VIRTUALIZATION AND CONTAINERS

ASSIGNMENT

Submitted By:

Dona M Thomas

S2 MCA, Rollno:49

Submitted Date:

23/05/2022

DOCKER CERTIFICATE

SkillUP
by Simplilearn

Declaration of Completion

DONA M THOMAS

has successfully completed the online course:

Getting Started with Docker

This professional has demonstrated initiative and a commitment to deepening their skills and advancing their career. Well done!

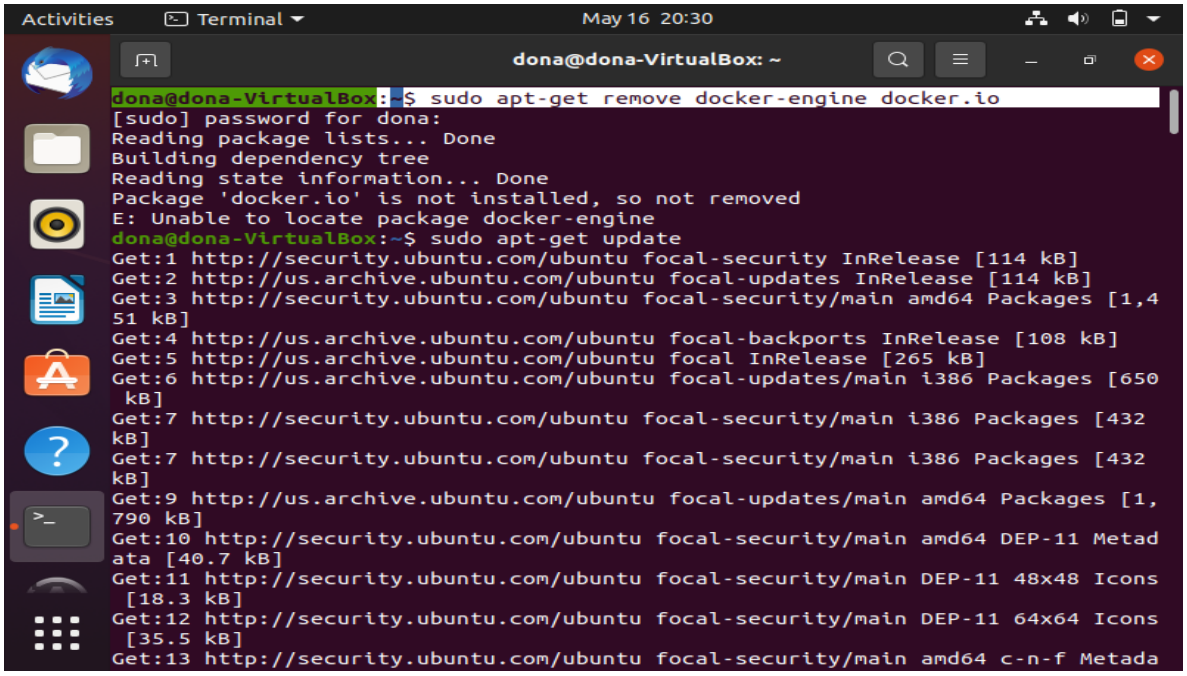
18th Apr 2022

Certificate code : 3396058

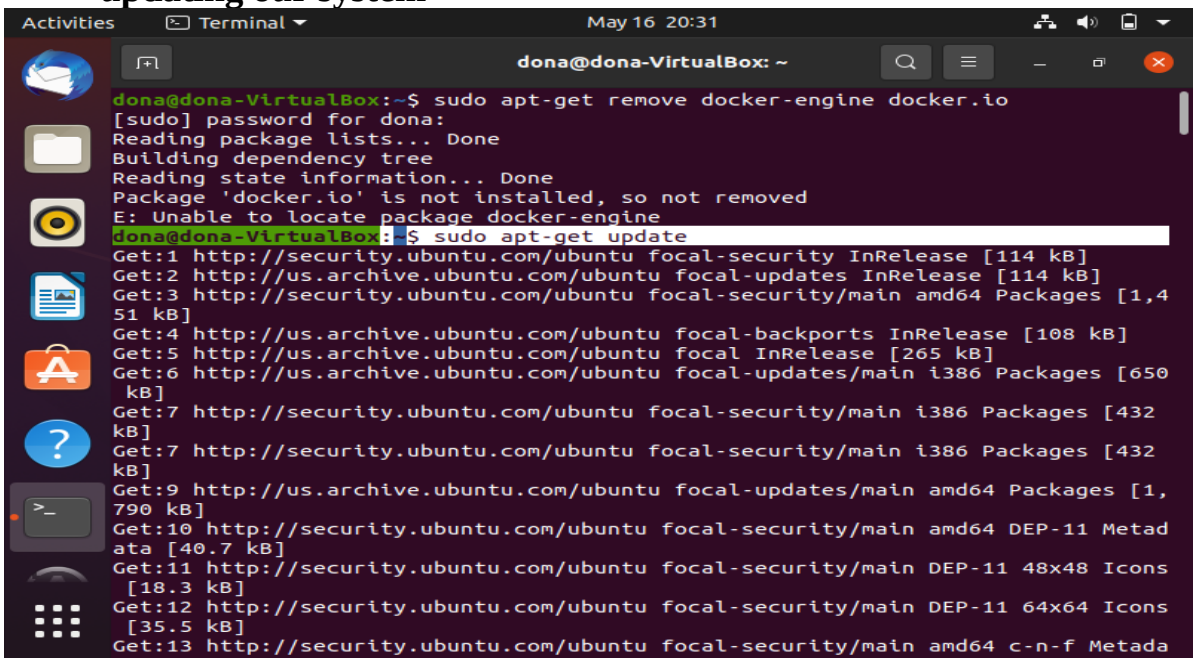
Krishna Kumar
CEO

Docker Installation and Container

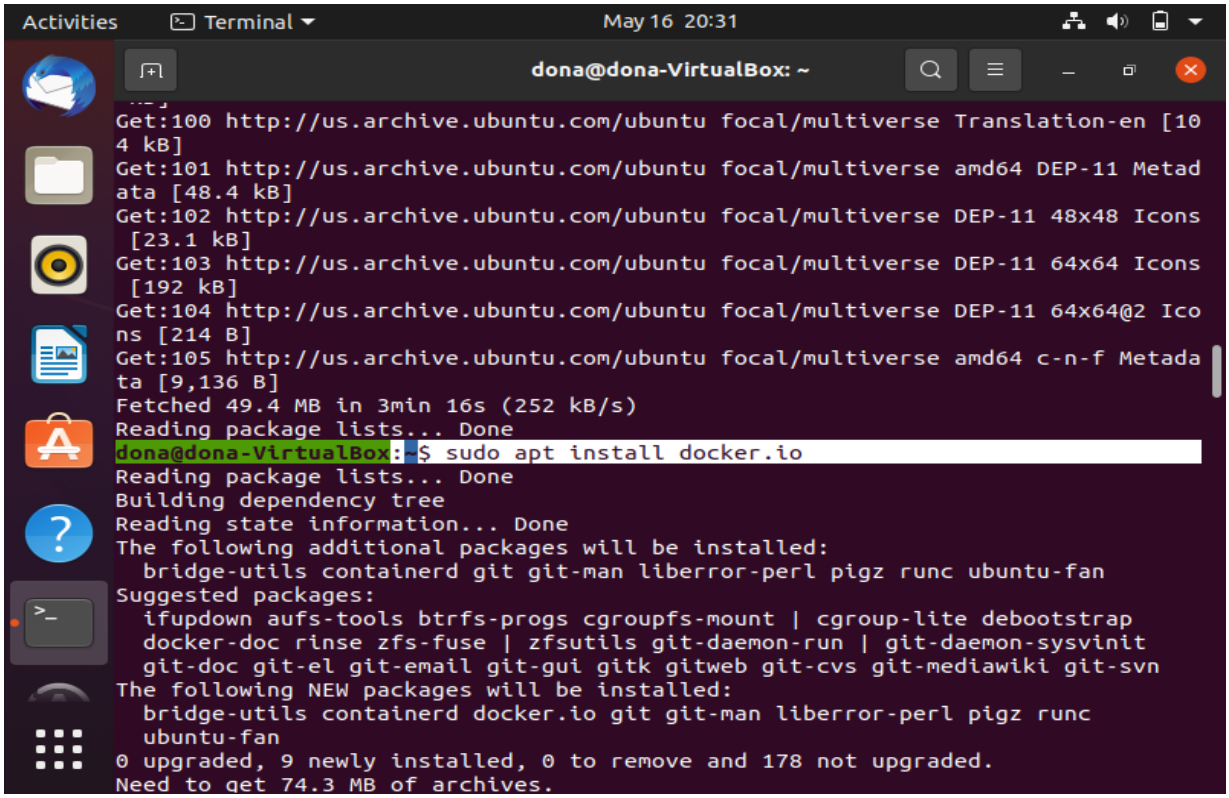
- **Already you have docker. Use this command if you want to remove.**



