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COURSE	**Operating System Lab**
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System Administration :-> Lab Task #3

First of all I install docker and then start the service of docker and then I download Ubuntu template. Here is the screen shot and then I make a container name by mysql-container

Then I install vim on this mysql-container

```
                                    root@3981158dd263: /
File  Edit  View  Search  Terminal  Help
Get:7 http://archive.ubuntu.com/ubuntu focal-backports InRelease [89.2 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.3 MB]
Get:9 http://archive.ubuntu.com/ubuntu focal/restricted amd64 Packages [33.4 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal/main amd64 Packages [1275 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [177 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [3190 B]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [14.1 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [42.7 kB]
Fetched 13.5 MB in 1min 5s (207 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
All packages are up to date.
root@3981158dd263:/# apt install vim -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  alsa-topology-conf alsa-ucm-conf file libasound2 libasound2-data libcanberra0 libexpat1 libgpm2 libltdl7 libmagic-mgc libmagic1 libmpdec2
  libogg0 libpython3.8 libpython3.8-minimal libpython3.8-stdlib libreadline8 libsqlite3-0 libssl1.1 libtdb1 libvorbis0a libvorbisfile3
  mime-support readline-common sound-theme-freedesktop vim-common vim-runtime xxd xz-utils
Suggested packages:
  libasound2-plugins alsa-utils libcanberra-gtk0 libcanberra-pulse gpm readline-doc ctags vim-doc vim-scripts
The following NEW packages will be installed:
  alsa-topology-conf alsa-ucm-conf file libasound2 libasound2-data libcanberra0 libexpat1 libgpm2 libltdl7 libmagic-mgc libmagic1 libmpdec2
  libogg0 libpython3.8 libpython3.8-minimal libpython3.8-stdlib libreadline8 libsqlite3-0 libssl1.1 libtdb1 libvorbis0a libvorbisfile3
  mime-support readline-common sound-theme-freedesktop vim vim-common vim-runtime xxd xz-utils
0 upgraded, 30 newly installed, 0 to remove and 0 not upgraded.
Need to get 14.9 MB of archives.
After this operation, 70.3 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 libmagic-mgc amd64 1:5.38-4 [218 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal/main amd64 libmagic1 amd64 1:5.38-4 [75.9 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal/main amd64 file amd64 1:5.38-4 [23.3 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal/main amd64 libexpat1 amd64 2.2.9-1build1 [73.3 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 libmpdec2 amd64 2.4.2-3 [81.1 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/main amd64 libssl1.1 amd64 1.1.1f-1ubuntu2 [1318 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libpython3.8-minimal amd64 3.8.2-1ubuntu1.1 [705 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/main amd64 mime-support all 3.64ubuntu1 [30.6 kB]
```

Then I see how many containers are running now

```
┌tashfeen222@hp ~
└$ sudo docker ps -a
[sudo] password for tashfeen222:
CONTAINER ID      IMAGE           COMMAND         CREATED       STATUS                    PORTS         NAMES
3981158dd263      ubuntu          "/bin/bash"     4 hours ago   Exited (129) 42 seconds ago             mysql-contai
ner
┌tashfeen222@hp ~
└$
```

Then I start mysql service

```
root@3981158dd263:/# service mysql start
 * Starting MySQL database server mysqld
su: warning: cannot change directory to /nonexistent: No such file or directory
                                                                                    [ OK ]
root@3981158dd263:/#
```

Then I run mysql


```
root@3981158dd263: /
File Edit View Search Terminal Help
root@3981158dd263:/# service mysql start
 * Starting MySQL database server mysqld
                                                      su: war
ning: cannot change directory to /nonexistent: No such file or directo
ry
                                                      [ OK ]
root@3981158dd263:/# mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.19-0ubuntu5 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input st
atement.

mysql>
```

In the Previous Screenshot when I run mysql then its directly
open but I don't want this directly.So now i select some
password and flush privileges because of safety reason


```
mysql> ALTER USER 'root'@'localhost' IDENTIFIED with
    -> mysql_native_password BY 'cadet6035!';
Query OK, 0 rows affected (0.35 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.07 sec)

mysql> \q
Bye
```

