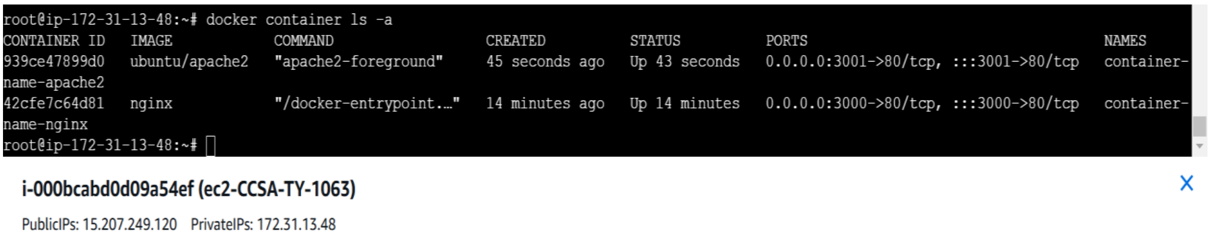
```
root@ip-172-31-13-48:~# docker run -d --name container-name-apache2 -p 3001:80 ubuntu/apache2
Unable to find image 'ubuntu/apache2:latest' locally
latest: Pulling from ubuntu/apache2
207a8499ffa9: Pull complete
1db32677b891: Pull complete
cbeb97bc6e2c: Pull complete
Digest: sha256:590b7b0f55fbfaf363be800d938247addfdfd461371082bc0cb56ac7dbc5876b
Status: Downloaded newer image for ubuntu/apache2:latest
939ce47899d0a1b8cbe2dd85451945ee70b09cea50c77bab1b681217e38216e9
root@ip-172-31-13-48:~# 
```

i-000bcabd0d09a54ef (ec2-CCSA-TY-1063)

PublicIPs: 15.207.249.120 PrivateIPs: 172.31.13.48

6. List all containers

- docker container ls -a



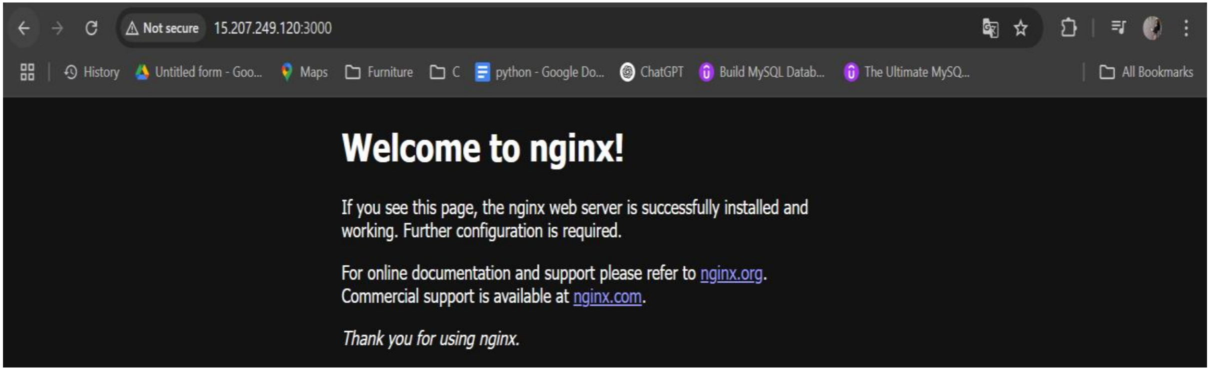
```
root@ip-172-31-13-48:~# docker container ls -a
CONTAINER ID   IMAGE            COMMAND                  CREATED          STATUS          PORTS                                   NAMES
939ce47899d0   ubuntu/apache2   "apache2-foreground"     45 seconds ago   Up 43 seconds   0.0.0.0:3001->80/tcp, :::3001->80/tcp   container-
name-apache2
42cfe7c64d81   nginx            "/docker-entrypoint.…"   14 minutes ago   Up 14 minutes   0.0.0.0:3000->80/tcp, :::3000->80/tcp   container-
name-nginx
root@ip-172-31-13-48:~# 
```

i-000bcabd0d09a54ef (ec2-CCSA-TY-1063)