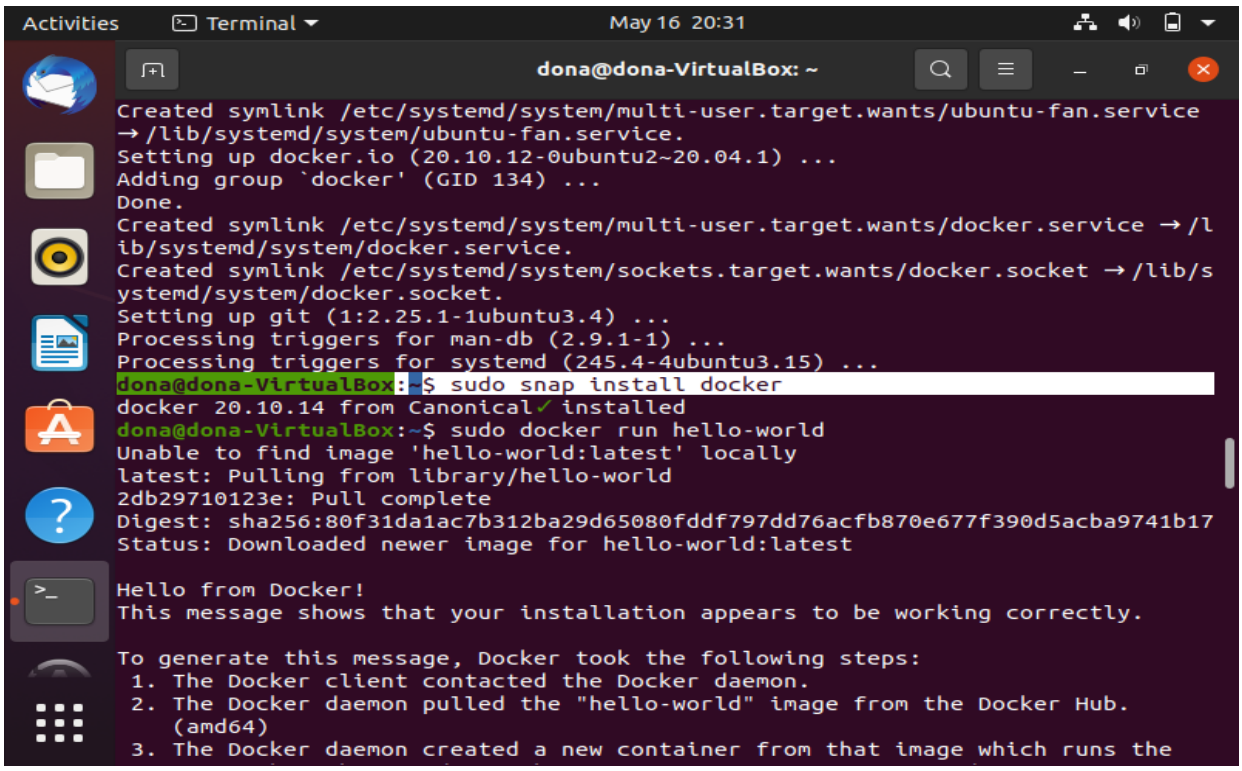
- **updating our system**



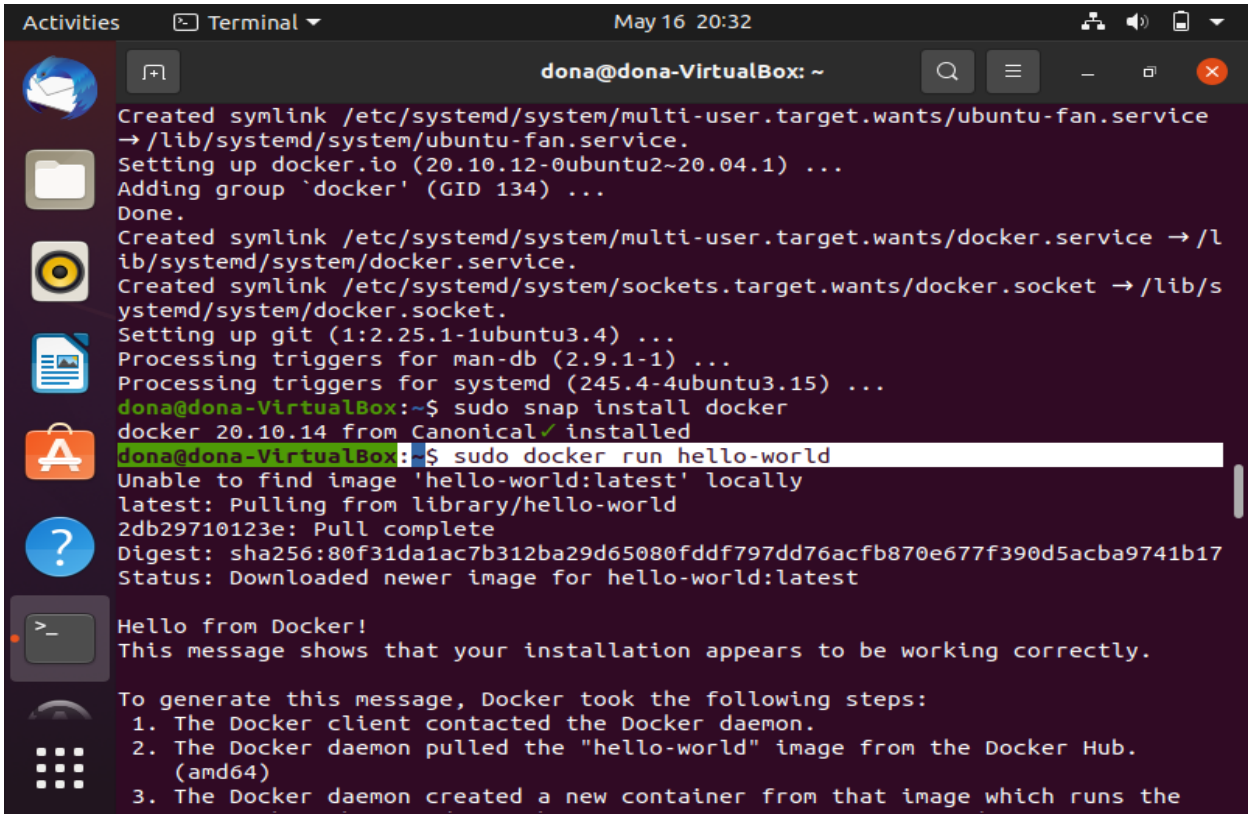
- **installing docker**



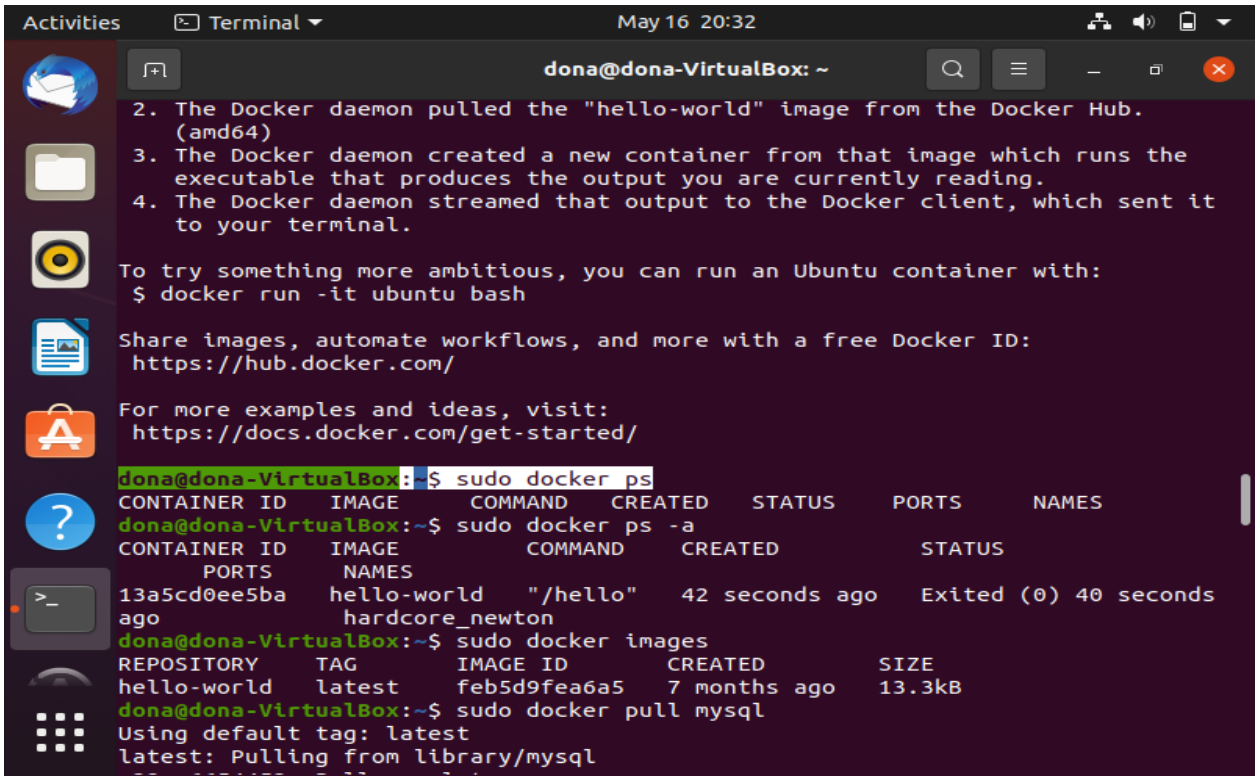
- **installing docker dependency packages**