Now I run mysql –uroot –p and then it gave from me password according to run mysql and then I provide password

```
mysql> ALTER USER 'root'@'localhost' IDENTIFIED with
    -> mysql_native_password BY 'cadet6035!';
Query OK, 0 rows affected (0.35 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.07 sec)

mysql> \q
Bye
root@3981158dd263:/# mysql
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: NO)
root@3981158dd263:/# mysql -uroot -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 12
Server version: 8.0.19-0ubuntu5 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

Now I exit from mysql-container and now again going to this container

```
┌─tashfeen222@hp ~
└─$ sudo docker exec -it mysql-container bash
[sudo] password for tashfeen222:
root@3981158dd263:/# mysql -uroot -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 13
Server version: 8.0.19-0ubuntu5 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input st
atement.

mysql> \q
Bye
root@3981158dd263:/# exit
```

And then I make another container named by apache-container


```
┌tashfeen222@hp ~
└─$ sudo docker run --name apache-container -it ubuntu
root@37e385540a7c:/#
```

```
                                    watch 'sudo docker ps -a'                                    ─□✕

File  Edit  View  Search  Terminal  Help
Every 2.0s: sudo docker ps -a                                          hp: Fri May  1 23:34:30 2020

CONTAINER ID    IMAGE          COMMAND          CREATED           STATUS             PORTS        NAMES
37e385540a7c    ubuntu         "/bin/bash"      About a minute ago Up About a minute               apache-container
3981158dd263    ubuntu         "/bin/bash"      6 hours ago       Up About an hour                 mysql-container
```

Then I install apche2 on this container


```
                                    root@37e385540a7c: /                                           ─□✕

File  Edit  View  Search  Terminal  Help
root@37e385540a7c:/# 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 ca-certificates file krb5-locales libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap
  libasn1-8-heimdal libbrotli1 libcurl4 libexpat1 libgdbm-compat4 libgdbm6 libgssapi-krb5-2 libgssapi3-heimdal libhcrypto4-heimdal
  libheimbase1-heimdal libheimntlm0-heimdal libhx509-5-heimdal libicu66 libjansson4 libk5crypto3 libkeyutils1 libkrb5-26-heimdal libkrb5-3
  libkrb5support0 libldap-2.4-2 libldap-common liblua5.2-0 libmagic-mgc libmagic1 libnghttp2-14 libperl5.30 libpsl5 libroken18-heimdal
  librtmp1 libsasl2-2 libsasl2-modules libsasl2-modules-db libsqlite3-0 libssh-4 libssl1.1 libwind0-heimdal libxml2 mime-support netbase
  openssl perl perl-modules-5.30 publicsuffix ssl-cert tzdata xz-utils
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser ufw gdbm-l10n krb5-doc krb5-user libsasl2-modules-gssapi-mit
  | libsasl2-modules-gssapi-heimdal libsasl2-modules-ldap libsasl2-modules-otp libsasl2-modules-sql perl-doc libterm-readline-gnu-perl
  | libterm-readline-perl-perl make libb-debug-perl liblocale-codes-perl openssl-blacklist
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils ca-certificates file krb5-locales libapr1 libaprutil1 libaprutil1-dbd-sqlite3
  libaprutil1-ldap libasn1-8-heimdal libbrotli1 libcurl4 libexpat1 libgdbm-compat4 libgdbm6 libgssapi-krb5-2 libgssapi3-heimdal
  libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal libhx509-5-heimdal libicu66 libjansson4 libk5crypto3 libkeyutils1
  libkrb5-26-heimdal libkrb5-3 libkrb5support0 libldap-2.4-2 libldap-common liblua5.2-0 libmagic-mgc libmagic1 libnghttp2-14 libperl5.30
  libpsl5 libroken18-heimdal librtmp1 libsasl2-2 libsasl2-modules libsasl2-modules-db libsqlite3-0 libssh-4 libssl1.1 libwind0-heimdal
  libxml2 mime-support netbase openssl perl perl-modules-5.30 publicsuffix ssl-cert tzdata xz-utils
0 upgraded, 57 newly installed, 0 to remove and 0 not upgraded.
Need to get 24.1 MB of archives.
After this operation, 117 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 perl-modules-5.30 all 5.30.0-9build1 [2737 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal/main amd64 libgdbm6 amd64 1.18.1-5 [27.4 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal/main amd64 libgdbm-compat4 amd64 1.18.1-5 [6244 B]
Get:4 http://archive.ubuntu.com/ubuntu focal/main amd64 libperl5.30 amd64 5.30.0-9build1 [3943 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 perl amd64 5.30.0-9build1 [224 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/main amd64 libapr1 amd64 1.6.5-1ubuntu1 [91.4 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal/main amd64 libexpat1 amd64 2.2.9-1build1 [73.3 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/main amd64 libssl1.1 amd64 1.1.1f-1ubuntu2 [1318 kB]
Get:9 http://archive.ubuntu.com/ubuntu focal/main amd64 libaprutil1 amd64 1.6.1-4ubuntu2 [84.7 kB]
Get:9 http://archive.ubuntu.com/ubuntu focal/main amd64 libaprutil1 amd64 1.6.1-4ubuntu2 [84.7 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal/main amd64 libsqlite3-0 amd64 3.31.1-4 [548 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-4ubuntu2 [10.5 kB]
```

Now I start the service of apache2

