

### Assignment 3 :

1.Install a lightweight web server (e.g., Apache or Nginx) using your package manager.

Apache is a very popular and widely-used web server. To install Apache

#### Update the package list:

First, make sure your package list is up to date:

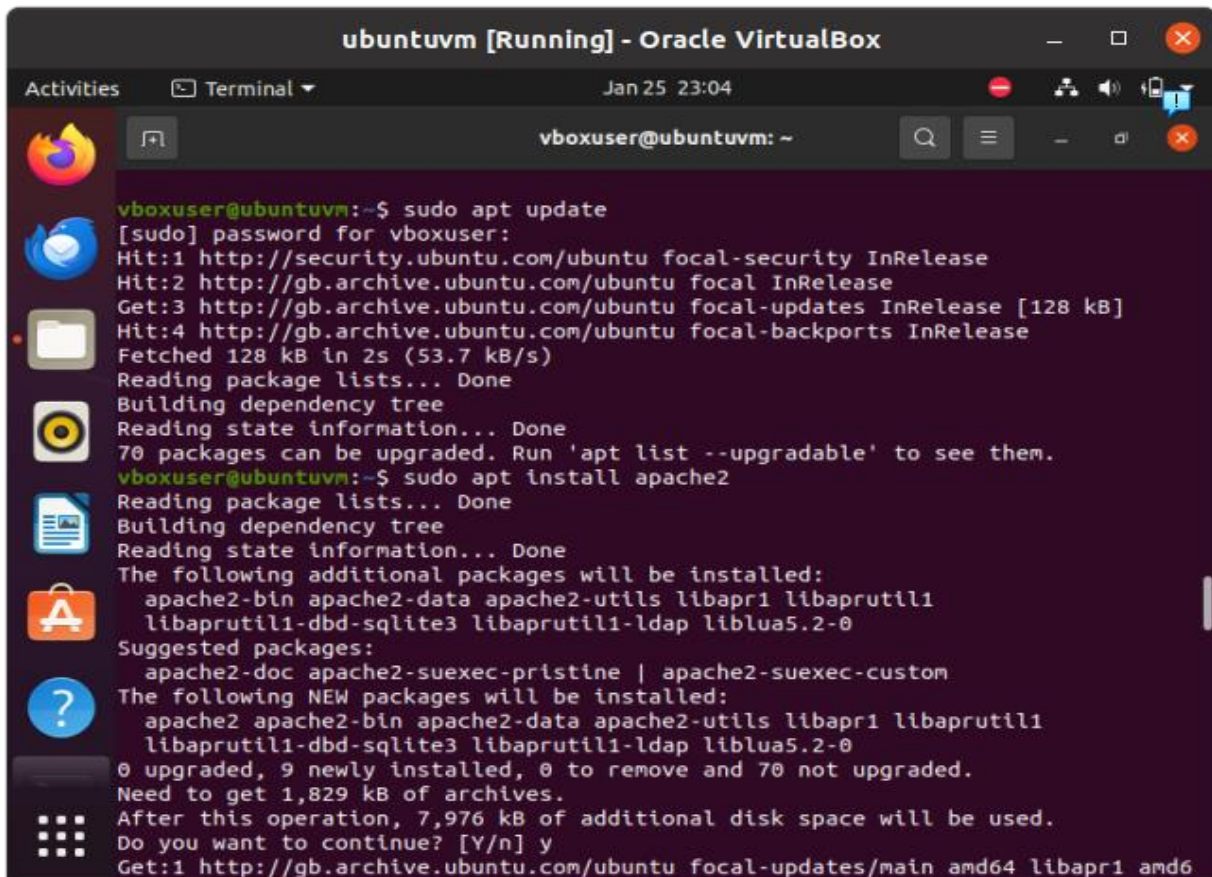
```
sudo apt update
```

#### Install Apache:

Now, install Apache using apt:

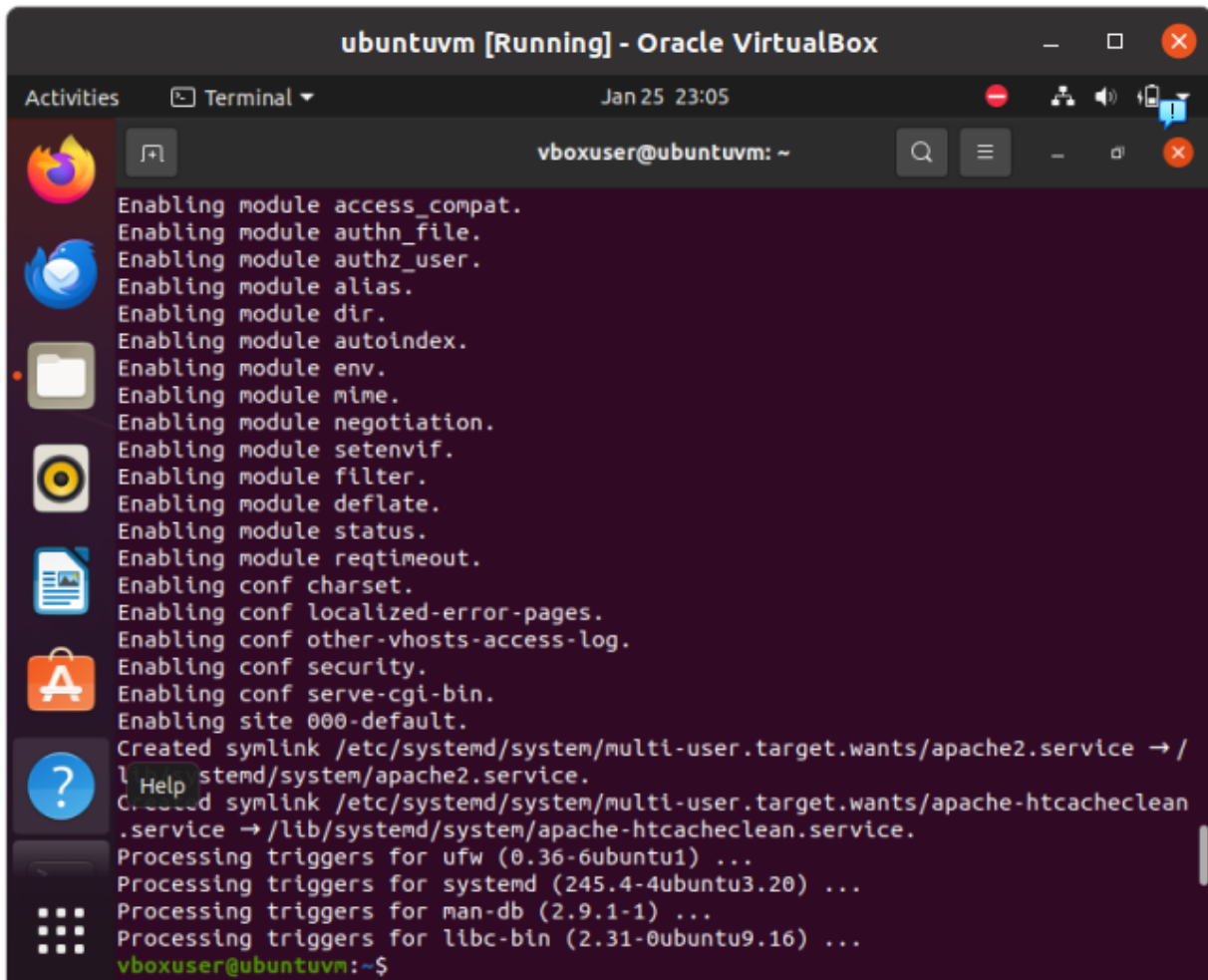
```
sudo apt install apache2
```

This command installs Apache and its dependencies.



```
ubuntuvvm [Running] - Oracle VirtualBox
Activities Terminal Jan 25 23:04
vboxuser@ubuntuvvm: ~

vboxuser@ubuntuvvm:~$ sudo apt update
[sudo] password for vboxuser:
Hit:1 http://security.ubuntu.com/ubuntu focal-security InRelease
Hit:2 http://gb.archive.ubuntu.com/ubuntu focal InRelease
Get:3 http://gb.archive.ubuntu.com/ubuntu focal-updates InRelease [128 kB]
Hit:4 http://gb.archive.ubuntu.com/ubuntu focal-backports InRelease
Fetched 128 kB in 2s (53.7 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
70 packages can be upgraded. Run 'apt list --upgradable' to see them.
vboxuser@ubuntuvvm:~$ 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 70 not upgraded.
Need to get 1,829 kB of archives.
After this operation, 7,976 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://gb.archive.ubuntu.com/ubuntu focal-updates/main amd64 libapr1 amd64
```



```
ubuntuvm [Running] - Oracle VirtualBox
Activities Terminal Jan 25 23:05
vboxuser@ubuntuvm: ~
Enabling module access_compat.
Enabling module authn_file.
Enabling module authz_user.
Enabling module alias.
Enabling module dir.
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 (245.4-4ubuntu3.20) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.16) ...
vboxuser@ubuntuvm:~$
```

2: Start the Web Server Service and Verify It's Running Using systemctl

After installation, you can start the Apache web server using:

```
sudo systemctl start apache2
```