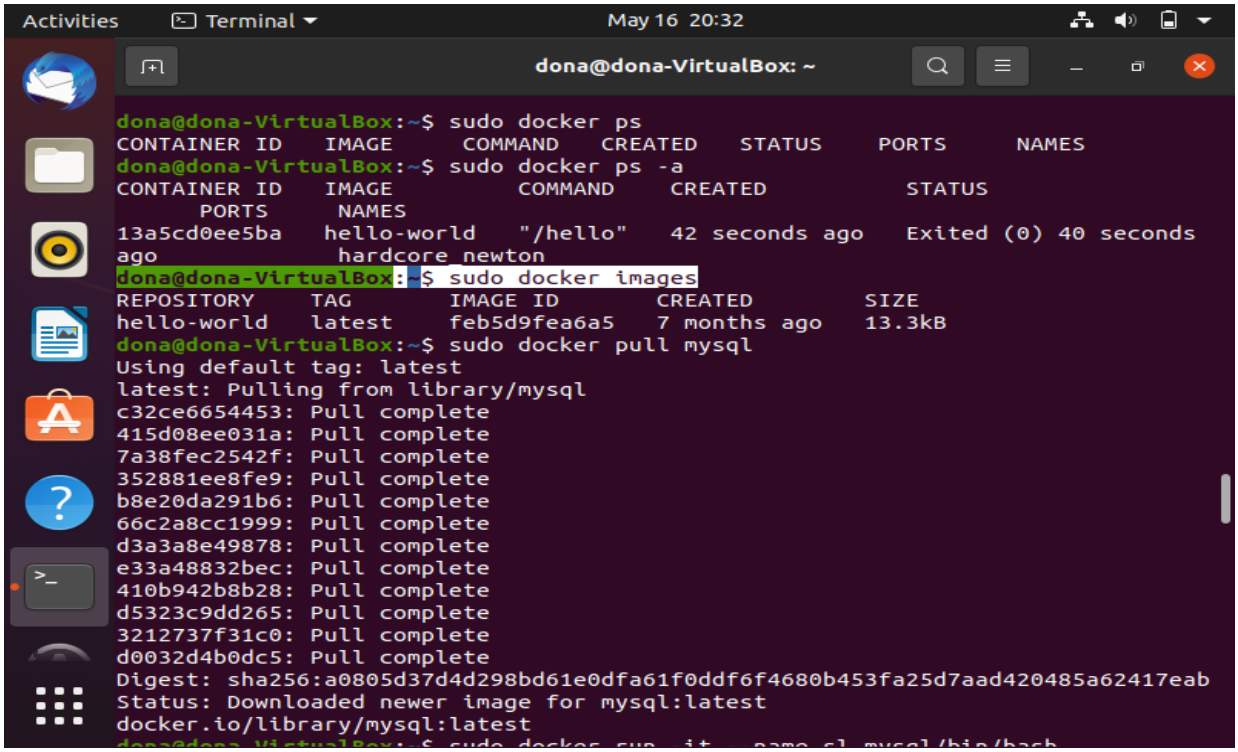


- **pulling hello-world from docker hub**



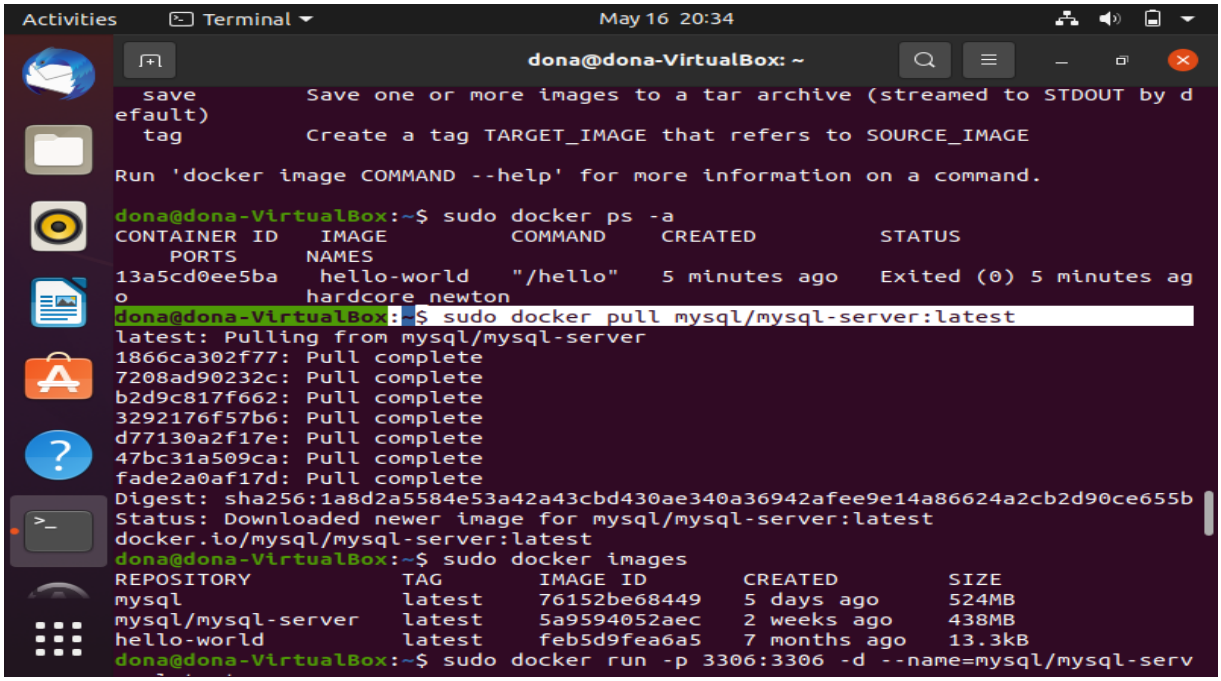
- **displaying the images**

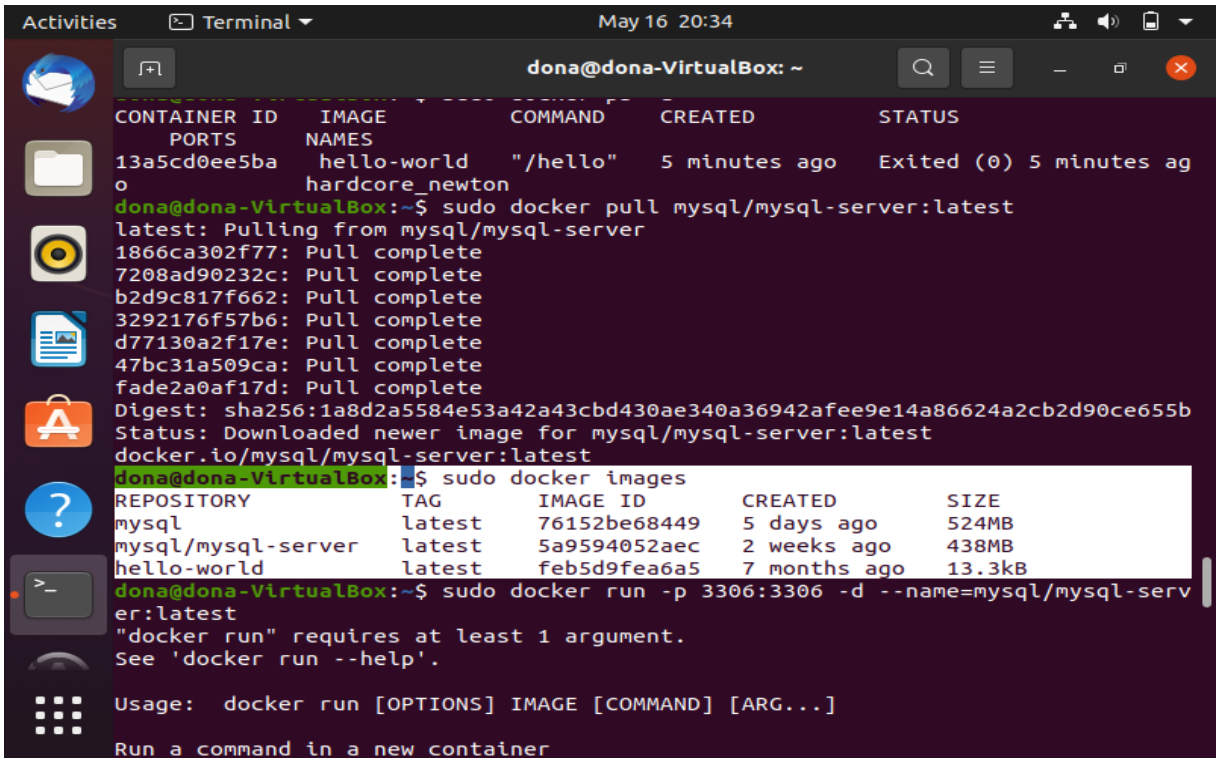



Activities
Terminal
May 16 20:32
dona@dona-VirtualBox: ~
dona@dona-VirtualBox:~$ sudo docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
dona@dona-VirtualBox:~$ sudo docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS
PORTS NAMES
13a5cd0ee5ba hello-world "/hello" 42 seconds ago Exited (0) 40 seconds
ago hardcore_newton
dona@dona-VirtualBox:~$ sudo docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
hello-world latest feb5d9fea6a5 7 months ago 13.3kB
dona@dona-VirtualBox:~$ sudo docker pull mysql
Using default tag: latest
latest: Pulling from library/mysql
c32ce6654453: Pull complete
415d08ee031a: Pull complete
7a38fec2542f: Pull complete
352881ee8fe9: Pull complete
b8e20da291b6: Pull complete
66c2a8cc1999: Pull complete
d3a3a8e49878: Pull complete
e33a48832bec: Pull complete
410b942b8b28: Pull complete
d5323c9dd265: Pull complete
3212737f31c0: Pull complete
d0032d4b0dc5: Pull complete
Digest: sha256:a0805d37d4d298bd61e0dfa61f0ddf6f4680b453fa25d7aad420485a62417eab
Status: Downloaded newer image for mysql:latest
docker.io/library/mysql:latest

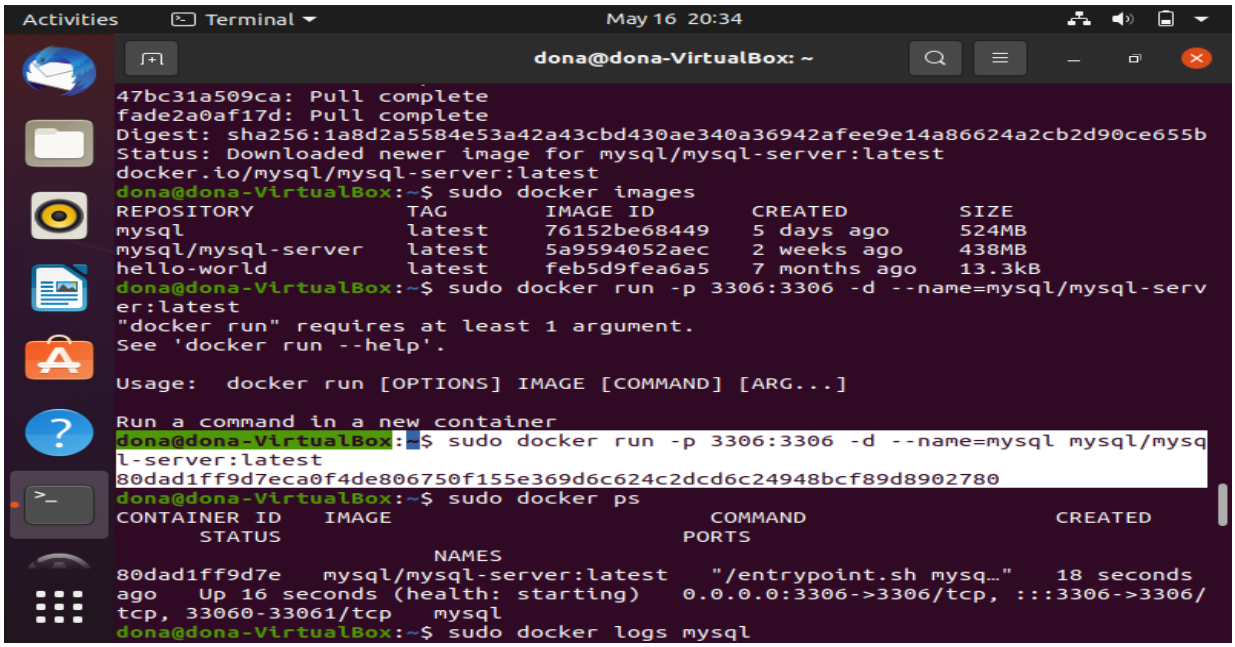
Deployment of MYSQL

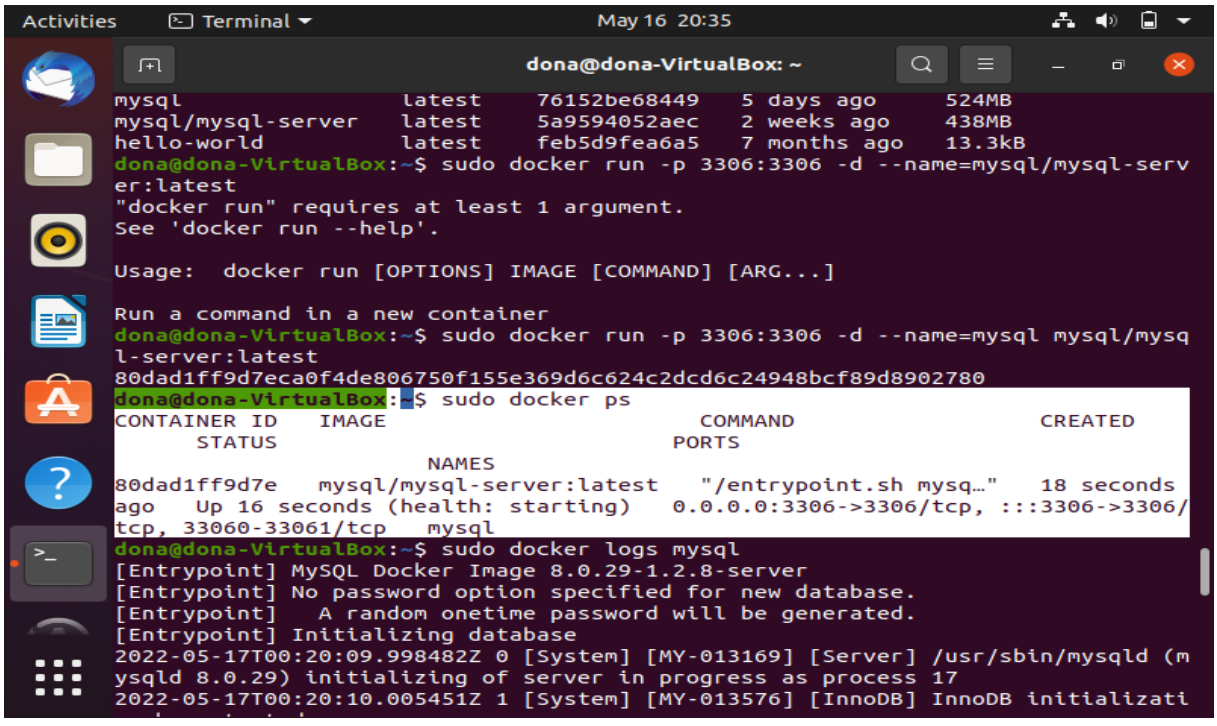
- **pulling mysql and showing the mysql image**