```
                                    root@37e385540a7c: /
File  Edit  View  Search  Terminal  Help
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.
invoke-rc.d: could not determine current runlevel
invoke-rc.d: policy-rc.d denied execution of start.
Processing triggers for libc-bin (2.31-0ubuntu9) ...
Processing triggers for ca-certificates (20190110ubuntu1) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
root@37e385540a7c:/# service apache2 start
 * Starting Apache httpd web server apache2                  AH00558: apache2: Could not reliably determine the server's ful
ly qualified domain name, using 172.17.0.3. Set the 'ServerName' directive globally to suppress this message
 *
root@37e385540a7c:/# clear
```

Then I Install vim on this apache container

```
                                    root@37e385540a7c: /
File  Edit  View  Search  Terminal  Help
root@37e385540a7c:/# apt install vim
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  alsa-topology-conf alsa-ucm-conf libasound2 libasound2-data libcanberra0 libgpm2 libltdl7 libmpdec2 libogg0 libpython3.8
  libpython3.8-minimal libpython3.8-stdlib libreadline8 libtdb1 libvorbis0a libvorbisfile3 readline-common sound-theme-freedesktop
  vim-common vim-runtime xxd
Suggested packages:
  libasound2-plugins alsa-utils libcanberra-gtk0 libcanberra-pulse gpm readline-doc ctags vim-doc vim-scripts
The following NEW packages will be installed:
  alsa-topology-conf alsa-ucm-conf libasound2 libasound2-data libcanberra0 libgpm2 libltdl7 libmpdec2 libogg0 libpython3.8
  libpython3.8-minimal libpython3.8-stdlib libreadline8 libtdb1 libvorbis0a libvorbisfile3 readline-common sound-theme-freedesktop
  vim vim-common vim-runtime xxd
0 upgraded, 22 newly installed, 0 to remove and 0 not upgraded.
Need to get 12.5 MB of archives.
After this operation, 57.8 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 libmpdec2 amd64 2.4.2-3 [81.1 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libpython3.8-minimal amd64 3.8.2-1ubuntu1.1 [705 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal/main amd64 readline-common all 8.0-4 [53.5 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal/main amd64 libreadline8 amd64 8.0-4 [131 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libpython3.8-stdlib amd64 3.8.2-1ubuntu1.1 [1666 kB]
16% [5 libpython3.8-stdlib 942 kB/1666 kB 57%]                                            173 kB/s 1min 1s
```

Then I install php and some libraries because we need it in future

```
                                    root@37e385540a7c: /
File  Edit  View  Search  Terminal  Help
root@37e385540a7c:/# apt install php libapache2-mod-php php-cli php-mysql -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
libapache2-mod-php is already the newest version (2:7.4+75).
php is already the newest version (2:7.4+75).
php-cli is already the newest version (2:7.4+75).
php-mysql is already the newest version (2:7.4+75).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@37e385540a7c:/#
```

Now using ifconfig I found address but this command doesn't work. So for this I need two install two tools

Then again I use ifconfig command and there are two interfaces show

Then I see processes

```
root@37e385540a7c:/# ps aux
USER        PID %CPU %MEM    VSZ   RSS TTY       STAT START   TIME COMMAND
root          1  0.0  0.0   4112  3396 pts/0     Ss+  04:36   0:00 /bin/bash
root          9  0.0  0.0   4240  3600 pts/1     Ss   04:38   0:00 bash
root       3344  0.0  0.1   6524  4336 ?         Ss   04:47   0:00 /usr/sbin/apache2 -k start
www-data   3347  0.0  0.0 1997604 3848 ?         Sl   04:47   0:00 /usr/sbin/apache2 -k start
www-data   3348  0.0  0.0 1997604 3848 ?         Sl   04:47   0:00 /usr/sbin/apache2 -k start
root      11224  0.0  0.0   5884  2872 pts/1     R+   05:04   0:00 ps aux
root@37e385540a7c:/# 
```

Now using netstat I see network statistics and then see how many connect and this is for all that have port 80