### Verify That the Web Server Is Running:

Use systemctl status to check the status of the web server service:

```
sudo systemctl status apache2
```

```
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 (245.4-4ubuntu3.20) ...  
Processing triggers for man-db (2.9.1-1) ...  
Processing triggers for libc-bin (2.31-0ubuntu9.16) ...  
vboxuser@ubuntuvm:~$  
  
vboxuser@ubuntuvm:~$ sudo systemctl start apache2  
vboxuser@ubuntuvm:~$ sudo systemctl status apache2  
● apache2.service - The Apache HTTP Server  
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor prese  
   Main PID: 118291 (apache2)  
   Tasks: 55 (limit: 2247)  
   Memory: 5.1M  
   CGroup: /system.slice/apache2.service  
           └─118291 /usr/sbin/apache2 -k start  
             └─118292 /usr/sbin/apache2 -k start  
               └─118293 /usr/sbin/apache2 -k start  
  
Jan 25 22:55:22 ubuntuvm systemd[1]: Starting The Apache HTTP Server...  
Jan 25 22:55:22 ubuntuvm systemd[1]: Started The Apache HTTP Server.  
  
vboxuser@ubuntuvm:~$  
vboxuser@ubuntuvm:~$
```

3: Use the ps Command to Identify the Process Associated with the Web Server and Note Its PID

The ps command will help you find the process ID (PID) of the running web server.

```
ps aux | grep apache2
```

This will list the processes associated with Apache. The PID will be listed in the second column of the output.

**Note:** The grep apache2 or grep nginx part filters the results to show only the web server process.

```
ubuntuvn [Running] - Oracle VirtualBox
Activities Terminal Jan 25 23:07
vboxuser@ubuntuvn: ~

Jan 25 22:55:22 ubuntuvn systemd[1]: Starting The Apache HTTP Server...
Jan 25 22:55:22 ubuntuvn systemd[1]: Started The Apache HTTP Server.

vboxuser@ubuntuvn:~$
vboxuser@ubuntuvn:~$
vboxuser@ubuntuvn:~$ ps aux | grep apache2
root      118291  0.0  0.2  6540  4380 ?        Ss   22:55   0:00 /usr/sbin/ap
ache2 -k start
www-data  118292  0.0  0.2 1211428 4408 ?        Sl   22:55   0:00 /usr/sbin/ap
ache2 -k start
www-data  118293  0.0  0.2 1211428 4408 ?        Sl   22:55   0:00 /usr/sbin/ap
ache2 -k start
vboxuser  119436  0.0  0.0   8908   720 pts/0    S+   23:00   0:00 grep --color
=auto apache2
vboxuser@ubuntuvn:~$
vboxuser@ubuntuvn:~$
vboxuser@ubuntuvn:~$
vboxuser@ubuntuvn:~$
vboxuser@ubuntuvn:~$ sudo systemctl restart apache2
vboxuser@ubuntuvn:~$ ps aux | grep apache2
root      119451  0.0  0.2  6540  4492 ?        Ss   23:01   0:00 /usr/sbin/ap
ache2 -k start
www-data  119452  0.0  0.2 1211428 4320 ?        Sl   23:01   0:00 /usr/sbin/ap
ache2 -k start
www-data  119453  0.0  0.2 1211428 4320 ?        Sl   23:01   0:00 /usr/sbin/ap
ache2 -k start
vboxuser  119510  0.0  0.0   8908   720 pts/0    S+   23:02   0:00 grep --color
=auto apache2
vboxuser@ubuntuvn:~$
```

#### 4: Restart the Web Server Service and Confirm That Its PID Changes

I have restarted the web server service in my case (apache2) with the help of these command.

Sudo systemctl restart apache2

In the above picture showing that the PID is changed when it restart command is passed.

You can see that when apache2 was not restarted the PID was (118291,118292,118293) and after the apache2 server is restarted the PID is (119451,119452,119453).

5: Write a Script That Monitors the Web Server Process and Restarts It Automatically If It Stops

Script to Monitor and Restart Web Server

Let's create a script called monitor\_web\_server.sh.

```
sudo nano /usr/local/bin/monitor_web_server.sh
```

```
#!/bin/bash
```

```
# Define the web server service
```

```
WEB_SERVER="apache2" # or "nginx"
```

```
# Check if the web server is running
```

```
if ! systemctl is-active --quiet $WEB_SERVER; then
```