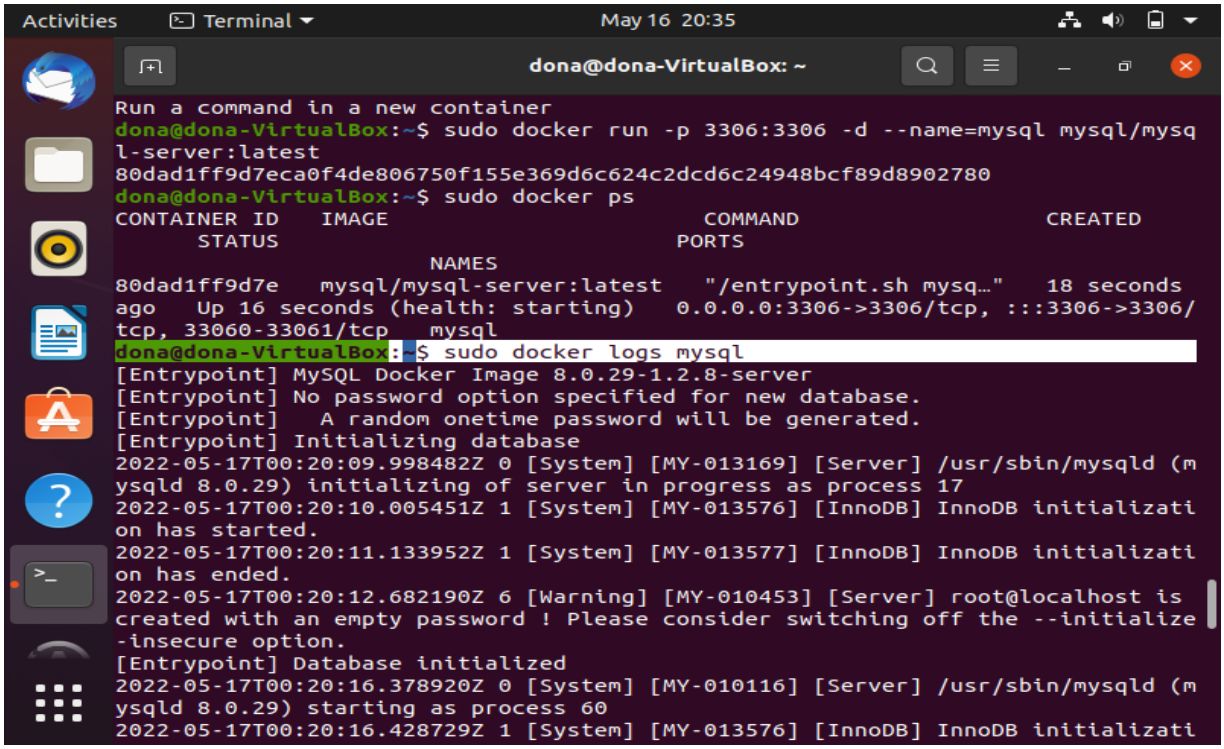




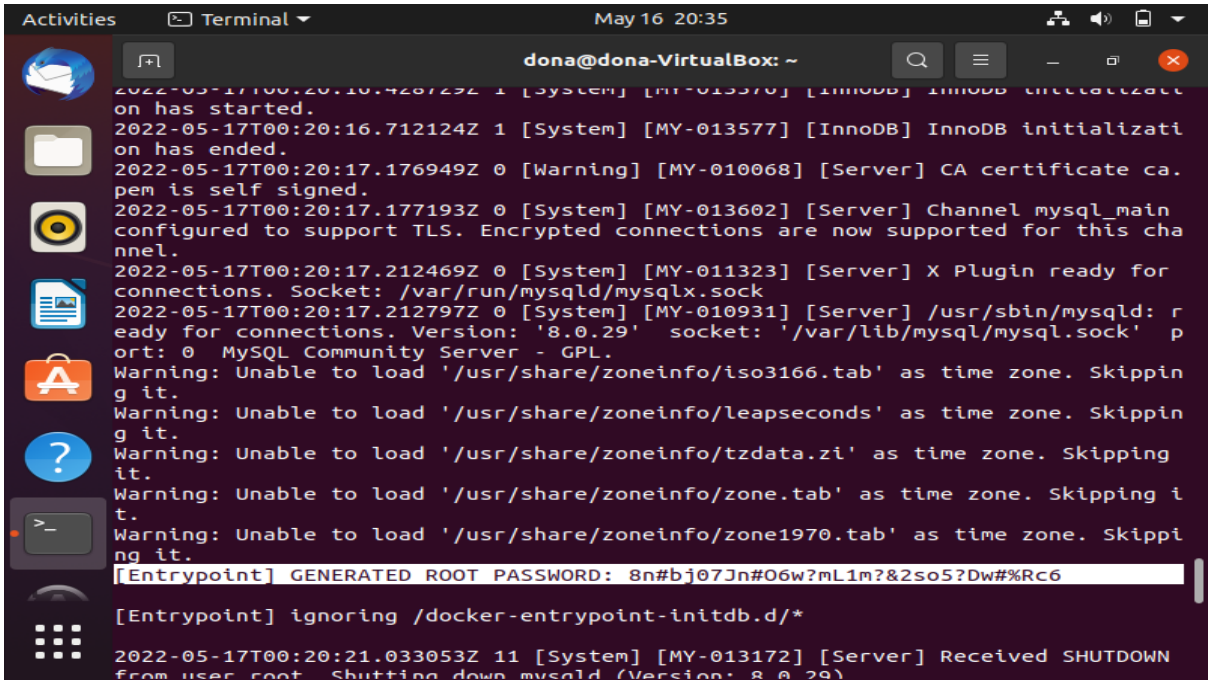
- **running the mysql and linking the port address: sudo docker -p 3306:3306 -d –name=mysql mysql/mysql-server:latest**
- **checking whether it is in running state by :sudo docker ps**
- **then type sudo docker logs mysql**



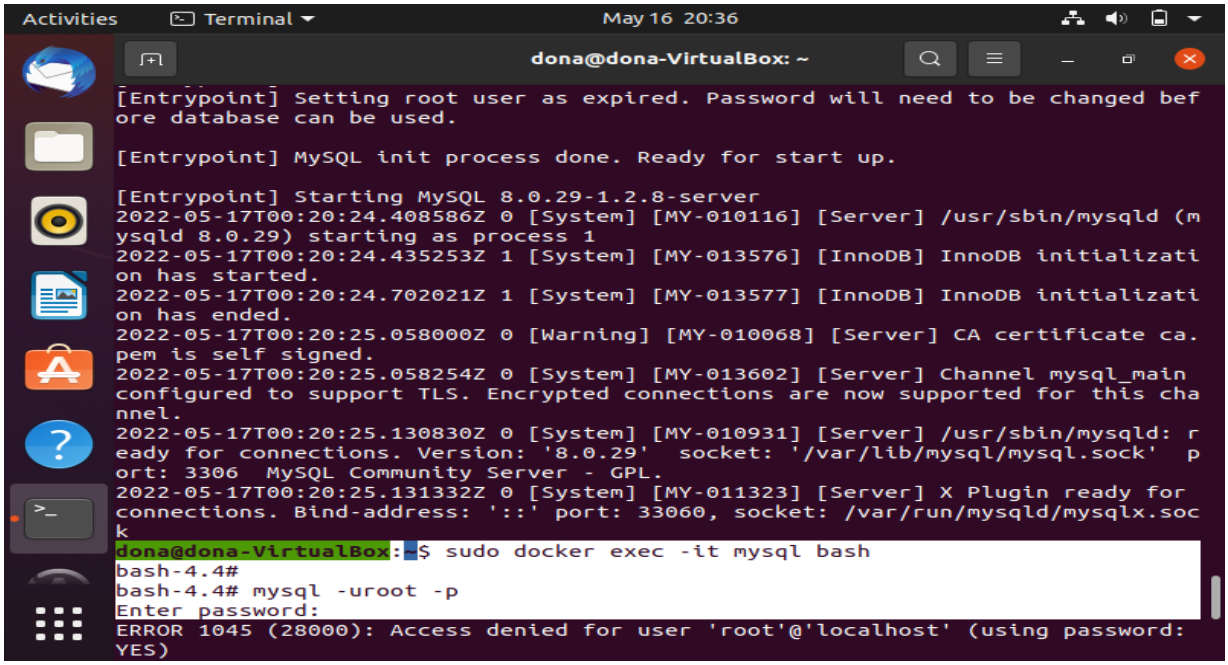




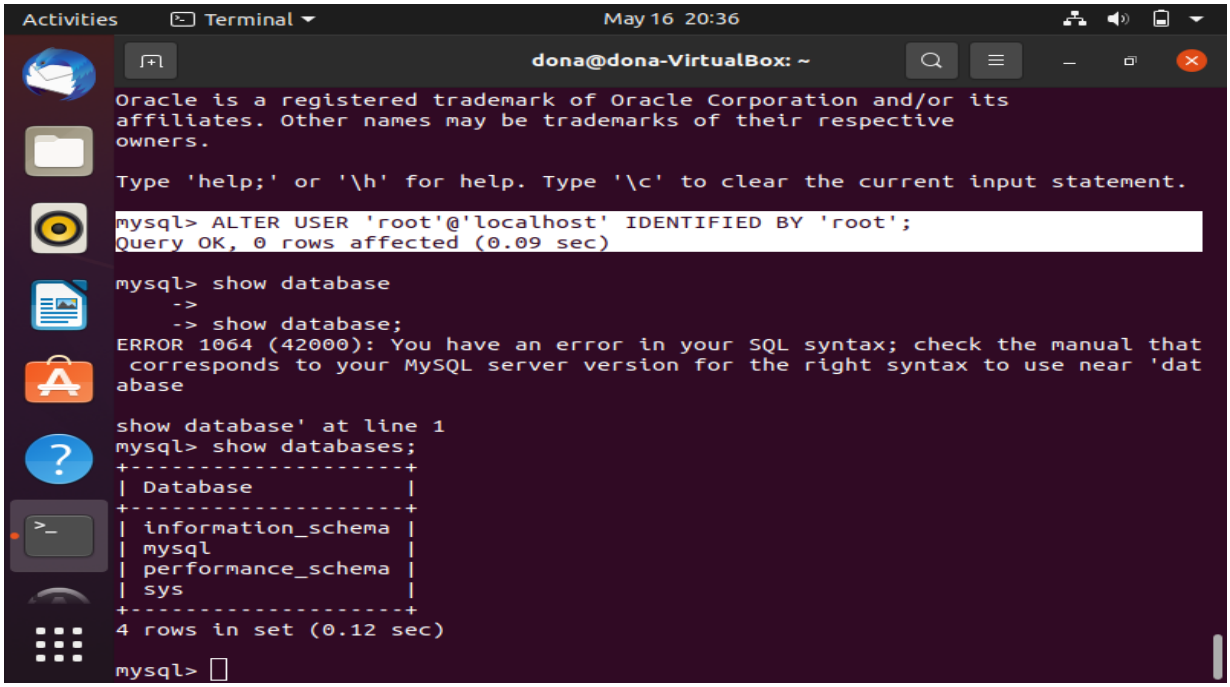
- **a password will be generated by that command copy that command and paste it some writer or editor**

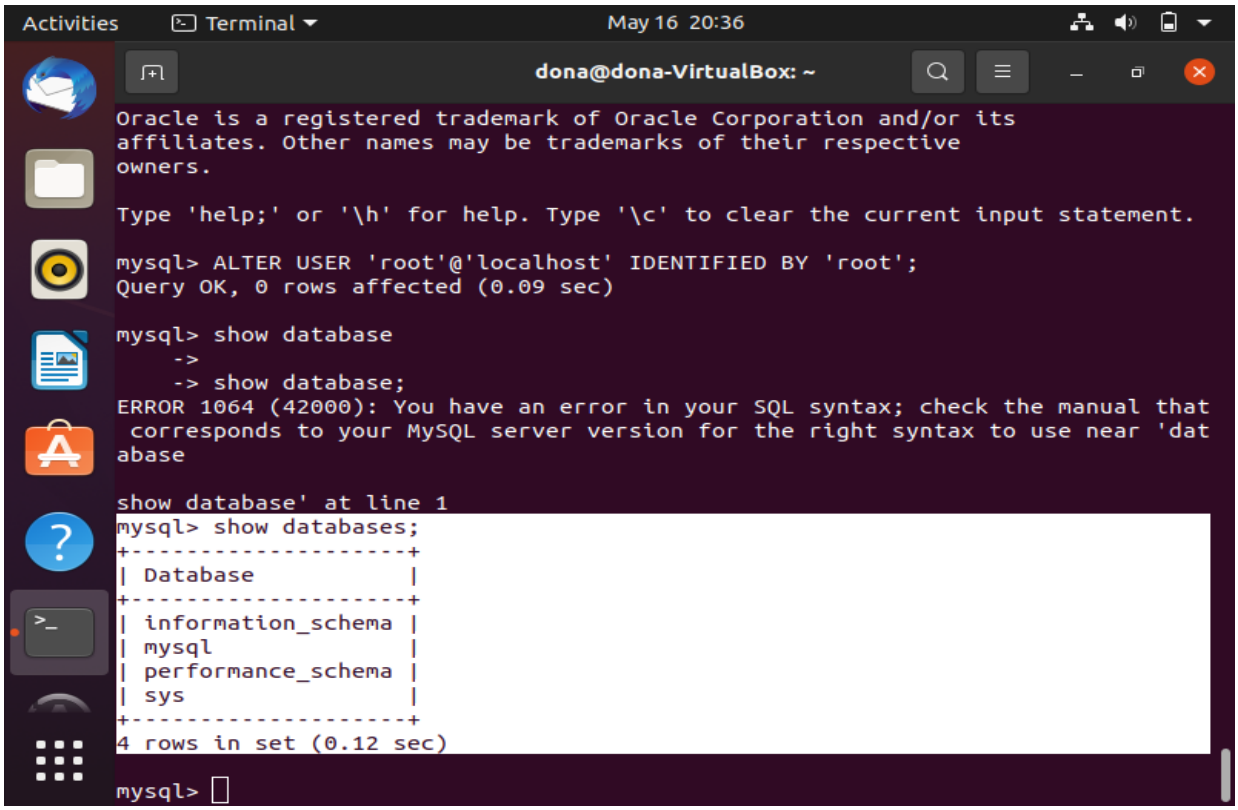


- **then execute the mysql by : sudo docker exec -it mysql bash**
- **Then :mysql -uroot -p**