```
root@37e385540a7c:/# ps aux
USER        PID %CPU %MEM    VSZ   RSS TTY       STAT START   TIME COMMAND
root          1  0.0  0.0   4112  3396 pts/0     Ss+  04:36   0:00 /bin/bash
root          9  0.0  0.0   4240  3600 pts/1     Ss   04:38   0:00 bash
root       3344  0.0  0.1   6524  4336 ?         Ss   04:47   0:00 /usr/sbin/apache2 -k start
www-data   3347  0.0  0.0 1997604 3848 ?         Sl   04:47   0:00 /usr/sbin/apache2 -k start
www-data   3348  0.0  0.0 1997604 3848 ?         Sl   04:47   0:00 /usr/sbin/apache2 -k start
root      11224  0.0  0.0   5884  2872 pts/1     R+   05:04   0:00 ps aux
root@37e385540a7c:/# netstat -ntulp
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address         Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:80            0.0.0.0:*               LISTEN      3344/apache2
root@37e385540a7c:/# 
```

## Then I see the process again

```
                                    root@37e385540a7c: /
File  Edit  View  Search  Terminal  Help
root@37e385540a7c:/# ps aux
USER        PID %CPU %MEM    VSZ   RSS TTY       STAT START   TIME COMMAND
root          1  0.0  0.0   4112  3396 pts/0     Ss+  04:36   0:00 /bin/bash
root          9  0.0  0.0   4240  3600 pts/1     Ss   04:38   0:00 bash
root       3344  0.0  0.1   6524  4336 ?         Ss   04:47   0:00 /usr/sbin/apache2 -k start
www-data   3347  0.0  0.0 1997604 3848 ?         Sl   04:47   0:00 /usr/sbin/apache2 -k start
www-data   3348  0.0  0.0 1997604 3848 ?         Sl   04:47   0:00 /usr/sbin/apache2 -k start
root      11224  0.0  0.0   5884  2872 pts/1     R+   05:04   0:00 ps aux
root@37e385540a7c:/# netstat -ntulp
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address         Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:80            0.0.0.0:*               LISTEN      3344/apache2
root@37e385540a7c:/# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 172.17.0.3  netmask 255.255.0.0  broadcast 172.17.255.255
        ether 02:42:ac:11:00:03  txqueuelen 0  (Ethernet)
        RX packets 37271  bytes 57336328 (57.3 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 31488  bytes 2709145 (2.7 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