PublicIPs: 15.207.249.120 PrivateIPs: 172.31.13.48

NOTE: inbound rule should be in all traffic

7. Copy the ipv4 and port (ipv4:port)



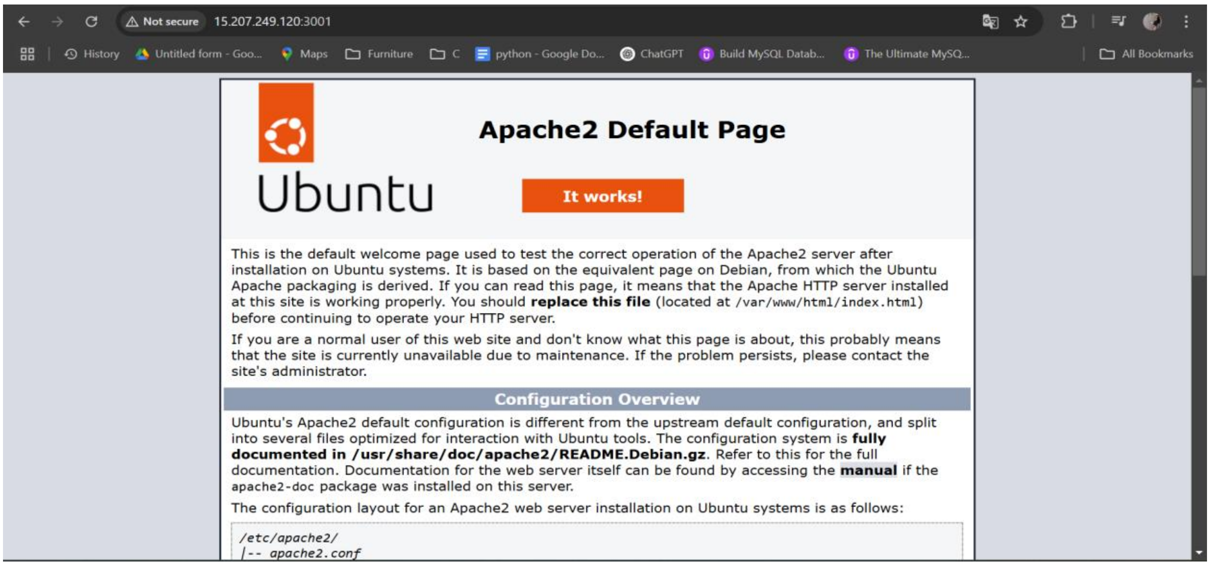
Not secure 15.207.249.120:3000

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.



Apache2 Default Page

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

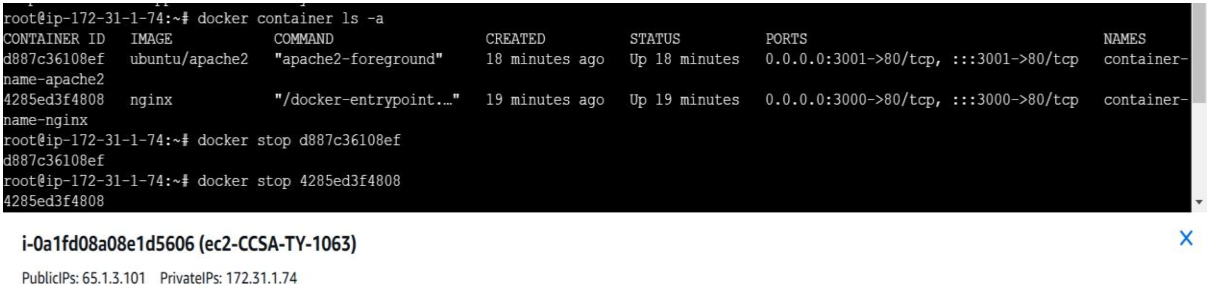
Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in /usr/share/doc/apache2/README.Debian.gz**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
```

8. Now to stop, start, kill and prune, run the following commands:

- docker stop (container-Id)

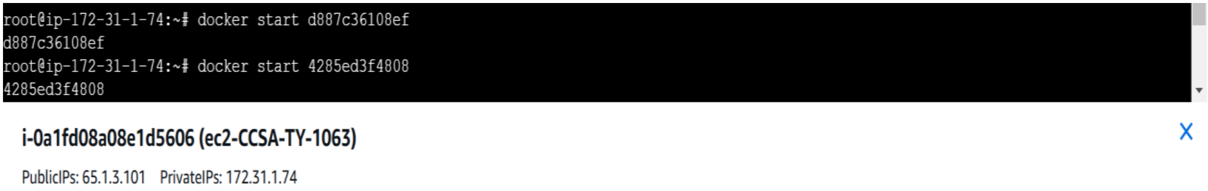