- **Then password will ask.Enter the password we have safed**
- **Then we can change the password by ALTER USER 'root'@'localhost' IDENTIFIED BY 'newpassword';**


Activities
Terminal
May 16 20:36
dona@dona-VirtualBox: ~
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql> ALTER USER 'root'@'localhost' IDENTIFIED BY 'root';
Query OK, 0 rows affected (0.09 sec)
mysql> show database
-> -> show database;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that
corresponds to your MySQL server version for the right syntax to use near 'dat
abase
show database' at line 1
mysql> show databases;
+--------------------+
| Database |
+--------------------+
| information_schema |
| mysql |
| performance_schema |
| sys |
+--------------------+
4 rows in set (0.12 sec)
mysql>

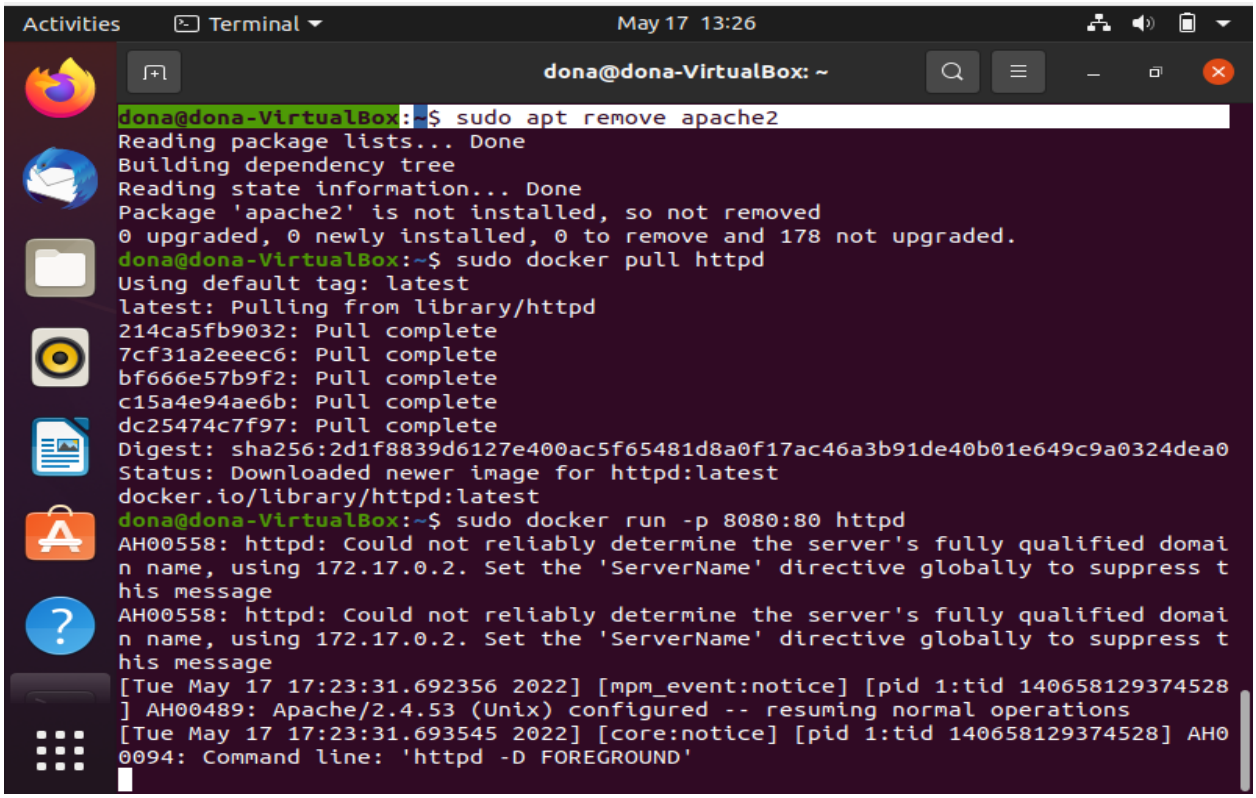

Activities
Terminal
May 16 20:36
dona@dona-VirtualBox: ~
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql> ALTER USER 'root'@'localhost' IDENTIFIED BY 'root';
Query OK, 0 rows affected (0.09 sec)
mysql> show database
-> -> show database;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that
corresponds to your MySQL server version for the right syntax to use near 'dat
abase
show database' at line 1
mysql> show databases;
+--------------------+
| Database |
+--------------------+
| information_schema |
| mysql |
| performance_schema |
| sys |
+--------------------+
4 rows in set (0.12 sec)
mysql>

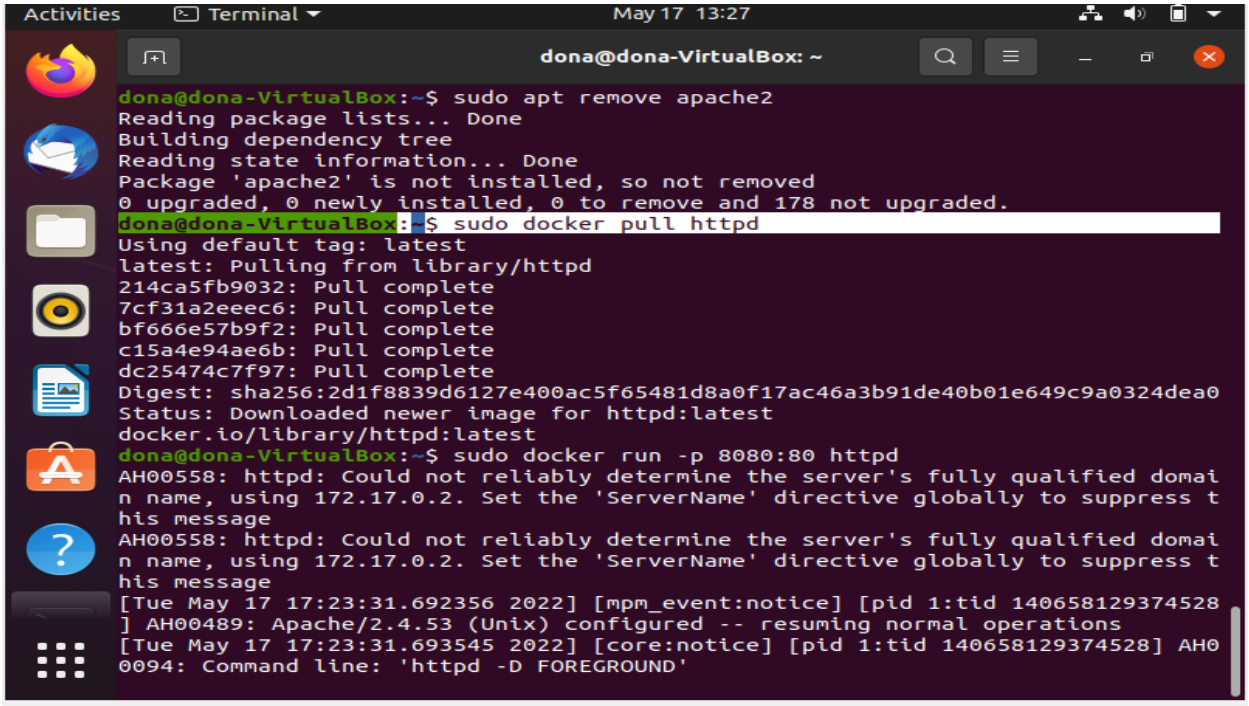
Deployment of Apache

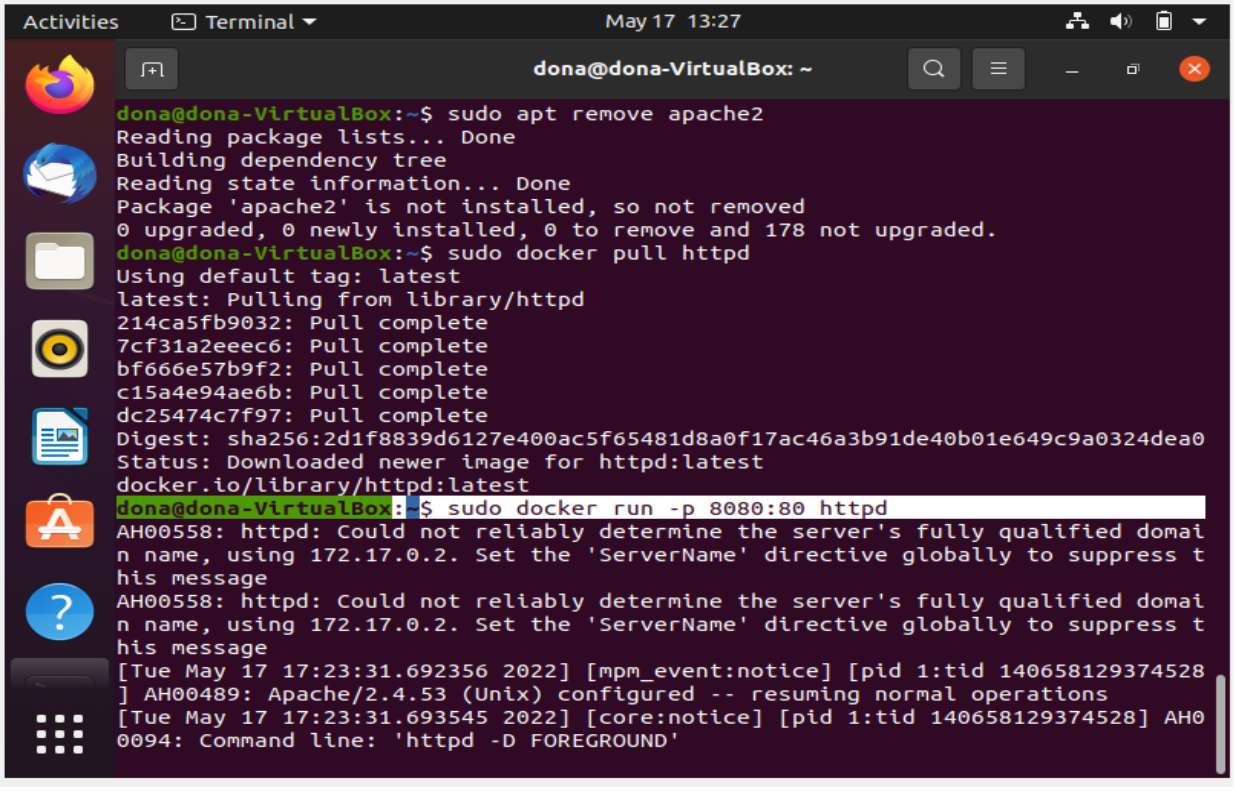
Step 1: To install the Apache package on Ubuntu

Step 2: The system prompts for confirmation do so, and allow the system to complete the installation.