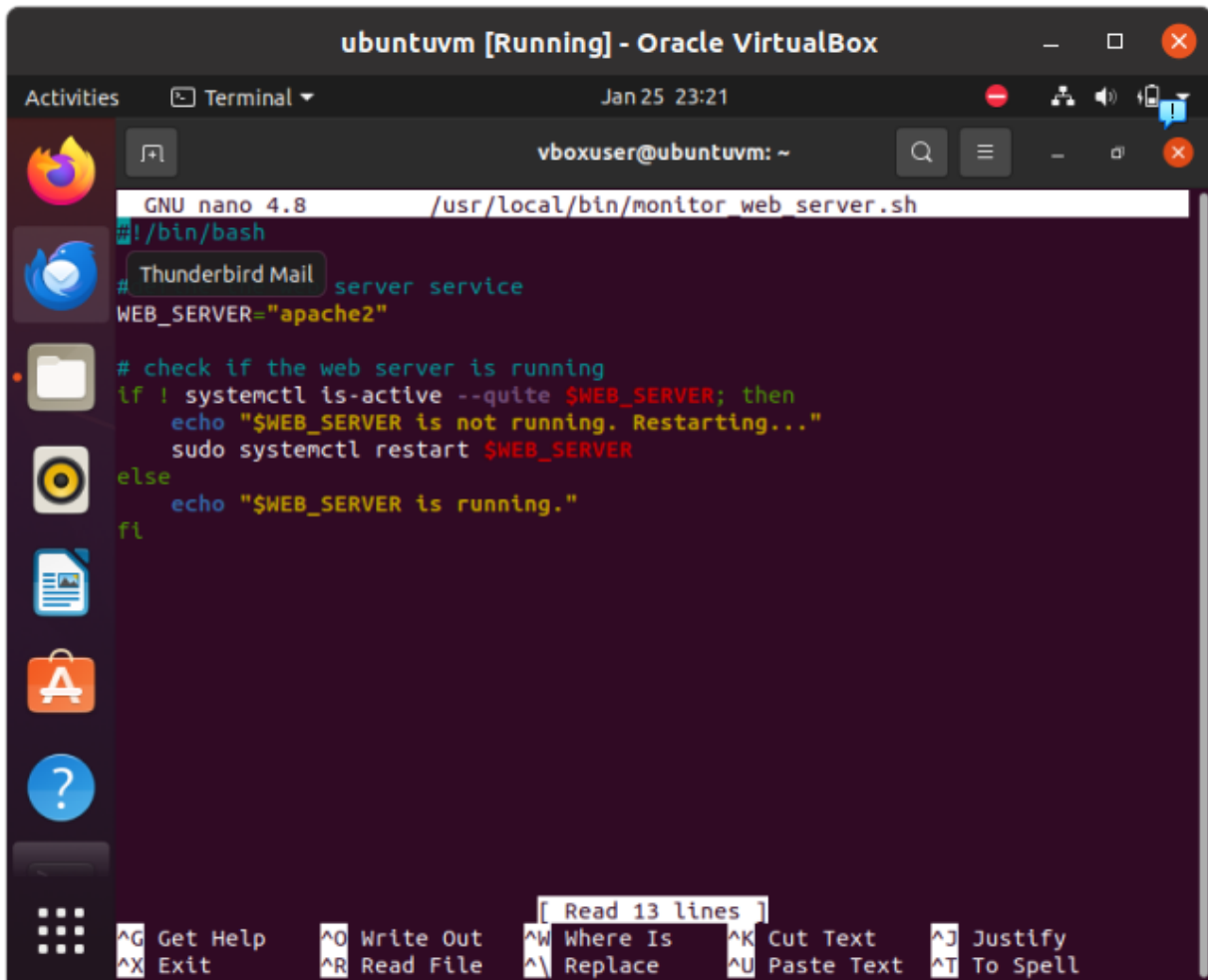
```
    echo "$WEB_SERVER is not running. Restarting..."
```

```
    sudo systemctl restart $WEB_SERVER
```

```
else
```

```
    echo "$WEB_SERVER is running."
```

```
Fi
```



The screenshot shows a terminal window titled "ubuntuvvm [Running] - Oracle VirtualBox". The terminal is running a nano 4.8 editor on the file `/usr/local/bin/monitor_web_server.sh`. The user is `vboxuser@ubuntuvvm: ~`. The script content is as follows:

```
#!/bin/bash
# Thunderbird Mail server service
WEB_SERVER="apache2"

# check if the web server is running
if ! systemctl is-active --quiet $WEB_SERVER; then
    echo "$WEB_SERVER is not running. Restarting..."
    sudo systemctl restart $WEB_SERVER
else
    echo "$WEB_SERVER is running."
fi
```

At the bottom of the terminal, there is a status bar with various keyboard shortcuts: `^G Get Help`, `^O Write Out`, `^W Where Is`, `^K Cut Text`, `^J Justify`, `^X Exit`, `^R Read File`, `^_ Replace`, `^U Paste Text`, and `^T To Spell`. A message `[ Read 13 lines ]` is also visible.

After saving the script, make it executable:

```
sudo chmod +x /usr/local/bin/monitor_web_server.sh
```

You can run the script manually to check if it works:

```
/usr/local/bin/monitor_web_server.sh
```