```
root@ip-172-31-1-74:~# docker container ls -a
CONTAINER ID   IMAGE           COMMAND                  CREATED          STATUS          PORTS                                   NAMES
d887c36108ef   ubuntu/apache2  "apache2-foreground"     18 minutes ago   Up 18 minutes   0.0.0.0:3001->80/tcp, :::3001->80/tcp   container-
name-apache2
4285ed3f4808   nginx           "/docker-entrypoint.…"   19 minutes ago   Up 19 minutes   0.0.0.0:3000->80/tcp, :::3000->80/tcp   container-
name-nginx
root@ip-172-31-1-74:~# docker stop d887c36108ef
d887c36108ef
root@ip-172-31-1-74:~# docker stop 4285ed3f4808
4285ed3f4808
```

i-0a1fd08a08e1d5606 (ec2-CCSA-TY-1063)

PublicIPs: 65.1.3.101 PrivateIPs: 172.31.1.74

- docker start (container-Id)

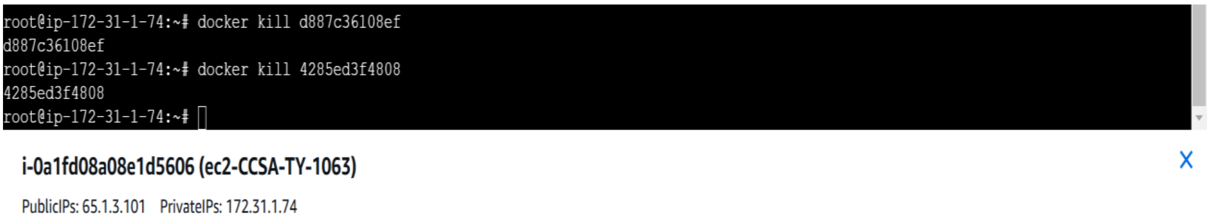


```
root@ip-172-31-1-74:~# docker start d887c36108ef
d887c36108ef
root@ip-172-31-1-74:~# docker start 4285ed3f4808
4285ed3f4808
```

i-0a1fd08a08e1d5606 (ec2-CCSA-TY-1063)

PublicIPs: 65.1.3.101 PrivateIPs: 172.31.1.74

- docker kill (container-Id)

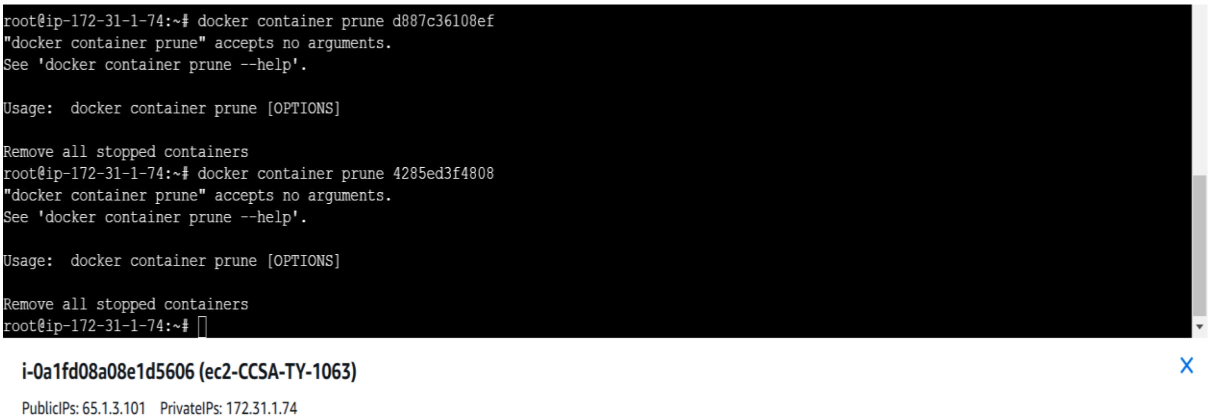


```
root@ip-172-31-1-74:~# docker kill d887c36108ef
d887c36108ef
root@ip-172-31-1-74:~# docker kill 4285ed3f4808
4285ed3f4808
root@ip-172-31-1-74:~# 
```

i-0a1fd08a08e1d5606 (ec2-CCSA-TY-1063)

PublicIPs: 65.1.3.101 PrivateIPs: 172.31.1.74

- docker container prune (container-Id)



```
root@ip-172-31-1-74:~# docker container prune d887c36108ef
"docker container prune" accepts no arguments.
See 'docker container prune --help'.

Usage:  docker container prune [OPTIONS]

Remove all stopped containers
root@ip-172-31-1-74:~# docker container prune 4285ed3f4808
"docker container prune" accepts no arguments.
See 'docker container prune --help'.

Usage:  docker container prune [OPTIONS]

Remove all stopped containers
root@ip-172-31-1-74:~# 
```

i-0a1fd08a08e1d5606 (ec2-CCSA-TY-1063)

PublicIPs: 65.1.3.101 PrivateIPs: 172.31.1.74