Step 3: To verify Apache was installed correctly, Open a web browser and type in the address bar.




Activities
Terminal
May 17 13:27
dona@dona-VirtualBox: ~
dona@dona-VirtualBox:~$ sudo apt remove apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
Package 'apache2' is not installed, so not removed
0 upgraded, 0 newly installed, 0 to remove and 178 not upgraded.
dona@dona-VirtualBox:~$ sudo docker pull httpd
Using default tag: latest
latest: Pulling from library/httpd
214ca5fb9032: Pull complete
7cf31a2eeec6: Pull complete
bf666e57b9f2: Pull complete
c15a4e94ae6b: Pull complete
dc25474c7f97: Pull complete
Digest: sha256:2d1f8839d6127e400ac5f65481d8a0f17ac46a3b91de40b01e649c9a0324dea0
Status: Downloaded newer image for httpd:latest
docker.io/library/httpd:latest
dona@dona-VirtualBox:~$ sudo docker run -p 8080:80 httpd
AH00558: httpd: Could not reliably determine the server's fully qualified domai
n name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress t
his message
AH00558: httpd: Could not reliably determine the server's fully qualified domai
n name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress t
his message
[Tue May 17 17:23:31.692356 2022] [mpm_event:notice] [pid 1:tid 140658129374528
] AH00489: Apache/2.4.53 (Unix) configured -- resuming normal operations
[Tue May 17 17:23:31.693545 2022] [core:notice] [pid 1:tid 140658129374528] AH0
0094: Command line: 'httpd -D FOREGROUND'


Activities
Terminal
May 17 13:27
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Reading package lists... Done
Building dependency tree
Reading state information... Done
Package 'apache2' is not installed, so not removed
0 upgraded, 0 newly installed, 0 to remove and 178 not upgraded.
dona@dona-VirtualBox:~$ sudo docker pull httpd
Using default tag: latest
latest: Pulling from library/httpd
214ca5fb9032: Pull complete
7cf31a2eeec6: Pull complete
bf666e57b9f2: Pull complete
c15a4e94ae6b: Pull complete
dc25474c7f97: Pull complete
Digest: sha256:2d1f8839d6127e400ac5f65481d8a0f17ac46a3b91de40b01e649c9a0324dea0
Status: Downloaded newer image for httpd:latest
docker.io/library/httpd:latest
dona@dona-VirtualBox:~$ sudo docker run -p 8080:80 httpd
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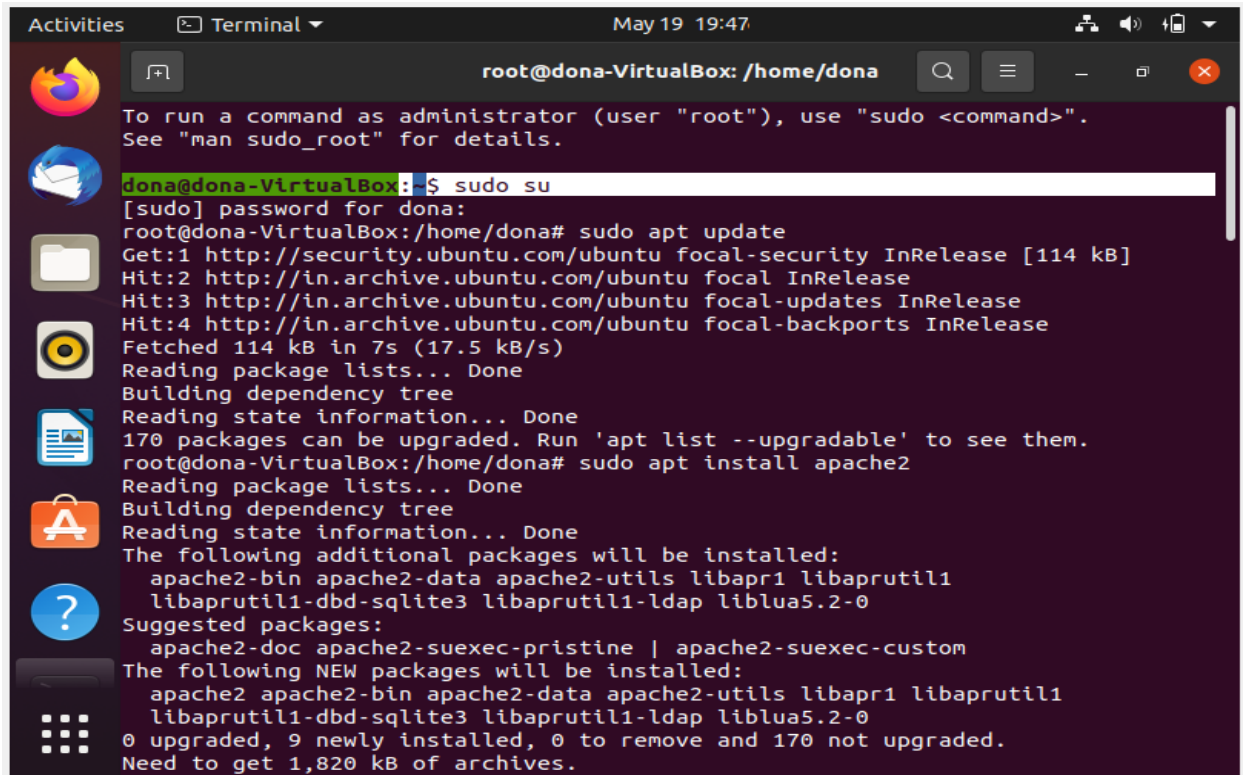
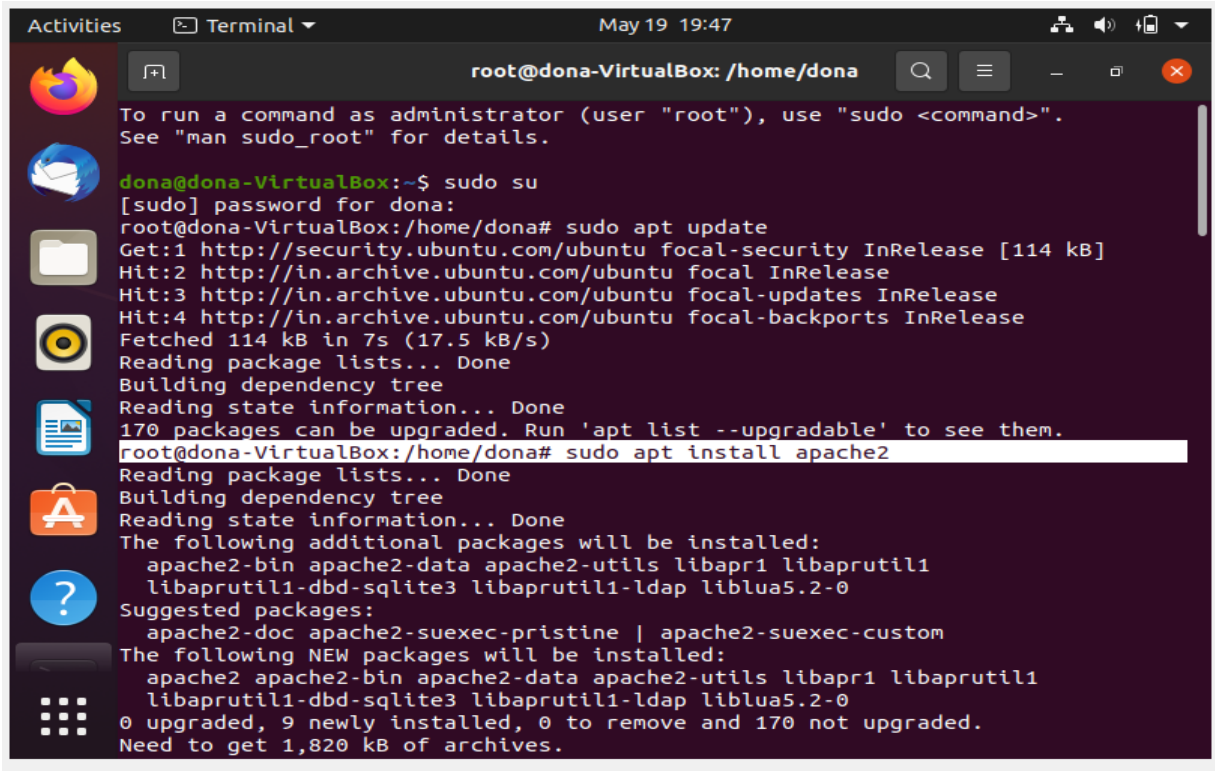
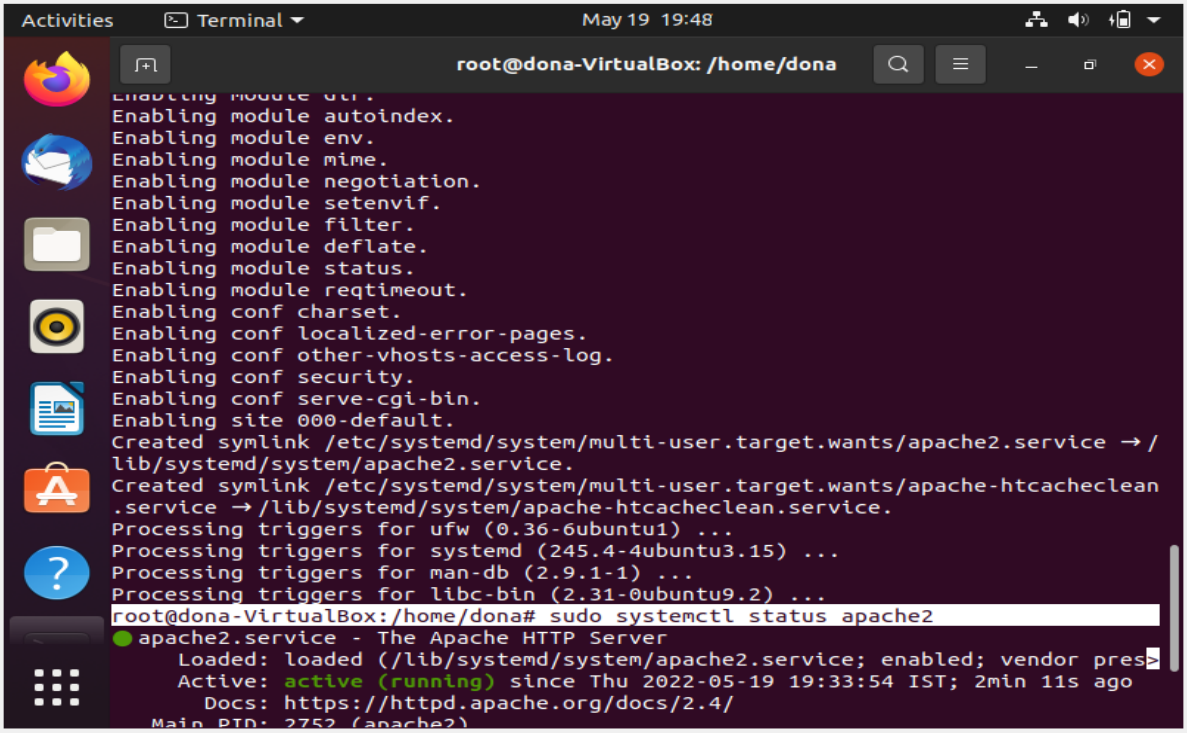
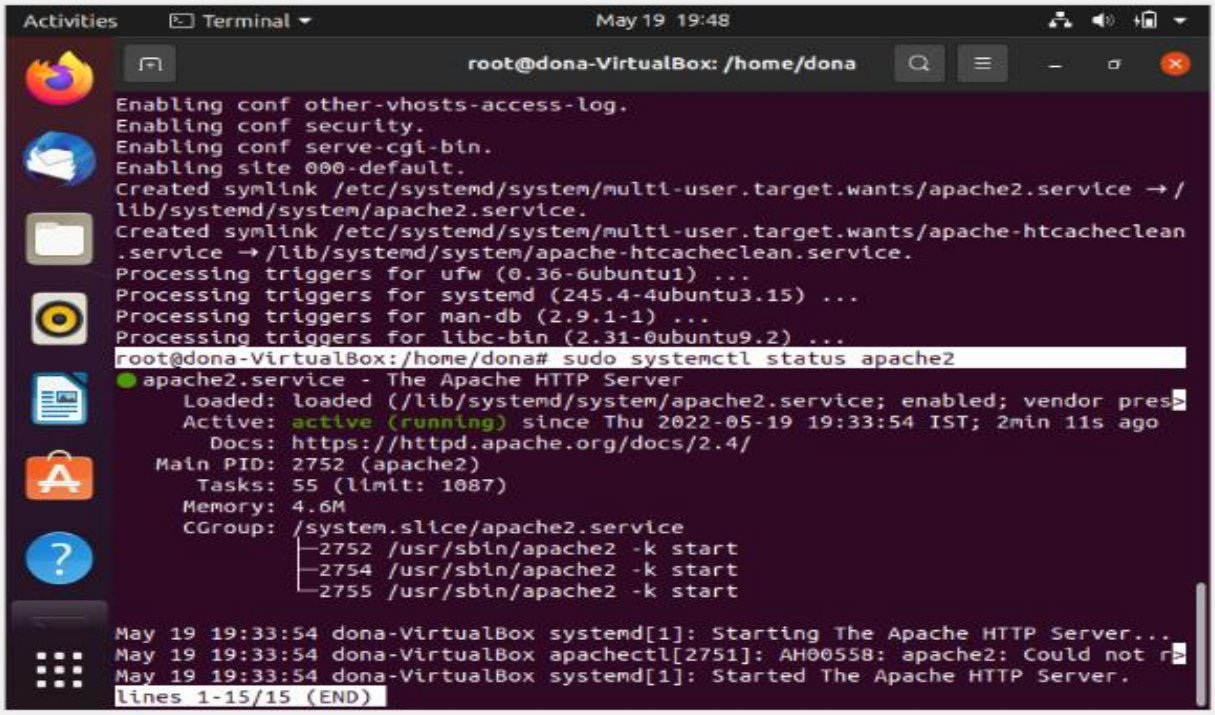
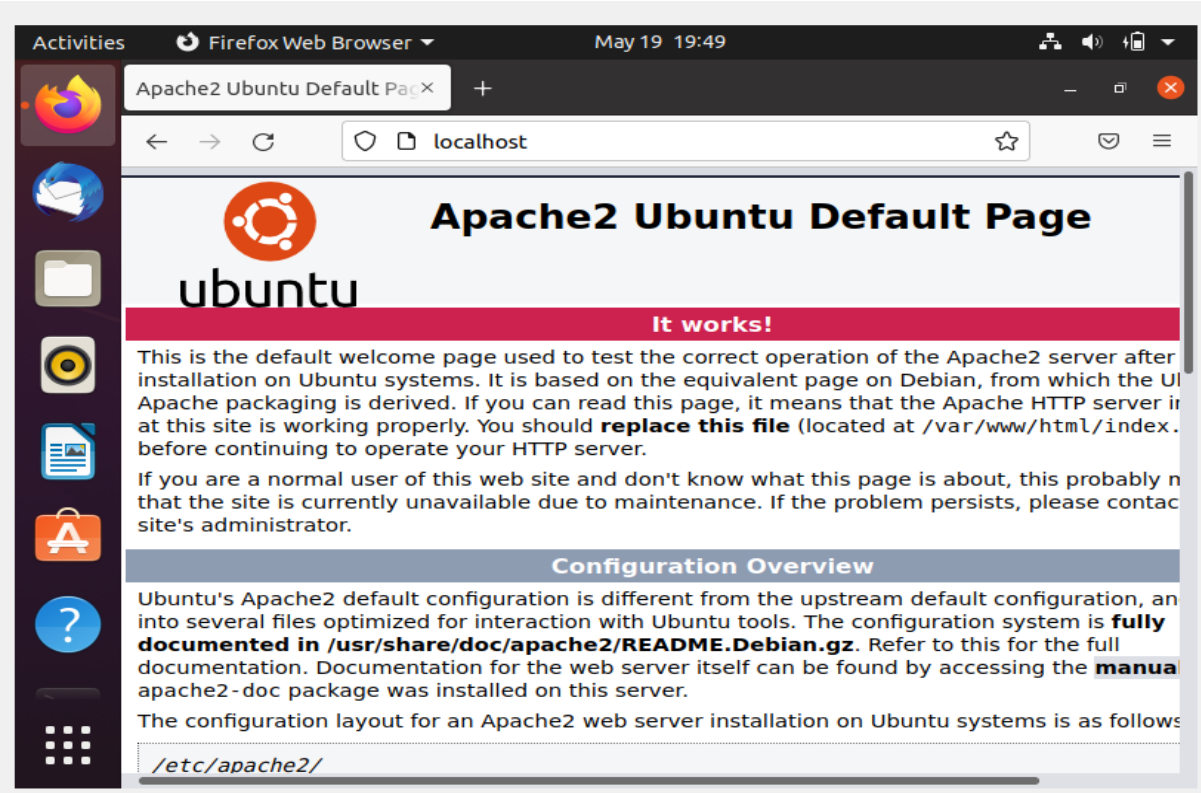
[Tue May 17 17:23:31.692356 2022] [mpm_event:notice] [pid 1:tid 140658129374528
] AH00489: Apache/2.4.53 (Unix) configured -- resuming normal operations
[Tue May 17 17:23:31.693545 2022] [core:notice] [pid 1:tid 140658129374528] AH0
0094: Command line: 'httpd -D FOREGROUND'