root@37e385540a7c:/# 
```
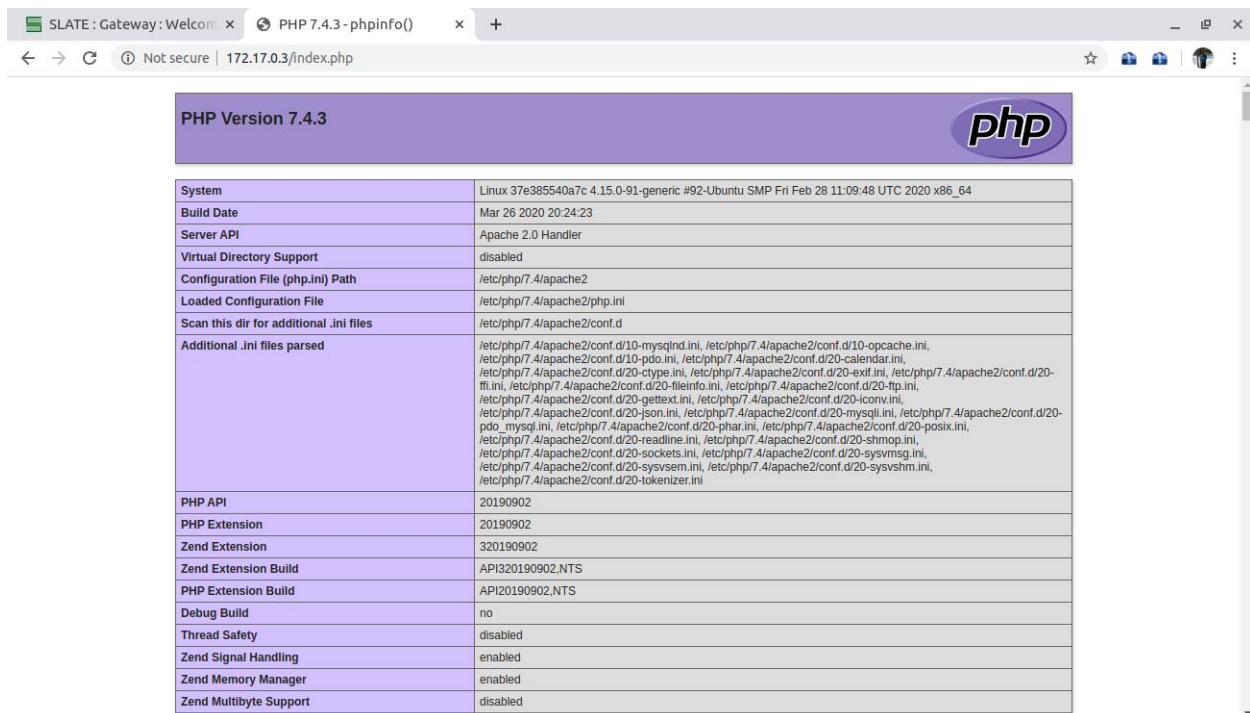
Then I use this address to see in my host machine
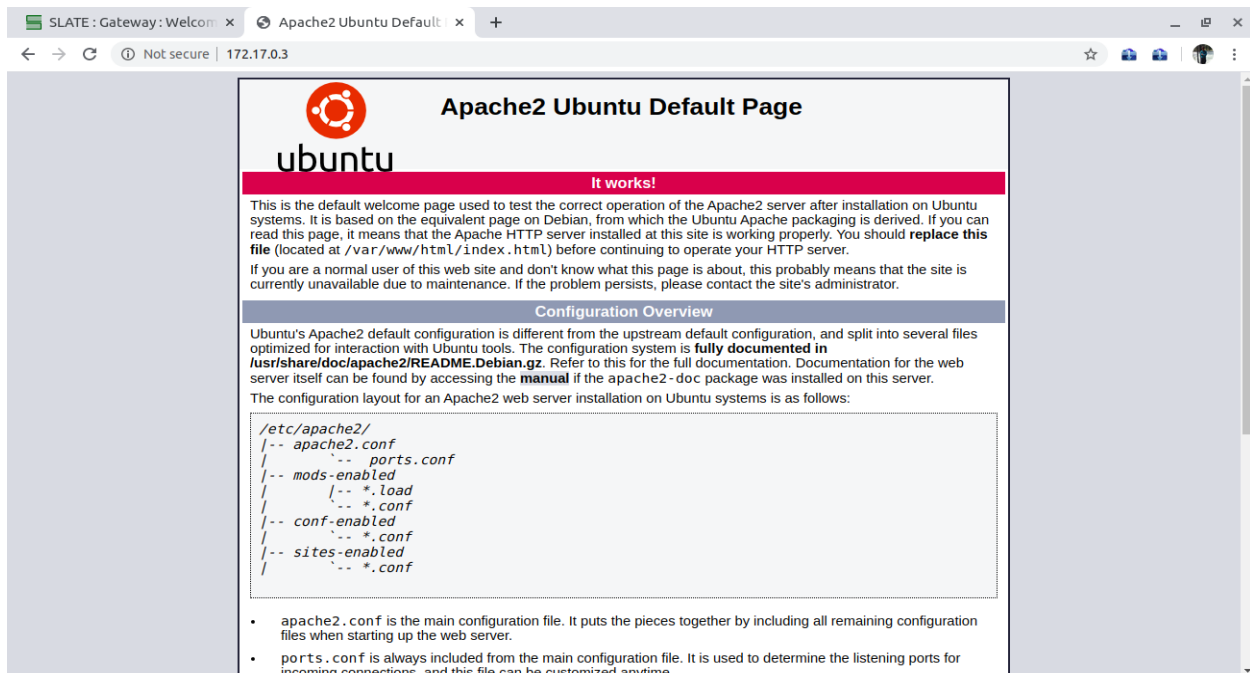
Then I make one index.php file and then see the result in host browser. Its means my containers work good and effectively

←----------------THE END---------------→