Activities
Terminal
May 19 19:47
root@dona-VirtualBox: /home/dona
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
dona@dona-VirtualBox:~$ sudo su
[sudo] password for dona:
root@dona-VirtualBox:/home/dona# sudo apt update
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:2 http://in.archive.ubuntu.com/ubuntu focal InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:4 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease
Fetched 114 kB in 7s (17.5 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
170 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@dona-VirtualBox:/home/dona# sudo apt install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
apache2-bin apache2-data apache2-utils libapr1 libaprutil1
libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
Suggested packages:
apache2-doc apache2-suexec-pristine | apache2-suexec-custom
The following NEW packages will be installed:
apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1
libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
0 upgraded, 9 newly installed, 0 to remove and 170 not upgraded.
Need to get 1,820 kB of archives.


Activities
Terminal
May 19 19:47
root@dona-VirtualBox: /home/dona
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
dona@dona-VirtualBox:~$ sudo su
[sudo] password for dona:
root@dona-VirtualBox:/home/dona# sudo apt update
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:2 http://in.archive.ubuntu.com/ubuntu focal InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:4 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease
Fetched 114 kB in 7s (17.5 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
170 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@dona-VirtualBox:/home/dona# sudo apt install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
apache2-bin apache2-data apache2-utils libapr1 libaprutil1
libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
Suggested packages:
apache2-doc apache2-suexec-pristine | apache2-suexec-custom
The following NEW packages will be installed:
apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1
libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
0 upgraded, 9 newly installed, 0 to remove and 170 not upgraded.
Need to get 1,820 kB of archives.


Activities
Terminal
May 19 19:48
root@dona-VirtualBox: /home/dona
Enabling module autoindex.
Enabling module env.
Enabling module mime.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36-6ubuntu1) ...
Processing triggers for systemd (245.4-4ubuntu3.15) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
root@dona-VirtualBox:/home/dona# sudo systemctl status apache2
apache2.service - The Apache HTTP Server
Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pres
Active: active (running) since Thu 2022-05-19 19:33:54 IST; 2min 11s ago
Docs: https://httpd.apache.org/docs/2.4/


Activities
Terminal
May 19 19:48
root@dona-VirtualBox: /home/dona
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36-6ubuntu1) ...
Processing triggers for systemd (245.4-4ubuntu3.15) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
root@dona-VirtualBox:/home/dona# sudo systemctl status apache2
apache2.service - The Apache HTTP Server
Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pres
Active: active (running) since Thu 2022-05-19 19:33:54 IST; 2min 11s ago
Docs: https://httpd.apache.org/docs/2.4/
Main PID: 2752 (apache2)
Tasks: 55 (limit: 1087)
Memory: 4.6M
CGroup: /system.slice/apache2.service
├─2752 /usr/sbin/apache2 -k start
├─2754 /usr/sbin/apache2 -k start
└─2755 /usr/sbin/apache2 -k start
May 19 19:33:54 dona-VirtualBox systemd[1]: Starting The Apache HTTP Server...
May 19 19:33:54 dona-VirtualBox apachectl[2751]: AH00558: apache2: Could not r
May 19 19:33:54 dona-VirtualBox systemd[1]: Started The Apache HTTP Server.
lines 1-15/15 (END)



HOSTING A SIMPLE WEBSITE

Requests made to public IP address on port 8098 be redirected to port 80 on the container

named dona. Also, instead of serving content from the container itself, we will serve a

simple web page from /home/dona/website1. Do this by mapping /home/dona/website1/ on

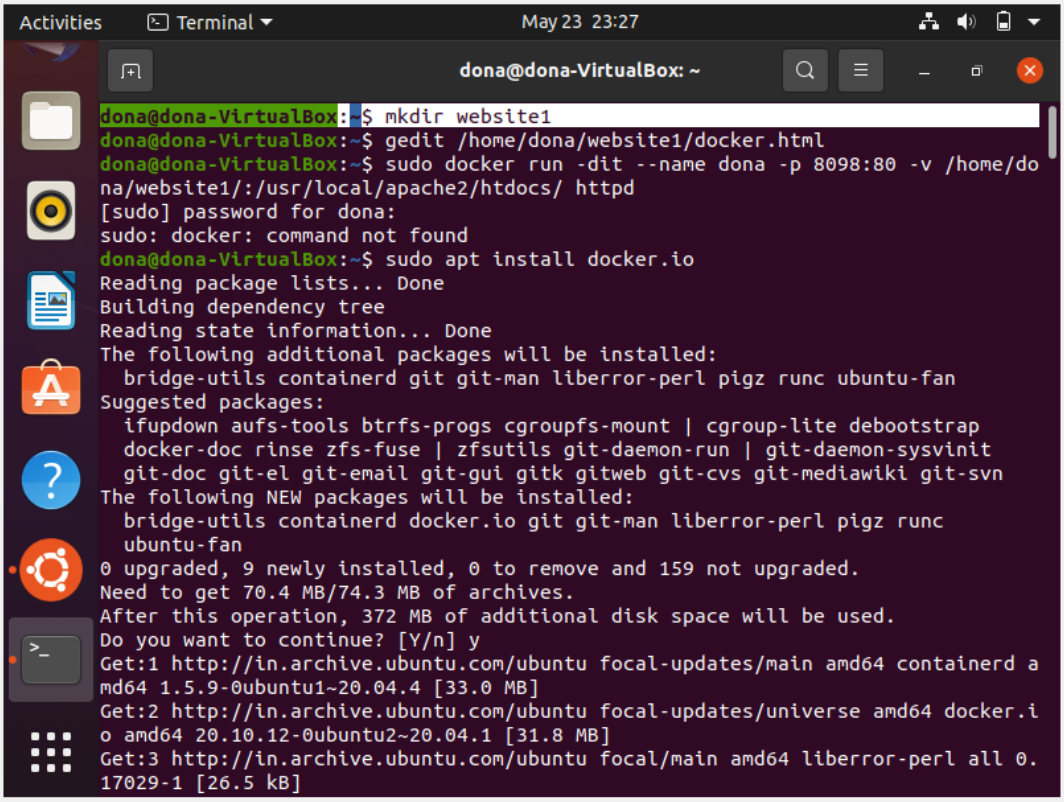
the /usr/local/apache2/htdocs/ on the container.

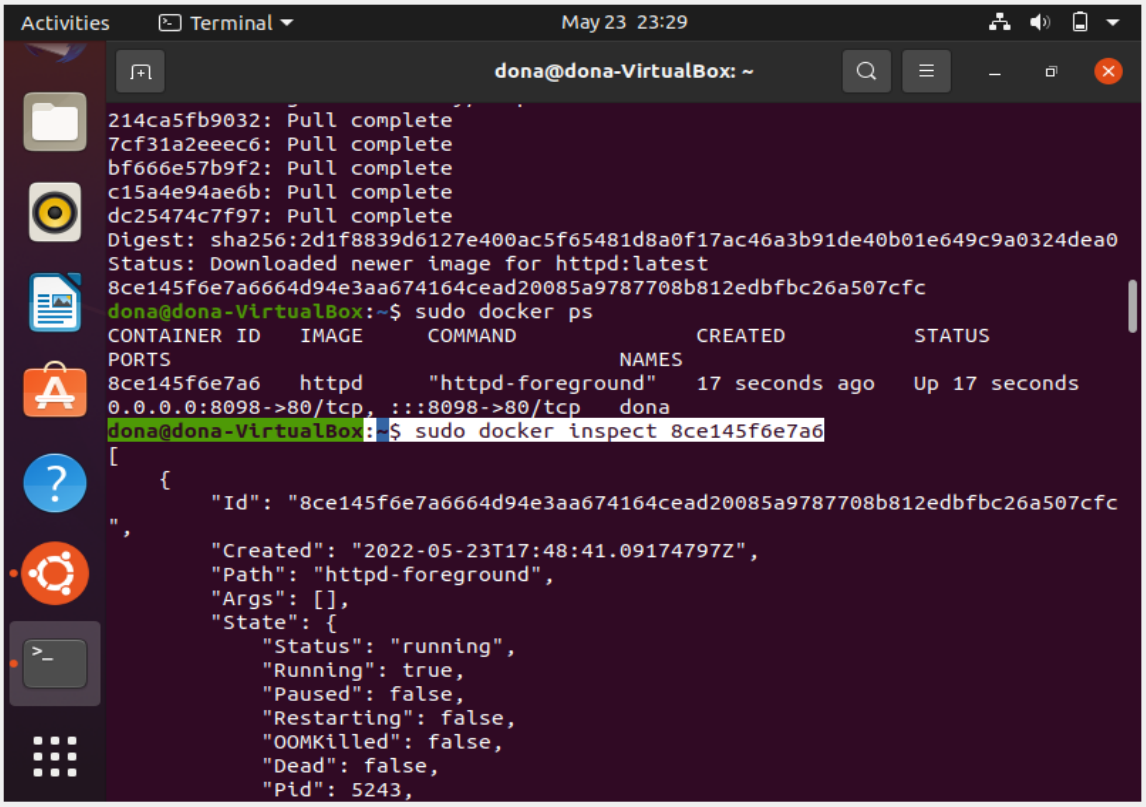
Directory website is created containing a simple web page named docker.html, and after saving

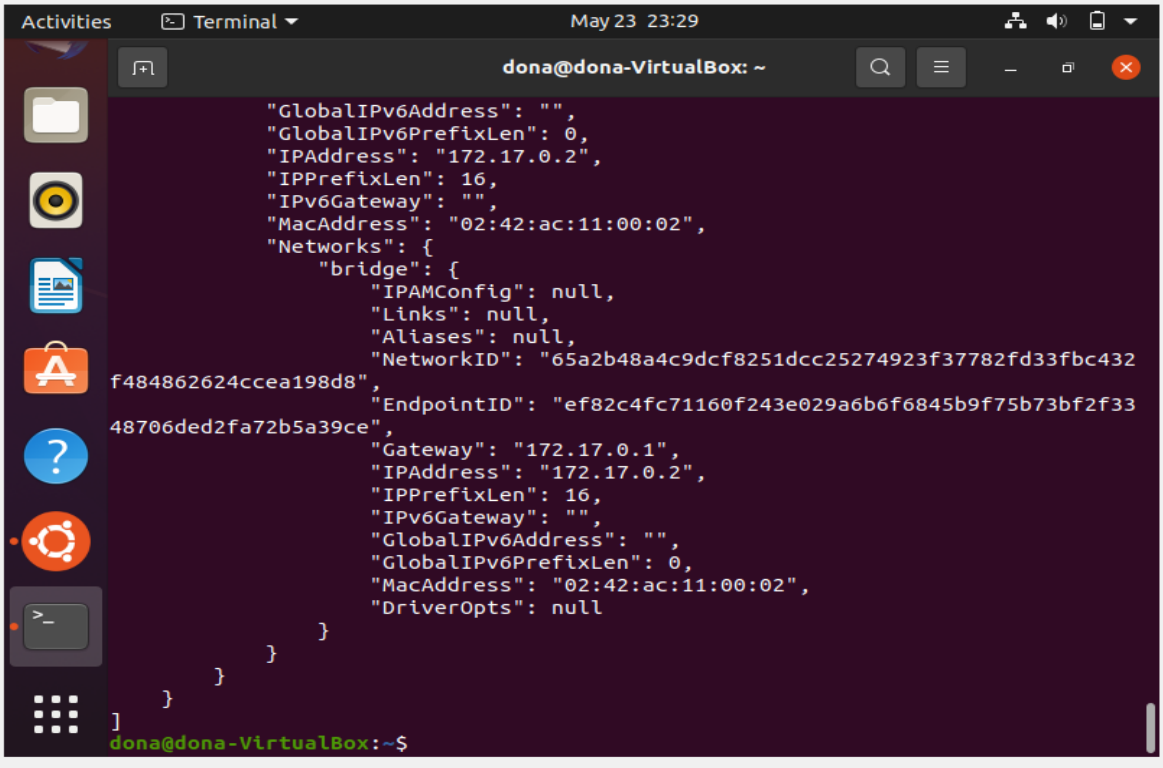
the html file, point your browser to Server-IP:8098/docker.html (where Server-IP is host's

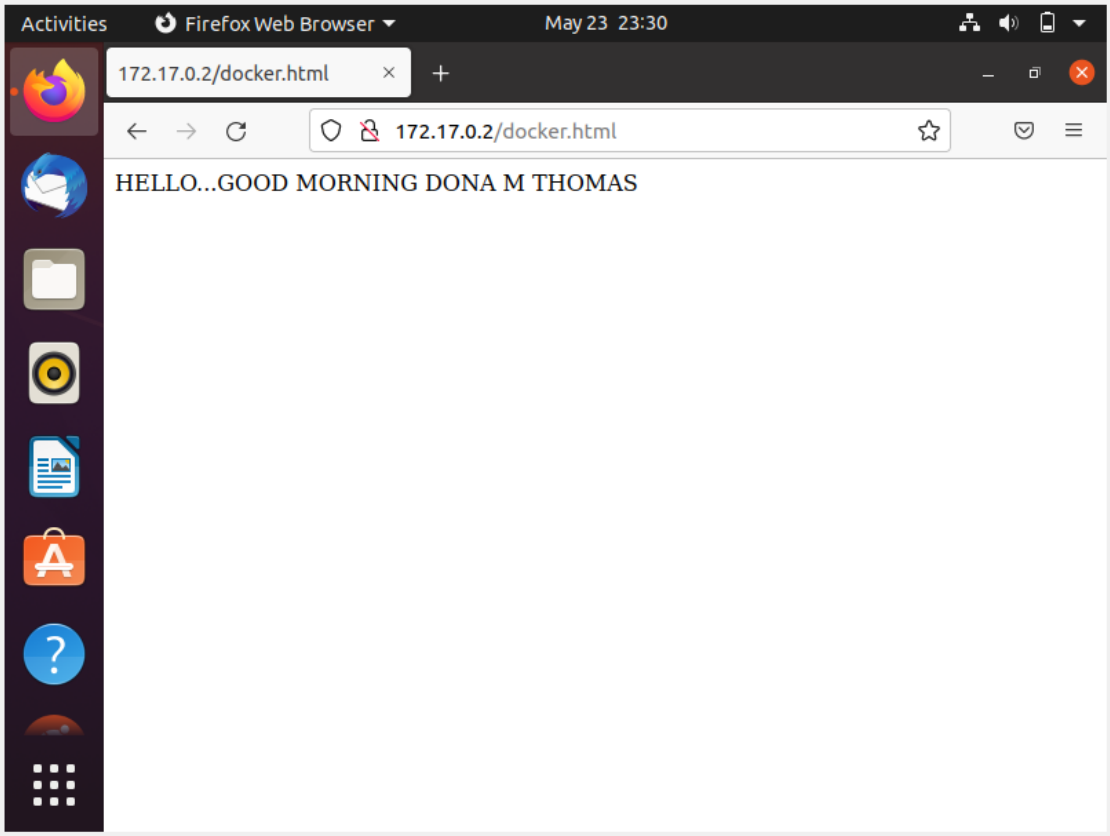
public IP address). Find the IP address by inspect command using the container id. We can also

simply paste the corresponding IP address on the browser.




Activities
Terminal
May 23 23:29
dona@dona-VirtualBox: ~
214ca5fb9032: Pull complete
7cf31a2eeec6: Pull complete
bf666e57b9f2: Pull complete
c15a4e94ae6b: Pull complete
dc25474c7f97: Pull complete
Digest: sha256:2d1f8839d6127e400ac5f65481d8a0f17ac46a3b91de40b01e649c9a0324dea0
Status: Downloaded newer image for httpd:latest
8ce145f6e7a6664d94e3aa674164cead20085a9787708b812edbfbc26a507cfc
dona@dona-VirtualBox:~$ sudo docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS
PORTS NAMES
8ce145f6e7a6 httpd "httpd-foreground" 17 seconds ago Up 17 seconds
0.0.0.0:8098->80/tcp, :::8098->80/tcp dona
dona@dona-VirtualBox:~$ sudo docker inspect 8ce145f6e7a6
[
{
"Id": "8ce145f6e7a6664d94e3aa674164cead20085a9787708b812edbfbc26a507cfc
",
"Created": "2022-05-23T17:48:41.09174797Z",
"Path": "httpd-foreground",
"Args": [],
"State": {
"Status": "running",
"Running": true,
"Paused": false,
"Restarting": false,
"OOMKilled": false,
"Dead": false,
"Pid": 5243,


Activities
Terminal
May 23 23:29
dona@dona-VirtualBox: ~
"GlobalIPv6Address": "",
"GlobalIPv6PrefixLen": 0,
"IPAddress": "172.17.0.2",
"IPPrefixLen": 16,
"IPv6Gateway": "",
"MacAddress": "02:42:ac:11:00:02",
"Networks": {
"bridge": {
"IPAMConfig": null,
"Links": null,
"Aliases": null,
"NetworkID": "65a2b48a4c9dcf8251dcc25274923f37782fd33fbc432
f484862624ccea198d8",
"EndpointID": "ef82c4fc71160f243e029a6b6f6845b9f75b73bf2f33
48706ded2fa72b5a39ce",
"Gateway": "172.17.0.1",
"IPAddress": "172.17.0.2",
"IPPrefixLen": 16,
"IPv6Gateway": "",
"GlobalIPv6Address": "",
"GlobalIPv6PrefixLen": 0,
"MacAddress": "02:42:ac:11:00:02",
"DriverOpts": null
}
}
}
}
]
dona@dona-VirtualBox:~$


Activities
Firefox Web Browser
May 23 23:30
172.17.0.2/docker.html
172.17.0.2/docker.html
HELLO...GOOD MORNING DONA M THOMAS